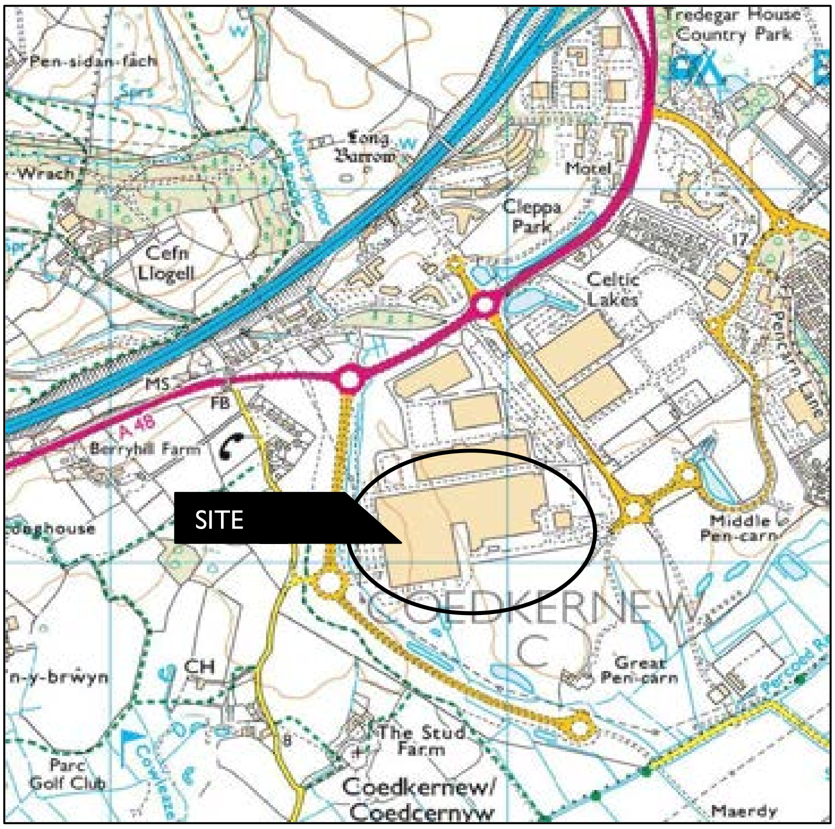
GEOTECHNICS
geotechnical and geoenvironmental specialists

Ground Investigation



www.geotechnics.co.uk

Former Quinn Radiator Factory Site, Newport, Wales

Factual and Interpretative Report

for
Pinnacle Consulting Engineers Limited

Project Number: PN224395

February 2023

Issuing Office:

North West Office
Geotechnics Limited
The Geotechnical Centre
Unit 1, Borders Industrial Estate
River Lane, Saltney
Chester
CH4 8RJ
T: 01244 671 117
F: 01244 671 122
mail@chester.geotechnics.co.uk

Head Office
Geotechnics Limited
The Geotechnical Centre
203 Torrington Avenue
Tile Hill
Coventry
CV4 9AP
T: 02476 694 664
F: 02476 694 642
mail@geotechnics.co.uk

South West Office
Geotechnics Limited
The Geotechnical Centre
7 Pinbrook Units
Venny Bridge
Exeter
EX4 8JQ
T: 01392 463 110
F: 01392 463 111
mail@exeter.geotechnics.co.uk

North East Office
The Geotechnical Centre
Unit 1, Bypass Park Estate
Sherburn-in-Elmet
Leeds
LS25 6EP
Tel: 01977 525030
mail@yorkshire.geotechnics.co.uk

For

Factual and Interpretative Report

Former Quinn Radiator Factory Site, Newport, Wales

for
Pinnacle Consulting Engineers Limited

Project No:
PN224395
February 2023

LIST OF CONTENTS

APPENDICES

1.0 INTRODUCTION

A supplementary geotechnical and geo-environmental ground investigation was carried out by Geotechnics Limited at the site of a former radiator manufacturing facility on the outskirts of Newport. The investigation was carried out to the instruction of Pinnacle Consulting Engineers Limited (Pinnacle), the Client.

An initial ground investigation was undertaken by Geotechnics Limited, in August 2021 and reported previously (reference: PN214233 Former Quinn Radiator Factory, Factual and Interpretative Report, September 2021) and this report should be read in consultation with the previous report.

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 Brief for the project is included in Appendix 1. The investigation comprised cable percussive and rotary boreholes, in situ and laboratory testing and reporting. A geotechnical interpretation and evaluation of the data obtained was also commissioned. No geoenvironmental interpretation and assessment of the data was instructed by the Client. The investigation supplements the previous 2021 ground investigation.

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 14 of this report.

A desk study (Phase 1 Desk Study) has been undertaken by Geotechnics Limited (reference: PN214233 Newport Quinn Preliminary Risk Assessment, May 2021) which summarises the site, its history, geology and ground conditions and provides a preliminary risk assessment and geotechnical risk assessment for the site (see also Section 7). An interpretation of the data obtained is presented in Section 8 and an evaluation of its significance in relation to proposals available at the time of preparation of this report is presented in Section 9.

This ground investigation supplements a previous investigation (referred to in this report as the initial phase ground investigation) also undertaken by Geotechnics Limited, in August 2021 and reported previously (reference: PN214233 Former Quin Radiator Factory, Factual and Interpretative Report, September 2021). The findings are summarised in Section 7. However, the 2021 report should be read in combination with this report for a complete understanding of the ground conditions encountered.

Attention is drawn to the Investigation Techniques and General Notes presented in Appendix 15 to aid an understanding of the procedures followed and the context in which the report should be read.

The report is presented in pdf format and 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.

4.0 THE SITE

4.1 Location

The site is located approximately 5km south-west of the centre of Newport and approximately 1km south of junction 28 on the M4 motorway. The approximate Ordnance Survey National Grid Reference for the centre of the site is ST 278 841 and an extract from the relevant 1:25,000 Scale O.S. Map is included as Appendix 1.

4.2 Description

The site is approximately rectangular in shape and covers an area of approximately 16.59 ha. It comprises a disused radiator manufacturing site with associated areas of hardstanding for roads and parking and areas of soft landscaping comprising mostly short field grass, bushes and mature and semi-mature trees around the perimeter. Most of structures remain in situ with the internal manufacturing infrastructure largely removed to allow access for the drilling rigs. The structures include a large L-shaped warehouse type building with another similar but smaller structure to the south and a concrete slab between. A two storey office building is located to the south-east. Asphalt roads and vehicle parking and grassed areas with shrubs and scattered trees are present towards the periphery of the site mainly to the south and east.

The site has an elevation of approximately 10m OD and slopes gently from north-west to south-east.

There are no water features located on-site, but a pond is located approximately 70m south and a drainage ditch is located approximately 20m to the west.

Several storage vessels were observed including oil and propane bottles, former paint storage tanks, liquid oxygen and liquid argon tanks and gas bottles. Numerous service access chambers were observed including storm and foul drains.

5.0 PROCEDURE

5.1 Commissioning

The current phase of work was awarded following submission of a proposal for ground investigation of the site in accordance with the Client's requirements. An initial phase of ground investigation was undertaken in 2021 as referenced above. The scope of the investigation is summarised below and is detailed within the Brief presented as the offer letter in Appendix 1.

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, BS EN ISO 14688-1:2018 and BS EN ISO 14689:2018. The Cable Percussive Borehole, Rotary Borehole and Dynamic Sample Borehole positions are shown on the Exploratory Hole Location Plan in Appendix 14.

The Exploratory Hole locations were specified by Geotechnics Limited, and were located to supplement the previous limited initial ground investigation to provide more detailed information across the area of interest and coverage where data was sparse.

The co-ordinates and levels shown on the Exploratory Hole Records were measured using a GPS survey device. Positions within the buildings were surveyed using taped measurements from GPS located positions. The depths quoted on the exploratory hole records are in metres below ground level (bgl).

Prior to the investigation, a survey was carried out by Midland Survey Limited utilising Ground Penetrating Radar (GPR) techniques to check for the presence of buried services at the proposed exploratory hole locations. At each exploratory hole location an inspection pit was excavated using hand tools to a depth of 1.20m below ground level to check for the presence of underground services. Prior to and on completion of the excavation, the location was scanned using a cable avoidance tool (CAT). At those locations where concrete was present at ground level, 300mm diameter coring was used to advance the exploratory hole through the concrete and facilitate the excavation of the inspection pit. Details of the concrete coring is included on the appropriate exploratory hole records.

5.3 Cable Percussion Boreholes

Thirty (30 No.)150mm diameter boreholes (BH01 to BH30) were sunk by Cable Percussion Tool techniques to depths of between 1.20m to 11.40m bgl. The work was carried out between 27th July and 2nd September 2022.

Three holes (BH04, BH14 and BH17) had to be moved a short distance from the original location due to concrete obstructions being encountered at shallow depth. The revised locations were numbered BH04A, BH14A and BH17A.

Representative disturbed (D and B) and driven open-tube thin-walled (UT) samples of the soils encountered were obtained at regular intervals. 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. In addition, environmental soil samples (ES) were recovered at the depths indicated on the Borehole Records which are presented in Appendix 3 and 4.

On encountering groundwater, boring operations were suspended for 20 minutes in order to record any rise in water level. Full details of groundwater observations during site work are included on the Borehole Records.

On completion, ten boreholes were continued by rotary coring drilling techniques (see Section 5.4).

On completion, standpipes were installed in several of the boreholes as detailed in Section 5.6. Those boreholes without an installation were backfilled with bentonite and the surface reinstated.

5.4 Rotary Cored (follow-on) Boreholes

Ten (10 No.) boreholes (numbered BH01, BH04A, BH07, BH10, BH14A, BH17A, BH23, BH27, BH28 and BH30) were extended using rotary coring techniques through the base of the cable percussion boreholes which had been left open and cased to facilitate rotary drilling. The rotary core boreholes were 120mm in diameter producing 90mm diameter core and were taken to depths ranging between 19.50m and 21.00m bgl. The work was carried out between the 27th July and the 26th August 2022.

The drilling equipment on this particular contract utilised air mist as the flushing medium.

Rock cores were extruded horizontally in transparent liners and placed into suitable core boxes. Borehole records and photographs of the core are included in Appendices 4 and 5 respectively.

Groundwater observations are included on the Borehole Records where appropriate. It should be noted that the addition of air mist to the borehole as part of the drilling process may have masked the presence of groundwater in the borehole. On completion, standpipes were installed in most of the boreholes (see Section 5.6).

5.5 In Situ Plate Load Tests

Seventeen (17 No.) Plate Load Tests were carried out at the locations marked on the Exploratory Hole Location Plan (see Appendix 14) and numbered PLT1 to PLT5 and PLT7 to PLT18 at depths ranging between 0.15m and 0.45m bgl. Where necessary the concrete floor slab was broken out using a hydraulic breaker attachment to an excavator. The incremental loading tests were carried out in accordance with BS 1377-9:1990 and the Design Manual for Roads and Bridges IAN 73/06 Revision 1 (2009) using a 300mm diameter plate. The reaction for the test was provided by a backhoe excavator (JCB 3CX). The test loads were selected by Geotechnics Limited and the results are presented in Appendix 6 and summarised in the table below;

Location	Depth (m)	Equivalent CBR (%)	Modulus of Subgrade Reaction (kN/m^2)	Strata Tested (see Results Sheets for full description)
1	0.23	24	90	MG: Reddish brown gravelly slightly silty sand.
2	0.44	4.9	36	MG: Reddish brown gravelly slightly silty sand.
3	0.23	8.1	49	MG: Orangish brown gravelly sand.
4	0.22	27	98	MG: Brown gravelly sand.
5	0.19	19	81	MG: Reddish brown sandy gravel.
7	0.20	104	212	MG: Grey sandy gravel of sandstone and aircrete.
8	0.20	58	151	MG: Brown gravelly sand low cobble content.
9	0.24	9.7	54	MG: Reddish brown gravelly sand.
10	0.20	130	242	MG: Brown gravelly sand.
11	0.21	27	97	MG: Brown slightly gravelly clayey sand.
12	0.15	21	84	MG: Dark brown gravelly sand.
13	0.45	70	169	MG: Yellowish brown very gravelly sand.
14	0.20	99	207	MG: Yellowish brown very gravelly sand.
15	0.20	99	207	MG: Black mottled brown gravelly sand.
16	0.20	3.8	31	MG: Brown gravelly sand low cobble content.
17	0.45	13	65	MG: Dark grey brown gravelly sand, cobbs.
18	0.40	17	74	MG: Dark grey to black slightly gravelly sand.

5.6 Instrumentation and Monitoring

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

Exploratory Hole	Standpipe Slotted Pipe & Filter Zone (m)	Strata Monitored
BH01	14.00 to 18.00	Bedrock: Sandstone.
BH03	3.50 to 5.50	Gravel (River Terrace Deposits)
BH04A	15.00 to 17.00	Bedrock: Mudstone.
BH06	1.00 to 2.70	Clay (River Terrace Deposits)
BH07	13.00 to 20.50	Bedrock: Mudstone.
BH09	4.50 to 5.50	Peat.
BH10	5.00 to 6.50	Bedrock: Mudstone/Siltstone.
BH13	4.00 to 5.00	Gravel of mudstone and sandstone (probable weathered bedrock).
BH17A	10.00 to 12.00	Bedrock: Mudstone and sandstone
BH19	4.00 to 5.00	Gravel (River Terrace Deposits)
BH23	9.00 to 13.00	Bedrock: Mudstone.
BH25	3.00 to 4.60	Clay (Alluvium)
BH28	3.00 to 5.00	Clay (River Terrace Deposits)/ Bedrock (Mudstone).
BH30	9.00 to 11.00	Bedrock: Sandstone.

Monitoring of the gas and groundwater levels were undertaken on the 13th (only BH01, BH04A, BH06, BH07), 19th and 26th September 2022.

On each of the manual monitoring rounds a record of the groundwater level in the standpipes was obtained. The following parameters were measured and recorded in each standpipe using a Gas Data Limited GFM435 Gas Analyser.

- Concentrations (% Vol) of CH_4, O_2, CO_2, along with (ppm) H_2S, CO.

- Flow Rate.
- Differential Pressure.
- Barometric Pressure.

The results of the monitoring are presented in Appendix 7.

6.0 LABORATORY TESTING

6.1 Geotechnical

The laboratory testing schedule was formulated by Geotechnics Limited in order to relate to the proposed development plans available at the time of scheduling. The number and type of testing undertaken was constrained by the Client's financial limits, with the investigation being considered as a preliminary phase of the investigation works.

Geotechnics Limited UKAS accredited Laboratory

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 8 Any descriptions, opinions and interpretations are outside the scope of UKAS accreditation.

The tests undertaken are summarised as follows:-

Standard	Test Description	Quantity
BS EN ISO 17892-1:2014	Water Content Determination	32
BS EN ISO 17892-12:2018 Cl. 5.3 & 5.5	Determination of Liquid and Plastic Limits	29
BS EN ISO 17892-4:2016 Cl. 5.2	Particle Size Distribution Determination – Sieving Method	18
BS EN ISO 17892-4:2016 Cl. 5.4	Particle Size Distribution Determination – Pipette Method	14
BS EN ISO 17892-8:2018	Shear Strength by Unconsolidated Undrained Triaxial Test – Single Stage.	2
BS 1377:1990 Part 4: 1990 Cl. 3.3	Dry Density/Moisture Content relationship determination. Compaction Test - British Standard (2.5 kg Hammer)	7
BS 1377:1990 Part 4: 1990 Cl. 3.5	Dry Density/Moisture Content relationship determination. Compaction Test - British Standard (4.5 kg Hammer)	7
BS 1377:1990 Part 4: 1990 Cl. 7.2	California Bearing Ratio (CBR) Measurement	13
ASTM D5334-14	Determination of Thermal Conductivity of Soil and Soft Rock by Thermal Needle Probe.	22

Derwentside Environmental Testing Services (DETS) Laboratory

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

BRE Special Digest 1 Suite

Twenty six specimens, each comprising the following suite of tests;
Total Sulphur, Total Sulphate, Water Soluble Sulphate, pH, Magnesium, Ammonia, Chloride and Nitrate.

In addition, two organic content tests were undertaken.

The results of these tests are presented in Appendix 8.

Professional Soils Laboratory (PSL) Limited Laboratory

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

Standard	Test Description	Quantity
BS EN ISO 17892-5:2017	Incremental Loading Oedometer	1
ISRM Testing Methods	Unconfined Compressive Strength Determination	38
ISRM Testing Methods	Point Load Determination	257

The results of these tests are presented in Appendix 8.

6.2 Contamination

Selected samples of soil and groundwater were tested at the laboratories of Derwentside Environmental Testing Services Limited for a number of determinands in order to quantify potential site contamination. The determinands were selected by Geotechnics Limited were based on potential contaminants identified from the findings of the previous desk study and initial phase ground investigation. The laboratory results are detailed on the results sheets in Appendices 9 and 10 together with the test result as well as the test method, accreditation and detection limit.

7.0 SUMMARY OF PREVIOUS INVESTIGATIONS

7.1 General

A desk study for the site has been undertaken by Geotechnics and the results presented and discussed in report "Preliminary Risk Assessment – Newport Quinn SDD RPF, Newport, Wales", Report Number PN214233 dated May 2021. The findings of the desk study are also summarised in the report on the previous (initial phase) ground investigation, reference "Factual and Interpretative Report – Newport, Wales, NP10 8FS", Report Number PN214233, dated September 2021.

Both reports should be read in conjunction with this report. A summary of the pertinent findings of the previous reports is given in the following sections in relation to the geology at the site. The site history, hydrology, hydrogeology, unexploded ordnance and environmental issues are all briefly summarised in the previous factual and interpretative report and discussed in more detail in the desk study and are not repeated in this report.

7.2 Published Geology

Published geological maps indicate that most of the site is underlain by Quaternary River Terrace Deposits comprising mostly sand and gravel deposits. A small area in the central western part of the site is shown to be underlain by Alluvium associated with a former river channel. Made Ground would be expected above the natural superficial deposits, associated with the existing development.

Bedrock geology is shown to be the Devonian St. Maughan's Formation comprising interbedded mudstones and sandstones. The south-eastern corner of the site is shown to be underlain by Triassic Mercia Mudstone deposits.

7.3 Previous Investigation Data

A summary of the findings of the initial phase of ground investigation referred to above are presented below.

Details of the initial phase investigation are described and interpreted in the previous report which should be read in combination with this report for a complete understanding of the ground conditions. Exploratory holes were generally located at or outside the perimeter of the existing warehouse building due to access restrictions inside the buildings.

The previous investigation comprised four 200mm diameter boreholes (numbered CP-BH101 to CP-BH103 and WS-BH109) sunk by Cable Percussion Tool techniques to depths of 5.50m (CP-BH101), 8.44m (CP-BH102), 3.45m (CP-BH103) and 9.95m (WS-BH109) below ground level. A fifth borehole (CP-BH105) was terminated on a buried obstruction within the inspection pit at a depth of 0.65m below ground level. Proposed borehole CP-BH104 was cancelled due to time constraints. The work was carried out between 24th May and 1st June 2021.

Five boreholes (numbered RC-BH101 to RC-BH105), up to 100mm in diameter, were sunk utilising a combination of dynamic sampling, rotary open-hole and rotary coring techniques to depths ranging between 7.50m and 15.00m below ground level. The work was carried out between 27th May and 8th June 2021.

Ten Dynamic Sample Boreholes (numbered WS-BH101 to WS-BH108, WS-BH110 and WS-BH111) were undertaken to depths ranging between 1.60m and 4.45m below ground level. The work was carried out between 24th and 27th May 2021. Proposed Dynamic Sample Borehole WS-BH109 was carried out using Cable Percussion techniques due to drilling rig availability.

The locations of the boreholes are shown on Exploratory Hole Location Plan in Appendix 14.

On completion, standpipes were installed in 16 of the boreholes for long term monitoring. Laboratory testing was undertaken on recovered samples (see previous report).

Selected samples of soil and groundwater were tested for a number of determinands in order to quantify potential site contamination (see previous report).

The initial ground investigation encountered Made Ground comprising concrete or asphalt at the surface underlain by sand and gravel with some clay, silt, cobbles, clinker, slag and brick fragments. The Made Ground was found to depths ranging between 0.65m and 4.10m bgl. A number of the exploratory holes were terminated in the Made Ground on encountering obstructions. Standard penetration tests (SPT) indicated the granular material to range between loose and very dense and the cohesive material indicative of high strength clay.

Underlying the Made Ground the exploratory holes encountered clay deposits that possibly represent the Alluvium, River Terrace Deposits and the upper weathered zone of the bedrock. The clay deposits were reddish brown or grey mottled brown in colour and contained a proportion of sand and gravel. They were typically firm and in some places stiff. However, some boreholes encountered layers of soft/very soft clay with some pockets of organic matter that probably comprise the Alluvium. In situ testing indicated the material to range between low to very high strength and with occasional obstructions. The small programme of laboratory testing indicated the clays to be low to high strength and medium to high compressibility. A low to medium (rarely high) classification for volume change potential was indicated.

Bedrock comprising mudstone and siltstone was encountered from depths ranging between 2.80m and 9.40m below ground level (7.80 and 1.35m OD). The material typically comprised extremely weak or very weak brownish red mudstone, occasionally interbedded with very weak grey siltstone. The bedrock was proved to a maximum depth of 15.10m below ground level. Laboratory test results indicated the strength to range from a stiff, high strength clay to extremely weak to moderately weak rock.

Groundwater was encountered within Made Ground deposits in three exploratory holes at 0.90m bgl rising to 0.55m bgl in Borehole WS-BH105. Borehole RC-BH105 encountered groundwater at 2.20m bgl which did not rise. Within the River Terrace Deposits (gravel) Boreholes RC-BH103 and CP-BH102 struck groundwater; at 2.63m bgl rising to 2.00m bgl and at 5.60m bgl with no rise. Within the bedrock, groundwater was encountered in one borehole at 9.00m bgl rising to 4.53m bgl.

Groundwater monitoring undertaken on the 16th June 2021 showed that groundwater was present in all but one of the monitoring wells varying in depth between 0.71m bgl and 3.00m bgl.

Chemical contamination sampling and testing of soil and groundwater and monitoring of permanent ground gases was undertaken to;

- investigate potential hydrocarbons in shallow Made Ground and its potential migration external to the existing warehouse structure,
- investigate potential sources of contaminants near to existing above ground storage tanks and,
- for general site coverage and characterisation.

The findings from the initial investigation can be briefly summarised as follows:-

- The soil testing undertaken as part of an environmental assessment indicated no heavy metals exceeded any generic assessment criteria (GAC) for a commercial end use. No organic contaminants exceeded the relevant GAC. No other inorganic contaminants exceeded the relevant GAC. All samples were negative for the presence of asbestos.

- Concentrations of phytotoxic metals have been recorded in Made Ground in excess of the guideline values for the protection of plants as presented in the Defra Sewage Sludge Code of Practice. Within the Made Ground one sample had marginally elevated values when compared to the relevant GAC. Geotechnics Limited do not consider any additional consideration is required with regards to risk to plants.

- Groundwater samples from the initial investigation were screened against Environmental Quality Standards (EQS) appropriate for the protection of surface water receptors. Exceedances were encountered in both perched groundwater within Made Ground and deeper groundwater. The majority of EQS exceedances show concentrations marginally above the EQS and exceedances were not shown across the whole site. For heavy metals there are no discernible differences between concentrations in perched groundwater in Made Ground and deeper groundwater in Natural deposits. The concentrations present are considered to be typical of regional background concentrations.

- There was no evidence of gross contaminant impact of perched groundwater or natural groundwater from petroleum hydrocarbons and no light non-aqueous phase liquid (LNAPL) was observed during monitoring and/or purging of groundwater prior to sampling.

- No volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOC) were detected above the laboratory limit of detection.

- The permanent ground gas monitoring results confirmed that there are no significant sources of ground gas.

- The findings of the environmental assessment have shown that the only potential concern is from the presence of hexavalent chrome in localised areas of Made Ground, probably related to the presence of slag. Potential risks to construction workers will be mitigated by the appropriate use of personal protective equipment and standard construction hygiene standards. Following development, even if the Made Ground with hexavalent chromium GAC exceedances remains in-situ, the presence of buildings and hardstanding will break the pathway for exposure to future site users.

- The results of assessment of Waste Characterisation indicated Made Ground from CP-BH102 at 0.5m and Made Ground at WS-BH108 at 1.0m were hazardous due to the concentration of chromium. All of the other the materials encountered during the investigation were classified as non-hazardous. Hazardous material that is excavated would need to be removed from site. In accordance with the Waste Regulations, pre-treatment of hazardous materials is required prior to disposal. Due to the limited size of the site it is recommended that hazardous material be taken to a soil treatment centre for pre-treatment where the soils hazardous properties may be reduced. The site must register as a producer of Hazardous Waste with Natural Resources Wales and appropriate Duty of Care Waste Transfer procedures followed.

- All other Made Ground materials on site are therefore likely to be classified as either inert or non-hazardous waste.

- In conclusion the investigation indicated that there were no significant geoenvironmental risks present at the site, with potential risks to construction workers being mitigated via health and safety procedures. It was recommended that one round of confirmatory groundwater sampling using the low-flow purging and sampling technique should be undertaken during any subsequent geotechnical investigation.

8.0 INTERPRETATION

8.1 Ground Conditions

On the basis of the expected geology discussed in the Desk Study and the findings of the exploratory holes the various strata proved in the investigation has been classified into the following divisions:-

- Topsoil
- Made Ground (incl. asphalt (Tarmacadam) and concrete)
- Alluvium (incl. organic clay and peat)
- River Terrace Deposits - Cohesive
- River Terrace Deposits - Granular
- St. Maughan's Formation (Upper Clay Layer)
- St. Maughan's Formation (Mudstone / Siltstone)

The ground profile exposed in the exploratory holes represents the conditions at discrete locations. The degree to which they represent conditions between or beyond the exploratory holes is a matter for conjecture and these can only be interpolated and hence, the uncertainties arising from this should be recognised.

Sections through the site are included in Appendix 12 to give an indication of the ground and groundwater conditions at the site. These sections are indicative only and reference should be made to the Exploratory Hole Records for detailed descriptions of the soils and the groundwater conditions encountered.

The table below provides a brief summary of the ground profiles found in the exploratory holes. Reference should be made to the Exploratory Hole Records for detailed descriptions of the soils encountered.

The ground profile at the site is summarised as follows:-

Stratum	Typical Description	Depth to Top (m bgl)	Level of Top (m OD)	Thickness (m)
Topsoil	Brown slightly gravelly sand with rootlets. (Borehole BH28 only).	GL	10.83	0.15
Made Ground - Concrete	Light to dark grey concrete. (Boreholes BH05, BH06, BH08, BH09, BH10, BH11, BH12, BH13, BH14, BH14A, BH15, BH17, BH17A, BH18, BH19, BH20, BH21, BH24, BH25, BH26, BH30).	GL to 0.02m	10.65 to 9.99	0.15 to 0.45
Made Ground - Asphalt	Black tarmacadam. (Boreholes BH01, BH02, BH03, BH04, BH4A, BH05, BH07, BH22, BH23, BH27 and BH29).	GL	12.68 to 10.18	0.02 to 0.25
Made Ground	Light to dark brown, reddish, yellowish, orangish and greyish brown, slightly clayey gravelly, sand.	GL (BH16) to 0.45 (BH20, BH21)	13.12 to 10.03	0.20 (BH20) to 2.85 (BH28)

	Rarely sandy gravel and rarely sandy gravelly clay. Occasionally with ash, clinker and slag. Occasionally with low cobble content of sandstone, concrete, siltstone, granite and brick fragments. Rarely with blocks of aircrete, Thermolite insulation, wood fragments and occasionally metal (including steel reinforcement bar) fragments.			
Alluvium	Soft to firm, light to dark brown, slightly sandy, slightly gravelly, CLAY occasionally light brown slightly gravelly SAND with a low cobble content. (Boreholes BH09, BH17A, BH26). Soft to firm dark brown mottled grey or brown slightly sandy slightly gravelly pseudo-fibrous PEAT and organic CLAY with wood fragments. (Boreholes BH09 and BH26).	1.20 (BH17A, BH26) to 3.00 (BH09)	9.84 to 8.01	1.50 (BH09) to 6.40 (BH26)
River Terrace Deposits - Cohesive	Soft to firm occasionally stiff to very stiff, brown occasionally mottled grey, orangish and yellowish, sandy, gravelly, CLAY occasionally with low cobble content. (BH01, BH03, BH04A, BH05, BH06, BH07, BH10, BH11, BH14A, BH15, BH16, BH18, BH24, BH25, BH28 and BH29)	0.36 (BH07) to 3.00 (BH10, BH28)	12.32 to 7.83	0.24 (BH27) to 4.00 (BH18)
River Terrace Deposits - Granular	Medium dense to dense brown, occasionally orangish, sandy, clayey, sub-angular to sub-rounded GRAVEL, gravelly SAND occasionally with low cobble content. (BH01, BH02, BH03, BH07, BH08, BH12, BH13, BH15, BH18, BH19, BH20, BH21, BH22, BH23, BH24, BH25, BH27 and BH29)	0.30 (BH22) to 3.00 (BH01, BH02, BH03, BH18)	7.77 to 12.08	0.40 (BH18) to 4.40 (BH07)
St. Maughan's Formation (Upper Clay Layer)	Firm to stiff, occasionally very stiff, reddish brown gravelly sandy CLAY occasionally with a low cobble content. Gravel and cobbles are mudstone, siltstone and sandstone.	2.30 (BH30) to 7.60 (BH26)	9.02 (BH16) to 3.35 (BH26)	1.40 (BH08, BH10, BH25) to 4.73 (BH18)
St. Maughan's Formation (Mudstone / Siltstone)	Extremely weak to medium strong reddish brown MUDSTONE, SILTSTONE and SANDSTONE, generally with closely to very closely spaced horizontal to 60 degree inclined discontinuities. Occasionally interbedded. Mudstone occasionally recovered as gravelly clay.	3.70 (BH29) to 8.00 (BH01)	7.52 (BH29) to 2.86 (BH01)	17.20* (maximum proven; BH28)

*Base of stratum not proven

8.1.1 Topsoil

Topsoil was only encountered in Borehole BH28. The material was described as brown slightly gravelly sand with rootlets and was 0.15m thick.

8.1.2 Made Ground

Made Ground was encountered in all of the exploratory holes. The material varied across the site, both in terms of thickness and composition.

The exploratory holes within the main structure and several immediately adjacent to it proved the concrete floor slab at the surface to be between 0.15m and 0.45m thick.

Borehole BH17 was terminated on a probable concrete obstruction at 1.70m depth which was 1.50m below the base of the main concrete slab. Borehole BH04 was terminated due to a concrete obstruction at 1.54m depth and Borehole BH14 also on a concrete obstruction at 1.20m depth.

Exploratory holes undertaken just to the north of the main warehouse building and within car parking areas or roadways near to the building encountered between 0.02m and 0.25m thick asphalt. A thin skin of asphalt overlay concrete in one hole, Borehole BH05.

Beneath the surface materials, Made Ground was encountered in all exploratory holes and, whilst predominantly granular, is variously described as light to dark brown, reddish, yellowish, orangish and greyish brown, slightly clayey gravelly, sand, sandy gravel and rarely sandy gravelly clay, occasionally with ash, clinker and slag, occasionally with a low cobble content of sandstone, concrete, siltstone, granite and brick fragments, rarely with blocks of aircrete, Thermolite insulation, wood fragments and occasionally with metal fragments and including steel reinforcement bar.

The maximum depth of the base of the material varies from between 0.30m (10.40m OD) and 3.00m (7.83m OD). The greatest depth was found in exploratory holes BH09 and BH10, in the north-western quadrant of the site, BH30 near to the south-western corner and BH28 in the south-eastern part of the site. These also correspond to the lowest elevations at which it was encountered. The initial ground investigation found Made Ground to a maximum depth of 4.10m below ground level (RC-BH105; north-eastern part of the site). These deeper areas of Made Ground indicate the variable nature of its depth and likely represent where softer areas of natural ground may have been excavated and replaced in preparation of the construction of the concrete slab for structures.

One water content test indicated a natural value of 9.5% for a sample of clay, see Figure 1 (Appendix 11).

One particle size distribution test classified the made ground as very sandy clayey gravel, with 22% fine material (<63µm), 34% sand and 44% gravel fractions, see Figure 3.1 (Appendix 11).

The SPT N values were found to be between 15 and 43 indicating a relative density of medium dense to dense. The results have bene plotted and are shown on Figure 4.1 (Appendix 11). The N values do not shown a clear trend with depth, being variable. Five tests did not achieve the required full penetration and are considered to have encountered gravel or cobbles.

A laboratory CBR test on granular Made Ground provided values of 37% (top) and 58% (bottom) with an average of 48%.

The results of seventeen plate load tests gave equivalent CBR values ranging between 3.8% and 130% with all but 6 of the CBR values being below 27%. The associated Modulus of Subgrade Reaction were between 31 and 242 kN/m^2.

A table summarising the test results and derived parameters for the Made Ground is presented as Table 1 in Appendix 11.

8.1.3 Alluvium

Below the Made Ground in Boreholes BH09 BH17A, and BH26, soil classified as Alluvium was encountered. It was generally found to comprise soft to firm, light to dark brown, slightly sandy, slightly gravelly, clay occasionally with a slight organic odour. In Borehole BH09 a 1m thick layer of peat from 4.50m bgl was encountered.

The alluvium was encountered from depths ranging between 1.20m and 3.00m bgl (9.84 and 8.01m OD) and was found to be between 1.50m and 6.40m thick. The base was proven at depths ranging from between 3.40m (BH17A) and 7.60m (BH09). The material was generally present along a north to south trending strip of land in the western third of the site. The soft clay soils found in this area in Boreholes CP-BH101, WS-BH110, and WS-BH130 from the previous investigation and also located in this area may also comprise Alluvium.

The water content was found to be variable and ranged from 10.4 to 141%, see Figure 1 (Appendix 11). The Atterberg Limit test results gave a Plasticity Index (PI) ranging between 17 and 23% and generally classifying the soil as a clay of intermediate plasticity with one result plotting just into the low category and another plotting as silt (see Figure 2, Appendix 11). Modifying the PI to take account of the soil particles greater than 425µm of the sample tested following the procedures in NHBC Standards Chapter 4.2 gives Modified PIs of between 7 and 23% with an average of 15% indicating no volume change to medium volume change potential. The high water content of 141% is indicative of an organic material. A sample of peat was indicated to be non-plastic which is due to the fibrous nature of the material.

The SPT N values were found to be between 0 and 26 and are shown on Figure 4.1 (Appendix 11). Values are scattered and show a slight increase in value down to 3m depth then decrease to 7.00m. Based on the relationship $c_u = f_l x N$ (kN/m^2) proposed by Stroud & Butler, where $f_l = 5$ for clay using the mean PI of 19%, the N values are approximately equivalent to undrained shear strengths of 0 to 130 kN/m^2 (average 59 kN/m^2) which are indicative of extremely low to high strength conditions. The SPTs in BH17A at 1.20m (N=15), 2.00m (N=19) and 3.00m (N=26) depth are considered likely to have encountered cobbles which are included in the stratum description.

One compaction test results showed a maximum dry density of 2.19 Mg/m^3 and optimum water content of 6.0%. The natural water content of the material indicates it to be wet of optimum.

The organic content of samples from BH09 (4.50m – 5.00 m depth) and BH26 (4.80m depth) was found to be 0.7% and 21% respectively.

Two samples underwent one dimensional consolidation testing by oedometer. A sample of clay with a slightly organic odour from borehole BH09 at 4.00m depth resulted in a coefficient of compressibility m_v of 0.44 m^2/MN over a pressure range of 0-40kPa indicating the material to have a high compressibility. A sample of clayey pseudo-fibrous peat from borehole BH09 at 5.00m depth resulted in a coefficient of compressibility m_v of 1.51 m^2/MN over a pressure range of 0-50 kN/m^2 indicating the material to have a very high compressibility. Results obtained during the initial investigation have been reviewed and tests undertaken in Boreholes CP-BH102 and CP-BH103 in the south of the western half of the site (to the south and west of Boreholes BH26) indicated the clay to be medium to high compressibility.

Two specimens were testing in the laboratory for Thermal Conductivity. Results ranged between 2.54 and 2.57 W/(m.k) (average 2.56 W/(m.k)) with associated Thermal Resistivity of 0.39 (m.k)/W. The temperature of the specimens ranged between 19.3 and 20.3 °C (average 20 °C). Bulk density results taken as part of the testing ranged between 1.66 and 2.24 Mg/m^3 (2.01 Mg/m^3).

A table summarising the test results and derived parameters for the Alluvium is presented as Table 2 in Appendix 11.

8.1.4 River Terrace Deposits

Soils classified as the River Terrace Deposits were encountered in the most of boreholes below the Made Ground. The soils encountered can be divided into two groups; Cohesive soils and Granular Soils.

Cohesive Layer

Cohesive Layers in the River Terrace Deposits comprising soft to firm occasionally stiff to very stiff, brown occasionally mottled grey, orangish and yellowish, sandy, gravelly, clay occasionally with low cobble content were found in Boreholes BH01, BH03, BH04A, BH05, BH06, BH07, BH10, BH11, BH14A, BH15, BH16, BH18, BH24, BH25, BH28 and BH29. It was encountered from depths ranging between 0.36m (BH07) and 3.00m (BH10 and BH28), at elevations ranging between 7.83 and 12.32 m OD, and ranged in thickness between 0.10m and 4.40m. These deposits were found mainly along the northern edge and the northern half of the eastern third of the site.

The water content was found to be variable and ranged between 8 and 41%, see Figure 1 (Appendix 11). The

Atterberg Limit test results gave a Plasticity Index (PI) ranging between 9 and 23% generally classifying the soil as a clay of low to intermediate plasticity with one result plotting just into the high category and another plotting below the 'A-line as a silt (see Figure 2, Appendix 11). Modifying the PI to take account of the soil particles greater than 425µm of the sample tested following the procedures in NHBC Standards Chapter 4.2 gives Modified PIs of between 4 and 20% indicating a range between no volume change and a low volume change potential.

Three particle size distribution tests showed generally similar curves classifying the material as described above, with between 23 and 59% fine material (<63µm), between 24 and 49% sand and between 17 and 44% gravel fractions (see Figure 3.2, Appendix 11).

The SPT N values were found to be between 11 and 46 and are shown on Figure 4.1 (Appendix 11). Values are scattered and do not show a particular change with depth. Based on the relationship $c_u = f_1 x N$ (kN/m^2) proposed by Stroud & Butler, where $f_1 = 6$ for clay using the mean PI of 15%, the N values are approximately equivalent to undrained shear strengths of 66 to 276 kN/m^2 which are indicative of medium to very high strength conditions. Twelve test failed to achieve full penetration and produced. These tests are considered likely to have encountered gravel or possibly cobbles.

One unconsolidated undrained triaxial test gave an undrained shear strength results of 64 kN/m^2 indicating an undrained strength of medium strength. A plot of shear strength against depth including equivalent undrained shear strength derived from SPT N values is presented on Figure 5 (Appendix 11).

Five compaction test results showed a range of maximum dry density and optimum water content values ranging from 2.03 to 2.20 Mg/m^3 and from 7.5 to 9% respectively. The natural water content of the material indicates it to generally be wet of optimum.

Five laboratory CBR tests provided values of between 0.59 and 47% with an average of approximately 8%.

Seven specimens were tested in the laboratory for Thermal Conductivity. Results ranged between 1.24 and 3.37 W/(m.k) (average 2.29 W/(m.k)) with associated Thermal Resistivity ranging between 0.30 and 0.81 (m.k)/W (average 0.48 (m.k)/W). The temperature of the specimens ranged between 19.3 and 20.3 °C (average 19.9 °C). Bulk density results taken as part of the testing ranged between 1.66 and 2.23 Mg/m^3 (average 2.08 Mg/m^3).

A table summarising the test results and derived parameters for the River Terrace Deposits - Cohesive is presented as Table 3 in Appendix 11.

Granular Layer

Granular Layers in the River Terrace Deposits comprising medium dense to dense brown, occasionally orangish brown, sandy, clayey, sub-angular to sub-rounded gravel, gravelly sand in places, with low cobble content were found in Boreholes BH01, BH02, BH03, BH07, BH08, BH12, BH13, BH15, BH18, BH19, BH20, BH21, BH22, BH23, BH24, BH25, BH27 and BH29. The material was encountered from depths ranging between 0.30m (BH22) and 3.00m (BH01, BH02, BH03 and BH18), at elevations ranging between 7.77 and 12.08 m OD, and ranged in thickness between 0.40m (BH18) and 4.40m (BH07). These granular soils are generally present in the southern part of eastern two thirds of the site, as well as in some boreholes in the western third and the eastern edge. There is also the absence of granular soils from the previous investigation boreholes around the edge of the site

Fourteen particle size distribution tests showed generally similar curves classifying the material as described above, with between approximately 3 and 26% fine material (<63µm), between 7 and 43% sand and between 36 and 81% gravel fractions, with a cobble content of between 0 and 9%. See Figure 3.2 (Appendix 11).

The SPT N values were found to be between 11 and 51 and are shown on Figure 4.1 (Appendix 11). Values are scattered and do not show a particular change with depth. Eighteen tests failed to achieve full penetration with penetrations of 75 to 265 mm being achieved for 50 blows These tests are considered likely to have encountered gravel or cobbles.

Seven compaction test results showed a range of maximum dry density and optimum water content values ranging from 2.10 to 2.21 Mg/m^3 and from 6 to 9% respectively.

Seven laboratory CBR tests provided values of between 1.20 and 55% with an average of approximately 22%.

Ten specimens were tested in the laboratory for Thermal Conductivity. Results ranged between 1.80 and 2.78 W/(m.k) (average 2.37 W/(m.k)) with associated Thermal Resistivity ranging between 0.36 and 0.55 (m.k)/W (average 0.43 (m.k)/W). The temperature of the specimens ranged between 17.8 and 20.6 °C (average 19.8 °C). Bulk density results taken as part of the testing ranged between 1.93 and 2.84 Mg/m^3 (2.19 Mg/m^3).

A table summarising the test results and derived parameters for the River Terrace Deposits - Granular is presented as Table 4 in Appendix 11.

8.1.5 St. Maughan's Formation (Upper Clay Layer)

Clay soil classified as the St. Maughans Formation was encountered below the River Terrace Deposits or the Alluvium in the most of exploratory holes and probably comprises the upper weathered zone of the formation. The material is described as firm to stiff, occasionally very stiff, reddish brown gravelly sandy clay, occasionally with a low cobble content. The gravel and cobbles are mudstone, siltstone and sandstone. It was encountered at depths ranging from between 2.30m and 7.60m (3.35 and 9.02 m OD) and ranged in thickness from 1.40m to 4.73m. The level of the surface is generally at lower elevations in a north west to south east strip of land towards the west site.

Whilst the bedrock below this layer will also be weathered to some degree these clay soils have been separated from the underlying rock strata of the St. Maughan's Formation in order to separate the more highly weathered material which is likely to behave more like a clay than a rock and was able to be penetrated using cable percussive boring techniques.

The water content was found to be variable and ranged between 9.5 and 40%, see Figure 1 (Appendix 11). The Atterberg Limit test results gave a Plasticity Index (PI) ranging between 14 and 34% generally classifying the soil as a clay of low to intermediate plasticity and silt of high and very high plasticity, see Figure 2 (Appendix 11). Modifying the PI to take account of the soil particles greater than 425μm of the sample tested following the procedures in NHBC Standards Chapter 4.2 gives Modified PIs of between 10 and 31% indicating a low to medium volume change potential.

The SPT N values were found to range between 7 and 50 and are shown on Figure 4.1 (Appendix 11). A slight increase in the N value with depth can be seen. A general lower bound line to most of the data shows an increase in N from about 17 at 3m bgl to 33 at 10m bgl with a small number of tests with low N values of less than 11 can be seen indicating the presence of low strength zones within the stratum. Based on the relationship $c_u = f_1 x N$ (kN/m^2) proposed by Stroud & Butler, where $f_1 = 5$ for clay using the mean PI of 22%, the N values are approximately equivalent to undrained shear strengths of 85 to 250 kN/m^2 for those N values over 11 which are indicative of high and very high strength conditions. The N values less than 11 are approximately equal to undrained shear strengths of 35 to 55 kN/m^2 indicating zones of low and medium strength. Fourteen test did not achieve full penetration and produced 'Extrapolated N' values of between 78 and 563. These tests are considered likely to have encountered more competent bedrock or gravel and cobble lithorelicts.

One unconsolidated undrained triaxial test gave an undrained shear strength result of 76 kN/m^2 indicating high strength conditions. A plot of undrained shear strength against depth including the undrained shear strengths derived from the SPT N values is presented on Figure 5 (Appendix 11).

One compaction test results showed maximum dry density and optimum water content values of 1.75 Mg/m^3 and from 18% respectively. The natural water content of the material indicates it to generally be wet of optimum.

Two specimens were tested in the laboratory for Thermal Conductivity. Results ranged between 2.60 and 2.71 W/(m.k) (average 2.66 W/(m.k)) with associated Thermal Resistivity ranging between 0.37 and 0.38 (m.k)/W (average 0.38 (m.k)/W). The temperature of the specimens ranged between 17.8 and 20.6 °C (average 19.1 °C). Bulk density results taken as part of the testing ranged between 1.93 and 2.84 Mg/m^3 (average 2.21 Mg/m^3).

The range of measured and derived parameters for the clay have been tabulated in Table 4 of Appendix 11.

8.1.6 Mudstone / Siltstone (St. Maughan's Formation)

Below the Upper Clay Layer, bedrock comprising mudstone, siltstone and sandstone was encountered. These were described as

- Extremely weak to weak reddish brown MUDSTONE. Discontinuities are horizontal to inclined (10 to 60 degrees), very closely to closely spaced planar to undulating, smooth with occasional black staining.
- Extremely weak to medium strong light grey and reddish brown SILTSTONE with occasional inclusions of grey siltstone. Discontinuities are horizontal to inclined (30 to 40 degrees), very closely to closely spaced, planar to undulating and smooth with occasional black staining.
- Weak to medium strong reddish brown SANDSTONE. Discontinuities are horizontal, closely spaced, planar to undulating, smooth with occasional black staining.

The material is occasionally interbedded and the mudstone is occasionally recovered as gravelly clay.

The rock layers were encountered at depths ranging between 3.70m and 8.00m bgl (2.86m OD and 7.52m OD). The initial ground investigation encountered the deepest bedrock at 9.40m below ground level (1.35m OD) in Borehole WS-BH109 just west of the middle of the southern edge of the site. The maximum depth proven was 21.00m below ground level. The surface of the bedrock is generally at a lower elevation towards the western third of the site.

Seventeen Standard Penetration Test results (Figure 4.1, Appendix 11) did not achieve the required full penetration with a penetration of 40 to 290 for 50 blows. 'Extrapolated N' values of between 78 and 563 have been estimated and are shown on Figure 4.2. The plot shows a general increase in Extrapolated N value with depth. Twelve tests carried out in the upper sections of the bedrock (Boreholes BH01, BH03, BH16, BH19, BH20, BH21, BH23, BH28, BH29 and BH30) were found to range between 26 and 61. These tests were undertaken on weaker, clay layers and non-intact zones within the bedrock and are probably not representative of the mass bedrock strength.

Unconfined Compressive Strength laboratory tests (Figure 7, Appendix 11) carried out indicate the rock strength for the sandstone to range between 5.31 and 13.00 MN/m^2 (indicating generally weak); for the siltstone 2.03 and 7.72 MN/m^2 (indicating very weak to weak) and for the mudstone 0.84 and 19.60 MN/m^2 (indicating extremely weak to weak, occasionally moderately weak). A summary of the results are presented as Table 5 in Appendix 11.

Point load tests were undertaken on samples of the bedrock (mudstone, siltstone and sandstone) and gave $Is_{(50)}$ values ranging between 0.01 and 5.41 MN/m^2 (Axial 0.03 to 5.41 MN/m^2, Diametral 0.01 to 4.27 MN/m^2). The $Is_{(50)}$ values are shown on Figure 6, Appendix 11. Applying a factor of 20 to the $Is_{(50)}$ values in general accordance with suggestions by Broch and Franklin (1972) provides values ranging between 0.2 and 108.2 MN/m^2 (indicating extremely weak to very strong) which is generally in accordance with the visual descriptions recorded. Based on the factored values, the sandstone was found to have an estimated strength of between 0.4 and 85 MN/m^2 (indicating extremely weak to strong), the siltstone between 0.4 and 10 MN/m^2 (indicating extremely weak to weak) and the mudstone between 0.2 and 108 MN/m^2 (indicating extremely weak to very strong). The factored point load results correlate fairly well with the UCS test results considering that the UCS tests are likely to have been undertaken on more competent specimens. However, a different correlation factor may be deemed appropriate for design purposes. The factored values and UCS test results are shown plotted against depth on Figure 7, Appendix 11.

Water Content tests carried out produced results ranging from 4.7 to 10.7% for sandstone, 5.8 to 11.8% for siltstone and 3.1 to 22.5% for mudstone.

One specimen was tested in the laboratory for Thermal Conductivity. The result was 1.18 W/(m.k) with associated Thermal Resistivity of 0.85 (m.k)/W. The temperature of the specimen was 19.1 °C. A bulk density result taken as part of the testing was 1.87 Mg/m^3.

The range of measured and derived parameters for the bedrock have been tabulated in Table 5 of Appendix 11.

8.2 Groundwater

Groundwater was struck during boring at the depths indicated in the following table together with the level risen to following a 20 minute pause in the drilling operations:-

Exploratory Hole	Depth Struck, m bgl (m OD)	Level after 20mins, m bgl (m OD)	Casing Depth m bgl
BH01	3.00 (7.86)	1.50 (9.36)	3.00
BH02	7.40 (3.48)	3.70 (7.18)	7.00
BH02	8.50 (2.38)	6.10 (4.78)	8.50
BH03	3.50 (7.27)	5.80 (4.97)	3.00
BH04A	4.00 (6.86)	3.90 (6.96)	3.30
BH13	3.45 (7.54)	1.39 (9.60)	3.45
BH17A	5.60 (5.44)	5.50 (5.54)	4.00
BH18	8.45 (2.58)	7.90 (3.13)	-
BH18	10.00 (1.03)	6.00 (5.03)	-
BH23	12.00 (-0.09)	11.00 (0.91)	10.50
BH27	16.00 (-5.82)	6.10 (4.08)	10.10
BH30	10.00 (0.99)	4.30 (6.69)	7.50

It should be noted that the addition of drilling fluid may have masked some groundwater strikes.

The depth to first groundwater strike in each of the above boreholes ranged from 3.00m to 16.00m below ground level, equating to elevations between 7.86m OD and -5.82m OD. The highest standing water level in the boreholes recorded after 20 minutes standing or overnight were measured at 1.39m below ground level (9.60m OD) in Borehole BH13.

Groundwater levels monitored in the morning (start of the shift) following the previous day of drilling are presented as follows:

Exploratory Hole	Date and time	Water depth m bgl (m OD)	Borehole depth m bgl	Stratum at base of hole m bgl	Casing depth m bgl
BH03	02/09/2022	Dry	1.20	Made Ground (Gravel)	-
BH04	10/08/2022	Dry	1.54	Made Ground (Sand)	-
BH05	15/08/2022	Dry	1.20	Made Ground (Gravel)	-
BH06	19/08/2022	Dry	1.20	Made Ground (Sand)	-
BH08	22/08/2022	Dry	1.20	Made Ground (Sand)	-
BH09	30/08/2022	Dry	2.50	Made Ground (Sand)	2.50
BH11	18/08/2022	Dry	5.00	Clay	4.50
BH12	16/08/2022	Dry	1.20	Gravel	-
BH12	17/08/2022	Dry	3.00	Clay (weathered bedrock)	3.00
BH13	09/08/2022	Dry	1.20	Made Ground (Sand)	-
BH13	15/08/2022	Dry	2.30	Sand	2.00
BH13	16/08/2022	5.40	5.50	Gravel (weathered bedrock)	5.50
BH15	02/08/2022	Dry	1.20	Made Ground (Sand)	-
BH16	18/08/2022	Dry	4.10	Clay	4.00
BH17	08/08/2022	Dry	1.70	Made Ground (Clay)	-
BH18	04/08/2022	Dry	6.00	Clay (weathered bedrock)	6.00
BH19	01/09/2022	Dry	1.20	Made Ground (Gravel)	-
BH20	31/8/2022	Dry	1.20	Sand	-

BH21	31/08/2022	Dry	1.20	Made Ground (Sand)	-
BH21	01/09/2022	Dry	3.45	Gravel	3.00
BH22	01/08/2022	Dry	1.20	Gravel	-
BH22	02/08/2022	Dry	2.00	Gravel	2.00
BH24	25/08/2022	Dry	1.20	Made Ground (Sand)	-
BH25	23/08/2022	Dry	1.20	Clay	-
BH26	10/08/2022	Dry	1.20	Made Ground (Sand)	-
BH26	11/08/2022	Dry	3.45	Clay	3.00
BH26	12/08/2022	Dry	8.45	Clay (weathered bedrock)	8.00

As part of the initial phase ground investigation, observations made during progression of exploratory holes and during post-installation monitoring have shown that groundwater occurs both as perched groundwater within Made Ground, and as groundwater in the deeper natural deposits. The table below shows a summary of strata where monitoring wells are installed and the standing groundwater level (m OD) measured on the 17th June 2021:

Exploratory Hole	Slotted pipe and (Filter Zone) (m)	Groundwater Level		Strata Monitored
		Depth (m bgl)	Level (m OD)	
WS-BH102	1.00 to 2.28 (1.00 to 2.28)	-	Dry	Made Ground
WS-BH103	1.00 to 2.50 (1.00 to 2.50)	2.13	7.76	Made Ground
WS-BH104	0.50 to 2.00 (0.50 to 2.25)	1.88	8.19	Made Ground
WS-BH105	0.50 to 1.00 (0.50 to 1.00)	0.62	9.43	Made Ground
WS-BH106	0.50 to 1.50 (0.50 to 1.50)	1.46	8.94	Made Ground
WS-BH109	0.50 to 2.50 (0.50 to 2.50)	1.13	9.62	Made Ground
WS-BH110	2.00 to 4.00 (2.00 to 4.45)	2.84	8.11	Made Ground
WS-BH111	2.00 to 3.00 (2.00 to 3.45)	3.00	7.92	Made Ground
CP-BH103	1.00 to 3.00 (1.00 to 3.45)	1.33	9.27	Made Ground
RC-BH101	1.00 to 3.00 (1.00 to 3.45)	2.54	7.64	Made Ground
RC-BH105	1.00 to 4.00 (1.00 to 4.00)	1.93	8.84	Made Ground
CP-BH101	4.00 to 5.50 (4.00 to 5.50)	2.00	7.65	Superficial deposits
CP-BH102	4.00 to 8.00 (4.00 to 8.44)	3.00	7.28	Superficial deposits
RC-BH102	3.00 to 12.00 (3.00 to 12.00)	2.61	7.74	Bedrock
RC-BH103	2.00 to 8.30 (2.00 to 8.30)	2.21	7.78	Bedrock
RC-BH104	3.00 to 15.00 (3.00 to 15.10)	2.50	8.36	Bedrock

The results of monitoring within the current investigation carried out on the 20th and 26th September, 2022 together with installations from the initial investigation are summarised as follows:

Exploratory Hole	Response Zone (m)	Groundwater Level		Strata Monitored
		Depth (m bgl)	Level (m OD)	
BH01	14.00 to 18.00	2.63 to 2.68	8.23 to 8.18	Bedrock: Sandstone.
BH03	3.50 to 5.50	2.13 to 2.25	8.64 to 8.52	Gravel (River Terrace Deposits)
BH04A	15.00 to 17.00	2.56 to 2.62	8.30 to 8.24	Bedrock: Mudstone.
BH06	1.00 to 2.70	1.77 to 1.80	9.09 to 9.06	Clay (River Terrace Deposits)
BH07	13.00 to 20.50	4.84 to 4.95	7.84 to 7.73	Bedrock: Mudstone.
BH09	4.50 to 5.50	2.28 to 2.29	8.73 to 8.72	Peat.
BH10	5.00 to 6.50	2.79 to 2.83	8.21 to 8.17	Bedrock: Mudstone/Siltstone.
BH17A	4.00 to 5.00	3.44 to 3.56	7.60 to 7.48	Gravel of mudstone and sandstone (probable weathered bedrock).
BH19	10.00 to 12.00	3.00 to 3.03	8.01 to 7.98	Bedrock: Mudstone and sandstone
BH23	4.00 to 5.00	4.73 to 4.75	7.18 to 6.26	Gravel (River Terrace Deposits)
BH25	9.00 to 13.00	3.07 to 4.56	7.93 to 6.44	Bedrock: Mudstone.

BH28	3.00 to 4.60	3.45 to 3.50	7.38 to 7.33	Clay (Alluvium)
BH30	3.00 to 5.00	3.22 to 3.25	7.77 to 7.74	Clay (River Terrace Deposits)/ Bedrock (Mudstone).
CP-BH101	4.00 to 5.50	1.95 to 2.10	7.70 to 7.55	Clay and mudstone
CP-BH102	4.00 to 8.44	3.92 to 4.69	6.36 to 5.59	Clay and mudstone
CP-BH103	1.00 to 3.45	1.30 to 1.36	9.30 to 9.24	Clay and mudstone
RC-BH101	1.00 to 3.00	2.26 to 2.32	7.92 to 7.86	Made Ground and clay
RC-BH102	3.00 to 12.00	2.64 to 2.66	7.71 to 7.69	Clay and mudstone
RC-BH103	2.00 to 8.30	2.35 to 4.10	7.64 to 5.89	Clay and mudstone
RC-BH104	3.00 to 15.10	2.62 to 2.64	8.24 to 8.22	Clay and mudstone
RC-BH105	1.00 to 4.00	3.08 to 3.12	7.69 to 7.65	Made Ground (sand and gravel)
WS-BH102	1.00 to 2.28	Dry	-	Made Ground (gravel)
WS-BH103	1.00 to 2.50	Dry	-	Made Ground (gravel) and clay
WS-BH104	0.50 to 2.25	Dry	-	Made Ground (gravel) and clay
WS-BH105	0.50 to 1.00	0.73	9.32	Made Ground (sand)
WS-BH106	0.50 to 1.50	1.48 to 1.58	8.92 to 8.82	Made Ground (sand and gravel)
WS-BH109	0.50 to 2.50	1.13 to 1.14	9.62 to 9.61	Made Ground and clay
WS-BH110	2.00 to 4.45	2.86 to 2.88	8.09 to 8.07	Made Ground, gravel and clay
WS-BH111	2.00 to 3.45	2.74	8.18	Made Ground (gravel) and mudstone

Groundwater depths during monitoring ranged between 1.13m and 4.69m below ground level and elevations ranging between 6.36m and 9.61m OD.

It is considered that the relatively shallow groundwater encountered within several of the boreholes may represent perched groundwater within the Made Ground. The groundwater below what is likely to be perched water has been measured as shallow as 1.77m below ground level.

It should be noted that groundwater levels can vary both seasonally and after prolonged periods of wet or dry weather.

The results of the monitoring are presented in Appendix 7.

9.0 GEOTECHNICAL EVALUATION

9.1 Proposals

It is understood that proposals for the site include demolition and clearance of the existing buildings/hardstanding followed by the construction of a new data centre comprising two buildings with associated areas of access roadways, hardstanding and car parking. It is also understood that the proposed development will include areas of soft landscaping and a number of ponds.

The three main structures of the proposed development are shown on the Proposed Masterplan (Appendix 13) are the two main data centre buildings (CWL 01 and CWL 02) and the electricity sub-station (structure number 04) The data centre buildings (CWL 01 and CWL 02) are expected to be of steel framed construction with lightweight cladding. The maximum anticipated structural loading at foundation level is understood to be 450kN and the maximum anticipated ground floor loading is 25kN/m^2. The building and ground floor slab are not expected to be particularly sensitive to settlement. It is understood that some minor retaining structures (1.20m high) will be required for the unloading docks.

At the time of writing the proposed finished floor levels (FFL) for both buildings are understood to be 11.50m above OD. A central, southern area believed to be at the proposed location of an electrical sub-station has a FFL indicated to be 11.15m. As a result of these proposed levels, a degree of cut and fill will be required, the primary cut area being towards the north-eastern corner of the site and primary fill area being towards the central part of the southern boundary.

A plan showing the proposed general arrangement options at the time of preparation of this report is presented in Appendix 14.

9.2 Foundation Design Principles

In formulating proposals for foundation and floor slab design, the two primary controlling factors are soil strength and foundation settlement. In general it is the latter which is the primary determinand of what is perceived to be satisfactory performance. For clay soils, allowable bearing capacity is based on undrained shear strength, although a Factor of Safety of 3 is commonly adopted in order to ensure that the loading is on the sensibly linear component of the stress/strain curve for the soil.

With time, the clays will strengthen under the higher loadings as any excess pore water pressures dissipate. Hence, the worst case is at the time of initial loading and, for gradually applied or static loading, bearing capacity should progressively increase. For eccentric loading, where peak load is at an extremity of the foundation, this can be higher than the allowable load, provided that the mean equivalent stress is within the allowable value.

For granular or essentially free draining soils the frictional characteristics and density will dominate bearing capacity and this is generally much higher than for clay soils. For normal spread foundations conventional design is typically based on the stress which would give rise to 25mm settlement. Actual settlements will depend upon the type, period, load intensity and width of the loaded area and the thickness and compressibility of the soils below.

A further issue for foundations is the degree of variability in the foundation soils. The adoption of a lower bearing pressure than strength criteria would indicate implicitly that a larger foundation is likely to behave more in line with average conditions and hence, for a given load, will result in less differential settlement.

9.3 Geotechnical Classification

The geotechnical classification appropriate for the site development, as defined in BS EN 1997-1:2004+A1:2013, is Category 2 as the anticipated development and construction comprises conventional geotechnical structures and foundations.

9.4 Earthworks

The proposed finished ground and floor levels will require a degree of cut and fill to be carried out. Several samples of soil from exploratory holes in the 'cut' areas were tested in the laboratory and samples of granular material were tested for particle size distribution and moisture content/dry density relationship and cohesive material was tested for water content, Plasticity Limits and moisture content/dry density relationship.

The particle size distributions of the granular materials were all seen to be generally well-graded and the percentage fines (smaller than 63µm) was generally low, ranging from 3% to 12% and classify as Class 1A according to the Specification for Highway Works Series 600. Cohesive samples from this are were of low plasticity and on the boundary between low and intermediate plasticity with a significant amount (32 to 42%) of granular material being retained on the 425µm sieve and classify as Class 2A according to the Specification for Highway Works Series 600. For all samples tested, the natural water contents were generally within 1% to 3% of the optimum moisture contents determined from the compaction test curves.

The soil samples tested suggest that the 'cut' soils, although variable in nature could be suitable for re-use in 'fill' areas. However, controls will need to be in place to ensure adequate screening of the soils to ensure separation of different classes of materials. Care will also be needed to ensure that water contents remain close to optimum in order to ensure that materials are placed at or close to maximum dry density.

Areas of soft, medium/high compressibility clay were encountered at depth in some of the exploratory holes. Raising ground levels above such materials will increase the overburden pressure on them and this is likely to result in some long-term consolidation settlement. Based on proposals available at the time of preparation of this report, a maximum 'fill' thickness of around 1.0m is anticipated. This would produce an increase in overburden pressure of the order of approximately 20kN/m². It is estimated that such an increase in stress on a 2m thick layer of the soft clay (e.g. CP-BH102) could result in consolidation settlements in the soft clay alone of the order of 20mm. It would therefore be advisable to leave final surfacing for as long as possible after the cut/fill operation to minimise any distress to the finished surface or to consider the treatment or removal of such soft areas. Advice should be sought from a lime stabilisation specialist to discuss the potential for using such techniques to improve the condition of the near surface ground. Total sulphate (SO4) values encountered during laboratory testing ranged between 0.01 and 0.29% and should be considered when discussing this potential option.

9.5 Foundation Solutions

The approach to design and selection of suitable foundation options for this site is based on a hierarchy of complexity and expense. If the simplest and cheapest solution case can be shown to be appropriate, then further discussion is considered superfluous. Where such simple and proven techniques are not expected to be suitable, then other options are examined in more detail. The following options have been considered:

- Traditional pad foundations at shallow depth.
- Traditional pad foundations, but using trench fill to transfer loads to soils at greater depths.
- Raft foundation to reduce the intensity of loading.
- Ground improvement prior to foundation construction.
- Piled solution, including selection of suitable pile types and preliminary calculation of carrying capacity.

9.5.1 Pad Foundations

The Made Ground, due to its variable nature and thickness and to avoid unpredictable total and differential settlements, does not form a suitable founding stratum. With Made Ground present to depths of up to 4.10m encountered in the initial ground investigation (3.00m in the most recent investigation), the use of traditional pad foundations is precluded.

9.5.2 Trench Fill Foundations

Consideration has been given to the use of concrete trench fill foundations taken through the Made Ground into the underlying natural soils. The three main structures of the proposed development CWL 01, CWL 02 and electricity sub-station (structure number 04 on the Proposed Masterplan) are discussed separately. Existing shallow foundations would need to be grubbed out to facilitate such foundations and any existing piles would need to be avoided.

Building CWL 01

Ground conditions comprise Made Ground up to 3.00m deep, underlain by cohesive deposits in some areas and granular deposits in other areas. In view of the variable nature of the materials beneath the proposed structure, including instances where the depth to the firm clay strata is up to 4.80m (Borehole BH10), organic material within Alluvium and peat to 5.50m (BH09), that could lead to excessive differential settlements of greater than 25mm and in places significant total settlements the use of trench fill foundations is unlikely to be economically viable. Therefore, trench fill foundations are likely to be precluded for this structure and consideration should be given to the use of ground improvement or piled foundations as discussed below. At the western end the structure may encroach over an area of soft alluvial soils including peat to a maximum depth of 5.50m below ground level (Borehole BH09). Elsewhere, the underlying River Terrace Clay Layers are typically firm and in some places stiff, although some layers of soft/very soft clay were encountered and these would results in long-term consolidation settlements where they are within the zone of influence of the foundation loads. As discussed in Section 9.4 above, settlements from placed 'fill' materials could be of the order of 20mm or more where they bear onto alluvial soils. Higher structural loadings would therefore increase settlements to levels that would be considered unacceptable. A safe bearing capacity in the order of 80 kN/m^2 can be anticipated for the lower strength cohesive deposits. River Terrace Granular deposits are also likely to be present under part of the structure and would provide a suitable founding stratum with considerably higher bearing capacity with low settlements compared to those foundations bearing on to the soft clay soils. The probable deep open excavations required are also likely to suffer from instability.

Building CWL 02

Ground conditions comprise Made Ground up to 1.20m deep, underlain by cohesive deposits in some areas and granular deposits in others. Hence as with Building CWL 01, in view of the variable ground conditions the use of trench fill foundations are likely to be precluded for this structure and consideration should be given to the use of ground improvement or piled foundations as discussed below. In the central part of the building footprint, Borehole BH17A encountered Alluvium comprising soft clay to a depth of 3.40m below ground level. Relatively high SPT N values within this stratum in Borehole BH17A are considered to relate to encountering boulders (low cobble content). A safe bearing capacity in the order of 80 kN/m^2 can be anticipated for the soft cohesive deposits. The variation between low strength cohesive and granular deposits is likely to lead to excessive total and differential settlement of greater than 25mm. In order to reach a suitable bearing stratum excavation up to 3.40m below ground level is anticipated with associated instability of excavation sides.

Electricity sub-station

There are no exploratory holes within the footprint of the proposed structure. However, ground conditions within this region of the site comprise Made Ground up to approximately 2.70m deep, underlain by cohesive deposits in some areas and granular deposits in others. Immediately to the west of the proposed sub-station location Borehole BH26 encountered Alluvium comprising soft and organic clay to a depth of 7.60m below ground level. Borehole WS-BH103 from the previous ground investigation, to the south of the proposed structure, encountered soft clay to its termination depth of 3.38m below ground level. However, Boreholes BH19, BH20 and BH27 to the north and east of the proposed structure indicate the presence of granular soils overlying mudstone bedrock. On the basis of the findings of Borehole BH26 a safe bearing capacity of around 40 kN/m^2 can be assumed for such material. Given the possibility of soft cohesive deposits to at least 2.70m below ground level and the possible presence of Alluvium to greater depths as described above with the associated total and differential settlement of greater than 25mm then trench fill foundations are likely to be precluded for this structure. However, if additional boreholes were to be undertaken within the footprint of the proposed structure and proved the absence of clay soils then trench fill could potentially be adopted.

9.5.3 Raft Foundations

Consideration has been given to the use of a reinforced concrete raft foundations to reduce the intensity of loading on the Made Ground and underlying low strength cohesive material. However, with the variable thickness of Made Ground and the presence of some soft and very soft clay and organic material, there is a risk that unacceptable differential settlements could occur resulting in cracking and tilting of the rafts. Furthermore, due to the length of the proposed buildings, it is considered unlikely that raft foundations with adequate stiffness to mitigate the effects of potential settlements could be economically designed/constructed without treatment of the Made Ground or soft compressible clay deposits. The use of raft foundations therefore is considered to be precluded.

9.5.4 Ground Improvement

Consideration has been given to the use of the vibratory 'vibro' ground improvement process by which stone columns would be formed through the Made Ground and underlying clay to increase the load bearing capacity.

However, the success of the 'vibro' technique is generally considered to be marginal where very soft clays are present due to the limited lateral restraint provided to the stone columns by the clay. This can result in stone migrating into the adjacent clay when loaded, thus leading to settlement of the foundations. Very soft clay was encountered in borehole CP-BH102 and soft clays/silts were encountered elsewhere below the site such as Borehole BH26. Prior to progressing vibro ground treatment designs the advice of specialist contractors should be sought to confirm the suitability of their methods for the particular ground conditions and to allow development of designs and costings. Any vibro-replacement works should ensure full depth treatment of the fills and should penetrate into the competent underlying strata and could also be suitably designed to accommodate the proposed foundation and floor slab loading subject to suitable settlement behaviour being found (see Section 9.6) and should be undertaken by suitably experienced ground treatment contractors. The presence of old foundations or buried structures if left in place must also be considered in the design. Assurances should also be sought on the likely bearing capacity that would be available for pad foundations and the likely settlements that would occur.

9.5.5 Piled Foundations

With the variable nature and thickness of Made Ground together with variable presence of some soft and occasionally very soft medium and high compressibility clays and granular soils below the building locations and relatively shallow groundwater level, consideration could be given to the adoption of piled foundations. Piles of either the driven or CFA bored type are likely to be suited to the ground conditions. It is recommended that specialist piling contractors are asked for advice on the suitability of their individual piling systems to these ground conditions. They should also be asked for their estimates of the pile size, length and load capacity relationship. For guidance purposes only, it is estimated that a 300mm diameter bored pile socketed 1.00m into the very weak to weak (or stronger) mudstone bedrock should be capable of supporting a safe working load of the order of 250kN. Higher working loads could be achieved by increasing the pile diameter or socket length.

As discussed above, the earthworks operation is expected to cause long-term consolidation settlement of the Made Ground and clay strata in some 'filled' parts of the site. Allowance should therefore be made in the pile design for negative skin friction on the upper part of the pile shaft in those areas of the site where 'fill' is to be placed.

This investigation has not included any investigation of the foundations to the existing buildings. Given the findings of the exploratory holes, it is anticipated that some of the existing buildings may also be supported on piled foundations. If that is the case, it may be possible to re-use these piles to provide support for the proposed buildings. Further investigation would be required, following demolition and clearance of the existing buildings.

9.5.6 Seasonal Ground Movements

NHBC Standards Chapter 4.2, 'Building near Trees' (2022) gives guidance on foundation depths and precautions against heave where foundations are to be constructed within influencing distance of trees and the volume change potential of the foundation soils. There are not believed to be any existing trees in influencing distance of the site. However, any planting which may be planned as part of the development will need to be considered.

The volume change potential of the soils found during the investigation are based on the Modified Plasticity Index I'p, which is calculated as follows:

$$\mathbf{I'p = PI \times \frac{\underline{\%\ less\ than\ 425\mu m}}{100}}$$

The Modified Plasticity Index for the strata are summarised in Tables 1 to 4 of Appendix 11. The volume change potential for each of the stratum are summarised as follows:-

Strata Type	Volume Change Potential
Made Ground	Medium (based on initial phase of GI)
Alluvium	Low
River Terrace Deposits	Low
St. Maughan's Formation (Upper Clay Layer	Low

Tests on samples of clay from the boreholes have shown the clay (Alluvium, River Terrace Deposits and St Maughan's Formation) to typically be of 'low' volume change potential. The initial phase of ground investigation indicated that the Made Ground had a 'Medium' volume change potential. Clays can shrink and swell due to seasonal variations in moisture content or due to variations in moisture content caused by tree root systems. It is therefore recommended that foundations are designed to limit the effects of any seasonal ground movements, especially where any trees are planned, present or have been removed within influencing distance of foundations. For piled foundations this could include sleeving the upper part of the pile shafts and providing compressible materials below any pile caps, ground beams or suspended floor slabs. Guidance on suitable precautions is provided in NHBC Chapter 4.2 'Building near trees'.

9.6 Slab Design

The long term settlement of the floor slab will depend on a number of factors including the structural design of the slab, the duration, intensity and distribution of the applied loading as well as the strength, compressibility and history of the soils beneath slab. The preferred solution for the floor slab will also depend on the type of foundation adopted with a suspended floor slab typically being used where the structural loads are carried on piled foundations.

Due to presence of Made Ground and its thickness and variability, as well the presence of some soft and very soft and organic clays, the adoption of a ground floor slab construction unlikely to be viable due to the risk of unacceptable settlements developing. It is therefore recommended that a fully suspended ground floor slab construction is adopted with all loads carried on the main structural foundations.

A ground bearing could be used following treatment of the Made Ground and the soft clays by extending the use of techniques such as vibro-compaction/replacement, if used for the foundations, beneath the area of the floor slab.

9.7 Retaining Walls

It is understood that some minor retaining structures (1.20m high) may be required for the vehicle unloading platforms. On the building line, it is anticipated that these walls will be supported on the main structural foundations. It is therefore recommended that similar foundations are used to support the retaining walls as they lead away from the buildings, in order to provide uniform support and minimise the risk of differential movements occurring. Testing on samples of the granular Made Ground which is likely to be retained indicates it to be well-graded with a generally low fines (<63μm) content. *British Standard BS8002:2015 Code of Practice for Earth Retaining Structures* provides suggested values for characteristic weight density (γ_k) and methods of estimating the critical state angle of shearing resistance ($\phi'_{cv,k}$). Based on the findings of the exploratory holes and laboratory test results, the following values are suggested for retaining wall design purposes assuming that the predominantly granular Made Ground would be the retained material:

γ_k = 18 kN/m^2
$\phi'_{cv,k}$ = 36°

Design should take into account the ground conditions local to the proposed structure.

9.8 Buried Concrete

The results of the chemical testing on samples from the site during this investigation are summarised and presented in Tables 1 to 4 in Appendix 11.

Based on the procedures outlined in BRE Special Digest 1 : 2005 and the test results for water soluble sulphate the Design Sulphate Class for the strata at the site are shown in the table below together with the Aggressive Chemical Environment for Concrete (ACEC) Class. The results include those of the initial investigation. In view of the potential presence of pyrite that can oxidise to form sulphates, a check for their presence has been undertaken. The Oxidisable Sulphate Content (OS) is determined from the Total Potential Sulphur content and Total Sulphate content for the soils at the site. The oxidisable sulphate contents determined from the results do not indicate that pyrite is present.

The site is unlikely to contain chemical residues produced by or associated with industrial production. However, a "brownfield location" is considered for the Made Ground. For conservatism, groundwater is considered to be "mobile" for the assessment of the ACEC class.

Strata Type	Design Sulphate Class	ACEC Class
Made Ground	DS-1	AC-1
River Terrace Deposits	DS-1	AC-1
St Maughan's Formation	DS-1	AC-1

Any subsurface concrete or concrete in contact with the fill sourced from these stratum should be designed to meet the requirements of the appropriate classification.

9.9 Excavations

The soils encountered in the boreholes would generally be considered 'easy digging' for normal backhoe excavation plant. However, it should be noted that some buried obstructions were encountered within the boreholes and substructure remains will likely be present following demolition and clearance of the existing buildings. Methods of removal of these obstructions will depend on their size, nature and depth below ground level. It may be possible to remove some using the large buckets of an hydraulic excavator, others may need breaking up using hydraulic breaker attachments to the excavating plant. Allowance should therefore be made for removing such concrete or other buried obstructions using hydraulic breakers where necessary.

Where foundation excavations extend to depths greater than 1m they will need to be fully shored if entry by personnel is required. Even for shallow excavations the need for support will still need to be evaluated under CDM regulations. Shallow excavations (less than 1.20m) will likely remain relatively stable in the short-term although some local spalling may occur. Where such excavations are left open for longer periods, it is recommended that the sides are battered back to slopes no steeper than 1 (vertical) to 2 (horizontal). Alternatively, and for deeper excavations, support should be provided using close boarding or trench sheets with appropriately spaced walings and props.

The exploratory holes have shown the presence of perched groundwater within the Made Ground and monitoring has shown this to produce standing water levels at relatively shallow depths. Monitoring of installations within the natural soils has shown groundwater to be present as shallow as 1.77m below ground level. As a result, groundwater inflows are likely to be encountered in excavations of about 1.50m and deeper (possibly shallower) with accumulations occurring where such excavations are left open. The rate of water inflow will be dependent on the percentage of fine material present within the soils and this appears to vary across the site. Where the rate of inflow is relatively low, inflows are likely to be able to be dealt with by simple filtered pumping from sumps. Where higher rates of inflow are encountered, more specialist dewatering methods, such as well-point dewatering may be necessary.

All plant and machinery will need to maintain an appropriate stand off from the crest of all open excavations.

When exposed, the formation level for the foundations should be kept dry and steps taken to avoid disturbance. Prior to construction the formation should be inspected and any soft / loose spots removed. All formations should be protected from mechanical disturbance and assumed to be frost-susceptible.

9.10 Pavement Design

The conditions prevailing at the time of construction will affect the CBR of the subgrade soil and its strength. Research has shown the importance of the equilibrium moisture content of the subgrade. The relationship between soil suction and the moisture content shows that a soil that becomes wet during construction will retain water and will therefore be weaker under the pavement in the equilibrium condition than a foundation that has remained dry, particularly for soils of low to medium plasticity.

Equilibrium CBR values for various materials for poor and good construction conditions are given in a report by the TRRL (Report 1132) and in CD225 Revision 1 "Design for new pavement foundations" produced by the Highways Agency. The Made Ground materials likely to be exposed at formation level typically comprise sand and gravel with some silt, clay, cobbles, clinker, slag, brick fragments and occasional blocks of aircrete and Thermolite, and wood fragment and metal.

For sands and gravels an equilibrium CBR in excess of 10% is generally indicated. Laboratory testing indicated CBR values ranging between 37% and 58%. However, values as low as 3.8% were obtained for the Made Ground during the plate load testing. Laboratory CBR values on recompacted samples of Alluvium resulted in values of average 11% (two tests) and for the River Terrace Deposits average 17% (ten tests).

Without the benefit of in situ CBR test results on the actual formation surface, it is recommended that a cautious approach to pavement design is taken using a design CBR value of 5%. All formations should be assumed to be frost susceptible.

The exposed surface should be proof-rolled and any soft spots that depress unduly should be removed and replaced with clean crushed stone or similar suitable granular fill. Further testing of the formation surface following the site strip and any re-grading would assist with confirmation of the design CBR value and may allow a higher CBR value to be adopted.

9.11 Geotechnical Risk Register

A geotechnical risk register for the site is presented to reflect the findings of this investigation and above recommendations, as follows:

	Condition	**Hazard**	**Potential Impact**	**Before Control**			**Comments / Proposed Mitigation**	**After Control**		
				Probability	**Impact**	**Risk**		**Probability**	**Impact**	**Risk**
R1	Compressible ground	Insufficient bearing capacity leading to potentially increased total and differential settlement problems.	Failure / excessive movement of the foundations / ground bearing floor slabs leading to cracking of buildings. Potential for differential settlement.	**3 (P)**	**4 (H)**	**12 (Md)**	Adopt appropriate foundations to transfer the applied structural loads into the natural soils. Piled foundations bearing into the rock of the St Maughan's Formation likely to be the most suitable option. All foundation excavations to be inspected prior to foundation construction.	**1 (VU)**	**4 (H)**	**4 (N)**
R2	Made Ground	Variable behaviour and thickness leading to variable bearing capacities and unpredictable total and differential settlements.	Failure / excessive movement of the foundations / ground bearing floor slabs leading to cracking of buildings. Potential for differential settlement.	**5 (VL)**	**4 (H)**	**20 (Sv)**	Foundations to be taken below any Made Ground and bear into the natural soils.	**1 (VU)**	**4 (H)**	**4 (N)**
R3	Swelling / Shrinking Soils	Shallow foundation movement due to seasonal shrinkage / swelling of clay soils associated with trees and shrubs.	Excessive movement of the foundations / ground bearing floor slabs leading to cracking of buildings.	**2 (U)**	**4 (H)**	**8 (Mn)**	Foundations within influencing distance of planned, trees should be constructed is stable ground using guidance in NHBC Chapter 4.2 'Building Near Trees'. Requirements for compressible materials/voids adjacent to foundations/below floor slabs should also be followed.	**1 (VU)**	**4 (H)**	**4 (N)**
R4	Obstruction / Hard Strata	Affecting excavations during construction works and potential hard spots below foundations / floor slabs.	Differential movement of the foundations / ground bearing floor slabs leading to cracking of buildings. Delays to excavations during construction.	**3 (P)**	**4 (H)**	**12 (Md)**	Use backhoe excavation plant but have hydraulic breakers available to assist with the removal of any remnant hardstanding, concrete floor slabs, foundations or other substructure remains following the demolition of the previous development. The design needs to take account of any sub-structures and former foundations left in place.	**2 (U)**	**4 (H)**	**8 (Mn)**

R5	High groundwater	Instability of foundation excavations and problems with foundation, floor slab and road / hardstanding formations.	Excessive movement of the foundations / ground bearing floor slabs leading to cracking of buildings and subsidence of roads / hardstanding areas.	**2 (U)**	**4 (H)**	**8 (Mn)**	Shallow groundwater encountered within some exploratory holes. Sump pumping may be suitable.	**I (VU)**	**4 (H)**	**4 (N)**
R6	Chemically Aggressive Soil	Corrosive attack of buried concrete from soils on the site.	Degradation of concrete foundation and buried concrete structures leading to failure.	**2 (U)**	**3 (M)**	**6 (Mn)**	Provisionally use concrete to AC-1 classification of BRE SD1 for subsurface concrete. Further testing is recommended to confirm the above classes as part of future investigation.	**1 (VU)**	**3 (M)**	**3 (N)**
R7	Buried services	Damage during construction works posing risk to Health and Safety of site personnel and public. Evidence of the presence of buried services noted during site walkover.	Increased cost and delay for unplanned diversions, protection or repair.	**2 (U)**	**5 (VH)**	**10 (Md)**	All Statutory Service Plans to be provided to the Specialist Contractors prior to works taking place. Vigilance throughout any excavation work for any indications of unrecorded buried services.	**1 (VU)**	**5 (VH)**	**5 (Mn)**
R8	Slopes	Failure of existing slopes and any slope created during development separating different areas. The site is near flat.	Not expected.	**I (VU)**	**4 (H)**	**4 (N)**	**-**	**-**	**-**	-
R9	Retaining Walls	Failure or movement of any new retaining walls or structures during development separating the different site areas.	Low retaining walls associated with loading platforms; differential settlement; failure of wall.	**2 (U)**	**4 (H)**	**8 (Mn)**	Use similar foundations to the adjacent structure. Design wall in accordance with current guidance.	**I (VU)**	**4 (H)**	**4 (N)**
R 10	Solution Features	Potential collapse or settlement of ground affecting buildings, hardstanding and infrastructure.	Not expected.	**1 (VU)**	**4 (H)**	**4 (N)**		**-**	**-**	-
R 11	Mining Activities	Potential collapse or settlement of ground affecting buildings, hardstanding and infrastructure.	Not expected.	**1 (VU)**	**4 (H)**	**4 (N)**		**-**	**-**	-
R 12	Frost Susceptibility	Affecting the subgrade of roads and areas of hardstanding.	Subsidence and cracking of roads and areas for hardstanding and increased maintenance and management costs.	**2 (U)**	**3 (M)**	**6 (Mn)**	For conservatism assume all formation soils are frost susceptible and design accordingly.	**1 (VU)**	**3 (P)**	**3 (N)**
R 13	UXO	Affecting investigation and construction works and posing risk to Health and Safety of site personnel and the public.	Increased costs and delay to the project and potential serious injury or death.	**2 (U)**	**5 (VH)**	**10 (Md)**	Preliminary UXO Threat Assessment carried out and risk assessed as low and no further action required. Vigilance throughout investigation and construction works required.	**1 (VU)**	**5 (VH)**	**5 (Mn)**

10.0 CONCLUSIONS

10.1 Geotechnical

This preliminary ground investigation has shown the site to be underlain by a variable thickness of Made Ground of between 0.50 and 4.10m overlying Alluvium and River Terrace Deposits. Weathered mudstone bedrock (clay) was encountered at depths ranging between 2.30 and 7.60m and more competent bedrock comprising mudstone, siltstone and sandstone of the St. Maughan's Formation was encountered at depths ranging between 3.70 and 9.40m. The Made Ground Alluvial superficial deposits are not considered to be a suitable founding stratum for the proposed structures.

The variable nature, thickness and lateral extent of the Made Ground, Alluvium and cohesive River Terrace Deposits with the presence of some soft, highly compressible, organic clays below the site suggests that this material is not suitable for the anticipated loads from the proposed structures. Trench fill foundations extending below the soft clays may be possible in some areas. However, the possibility of unacceptable total and differential settlement together with excavation instability are likely to make this solution uneconomic. Therefore, the most suitable foundation solution to be adopted is considered to be piled foundations with a suspended floor slab.

To limit the effects of seasonal ground movements especially where any trees may be proposed within influencing distance of the foundations piled foundations may require sleeves over the upper part of the pile shafts.

Minimum foundation depths for any shallow foundations for lightly loaded structures and the requirement for voids or compressible materials against the face of foundations or below floor slabs should be determined in accordance with NHBC Chapter 4.2, 'Building near trees'. As a precaution against heave in the underlying clay soils there are requirements for compressible materials/voids adjacent to foundations/below floor slabs in accordance with NHBC guidelines.

Testing carried out during this preliminary investigation indicates that subsurface concrete should provisionally be designed to comply with the ACEC Class of AC-1 of BRE Special Digest 1.

It would be prudent to adopt a conservative approach to pavement design, with the adoption of a preliminary design CBR value of 5% for the site. Where weaker zones are present at formation level, the exposed surface should be proof-rolled and any soft spots that depress unduly should be removed and replaced with compacted clean crushed stone or similar suitable granular fill. Further CBR testing of the likely formation surface is advised prior to final design/construction.

The natural material below the site often comprised clayey sand and clayey gravel and clay or mudstone and will likely exhibit poor to negligible infiltration rates. If the possible use of soakaway drainage is to be investigated, it would be necessary to carry out soakaway tests in accordance with BRE Digest 365 'Soakaway Design', 2016.

Significant earthworks are not anticipated on this generally flat-lying site. Surplus spoil will arise from excavations for foundations. These arising's may be possible for re-use, if required, for any landscape mounds, subject to their geo-environmental suitability.

Due to the generally flat topography of the site and the understood construction proposals, it is anticipated that significant retaining walls are unlikely to be required as part of the proposed development. Low retaining walls associated with vehicle loading platforms should be founded on similar foundations to the adjacent structure to avoid differential settlement.

It is recommended that further investigation is carried out once development proposals are further developed to provide information:-

- Confirmation of the design CBR value of the formation once exposed.
- Additional information on the pH and sulphate levels for the design of buried concrete.

11.0 REFERENCES

Environmental Protection Act 1990: Part IIA, Contaminated Land Statutory Guidance, HM Government, April 2012.

BS 8500-1: 2015+A1:2016: Concrete – Complementary British Standard to BS EN 206-1 – Part 1: Method of specifying and guidance for the specifier. British Standards Institution.

BS 8576: 2013: Guidance on investigation for ground gas – Permanent gases and Volatile Organic Compounds (VOCs). British Standards Institution

BS 5930: 2015: Code of practice for site investigation. British Standards Institution.

BS 10175: 2011+A2 2017: Investigation of potentially contaminated sites – Code of Practice. British Standards Institution

BS 3882: 2015: Specification for topsoil and requirements for use. British Standards Institution.

BS 8601: 2013: Specification for subsoil and requirements for use. British Standards Institution.

BS EN 1992: 1992: Design of concrete structures. In 4 parts plus Addendums. British Standards Institution

Building Research Establishment: 2010: Part C.

Building Research Establishment: 2015: Radon: Guidance on protective measures for new buildings. November 2015.

Building Research Establishment: 2016: Report No BR365, Soakaway Design. February 2016.

Card G, Lucas J, Wilson S: 2019: Technical paper: Risk and Reliability in Gas Protection Design – 20 years on: Part 2

CIRIA: 2007: C665: Assessing Risks Posed by Hazardous Ground Gases for Buildings. Authors Wilson, S, S Oliver, H Mallet, H Hutchings & G Card. Construction Industry Research & Information Association, London.

CIRIA: 2009: C682: The VOCs Handbook. Investigating, assessing and managing risks from inhalation of Volatile Organic Compounds (VOCs) at land affected by contamination.

CIRIA: 2014: Good practice on the testing and verification of protection systems for buildings against hazardous ground gases Report C735. Construction Industry Research & Information Association, London.

CL:AIRE / Sustainable Remediation Forum (SuRF): 2011: A framework for assessing the sustainability of soil and groundwater remediation. (Sponsored by the Homes and Communities Agency, March 2011)

CL:AIRE: 2012: A Pragmatic Approach to Ground Gas Risk Assessment, Research Bulletin RB 17. November 2012. Contaminated Land: Applications in Real Environments

CL:AIRE: 2016: CAR-SOIL – Control of Asbestos Regulations 2012. Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials. Industrial Guidance. Contaminated Land: Applications in Real Environments

CL:AIRE: 2020 : Professional Guidance: Comparing Soil Concentration Data with a Critical Value

Coal Authority: 2019: Guidance on Managing the Risk of Hazardous Gases when Drilling or Piling Near Coal. Version 2 (April 2019). Written and published in conjunction with AGS, BDA, HSE and FPS

Department for Environment, Food and Rural Affairs and the Environment Agency: 2002: Toxicological Reports for Individual Soil Contaminants, Reports TOX 1-10.

Department for Environment, Food and Rural Affairs: 2012: Contaminated Land Statutory Guidance, April 2012

Department for Environment, Food and Rural Affairs: 2013: Development of Category 4 Screening Levels for assessment of land affected by contamination - SP1010 (December 2013).

Department of the Environment Transport and the Regions: 2000: A Guide to Risk Assessment and Risk Management for Environmental Protection (also called Greenleaves II)

Defra: 2018: Sewage sludge in agriculture: code of practice for England, Wales & Northern Ireland.

Environment Agency: 2010: GPLC1 – Guiding principles for land contamination. GPLC2 – FAQs, technical information and references. GPLC3 – Reporting checklists.

Environment Agency: 2020: Land Contamination Risk Management

Environment Agency: 2000. Monitored Natural Attenuation Vapour Transfer of Soil Contaminants, R&D Technical Report P5-018/Tr.

Environment Agency: 2002. Collation of Toxicological Data and Development of Guideline Values for Explosive Substances, R&D Project Record P5-036/01.

Environment Agency: 2002. In-Vitro Methods for the Measurement of the Oral Bioaccessibility of Selected Metals and Metalloids in Soils: A Critical Review, Technical Report P5-062/TR/01.

Environment Agency: 2003: Consultation On Agency Policy: Building Development On or within 250m of a Landfill Site. Background information, July 2003.

Environment Agency: 2003: Review of the Fate and Transport of Selected Contaminants in the Soil Environment Draft Technical Report P5-079/TR1

Environment Agency: 2004: LFTGN-03. Guidance on the Management of Landfill Gas.

Environment Agency: 2004: Water Quality Consenting Appendices to Guidance, Dangerous Substances in Discharges to Surface Waters.

Environment Agency: 2005: The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils. P5-080/TR3, February 2005.

Environment Agency: 2005. Review of Building Parameters for Development of a Soil Vapour Intrusion Model, Report P5-079/PR.

Environment Agency: 2005. International Workshop On The Potential Use of Bioaccessibility Testing In Risk Assessment Of Land Contamination, Science Report SC040054.

Environment Agency: 2006: Remedial Targets Methodology – Hydrogeological Risk Assessment for Land Contamination. Carey, M.A., P.A. Marsland, & J.W.N. Smith.

Environment Agency: 2008: Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values Science report SC050021/SR7

Environment Agency: 2008: Updated Technical Background to the CLEA model Science Report SC050021/SR3 and CLEA Model 1.071 (2014)

Environment Agency: 2008: Human Health Toxicological Assessment of Contaminants in Soil SC050021/SR2

Environment Agency: 2008: A review of Bodyweight and Height Data Used within the Contaminated Land Exposure Assessment model (CLEA) SC050021/Technical Review 1

Environment Agency: 2008: Guidance for the Safe Development of Housing on Land Affected by Contamination. EA/NHBC/CIEH R & D Publication 66.

Environment Agency: 2009: Petroleum Hydrocarbons in Groundwater. Supplementary Guidance for Hydrogeological Risk Assessment

Environment Agency: 2010: Evidence, Verification of Remediation of Land Contamination. Report SC030114/R1

Environment Agency: 2010: GPLC1 – Guiding principles for land contamination. GPLC2 – FAQs, technical information and references. GPLC3 – Reporting checklists.

Environment Agency: 2021: Waste Classification – Guidance on the classification and assessment of waste. Technical Guidance WM3 1st Edition, v1.1 GB January 2021.

Environment Agency: 2017: The Environment Agency's Approach to Groundwater Protection. November 2017 Version 1.01

Highways Agency, "Interim Advice Note 73/06: Design guidance for road and pavement foundations (HD52)," Highways Agency, London, 2009.

Highways Agency, Manual of Contract Documents for Highway Works (MCHW) Vol 1 Series 600, Highways Agency, London, 2016.

HMSO: 1995: Part 2A of the Environmental Protection Act 1990, as inserted by Section 57 of the Environment Act 1995, was brought into force on 1 April 2000

HM Government: 2013: The Building Regulations 2010. Part C. Site Preparation and resistance to contaminants and moisture. 2004 Edition with Amendments 2010 & 2013.

Ministry of Housing, Communities & Local Government: 2019: National Planning Policy Framework, February 2019.

Nathanail et al: 2015 The LQM/CIEH S4ULs for Human Health Risk Assessment

NHBC & RSK Group: 2007: Guidance on the Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present. Report No 10627-R01 (04). Authors Boyle, R. & P. Witherington, National House Building Council.

NHBC: 2020: NHBC Standards, including Part 4 - Standards for Foundations and Part 5 - Substructure and ground floors

State of NSW and Office of the Environment and Heritage: 2019: Human health soil screening criteria for PFOS, PFHxS and PFOA -Calculation protocols and draft values for potential inclusion in the PFAS National Environmental Management Plan

Statutory Instruments: 2012: Environmental Protection, England. Contaminated Land (England) (Amendment) Regulations 2012 No. 263 coming into force 6th April 2012.

Statutory Instruments: 2015: The Construction (Design and Management) Regulations 2015 (CDM 2015) coming into force 6th April 2015.

Stroud, M.A. and Butler, F.G.: 1975: "The SPT and the Engineering Properties of Glacial Materials." Proc. Engng Behaviour of Glacial Materials, Birmingham.

APPENDIX 1

Client Brief

GEOTECHNICS
geotechnical and geoenvironmental specialists

Our ref: MM/QN220354
Date: 18th March 2022

For the attention of Mr. Ed Coupe

Dear Sir

Ground Investigation Quotation: Newport Quinn

We refer to your enquiry of December 2021 and respond with our quotation based upon a scope of works recommended by our principle geotechnical engineering team. All work will be re-measured on completion and Geotechnics Ltd will advise you verbally and subsequently in writing should site and/or ground conditions dictate that additional or amended works be considered necessary, the impact on costs and whether the contract period is likely to be exceeded.

Geotechnics Limited will be responsible for undertaking:

- 20 Nr. cable percussion boreholes to rockhead.
- 10 Nr. cable percussion boreholes with rotary follow-on to 20m depth.
- 18 Nr. plate load tests up to a maximum depth of 0.50m below ground level.
- Concrete coring of all positions in hard standing to facilitate inspection pits.
- Breaking out 1.50m by 1.50m area at each plate load location.
- GPR service clearance at all exploratory hole locations.
- Provision of welfare and storage facilities.
- Provision of full time supervision.
- Installation and monitoring of 15 Nr. 50mm HDPE standpipes.
- Sampling and geotechnical/geochemical testing.
- Interpretative geotechnical reporting.
- A return visit to site once the demolition and leveling of the site has taken place to undertake resistivity testing and plate load testing at formation level.

Pinnacle shall be responsible for providing:

- Up to date design drawings for the proposed development and cut and fill plan.
- Unrestricted access to the site.
- Secure site.

We have also assumed the following:

a) Undisturbed samples, including Class 1 samples or Standard Penetration Tests (SPT's) at 1m intervals to 5m depth and 1.5m thereafter.

b) Access by a Land Rover towed cable percussion boring rig and rubber tracked rotary rig (Comacchio 205 or similar) is available, together with unlimited headroom. No allowance has been made for access facilitation such as tracked dumpers or ground protection, as this would be dependent on conditions at the time of the ground investigation.

www.geotechnics.co.uk | mail@geotechnics.co.uk

Coventry Office
The Geotechnical Centre
203 Torrington Avenue
Tile Hill
Coventry
CV4 9AP
☎ 024 7669 4664

Chester Office
The Geotechnical Centre
Unit 1, Borders Industrial Park
River Lane, Saltney
Chester
CH4 8RJ
☎ 01244 671 117

Exeter Office
The Geotechnical Centre
7 Pinbrook Units
Venny Bridge
Exeter
EX4 8JQ
☎ 01392 463 110

Yorkshire Office
The Geotechnical Centre
Unit 1, Bypass Park Estate
Sherburn-in-Elmet
Yorkshire
LS25 6EP
☎ 01977 525 037

Registered in England and Wales No. 1757790

c) We recommend that the insitu resistivity testing (Wenner probe) be undertaken once the existing buildings have been removed and the site has been leveled as any metallic objects will cloud the resolution of the survey leading to inaccurate data.

d) Item **23** and **26** has been provided for geochemical testing and reporting in the event that contamination is encountered on site as per BS10175. Assuming no contamination is encountered, this rate will not be applied.

e) No allowance cleaning the areas around exploratory hole locations. All excavation will be backfilled with arising and any excess arising's will be stockpiled onsite to be removed during demolition.

We ask you to note that it is company policy to excavate service inspection pits to 1.2m depth at all borehole locations unless instructed in writing by the Client/Engineer not to do so. Any such written instruction shall relieve Geotechnics Ltd of any responsibility for damage to underground apparatus.

According to our present commitments we could commence the fieldwork within about three weeks from receipt of your written instruction. We estimate that the fieldwork would take about five weeks and our draft report would be submitted to you within five to six weeks of the end of site work, assuming geotechnical testing is commissioned. Preliminary information would be made available to you throughout.

Should you require any other information in the meantime or wish to discuss the scope of the work proposed, please do not hesitate to contact the undersigned.

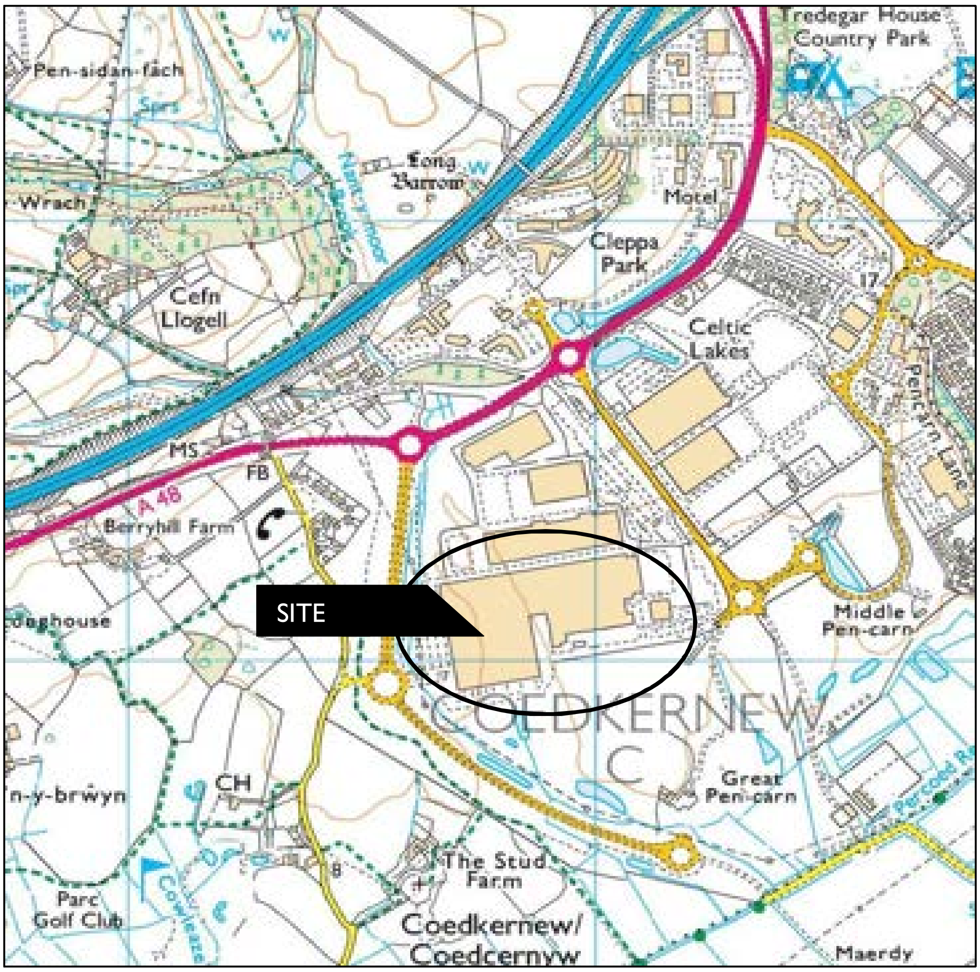
Yours faithfully

Matthew McLaughlin – Estimator
for GEOTECHNICS LIMITED – North West Office
e-mail: MMclaughlin@geotechnics.co.uk

APPENDIX 2

Site Location Plan

SITE LOCATION PLAN



PN224395

Ground Investigation

Former Quinn Radiator Factory Site
for
Pinnacle Consulting Engineers Limited

GEOTECHNICS
geotechnical and geoenvironmental specialists

APPENDIX 3

Cable Percussion Borehole Records

DATA SHEET - Symbols and Abbreviations used on Records

Sample Types

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

Insitu Testing / Properties

CBRP	CBR using TRL probe
CHP	Constant Head Permeability Test
COND	Electrical conductivity
TC	Thermal Conductivity
TR	Thermal Resistivity
HV	Strength from Hand Vane
ICBR	CBR Test
IDEN	Density Test
IRES	Resistivity Test
MEX	CBR using Mexecone Probe Test
PKR	Packer Permeability Test
PLT	Plate Load Test
PP	Strength from Pocket Penetrometer
Temp	Temperature
VHP	Variable Head Permeability Test
VN	Strength from Insitu Vane
w%	Water content

(All other strengths from undrained triaxial testing)

S	Standard Penetration Test (SPT)
C	SPT with cone
N	SPT Result
-/-	Blows/penetration (mm) after seating drive
-*/- (mm)	Total blows/penetration
( )	Extrapolated value

Groundwater

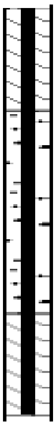
Water Strike	▽
Depth Water Rose To	▼

Instrumentation

Seal

Filter

Seal



Strata — Legend

Made Ground Granular

Made Ground Cohesive

Topsoil

Cobbles and Boulders

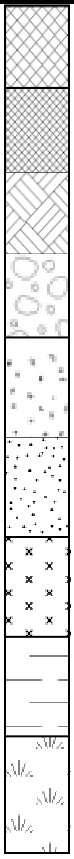
Gravel

Sand

Silt

Clay

Peat



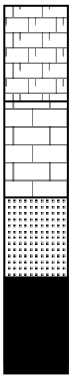
Note: Composite soil types shown by combined symbols

Chalk

Limestone

Sandstone

Coal



Strata, Continued

Mudstone

Siltstone

Metamorphic Rock

Fine Grained

Medium Grained

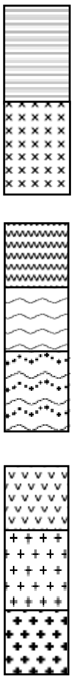
Coarse Grained

Igneous Rock

Fine Grained

Medium Grained

Coarse Grained



Backfill Materials

Arisings

Bentonite

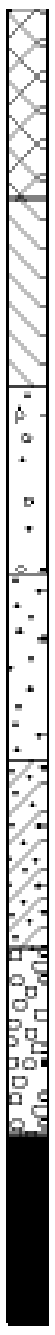
Concrete

Sand

Grout

Gravel

Asphalt/Tarmacadam



Rotary Core

RQD	Rock Quality Designation (% of intact core >100mm)
FRACTURE INDEX	Fractures/metre
NI	Non-intact core
NR	No core recovery
AZCL	Assumed zone of core loss

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

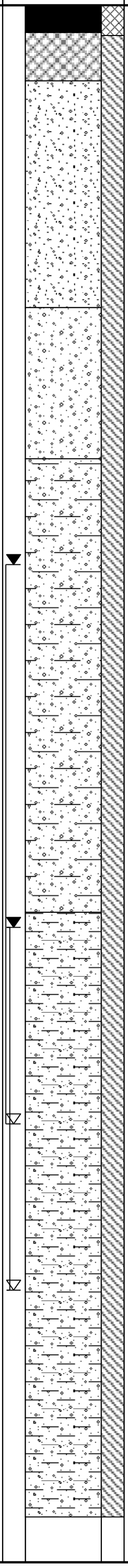
Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH02
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327760.5 E 184201.7 N	**Ground Level**	10.88 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.18 - 0.55	B				
0.25	D				
0.25	ES				
0.55	D				
0.55	ES				
0.55 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.65		1.20 (DRY)			S34
1.20 - 1.65	D				
1.20 - 1.70	B				
1.80	D				
2.00 - 2.45		2.00 (DRY)			S23
2.00	ES				
2.00 - 2.45	D				
2.00 - 2.50	B				
2.80	D				
3.00 - 3.45		3.00 (DRY)			S40
3.00 - 3.45	D				
3.00 - 3.50	B				
3.80	D				
4.00 - 4.45		4.00 (DRY)			S18
4.00 - 4.45	D				
4.00 - 4.50	B				
4.80	D				
5.00 - 5.45		5.00 (DRY)			S16
5.00 - 5.45	D				
5.00 - 5.50	B				
6.00 - 6.45		6.00 (DRY)			S33
6.00 - 6.45	D				
6.00 - 6.50	B				
6.80	D			12	
7.00 - 7.45		7.00 (DRY)			S42
7.00 - 7.45	D				
7.00 - 7.50	B				
7.80	D				
8.00 - 8.45		8.00 (DRY)			S34
8.00 - 8.45	D				
8.00 - 8.50	B				
8.80	D				
9.00 - 9.45		9.00 (DRY)			S50
9.00 - 9.45	D				
9.00 - 9.50	B				
9.80	D				
10.00 - 10.45		10.00 (DRY)			S33

Description	Depth	Level (m OD)
MADE GROUND: Black tarmacadam. [MADE GROUND - TARMACADAM]	0.18	10.70
MADE GROUND: Reddish brown gravelly fine to coarse sand. Gravel is anuglar to subangular fine to coarse of sandstone and limestone. [MADE GROUND]	0.50	10.38
Light brown slightly gravelly fine to medium SAND with a low subrounded cobble content of siltstone. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR] Below 1.20m, dense.	2.00	8.88
Medium dense orangish brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of various lithologies. Low subrounded cobble content of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR]	3.00	7.88
Dense orangish brown sandy slightly clayey GRAVEL with a low subrounded cobble content of sandstone. Gravel is angular to subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR] Below 4.00m, medium dense.	6.00	4.88
Very stiff purplish red slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY] Between 6.00m and 9.45m, occasional pockets of orange mottled bluish grey fine to coarse sand. Below 9.80m, sand is medium to coarse.		

Legend



Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	AC/RW
11.40	0.15	Cable Percussion	WN/JB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00		DRY	18/08/22	08:00
11.40	11.40	6.10	18/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
7.40	7.00	3.70	20		Moderate inflow.
8.50	8.50	6.10	2		Moderate inflow.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 11.00-11.40m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 11.40m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 2 06/01/2023

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH02
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327760.5 E 184201.7 N	**Ground Level**	10.88 m OD

Sampling			Properties			Strata			Scale 1:50
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N	Description	Depth	Legend	Level (m OD)
10.00 - 10.45	D								
10.00 - 10.50	B								
10.80	D								
11.00 - 11.40		11.00 (DRY)			S50/ 245mm				
11.00 - 11.45	D								
						End of Borehole	11.40		-0.52

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 2 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

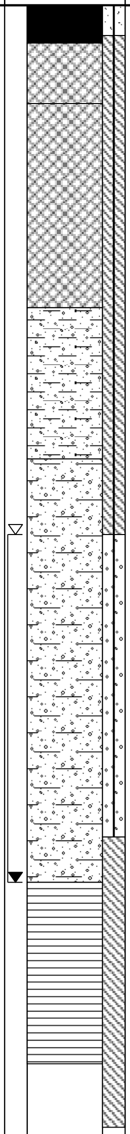
PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH03
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327816.5 E 184219.4 N	**Ground Level**	10.77 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.30	D				
0.30	ES				
0.30 - 0.40	B				
0.60	D				
0.60	ES				
0.65 - 0.75	B				
1.00	D				
1.00	ES				
1.00 - 1.10	B				
1.20 - 1.65		1.20 (DRY)			C21
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C22
2.00 - 2.50	B			11	
2.00 - 2.50	D				
3.00 - 3.45		3.00 (DRY)			C30
3.00 - 3.50	B				
4.00 - 4.45		4.00 (DRY)			C35
4.00 - 4.50	B				
5.00 - 5.45		5.00 (DRY)			C29
5.00 - 5.50	B				
5.80	D			32	
6.00 - 6.45		6.00 (DRY)			C29
6.00 - 6.50	B				
7.00 - 7.42		7.00 (DRY)			C50/ 275mm

Description	Depth	Level (m OD)
MADE GROUND: Black tarmacadam. [MADE GROUND - TARMACADAM]	0.25	10.52
MADE GROUND: Orangish brown gravelly slightly silty fine to coarse sand. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone.. [MADE GROUND]	0.65	10.12
MADE GROUND: Brown sandy angular to subangular fine to coarse gravel of limestone, sandstone and granite. [MADE GROUND] Below 0.90m, clayey.	2.00	8.77
Firm reddish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-COHESIVE]	3.00	7.77
Medium dense to dense brown very sandy clayey subangular to subrounded fine to coarse GRAVEL of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR] Below 3.50m, high subrounded to rounded cobble content of siltstone and sandstone. Pockets of firm clay.	5.80	4.97
Extremely weak reddish brown MUDSTONE. Recovered as slightly sandy gravelly silt. [ST MAUGHANS FORMATION]	7.00	3.77



End of Borehole

Boring				Progress					Groundwater					
Depth	Hole Dia.	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20	0.30	Inspection Pit		0.00			15/08/22	08:00	3.50	3.00	5.80	20	5.80	Medium inflow.
7.43	0.30	Cable Percussion	WO/JT	1.20		DRY	15/08/22	17:00						
				1.20		DRY	02/09/22	08:00						
				7.43	7.00	DRY	02/09/22	17:00						

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
A 50mm standpipe was installed to 5.50m with a geowrapped slotted section from 3.50 to 5.50m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 5.50m, gravel filter up to 3.50m, bentonite seal up to 0.20m, concrete up to ground level.
At 7.42m cable percussion borehole terminated on encountering bedrock.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	TL
Checked by	JN
Figure	Sheet 1 of 1
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project Newport Quinn Phase 2
Client Pinnacle Consulting Engineers Limited
Engineer Pinnacle Consulting Engineers Limited
National Grid Coordinates 327875.9 E 184217.4 N
Project No. PN224395
Borehole BH04
Ground Level 10.77 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.20	D				
0.20	ES				
0.20 - 0.40	B				
0.40 - 0.60	B				
0.50	D				
0.50	ES				
1.20 - 1.54		1.20 (DRY)			C50/ 245mm
3.00 - 3.50	D				

Description	Depth	Legend	Level (m OD)
MADE GROUND: Black tarmacadam. [MADE GROUND - TARMACADAM]	0.21	■	10.56
MADE GROUND: Brown gravelly fine to medium sand. Gravel is subangular fine to coarse of sandstone. [MADE GROUND]	0.46	▨	10.31
MADE GROUND: Brown slightly gravelly fine to medium sand with a low subrounded cobble content of sandstone. Gravel is subanuglar to subrounded fine to coarse of sandstone. [MADE GROUND]	1.54	▨	9.23
End of Borehole			

Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	AC/RW
1.54	0.15	Cable Percussion	WO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			10/08/22	08:00
1.54		DRY	10/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
Cable Percussion borehole terminated at 1.54m depth on encountering a concrete obstruction and the Cable Percussion rig was moved to location BH4A.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Borehole backfilled with bentonite pellets and topped with arisings on completion.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by AC
Checked by JN
Figure Sheet 1 of 1
06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

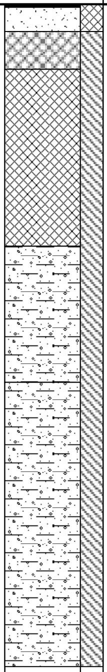
Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328000.0 E 184242.0 N	**Borehole**	BH05
				Ground Level	10.76 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.25	D				
0.25	ES				
0.25 - 0.50	B				
0.50	D				
0.50	ES				
0.50 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.70	B				
2.00 - 2.28		2.00 (DRY)			C50/ 125mm
2.00 - 2.50	B				
2.60	D			40	
3.00 - 3.45		3.00 (DRY)			C36
3.00 - 3.50	B				
4.00 - 4.38		4.00 (DRY)			C50/ 230mm

Description	Depth	Level (m OD)
MADE GROUND: Black tarmacadam. [MADE GROUND - TARMACADAM]	0.02	10.74
MADE GROUND: Grey concrete. [MADE GROUND - CONCRETE]	0.18	10.58
MADE GROUND: Reddish brown sandy subangular fine to coarse gravel of siltstone and sandstone. [MADE GROUND]	0.43	10.33
PROBABLE MADE GROUND: Brown sandy subangular to subrounded fine to coarse gravel of sandstone and siltstone. Low subrounded cobble content. [MADE GROUND]	1.60	9.16
Stiff to very stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-COHESIVE]	2.50	8.26
Firm reddish brown slightly sandy slightly gravelly CLAY with occasional bands of silt. Gravel is subrounded fine to medium of siltstone and sandstone probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY] Below 2.60m, stiff. Black organic staining (up to 30mm) and pockets of bluish grey (10-20mm). Below 3.00m, very stiff.	4.38	6.38
End of Borehole		

Legend



Boring

Depth	Hole Dia.	Technique	Crew
0.18	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	AC/RW
4.38	0.15	Cable Percussion	WO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00		DRY	10/08/22	13:01
1.20		DRY	10/08/22	17:00
1.20		DRY	15/08/22	08:00
4.38	3.00	DRY	15/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 1.60-2.50m for 150 minutes.
Chiselling: 3.70-4.00m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 4.38m cable percussion borehole terminated on encountering bedrock.

Logged in accordance with BS5930:2015 + A1:2020

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged by	TL
Checked by	JN
Figure	Sheet 1 of 1

06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH06
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328131.6 E 184239.8 N	**Ground Level**	10.86 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.20 - 0.45	B				
0.25	D				
0.25	ES				
0.45 - 0.80	B				
0.50	D				
0.50	ES				
0.80 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.65		1.20 (DRY)			C22
1.20 - 1.70	B			9	
2.00 - 2.45		2.00 (DRY)			C31
2.00 - 2.50	B				
2.00 - 2.50	D				
2.70	D				
3.00 - 3.45		3.00 (DRY)			S31
3.00 - 3.45	D				
3.00 - 3.50	B				
4.00 - 4.40		3.00 (DRY)			C50/ 250mm

Description	Depth	Legend	Level (m OD)
MADE GROUND: Light grey concrete. [MADE GROUND - CONCRETE]	0.20	▨	10.66
MADE GROUND: Dark brown and grey gravelly fine to coarse sand. Gravel is subangular to subrounded fine to coarse of sandstone and concrete. Occasional fragments of metal. [MADE GROUND]	0.45	▨	10.41
MADE GROUND: Yellowish brown gravelly fine to coarse sand with a low subangular cobble content of sandstone. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone and concrete. [MADE GROUND]	1.20	▨	9.66
Stiff light brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-COHESIVE] Below 2.00m, very stiff.	2.70	▨	8.16
Very stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY]	4.40	▨	6.46
End of Borehole			

Boring

Depth	Hole Dia.	Technique	Crew
0.15	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	JZW/AC
4.40	0.15	Cable Percussion	WO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			01/08/22	08:00
1.20		DRY	01/08/22	18:00
1.20		DRY	19/08/22	08:00
4.40	3.00	DRY	19/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 3.80-4.00m for 60 minutes.
A 50mm standpipe was installed to 2.70m with a geowrapped slotted section from 1.00 to 2.70m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 2.70m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level.
At 4.40m cable percussion borehole terminated on encountering bedrock.
Logged in accordance with BS5930:2015 + A1:2020

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged by	JZW
Checked by	JN
Figure	Sheet 1 of 1
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

***BOREHOLE RECORD** - Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH08
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327709.8 E 184130.1 N	**Ground Level**	10.95 m OD

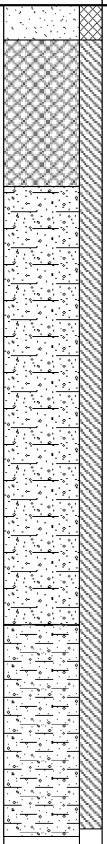
Sampling / Properties

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.30 - 0.50	B				
0.40	D				
0.40	ES				
0.60 - 0.75	B				
0.65	D				
0.75	ES				
0.90	D				
0.95 - 1.10	B				
1.10	ES				
1.20 - 1.65		1.20 (DRY)			C17
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C21
2.00 - 2.50	B				
2.10	D				
3.00 - 3.45		3.00 (DRY)			C21
3.00 - 3.50	B				
4.00 - 4.45		4.00 (DRY)			C32
4.00 - 5.00	B				
5.00 - 5.45		5.00 (DRY)			S50
5.00 - 5.45	D			28	

Strata Scale 1:50

Description	Depth	Level (m OD)
MADE GROUND: Strong grey concrete. [MADE GROUND - CONCRETE]	0.23	10.72
MADE GROUND: Brown gravelly slightly silty fine to coarse sand with a low cobble content (<80mm) of granite. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone and granite. [MADE GROUND] Below 0.95m, cobbles are >100mm.	1.20	9.75
Medium dense brown gravelly fine to coarse clayey SAND. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR] Below 3.00m, with low cobble content.	4.10	6.85
Firm to stiff reddish brown slightly sandy slightly gravelly CLAY with a low cobble content of subangular siltstone. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY]	5.50	5.45
End of Borehole		

Legend



Boring

Depth	Hole Dia.	Technique	Crew
0.23	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	AC/JM
5.45	0.15	Cable Percussion	WO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			16/08/22	08:00
1.20		DRY	16/08/22	17:00
1.20		DRY	22/08/22	08:00
5.45	4.50	DRY	22/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 4.70-5.00m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 5.45m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	TL
Checked by	JN
Figure	Sheet 1 of 1
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion* *PRELIMINARY*

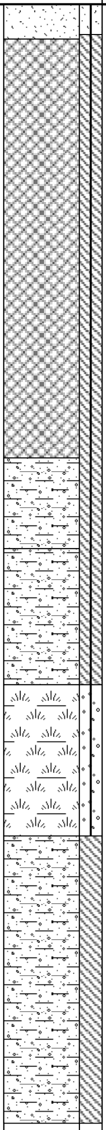
Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327771.6 E 184141.0 N	**Borehole**	BH09
				Ground Level	11.01 m OD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.23 - 1.20	B				
0.30	D				
0.30	ES				
0.50	D				
0.50	ES				
1.00	D				
1.00	ES				
1.20 - 1.65		(DRY)			C34
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C43
2.00 - 2.50	B				
3.00 - 3.45		3.00 (DRY)			C31
3.00 - 3.50	B				
3.20	D				
3.60 - 4.50	B				
3.80	D			27	
4.00 - 4.45	U11	4.00 (DRY)			
4.00 - 4.45	UT			33	
4.45 - 4.50	D				
4.50 - 5.00	B				
4.50 - 5.00	D				
5.00 - 5.45	U15	5.00 (DRY)			
5.00 - 5.45	UT				
5.45 - 5.50	D			141	
6.00 - 6.45		6.00 (DRY)			C26
6.00 - 6.50	B				
7.00 - 7.40		6.00 (DRY)			S50/ 245mm
7.00 - 7.40	D				

Description	Depth	Level (m OD)
MADE GROUND: Light grey concrete. [MADE GROUND - CONCRETE]	0.23	10.78
MADE GROUND: Reddish brown gravelly fine to coarse sand. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone, limestone and tarmacadam. [MADE GROUND] Below 0.60m, low subrounded cobble content of sandstone. Between 0.80-0.90m, band of tarmacadam.	3.00	8.01
Firm to stiff light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [ALLUVIUM]	3.60	7.41
Firm reddish brown slightly sandy slightly gravelly CLAY occasionally tending towards silt. Gravel is subangular fine to coarse of sandstone. Slight organic odour. [ALLUVIUM]	4.50	6.51
Dark brown mottled grey clayey pseudo-fibrous PEAT with many fragments of wood. [PEAT]	5.50	5.51
Stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mudstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY]	7.40	3.61
End of Borehole		

Legend



Boring

Depth	Hole Dia.	Technique	Crew
0.23	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	PO/JT
7.40	0.15	Cable Percussion	PO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00		DRY	26/08/22	08:00
2.50	2.50	DRY	26/08/22	17:00
2.50	2.50	DRY	30/08/22	08:00
7.40	6.00	DRY	30/08/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
A 50mm standpipe was installed to 5.50m with a geowrapped slotted section from 4.50m to 5.50m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 5.50m, gravel filter up to 4.50m, bentonite seal up to 0.20m, concrete up to ground level.
Borehole terminated at 7.40m depth upon encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by AC
Checked by JN
Figure Sheet 1 of 1
06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH11
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327884.0 E 184159.6 N	**Ground Level**	10.97 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.21 - 0.30	B				
0.25	D				
0.30	ES				
0.40	D				
0.40 - 0.50	B				
0.60	D				
0.70	ES				
0.90 - 1.10	B				
1.10	ES				
1.20 - 1.40		1.20 (DRY)			S50/ 45mm
1.20 - 1.40	D			11	
1.20 - 1.70	B				
1.80	D				
2.00 - 2.35		2.00 (DRY)			S50/ 200mm
2.00	ES				
2.00 - 2.50	B				
2.00 - 2.50	D				
2.80	D				
3.00 - 3.45		3.00 (DRY)			S26
3.00 - 3.45	D				
3.00 - 3.50	B			36	
3.80	D				
4.00 - 4.38		4.00 (DRY)			S50/ 225mm
4.00 - 4.38	D				
4.00 - 4.50	B				
4.80	D				
5.00 - 5.43		5.00 (DRY)			S50/ 280mm
5.00 - 5.45	D				

Description	Depth	Legend	Level (m OD)
MADE GROUND: Grey concrete. [MADE GROUND - CONCRETE]	0.21		10.76
MADE GROUND: Brown slightly gravelly clayey fine to coarse sand. Gravel is subangular to subrounded fine to coarse of siltstone and granite. [MADE GROUND]	0.30		10.67
MADE GROUND: Orangish green gravelly slightly silty fine to coarse sand. Gravel is subangular to subrounded fine to coarse of siltstone and granite. [MADE GROUND] Below 0.75m, low cobble content (up to 100mm) of granite.	1.20		9.77
Firm light brown sandy gravelly CLAY with a low subrounded cobble content of siltstone and sandstone. Gravel is subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-COHESIVE]	2.80		8.17
Firm to stiff reddish brown slightly sandy slightly gravelly CLAY with occasional bands of silt. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY]	5.43		5.54
End of Borehole			

Boring

Depth	Hole Dia.	Technique	Crew
0.21	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	WN/JB
5.43	0.15	Cable Percussion	WN/JB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			17/08/22	08:00
5.00	4.50	DRY	17/08/22	17:00
5.00	4.50	DRY	18/08/22	08:00
5.43	5.00	DRY	18/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 2.00-3.00m for 60 minutes.
Chiselling: 5.00-5.430m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 5.43m cable percussion borehole terminated on encountering bedrock.

Logged in accordance with BS5930:2015 + A1:2020

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged by	TL
Checked by	JN
Figure	Sheet 1 of 1
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

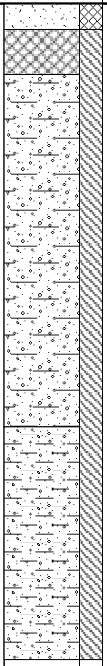
Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH12
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327945.1 E 184170.6 N	**Ground Level**	10.99 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.20	D				
0.20	ES				
0.20 - 0.40	B				
0.50	D				
0.50	ES				
0.50 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.46		1.20 (DRY)			S50/ 110mm
1.20 - 1.46	D				
1.20 - 1.70	B				
1.80	D				
2.00 - 2.45		2.00 (DRY)			S33
2.00	ES				
2.00 - 2.45	D				
2.00 - 2.50	B				
2.80	D				
3.00 - 3.37		3.00 (DRY)			S50/ 220mm
3.00	ES				
3.00 - 3.37	D				
3.00 - 3.50	B				
3.80	D				
4.00 - 4.34		4.00 (DRY)			S50/ 190mm
4.00 - 4.34	D				

Description	Depth	Level (m OD)
MADE GROUND: Grey concrete. [MADE GROUND - CONCRETE]	0.17	10.82
MADE GROUND: Dark brown gravelly medium to coarse sand. Gravel is subangular fine to coarse of sandstone and brick fragments. Rare metal fragments. [MADE GROUND]	0.47	10.52
Dense brown very sandy clayey GRAVEL with a low subrounded cobble content. Gravel is subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR] Below 1.20m, clayey.	2.80	8.19
Stiff to very stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY]	4.34	6.65
End of Borehole		

Legend



Boring

Depth	Hole Dia.	Technique	Crew
0.17	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	AC/RW
4.34	0.15	Cable Percussion	WN/JB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00		DRY	11/08/22	08:00
1.20		DRY	11/08/22	17:00
1.20		DRY	16/08/22	08:00
3.00	3.00	DRY	16/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 1.20-1.80m for 60 minutes.
Chiselling: 3.50-4.00m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 4.34m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion* *PRELIMINARY*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH12
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327945.1 E 184170.6 N	**Ground Level**	10.99 m OD

Sampling			Properties			Strata			Scale 1:50
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N	Description	Depth	Legend	Level (m OD)

Boring				**Progress**					**Groundwater**					
Depth	Hole Dia.	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
				3.00	3.00	DRY	17/08/22	08:00						
				4.34	4.00	DRY	17/08/22	17:00						

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 2 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328001.1 E 184179.7 N	**Borehole**	BH13
				Ground Level	10.99 m OD

Sampling

Properties

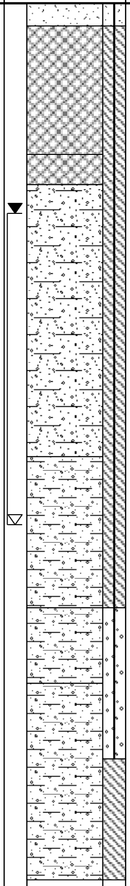
Strata

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.15	D				
0.15	ES				
0.15 - 0.60	B				
0.50	D				
0.50	ES				
0.60 - 1.00	B				
1.00 - 1.20	B				
1.20 - 1.35		(DRY)			S50/ 75mm
1.20 - 1.35	D				
1.20 - 1.70	B				
1.80	D				
2.00 - 2.15		2.00 (DRY)			S50/ 75mm
2.00	ES				
2.00 - 2.15	D				
2.00 - 2.50	B				
2.80	D				
3.00 - 3.45		3.00 (DRY)			S17
3.00 - 3.45	D			21	
3.00 - 3.50	B				
3.80	D				
4.00 - 4.45		4.00 (1.39)			S26
4.00 - 4.45	D				
4.00 - 4.50	B				
4.80	D			10	
5.00 - 5.45		5.00 (1.39)			S7
5.00 - 5.45	D				
5.00 - 5.50	B				
5.60 - 5.69		5.00 (5.40)			S50/ 15mm
5.60	D				

Description	Depth	Level (m OD)
MADE GROUND: Grey concrete. [MADE GROUND - CONCRETE]	0.15	10.84
MADE GROUND: Yellowish brown very gravelly fine to coarse sand. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone, concrete and brick fragments. [MADE GROUND] Below 0.60m, slightly clayey gravelly fine to coarse SAND.	1.00	9.99
MADE GROUND: Yellowish brown gravelly clayey fine to coarse sand. Gravel is subanuglar to subrounded fine to coarse of siltstone and sandstone. [MADE GROUND]	1.20	9.79
Dense light brown gravelly clayey medium to coarse SAND with a low subrounded cobble content of sandstone. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR] Between 2.50m and 3.00m, driller notes no flush returns whilst open-hole drilling.	3.00	7.99
Firm to stiff dark reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone. [ST MAUGHANS FORMATION-UPPER CLAY]	4.00	6.99
Firm light brown sandy gravelly CLAY with a medium subrounded cobble content of sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. [ST MAUGHANS FORMATION-UPPER CLAY]	4.50	6.49
Firm to stiff dark reddish brown sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY] At 5.00m, soft.	5.80	5.19
End of Borehole		

Legend



Boring

Depth	Hole Dia.	Technique	Crew
0.15	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	JZW/DG
5.80	0.15	Cable Percussion	WO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			03/08/22	08:00
1.20		DRY	03/08/22	17:00
1.20		DRY	09/08/22	08:00
2.30	2.00	DRY	09/08/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
3.45	3.45	1.39	20		Medium inflow.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 1.50-1.80m for 60 minutes, 1.80-2.00m for 60 minutes, 2.00-2.30m for 60 minutes, 5.50-5.80m for 60 minutes.
50mm standpipe was installed to 5.00m with a geowrapped slotted section from 4.00m to 5.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 5.00m, gravel filter up to 4.00m, bentonite seal up to 0.20m, concrete up to ground level.
At 5.80m cable percussion borehole terminated on encountering bedrock.
Logged in accordance with BS5930:2015 + A1:2020

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion* *PRELIMINARY*

Project Newport Quinn Phase 2

Client Pinnacle Consulting Engineers Limited

Engineer Pinnacle Consulting Engineers Limited

National Grid Coordinates 328001.1 E
184179.7 N

Project No. PN224395
Borehole BH13
Ground Level 10.99 m OD

Sampling			Properties			Strata			Scale 1:50
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N	Description	Depth	Legend	Level (m OD)

Boring				Progress					Groundwater					
Depth	Hole Dia.	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
				2.30	2.00	DRY	15/08/22	08:00						
				5.50	5.50	1.39	15/08/22	17:00						
				5.50	5.50	5.40	16/08/22	08:00						
				5.80	5.80	5.40	16/08/22	17:00						

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by AC
Checked by JN
Figure Sheet 2 of 2
06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH14
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328061.6 E 184190.6 N	**Ground Level**	11.03 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.20 - 0.70	B				
0.25	D				
0.25	ES				
0.50	D				
0.50	ES				
0.70 - 1.20	B				

Description	Depth	Legend	Level (m OD)
MADE GROUND: Dark grey concrete. [MADE GROUND - CONCRETE]	0.20	░	10.83
MADE GROUND: Yellowish brown very gravelly fine to coarse sand. Gravel is subanuglar to subrounded fine to coarse of siltstone, sandstone, concrete and slag. [MADE GROUND] Below 0.70m, gravel is subrounded of siltstone and sandstone.	1.20	▨	9.83
End of Borehole			

Boring

Depth	Hole Dia.	Technique	Crew
0.20	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	JM/DG

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			02/08/22	08:00
1.20		DRY	02/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
At 1.20m depth on encountering a concrete obstruction the Cable Percussion rig was moved to location BH14A.
Borehole backfilled with bentonite pellets and topped with arisings on completion.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	JWZ
Checked by	JN
Figure	Sheet 1 of 1
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH15
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328128.5 E 184193.1 N	**Ground Level**	10.65 m OD

Scale 1:50

Sampling			Properties		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.20 - 0.35	B				
0.25	D				
0.25	ES				
0.35 - 0.70	B				
0.50	D				
0.50	ES				
0.70 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.60		1.20 (DRY)			S50/ 255mm
1.20 - 1.60	B				
1.20 - 1.65	D				
1.80	D				
2.00 - 2.45		2.00 (DRY)			S11
2.00	ES				
2.00 - 2.45	D				
2.00 - 2.50	B				
2.80	D				
3.00	ES				
3.00 - 3.45	UT150	3.00 (DRY)			
3.00 - 3.45			64		
3.50	D			22	
3.50 - 4.00	B				
4.00 - 4.38		4.00 (DRY)			S50/ 230mm
4.00 - 4.38	D				
4.00 - 4.50	B				

Strata		
Description	Depth	Level (m OD)
MADE GROUND: Light grey concrete. [MADE GROUND - CONCRETE]	0.20	10.45
MADE GROUND: Black mottled brown gravelly fine to coarse sand. Gravel is subangular to subrounded fine to coarse of sandstone and concrete. [MADE GROUND]	0.35	10.30
MADE GROUND: Reddish brown gravelly fine to coarse sand. Gravel is subangular fine to coarse of sandstone, limestone and concrete. [MADE GROUND] Below 0.70m, slightly silty.	1.25	9.40
Very dense light brown slightly gravelly clayey SAND with localised clay pockets. Gravel is subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR]	2.00	8.65
Firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone (probable weathered bedrock). [RIVER TERRACE DEPOSITS-COHESIVE] At 3.00m, medium strength. Below 4.00m, very stiff.	4.60	6.05
End of Borehole		

Boring

Depth	Hole Dia.	Technique	Crew
0.20	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	RW/AC
4.60	0.15	Cable Percussion	WN/JB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			26/07/22	08:00
1.20		DRY	26/07/22	17:00
1.20		DRY	02/08/22	08:00
4.60	4.50	DRY	02/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 4.50-4.60m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 4.60m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 1
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

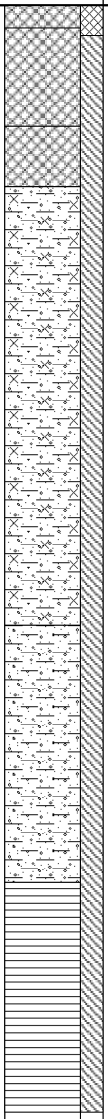
PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH16
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328193.2 E 184185.1 N	**Ground Level**	13.12 m OD

Sampling / Properties

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.20 - 0.50	B				
0.30	ES				
0.40	D				
0.60	D				
0.65 - 0.75	B				
0.70	ES				
0.85	D				
1.00 - 1.20	B				
1.10	ES				
1.20 - 1.51		1.20 (DRY)			C50/ 160mm
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C29
2.00 - 2.50	B				
3.00 - 3.32		3.00 (DRY)			C50/ 175mm
3.00 - 3.50	B				
4.00 - 4.10		4.00 (DRY)			C50/ 35mm
4.00 - 4.50	B				
5.00 - 5.27		5.00 (DRY)			C50/ 120mm
5.00 - 5.50	B				
5.80	D				
6.00 - 6.45		6.00 (DRY)			C28
6.00 - 6.50	B				
7.00 - 7.32		6.00 (DRY)			S50/ 165mm
7.00 - 7.32	D				

Strata Scale 1:50



Description	Depth	Level (m OD)
Grass over MADE GROUND: Light brown gravelly slightly silty fine to coarse sand with rootlets. Gravel is subangular to subrounded fine to coarse of granite. [MADE GROUND]	0.15	12.97
MADE GROUND: Brown gravelly slightly silty fine to coarse sand with a low cobble content (<80mm) of granite. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone and granite. [MADE GROUND]	0.80	12.32
MADE GROUND: Dark brown slightly gravelly slightly clayey fine to coarse sand. Gravel is subangular to subrounded fine to coarse of siltstone and granite. [MADE GROUND] At 0.80m, band (5mm) of dark grey clay. Below 1.00m, low cobble content (<120mm) of granite.	1.20	11.92
Stiff yellowish brown slightly sandy slightly gravelly silty CLAY. Gravel is subangular fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-COHESIVE] Below 3.00m, very stiff.	4.10	9.02
Very stiff light brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone. [ST MAUGHANS FORMATION-UPPER CLAY]	5.80	7.32
Extremely weak reddish brown SANDSTONE. Recovered as sandy gravel. [ST MAUGHANS FORMATION]	7.32	5.80
End of Borehole		

Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	WO/JT
7.32	0.15	Cable Percussion	WO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			17/08/22	08:00
4.10	4.00	DRY	17/08/22	17:00
4.10	4.00	DRY	18/08/22	08:00
7.32	6.00	DRY	18/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow Progress: 1.20-1.60m for 90 minutes, 2.50-4.00m for 210 minutes, 4.00-4.60m for 120 minutes.
Chiselling: 3.00-3.30m for 60 minutes, 5.30-5.50m for 75 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 7.32m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Checked by JN
Figure Sheet 1 of 1
06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

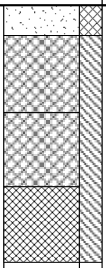
BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327719.9 E 184071.1 N	**Borehole**	BH17
				Ground Level	11.06 m OD

Scale 1:50

Sampling			Properties			Strata
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N	
0.20	D					
0.20	ES					
0.20 - 0.60	B					
0.50	D					
0.50	ES					
0.60 - 1.20	B					
1.00	D					
1.00	ES					
1.20 - 1.65		(DRY)			C15	
1.20 - 1.70	B					



Description	Depth	Legend	Level (m OD)
MADE GROUND: Grey concrete. [MADE GROUND - CONCRETE]	0.20		10.86
MADE GROUND: Dark greyish brown gravelly medium sand with a low cobble content. Gravel is angular to subrounded fine to coarse of sandstone and concrete. Some fragments of metal. [MADE GROUND]	0.71		10.35
MADE GROUND: Dark greyish brown slightly gravelly medium sand. Gravel is angular to subangular fine to coarse of sandstone and concrete. [MADE GROUND]	1.20		9.86
MADE GROUND: Firm brownish grey slightly sandy slightly gravelly clay. [MADE GROUND] At 1.70m, obstruction. Probable concrete.	1.70		9.36

End of Borehole

Boring

Depth	Hole Dia.	Technique	Crew
0.20	0.30	Concrete Core	D Drill
1.20	0.30	Inspection Pit	AC/RW
1.70	0.15	Cable Percussion	PO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00		DRY	08/08/22	08:00
1.70		DRY	08/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
At 1.70m depth on encountering a concrete obstruction the Cable Percussion rig was moved to location BH17A.
Borehole backfilled with bentonite pellets and topped with arisings on completion.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 1
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327781.8 E 184081.0 N	**Borehole**	BH18
				Ground Level	11.03 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.25	D				
0.25	ES				
0.25 - 0.60	B				
0.50	D				
0.50	ES				
0.60 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.65		(DRY)			S34
1.20 - 1.65	D				
1.20 - 1.70	B				
1.80	D				
2.00 - 2.45		2.00 (DRY)			S12
2.00	ES				
2.00 - 2.45	D				
2.00 - 2.50	B				
2.80	D				
3.00 - 3.38		3.00 (DRY)			S50/ 225mm
3.00	ES				
3.00 - 3.38	D				
3.00 - 3.50	B				
3.80	D			12	
4.00 - 4.45		4.00 (DRY)			S16
4.00	ES				
4.00 - 4.45	D				
4.00 - 4.50	B				
4.80	D				
5.00 - 5.45		5.00 (DRY)			S16
5.00 - 5.45	D				
5.00 - 5.50	B				
5.60 - 5.80	B				
5.80	D				
6.00 - 6.45		6.00 (DRY)			S29
6.00 - 6.45	D				
6.00 - 6.50	B				
6.80	D				
7.00 - 7.45		7.00 (DRY)			S11
7.00 - 7.45	D				
7.00 - 7.50	B				
7.50	D				
8.00 - 8.45		8.00 (DRY)			S34
8.00 - 8.45	D				
8.00 - 8.50	B				
8.80	D				
9.00 - 9.45		9.00 (7.90)			S28
9.00 - 9.45	D				
9.00 - 9.50	B				
9.80	D				
10.00 - 10.33		10.00 (6.00)			S50/ 180mm

Description	Depth	Legend	Level (m OD)
MADE GROUND: Light grey concrete. [MADE GROUND - CONCRETE]	0.22		10.81
MADE GROUND: Dark grey to black slightly gravelly medium to coarse sand. Gravel is subangular to subrounded fine to coarse of sandstone and clinker. Sand contains ash. Some fragments of metal. [MADE GROUND] Below 0.80m, low angular to subangular cobble content of sandstone. Occasional fragments of plastic, rubber and wire. Below 1.00m, pockets of reddish brown sandy clay.	1.20		9.83
Very stiff light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and siltstone. [RIVER TERRACE DEPOSITS-COHESIVE] Below 2.00m, firm.	3.00		8.03
Very dense light brown very sandy clayey GRAVEL with occasional clay pockets. Gravel is angular to subangular fine to medium of sandstone. [RIVER TERRACE DEPOSITS-GRANULAR]	3.40		7.63
Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and siltstone. [RIVER TERRACE DEPOSITS-COHESIVE]	5.60		5.43
Stiff becoming stiff dark reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to medium of mudstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY] Below 7.00m, firm. Below 8.00m, very stiff. Below 9.00m, stiff.			

Boring

Depth	Hole Dia.	Technique	Crew
0.22	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	RW/AC
10.33	0.15	Cable Percussion	WN/JB

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			03/08/22	08:00
6.00	6.00	DRY	03/08/22	18:00
6.00	6.00	DRY	04/08/22	08:00
10.33	10.00	6.0	04/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
8.45		7.90	20		Seepage.
10.00		6.00	20		Seepage.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 9.80-10.00m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 10.33m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 1 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327781.8 E 184081.0 N	**Borehole**	BH18
				Ground Level	11.03 m OD

Sampling			Properties			Strata			Scale 1:50
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N	Description	Depth	Legend	Level (m OD)
10.00 - 10.33	D					Below 10.00m, very stiff.	10.33	▨	0.70
						End of Borehole			

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

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 2 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

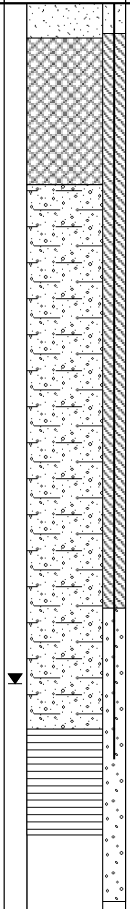
PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH19
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327837.4 E 184090.8 N	**Ground Level**	11.01 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.25	D				
0.25	ES				
0.25 - 0.60	B				
0.50	D				
0.50	ES				
0.60 - 1.20	B				
1.00	D				
1.00	ES				
1.10 - 1.20	D				
1.20 - 1.65		1.20 (DRY)			C32
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C38
2.00 - 2.50	B				
3.00 - 3.45		3.00 (DRY)			C32
3.00 - 3.50	B				
4.00 - 4.45		4.00 (DRY)			C30
4.00 - 4.50	B				
4.50 - 4.80	D				
5.00 - 5.45		5.00 (DRY)			C30
5.00 - 5.50	B				
5.50 - 5.94		5.50 (DRY)			C50/ 290mm

Description	Depth	Level (m OD)
MADE GROUND: Light grey concrete. [MADE GROUND - CONCRETE]	0.23	10.78
MADE GROUND: Dark brown gravelly fine to coarse sand. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone and limestone. Some fragments of metal. [MADE GROUND] Below 0.60m, locally silty. At 0.80m, section of black tube (150mm diameter).	1.20	9.81
Brown very sandy subangular to subrounded fine to coarse clayey GRAVEL of siltstone and sandstone. Medium subangular to subrounded cobble content of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR] Below 4.50m, very clayey.	4.80	6.21
Extremely weak reddish brown MUDSTONE. Recovered as slightly sandy gravelly clay. [ST MAUGHANS FORMATION]	5.50	5.51
End of Borehole		



Boring

Depth	Hole Dia.	Technique	Crew
0.23	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	RW/AC
5.94	0.15	Cable Percussion	WO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			03/08/22	08:00
1.20		DRY	03/08/22	18:00
1.20		DRY	01/09/22	08:00
5.94	5.50	DRY	01/09/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
4.50	4.00			5.00	Slow inflow.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
A 50mm standpipe was installed to 5.00m with a geowrapped slotted section from 4.00m to 5.00m with a flush cover installed.
Backfill details from base of hole: gravel filter up to 4.00m, bentonite seal up to 0.20m, concrete up to ground level.
At 5.94m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 1 of 1
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327950.9 E 184113.7 N	**Borehole**	BH20
				Ground Level	11.01 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.45 - 0.65	B				
0.50	D				
0.50	ES				
0.65 - 1.20	B				
0.80	D				
0.80	ES				
1.00	D				
1.00	ES				
1.20 - 1.65		1.20 (DRY)			C51
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C36
2.00 - 2.50	B				
3.00 - 3.45		3.00 (DRY)			C26
3.00 - 3.50	B				
3.80	D				
4.00 - 4.45		4.00 (DRY)			C29
4.00 - 4.50	B				
5.00 - 5.40		5.00 (DRY)			S50/ 250mm
5.00 - 5.45	D				

Description	Depth	Legend	Level (m OD)
MADE GROUND: Light grey concrete. [MADE GROUND - CONCRETE]	0.45	▨	10.56
MADE GROUND: Dark greyish brown sandy subangular fine to coarse gravel of siltstone and sandstone. Occasional metal fragments. [MADE GROUND]	0.65	▨	10.36
Medium dense to dense brown very gravelly fine to coarse clayey SAND with a low subrounded cobble content of sandstone. Gravel is subrounded to rounded fine to coarse of sandstone. [RIVER TERRACE DEPOSITS-GRANULAR] Below 1.20m, clayey. Below 2.00m, very clayey, pockets of clay. Medium cobble content of subangular to subrounded siltstone and sandstone.	4.00	▨	7.01
Extremely weak reddish brown MUDSTONE. Recovered as slightly sandy gravelly clay. [ST MAUGHANS FORMATION]	5.00	▨	6.01
End of Borehole			

Boring

Depth	Hole Dia.	Technique	Crew
0.45	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	AC/JM
5.40	0.15	Cable Percussion	WO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00		DRY	10/08/22	08:00
1.20		DRY	10/08/22	17:00
1.20		DRY	31/08/22	08:00
5.40	5.00	DRY	31/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 1.40-2.00m for 90 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 5.40m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 1

06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH21
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328008.4 E 184123.8 N	**Ground Level**	11.03 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.50	D				
0.50	ES				
0.50 - 0.80	B				
0.80 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.62		1.20 (DRY)			C50/ 265mm
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C33
2.00 - 2.50	B				
3.00 - 3.45		3.00 (DRY)			C36
3.00 - 3.50	B				
4.00 - 4.45		4.00 (DRY)			C30
4.00 - 4.50	B				
5.00 - 5.42		5.00 (DRY)			S50/ 270mm
5.00 - 5.45	D				

Description	Depth	Legend	Level (m OD)
MADE GROUND: Grey concrete. [MADE GROUND - CONCRETE]	0.45	▨	10.58
MADE GROUND: Brown gravelly fine to medium sand. Gravel is subangular fine to coarse of siltstone and sandstone. [MADE GROUND]	1.20	▨	9.83
Dense to very dense brown very sandy angular to subrounded fine to coarse clayey GRAVEL of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR] Below 2.00m, pockets of clay.	3.80	▨	7.23
Extremely weak reddish brown MUDSTONE. Recovered as slightly sandy gravelly clay. [ST MAUGHANS FORMATION]	5.00	▨	6.03
End of Borehole			

Boring

Depth	Hole Dia.	Technique	Crew
0.45	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	JM/DG
5.42	0.15	Cable Percussion	WO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			29/07/22	08:00
1.20		DRY	29/07/22	17:00
1.20		DRY	31/08/22	08:00
3.45	3.00	DRY	31/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 1.50-2.00m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 5.42m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 1 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH21
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328008.4 E 184123.8 N	**Ground Level**	11.03 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N	Description	Depth	Legend	Level (m OD)

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
3.45	3.00	DRY	01/09/22	08:00
5.42	5.00	DRY	01/09/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 2 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

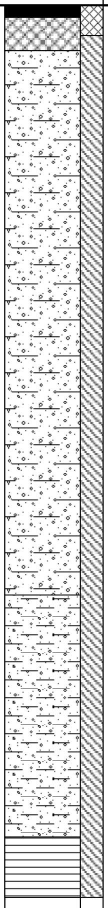
Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328141.9 E 184144.1 N	**Borehole**	BH22
				Ground Level	10.70 m OD

Sampling / Properties

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.08 - 0.30	B				
0.20	D				
0.20	ES				
0.30 - 1.20	B				
0.50	D				
0.50	ES				
1.00	D				
1.00	ES				
1.20 - 1.65		(DRY)			C37
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C31
2.00 - 2.50	B				
3.00 - 3.45		3.00 (DRY)			C32
3.00 - 3.50	B				
3.90	D				
4.00 - 4.45		4.00 (DRY)			S35
4.00	D				
4.00 - 4.50	B				
5.00 - 5.45		4.00 (DRY)			S35
5.00					
5.00	D				
5.50 - 5.90		4.00 (DRY)			C50/ 245mm

Strata Scale 1:50

Description	Depth	Legend	Level (m OD)
MADE GROUND: Black tarmacadam. [MADE GROUND - TARMACADAM]	0.08		10.62
MADE GROUND: Reddish brown gravelly medium to coarse sand with a low subrounded cobble content of sandstone. Gravel is angular to subangular medium to coarse of siltstone, sandstone, quartz and occasional concrete fragments. [MADE GROUND]	0.30		10.40
Dense dark brown very sandy fine to coarse subrounded clayey GRAVEL with a low subrounded cobble content of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR]	3.90		6.80
Stiff dark reddish brown mottled grey slightly sandy slightly gravelly CLAY with local pockets of soft clay. Gravel is angular to subangular fine to medium of mudstone (Weathered calcareous mudstone). [ST MAUGHANS FORMATION-UPPER CLAY]	5.50		5.20
Extremely weak dark reddish brown calcareous MUDSTONE. [ST MAUGHANS FORMATION]	5.90		4.80
End of Borehole			



Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit Cable Percussion	RW/AC PO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			27/07/22	08:00
1.20		DRY	27/07/22	17:00
1.20		DRY	01/08/22	08:00
2.00	2.00	DRY	01/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1 litre plastic tub.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 5.90m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH22
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328141.9 E 184144.1 N	**Ground Level**	10.70 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N	Description	Depth	Legend	Level (m OD)

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
2.00	2.00	DRY	02/08/22	08:00
5.90	4.00	DRY	02/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 2 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327731.1 E 184000.5 N	**Borehole**	BH24
				Ground Level	11.06 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.20 - 0.50	B				
0.25	D				
0.25	ES				
0.50 - 0.80	B				
0.60	D				
0.60	ES				
1.00	D				
1.00	ES				
1.20 - 1.29		(DRY)			C50/ 50mm
1.20 - 1.70	B				
2.00 - 2.14		2.00 (DRY)			C50/ 65mm
2.00	D			9	
2.00 - 2.50	B				
3.00 - 3.45		3.00 (DRY)			C42
3.00 - 3.50	B				
4.00 - 4.45		3.50 (DRY)			C30
4.00	D				
4.00 - 4.50	B				
5.00 - 5.40		3.50 (DRY)			C50/ 255mm

Description	Depth	Level (m OD)
MADE GROUND: Grey concrete. [MADE GROUND - CONCRETE]	0.21	10.85
MADE GROUND: Dark greyish brown slightly gravelly medium sand. Gravel is subangular to subrounded fine to coarse of sandstone, metal and aircrete fragments. [MADE GROUND]	0.66	10.40
MADE GROUND: Reddish brown slightly gravelly medium sand with a low subangular to subrounded cobble content of sandstone. Gravel is subangular to subrounded medium to coarse of sandstone. [MADE GROUND]	0.81	10.25
MADE GROUND: Dark greyish brown slightly gravelly medium sand with a low subangular to subrounded cobble content of sandstone and aircrete fragments. Gravel is subangular to subrounded medium to coarse of sandstone and aircrete fragments. [MADE GROUND]	1.20	9.86
Soft to firm dark brown slightly gravelly sandy CLAY with a low subrounded cobble content of siltstone and sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. [RIVER TERRACE DEPOSITS-COHESIVE]	2.50	8.56
Brown fine to coarse SAND and subangular to subrounded fine to coarse GRAVEL of various lithologies. [RIVER TERRACE DEPOSITS-GRANULAR]	3.00	8.06
Firm reddish brown slightly sandy slightly gravelly CLAY with a low subrounded cobble content of mudstone. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY] At 5.00m, stiff.	5.41	5.65
End of Borehole		

Boring

Depth	Hole Dia.	Technique	Crew
0.21	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	JM/DG
5.41	0.15	Cable Percussion	PO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			28/07/22	08:00
1.20		DRY	28/07/22	17:00
1.20		DRY	25/08/22	08:00
2.50	2.50	DRY	25/08/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 1.40-2.50m for 270 minutes
Chiselling: 1.20-1.40m for 90 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 5.41m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 1 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH24
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327731.1 E 184000.5 N	**Ground Level**	11.06 m OD

Sampling			Properties			Strata			Scale 1:50
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N	Description	Depth	Legend	Level (m OD)

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
2.50	2.50	DRY	26/08/22	08:00
5.41	3.50	DRY	26/08/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 2 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD* - *Cable Percussion

PRELIMINARY

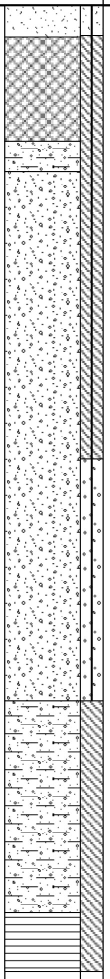
Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH25
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327792.4 E 184010.5 N	**Ground Level**	11.00 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.21 - 0.80	B				
0.25	D				
0.25	ES				
0.55	D				
0.55	ES				
0.90 - 1.20	B				
1.00	D			11	
1.00	ES				
1.20 - 1.65		1.20 (DRY)			C17
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C31
2.00 - 2.50	B				
3.00 - 3.45		3.00 (DRY)			C48
3.00 - 3.50	B				
4.00 - 4.40		4.00 (DRY)			C50/ 247mm
4.00 - 4.50	B				
4.60	D				
5.00 - 5.45		5.00 (DRY)			C39
5.00 - 5.50	B				
6.00 - 6.39		6.00 (DRY)			S50/ 241mm
6.00 - 6.45	D				

Description	Depth	Level (m OD)
MADE GROUND: Light grey concrete. [MADE GROUND - CONCRETE]	0.21	10.79
MADE GROUND: Dark brown gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of sandstone and concrete. Sand is of ash. [MADE GROUND] At 0.21m, plastic geotextile.	0.90	10.10
Soft to firm dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-COHESIVE] Below 1.00m, gravel is fine to medium	1.10	9.90
Medium dense brown clayey SAND and GRAVEL with low cobble content. Gravel is fine to coarse subangular to subrounded. Gravel and cobbles of various lithologies. [RIVER TERRACE DEPOSITS-GRANULAR] Below 4.00m, light brown, sandy.	4.60	6.40
Stiff dark red slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY]	6.00	5.00
Extremely weak reddish brown MUDSTONE. Recovered as gravelly clay. [ST MAUGHANS FORMATION]	6.39	4.61
End of Borehole		

Legend



Boring

Depth	Hole Dia.	Technique	Crew
0.21	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	RW/AC
6.00	0.15	Cable Percussion	WO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			26/07/22	08:00
1.20		DRY	26/07/22	17:00
1.20		DRY	23/08/22	08:00
4.00	4.00	DRY	23/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 3.00-4.00m for 150 minutes, 5.00-6.00m for 60 minutes.
A 50mm standpipe was installed to 4.60m with a geowrapped slotted section from 3.00m to 4.60m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 4.60m, gravel filter up to 3.00m, bentonite seal up to 0.20m, concrete up to ground level.
At 6.39m cable percussion borehole terminated on encountering bedrock.
Logged in accordance with BS5930:2015 + A1:2020

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH25
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327792.4 E 184010.5 N	**Ground Level**	11.00 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N	Description	Depth	Legend	Level (m OD)

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
4.00	4.00	DRY	24/08/22	08:00
6.39	6.00	DRY	24/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 2 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH26
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327846.6 E 184019.3 N	**Ground Level**	10.95 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.25	D				
0.25	ES				
0.25 - 0.60	B				
0.50	D				
0.50	ES				
0.60 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.51		(DRY)			S50/ 160mm
1.20	D				
1.20 - 1.70	B				
1.80	D			11	
2.00 - 2.33		2.00 (DRY)			S50/ 175mm
2.00	D				
2.00	ES				
2.00 - 2.50	B				
2.80	D				
3.00 - 3.45		3.00 (DRY)			S11
3.00	ES				
3.00 - 3.45	D				
3.00 - 3.50	B				
3.80	D				
4.00 - 4.45		4.00 (DRY)			S8
4.00	ES				
4.00 - 4.45	D			33	
4.00 - 4.50	B				
4.80	D				
5.00 - 5.45		5.00 (DRY)			S4
5.00	ES				
5.00 - 5.45	D				
5.00 - 5.50	B				
5.80	D				
6.00 - 6.45		6.00 (DRY)			S0*/ 450mm
6.00	ES				
6.00 - 6.45	D				
6.00 - 6.50	B				
6.80	D				
7.00 - 7.45		7.00 (DRY)			S7
7.00 - 7.45	D				
7.00 - 7.50	B				
7.80	D				
8.00 - 8.45		8.00 (DRY)			S7
8.00 - 8.45	D				
8.00 - 8.50	B				
8.80	D				
9.00 - 9.38		9.00 (DRY)			S50/ 225mm
9.00 - 9.38	D				

Description	Depth	Legend	Level (m OD)
MADE GROUND: Light grey concrete. [MADE GROUND - CONCRETE]	0.21		10.74
MADE GROUND: Light greyish brown gravelly medium to coarse sand. Gravel is angular to subangular fine to coarse of siltstone, sandstone and concrete. Some fragments of steel reinforcing bar and 'ThermoLite' insulation.. [MADE GROUND]	0.60		10.35
MADE GROUND: Dark brown slightly gravelly fine to coarse sand with a low subrounded cobble content. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone and limestone. [MADE GROUND]	1.20		9.75
Soft to firm light brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. With probable low coble content. [ALLUVIUM]	4.00		6.95
Soft to firm light brown mottled dark brown slightly sandy slightly gravelly organic CLAY with frequent bands of pseudo-fibrous peat and wood fragments. Occasionally tending to wards silt. Gravel is subrounded to rounded fine to coarse of siltstone and sandstone. [ALLUVIUM]	7.60		3.35
Soft becoming firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of mudstone, siltstone and sandstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY] At 9.00m becoming stiff to very stiff.	9.38		1.57
End of Borehole			

Boring

Depth	Hole Dia.	Technique	Crew
0.21	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	RW/AC
9.38	0.15	Cable Percussion	WN

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			29/07/22	08:00
1.20		DRY	29/07/22	18:00
1.20		DRY	10/08/22	08:00
3.45	3.00	DRY	10/08/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 8.80-9.00m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 9.38m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 1 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH26
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327846.6 E 184019.3 N	**Ground Level**	10.95 m OD

Sampling			Properties			Strata		Scale 1:50	
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N	Description	Depth	Legend	Level (m OD)

Boring				Progress					Groundwater					
Depth	Hole Dia.	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
				3.45	3.00	DRY	11/08/22	08:00						
				8.45	8.00	DRY	11/08/22	18:00						
				8.45	8.00	DRY	12/08/22	08:00						
				9.38	9.00	DRY	12/08/22	18:00						

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 2 of 2
	06/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion* *PRELIMINARY*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH29
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328189.7 E 184099.2 N	**Ground Level**	11.22 m OD

Sampling / Properties

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.10 - 0.25	B				
0.20	D				
0.20	ES				
0.30 - 0.60	B				
0.50	D				
0.50	ES				
0.90 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.65		1.20 (DRY)			C26
1.20 - 1.70	B				
1.80	D			8	
2.00 - 2.45		2.00 (DRY)			C46
2.00	ES				
2.00 - 2.50	B				
2.70	D				
3.00 - 3.45		3.00 (DRY)			C32
3.00 - 3.50	B				
3.70	D				
4.00 - 4.45		4.00 (DRY)			S26
4.00 - 4.45	D				
4.00 - 4.50	B				
5.00 - 5.45		5.00 (DRY)			S39
5.00 - 5.45	D				
5.00 - 5.50	B				
5.50 - 5.90		5.00 (DRY)			S50/ 255mm

Strata Scale 1:50

Description	Depth	Legend	Level (m OD)
MADE GROUND: Black tarmacadam. [MADE GROUND - TARMACADAM]	0.10		11.12
MADE GROUND: Reddish brown gravelly medium to coarse sand with a low cobble content. Gravel is subangular to subrounded medium to coarse of igneous lithologies. [MADE GROUND]	0.25		10.97
MADE GROUND: Greyish brown gravelly medium to coarse sand with a low cobble content. Gravel is subangular to subrounded medium to coarse of concrete. [MADE GROUND]	0.90		10.32
Light brown gravelly medium to coarse SAND. Gravel is subrounded fine to coarse of sandstone. [RIVER TERRACE DEPOSITS-GRANULAR]	1.20		10.02
Soft to firm orangish brown slightly gravelly sandy CLAY with a low subrounded cobble content. Gravel is subrounded fine to coarse of siltstone. [RIVER TERRACE DEPOSITS-COHESIVE]			
Extremely weak reddish brown MUDSTONE. Recovered as stiff to very stiff reddish brown slightly gravelly clay. [ST MAUGHANS FORMATION]	3.70		7.52
End of Borehole	5.90		5.32

Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	RW/AC
5.90	0.15	Cable Percussion	PO/JT

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			28/07/22	08:00
5.90	5.00	DRY	28/07/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 2.40-2.80m for 75 minutes and 3.10-3.50m for 60 minutes.
Chiselling: 5.30-5.50m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.
At 5.90m cable percussion borehole terminated on encountering bedrock.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 1 of 1

06/01/2023

GEOTECHNICS geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

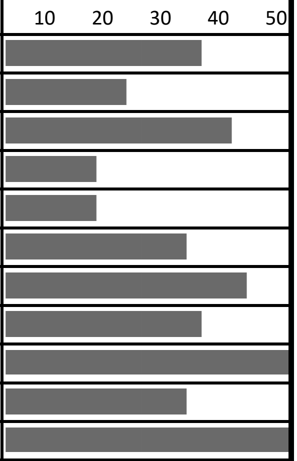
Project Newport Quinn Phase 2

Engineer Pinnacle Consulting Engineers Limited

Project No. PN224395

Client Pinnacle Consulting Engineers Limited

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		
BH02	1.20	9.68	S		4	3	10	10	7	7	34	
BH02	2.00	8.88	S		3	4	4	5	5	9	23	
BH02	3.00	7.88	S		8	10	10	10	10	10	40	
BH02	4.00	6.88	S		1	1	4	4	6	4	18	
BH02	5.00	5.88	S		2	3	3	4	4	5	16	
BH02	6.00	4.88	S		8	7	7	6	10	10	33	
BH02	7.00	3.88	S		4	10	12	12	8	10	42	
BH02	8.00	2.88	S		8	8	10	8	8	8	34	
BH02	9.00	1.88	S		12	13	16	12	10	12	50	
BH02	10.00	0.88	S		4	7	8	8	8	9	33	
BH02	11.00	-0.12	S		10	12	15	13	12	10	50/245	



Hammer No.:	JB14	**Remarks**
Energy Ratio, Er (%):	63	

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - SPT with split spoon sampler

C - SPT with cone

L - Split Spoon liner used

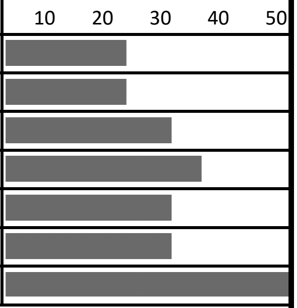
Printed: 07/09/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		
BH03	1.20	9.57	C		4	4	5	6	5	5	21	
BH03	2.00	8.77	C		5	5	5	6	5	6	22	
BH03	3.00	7.77	C		6	7	7	8	7	8	30	
BH03	4.00	6.77	C		5	7	9	9	8	9	35	
BH03	5.00	5.77	C		6	7	8	8	7	6	29	
BH03	6.00	4.77	C		5	6	6	7	8	8	29	
BH03	7.00	3.77	C		8	10	11	12	14	13	50/275	



Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

GEOTECHNICS
geotechnical and geoenvironmental specialists

Printed: 07/09/2022

AGS

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH04	1.20	9.57	C		9	16	50				50/245	

Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

Printed: 07/09/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		10 20 30 40 50
BH05	2.00	8.76	C		9	12	16	34			50/125	
BH05	3.00	7.76	C		7	8	8	9	9	10	36	
BH05	4.00	6.76	C		8	11	14	15	17	4	50/230	

Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

Printed: 07/09/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		10 20 30 40 50
BH06	1.20	9.66	C		5	4	6	6	5	5	22	
BH06	2.00	8.86	C		7	9	9	8	7	7	31	
BH06	3.00	7.86	S		7	7	8	8	7	8	31	
BH06	4.00	6.86	C		8	11	12	14	14	10	50/250	

Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

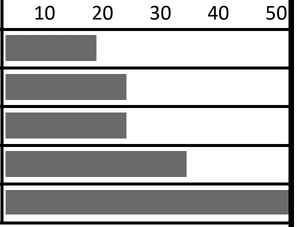
Printed: 07/09/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH08	1.20	9.75	C		2	4	4	5	4	4	17	
BH08	2.00	8.95	C		5	5	6	5	5	5	21	
BH08	3.00	7.95	C		5	6	5	6	5	5	21	
BH08	4.00	6.95	C		7	8	8	7	8	9	32	
BH08	5.00	5.95	S		8	10	14	11	12	13	50	



Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S - SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C - SPT with cone
SWP	Penetration under own weight (mm)	L - Split Spoon liner used

Printed: 07/09/2022

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		10 20 30 40 50
BH09	1.20	9.81	C		5	6	9	9	8	8	34	
BH09	2.00	9.01	C		8	9	10	10	11	12	43	
BH09	3.00	8.01	C		5	6	7	7	8	9	31	
BH09	6.00	5.01	C		5	6	6	7	6	7	26	
BH09	7.00	4.01	S		8	10	11	14	14	11	50/245	

Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

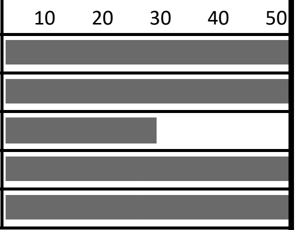
Printed: 07/09/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		
BH11	1.20	9.77	S		4	8	50				50/45	
BH11	2.00	8.97	S		5	6	20	12	18		50/200	
BH11	3.00	7.97	S		3	2	4	6	8	8	26	
BH11	4.00	6.97	S		4	10	12	17	21		50/225	
BH11	5.00	5.97	S		10	10	15	18	17		50/280	



Hammer No.:	JB14	**Remarks**
Energy Ratio, Er (%):	63	

-/-	Blows/penetration (mm) after seating	S - SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C - SPT with cone
SWP	Penetration under own weight (mm)	L - Split Spoon liner used

Printed: 07/09/2022

AGS

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		10 20 30 40 50
BH12	1.20	9.79	S		5	10	15	35			50/110	
BH12	2.00	8.99	S		8	9	7	8	9	9	33	
BH12	3.00	7.99	S		4	8	13	20	17		50/220	
BH12	4.00	6.99	S		7	12	20	18	12		50/190	

Hammer No.:	JB14	**Remarks**
Energy Ratio, Er (%):	63	

-/-	Blows/penetration (mm) after seating	S - SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C - SPT with cone
SWP	Penetration under own weight (mm)	L - Split Spoon liner used

Printed: 07/09/2022

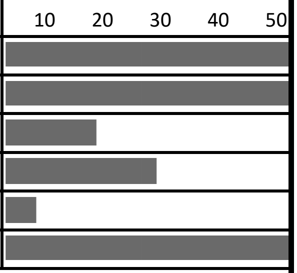
GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**	
BH13	1.20	9.79	S		25		50				50/75
BH13	2.00	8.99	S		25		50				50/75
BH13	3.00	7.99	S		2	3	7	4	2	4	17
BH13	4.00	6.99	S		1	5	5	5	6	10	26
BH13	5.00	5.99	S		1	2	3	2	-	2	7
BH13	5.60	5.39	S		25		50				50/15

Uncorrected SPT 'N' value



Hammer No.:	JB14	**Remarks**
Energy Ratio, Er (%):	63	

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - SPT with split spoon sampler

C - SPT with cone

L - Split Spoon liner used

Printed: 07/09/2022

AGS

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		10 20 30 40 50
BH15	1.20	9.45	S		4	17	20	17	13		50/255	
BH15	2.00	8.65	S		2	3	2	2	3	4	11	
BH15	4.00	6.65	S		12	13	20	30			50/230	

Hammer No.:	JB14	**Remarks**
Energy Ratio, Er (%):	63	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

Printed: 07/09/2022

AGS

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - SPT Results Summary

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH16	1.20	11.92	C		8	10	14	28	8		50/160	
BH16	2.00	11.12	C		7	7	9	7	6	7	29	
BH16	3.00	10.12	C		10	16	19	21	10		50/175	
BH16	4.00	9.12	C		25		50				50/35	
BH16	5.00	8.12	C		8	12	19	31			50/120	
BH16	6.00	7.12	C		7	7	6	7	8	7	28	
BH16	7.00	6.12	S		9	16	19	22	9		50/165	

Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

Printed: 07/09/2022

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH17	1.20	9.86	C		3	4	3	4	4	4	15	▇

Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - SPT with split spoon sampler

C - SPT with cone

L - Split Spoon liner used

Printed: 07/09/2022

AGS

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project Newport Quinn Phase 2

Engineer Pinnacle Consulting Engineers Limited

Project No. PN224395

Client Pinnacle Consulting Engineers Limited

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		
BH18	1.20	9.83	S		9	10	8	7	9	10	34	
BH18	2.00	9.03	S		2	3	3	4	2	3	12	
BH18	3.00	8.03	S		4	6	15	15	20		50/225	
BH18	4.00	7.03	S		2	3	3	4	5	4	16	
BH18	5.00	6.03	S		2	2	3	4	4	5	16	
BH18	6.00	5.03	S		2	4	6	6	8	9	29	
BH18	7.00	4.03	S		1	1	2	3	3	3	11	
BH18	8.00	3.03	S		2	4	7	7	10	10	34	
BH18	9.00	2.03	S		2	3	3	6	9	10	28	
BH18	10.00	1.03	S		2	6	15	15	20		50/180	

Hammer No.:	JB14	**Remarks**
Energy Ratio, Er (%):	63	

-/-	Blows/penetration (mm) after seating
-*/-	Total blows/penetration (mm)
SWP	Penetration under own weight (mm)

S - SPT with split spoon sampler

C - SPT with cone

L - Split Spoon liner used

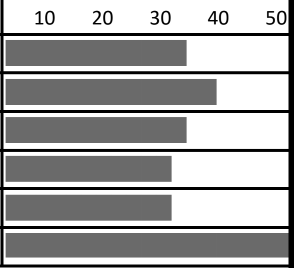
Printed: 07/09/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH19	1.20	9.81	C		4	7	8	8	9	7	32	
BH19	2.00	9.01	C		5	8	9	9	10	10	38	
BH19	3.00	8.01	C		6	6	7	8	8	9	32	
BH19	4.00	7.01	C		5	7	7	7	8	8	30	
BH19	5.00	6.01	C		7	6	6	7	8	9	30	
BH19	5.50	5.51	C		9	9	10	10	16	14	50/290	



Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

Printed: 07/09/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		10 20 30 40 50
BH20	1.20	9.81	C		8	10	9	14	14	14	51	
BH20	2.00	9.01	C		7	8	8	9	9	10	36	
BH20	3.00	8.01	C		5	8	9	7	5	5	26	
BH20	4.00	7.01	C		5	6	7	7	8	7	29	
BH20	5.00	6.01	S		9	11	12	14	14	10	50/250	

Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

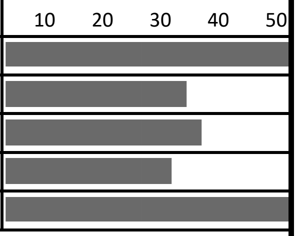
Printed: 07/09/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		
BH21	1.20	9.83	C		9	16	23	27			50/265	
BH21	2.00	9.03	C		5	7	8	8	9	8	33	
BH21	3.00	8.03	C		6	9	8	9	9	10	36	
BH21	4.00	7.03	C		3	5	7	7	8	8	30	
BH21	5.00	6.03	S		6	10	11	13	15	11	50/270	



Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S - SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C - SPT with cone
SWP	Penetration under own weight (mm)	L - Split Spoon liner used

Printed: 07/09/2022

AGS

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

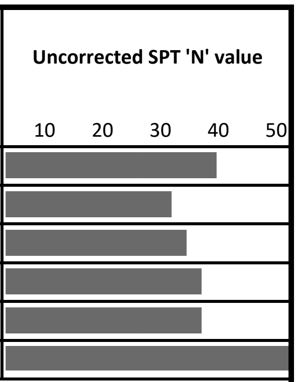
Project Newport Quinn Phase 2

Engineer Pinnacle Consulting Engineers Limited

Project No. PN224395

Client Pinnacle Consulting Engineers Limited

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)	
BH22	1.20	9.50	C		8	8	9	9	10	9	37
BH22	2.00	8.70	C		6	7	7	8	8	8	31
BH22	3.00	7.70	C		5	7	7	8	8	9	32
BH22	4.00	6.70	S		5	7	8	8	9	10	35
BH22	5.00	5.70	S		7	8	9	8	9	9	35
BH22	5.50	5.20	C		9	16	15	14	15	6	50/245



Hammer No.:	SAM1
Energy Ratio, Er (%):	75

Remarks

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - SPT with split spoon sampler

C - SPT with cone

L - Split Spoon liner used

Printed: 07/09/2022

AGS

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

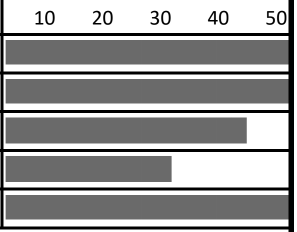
Project Newport Quinn Phase 2

Engineer Pinnacle Consulting Engineers Limited

Project No. PN224395

Client Pinnacle Consulting Engineers Limited

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		
BH24	1.20	9.86	C		25		50				50/50	
BH24	2.00	9.06	C		25		50				50/65	
BH24	3.00	8.06	C		4	7	9	10	14	9	42	
BH24	4.00	7.06	C		6	7	7	8	7	8	30	
BH24	5.00	6.06	C		9	10	12	14	16	8	50/255	



Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - SPT with split spoon sampler

C - SPT with cone

L - Split Spoon liner used

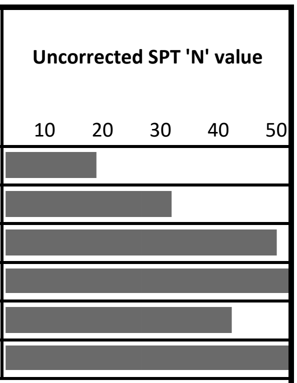
Printed: 07/09/2022

AGS

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)	
BH25	1.20	9.80	C		3	4	3	4	5	5	17
BH25	2.00	9.00	C		5	6	6	8	8	9	31
BH25	3.00	8.00	C		5	6	9	14	17	8	48
BH25	4.00	7.00	C		8	12	19	31			50/247
BH25	5.00	6.00	C		7	8	8	9	10	12	39
BH25	6.00	5.00	S		8	14	4	16	16	14	50/241



Hammer No.:	SAM1
Energy Ratio, Er (%):	75

Remarks

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

FIELDWORK RESULTS - *SPT Results Summary*

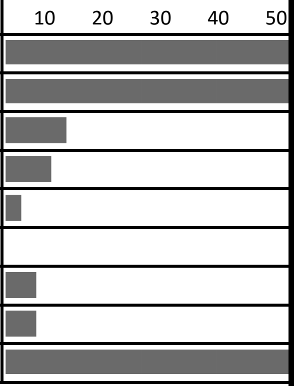
Project Newport Quinn Phase 2

Engineer Pinnacle Consulting Engineers Limited

Project No. PN224395

Client Pinnacle Consulting Engineers Limited

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH26	1.20	9.75	S		15	10	15	15	20		50/160	
BH26	2.00	8.95	S		15	10	15	15	20		50/175	
BH26	3.00	7.95	S		10	9	7	3	-	1	11	
BH26	4.00	6.95	S		1	2	2	2	2	2	8	
BH26	5.00	5.95	S		1	1	1	1	1	1	4	
BH26	6.00	4.95	S		-	-	-	-	-	-	0*/450	
BH26	7.00	3.95	S		1	1	2	2	1	2	7	
BH26	8.00	2.95	S		1	-	1	2	2	2	7	
BH26	9.00	1.95	S		10	15	15	15	20		50/225	



Hammer No.:	JB14	**Remarks**
Energy Ratio, Er (%):	63	

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - SPT with split spoon sampler

C - SPT with cone

L - Split Spoon liner used

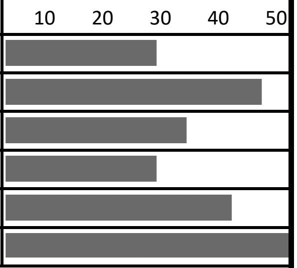
Printed: 07/09/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		
BH29	1.20	10.02	C		2	5	7	7	6	6	26	
BH29	2.00	9.22	C		7	9	12	12	10	12	46	
BH29	3.00	8.22	C		5	8	7	8	8	9	32	
BH29	4.00	7.22	S		4	5	6	6	7	7	26	
BH29	5.00	6.22	S		8	9	9	10	10	10	39	
BH29	5.50	5.72	S		9	11	12	13	14	11	50/255	



Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

Printed: 07/09/2022

AGS

GEOTECHNICS
geotechnical and geoenvironmental specialists

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

JB Site Investigation
Ramparts Business Park
Berwick upon Tweed
TD15 1TB
Tel: 01289 304646

SPT Hammer Ref: JB14
Test Date: 16/06/2022
Report Date: 14/07/2022
File Name: JB14.spt
Test Operator: JB

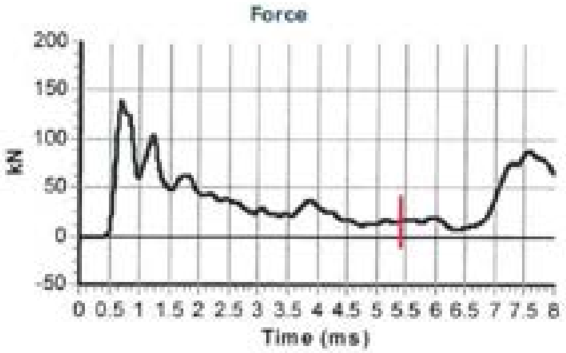
Instrumented Rod Data

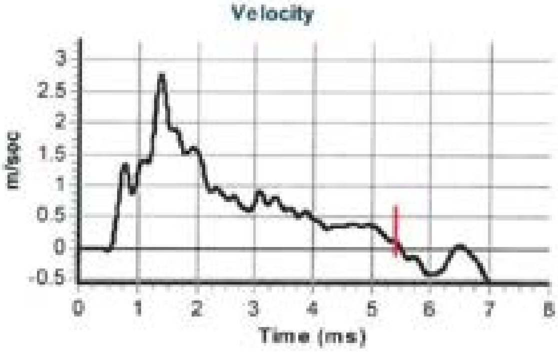
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.1
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 6178
Accelerometer No.2: 5843

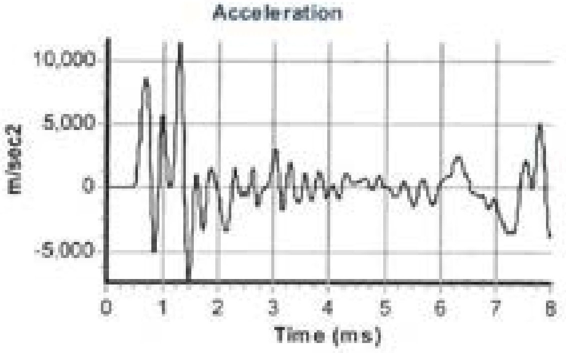
SPT Hammer Information

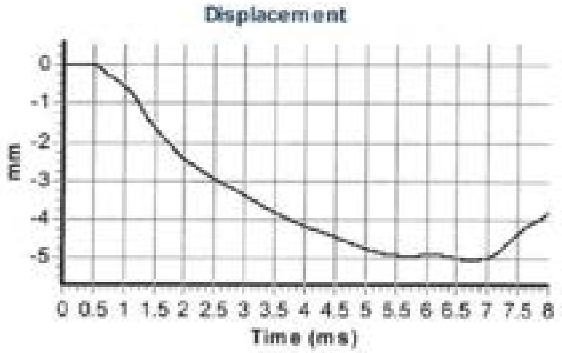
Hammer Mass m (kg): 63.3
Falling Height h (mm): 760
SPT String Length L (m): 11.0

Comments / Location


Force


Velocity


Acceleration


Displacement

Calculations

Area of Rod A (mm2): 918
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 300

Energy Ratio E_r (%): 63

Signed:
Title:

Borehole

SPT Hammer Energy Test Report

In accordance with BSEN ISO 22476-3:2005

Unit 8
Orton Enterprise Centre
Orton Southgate
Peterborough
PE2 6XU

SPT Hammer Ref: SAM1
Test Date: 05/05/2022
Report Date: 05/05/2022
File Name: SAM1.spt
Test Operator: PR

Instrumented Rod Data

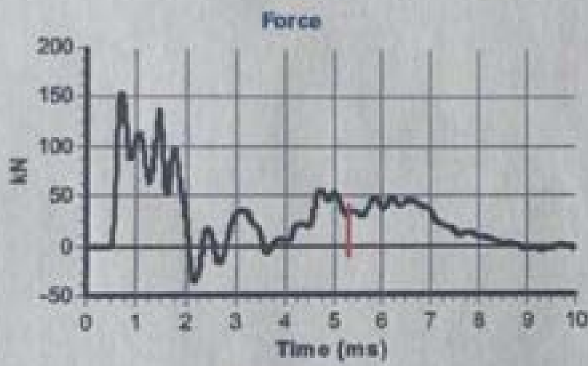
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.3
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	11853
Accelerometer No.2:	10332

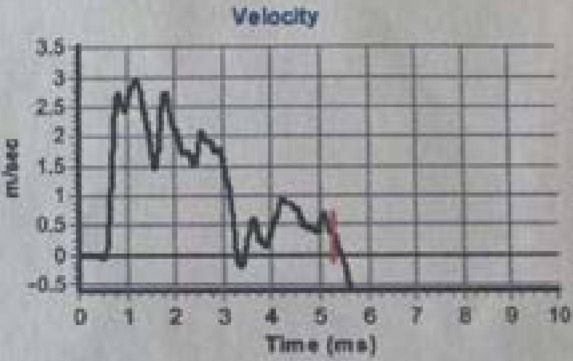
SPT Hammer Information

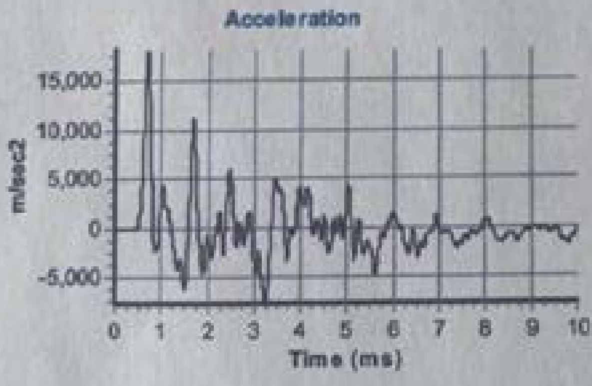
Hammer Mass m (kg):	63.0
Falling Height h (mm):	760
SPT String Length L (m):	15.0

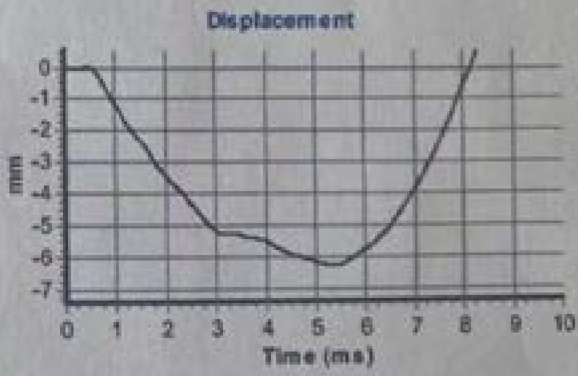
Comments / Location

Maximum calibration interval is 12 months









Calculations

Area of Rod A (mm2):	944
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	356

Energy Ratio E_r (%): 75

P. Rodgman

Signed: PR
Title: Operator

APPENDIX 4

Cable Percussion -Rotary Follow-on Borehole Records

DATA SHEET - Symbols and Abbreviations used on Records

Sample Types

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

Insitu Testing / Properties

CBRP	CBR using TRL probe
CHP	Constant Head Permeability Test
COND	Electrical conductivity
TC	Thermal Conductivity
TR	Thermal Resistivity
HV	Strength from Hand Vane
ICBR	CBR Test
IDEN	Density Test
IRES	Resistivity Test
MEX	CBR using Mexecone Probe Test
PKR	Packer Permeability Test
PLT	Plate Load Test
PP	Strength from Pocket Penetrometer
Temp	Temperature
VHP	Variable Head Permeability Test
VN	Strength from Insitu Vane
w%	Water content

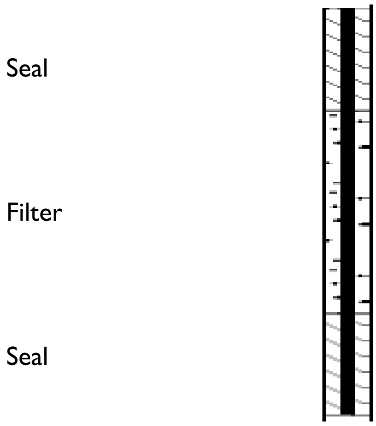
(All other strengths from undrained triaxial testing)

S	Standard Penetration Test (SPT)
C	SPT with cone
N	SPT Result
-/-	Blows/penetration (mm) after seating drive
-*/- (mm)	Total blows/penetration
( )	Extrapolated value

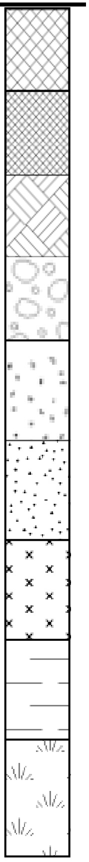
Groundwater

Water Strike	∇
Depth Water Rose To	▼

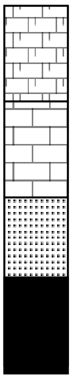
Instrumentation



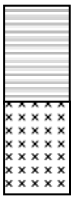
Strata — Legend



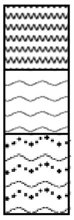
Note: Composite soil types shown by combined symbols



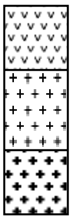
Strata, Continued



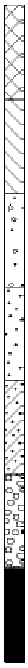
Metamorphic Rock



Igneous Rock



Backfill Materials



Rotary Core

RQD	Rock Quality Designation (% of intact core >100mm)
FRACTURE INDEX	Fractures/metre
NI	Non-intact core
NR	No core recovery
AZCL	Assumed zone of core loss

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH01
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327700.5 E 184190.8 N	**Ground Level**	10.86 m OD

Sampling / Properties

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.20	D				
0.20	ES				
0.20 - 0.60	B				
0.50	D				
0.50	ES				
0.60 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.65		(DRY)			S11
1.20 - 1.65	D				
1.20 - 1.70	B				
1.80	D				
2.00 - 2.45		2.00 (DRY)			S12
2.00	ES				
2.00 - 2.45	D				
2.00 - 2.50	B				
2.80	D				
3.00 - 3.45		3.00 (DRY)			S22
3.00	ES				
3.00 - 3.45	D				
3.00 - 3.50	B				
3.80	D				
4.00 - 4.45		4.00 (1.50)			S14
4.00	ES				
4.00 - 4.45	D				
4.00 - 4.50	B				
4.80	D			16	
5.00 - 5.45		5.00 (DRY)			S9
5.00	ES				
5.00 - 5.45	D				
5.00 - 5.50	B				
5.80	D				
6.00 - 6.38		6.00 (DRY)			S50/ 225mm
6.00 - 6.38	D				

Strata — Scale 1:50

Description	Depth	Level (m OD)
MADE GROUND: Black tarmacadam. [MADE GROUND - TARMACADAM]	0.19	10.67
MADE GROUND: Reddish brown slightly clayey gravelly medium sand. Gravel is angular fine to coarse of sandstone and limestone. [MADE GROUND]	0.56	10.30
MADE GROUND: Light brown slightly sandy subangular to subrounded fine to coarse gravel of siltstone, sandstone and limestone. [MADE GROUND]	1.20	9.66
Soft to firm brown gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of siltstone. [RIVER TERRACE DEPOSITS-COHESIVE]	3.00	7.86
Medium dense brown very sandy clayey GRAVEL. Gravel is subrounded fine to medium of sandstone and siltstone. [RIVER TERRACE DEPOSITS-GRANULAR]	5.00	5.86
Firm to stiff reddish brown gravelly CLAY. Gravel is subangular fine to medium of mudstone (Weathered mudstone). [ST MAUGHANS FORMATION-UPPER CLAY]	6.38	4.48
Borehole continued by rotary techniques - see next page		

Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	AC/RW
6.38	0.15	Cable Percussion	WO/JT
20.20	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			09/08/22	08:00
3.00	3.00	DRY	09/08/22	17:00
3.00	3.00	1.50	10/08/22	08:00
6.38	6.00	DRY	10/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
3.00	3.00	1.50	20		Water entering hole overnight.
15.00	10.50				Driller notes large water strike during

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 5.50-6.00m for 60 minutes.
A 50mm standpipe was installed to 18.00m with a geowrapped slotted section from 14.00m to 18.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 18.00m, gravel filter up to 12.00m, bentonite seal up to 0.20m, concrete up to ground level.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 1 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

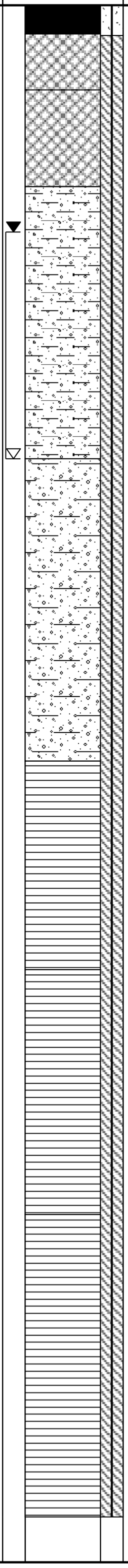
BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH01
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327700.5 E 184190.8 N	**Ground Level**	10.86 m OD

Sampling/Testing | Drilling | Strata | Scale 1:50

Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
							Borehole continued by rotary techniques - see below				
		6.00 - 7.50 (92mm)	6.00 ADDED	20 0	0	AZCL NI NI	Firm to stiff dark reddish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to medium of mudstone (Weathered mudstone). [ST MAUGHANS FORMATION-UPPER CLAY]	Between 6.00-7.19m, assumed zone of core loss. Between 7.19-7.50m, non-intact.			
7.50 - 7.95	C26	7.50 - 9.00 (92mm)	7.50 ADDED	66 46	34	AZCL		Between 7.50-8.00m, assumed zone of core loss.			
8.18 - 8.26	C					NI	Extremely weak to weak reddish brown MUDSTONE with occasional closely to medium spaced nodules of light grey mudstone. [ST MAUGHANS FORMATION]	Between 8.00-8.17m, non-intact, recovered as gravel. horizontal to inclined (15 - 45 deg.), very closely to closely spaced, planar, smooth discontinuities.	8.00		2.86
8.26 - 8.38	C					9					
8.42 - 8.61	C										
8.61 - 8.71	C	9.00 - 10.50 (92mm)	9.00 ADDED	10 0	0	AZCL		Between 9.00-10.34m, assumed zone of core loss.			
8.73 - 8.80	C										
8.86 - 9.00	C										
9.00 - 9.45	C42										



Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	AC/RW
6.38	0.15	Cable Percussion	WO/JT
20.20	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			09/08/22	08:00
3.00	3.00	DRY	09/08/22	17:00
3.00	3.00	1.50	10/08/22	08:00
6.38	6.00	DRY	10/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
3.00	3.00	1.50	20		Water entering hole overnight.
15.00	10.50				Driller notes large water strike during

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 5.50-6.00m for 60 minutes.
A 50mm standpipe was installed to 18.00m with a geowrapped slotted section from 14.00m to 18.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 18.00m, gravel filter up to 12.00m, bentonite seal up to 0.20m, concrete up to ground level.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 2 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH01
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327700.5 E 184190.8 N	**Ground Level**	10.86 m OD

Scale 1:50

Sampling/Testing

Sample / SPT Depth	SPT N / Type
10.50 - 10.68	C50/ 40mm
10.70 - 10.84	C
11.61 - 11.80	C
12.50 - 12.60	C
12.83 - 12.93	C
13.05 - 13.20	C
13.40 - 13.50	C
14.32 - 14.50	C
15.37 - 15.46	C
15.55 - 15.70	C
16.42 - 16.50	C
18.00 - 18.09	C
18.92 - 19.00	C
19.95 - 20.20	C

Drilling

Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)
9.00 - 10.50 (92mm)	9.00 ADDED	10 0	0
10.50 - 12.00 (92mm)	10.50 ADDED	94 61	47
12.00 - 13.50 (92mm)	10.50 ADDED	90 78	47
13.50 - 15.00 (92mm)	10.50 ADDED	98 71	55
15.00 - 16.50 (92mm)	10.50 ADDED	100 75	54
16.50 - 18.00 (92mm)	10.50 ADDED	87 62	24
18.00 - 19.00 (92mm)	10.50 ADDED	100 72	42
19.00 - 20.20 (92mm)	10.50 ADDED		

FI

NI, AZCL, NI, 12, NI, 100, 22, NI, 15, NI, 10, NI, AZCL, NI, 22, 5, 14, AZCL, NI, 33, NI, 22, NI, 11, NI, 15, NI, 15, NI, NI, 33, NI, 13, NI, 6, 22, AZCL, NI, 38, NI, 29, NI, 40, NI, 12, 14, NI, 16, 22, NI, 18, AZCL, 25, NI, 13, NI, 40, NI, 10

Strata

General	Depth	Level (m OD)
	10.34	0.52
Light grey and red SILTSTONE with some beds of sandstone (Recovered as subrounded to rounded fine to coarse gravel). [ST MAUGHANS FORMATION]	10.50	0.36
Extremely weak reddish brown MUDSTONE (Recovered as stiff slightly gravelly sandy clay). [ST MAUGHANS FORMATION]	10.75	0.11
Weak to medium strong reddish brown fine to medium grained SANDSTONE with occasional medium to widely spaced beds of light grey sandstone. Discontinuities are horizontal to inclined (10 - 35 deg.), very closely to closely spaced, planar to undulating and smooth with occasional black staining. [ST MAUGHANS FORMATION]		

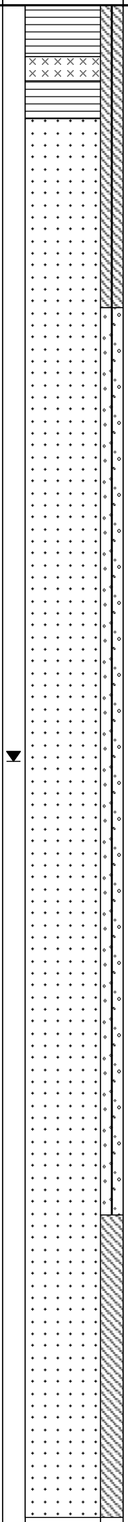
Detail

Between 10.34-10.50m, non-intact.

Between 10.50-10.58m, assumed zone of core loss.
Between 10.58-10.75m, non-intact.

Between 10.91-10.96m, non-intact, recovered as gravel.
Between 11.09-11.17m, non-intact, recovered as gravel of light grey sandstone.
Between 11.57-11.63m, non-intact, recovered as gravel.
Between 11.63-11.92m, horizontal to inclined (40 deg.), closely spaced, planar, smooth discontinuities.
Between 11.92-12.00m, non-intact, recovered as gravel.
Between 12.00-12.14m, assumed zone of core loss.
Between 12.14-12.24m, non-intact, recovered as gravel.
Between 12.51-12.87m, horizontal, medium spaced, planar, smooth discontinuities.
Between 13.21-13.38m, vertical, planar, smooth discontinuity.
Below 13.50m, becoming strong.
Between 13.50-13.53m, assumed zone of core loss.
Between 13.53-13.56m, non-intact, recovered as gravel.
Between 13.62-13.65m, non-intact, recovered as gravel.
Between 13.76-13.92m, vertical, planar to undulating, smooth to rough discontinuities.
Between 13.92-13.97m, non-intact, recovered as gravel.
Between 13.97-14.33m, horizontal to inclined (50 - 60 deg.), closely spaced, planar, smooth discontinuities with black staining.
Between 14.33-14.34, non-intact, recovered as gravel.
Between 14.66-14.74m, non-intact, recovered as gravel.
Between 14.74-14.94m, inclined (25 - 45 deg.), closely spaced, planar, smooth discontinuities with black staining.
Between 14.94-15.37m, non-intact, recovered as gravel.
Between 15.73-15.84m, non-intact, recovered as gravel.
Between 16.28-16.50m, horizontal to inclined (50 deg.), closely spaced, planar, smooth discontinuities.
Between 16.50-16.69m, assumed zone of core loss.
Between 16.69-16.71m,

Legend



Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
6.38	6.00	2.90	18/08/22	08:00
15.00	10.50	2.90	18/08/22	17:00
15.00	10.50	2.90	19/08/22	08:00
19.00	10.50	2.90	19/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					15.00-16.50m core run.

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 3 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH01
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327700.5 E 184190.8 N	**Ground Level**	10.86 m OD

Sampling/Testing | Drilling | Strata | Scale 1:50

Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
		19.00 - 20.20 (92mm)	10.50 ADDED					non-intact, recovered as gravel. Between 16.79-16.89m, non-intact, recovered as gravel. Between 17.06-17.16m, non-intact, recovered as gravel. Between 17.21-17.25m, non-intact, recovered as soft gravelly clay. Between 17.25-17.50m, horizontal to vertical, medium spaced, planar, smooth discontinuities. Between 17.50-18.00m, horizontal to inclined (45 deg.), c;losely spaced, planar, smooth discontinuities. Between 17.92-18.00m, extremely weak. Non-intact, recovered as sandy clay. Between 18.00-18.12m, non-intact, recovered as gravel. Between 18.12-18.30m, vertical, undulating, smooth discontinuity. Below 18.30m, becoming weak to medium strong. Between 18.30-18.75m, horizontal to inclined (30 - 45 deg.), extremely closely to closely spaced, planar, smooth discontinuities with black staining. Between 18.75-18.84m, non-intact, recovered as gravel. Between 18.84-19.00m, horizontal, closely spaced, planar to stepped, smooth discontinuities. Below 19.00m, strong. Between 19.00-19.05m, assumed zone of core loss. Between 19.13-19.19m, non-intact, recovered as gravel. Between 19.44-19.56m, vertical, undulating, smooth discontinuity. Between 19.56-19.61m, non-intact, recovered as gravel. Between 19.66-19.72m, non-intact, recovered as gravel.	20.20	▨	-9.34
								End of Borehole			

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
19.00	10.50	2.40	22/08/22	08:00
20.20	10.50	ADDED	22/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 4 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

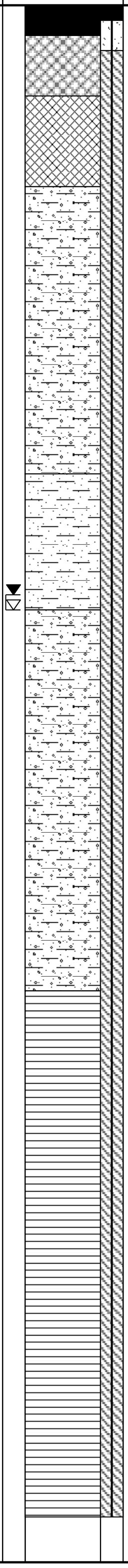
PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327873.4 E 184219.4 N	**Borehole**	BH04A
				Ground Level	10.86 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.25	D				
0.25	ES				
0.25 - 0.55	B				
0.60	D				
0.60	ES				
0.60 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.46		1.20 (DRY)			C50/ 115mm
1.20 - 1.70	B				
2.00 - 2.30		2.00 (DRY)			C50/ 145mm
2.00 - 2.50	B			11	
3.00 - 3.45		3.00 (DRY)			C27
3.00 - 3.50	B				
4.00 - 4.39		4.00 (3.90)			S50/ 237mm
4.00 - 4.45	D				

Description	Depth	Level (m OD)
MADE GROUND: Black tarmacadam. [MADE GROUND - TARMACADAM]	0.20	10.66
MADE GROUND: Reddish brown gravelly medium sand. Gravel is angular to subangular fine to coarse of siltstone and sandstone. [MADE GROUND]	0.60	10.26
PROBABLE MADE GROUND: Brown slightly gravelly medium sand with a low cobble content. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [MADE GROUND]	1.20	9.66
Very stiff brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-COHESIVE] Below 3.00m, stiff.	3.10	7.76
Stiff reddish brown slightly sandy CLAY. [ST MAUGHANS FORMATION-UPPER CLAY]	4.00	6.86
Firm to stiff reddish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of mudstone. Some nodules of light grey clay (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY] Below 4.00m, very stiff.		



Borehole continued by rotary techniques - see next page

Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	AC/RW
4.45	0.15	Cable Percussion	WO/JT
21.00	0.12	Rotary Core	

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00		DRY	10/08/22	08:00
1.20		DRY	10/08/22	17:00
1.20	1.20	DRY	16/08/22	08:00
4.45	4.00	3.90	16/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
4.00	3.30	3.90	20		Slow inflow.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 1.80-3.00m for 150 minutes.
Chiselling: 3.70-4.00m for 60 minutes.
A 50mm standpipe was installed to 17.00m with a geowrapped slotted section from 15.00m to 17.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 17.00m, gravel filter up to 15.00m, bentonite seal up to 0.30m, concrete up to ground level.
Logged in accordance with BS5930:2015 + A1:2020

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 4

05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327873.4 E 184219.4 N	**Borehole**	BH04A
				Ground Level	10.86 m OD

Scale 1:50

Sampling/Testing

Sample / SPT Depth	SPT N / Type
5.52 - 5.60	C
5.60 - 5.78	C
5.78 - 5.94	C
6.65 - 6.80	C
6.80 - 6.90	C
7.93 - 8.10	C
8.10 - 8.28	C
9.95 - 20.05	C

Drilling

Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)
4.00 - 5.00 (92mm)	4.00 ADDED	44 0	0
5.00 - 6.00 (92mm)	4.00 ADDED	69 0	0
6.00 - 7.50 (92mm)	4.00 ADDED	65 51	28
7.50 - 9.00 (92mm)	4.00 ADDED	96 51	33
9.00 - 10.50 (92mm)	4.00 ADDED	56 21	9

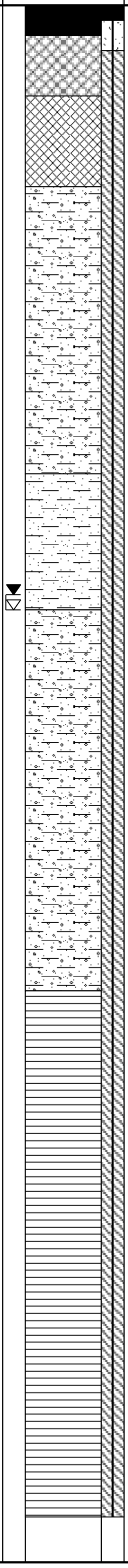
FI

AZCL
NI
NI
AZCL
NI
NI
AZCL
NI
11
NI
16
AZCL
NI
40
4
28
NI
AZCL
NI

Strata

General	Detail	Depth	Level (m OD)
Borehole continued by rotary techniques - see below			
Firm to stiff reddish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of mudstone. Some nodules of light grey clay (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY]	Between 4.00-4.56m, assumed zone of core loss. Between 4.56-4.86m, non-intact, recovered as slightly gravelly slightly clayey sand. Between 4.86-5.00m, non-intact, recovered as clay. Between 8.00-5.31m, assumed zone of core loss. Below 5.31m, stiff to very stiff. between 5.31-5.43m, non-intact, recovered as gravel. Between 5.43-6.00m, non-intact, recovered as very stiff clay (Possible weathered mudstone) Between 6.00-6.52m, assumed zone of core loss.	6.52	4.34
Extremely weak to weak reddish brown MUDSTONE with closely to medium spaced nodules of light grey mudstone. Horizontal to inclined (20 - 45 deg.), very closely to closely spaced, planar, smooth discontinuities. [ST MAUGHANS FORMATION]	Between 6.52-6.64m, non-intact, recovered as gravel. Between 7.32-7.38m, non-intact, recovered as gravel. Between 7.50-7.55m, assumed zone of core loss. Between 7.55-7.81m, non-intact, recovered as soft clay. Between 7.86-8.34m, inclined (45 - 50 deg.), medium spaced, planar, smooth discontinuities. Between 8.34-8.76m, horizontal to inclined (30 - 60 deg.), extremely closely to very closely spaced, planar to undulating, smooth to rough discontinuities with some gravel infill. Between 8.76-9.00m, non-intact, recovered as gravel. Between 9.00-9.66m, assumed zone of core loss. Between 9.66-10.02m, non-intact,		

Legend



Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	AC/RW
4.45	0.15	Cable Percussion	WO/JT
21.00	0.12	Rotary Core	

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00		DRY	10/08/22	08:00
1.20		DRY	10/08/22	17:00
1.20	1.20	DRY	16/08/22	08:00
4.45	4.00	3.90	16/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
4.00	3.30	3.90	20		Slow inflow.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 1.80-3.00m for 150 minutes.
Chiselling: 3.70-4.00m for 60 minutes.
A 50mm standpipe was installed to 17.00m with a geowrapped slotted section from 15.00m to 17.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 17.00m, gravel filter up to 15.00m, bentonite seal up to 0.30m, concrete up to ground level.
Logged in accordance with BS5930:2015 + A1:2020

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged by	AC
Checked by	JN
Figure	Sheet 2 of 4

05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary* *PRELIMINARY*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327873.4 E 184219.4 N	**Borehole**	BH04A
				Ground Level	10.86 m OD

Sampling/Testing | Drilling | Strata | Scale 1:50

Sample / SPT Depth	SPT N / Type
10.93 - 11.00	C
12.21 - 12.30	C
12.70 - 12.90	C
14.45 - 14.56	C
15.87 - 15.94	C
16.43 - 16.50	C
17.40 - 17.50	C
19.20 - 19.33	C

Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)
9.00 - 10.50 (92mm)	4.00 ADDED	56 21	9
10.50 - 12.00 (92mm)	400.00 ADDED	77 38	14
12.00 - 13.50 (92mm)	4.00 ADDED	93 85	66
13.50 - 15.00 (92mm)	4.00 ADDED	100 60	8
15.00 - 16.50 (92mm)	4.00 ADDED	88 67	0
16.50 - 18.00 (92mm)	4.00 ADDED	84 26	11
18.00 - 19.50 (92mm)	4.00 ADDED	90 41	9
19.50 - 21.00	4.00 ADDED		

FI
NI
22
NI
14
AZCL
NI
10
NI
40
NI
AZCL
NI
7
16
NI
13
NI
54
NI
24
NI
20
NI
18
NI
AZCL
17
NI
33
NI
28
AZCL
33
NI
44
NI
13
NI
AZCL
NI
27
NI
25
NI
17
NI
AZCL
NI
31
NI

General | Detail | Depth | Legend | Level (m OD)

recovered as soft gravelly clay.
Between 10.02-10.16m, non-intact, recovered as gravel.
Between 10.16-10.34m, horizontal, very closely to closely spaced, planar to undulating, smooth discontinuities.
Between 10.34-10.36m, non-intact, recovered as gravel.
Between 10.50-10.84m, assumed zone of core loss.
Between 10.84-11.05m, non-intact, recovered as gravel.
Between 11.05-12.00m, discontinuities have occasional soft clay infill.
Between 11.27-11.49m, discontinuities are medium spaced.
Between 11.61-11.74m, non-intact, recovered as gravel.
Between 11.79-12.00m, non-intact, recovered as gravel.
Between 12.00-12.10m, assumed zone of core loss.
Between 12.10-12.17m, non-intact, recovered as soft slightly gravelly clay.
Between 12.17-12.99m, horizontal, closely to medium spaced, planar to stepped, smooth discontinuities with some clay infill.
Between 12.99-13.24m, horizontal to vertical, closely spaced, planar to undulating, smooth discontinuities.
Between 13.24-13.28m, non-intact, recovered as gravel.
Between 13.50-13.53m, non-intact, recovered as gravel.
Between 13.53--13.96m, horizontal to inclined (45 deg.), extremely closely to closely spaced, planar to undulating, smooth discontinuities.
Between 13.64-13.67m, non-intact, recovered as gravel.
Between 13.96-14.10m, non-intact, recovered as gravel.
Between 14.53-14.63m, non-intact, recovered as gravel.
At 14.79m, stepped discontinuity.
Between 14.79-15.00m, non-intact, recovered as gravel.
Between 15.00-15.18m, assumed zone of core loss.
Between 16.03-16.11m, non-intact, recovered as gravel.
Between 16.20-16.43m, non-intact, recovered as gravel.
Between 16.50-16.73m., assumed zone of core loss.
Between 16.73-17.67m, weak to medium strong.
Between 16.73-16.79m, occasional

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
4.00	4.00	2.40	24/08/22	08:00
9.00	9.00	2.10	24/08/22	17:00
9.00	9.00	2.40	25/08/22	08:00
21.00	12.00	2.10	25/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by AC
Checked by JN
Figure Sheet 3 of 4
05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary* *PRELIMINARY*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH04A
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327873.4 E 184219.4 N	**Ground Level**	10.86 m OD

Sampling/Testing | Drilling | Strata | Scale 1:50

Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
		19.50 - 21.00	4.00 ADDED			14 NI 10 NI 16		veins of quartz. Between 16.79-17.14m, non-intact, recovered as gravel. Between 14.14-17.67m, many nodules of light grey mudstone. Between 17.43-17.67m, horizontal to vertical, closely spaced, planar, smooth discontinuities. Between 17.67-18.00m, non-intact, recovered as gravel. Between 18.00-18.14m, assumed zone of core loss. Between 18.14-18.24m, non-intact, recovered as gravel. Between 18.24-18.53m, non-intact, recovered as gravel. Between 18.53-18.89m, horizontal to vertical, very closely to closely spaced, planar to undulating, smooth to rough discontinuities. Between 18.59-18.89m, vertical discontinuity. Between 18.89-19.09m, non-intact, recovered as sand and gravel. Between 19.09-19.26m, weak to medium strong. Between 19.26-19.50m, non-intact, recovered as gravel. Between 19.50-19.61m, assumed zone of core loss. Between 19.61-19.69m, non-intact, recovered as gravel. Below 19.69m, weak to medium strong. Between 19.69-19.88m, horizontal, extremely closely to very closely spaced, planar, smooth discontinuities. Between 19.88-20.00m, non-intact, recovered as gravel. Between 20.14-20.26m, vertical discontinuity with black staining. Between 20.48-20.59m, non-intact, recovered as gravel.	21.00	▤	-10.14

End of Borehole

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 4 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328196.3 E 184235.5 N	**Borehole**	BH07
				Ground Level	12.68 m OD

Sampling / Properties

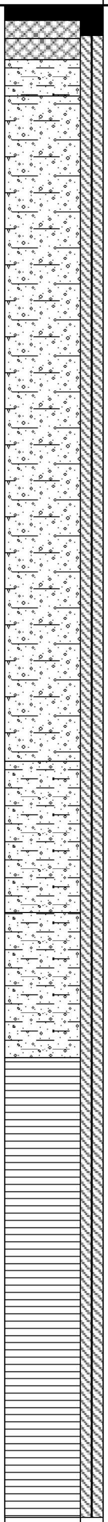
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.10	D				
0.10	ES				
0.10 - 0.25	B				
0.25 - 0.40	B				
0.40 - 0.60	B				
0.50	D			14	
0.50	ES				
0.60 - 0.90	B				
0.90 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.65		(DRY)			C32
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C34
2.00	D				
2.00 - 2.50	B				
3.00 - 3.42		3.00 (DRY)			C50/ 265mm
3.00	D			6	
3.00 - 3.50	B				
4.00 - 4.45		4.00 (DRY)			C36
4.00	D				
4.00 - 4.50	B				
5.00 - 5.45		5.00 (DRY)			S33
5.00 - 5.45	D				
5.00 - 5.50	B				
5.05	D			26	
6.00 - 6.39		5.00 (DRY)			S50/ 240mm
6.00 - 6.45	D				

Strata Scale 1:50

Description	Depth	Level (m OD)
MADE GROUND: Black tarmacadam. [MADE GROUND - TARMACADAM]	0.10	12.58
MADE GROUND: Reddish brown gravelly fine to coarse sand. Gravel is angular to subangular fine to medium of sandstone. [MADE GROUND]	0.22	12.46
MADE GROUND: Grey sandy angular to subangular fine to coarse gravel of sandstone and aircrete. Sand is of ash. [MADE GROUND]	0.36	12.32
Soft to firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded of siltstone and sandstone. [RIVER TERRACE DEPOSITS-COHESIVE]	0.60	12.08
Dense light brown slightly sandy subrounded fine to coarse clayey GRAVEL of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR] Below 0.90m, low subrounded cobble content of sandstone. Below 1.20m, dense, slightly clayey. Below 3.00m, very dense. Sand becomes fine to medium. Below 4.00m, dense.	5.00	7.68
Very stiff dark reddish brown slight sandy slightly gravelly CLAY. Gravel is angular fine to medium of mudstone. (Weathered mudstone) [ST MAUGHANS FORMATION-UPPER CLAY]	6.00	6.68
Very stiff dark reddish brown slight sandy slightly gravelly CLAY. Gravel is angular fine to medium of mudstone and sandstone. (Weathered mudstone). [ST MAUGHANS FORMATION-UPPER CLAY]		

Borehole continued by rotary techniques - see next page

Legend



Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.35	Inspection Pit	AC/RW
6.00	0.15	Cable Percussion	WPO/JT
20.30	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			04/08/22	08:00
6.45	5.00	DRY	04/08/22	17:00
6.00	6.00	3.90	22/08/22	08:00
7.50	7.50	DRY	22/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 3.00-4.00m for 150 minutes.
Chiselling: 5.70-6.00m for 60 minutes.
A 50mm standpipe was installed to 20.50m with a geowrapped slotted section from 13.0.00m to 20.50m with a flush cover installed.
Backfill details from base of hole: gravel filter up to 13.00m, bentonite seal up to 0.30m, concrete up to ground level.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 4
	05/01/2023

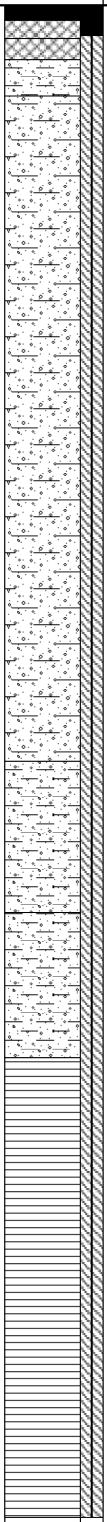
GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328196.3 E 184235.5 N	**Borehole**	BH07
				Ground Level	12.68 m OD

Sampling/Testing		Drilling					Strata		Scale 1:50		
Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
							Borehole continued by rotary techniques - see below				
		6.00 - 7.50 (92mm)	6.00 ADDED	73 6	0	AZCL NI 38 NI 44	Very stiff dark reddish brown slight sandy slightly gravelly CLAY. Gravel is angular fine to medium of mudstone and sandstone. (Weathered mudstone). [ST MAUGHANS FORMATION-UPPER CLAY]	Between 6.00-6.40m, Assumed zone of core loss. Between 6.40-6.96m, non-intact.	6.96		5.72
							Extremely weak to weak reddish brown MUDSTONE. Discontinuities are horizontal to inclined (30 - 50 deg.), very closely to closely spaced, planar to undulating, smooth with occasional black staining. [ST MAUGHANS FORMATION]	Between 7.09-7.41m, non-intact, recovered as soft to firm reddish brown slightly sandy slightly gravelly clay. Between 7.50-7.70m, assumed zone of core loss. Between 7.70-7.93m, non-intact, recovered as gravel. Between 7.97-8.20m, non-intact, recovered as soft slightly gravelly sandy clay. Between 8.25-8.31m, non-intact, recovered as gravel. Between 8.31-8.61m, horizontal, closely spaced, planar, rough discontinuities. Between 8.61-8.71m, non-intact, recovered as gravel. Between 8.80-8.91m, non-intact, recovered as gravel. Between 8.91-9.00m, horizontal to inclined (10 deg.), closely spaced, planar, rough discontinuities.			
7.86 - 7.90 8.32 - 8.42	C C	7.50 - 9.00 (92mm)	7.50 ADDED	86 38	8	AZCL NI 50 NI 40 NI 16 22 NI 22 NI 22					
9.94 - 10.02	C	9.00 - 10.50 (92mm)	9.00 ADDED	88 56	40	AZCL NI 13 NI					



Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.35	Inspection Pit	AC/RW
6.00	0.15	Cable Percussion	WPO/JT
20.30	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			04/08/22	08:00
6.45	5.00	DRY	04/08/22	17:00
6.00	6.00	3.90	22/08/22	08:00
7.50	7.50	DRY	22/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 3.00-4.00m for 150 minutes.
Chiselling: 5.70-6.00m for 60 minutes.
A 50mm standpipe was installed to 20.50m with a geowrapped slotted section from 13.0.00m to 20.50m with a flush cover installed.
Backfill details from base of hole: gravel filter up to 13.00m, bentonite seal up to 0.30m, concrete up to ground level.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 2 of 4

05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

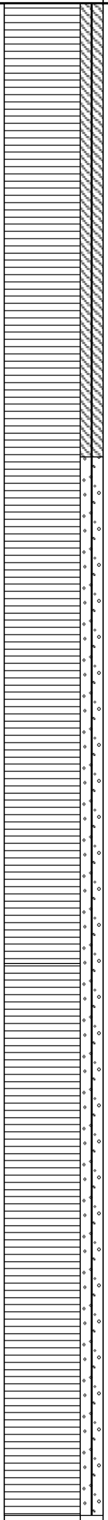
Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH07
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328196.3 E 184235.5 N	**Ground Level**	12.68 m OD

Scale 1:50

Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI
10.10 - 10.23 10.23 - 10.40 10.40 - 10.50	C C C	9.00 - 10.50 (92mm)	9.00 ADDED	88 56	40	9 NI 22 NI 40
		10.50 - 12.00 (92mm)	10.00 ADDED	85 36	0	AZCL NI 60 NI 33 NI 23 NI 22 NI
12.69 - 12.74	C	12.00 - 13.00 (92mm)	12.00 ADDED	64 29	13	AZCL NI 31 23 NI
13.43 - 13.48 13.70 - 13.84	C C	13.00 - 14.50 (92mm)	13.00 ADDED	82 34	9	AZCL NI 31 NI 40 NI 14 NI 28 NI 22
14.72 - 15.00 15.27 - 15.40 15.60 - 15.67	C C C	14.50 - 16.00 (92mm)	13.00 ADDED	88 57	45	AZCL NI 36 8 NI 16 NI 14 NI
16.90 - 17.05 17.21 - 17.40	C C	16.00 - 17.50 (92mm)	13.00 ADDED	94 67	62	AZCL NI 30 3 NI 14 NI 7 NI
17.70 - 17.93 18.00 - 18.06 18.90 - 19.00	C C C	17.50 - 19.00 (92mm)	13.00 ADDED	87 84	69	AZCL 8 21 9 NI 4
19.85 - 19.95	C	19.00 - 20.53 (92mm)	13.00 ADDED	100 100	10 0	2

Strata: General	Detail	Depth	Level (m OD)
	etween 9.00-9.18m, assumed zone of core loss. Between 9.18-9.50m, non-intact, recovered as gravel. Between 9.90-9.94m, non-intact, recovered as gravel. Between 10.25-10.31m, non-intact, recovered as gravel. Between 10.40-10.45m, non-intact, recovered as gravel. Between 10.50-10.72m, assumed zone of core loss. Between 10.72-10.92m, non-intact, recovered as gravel. Between 10.92-11.02m, horizontal, extremely closely to closely spaced, planar, smooth discontinuities. Between 10.92-11.02m, vertical, planar, smooth discontinuity. Between 11.02-11.12m, non-intact, recovered as gravel. Between 11.21-11.37m, non-intact, recovered as gravel. Between 11.63-11.77m, non-intact, recovered as gravel. Between 11.86-12.00m, non-intact, recovered as gravel. Between 12.00-12.36m, assumed zone of core loss. Between 12.36-12.61m, non-intact, recovered as gravel. Between 12.77-12.90m, thin bed of extremely weak to weak light grey mudstone with very closely spaced thick laminae of reddish brown mudstone. Between 12.77-12.90m, discontinuities have clay infill. Between 12.90-13.00m, non-intact, recovered as gravel. Between 13.00-13.27m, assumed zone of core loss.		
Very weak to weak reddish brown MUDSTONE. Discontinuities are horizontal to inclined (20 deg.), closely to medium spaced, planar, smooth with some clay infill. [ST MAUGHANS FORMATION]	Between 13.27-13.37m, non-intact, recovered as gravel. Between 13.37-13.56m, horizontal to inclined (45 deg.), extremely closely to closely spaced, planar, smooth discontinuities. Between 13.56-13.64m, non-intact, recovered as gravel. Between 13.69-13.71m, non-intact, recovered as gravel. Between 13.85-14.24m, non-intact, recovered as very soft slightly gravelly sandy clay. Between 14.31-14.41m, non-intact, recovered as gravel. Between 14.50-14.67m, assumed zone of core loss. Between 14.67-14.74m, non-intact, recovered as gravel. Between 14.85-15.22m, horizontal to inclined (30 deg.), closely to medium spaced, planar, smooth discontinuities.	16.35	-3.67

Legend



Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
7.50	7.50	DRY	23/08/22	08:00
20.30	13.00	19.70	23/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 3 of 4

05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328196.3 E 184235.5 N	**Borehole**	BH07
				Ground Level	12.68 m OD

Scale 1:50

Sampling/Testing		Drilling					Strata				
Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
		19.00 - 20.53 (92mm)	13.00 ADDED	100 100	10 0	5		etween 15.22-15.36m, non-intact, recovered as gravel. Between 15.54-15.65m, non-intact, recovered as soft slightly gravelly clay. Between 15.86-16.00m, non-intact, recovered as gravel. Between 16.00-16.08m, assumed zone of core loss. Between 16.08-16.22m, non-intact, recovered as soft gravelly clay. Between 16.22-16.35m, horizontal to inclined, extremely closely to very closely spaced, undulating to stepped, smooth discontinuities. Between 16.88-16.93m, non-intact, recovered as soft clay. Between 17.07-17.20m, non-intact, recovered as gravel. Between 17.46-17.50m, non-intact, recovered as clay. Between 17.50-17.69m, assumed zone of core loss. Between 18.26-18.31m, subhorizontal to inclined (10 deg.), closely spaced, planar, smooth discontinuities. Between 18.48-18.56m, non-intact, recovered as soft slightly gravelly clay. Between 18.80-18.86m, thin bed of weak light grey mudstone. Between 19.00-19.50m, closely spaced nodules of light grey mudstone. Between 19.00-19.96m, horizontal, widely spaced, planar, smooth discontinuities. End of Borehole	20.53	▤	-7.85

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

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 4 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

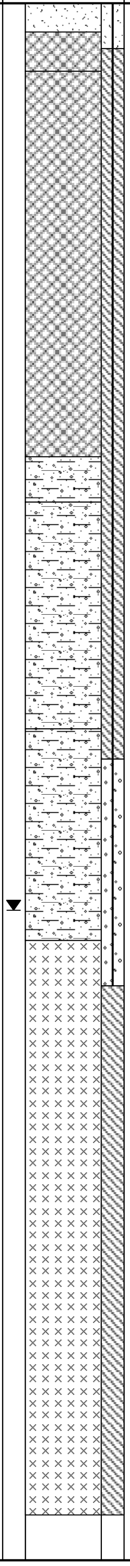
Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327827.4 E 184150.6 N	**Borehole**	BH10
				Ground Level	11.00 m OD

Sampling / Properties

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.25	D				
0.25	ES				
0.25 - 0.45	B				
0.45 - 1.20	B				
0.50	D				
0.50	ES				
1.00	D				
1.00	ES				
1.20 - 1.65		1.20 (DRY)			C15
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C19
2.00	ES				
2.00 - 2.50	B				
2.40	D				
3.00 - 3.45		3.00 (DRY)			C25
3.00	ES				
3.10	D			41	
3.50 - 4.00	B				
4.00 - 4.45	UTF				
4.00 - 4.50	B				
4.20	D			20	
5.00 - 5.45	UT				
5.00 - 5.50	B				
5.00 - 5.45			76		
5.50 - 6.00	B				
6.20 - 6.58		5.00 (6.00)			C50/ 225mm

Strata — Scale 1:50

Description	Depth	Level (m OD)
MADE GROUND: Grey concrete. [MADE GROUND - CONCRETE]	0.19	10.81
MADE GROUND: Brown gravelly medium sand. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone and brick fragments. [MADE GROUND]	0.45	10.55
MADE GROUND: Brown very sandy clayey gravel with a low rounded cobble content of sandstone. Gravel is subrounded fine to coarse of sandstone and siltstone. [MADE GROUND] Below 1.20m, medium dense. At 3.00m, geotextile.	3.00	8.00
Firm to stiff light grey mottled light brown and dark brown slightly sandy slightly gravelly CLAY with occasional bands of silt. Gravel is subangular to subrounded fine of siltstone. Occasional fragments of wood. [RIVER TERRACE DEPOSITS-COHESIVE]	3.30	7.70
Soft to firm light grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine of siltstone. [RIVER TERRACE DEPOSITS-COHESIVE]	4.80	6.20
Firm to stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, siltstone and mudstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY] At 5.00m, high strength.	6.20	4.80
Borehole continued by rotary techniques - see next page		



Boring

Depth	Hole Dia.	Technique	Crew
0.19	0.30	Concrete Core	D Drill
1.20	0.30	Inspection Pit	WO/JT
6.58	0.15	Cable Percussion	WO/JT
20.70	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00		DRY	10/08/22	08:00
6.58	6.20	DRY	10/08/22	17:00
6.58	6.20	5.20	15/08/22	08:00
16.20	7.20	ADDED	15/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
6.00	6.00				Seepage. No rise.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 5.90-6.20m for 60 minutes.
A 50mm standpipe was installed to 6.50m with a geowrapped slotted section from 5.00 to 6.50m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 6.50m, gravel filter up to 5.00m, bentonite seal up to 0.20m, concrete up to ground level.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 4
	05/01/2023

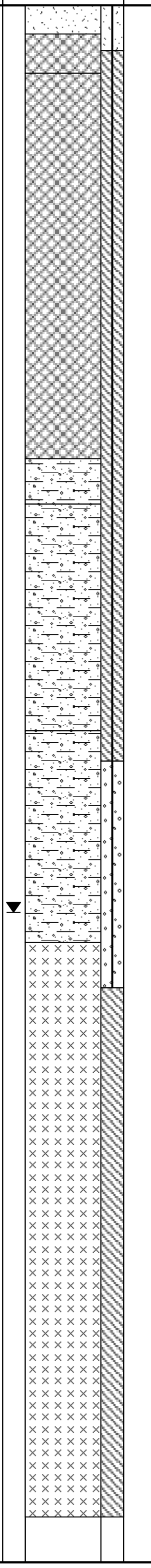
GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327827.4 E 184150.6 N	**Borehole**	BH10
				Ground Level	11.00 m OD

Sampling/Testing | Drilling | Strata | Scale 1:50

Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
							Borehole continued by rotary techniques - see below				
6.74 - 6.80	C	6.20 - 7.20 (92mm)	6.20 ADDED	62 5	5	AZCL NI 30 NI	Extremely to very weak reddish brown SILTSTONE with occasional nodules of grey siltstone. Discontinuities are horizontal to inclined (30 - 40 deg.), very closely to closely spaced, planar and smooth with occasional black staining. [ST MAUGHANS FORMATION]	Between 6.20-6.58m, assumed zone of core loss. Between 6.58-6.63m, non-intact, recovered as gravel. Between 6.76-7.20m, non-intact, recovered as gravelly slightly clayey sand. Between 7.20-7.30m, vertical, planar, smooth discontinuity with black staining. Between 7.60-7.73m, non-intact, recovered as gravel. Between 7.73-7.80m, horizontal to vertical, very closely to closely spaced, planar, smooth discontinuities. Between 7.80-8.08m, non-intact, recovered as gravelly sand. Between 8.08-8.20m, discontinuities with some sand infill. Between 8.14-8.20m, vertical, planar, smooth discontinuity. Between 8.20-8.26m, non-intact, recovered as slightly gravelly sand.			
7.50 - 7.54 8.45 - 8.53	C C	7.20 - 8.70 (92mm)	7.20 ADDED	100 46	6	25 NI 4 NI 33 NI 20					
8.98 - 9.06 9.47 - 9.60 9.90 - 10.10	C C C	8.70 - 10.20 (92mm)	7.20 ADDED	87 67	36	AZCL NI 11 NI 12					

Boring

Depth	Hole Dia.	Technique	Crew
0.19	0.30	Concrete Core	D Drill
1.20	0.30	Inspection Pit	WO/JT
6.58	0.15	Cable Percussion	WO/JT
20.70	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00		DRY	10/08/22	08:00
6.58	6.20	DRY	10/08/22	17:00
6.58	6.20	5.20	15/08/22	08:00
16.20	7.20	ADDED	15/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
6.00	6.00				Seepage. No rise.

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 5.90-6.20m for 60 minutes.
A 50mm standpipe was installed to 6.50m with a geowrapped slotted section from 5.00 to 6.50m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 6.50m, gravel filter up to 5.00m, bentonite seal up to 0.20m, concrete up to ground level.

Logged in accordance with BS5930:2015 + A1:2020

Logged by AC
Checked by JN
Figure Sheet 2 of 4
05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327827.4 E 184150.6 N	**Borehole**	BH10
				Ground Level	11.00 m OD

Scale 1:50

Sampling/Testing

Sample / SPT Depth	SPT N / Type
10.45 - 10.58	C
11.30 - 11.36	C
11.53 - 11.70	C
11.90 - 12.05	C
12.33 - 12.41	C
12.82 - 12.90	C
13.08 - 13.20	C
13.70 - 13.96	C
14.16 - 14.30	C
14.70 - 15.05	C
16.20 - 16.36	C
17.43 - 17.62	C
17.90 - 18.12	C
19.05 - 19.20	C

Drilling

Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)
8.70 - 10.20 (92mm)	7.20 ADDED	87 67	36
10.20 - 11.70 (92mm)	7.20 ADDED	90 70	46
11.70 - 13.20 (92mm)	7.20 ADDED	100 72	56
13.20 - 14.70 (92mm)	7.20 ADDED	90 78	49
14.70 - 16.20 (92mm)	7.20 ADDED	90 74	56
16.20 - 17.70 (92mm)	7.20 ADDED	100 96	67
17.70 - 19.20 (92mm)	7.20 ADDED	93 71	38
19.20 - 20.70 (92mm)	7.20 ADDED	100 92	45

FI

AZCL, 13, NI, 33, NI, 13, 28, NI, 10, 75, 14, NI, 16, NI, 11, AZCL, 33, NI, 18, NI, 11, NI, 50, AZCL, 5, 12, NI, 28, NI, 28, NI, 13, NI, 26, 75, 9, AZCL, 35, 8, 8, 22, 30, NI, 25, 13, NI, 66

Strata

General	Depth	Level (m OD)
Weak to medium strong reddish brown medium to coarse grained SANDSTONE. Discontinuities are horizontal, closely spaced, planar to undulating, smooth with occasional black staining. [ST MAUGHANS FORMATION]	10.62	0.38
Weak to medium strong reddish brown SILTSTONE with occasional nodules of light grey siltstone. Discontinuities are horizontal, closely spaced, planar and smooth. [ST MAUGHANS FORMATION]	13.20	-2.20
Weak to medium strong reddish brown fine to medium grained SANDSTONE with occasional nodules of light grey sandstone. Discontinuities are horizontal, closely occasionally medium spaced, planar to undulating and smooth [ST MAUGHANS FORMATION]	14.66	-3.66
Weak reddish brown MUDSTONE with occasional nodules of grey mudstone. Discontinuities are horizontal to inclined (20 deg.), very closely to closely spaced, planar to undulating and smooth. [ST MAUGHANS FORMATION]	15.61	-4.61
Weak to medium strong reddish brown fine to medium grained SANDSTONE. Discontinuities are horizontal to inclined (30 deg.), very closely to closely spaced, planar and smooth. [ST MAUGHANS FORMATION]	17.08	-6.08
Extremely weak to weak reddish brown MUDSTONE. [ST MAUGHANS FORMATION]	19.43	-8.43
Medium strong to strong reddish brown fine to medium grained SANDSTONE. [ST MAUGHANS FORMATION]	19.79	-8.79

Detail

etween 8.26-8.70m, discontinuities with some silt and sand infill.
Between 8.60-8.70m, vertical, undulating, smooth discontinuity.
Between 8.70-8.89m, assumed zone of core loss.
Between 8.89-9.10m, non-intact, recovered as gravel.
Below 9.10m, grading to medium strong sandstone.
Between 9.10-9.46m, discontinuities with some sand and gravel infill.
Between 9.46-9.50m, non-intact, recovered as gravel.
Between 9.50-10.20m, discontinuities with sand infill.
Between 10.20-10.34m, assumed zone of core loss.
Between 10.57-10.62m, non-intact, recovered as gravel.

Between 10.72-10.79m, non-intact, recovered as gravel including grey sandstone.
Between 11.13-11.30m and between 11.37-11.52m, vertical, planar to undulating, smooth discontinuities with black staining.
Between 11.77-11.93m, non-intact, recovered as gravel.
Between 11.93-12.32m, horizontal to inclined (40 deg.), closely spaced, planar, smooth discontinuities.
Between 12.32-12.36m, horizontal to inclined (45 deg.), very closely spaced, planar, smooth discontinuities with some sand infill.
Between 12.57-12.63m, non-intact, recovered as gravel.
Between 12.81-12.86m, non-intact, recovered as gravel.

Between 13.20-13.35m, assumed zone of core loss.
Between 13.41-13.47m, non-intact, recovered as gravel.
Between 13.58-13.61m, non-intact, recovered as gravel.
Between 13.61-14.61m, horizontal, very closely to medium spaced, planar to undulating, smooth discontinuities with black staining.
Between 14.61-14.66m, non-intact, recovered as gravel.

Between 14.70-14.85m, assumed zone of core loss.
Between 15.20-15.85m, horizontal to inclined (45 - 50 deg.), very closely to closely spaced, planar, smooth discontinuities with black staining.

Between 15.85-15.91m,

Boring Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
16.20	7.20	3.10	16/08/22	08:00
20.70	7.20	ADDED	16/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 3 of 4

05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH10
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327827.4 E 184150.6 N	**Ground Level**	11.00 m OD

Sampling/Testing		Drilling					Strata				Scale 1:50
Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
20.24 - 20.35	C	19.20 - 20.70 (92mm)	7.20 ADDED	100 92	45	14		non-intact, recovered as gravel. Between 15.98-16.08m, non-intact, recovered as gravel. Between 16.15-16.20m, non-intact, recovered as gravel. Between 16.68-16.78m, vertical, undulating, smooth discontinuity. Between 16.87-16.89m, non-intact, recovered as gravel. Between 17.08-17.70m, horizontal, closely spaced, planar, smooth discontinuities. Between 17.41-17.66m, grading to light grey medium grained sandstone. Between 17.70-17.80m, assumed zone of core loss. Between 17.80-17.94m, horizontal, very closely spaced, planar, smooth discontinuities with some sand and gravel infill. Between 17.94-18.17m, horizontal, medium spaced, undulating, smooth discontinuities. Between 18.82-18.91m, non-intact, recovered as gravel. Between 18.92-19.04m, vertical, planar, smooth discontinuity. Between 18.92-19.20m, discontinuities with some sand infill. Between 19.43-19.53m, non-intact, recovered as gravel. Between 19.53-19.56m, horizontal to inclined (20 deg.), very closely spaced, planar, smooth discontinuities. Between 19.56-19.79m, horizontal, closely spaced, planar, smooth discontinuities with some clay infill. Between 19.79-20.04m, light grey, with closely spaced beds of red sandstone. Between 19.79-20.70m, horizontal to inclined (15 - 20 deg.), closely spaced, planar, smooth discontinuities.	20.70	▨	-9.70
								End of Borehole			

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

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 4 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary* *PRELIMINARY*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328068.2 E 184185.7 N	**Borehole**	BH14A
				Ground Level	10.91 m OD

Sampling / Properties / Strata — Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.20	D				
0.20	ES				
0.20 - 0.60	B				
0.50	D				
0.50	ES				
0.60 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.65		(DRY)			S40
1.20 - 1.65	D				
1.20 - 1.70	B				
1.80	D				
2.00 - 2.30		2.00 (DRY)			S50/ 150mm
2.00	ES				
2.00 - 2.30	D				
2.00 - 2.50	B				
2.80	D			12	
3.00 - 3.45		3.00 (DRY)			S21
3.00	ES				
3.00 - 3.45	#				
3.00 - 3.45	D				
3.00 - 3.50	B				
3.80	D				
4.00 - 4.45		4.00 (DRY)			S15
4.00	ES				
4.00 - 4.45	D				
4.00 - 4.50	B				
4.80	D				
5.00 - 5.45		5.00 (DRY)			S30
5.00	ES				
5.00 - 5.45	D				
5.00 - 5.50	B				
5.80	D				
6.00 - 6.38		6.00 (DRY)			S50/ 230mm
6.00 - 6.38	D				

Description	Depth	Legend	Level (m OD)
MADE GROUND: Grey concrete. [MADE GROUND - CONCRETE]	0.15	░	10.76
MADE GROUND: Brown gravelly medium sand. Gravel is subangular to subrounded fine to coarse of sandstone and siltstone. [MADE GROUND]	0.40	▨	10.51
PROBABLE MADE GROUND: Dense brown slightly gravelly medium sand. Gravel is subangular to subrounded fine to medium of sandstone and siltstone. [MADE GROUND]	2.30	▨	8.61
Soft to firm brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded medium to coarse of sandstone and siltstone. [RIVER TERRACE DEPOSITS-COHESIVE]	3.00	░	7.91
Stiff reddish brown slightly gravelly CLAY. Gravel is angular to subangular fine to medium of mudstone lithorelicts. (Weathered calcareous mudstone). [ST MAUGHANS FORMATION-UPPER CLAY]		░	
Below 4.00m, firm.			
Below 5.00m, stiff			
Below 6.00m, very stiff.			
Borehole continued by rotary techniques - see next page		▤	

Boring

Depth	Hole Dia.	Technique	Crew
0.15	0.30	Concrete Core	D-Dril
1.20	0.30	Inspection Pit	AC/RW
6.40	0.15	Cable Percussion	WN/JB
21.00	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			04/08/22	08:00
2.30	2.00	DRY	04/08/22	18:00
2.30	2.00	DRY	05/08/22	08:00
5.45	4.50	DRY	05/08/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 1.80-2.60m for 240 minutes and 5.80-6.00m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 1 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

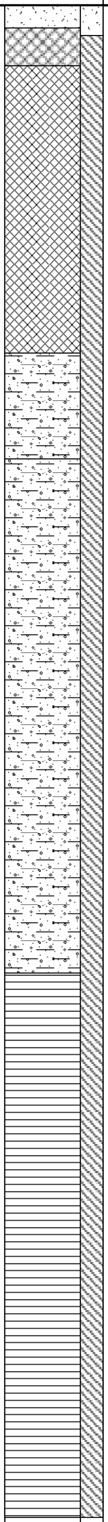
BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH14A
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328068.2 E 184185.7 N	**Ground Level**	10.91 m OD

Sampling/Testing | Drilling | Strata | Scale 1:50

Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
							Borehole continued by rotary techniques - see below				
6.90 - 7.15 7.15 - 7.25	C C	6.40 - 7.50 (92mm)	6.40 ADDED	90 66	52	AZCL NI NI 4 19	Extremely weak to weak reddish brown MUDSTONE with occasional nodules of grey mudstone. Discontinuities are horizontal to inclined (15 - 45 deg.), closely to medium spaced, planar to undulating, smooth occasionally rough with some clay infill. [ST MAUGHANS FORMATION]	Between 6.40-6.69m, assumed zone of core loss. Between 6.69-6.77m, non-intact, recovered as gravel. Between 6.77-6.82m, non-intact, recovered as soft slightly gravelly clay. Between 7.50-7.59m, non-intact, recovered as gravel. Between 8.04-8.06m, non-intact, recovered as gravel. Between 8.40-8.50m, horizontal, very closely to closely spaced, planar, smooth discontinuities. Between 8.40-8.50m, vertical, planar, rough discontinuity. Between 8.72-8.80m, non-intact, recovered as gravel. Between 8.80-9.00m, horizontal, very closely to closely spaced, planar to undulating, smooth discontinuities. Between 8.92-8.96m, vertical,			
8.03 - 8.15 8.50 - 8.60	C C	7.50 - 9.00 (92mm)	7.50 ADDED	100 75	73	NI 6 NI 5 50 13 NI 10					
		9.00 - 10.50 (92mm)	9.00 ADDED	83 18	0	AZCL NI 17					



Boring

Depth	Hole Dia.	Technique	Crew
0.15	0.30	Concrete Core	D-Dril
1.20	0.30	Inspection Pit	AC/RW
6.40	0.15	Cable Percussion	WN/JB
21.00	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			04/08/22	08:00
2.30	2.00	DRY	04/08/22	18:00
2.30	2.00	DRY	05/08/22	08:00
5.45	4.50	DRY	05/08/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 1.80-2.60m for 240 minutes and 5.80-6.00m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 2 of 4

05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328068.2 E 184185.7 N	**Borehole**	BH14A
				Ground Level	10.91 m OD

Sampling/Testing — Drilling — Strata — Scale 1:50

Sample / SPT Depth	SPT N / Type
10.80 - 10.90	C
11.15 - 11.35	C
11.80 - 12.00	C
12.00 - 12.19	C
12.80 - 12.90	C
13.15 - 13.40	C
13.40 - 13.50	C
13.90 - 14.00	C
14.00 - 14.10	C
14.90 - 15.00	C
16.15 - 16.25	C
16.77 - 16.88	C
17.45 - 17.65	C
17.77 - 17.88	C
18.80 - 18.90	C

Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)
9.00 - 10.50 (92mm)	9.00 ADDED	83 18	0
10.50 - 12.00 (92mm)	9.00 ADDED	100 74	48
12.00 - 13.50 (92mm)	9.00 ADDED	97 92	66
13.50 - 15.00 (92mm)	9.00 ADDED	71 64	45
15.00 - 16.50 (92mm)	9.00 ADDED	100 83	71
16.50 - 18.00 (92mm)	9.00 ADDED	94 72	62
18.00 - 19.50 (92mm)	9.00 ADDED	97 73	68
19.50 - 21.00	9.00 ADDED	100 94	53

FI (top to bottom): NI, NI, 75, 15, NI, 38, NI, 5, NI, 33, NI, 8, AZCL, 14, 4, NI, 66, 7, AZCL, 8, NI, 8, 15, NI, 4, 33, 9, 40, 15, 46, 20, AZCL, NI, 11, 18, 4, 9, NI, AZCL, 50, 100, NI, 11, NI, 9, 21

General	Depth	Level (m OD)
Extremely weak to weak light grey MUDSTONE with closely spaced beds of reddish brown mudstone (Dipping at 15-20 deg.). [ST MAUGHANS FORMATION]	14.80	-3.89
Extremely weak to weak reddish brown MUDSTONE with occasional nodules of grey mudstone. Discontinuities are horizontal to inclined (10 - 45 deg.), closely to medium spaced, planar to undulating, smooth occasionally rough with some clay infill. [ST MAUGHANS FORMATION]	15.00	-4.09

Detail

undulating, smooth discontinuity. Between 9.00-9.25m, assumed zone of core loss. Between 9.25-9.41m, recovered as very soft to soft slightly gravelly sandy clay. Between 9.69-10.50m, non-intact, recovered as very soft to soft slightly sandy slightly gravelly clay. Between 10.50-10.56m, non-intact, recovered as gravel. Between 10.97-11.04m, non-intact, recovered as gravel. Between 11.04-11.12m, horizontal to inclined (30 deg.), very closely to closely spaced, planar, smooth discontinuities. Between 11.12-11.15m, non-intact, recovered as sand. Between 11.49-11.54m, non-intact, recovered as very soft very sandy clay. Between 11.62-11.66m, vertical, undulating, rough discontinuity with some clay infill. Between 11.66-11.75m, non-intact, recovered as gravel. Between 12.00-12.04m, assumed zone of core loss. Between 13.03-13.06m, non-intact, recovered as gravel. Between 13.50-13.93m, assumed zone of core loss. Between 14.51-14.56m, non-intact, recovered as soft slightly gravelly clay. Between 14.56-14.80m, horizontal to inclined (20 - 30 deg.), medium spaced, undulating, rough discontinuities with some clay infill.

Between 14.80-15.00m, inclined (15 - 20 deg.), closely spaced, planar, smooth discontinuities with some clay infill.

Between 15.00-15.11m, assumed zone of core loss. Between 16.04-16.14m, horizontal, very closely spaced, planar, smooth discontinuities. Between 16.04-16.14m, vertical, planar, smooth discontinuities. Between 16.27-16.40m, horizontal, very closely to closely spaced, planar, smooth discontinuities. Between 16.50-16.58m, assumed zone of core loss. Between 16.58-16.66m, non-intact, recovered as gravel. Between 17.78-18.00m, non-intact, recovered as soft to firm slightly gravelly clay. Between 18.00-18.04m, assumed zone of core loss. Between 18.08-19.00m,

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
5.45	4.50	DRY	08/08/22	08:00
6.40	6.00	DRY	08/08/22	18:00
6.40	7.50	6.30	11/08/22	08:00
18.00	9.00	ADDED	11/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 3 of 4

05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH14A
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328068.2 E 184185.7 N	**Ground Level**	10.91 m OD

Scale 1:50

Sampling/Testing		Drilling					Strata				
Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
20.22 - 20.30	C	19.50 - 21.00	9.00 ADDED	100 94	53	8 NI 22		horizontal, widely spaced, planar, rough discontinuities with some clay infill. Between 19.00-19.23m, non-intact, recovered as gravel. Between 19.23-19.50m, horizontal to inclined (30 deg.), closely spaced, planar to stepped, smooth discontinuities. Between 19.50-19.55m, non-intact, recovered as gravel. Between 19.77-20.00m, horizontal to inclined (30 - 45 deg.), very closely to closely spaced, planar to undulating, smooth discontinuities. Between 20.87-20.91m, non-intact, recovered as gravel.	21.00	▨	-10.09
								End of Borehole			

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
18.00	9.00	6.50	12/08/22	08:00
21.00	9.00	ADDED	12/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 4 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

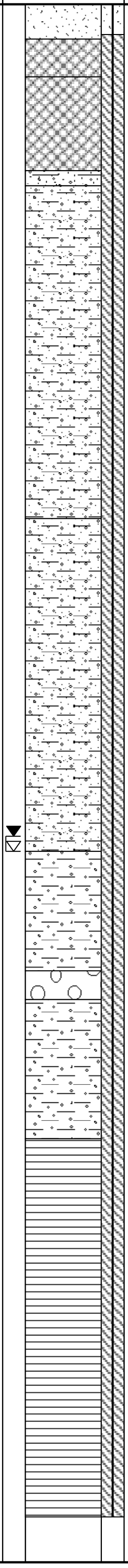
PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327715.8 E 184074.1 N	**Borehole**	BH17A
				Ground Level	11.04 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.25	D				
0.25	ES				
0.25 - 0.50	B				
0.50	D				
0.50	ES				
0.50 - 0.80	B				
0.80 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.65		(DRY)			C15
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C19
2.00	ES				
2.00 - 2.50	B				
2.30	D			10	
3.00 - 3.45		3.00 (DRY)			C26
3.00	ES				
3.00 - 3.40	B				
3.50 - 4.00	B				
4.00 - 4.45		4.00 (DRY)			S28
4.00 - 4.45	D				
4.00 - 4.50	B				
4.05	D			17	
5.00 - 5.45		4.00 (DRY)			C45
5.00 - 5.50	B				
5.60 - 6.05		4.00 (5.50)			C50

Description	Depth	Legend	Level (m OD)
MADE GROUND: Grey concrete. [MADE GROUND - CONCRETE]	0.23		10.81
MADE GROUND: Dark grey mottled brown gravelly medium to coarse sand. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone and clinker. Some fragments of wood and metal. [MADE GROUND]	0.48		10.56
MADE GROUND: Dark grey gravelly medium to coarse sand with a low cobble content. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone and concrete. [MADE GROUND]	1.10		9.94
MADE GROUND: Brown gravelly slightly clayey medium sand with a low cobble content. Gravel is subrounded medium to coarse of sandstone. [MADE GROUND]	1.20		9.84
Soft light brown slightly sandy slightly gravelly CLAY with a low subrounded cobble content of sandstone. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [ALLUVIUM]	3.40		7.64
Firm becoming stiff reddish brown slightly gravelly sandy CLAY with a low subrounded cobble content of mudstone and sandstone. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone. [ST MAUGHANS FORMATION-UPPER CLAY] At 5.00m, very stiff.	5.60		5.44
Borehole continued by rotary techniques - see next page			



Boring

Depth	Hole Dia.	Technique	Crew
0.23	0.30	Concrete Core	D Drill
1.20	0.30	Inspection Pit	AC/RW
6.05	0.15	Cable Percussion	PO/JT
20.00	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00		DRY	09/08/22	08:00
1.20		DRY	09/08/22	13:24
1.20		DRY	11/08/22	08:00
6.05	5.50	5.50	11/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
5.60	4.00	5.50	20		Seepage.

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 5.30-5.60m for 60 minutes
A 50mm standpipe was installed to 12.00m with a geowrapped slotted section from 10.00m to 12.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 12.00m, gravel filter up to 10.00m, bentonite seal up to 0.20m, concrete up to ground level.
SPTs at 2.00m and 3.00m are likely to have encountered cobbles.
Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327715.8 E 184074.1 N	**Borehole**	BH17A
				Ground Level	11.04 m OD

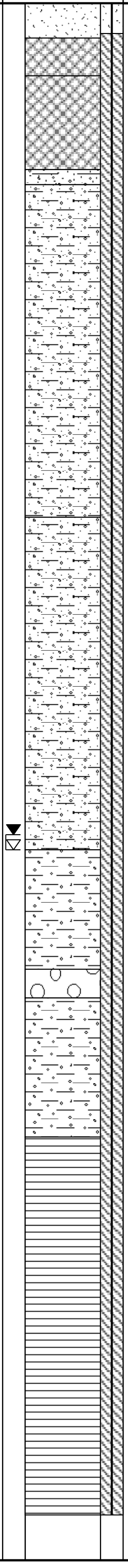
Sampling/Testing | Drilling | Strata | Scale 1:50

Sample / SPT Depth	SPT N / Type
6.50 - 6.70	C
7.05 - 7.10	C
7.10 - 7.47	C
7.60 - 7.77	C
8.62 - 8.92	C
9.30 - 9.50	C

Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI
5.60 - 6.00 (92mm)	5.50 ADDED	14 0	0	AZCL NI
6.00 - 7.50 (92mm)	6.00 ADDED	90 12	12	AZCL NI 10 NI
7.50 - 9.00 (92mm)	6.00 ADDED	90 86	74	AZCL 3 37 8
9.00 - 10.50 (92mm)	6.00 ADDED	86 86	80	AZCL 14 2

General	Detail	Depth	Level (m OD)
Borehole continued by rotary techniques - see below			
Stiff dark reddish brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of mudstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY]	Between 5.60-5.93m, assumed zone of core loss. Between 5.93-6.00m, non-intact, recovered as clay. Between 6.00-6.14m, assumed zone of core loss. Between 6.14-6.39m, non-intact, recovered as stiff clay.	6.39	4.65
BOULDER of weak to medium strong light grey medium to coarse grained sandstone (Possible sandstone bedrock). [ST MAUGHANS FORMATION-UPPER CLAY]	Between 6.39-6.58m, horizontal, closely spaced, planar, smooth discontinuities.	6.58	4.46
Stiff dark reddish brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mudstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY]	Between 6.58-7.50m, non-intact, recovered as clay.	7.50	3.54
Extremely weak reddish brown MUDSTONE with medium to widely spaced beds of grey sandstone. Discontinuities are horizontal to inclined (20 deg.), closely to medium spaced, planar and smooth. [ST MAUGHANS FORMATION]	Between 7.64-8.36m, horizontal to inclined (20 deg.), widely spaced, planar to undulating, smooth discontinuities. Between 8.36-8.52m, thin bed of sandstone. Inclined (20 - 40 deg.), very closely to closely spaced, planar, smooth discontinuities. Between 8.94-9.00m, thin bed of sandstone. Between 9.00-9.21m, assumed zone of core loss. Between 9.21-9.25m, very thin bed of sandstone. Between 9.49-10.40m, horizontal,		

Legend



Boring

Depth	Hole Dia.	Technique	Crew
0.23	0.30	Concrete Core	D Drill
1.20	0.30	Inspection Pit	AC/RW
6.05	0.15	Cable Percussion	PO/JT
20.00	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00		DRY	09/08/22	08:00
1.20		DRY	09/08/22	13:24
1.20		DRY	11/08/22	08:00
6.05	5.50	5.50	11/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
5.60	4.00	5.50	20		Seepage.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 5.30-5.60m for 60 minutes
A 50mm standpipe was installed to 12.00m with a geowrapped slotted section from 10.00m to 12.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 12.00m, gravel filter up to 10.00m, bentonite seal up to 0.20m, concrete up to ground level.
SPTs at 2.00m and 3.00m are likely to have encountered cobbles.
Logged in accordance with BS5930:2015 + A1:2020

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged by	AC
Checked by	JN
Figure	Sheet 2 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary* *PRELIMINARY*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327715.8 E 184074.1 N	**Borehole**	BH17A
				Ground Level	11.04 m OD

Scale 1:50

Sampling/Testing

Sample / SPT Depth	SPT N / Type
10.25 - 14.40	C
11.40 - 11.50	C
11.60 - 11.95	C
12.00 - 12.14	C
12.50 - 12.60	C
13.17 - 13.50	C
14.07 - 14.50	C
15.80 - 15.95	C
16.15 - 16.30	C
16.60 - 16.80	C
16.95 - 17.20	C
17.43 - 17.51	C
17.80 - 17.90	C
18.50 - 18.95	C
19.64 - 19.76	C
19.85 - 20.00	C

Drilling

Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)
9.00 - 10.50 (92mm)	6.00 ADDED	86 86	80
10.50 - 12.00 (92mm)	6.00 ADDED	100 96	66
12.00 - 13.50 (92mm)	6.00 ADDED	95 85	81
13.50 - 15.00 (92mm)	6.00 ADDED	87 86	83
15.00 - 16.50 (92mm)	6.00 ADDED	100 80	75
16.50 - 18.00 (92mm)	6.00 ADDED	96 92	70
18.00 - 18.50 (92mm)	6.00 ADDED	30 0	0
18.50 - 20.00 (92mm)	6.00 ADDED		

FI: 10, 16, 4, 9, NI, AZCL, 14, NI, 28, 3, AZCL, 2, 40, 7, NI, 6, NI, 6, NI, AZCL, NI, 5, 25, 8, AZCL, NI, NI, 3, NI

Strata

General	Depth	Level (m OD)
Weak to medium strong reddish brown medium to coarse grained SANDSTONE. [ST MAUGHANS FORMATION]	11.21	-0.17
Extremely weak reddish brown MUDSTONE. Discontinuities are horizontal to inclined (20 deg.), planar to undulating and smooth with some sandy clay infill. [ST MAUGHANS FORMATION]	11.49	-0.45
Weak reddish brown medium to coarse grained SANDSTONE. Discontinuities are inclined (15 - 20 deg.), closely spaced, planar and smooth with some sandy clay infill. [ST MAUGHANS FORMATION]	12.19	-1.15
Extremely weak to weak purplish brown MUDSTONE. Discontinuities are horizontal , medium to widely spaced, planar to undulating, smooth with some clay infill. [ST MAUGHANS FORMATION]	12.50	-1.46
Weak to medium strong reddish brown fine to medium grained SANDSTONE with closely to medium spaced horizontal and vertical bands of light grey sandstone. Discontinuities are inclined (15 - 20 deg.), closely to medium spaced, planar to undulating and smooth to rough. [ST MAUGHANS FORMATION]	17.22	-6.18
Extremely weak reddish brown MUDSTONE with occasional inclined (45 deg.) beds of grey mudstone. [ST MAUGHANS FORMATION]	18.50	-7.46
Strong reddish brown medium to coarse grained SANDSTONE with closely spaced beds of light grey sandstone. [ST MAUGHANS FORMATION]	19.20	-8.16
	20.00	-8.96

Detail

widely spaced, planar, smooth discontinuities.
Between 10.68-11.10m, horizontal, medium spaced, planar, smooth discontinuities with some sand infill.
Between 11.10-11.49m, horizontal to inclined (45 deg.), closely spaced, planar, smooth discontinuities.

Between 11.94-12.00m, non-intact, recovered as gravel.
Between 12.00-12.07m, assumed zone of core loss.
Between 12.07-12.19m, inclined (15 - 25 deg.), closely spaced, planar, smooth discontinuities with some sandy clay infill.

Between 12.28-12.43m, non-intact, recovered as sandy gravel.
Between 12.43-12.50m, horizontal to inclined (40 deg.), closely spaced, planar, smooth discontinuities with some sand infill.

Between 12.62-12.95m, vertical, undulating, smooth discontinuity.
Between 13.50-13.69m, assumed zone of core loss.
Between 13.69-17.22m, some nodules of light grey mudstone.
Between 14.69-14.74m, horizontal, very closely spaced, planar to undulating, smooth to rough discontinuities.
Between 15.00-15.03m, non-intact, recovered as soft clay.
Below 15.03m, horizontal to inclined (15 - 45 deg.), closely to medium spaced, planar to undulating, smooth to rough discontinuities with some clay infill.
Between 15.65-15.76m, non-intact, recovered as gravel.
Between 16.41-16.50m, non-intact, recovered as gravel.
Between 16.50-16.56m, assumed zone of core loss.
Between 16.56-16.61m, non-intact, recovered as gravel.

Between 17.53-17.77m, horizontal to inclined (20 - 45 deg.), very closely to closely spaced, planar to undulating, smooth discontinuities.
Between 17.77-18.00m, horizontal, medium spaced, planar to undulating, rough discontinuities.
Between 18.00-18.35m, assumed zone of core loss.
Between 18.35-18.50m, non-intact, recovered as sandy gravel of light grey sandstone.

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
6.05	5.50	3.10	17/08/22	08:00
20.00	6.00	3.10	17/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 3 of 4

05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH17A
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327715.8 E 184074.1 N	**Ground Level**	11.04 m OD

Scale 1:50

Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
								etween 18.50-18.60m, non-intact, recovered as clay. Between 18.60-19.20m, horizontal, widely spaced, planar, rough discontinuities. Between 19.20-19.34m, non-intact, recovered as gravel. End of Borehole			

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 4 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

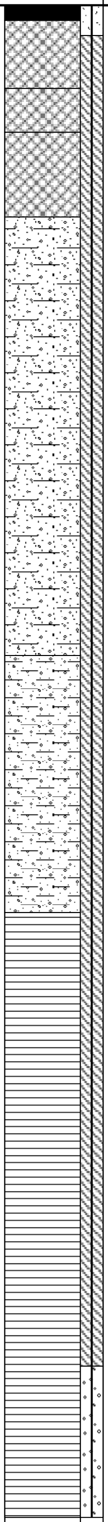
Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH23
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328219.0 E 184133.9 N	**Ground Level**	11.91 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.10 - 0.18	B				
0.18 - 0.40	B				
0.25	D				
0.25	ES				
0.55 - 0.84	B				
0.60	D				
0.60	ES				
0.84 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.65		1.20 (DRY)			C7
1.20	D				
1.50	D				
1.50 - 1.80	B				
2.00 - 2.45		2.00 (DRY)			C21
2.00	ES				
2.00 - 2.50	B				
2.20	D				
3.00 - 3.45		3.00 (DRY)			C27
3.00 - 3.50	B				
3.20	D				
4.00 - 4.45		4.00 (DRY)			C23
4.00 - 4.30	B				
4.20	D				
4.50 - 5.00	B				
4.70	D			23	
5.00 - 5.45		5.00 (DRY)			S37
5.00 - 5.45	D				
5.00 - 5.50	B				
5.20	D				
6.00 - 6.45		6.00 (DRY)			S39
6.00 - 6.45	D				

Description	Depth	Level (m OD)
MADE GROUND: Black tarmacadam. [MADE GROUND - TARMACADAM]	0.10	11.81
MADE GROUND: Reddish brown sandy angular to subangular fine to coarse gravel of sandstone and concrete. [MADE GROUND] Between 0.18m and 0.40m, cobble of concrete.	0.55	11.36
MADE GROUND: Yellowish brown mottled greenish grey slightly gravelly slightly silty fine to medium sand. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone and brick fragments. [MADE GROUND] At 0.70m, clay pipe encountered.	0.84	11.07
MADE GROUND: Reddish brown mottled yellow slightly gravelly fine to coarse sand with some pockets of soft clay. Gravel is subrounded fine to coarse of siltstone and sandstone. [MADE GROUND]	1.40	10.51
Medium dense orangish brown mottled grey very gravelly clayey SAND. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-GRANULAR]	4.30	7.61
Stiff dark reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of siltstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY]	6.00	5.91
Borehole continued by rotary techniques - see next page		

Legend



Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	PO/JT
6.00	0.15	Cable Percussion	PO/JT
19.50	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			27/07/22	08:00
6.00	5.00	DRY	27/07/22	17:00
6.00	6.00	4.00	01/08/22	08:00
10.50	10.50	8.10	01/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
12.00	10.50	11.00	20	11.00	Slow inflow.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 3.50-4.00m for 60 minutes.
A 50mm standpipe was installed to 13.00m with a geowrapped slotted section from 9.00m to 13.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 13.00m, gravel filter up to 9.00m, bentonite seal up to 0.20m, concrete up to ground level.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 1 of 4
	05/01/2023

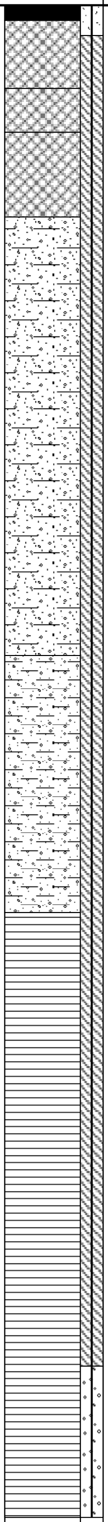
GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH23
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328219.0 E 184133.9 N	**Ground Level**	11.91 m OD

Sampling/Testing | Drilling | Strata | Scale 1:50

Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
							Borehole continued by rotary techniques - see below				
		6.00 - 7.50 (92mm)	6.00 ADDED	55 0	0	AZCL NI 25 NI	Extremely weak to very weak reddish brown MUDSTONE. [ST MAUGHANS FORMATION]	Between 6.00m and 6.68m, assumed zone of core loss. Between 6.68m and 6.84m, non-intact. At 6.90m, horizontal discontinuities, closely spaced, undulating, smooth, clean. Between 6.95m and 7.03m, subvertical discontinuity, undulating, smooth, clean. Between 7.00m and 7.50m, non-intact. Between 7.50m and 8.00m, assumed zone of core loss. Between 8.00m and 8.42m, non-intact. Between 8.40m and 8.50m, subvertical discontinuity, undulating, smooth, clean. Between 8.53m and 8.75m, and 8.89m and 9.00m, non-intact. Between 9.00m and 9.15m, assumed zone of core loss. Between 9.15m and 9.90m, non-intact. Recovered as gravelly clay. Between 9.93m and 10.50m,			
		7.50 - 9.00 (92mm)	7.50 ADDED	67 4	0	AZCL NI 27 NI 21 NI					
9.00 - 9.40	C50/ 255mm	9.00 - 10.50 (92mm)	10.50 ADDED	90 27	0	AZCL NI					

Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	PO/JT
6.00	0.15	Cable Percussion	PO/JT
19.50	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			27/07/22	08:00
6.00	5.00	DRY	27/07/22	17:00
6.00	6.00	4.00	01/08/22	08:00
10.50	10.50	8.10	01/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
12.00	10.50	11.00	20	11.00	Slow inflow.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 3.50-4.00m for 60 minutes.
A 50mm standpipe was installed to 13.00m with a geowrapped slotted section from 9.00m to 13.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 13.00m, gravel filter up to 9.00m, bentonite seal up to 0.20m, concrete up to ground level.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 2 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328219.0 E 184133.9 N	**Borehole**	BH23
				Ground Level	11.91 m OD

Sampling/Testing | Drilling | Strata | Scale 1:50

Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
		9.00 - 10.50 (92mm)	10.50 ADDED	90 27	0	22 NI 38 NI		horizontal discontinuities, closely spaced, undulating, stepped, smooth. Between 10.26m and 10.30m, and 10.40m and 10.50m, non-intact. Between 10.50m and 11.40m, assumed zone of core loss. Between 11.40m and 11.55m, non-intact. Between 11.55m and 11.89m, discontinuities are horizontal, very closely to closely spaced, undulating, rough, clean. Between 11.76m and 11.81m, speckled grey staining on fracture surfaces. Between 11.89m and 12.27m, non-intact. Recovered as clay. Between 12.05m and 12.10m, light grey. At 12.20m, light grey. Between 12.27m and 12.46m, discontinuities are horizontal to subhorizontal, extremely closely spaced, undulating, smooth. Between 12.39m and 12.42m, 12.46m and 12.57m, and 12.62m and 12.89m, non-intact. Between 12.89m and 13.10m, discontinuities are subhorizontal, very closely spaced, planar, smooth. Between 13.25m and 13.50m, non-intact. Between 13.50m and 14.57m, assumed zone of core loss. Between 14.57m and 14.72m, non-intact. Below 14.71m, discontinuities are subhorizontal, very closely spaced, stepped, smooth with some sand infill. Between 14.93m and 15.10m, non-intact. Below 15.00m, discontinuities are horizontal, closely spaced, undulating, rough with some sand infill. Between 15.36m and 15.44m, vertical discontinuity, undulating, smooth, clean. Between 15.46m and 15.58m, non-intact. Between 15.88m and 16.00m, vertical discontinuity, undulating, smooth, clean. Between 15.91m and 16.12m, and 16.50m and 16.60m, non-intact. Between 16.73m and 16.79m, grey. Between 17.15m and 17.24m, inclined discontinuity, undulating, smooth with sand infill. Below 17.30m, discontinuities have clay infill. At 17.75m, grey.			
11.80 - 11.90	C	10.50 - 12.00 (92mm)	10.50 ADDED	40 13	0	AZCL NI 26					
12.00 - 12.44 12.48 - 12.52 12.95 - 13.05	C50/ 285mm C C	12.00 - 13.50 (92mm)		100 37	10	NI >50 NI 50 NI 40 NI 19 NI					
14.70 - 14.85	C	13.50 - 15.00 (92mm)	15.00 ADDED	29 14	0	AZCL NI 19 NI					
15.15 - 15.28 15.68 - 15.82 16.10 - 16.37 16.37 - 16.50	C C C C	15.00 - 16.50 (92mm)	15.00 ADDED	100 61	50	22 NI 15 NI 5 NI					
16.65 - 16.90 16.90 - 17.10 17.10 - 17.25 17.60 - 17.90 17.90 - 18.00	C C C C C	16.50 - 18.00 (92mm)	15.00 ADDED	100 89	78	4					
		18.00 - 19.50 (92mm)	15.00 ADDED	33 0	0	AZCL NI			19.50		-7.59
19.50 - 19.92	C50/ 270mm										

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
10.50	10.50	8.10	02/08/22	08:00
19.50	15.00	11.00	02/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 3 of 4

05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH23
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328219.0 E 184133.9 N	**Ground Level**	11.91 m OD

Scale 1:50

Sampling/Testing		Drilling					Strata				
Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
								etween 18.00m and 19.00m, assumed zone of core loss. Between 19.00m and 19.50m, non-intact. Recovered as gravelly clay. End of Borehole			

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

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 4 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

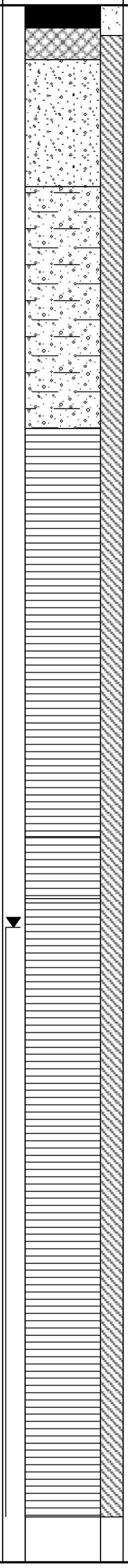
Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328006.4 E 184066.7 N	**Borehole**	BH27
				Ground Level	10.18 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.15 - 0.36	B				
0.20	D				
0.20	ES				
0.36 - 1.20	B				
0.50	D				
0.50	ES				
1.00	D				
1.00	ES				
1.20 - 1.65		(DRY)			C28
1.20 - 1.70	B				
2.00 - 2.45		2.00 (DRY)			C36
2.00 - 2.50	B				
2.80	D				
3.00 - 3.45		3.00 (DRY)			C26
3.00 - 3.50	B				
4.00 - 4.45		3.00 (DRY)			S29
4.00	D				
4.00 - 4.50	B				
5.00 - 5.45		3.00 (DRY)			S35
5.00	D				
5.50 - 5.91		3.00 (DRY)			C50/ 260mm

Description	Depth	Level (m OD)
MADE GROUND: Black tarmacadam. [MADE GROUND - TARMACADAM]	0.15	10.03
MADE GROUND: Dark grey mottled black gravelly medium to coarse sand. Gravel is subangular to subrounded fine to coarse of asphalt, sandstone, aircrete, concrete and brick fragments. [MADE GROUND]	0.36	9.82
Light brown gravelly medium to coarse SAND. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone and quartz (Possible Made Ground). [RIVER TERRACE DEPOSITS-GRANULAR]	1.20	8.98
Medium dense to dense light brown very sandy clayey GRAVEL. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone and quartz. [RIVER TERRACE DEPOSITS-GRANULAR]	2.80	7.38
Stiff dark reddish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to medium of mudstone and sandstone (Weathered calcareous mudstone). [ST MAUGHANS FORMATION-UPPER CLAY]	5.50	4.68
Extremely weak dark reddish brown calcareous MUDSTONE. Recovered as clayey gravel. [ST MAUGHANS FORMATION]	5.91	4.27

Borehole continued by rotary techniques - see next page



Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	RW/AC
5.50	0.15	Cable Percussion	WO/JT
20.60	0.12	Rotary Core	

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			27/07/22	08:00
1.20		DRY	27/07/22	17:00
1.20		DRY	03/08/22	08:00
5.91	5.50	DRY	03/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
16.00	10.10	6.10	20		Seepage.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1litre plastic tub.
Chiselling: 5.20-5.50m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 1 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

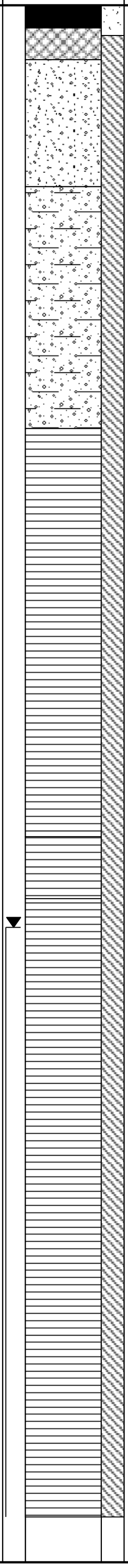
BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH27
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328006.4 E 184066.7 N	**Ground Level**	10.18 m OD

Scale 1:50

Sampling/Testing		Drilling					Strata				
Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
							Borehole continued by rotary techniques - see below				
6.80 - 6.88 7.03 - 7.10	C C	5.60 - 7.10 (92mm)	ADDED	65 46	18	AZCL 40 NI 22 NI 33 NI 16	Extremely weak to very weak reddish brown MUDSTONE. Discontinuities are horizontal, very closely to closely spaced, planar and undulating, rough and smooth. [ST MAUGHANS FORMATION]	Between 5.60-6.12m, assumed zone of core loss. Between 6.19-6.24m, non-intact (recovered as soft clay). Between 6.24-6.39m, band of weak grey sandstone (recovered as gravel). Between 6.41-6.49m, non-intact (recovered as gravel). Between 6.55-6.61m, non-intact (recovered as gravel). Between 6.61-7.10m, some sand infill (up to 50mm). Between 6.75-7.10m, interbedded with weak grey sandstone. Between 7.10-8.00m, assumed zone of core loss. Between 8.00-8.32m, non-intact (recovered as firm clay). Between 8.32-8.37m, non-intact (recovered as gravel). Between 8.53-8.60m, non-intact (recovered as gravel). Between 8.60-9.42m, assumed zone of core loss. Between 9.42-9.50m, non-intact			
		7.10 - 8.60 (92mm)	ADDED	40 0	0	AZCL NI 15 NI					
8.60 - 8.90 9.65 - 9.85	C50/ 145mm C	8.60 - 10.10 (92mm)	ADDED	45 20	16	AZCL NI 28 8 NI 40					



Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	RW/AC
5.50	0.15	Cable Percussion	WO/JT
20.60	0.12	Rotary Core	

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			27/07/22	08:00
1.20		DRY	27/07/22	17:00
1.20		DRY	03/08/22	08:00
5.91	5.50	DRY	03/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
16.00	10.10	6.10	20		Seepage.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1litre plastic tub.
Chiselling: 5.20-5.50m for 60 minutes.
Borehole backfilled with bentonite pellets and topped with arisings on completion.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 2 of 4

05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary* *PRELIMINARY*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328006.4 E 184066.7 N	**Borehole**	BH27
				Ground Level	10.18 m OD

Sampling/Testing | Drilling | Strata | Scale 1:50

Sample / SPT Depth	SPT N / Type
11.60 - 11.85	C
12.10 - 12.23	C
13.75 - 13.88	C
15.47 - 15.60	C
16.25 - 16.40	C
16.70 - 17.00	C
18.60 - 18.90	C
19.95 - 21.10	C

Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)
8.60 - 10.10 (92mm)	ADDED 10.10	45 20	16 26
10.10 - 11.60 (92mm)	ADDED	100 68	
11.60 - 13.10 (92mm)	10.10 ADDED	100 78	70
13.10 - 14.60 (92mm)	10.10 ADDED	88 80	65
14.60 - 16.10 (92mm)	10.10 ADDED	100 92	74
16.10 - 17.60 (92mm)	10.10 ADDED	100 96	90
17.60 - 19.10 (92mm)	10.10 ADDED	100 96	80
19.10 - 20.60 (92mm)	10.10 ADDED	92 92	80

FI
NI
NI
25
NI
20
NI
15
NI
15
7
33
12
33
16
NI
40
AZCL
NI
13
50
12
NI
3
24
26
NI
14
4
20
2
NI
10
NI
16
4
26
AZCL
47

General	Detail	Depth	Level (m OD)
	(recovered as gravel). Below 9.57m, discontinuities are horizontal and subhorizontal. Between 9.81-9.87m, non-intact (recovered as gravel). Between 9.92-10.20m, non-intact (recovered as gravel).		
Weak light grey SILTSTONE. Discontinuities are horizontal and subhorizontal, closely spaced, planar and undulating, rough, some clay infill (up to 30mm). [ST MAUGHANS FORMATION]	Between 10.36-10.50m, non-intact (recovered as gravel). Between 10.60-10.68m, non-intact (recovered as gravel).	10.81	-0.63
Very weak to weak reddish brown MUDSTONE. Discontinuities are horizontal and subhorizontal, very closely to closely spaced, planar, rough and smooth. [ST MAUGHANS FORMATION]	Between 10.81-10.96m, non-intact (recovered as gravel). Between 12.45-12.85m, closely spaced siltstone laminae. Between 12.50-12.72m, vertical, undulating, smooth discontinuity. Between 12.84-13.05m, non-intact (recovered as gravel). Between 13.10-13.28m, assumed zone of core loss. Between 13.10-16.10m, closely spaced bands of grey mudstone. Between 13.28-13.38m, non-intact (recovered as clay). Between 13.38-14.60m, discontinuities are closely to medium spaced. Between 15.00-15.03m, non-intact (recovered as firm clay). Between 15.97-16.07m, vertical, undulating, smooth discontinuity. Between 16.07-16.10m, non-intact (recovered as gravel). Between 17.44-17.60m, non-intact (recovered as gravel). Between 18.10-18.13m, vertical, undulating, rough discontinuity. Between 19.10-19.21m, assumed zone of core loss.	11.26	-1.08

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
5.91	5.50	DRY	05/08/22	08:00
10.10	8.00	ADDED	05/08/22	18:00
10.10	10.10	8.70	08/08/22	08:00
20.60	10.10	ADDED	08/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 3 of 4

05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary* *PRELIMINARY*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328006.4 E 184066.7 N	**Borehole**	BH27
				Ground Level	10.18 m OD

Scale 1:50

Sampling/Testing		Drilling					Strata				
Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
		19.10 - 20.60 (92mm)	10.10 ADDED	92 92	80	20			20.60	▨	-10.42
								End of Borehole			

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	AC
Checked by	JN
Figure	Sheet 4 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328110.5 E 184100.0 N	**Borehole**	BH28
				Ground Level	10.83 m OD

Sampling / Properties

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.15 - 0.60	B				
0.20	D				
0.20	ES				
0.50	D				
0.50	ES				
0.60 - 1.20	B				
1.00	D				
1.00	ES				
1.20 - 1.27		1.20 (DRY)			C50/ 30mm
1.20 - 1.70	B				
2.00 - 2.25		2.00 (DRY)			C50/ 100mm
2.00 - 2.50	B				
2.70	D				
3.00 - 3.26		3.00 (DRY)			C50/ 115mm
3.00 - 3.50	B				
3.80	D				
4.00 - 4.45		4.00 (DRY)			C38
4.00 - 4.50	B				
4.50 - 4.64		4.00 (DRY)			C50/ 70mm

Strata — Scale 1:50

Description	Depth	Legend	Level (m OD)
Grass over TOPSOIL: Brown slightly gravelly fine to medium sand with rootlets. Gravel is subrounded fine of siltstone. [TOPSOIL]	0.15		10.68
MADE GROUND: Light brown gravelly fine to medium sand with a low cobble content. Gravel is subangular to subrounded medium to coarse of siltstone and sandstone. [MADE GROUND]	3.00		7.83
Soft light brown slightly gravelly sandy CLAY with a low cobble content. Gravel is subangular to subrounded medium to coarse of siltstone and sandstone. [RIVER TERRACE DEPOSITS-COHESIVE]	3.80		7.03
Stiff to very stiff reddish brown MUDSTONE. Recovered as slightly gravelly clay. [ST MAUGHANS FORMATION]	4.50		6.33
Extremely weak to very weak reddish brown MUDSTONE. Discontinuities are horizontal and subhorizontal, very closely to closely spaced, planar and undulating, rough, clean. [ST MAUGHANS FORMATION]			

Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	WO/JT
4.50	0.15	Cable Percussion	WO/JT
21.00	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			29/07/22	08:00
3.00	3.00	DRY	29/07/22	18:00
3.00	3.00	DRY	01/08/22	08:00
4.64	4.50	DRY	01/08/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 1.50-2.00m for 90 minutes, 2.20-2.60m for 90 minutes and 3.00-3.80m for 195 minutes.
Chiselling: 1.20-1.50m for 90 minutes and 4.20-4.50m for 60 minutes.
50mm standpipe was installed to 5.00m with a geowrapped slotted section from 3.00m to 5.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 5.00m, gravel filter up to 3.00m, bentonite seal up to 0.20m, concrete up to ground level.
Logged in accordance with BS5930:2015 + A1:2020

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged by RW
Checked by JN
Figure Sheet 1 of 4
05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

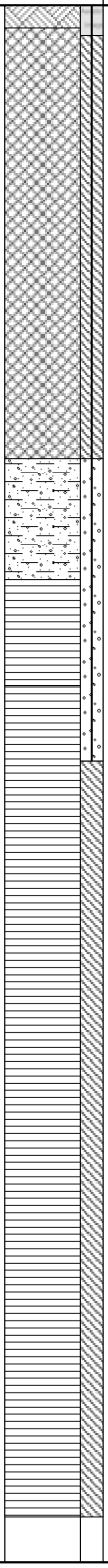
BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH28
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328110.5 E 184100.0 N	**Ground Level**	10.83 m OD

Sampling/Testing | Drilling | Strata | Scale 1:50

Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
							Borehole continued by rotary techniques - see below				
5.60 - 5.70 5.70 - 5.80	C C	4.50 - 6.00 (92mm)	4.50 ADDED	82 17	0	AZCL NI 2 NI	Extremely weak to very weak reddish brown MUDSTONE. Discontinuities are horizontal and subhorizontal, very closely to closely spaced, planar and undulating, rough, clean. [ST MAUGHANS FORMATION]	Between 4.50-4.77m, assumed zone of core loss. Between 4.77-5.57m, non-intact (recovered as gravel). Between 5.83-6.00m, non-intact (recovered as gravel). Between 6.00-7.14m, assumed zone of core loss. Between 7.14-7.50m, non-intact (recovered as gravel). Between 7.50-7.70m, assumed zone of core loss. Between 7.70-7.87m, non-intact (recovered as gravel). Some limestone gravel. Between 7.90-8.14m, non-intact (recovered as gravel). Between 8.23-8.26m, vertical, planar, smooth discontinuity. Between 8.26-8.32m, non-intact (recovered as gravel). Between 8.57-9.00m, non-intact (recovered as gravel). Between 9.00-9.12m, assumed zone of core loss. Between 9.12-9.25m, non-intact (recovered as gravel). Between 9.43-9.49m, non-intact (recovered as gravel). Between 9.49-9.64m, vertical, planar, smooth discontinuity. Between 9.97-10.26m, non-intact (recovered as clay and gravel).			
		6.00 - 7.50 (92mm)	6.00 ADDED	24 0	0	AZCL NI					
7.50 - 7.88 8.30 - 8.55	C50/ 225mm C	7.50 - 9.00 (92mm)	7.50 ADDED	86 26	16	AZCL NI >50 NI >50 NI 8 NI					
9.65 - 9.75	C	9.00 - 10.50 (92mm)	9.00 ADDED	92 60	25	AZCL NI 33 NI 25					



Boring

Depth	Hole Dia.	Technique	Crew
1.20	0.30	Inspection Pit	WO/JT
4.50	0.15	Cable Percussion	WO/JT
21.00	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			29/07/22	08:00
3.00	3.00	DRY	29/07/22	18:00
3.00	3.00	DRY	01/08/22	08:00
4.64	4.50	DRY	01/08/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					No groundwater strikes noted - may have been masked by water added.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Slow progress: 1.50-2.00m for 90 minutes, 2.20-2.60m for 90 minutes and 3.00-3.80m for 195 minutes.
Chiselling: 1.20-1.50m for 90 minutes and 4.20-4.50m for 60 minutes.
50mm standpipe was installed to 5.00m with a geowrapped slotted section from 3.00m to 5.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 5.00m, gravel filter up to 3.00m, bentonite seal up to 0.20m, concrete up to ground level.
Logged in accordance with BS5930:2015 + A1:2020

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged by	RW
Checked by	JN
Figure	Sheet 2 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary* *PRELIMINARY*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328110.5 E 184100.0 N	**Borehole**	BH28
				Ground Level	10.83 m OD

Sampling/Testing | Drilling | Strata | Scale 1:50

Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
10.30 - 10.45	C	9.00 - 10.50 (92mm)	9.00 ADDED	92 60	25	NI 8					
11.15 - 11.25 11.50 - 11.80	C C	10.50 - 12.00 (92mm)	9.00 ADDED	100 72	68	AZCL 12 NI 5 25 NI 7 4 NI		Between 10.50-10.65m, assumed zone of core loss. Between 10.50-11.00m, discontinuities are stepped. Between 10.81-10.85m, non-intact (recovered as gravel). Below 11.00m, clay infill in discontinuities (up to 30mm). Between 11.30-11.36m, non-intact (recovered as soft clay). Between 11.36-11.47m, non-intact (recovered as gravel). Between 11.89-12.00m, non-intact (recovered as soft clay).			
12.05 - 12.15	C	12.00 - 13.50 (92mm)		100 72	68	11 NI 10 NI 5 NI 12		Between 12.00-12.04, band of limestone (non-intact, recovered as gravel). Between 12.22-12.28m, non-intact (recovered as soft clay). Between 12.88-12.98m, non-intact (recovered as soft clay). Between 13.14-13.50m, non-intact (recovered as gravel).			
14.88 - 15.00	C	13.50 - 15.00 (92mm)		94 0	0	NI		Between 13.50-13.58m, assumed zone of core loss. Between 13.58-15.00m, non-intact (recovered as stiff reddish brown clay).			
		15.00 - 16.50 (92mm)		100 93	63	4 NI 7 17 NI		Below 15.00m, discontinuities are closely to medium spaced. Between 15.69-15.93m, vertical, planar, rough discontinuity.			
17.00 - 17.12 17.55 - 17.95	C C	16.50 - 18.00 (92mm)		100 100	91	4		Between 16.46-16.50m, non-intact (recovered as gravel).			
		18.00 - 19.50 (92mm)		68 8	0	AZCL NI >50 NI >50		Between 18.00-18.47m, assumed zone of core loss. Between 18.47-19.19m, non-intact (recovered as soft clay). Between 19.28-19.47, non-intact (recovered as gravel).			
19.90 - 20.00	C	19.50 - 21.00 (92mm)		100 80	67	NI 8 26		Between 19.50-19.70m, non-intact (recovered as firm clay).			

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
4.50	4.50	DRY	03/08/22	08:00
12.00	9.00	10.90	03/08/22	14:22
12.00	9.00	3.10	14/08/22	08:00
21.00	12.00	ADDED	14/08/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 3 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH28
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	328110.5 E 184100.0 N	**Ground Level**	10.83 m OD

Sampling/Testing		Drilling					Strata				Scale 1:50
Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
		19.50 - 21.00 (92mm)		100 80	67	2 21				▤	
								End of Borehole	21.00		-10.17

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 4 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

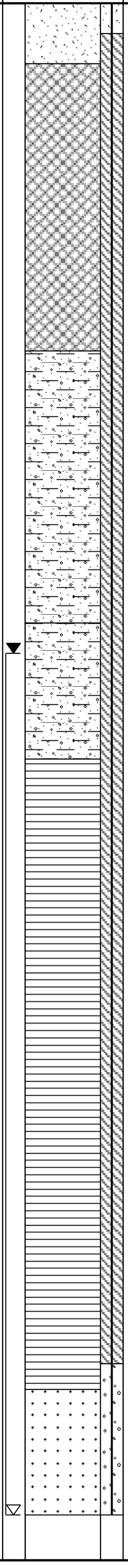
Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327758.3 E 183952.4 N	**Borehole**	BH30
				Ground Level	10.99 m OD

Sampling | Properties | Strata | Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w(%)	SPT N
0.40 - 0.80	B				
0.50	D				
0.50	ES				
0.80 - 1.20					
1.00	D				
1.00	ES				
1.20 - 1.65		(DRY)			C21
1.20 - 1.70	B				
1.50	ES				
2.00 - 2.45		2.00 (DRY)			C15
2.00 - 2.50	B				
3.00 - 3.45		3.00 (DRY)			C22
3.30	D			15	
3.50 - 4.00	B				
4.00 - 4.45		4.00 (DRY)			C27
5.00 - 5.45		4.50 (DRY)			S43
5.00 - 5.30	B				
5.00 - 5.45	D				

Description	Depth	Level (m OD)
MADE GROUND: Grey concrete. [MADE GROUND - CONCRETE]	0.40	10.59
MADE GROUND: Reddish brown slightly gravelly slightly clayey medium sand with occasional pockets of soft reddish brown sandy clay. Gravel is subangular to subrounded fine to medium of siltstone and sandstone. [MADE GROUND]	2.30	8.69
Firm reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. [ST MAUGHANS FORMATION-UPPER CLAY]	4.10	6.89
Firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mudstone, siltstone and sandstone (probable weathered bedrock). [ST MAUGHANS FORMATION-UPPER CLAY]	5.00	5.99
Borehole continued by rotary techniques - see next page		

Legend



Boring

Depth	Hole Dia.	Technique	Crew
0.40	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	JM/DG
5.75	0.15	Cable Percussion	PO/JT
20.20	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			28/07/22	15:37
1.20		DRY	28/07/22	17:00
1.20		DRY	05/08/22	08:00
4.45	4.00	DRY	05/08/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
10.00	7.50	4.30	20		Seepage.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 5.00-5.30m for 60 minutes.
50mm standpipe was installed to 11.00m with a geowrapped slotted section from 9.00m to 11.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 11.00m, gravel filter up to 9.00m, bentonite seal up to 0.20m, concrete up to ground level.

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 1 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

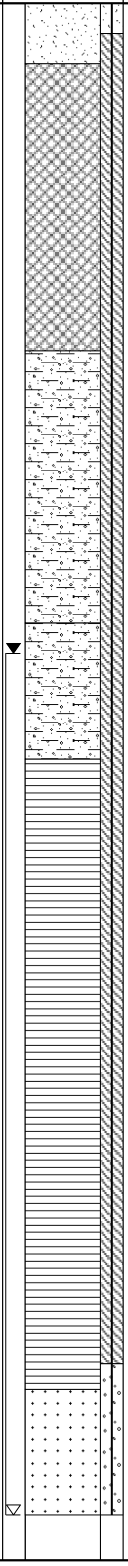
Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327758.3 E 183952.4 N	**Borehole**	BH30
				Ground Level	10.99 m OD

Scale 1:50

Sample / SPT Depth	SPT N / Type
5.30 - 5.75	D
5.30 - 5.75	S61
5.32 - 5.75	C
5.75 - 5.88	C
7.30 - 7.45	C
7.70 - 7.85	C
8.85 - 8.94	C
9.24 - 9.34	C
9.40 - 9.50	C

Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI
5.00 - 6.00 (92mm)	5.00 ADDED	70 68	68	AZCL NI 8
6.00 - 7.50 (92mm)	6.00 ADDED	93 71	71	AZCL 3 8 NI 11 NI
7.50 - 9.00 (92mm)	7.50 ADDED	89 86	15	AZCL NI 29
9.00 - 10.50 (92mm)	7.50 ADDED	88 67	32	AZCL NI 20 NI 19

Strata General	Detail	Depth	Level (m OD)
Borehole continued by rotary techniques - see below			
Extremely weak to weak reddish brown mottled grey MUDSTONE. Discontinuities are horizontal to subhorizontal (up to 20 deg.), closely to medium spaced, planar to undulating, rough with some clay infill. [ST MAUGHANS FORMATION]	Between 5.00-5.30m, assumed zone of core loss. Between 5.00-5.32m, non-intact, recovered as gravel Between 6.00-6.10m, assumed zone of core loss. Between 6.10-6.76m, discontinuities are widely spaced, smooth. Between 6.88-7.22m, non-intact, recovered as subangular fine to coarse gravel. Between 7.40-7.50m, non-intact, recovered as subangular fine to coarse gravel. Between 7.50-7.66m, assumed zone of core loss. Between 7.66-7.71m, non-intact, recovered as subangular fine to medium gravel. Between 7.71-9.00m, discontinuities are very closely to closely spaced, planar, smooth with some clay and gravel infill. Between 9.00-9.17m, assumed zone of core loss.		
Medium strong to strong reddish brown mottled grey fine to medium SANDSTONE. Discontinuities are horizontal, closely spaced, planar, smooth and clean. [ST MAUGHANS FORMATION]	Between 9.17-9.23m, non-intact, recovered as subangular medium to coarse gravel. Between 9.17-9.53m, vertical vein (up to 2mm thick) of quartzite. Between 9.53-9.64m, non-intact,	9.17	1.82



Boring

Depth	Hole Dia.	Technique	Crew
0.40	0.30	Concrete Core	D-Drill
1.20	0.30	Inspection Pit	JM/DG
5.75	0.15	Cable Percussion	PO/JT
20.20	0.12	Rotary Core	CJ/JS

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
0.00			28/07/22	15:37
1.20		DRY	28/07/22	17:00
1.20		DRY	05/08/22	08:00
4.45	4.00	DRY	05/08/22	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
10.00	7.50	4.30	20		Seepage.

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars and 1 x 1L plastic tub.
Chiselling: 5.00-5.30m for 60 minutes.
50mm standpipe was installed to 11.00m with a geowrapped slotted section from 9.00m to 11.00m with a flush cover installed.
Backfill details from base of hole: bentonite seal up to 11.00m, gravel filter up to 9.00m, bentonite seal up to 0.20m, concrete up to ground level.

Logged in accordance with BS5930:2015 + A1:2020

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged by RW
Checked by JN
Figure Sheet 2 of 4
05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary* *PRELIMINARY*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327758.3 E 183952.4 N	**Borehole**	BH30
				Ground Level	10.99 m OD

Scale 1:50

Sampling/Testing

Sample / SPT Depth	SPT N / Type
11.40 - 11.60	C
11.88 - 12.00	C
14.05 - 14.30	C
15.10 - 15.20	C
15.65 - 15.85	C
15.87 - 15.97	C
16.75 - 16.88	C
17.80 - 17.96	C
18.00 - 18.14	C
19.15 - 19.22	C

Drilling

Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)
9.00 - 10.50 (92mm)	7.50 ADDED	88 67	32
10.50 - 12.00 (92mm)	7.50 ADDED	97 84	71
12.00 - 13.50 (92mm)	7.50 ADDED	100 92	33
13.50 - 15.00 (92mm)	7.50 ADDED	95 91	71
15.00 - 16.50 (92mm)	7.50 ADDED	100 68	64
16.50 - 18.00 (92mm)	7.50 ADDED	95 63	47
18.00 - 19.50 (92mm)	7.50 ADDED	100 76	54
19.50 - 20.20 (92mm)	7.50 ADDED	100 64	40

FI: NI, AZCL, NI, 12, NI, 13, NI, 8, NI, 9, 15, 23, 5, 15, NI, 9, AZCL, 30, 13, 10, NI, 31, 11, >50, 17, 31, 36, 7

Strata

General	Depth	Level (m OD)
	10.35	0.64
Extremely weak to weak reddish brown mottled grey MUDSTONE. Discontinuities are subhorizontal to inclined (up to 40 deg.), closely to medium spaced, planar, smooth and rough with occasional clay infill. [ST MAUGHANS FORMATION]	17.75	-6.76
Medium strong reddish brown mottled grey SILTSTONE. Discontinuities are horizontal to subhorizontal (up to 30 deg.), very closely to closely spaced, planar, smooth and clean. [ST MAUGHANS FORMATION]	19.50	-8.51
Strong reddish brown medium to coarse grained SANDSTONE with vertical veins of quartzite. Discontinuities are horizontal, medium spaced, planar, smooth and clean. [ST MAUGHANS FORMATION]	19.90	-8.91
Weak reddish brown MUDSTONE. Discontinuities are horizontal, closely spaced, planar, smooth and clean. [ST MAUGHANS FORMATION]		

Detail

recovered as slightly clayey subangular fine to coarse gravel.

Between 10.35-10.50m, non-intact, recovered as subangular medium to coarse gravel.
Between 10.50-10.54m, assumed zone of core loss.
Between 10.54-10.62m, non-intact, recovered as subangular fine to coarse gravel.
Between 10.62-12.00m, occasional clay infill.
Between 13.50-13.53m, assumed zone of core loss.
Between 13.53-13.59m, non-intact, recovered as angular to subangular fine to coarse gravel.
Between 14.52-14.56m, non-intact, recovered as subangular fine to medium gravel.
Between 14.56-15.00m, discontinuities are horizontal, closely spaced, planar to undulating and rough.
Below 15.00m, discontinuities are horizontal to subhorizontal (up to 20 deg.), closely spaced, planar to undulating, smooth.
Between 15.20-15.46m, vertical discontinuity, undulating and smooth.
Between 15.85-16.08m, non-intact, recovered as subangular fine to medium gravel.
Between 16.50-16.57m, assumed zone of core loss.
Between 16.57-16.77m, discontinuities are very closely to closely spaced.
Between 16.58-16.65m, vertical discontinuity, undulating and smooth.
Between 17.28-17.58m, discontinuities are medium spaced. Vertical discontinuity, undulating and smooth.
Between 17.58-17.61m, non-intact, recovered as subangular fine to medium gravel.

Between 18.23-18.39m, yellow staining on discontinuity surfaces.
Between 18.39-18.43m, non-intact, recovered as subangular fine to medium gravel.
Between 18.51-19.28m, discontinuities are closely to medium spaced.
Between 18.52-19.28m, vertical discontinuity, planar to undulating, smooth with yellow staining on surfaces.
Between 19.14-19.20m, non-intact, recovered as subangular fine to medium gravel.
Between 19.28-19.39m, discontinuities are subhorizontal

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
4.45	4.00	DRY	08/08/22	08:00
5.75	4.50	DRY	08/08/22	18:00
5.75	4.50	DRY	09/08/22	08:00
16.50	7.50	ADDED	09/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 3 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

BOREHOLE RECORD - *Cable Percussion and Rotary*

PRELIMINARY

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
				Borehole	BH30
Client	Pinnacle Consulting Engineers Limited	**National Grid Coordinates**	327758.3 E 183952.4 N	**Ground Level**	10.99 m OD

Sampling/Testing		Drilling					Strata			Scale 1:50	
Sample / SPT Depth	SPT N / Type	Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	TCR/ SCR (%)	RQD (%)	FI	General	Detail	Depth	Legend	Level (m OD)
		19.50 - 20.20 (92mm)	7.50 ADDED	100 64	40	41 NI		to inclined (up to 45 deg.). Between 19.50-19.90m, vertical, undulating, smooth discontinuity.	20.20	▨	-9.21
								End of Borehole			

Boring

Depth	Hole Dia.	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
16.50	7.50	3.10	10/08/22	08:00
20.20	7.50	ADDED	10/08/22	17:00

Groundwater

Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbrevations are explained on the accompanying key sheets.
All dimensions are in metres.

Logged in accordance with BS5930:2015 + A1:2020

Logged by	RW
Checked by	JN
Figure	Sheet 4 of 4
	05/01/2023

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH01	1.20	9.66	S		1	1	2	2	3	4	11	
BH01	2.00	8.86	S		1	1	2	3	3	4	12	
BH01	3.00	7.86	S		4	4	5	7	6	4	22	
BH01	4.00	6.86	S		4	3	4	3	4	3	14	
BH01	5.00	5.86	S		2	4	3	2	2	2	9	
BH01	6.00	4.86	S		10	15	15	15	20		50/225	

Hammer No.:	JB14	**Remarks**
Energy Ratio, Er (%):	63	

-/- Blows/penetration (mm) after seating
-*/- Total blows/penetration (mm)
SWP Penetration under own weight (mm)

S - SPT with split spoon sampler
C - SPT with cone
L - Split Spoon liner used

Printed: 07/09/2022

AGS

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		10 20 30 40 50
BH01	7.50	3.36	C		4	5	4	6	8	8	26	
BH01	9.00	1.86	C		3	7	9	8	11	14	42	
BH01	10.50	0.36	C		11	14	50				50/40	

Hammer No.:	TEC 130133	**Remarks**
Energy Ratio, Er (%):	71	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

Printed: 07/09/2022

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		10 20 30 40 50
BH04A	1.20	9.66	C		8	12	24	26			50/115	
BH04A	2.00	8.86	C		9	16	19	31			50/145	
BH04A	3.00	7.86	C		10	8	7	6	7	7	27	
BH04A	4.00	6.86	S		9	12	14	16	17	3	50/237	

Hammer No.:	SAM1
Energy Ratio, Er (%):	75

Remarks

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

Printed: 07/09/2022

AGS

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH07	1.20	11.48	C		5	6	7	8	8	9	32	
BH07	2.00	10.68	C		6	7	7	9	9	9	34	
BH07	3.00	9.68	C		8	10	12	16	14	8	50/265	
BH07	4.00	8.68	C		7	9	9	8	9	10	36	
BH07	5.00	7.68	S		7	7	8	8	9	8	33	
BH07	6.00	6.68	S		9	16	15	16	16	3	50/240	

Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

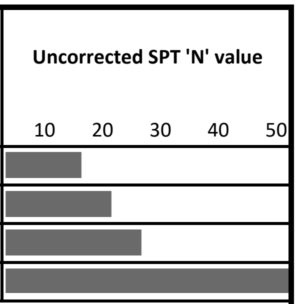
-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

Printed: 07/09/2022

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**	
BH10	1.20	9.80	C		2	3	4	3	4	4	15
BH10	2.00	9.00	C		3	5	4	5	5	5	19
BH10	3.00	8.00	C		3	5	5	6	7	7	25
BH10	6.20	4.80	C		9	16	16	15	19		50/225



Hammer No.:	SAM1
Energy Ratio, Er (%):	75

Remarks

-/-	Blows/penetration (mm) after seating	S - SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C - SPT with cone
SWP	Penetration under own weight (mm)	L - Split Spoon liner used

Printed: 07/09/2022

FIELDWORK RESULTS - *SPT Results Summary*

Project Newport Quinn Phase 2

Engineer Pinnacle Consulting Engineers Limited

Project No. PN224395

Client Pinnacle Consulting Engineers Limited

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH14A	1.20	9.71	S		4	4	10	10	10	10	40	
BH14A	2.00	8.91	S		2	3	25	25			50/150	
BH14A	3.00	7.91	S		3	3	4	5	6	6	21	
BH14A	4.00	6.91	S		2	3	3	4	4	4	15	
BH14A	5.00	5.91	S		2	4	5	5	10	10	30	
BH14A	6.00	4.91	S		5	7	7	7	16	20	50/230	

Hammer No.:	JB14
Energy Ratio, Er (%):	63

Remarks

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

Printed: 07/09/2022

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value** 10 20 30 40 50
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		
BH17A	1.20	9.84	C		3	3	4	4	3	4	15	
BH17A	2.00	9.04	C		3	4	5	4	5	5	19	
BH17A	3.00	8.04	C		4	6	6	7	7	6	26	
BH17A	4.00	7.04	S		7	7	6	8	7	7	28	
BH17A	5.00	6.04	C		8	10	10	10	12	13	45	
BH17A	5.60	5.44	C		7	9	8	12	14	16	50	

Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - SPT with split spoon sampler

C - SPT with cone

L - Split Spoon liner used

Printed: 07/09/2022

AGS

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project Newport Quinn Phase 2
Engineer Pinnacle Consulting Engineers Limited
Project No. PN224395

Client Pinnacle Consulting Engineers Limited

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH23	1.20	10.71	C		1	1	2	1	2	2	7	
BH23	2.00	9.91	C		2	4	4	5	7	5	21	
BH23	3.00	8.91	C		3	5	7	7	6	7	27	
BH23	4.00	7.91	C		4	5	6	5	6	6	23	
BH23	5.00	6.91	S		7	8	9	9	9	10	37	
BH23	6.00	5.91	S		7	9	9	10	10	10	39	

Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

GEOTECHNICS
geotechnical and geoenvironmental specialists

Printed: 07/09/2022

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		10 20 30 40 50
BH23	9.00	2.91	C		12	13	18	17	15		50/255	
BH23	12.00	-0.09	C		7	13	21	29			50/285	
BH23	19.50	-7.59	C		3	11	27	23			50/270	

Hammer No.:	TEC 130133	**Remarks**
Energy Ratio, Er (%):	71	

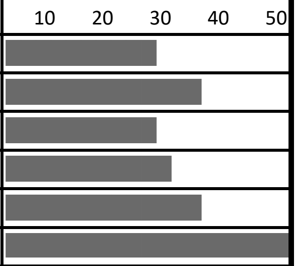
-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

Printed: 07/09/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		
BH27	1.20	8.98	C		5	6	6	7	7	8	28	
BH27	2.00	8.18	C		7	8	8	9	9	10	36	
BH27	3.00	7.18	C		5	7	6	7	6	7	26	
BH27	4.00	6.18	S		6	6	7	7	8	7	29	
BH27	5.00	5.18	S		7	7	8	9	9	9	35	
BH27	5.50	4.68	C		9	10	12	13	14	11	50/260	

Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

GEOTECHNICS
geotechnical and geoenvironmental specialists

Printed: 07/09/2022

FIELDWORK RESULTS - *SPT Results Summary*

Project Newport Quinn Phase 2

Engineer Pinnacle Consulting Engineers Limited

Project No. PN224395

Client Pinnacle Consulting Engineers Limited

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH27	8.60	1.58	C		6	13	22	28			50/145	

Hammer No.: TEC 130133

Energy Ratio, Er (%): 71

Remarks

-/-	Blows/penetration (mm) after seating
-*/-	Total blows/penetration (mm)
SWP	Penetration under own weight (mm)

S - SPT with split spoon sampler

C - SPT with cone

L - Split Spoon liner used

Printed: 07/09/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH28	1.20	9.63	C		25		50				50/30	
BH28	2.00	8.83	C		6	19	36	14			50/100	
BH28	3.00	7.83	C		10	12	31	19			50/115	
BH28	4.00	6.83	C		7	8	9	10	10	9	38	
BH28	4.50	6.33	C		25		50				50/70	

Hammer No.:	SAM1	**Remarks**
Energy Ratio, Er (%):	75	

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - SPT with split spoon sampler

C - SPT with cone

L - Split Spoon liner used

Printed: 07/09/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		10 20 30 40 50
BH28	7.50	3.33	C			8	21	24	5		50/225	

Hammer No.:	TEC 130133	**Remarks**
Energy Ratio, Er (%):	71	

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - SPT with split spoon sampler

C - SPT with cone

L - Split Spoon liner used

GEOTECHNICS
geotechnical and geoenvironmental specialists

Printed: 07/09/2022

AGS

FIELDWORK RESULTS - *SPT Results Summary*

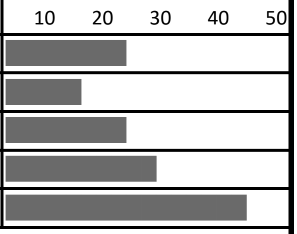
Project Newport Quinn Phase 2

Engineer Pinnacle Consulting Engineers Limited

Project No. PN224395

Client Pinnacle Consulting Engineers Limited

Hole	Depth (m bgl)	Depth (m OD)	SPT Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N' value
					0 - 75 (mm)	75 - 150 (mm)	0 - 75 (mm)	75 - 150 (mm)	150 - 225 (mm)	225 - 300 (mm)		10 20 30 40 50
BH30	1.20	9.79	C		2	3	5	5	6	5	21	
BH30	2.00	8.99	C		2	3	3	4	5	3	15	
BH30	3.00	7.99	C		3	4	6	6	5	5	22	
BH30	4.00	6.99	C		4	6	6	7	7	7	27	
BH30	5.00	5.99	S		7	9	10	10	11	12	43	



Hammer No.:	SAM1
Energy Ratio, Er (%):	75

Remarks

-/-	Blows/penetration (mm) after seating	S -	SPT with split spoon sampler
-*/-	Total blows/penetration (mm)	C -	SPT with cone
SWP	Penetration under own weight (mm)	L -	Split Spoon liner used

GEOTECHNICS
geotechnical and geoenvironmental specialists

Printed: 07/09/2022

AGS

FIELDWORK RESULTS - *SPT Results Summary*

Project	Newport Quinn Phase 2	**Engineer**	Pinnacle Consulting Engineers Limited	**Project No.**	PN224395
Client	Pinnacle Consulting Engineers Limited				

Hole	**Depth (m bgl)**	**Depth (m OD)**	**SPT Type**	**SWP (mm)**	**Seating Drive**		**Test Drive**				**SPT 'N' Value**	**Uncorrected SPT 'N' value**
					0 - 75 (mm)	**75 - 150 (mm)**	**0 - 75 (mm)**	**75 - 150 (mm)**	**150 - 225 (mm)**	**225 - 300 (mm)**		10 20 30 40 50
BH30	5.30	5.69	S		9	12	14	15	16	16	61	▬

Hammer No.:	TEC 130133	**Remarks**
Energy Ratio, Er (%):	71	

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - SPT with split spoon sampler

C - SPT with cone

L - Split Spoon liner used

Printed: 07/09/2022

Allied Exploration & Geotechnics Ltd.

Unit 25 Stella Gill Industrial Esatate
Pelton Fell
Chester-le-Street
DH2 2RG

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

SPT Hammer Ref:	TEC 130133
Test Date:	17/12/2020
Report Date:	17/12/2020
File Name:	1904052.spt
Test Operator:	BP

Instrumented Rod Data

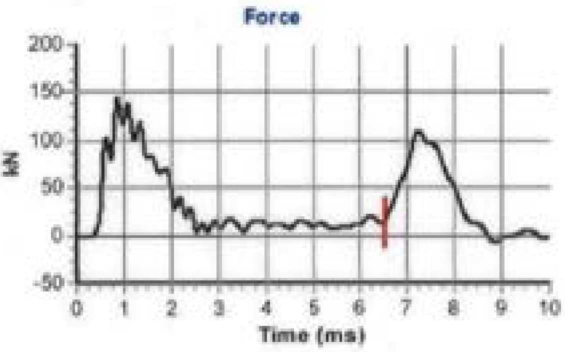
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.5
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	5991
Accelerometer No.2:	5990

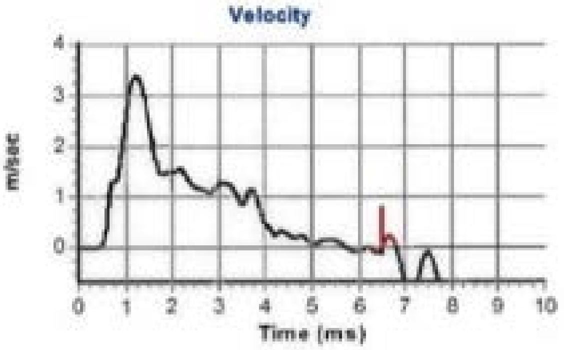
SPT Hammer Information

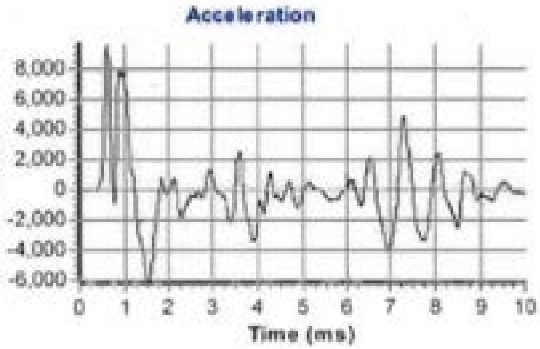
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	14.1

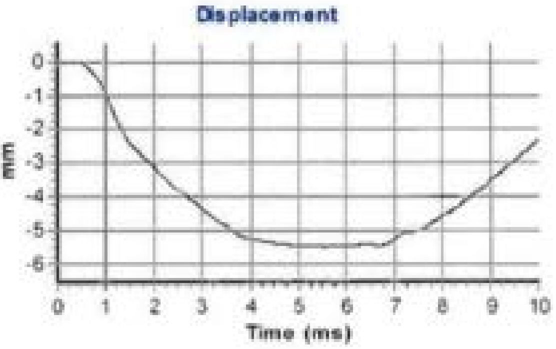
Comments / Location

Mass and drop supplied by client









Calculations

Area of Rod A (mm2):	970
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	334
Energy Ratio E_r (%):	**71**

Signed: Brian Proctor
Title: Technician

The recommended calibration interval is 12 months

APPENDIX 5

Rotary Core Photographs


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport Quinn
PROJECT NO.
PN224395
HOLE ID
BH01
DATE
28/9/22
BOX NO.
1
NOTES
6.00-10.50
6.0
7.5
7.5
9.0
9.0
10.5

BH01 - Box 1


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport Quinn
PROJECT NO.
PN224395
HOLE ID
BH01
DATE
18/9/22
BOX NO.
2
NOTES
10.50 - 13.50
10.5
12.0
13.5

BH01 - Box 2

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH01 - Box 3

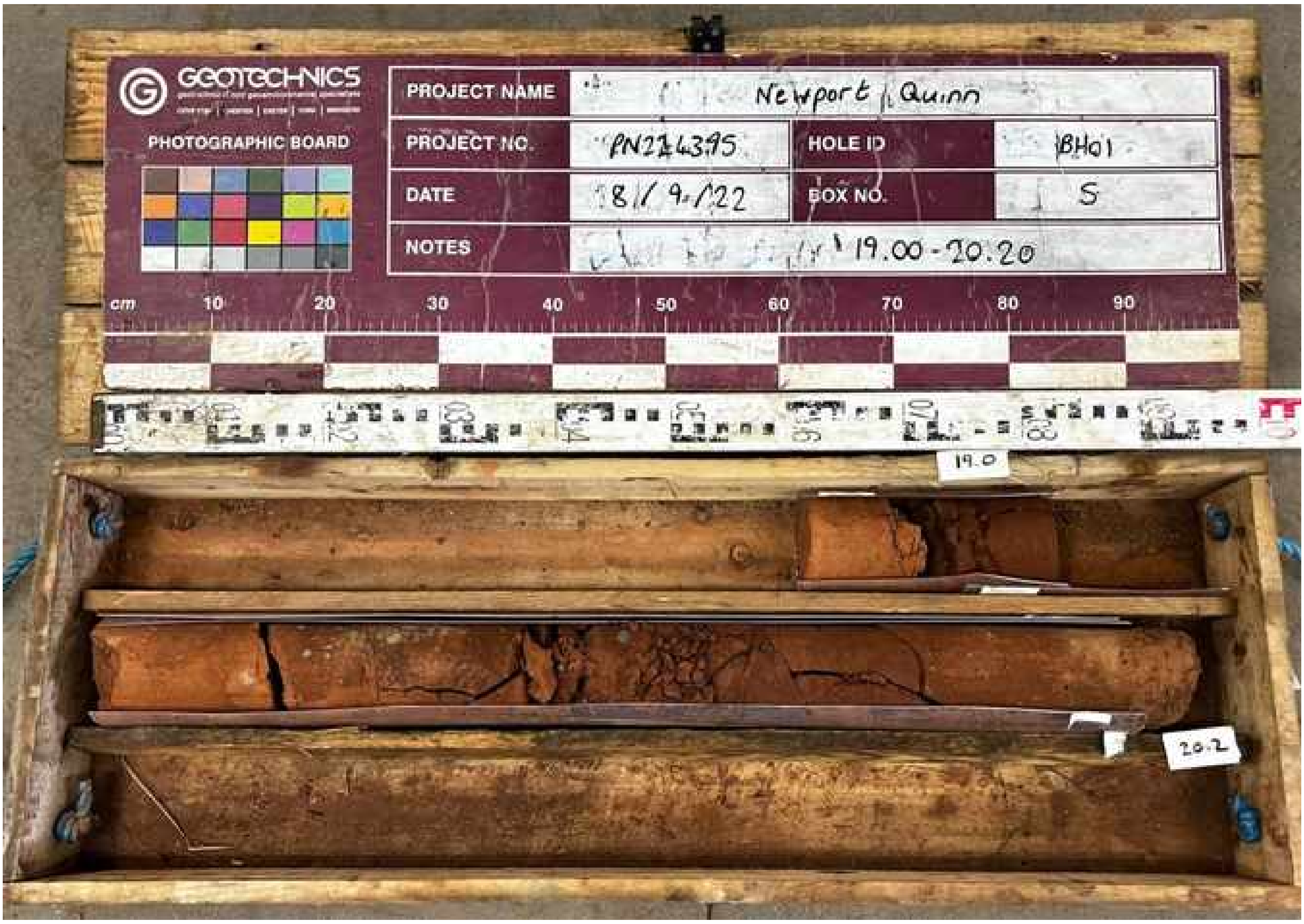
Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH01 - Box 4

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales



BH01 - Box 5

PROJECT NAME Newport

PROJECT NO. PN224395

HOLE ID BH04 (A)

DATE Aug 2022

BOX NO. 1

NOTES 4.01 - 7.50 mbgl

BH04A - Box 1

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH04A - Box 2

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales


PROJECT NAME: Newport
PROJECT NO.: PN224395
HOLE ID: BH04 (A)
DATE: Aug 2022
BOX NO.: 3
NOTES: 10.5–13.5 mbgl

BH04A - Box 3

PROJECT NAME: Newport

PROJECT NO.: PN224395

HOLE ID: BH04 (A)

DATE: Aug 2022

BOX NO.: 4

NOTES: 13.5-16.5mbgl

BH04A - Box 4


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport
PROJECT NO.
PN224395
HOLE ID
BH04 (A)
DATE
Aug 2022
BOX NO.
5
NOTES
16.5-19.5 mbgl
cm
10
20
30
40
50
60
70
80
90
16.5
19.5

BH04A - Box 5

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH04A - Box 6


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport
PROJECT NO.
PN224395
HOLE ID
BH07
DATE
Aug 2022
BOX NO.
1
NOTES
6.0 – 7.50 mbgl
cm
10
20
30
40
50
60
70
80
90
6.0
7.5

BH07 - Box 1

PHOTOGRAPHS

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH07 - Box 2


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport
PROJECT NO.
PN224395
HOLE ID
BH07
DATE
Aug 2022
BOX NO.
3
NOTES
10.5-13.0 mbgl
cm
10
20
30
40
50
60
70
80
90
10.5
12.0
13.0

BH07 - Box 3


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport
PROJECT NO.
PN224395
HOLE ID
BH07
DATE
Aug 2022
BOX NO.
4
NOTES
13.0-16.0 mbgl
cm
10
20
30
40
50
60
70
80
90

BH07 - Box 4

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH07 - Box 5

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH07 - Box 6

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH10 - Box 1

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH10 - Box 2

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH10 - Box 3


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME Newport
PROJECT NO. PN224395
HOLE ID BH10
DATE Aug 2022
BOX NO. 4
NOTES 14.70 - 17.70 mbgl
cm 10 20 30 40 50 60 70 80 90

BH10 - Box 4

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH10 - Box 5

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH14A - Box 1


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport
PROJECT NO.
PN224395
HOLE ID
BH14(A)
DATE
Aug 2022
BOX NO.
2
NOTES
9.0-12.0mbgl
cm
10
20
30
40
50
60
70
80
90
9.0
10.5
12.0

BH14A - Box 2


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport
PROJECT NO.
PN224395
HOLE ID
BH14(A)
DATE
Aug 2022
BOX NO.
3
NOTES
12.0-15.0mbgl
cm
10
20
30
40
50
60
70
80
90
12.0
13.5
15.0

BH14A - Box 3

GEOTECHNICS

PHOTOGRAPHIC BOARD

PROJECT NAME: Newport

PROJECT NO.: PN224395

HOLE ID: BH14(A)

DATE: Aug 2022

BOX NO.: 4

NOTES: 15.0 - 18.0mbgl

BH14A - Box 4

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH14A - Box 5

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH17A - Box 1

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH17A - Box 2


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport
PROJECT NO.
PN224395
HOLE ID
BH17 (A)
DATE
Aug 2022
BOX NO.
3
NOTES
10.5-13.50 mbgl
cm
10
20
30
40
50
60
70
80
90
10.5
12.0
13.5

BH17A - Box 3

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

GEOTECHNICS

PHOTOGRAPHIC BOARD

PROJECT NAME Newport

PROJECT NO. PN224395

HOLE ID BH~~17~~ (A)

DATE Aug 2022

BOX NO. 4

NOTES 13.5–16.50 mbgl

BH17A - Box 4


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport
PROJECT NO.
PN224395
HOLE ID
BH17 (A)
DATE
Aug 2022
BOX NO.
5
NOTES
16.5-18.5 mbgl
16.5
18.0
18.5

BH17A - Box 5

PROJECT NAME Newport
PROJECT NO. PN224395
HOLE ID BH17(A)
DATE Aug 2022
BOX NO. 6
NOTES 18.5-20.0 mbgl

BH17A - Box 6

PHOTOGRAPHS

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH23 - Box 1


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport Quinn
PROJECT NO.
PN224395
HOLE ID
BH23
DATE
Aug 2022
BOX NO.
2
NOTES
9.00- 12.00 mbgl
cm
10
20
30
40
50
60
70
80
90
9.00
10.50
10.50

BH23- Box 2

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH23- Box 3

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH23- Box 4


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME Newport
PROJECT NO. PN224395
HOLE ID BH27
DATE Aug 22
BOX NO. 1
NOTES 5.60-10.10 mbgl
cm 10 20 30 40 50 60 70 80 90
5.6
7.1
8.6
10.10

BH27 - Box 1

PHOTOGRAPHS

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

PROJECT NAME Newport
PROJECT NO. PN224395
HOLE ID BH27
DATE Aug 22
BOX NO. 2
NOTES 10.10-13.1 mbgl

BH27 - Box 2

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH27 - Box 3

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH27 - Box 4

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH27 - Box 5


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport
PROJECT NO.
PN224395
HOLE ID
BH28
DATE
Aug 22
BOX NO.
1
NOTES
4.5 - 9.0m
cm
10
20
30
40
50
60
70
80
90
4.5
6.0
7.5
7.5
9.0

BH28 - Box 1


GEOTECHNICS
PHOTOGRAPHIC BOARD
PROJECT NAME
Newport
PROJECT NO.
PN224395
HOLE ID
BH28
DATE
Aug 22
BOX NO.
3
NOTES
12.00-15.00mbgl
cm
10
20
30
40
50
60
70
80
90
12.00
13.50
13.50
15.00

BH28 - Box 2

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH28 - Box 3

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH28 - Box 4

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH28 - Box 5

PROJECT NAME Newport

PROJECT NO. PN224395

HOLE ID BH30

DATE Aug 22

BOX NO. 2

NOTES 7.5-10.5 mbgl

BH30 - Box 1

PROJECT NAME Newport

PROJECT NO. PN224395

HOLE ID BH30

DATE Aug 22

BOX NO. 3

NOTES 10.5-13.5 mbgl

BH30 - Box 2

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH30 - Box 3

Project Number : PN224395

Project : Former Quinn Radiator Factory Site, Newport, Wales

BH30 - Box 4

APPENDIX 6

In-Situ Plate Load Test Results

Form INS016 Rev 1
Sheet 1 - Test Results

INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT01
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	02 August 2022
		Test No	1

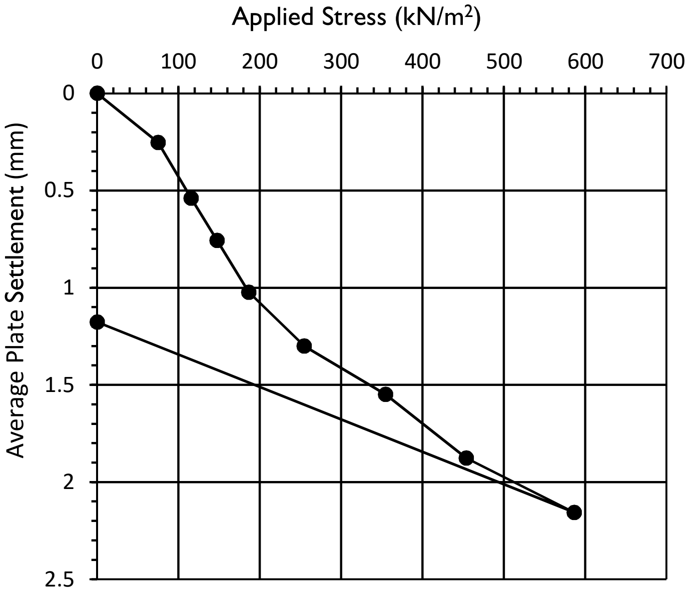
Test carried out in accordance with BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.23	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

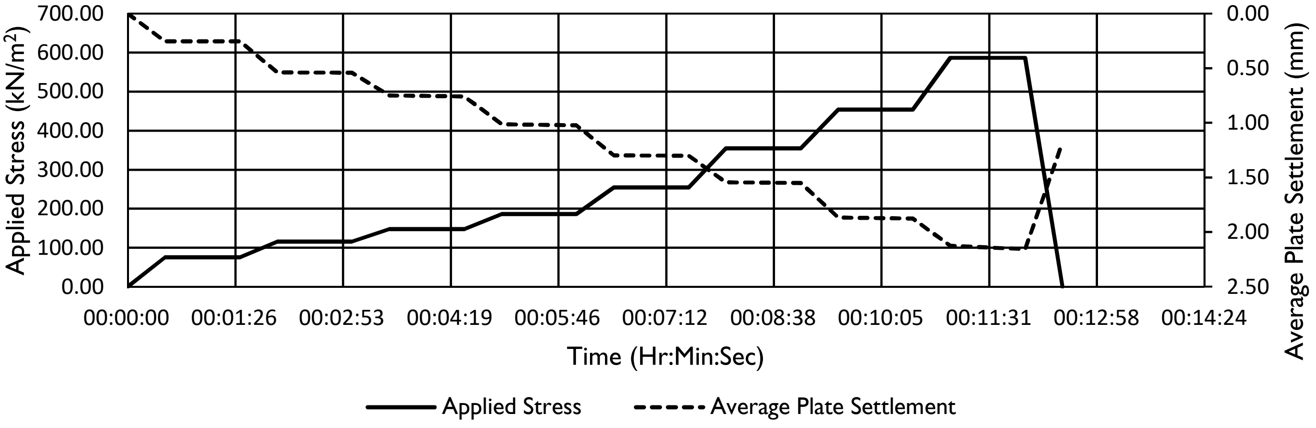
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
5.30	74.98	0.25
8.16	115.44	0.54
10.44	147.70	0.76
13.18	186.46	1.02
18.01	254.79	1.30
25.08	354.81	1.55
32.09	453.98	1.88
41.48	586.82	2.16
0.00	0.00	1.18

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	254.8 kN/m^2
Modulus of Subgrade Reaction	90.0 MN/m^2/m
Equivalent CBR Value	23.5 %

Remarks

GEOTECHNICS
geotechnical and geoenvironmental specialists

Form INS016 Rev 1
Sheet 1 - Test Results

INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT02
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	03 August 2022
		Test No	1

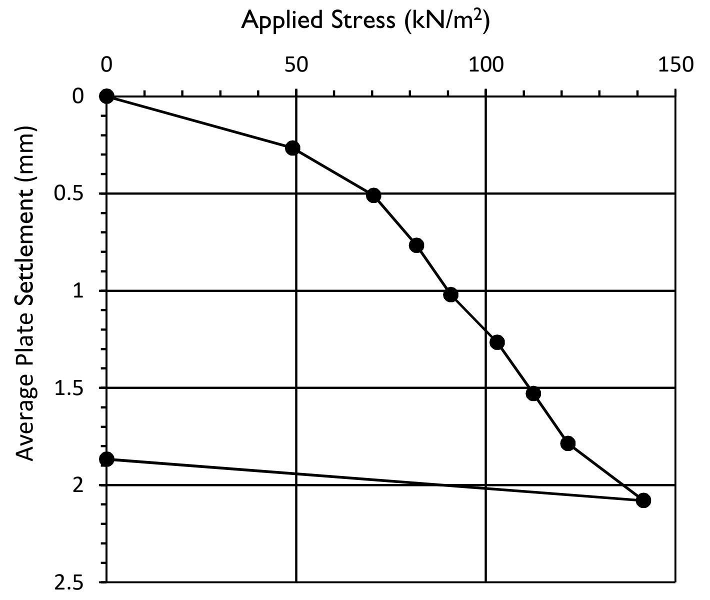
Test carried out in accordance with BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.44	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

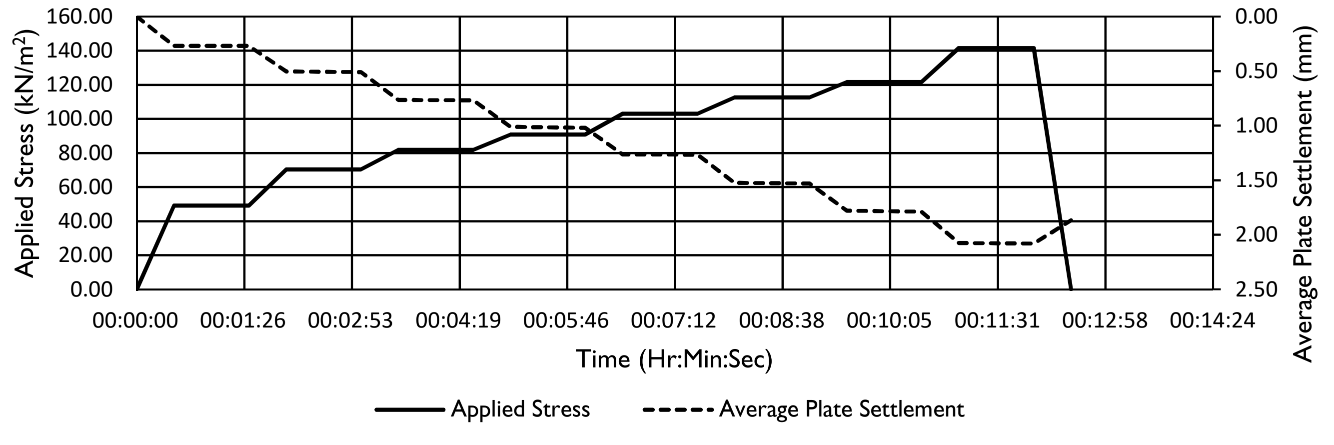
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
3.47	49.09	0.27
4.98	70.45	0.51
5.78	81.77	0.77
6.42	90.82	1.02
7.28	102.99	1.27
7.96	112.61	1.53
8.60	121.67	1.79
10.01	141.61	2.08
0.00	0.00	1.87

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	103.0 kN/m^2
Modulus of Subgrade Reaction	36.4 MN/m^2/m
Equivalent CBR Value	4.9 %

Remarks

GEOTECHNICS
geotechnical and geoenvironmental specialists

INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT03
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	03 August 2022
		Test No	1

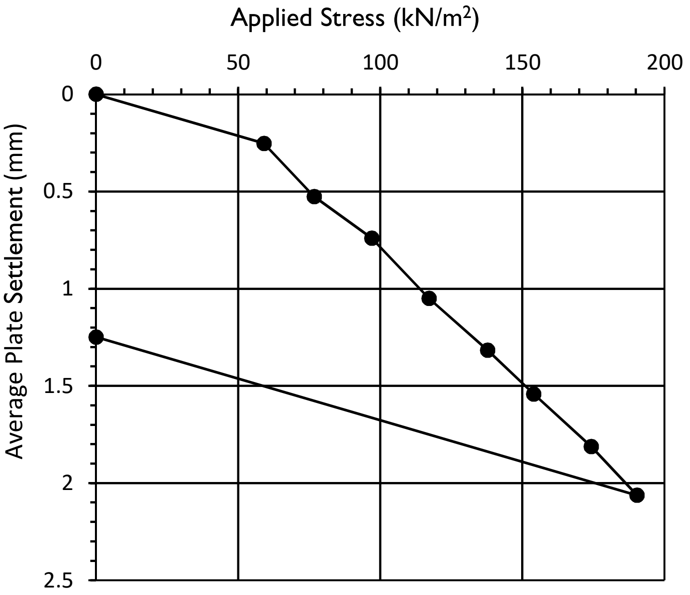
Test carried out in accordance with
BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.23	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

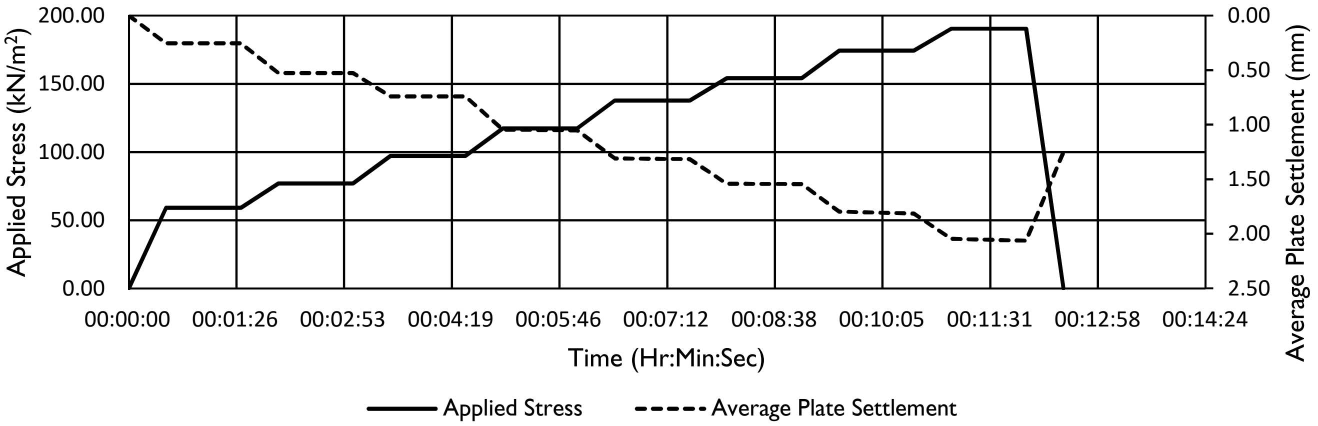
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
4.18	59.13	0.25
5.43	76.82	0.53
6.86	97.05	0.74
8.29	117.28	1.05
9.74	137.79	1.32
10.89	154.06	1.54
12.32	174.29	1.81
13.46	190.42	2.06
0.00	0.00	1.25

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	137.8 kN/m^2
Modulus of Subgrade Reaction	48.7 MN/m^2/m
Equivalent CBR Value	8.1 %

Remarks

Form INS016 Rev 1

INSITU TESTING - *Plate Load Test*

Sheet 1 - Test Results

Project	Newport Quinn - Phase 2	Test Location	PLT04
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	04 August 2022
		Test No	1

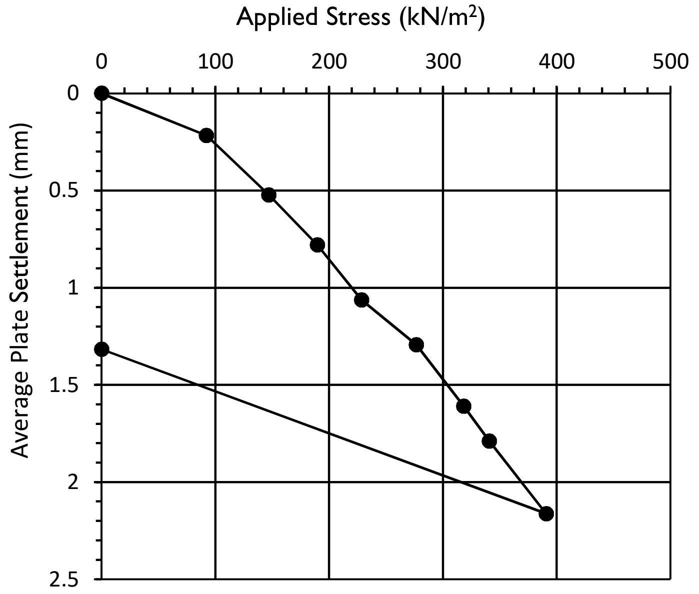
Test carried out in accordance with
BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.22	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

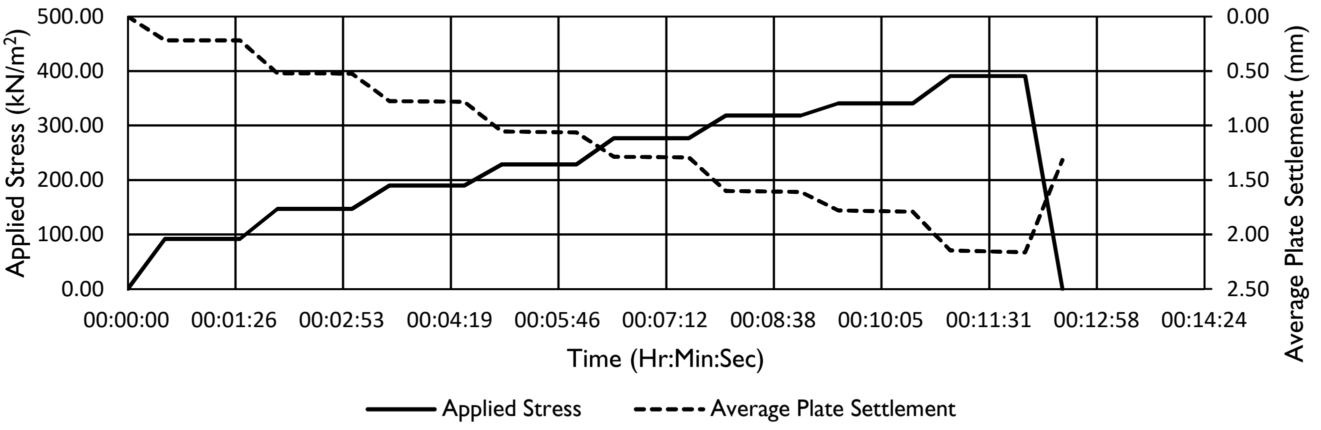
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
6.52	92.24	0.22
10.39	146.99	0.52
13.41	189.71	0.78
16.17	228.76	1.06
19.56	276.72	1.29
22.51	318.45	1.61
24.10	340.95	1.79
27.63	390.88	2.16
0.00	0.00	1.32

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	276.7 kN/m^2
Modulus of Subgrade Reaction	97.8 MN/m^2/m
Equivalent CBR Value	27.1 %

Remarks

GEOTECHNICS
geotechnical and geoenvironmental specialists

Form INS016 Rev 1
Sheet 1 - Test Results

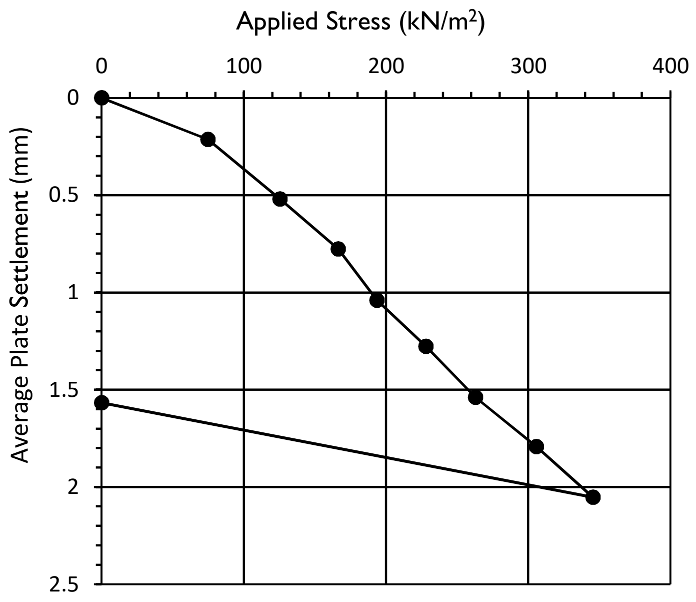
INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT05
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	04 August 2022
		Test No	1

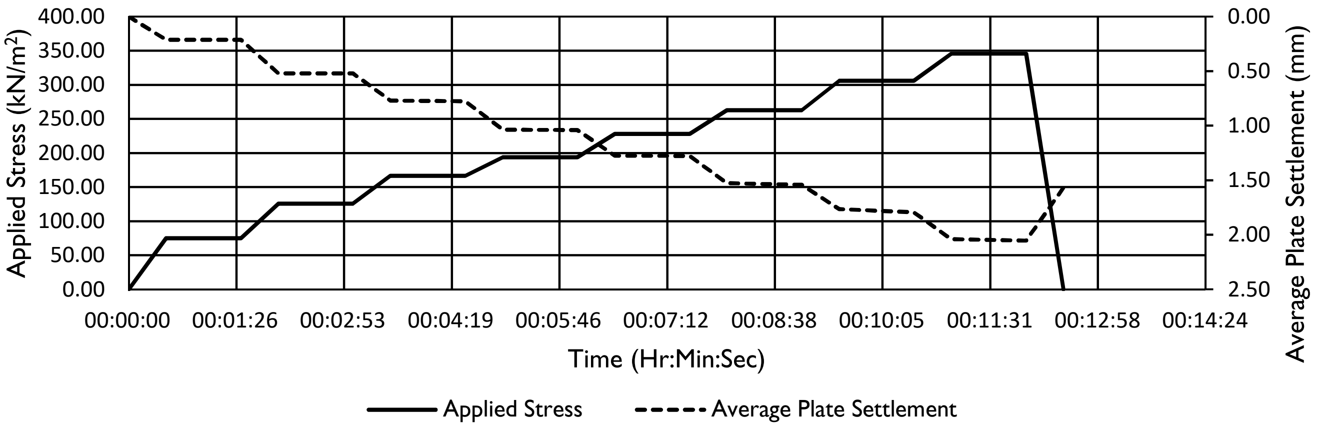
Test carried out in accordance with BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.19	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)	Applied Stress vs Average Plate Settlement
0.00	0.00	0.00	
5.29	74.84	0.21	
8.87	125.48	0.52	
11.76	166.37	0.78	
13.69	193.67	1.04	
16.13	228.19	1.28	
18.59	262.99	1.54	
21.61	305.72	1.79	
24.43	345.61	2.05	
0.00	0.00	1.57	

Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	228.2	kN/m^2
Modulus of Subgrade Reaction	80.6	MN/m^2/m
Equivalent CBR Value	19.4	%

Remarks

GEOTECHNICS
geotechnical and geoenvironmental specialists

Form INS016 Rev 1

INSITU TESTING - *Plate Load Test*

Sheet 1 - Test Results

Project	Newport Quinn - Phase 2	Test Location	PLT07
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	01 August 2022
		Test No	1

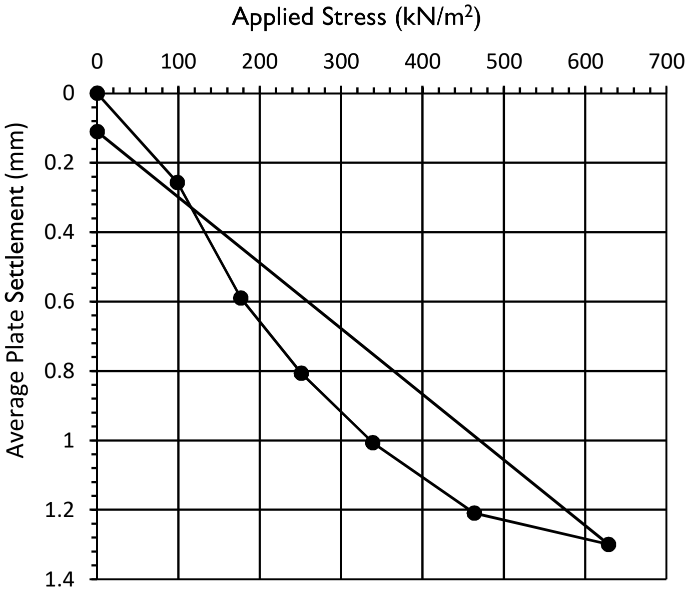
Test carried out in accordance with
BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.20	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

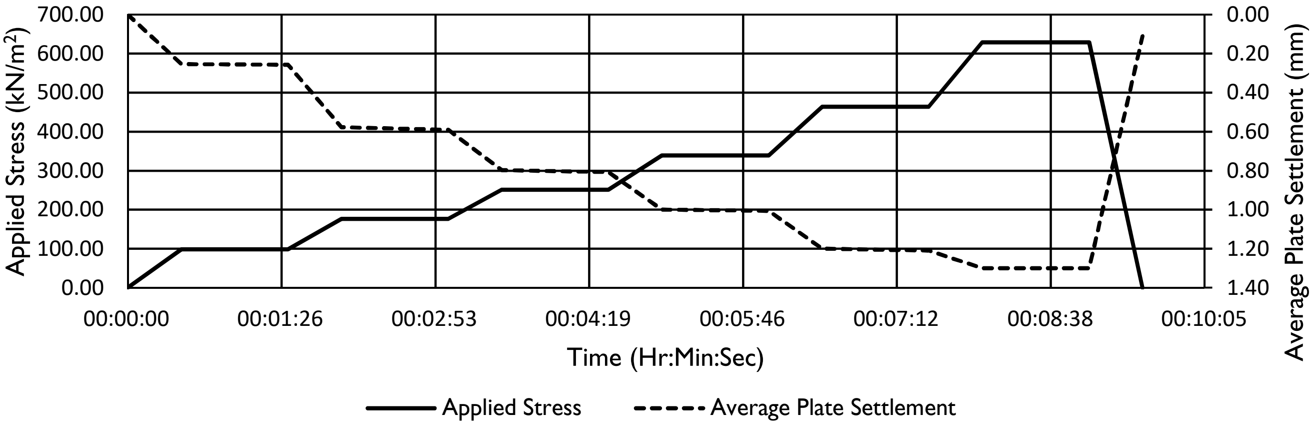
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
6.98	98.75	0.26
12.48	176.56	0.59
17.75	251.11	0.81
23.97	339.11	1.01
32.78	463.74	1.21
44.47	629.12	1.30
0.00	0.00	0.11

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	600.0 kN/m^2
Modulus of Subgrade Reaction	212.0 MN/m^2/m
Equivalent CBR Value	103.7 %

Remarks

GEOTECHNICS
geotechnical and geoenvironmental specialists

Form INS016 Rev 1

INSITU TESTING - *Plate Load Test*

Sheet 1 - Test Results

Project	Newport Quinn - Phase 2	Test Location	PLT08
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	02 August 2022
		Test No	1

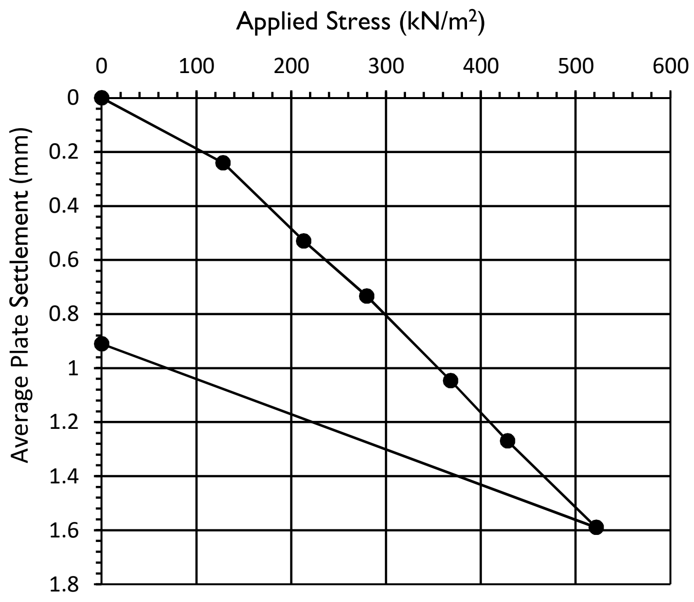
Test carried out in accordance with BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.20	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

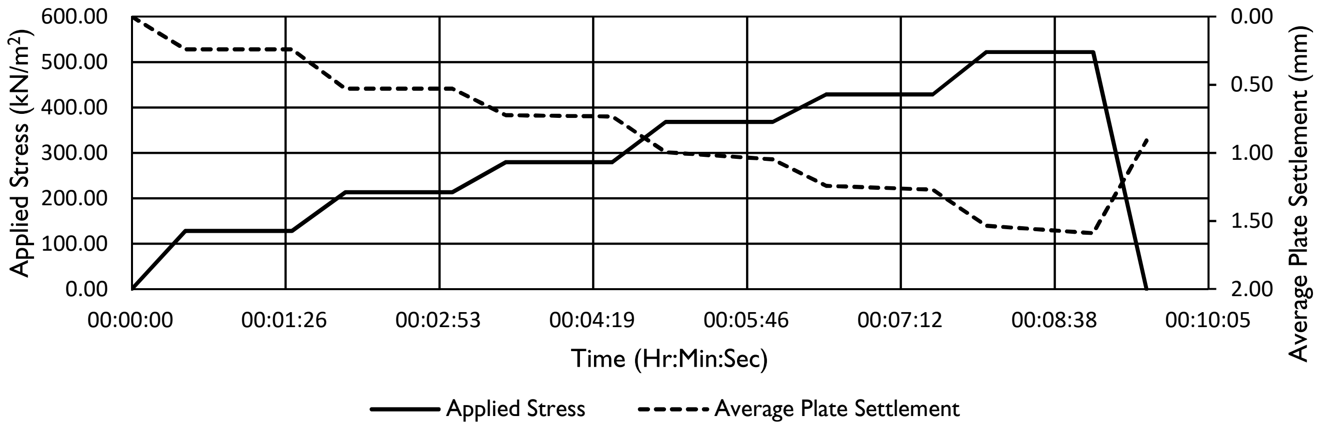
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
9.06	128.17	0.24
15.07	213.20	0.53
19.77	279.69	0.73
26.03	368.25	1.05
30.28	428.37	1.27
36.89	521.89	1.59
0.00	0.00	0.91

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	428.4 kN/m^2
Modulus of Subgrade Reaction	151.4 MN/m^2/m
Equivalent CBR Value	57.9 %

Remarks

GEOTECHNICS
geotechnical and geoenvironmental specialists

INSITU TESTING - *Plate Load Test*

Sheet 1 - Test Results

Project	Newport Quinn - Phase 2	Test Location	PLT09
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	03 August 2022
		Test No	1

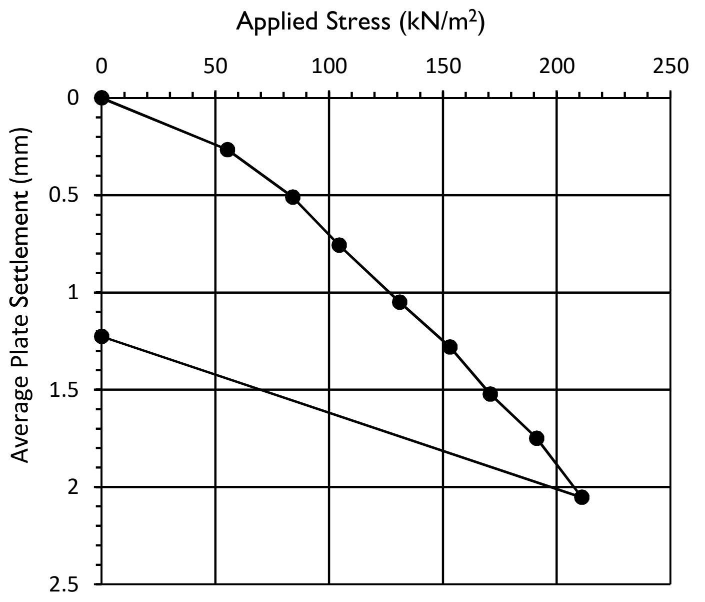
Test carried out in accordance with
BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.24	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

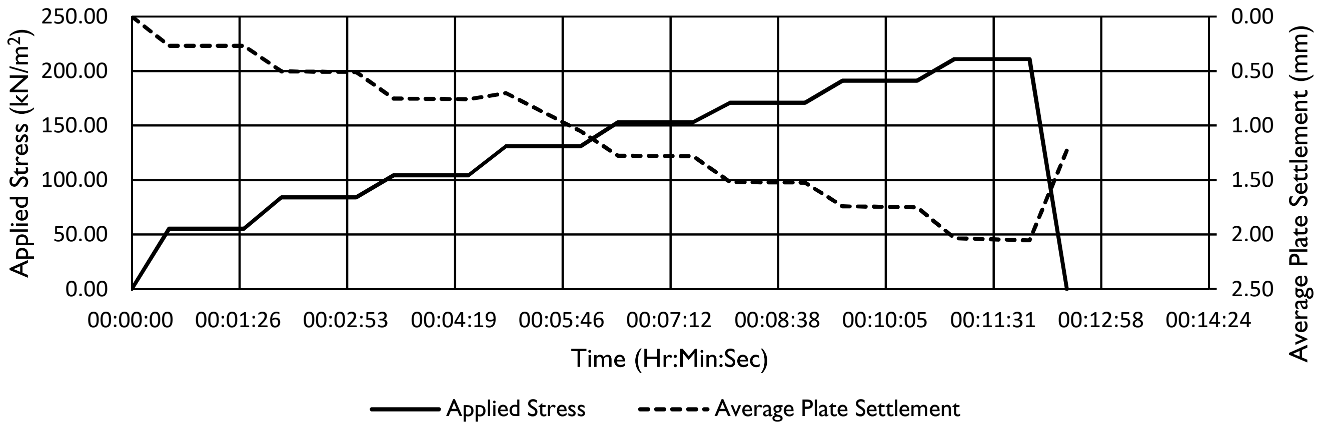
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
3.91	55.32	0.27
5.94	84.03	0.51
7.38	104.41	0.76
9.26	131.00	1.05
10.83	153.21	1.28
12.08	170.90	1.52
13.52	191.27	1.75
14.92	211.07	2.05
0.00	0.00	1.23

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	153.2 kN/m^2
Modulus of Subgrade Reaction	54.1 MN/m^2/m
Equivalent CBR Value	9.7 %

Remarks

GEOTECHNICS
geotechnical and geoenvironmental specialists

INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT10
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	01 August 2022
		Test No	1

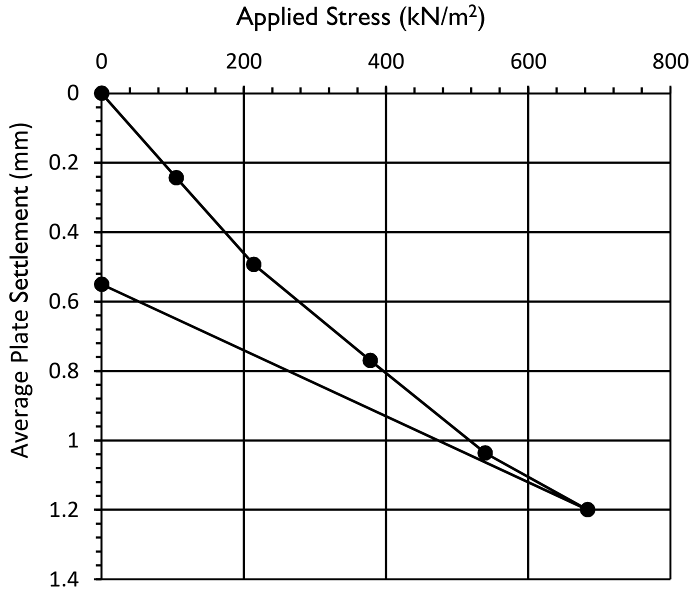
Test carried out in accordance with BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.20	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

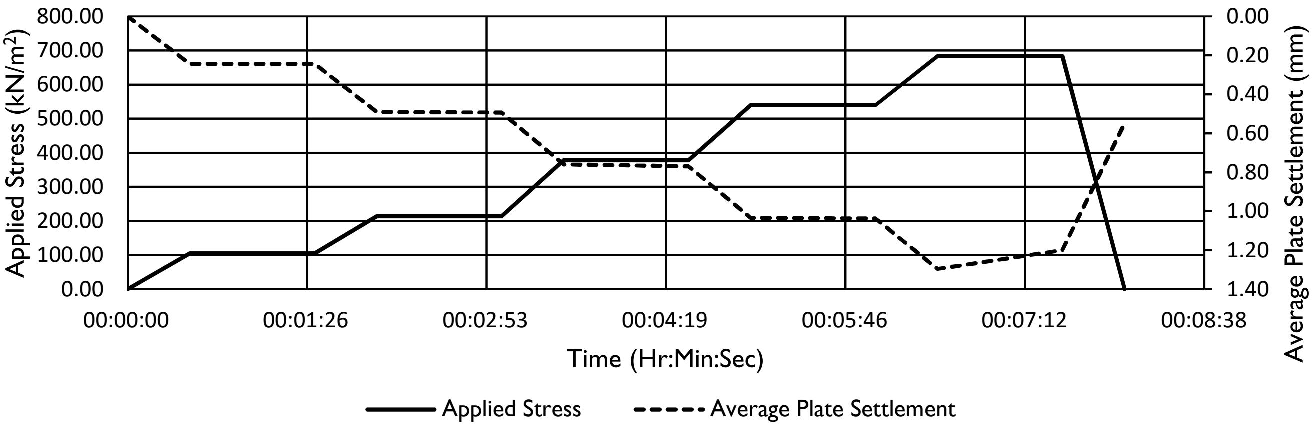
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
7.43	105.11	0.24
15.14	214.19	0.49
26.73	378.15	0.77
38.13	539.43	1.04
48.32	683.59	1.20
0.00	0.00	0.55

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement 683.6 kN/m^2
Modulus of Subgrade Reaction 241.6 MN/m^2/m
Equivalent CBR Value 130.0 %

Remarks

Equivalent CBR Value assumed to be 100%.

Form INS016 Rev 1

Sheet 1 - Test Results

INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT11
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	04 August 2022
		Test No	1

Test carried out in accordance with

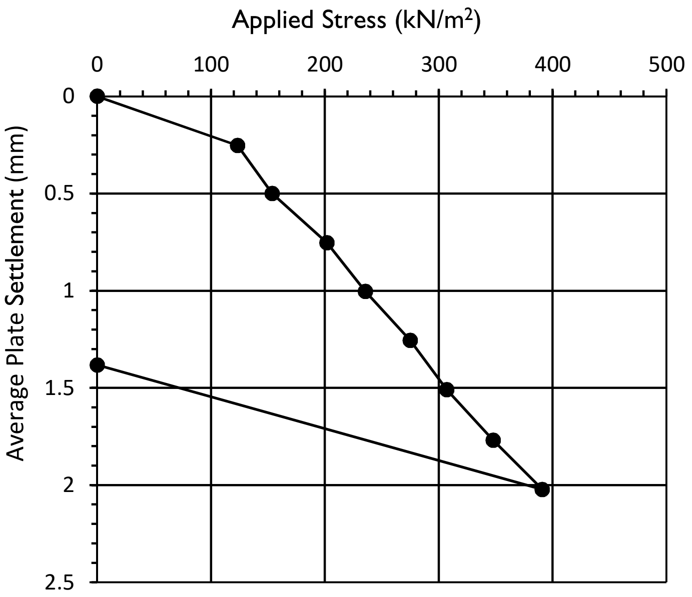
BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.21	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

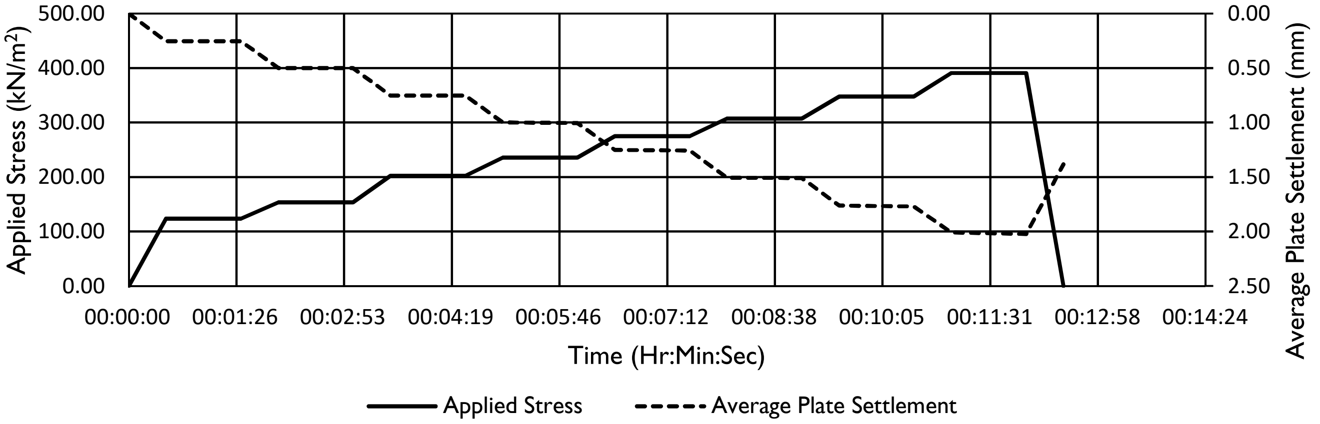
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
8.72	123.36	0.25
10.87	153.78	0.50
14.28	202.02	0.75
16.66	235.69	1.00
19.44	275.02	1.26
21.72	307.28	1.51
24.59	347.88	1.77
27.64	391.03	2.02
0.00	0.00	1.38

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	275.0	kN/m^2
Modulus of Subgrade Reaction	97.2	MN/m^2/m
Equivalent CBR Value	26.8	%

Remarks

GEOTECHNICS
geotechnical and geoenvironmental specialists

Form INS016 Rev 1
Sheet 1 - Test Results

INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT12
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	05 August 2022
		Test No	1

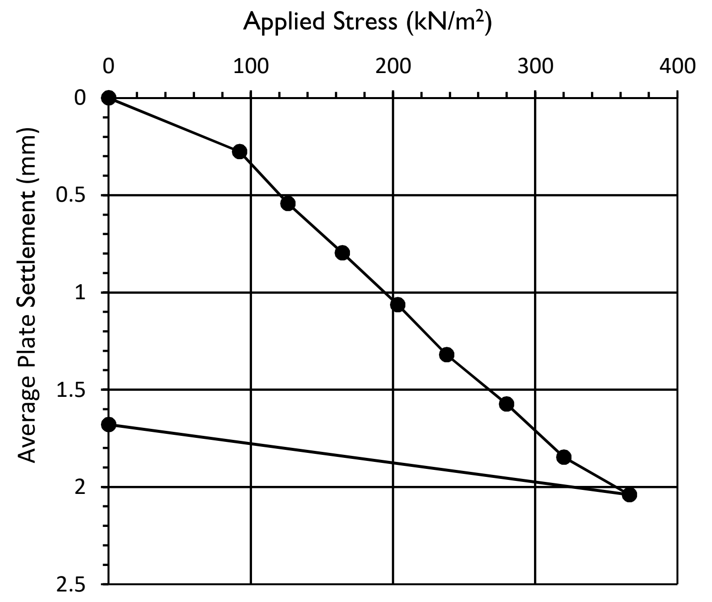
Test carried out in accordance with
BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.15	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

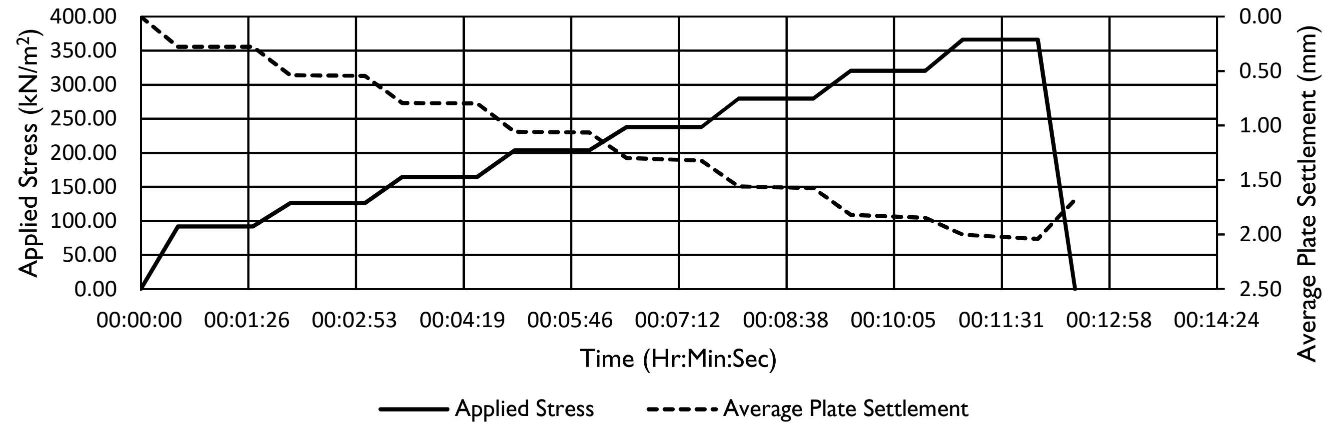
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
6.51	92.10	0.28
8.92	126.19	0.54
11.63	164.53	0.80
14.38	203.44	1.06
16.81	237.81	1.32
19.78	279.83	1.57
22.64	320.29	1.85
25.89	366.27	2.04
0.00	0.00	1.68

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	237.8 kN/m^2
Modulus of Subgrade Reaction	84.0 $MN/m^2/m$
Equivalent CBR Value	20.9 %

Remarks

GEOTECHNICS
geotechnical and geoenvironmental specialists

INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT13
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	04 August 2022
		Test No	1

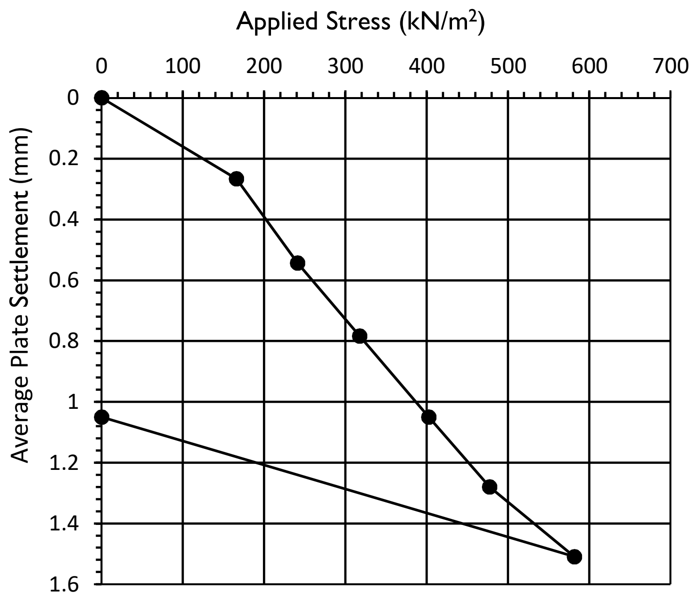
Test carried out in accordance with
BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.45	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

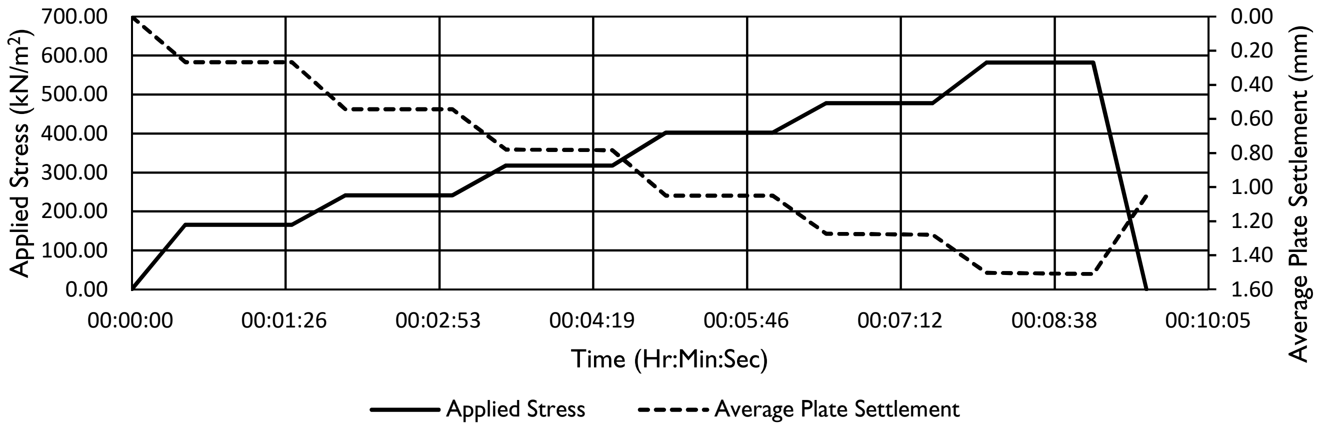
Test Results

Applied Load (kN)	Applied Stress (kN/m²)	Average Plate Settlement (mm)
0.00	0.00	0.00
11.73	165.95	0.27
17.05	241.21	0.54
22.47	317.89	0.78
28.46	402.63	1.05
33.76	477.61	1.28
41.15	582.15	1.51
0.00	0.00	1.05

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	477.6 kN/m²
Modulus of Subgrade Reaction	168.8 MN/m²/m
Equivalent CBR Value	69.9 %

Remarks

INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT14
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	01 August 2022
		Test No	1

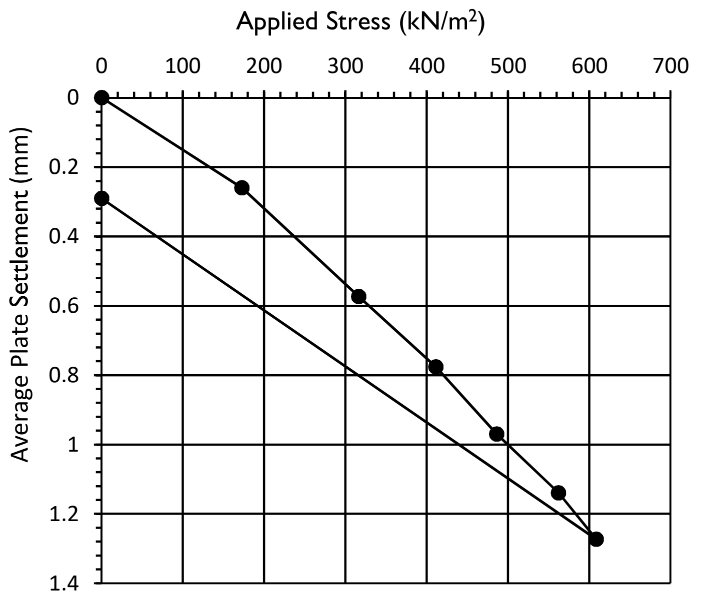
Test carried out in accordance with
BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.20	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

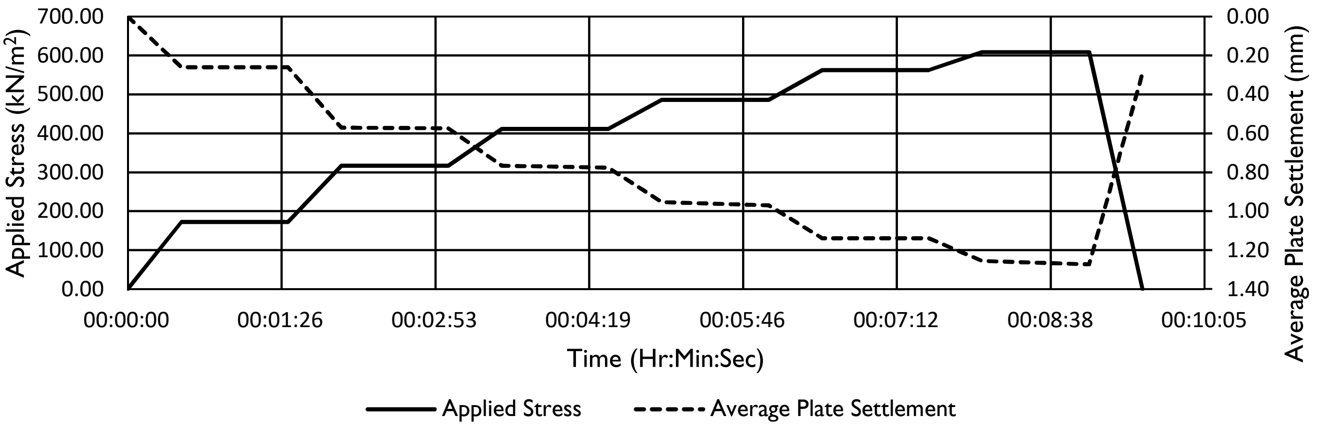
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
12.20	172.59	0.26
22.38	316.61	0.57
29.08	411.40	0.78
34.38	486.38	0.97
39.75	562.35	1.14
43.04	608.89	1.27
0.00	0.00	0.29

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	585.0 kN/m^2
Modulus of Subgrade Reaction	206.7 $MN/m^2/m$
Equivalent CBR Value	99.3 %

Remarks

INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT15
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	02 August 2022
		Test No	1

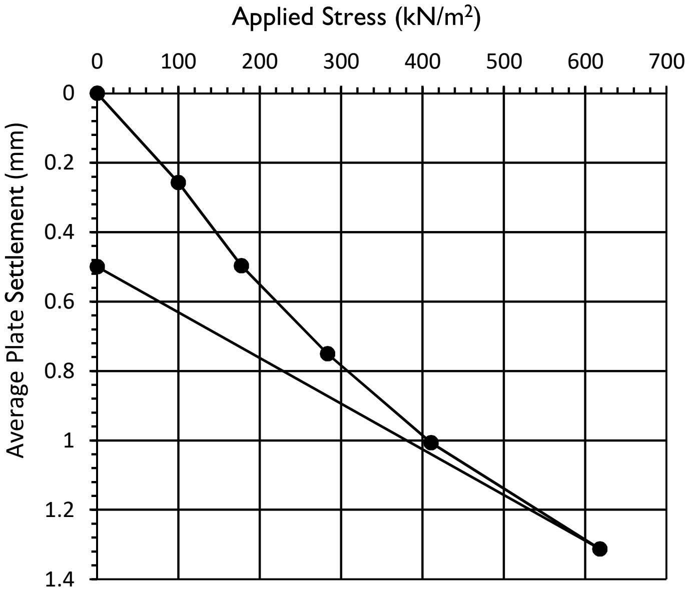
Test carried out in accordance with
BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.20	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

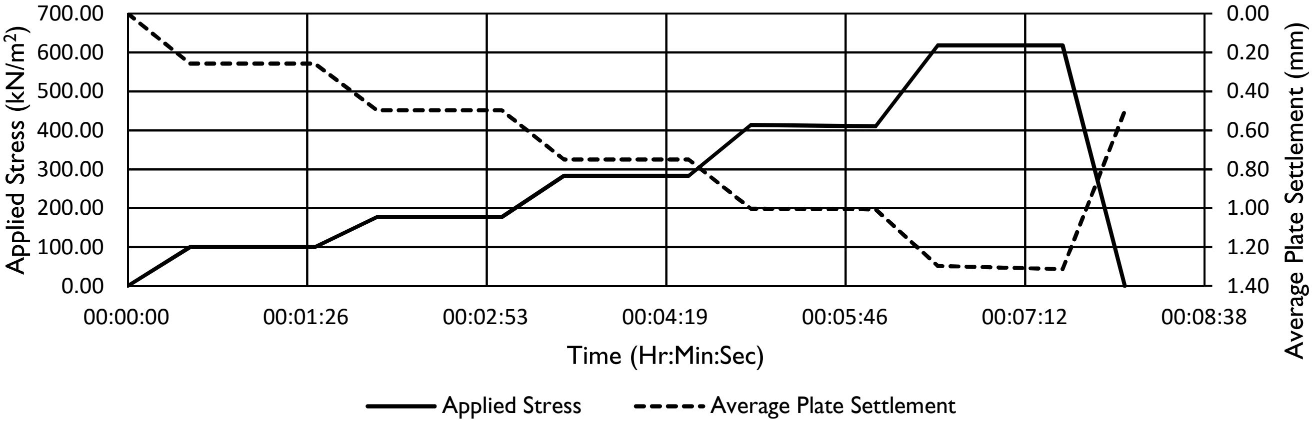
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
7.06	99.88	0.26
12.55	177.55	0.50
20.03	283.37	0.75
29.03	410.69	1.01
43.71	618.37	1.31
0.00	0.00	0.50

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	585.0 kN/m^2
Modulus of Subgrade Reaction	206.7 MN/m^2/m
Equivalent CBR Value	99.3 %

Remarks

INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT16
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	02 August 2022
		Test No	1

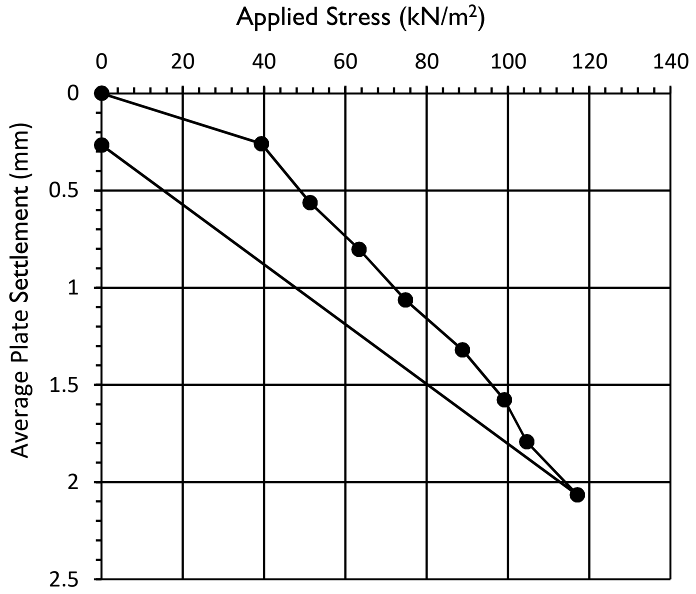
Test carried out in accordance with
BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.20	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

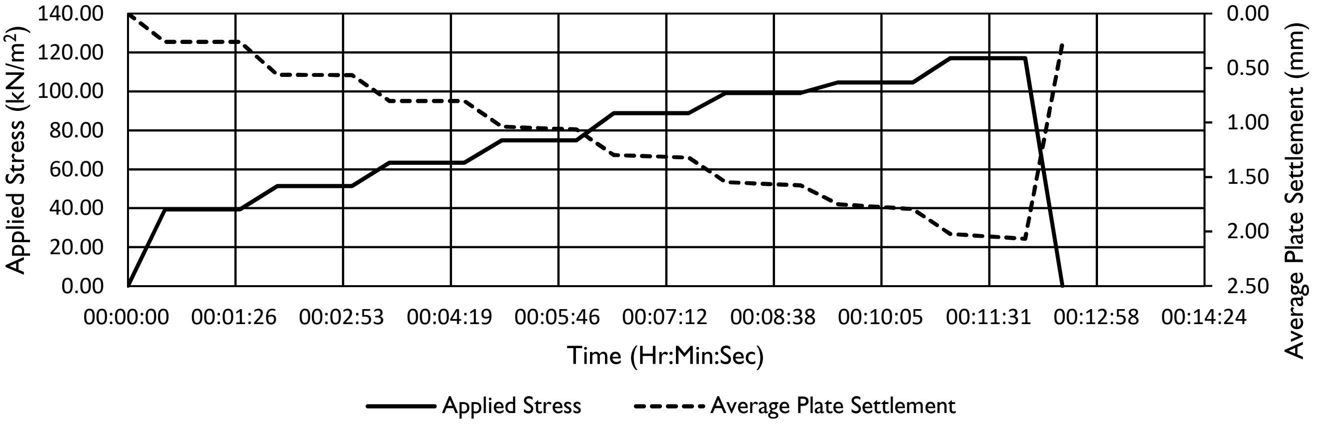
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
2.78	39.33	0.26
3.63	51.35	0.56
4.48	63.38	0.80
5.29	74.84	1.06
6.28	88.84	1.32
7.01	99.17	1.58
7.40	104.69	1.79
8.28	117.14	2.07
0.00	0.00	0.27

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	88.8 kN/m^2
Modulus of Subgrade Reaction	31.4 MN/m^2/m
Equivalent CBR Value	3.8 %

Remarks

INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT17
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	03 August 2022
		Test No	1

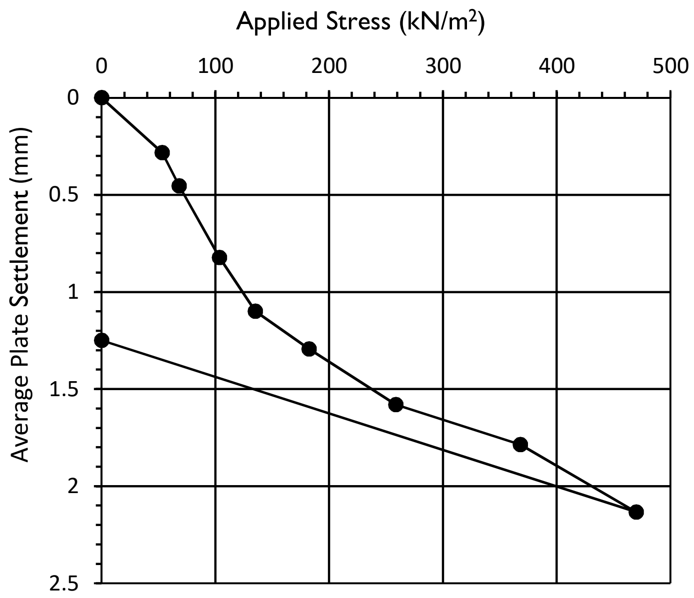
Test carried out in accordance with
BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.45	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

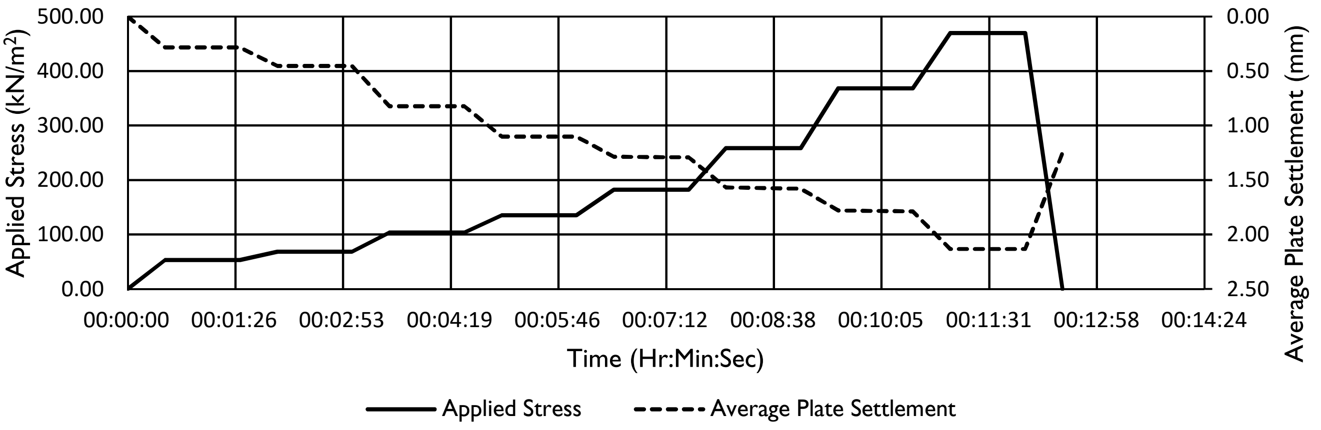
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
3.76	53.19	0.28
4.83	68.33	0.45
7.33	103.70	0.82
9.56	135.25	1.10
12.90	182.50	1.29
18.29	258.75	1.58
26.03	368.25	1.79
33.22	469.97	2.13
0.00	0.00	1.25

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	182.5 kN/m^2
Modulus of Subgrade Reaction	64.5 MN/m^2/m
Equivalent CBR Value	13.2 %

Remarks

GEOTECHNICS
geotechnical and geoenvironmental specialists

INSITU TESTING - *Plate Load Test*

Project	Newport Quinn - Phase 2	Test Location	PLT18
		Project No	PN224395
Client	Pinnacle Consulting Engineers	Date	03 August 2022
		Test No	1

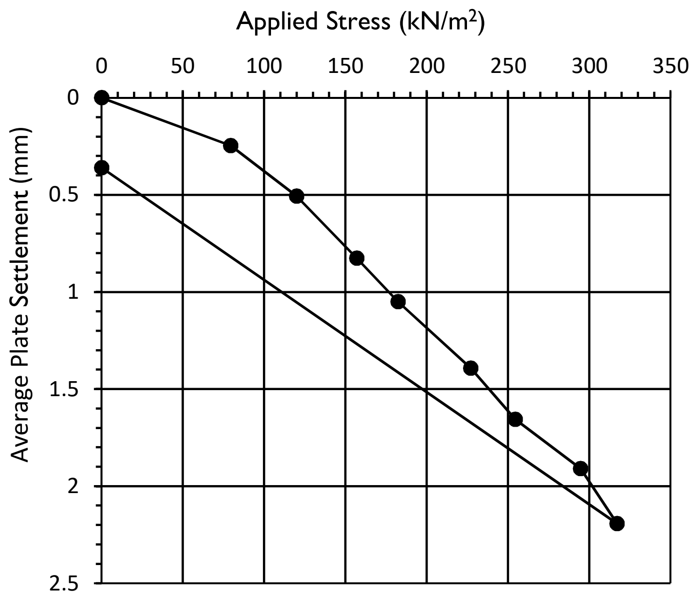
Test carried out in accordance with BS 1377-9:1990 & Design Manual for Roads & Bridges IAN 73/06 Revision 1 (2009)

Soil Description	MG - Reddish brown gravelly slightly silty fine to coarse sand.	Plate Diameter (mm)	300
Test Depth (m bgl)	0.40	Kentledge Type	JCB 3CX
Carried out by	AJ	Checked by	JSJ

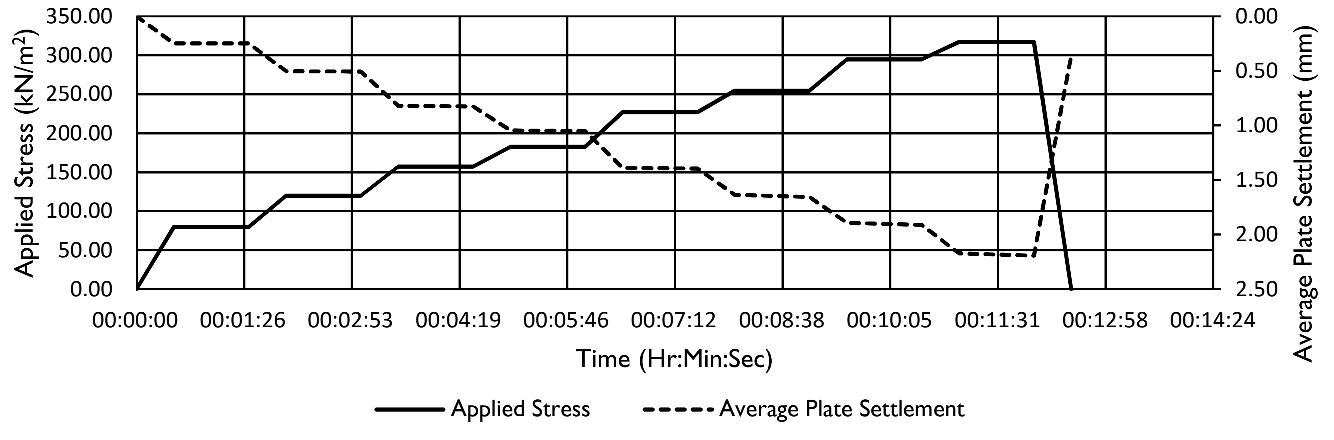
Test Results

Applied Load (kN)	Applied Stress (kN/m^2)	Average Plate Settlement (mm)
0.00	0.00	0.00
5.62	79.51	0.25
8.48	119.97	0.51
11.11	157.17	0.83
12.90	182.50	1.05
16.06	227.20	1.39
18.00	254.65	1.66
20.83	294.68	1.91
22.42	317.18	2.19
0.00	0.00	0.36

Applied Stress vs Average Plate Settlement



Applied Stress & Average Plate Settlement vs Time



Applied Stress at 1.25mm Settlement	210.0 kN/m^2
Modulus of Subgrade Reaction	74.2 $MN/m^2/m$
Equivalent CBR Value	16.8 %

Remarks

APPENDIX 7

Monitoring Results

FIELDWORK - *In Situ Gas Monitoring - Visit Record*

Project Newport Quinn Phase 2

Client Pinnacle Consulting Engineers Limited

Project No. PN224395

Instrument used

Date 13/09/2022

Meteorological Conditions:

Ground Condition: 0

Precipitation: 0

Wind: 0

Cloud Cover: 0

Atmospheric Pressure Trend: 0

Location ID	Pipe Ref.	Installation Diameter (mm)	Time of Reading (hh:mm:ss)	Flow (Peak) (l/hr)	Flow (Steady) (l/hr)	Methane (Peak) (% v/v)	Methane (Steady) (% v/v)	Carbon Dioxide (Peak) (% v/v)	Carbon Dioxide (Steady) (% v/v)	Oxygen (Peak) (% v/v)	Oxygen (Steady) (% v/v)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID (ppm)	Air Temperature (°C)	Atmospheric Pressure (mb)	Diff. Pressure (Pa)	Depth to Water (m bgl)	Depth to Base (m bgl)	Remarks
BH01	1	50		0.0	0.0	0.0	0.0	0.2	0.2	20.0	20.0	0	0		16.0	1012	0	2.63	17.62	
BH04A	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.1	20.1	0	0		16.0	1012	0	2.56	16.99	
BH06	1	50		0.0	0.0	0.0	0.0	1.5	1.5	19.0	19.0	0	0		16.0	1012	0	1.77	2.70	
BH07	1	50		0.0	0.0	0.0	0.0	0.8	0.8	19.7	19.7	0	0		16.0	1012	0	4.84	20.30	

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK - *In Situ Gas Monitoring - Visit Record*

Project Newport Quinn Phase 2
Client Pinnacle Consulting Engineers Limited
Project No. PN224395
Instrument used
Date 20/09/2022

Meteorological Conditions:
Ground Condition: Dry
Precipitation: None
Wind: Still
Cloud Cover: Cloudy
Atmospheric Pressure Trend: Falling

Location ID	Pipe Ref.	Installation Diameter (mm)	Time of Reading (hh:mm:ss)	Flow (Peak) (l/hr)	Flow (Steady) (l/hr)	Methane (Peak) (% v/v)	Methane (Steady) (% v/v)	Carbon Dioxide (Peak) (% v/v)	Carbon Dioxide (Steady) (% v/v)	Oxygen (Peak) (% v/v)	Oxygen (Steady) (% v/v)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	PID (ppm)	Air Temperature (°C)	Atmospheric Pressure (mb)	Diff. Pressure (Pa)	Depth to Water (m bgl)	Depth to Base (m bgl)	Remarks
BH01	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.4	20.4	0	0		17.0	1028	0	2.68		
BH03	1	50		0.0	0.0	0.0	0.0	0.0	0.1	20.4	20.4	0	0		17.0	1028	0	2.25		
BH04A	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.4	20.4	0	0		17.0	1028	0	2.62		
BH06	1	50		0.0	0.0	0.0	0.0	1.3	1.3	18.9	18.9	0	0		17.0	1027	0	1.80		
BH07	1	50		0.0	0.0	0.0	0.0	0.4	0.6	19.6	19.6	0	0		17.0	1027	0	4.95		
BH09	1	50		-28.0	0.0	1.0	1.0	1.7	1.7	18.7	18.7	0	0		17.0	1026	-198	2.28		
BH10	1	50		0.0	0.0	0.0	0.0	0.7	0.7	17.6	17.6	0	0		17.0	1025	0	2.83		
BH13	1	50																		
BH17A	1	50		9.0	0.0	0.0	0.0	0.1	0.1	19.8	19.8	0	0		17.0	1026	0	3.44		
BH19	1	50																3.03		Unable to monitor gas concentrations as no gas bung installed.
BH23	1	50																4.75		Unable to monitor gas concentrations as no gas bung installed.
BH25	1	50		0.0	0.0	0.0	0.0	0.5	0.5	8.5	8.5	0	0		20.0	1026	0	4.56		
BH28	1	50																3.45		Unable to monitor gas concentrations as gas bung open.
BH30	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.1	20.1	0	0		20.0	1026	0	3.25		
CP-BH101	2	50																2.10		Unable to monitor gas concentrations as installation flooded. Groundwater level measured after opening bung to allow surface water to drain into installation.
CP-BH102	1	50																4.69		Unable to monitor gas concentrations as installation flooded. Groundwater level measured after opening bung to allow surface water to drain into installation.
CP-BH103	1	50																1.30		Unable to monitor gas concentrations as installation flooded. Groundwater level measured after opening bung to allow surface water to drain into installation.
RC-BH101	1	50		4.3	0.0	0.0	0.0	0.5	0.5	20.2	20.2	0	0		20.0	1026	0	2.26		
RC-BH102	1	50																2.66		Unable to monitor gas concentrations as gas bung open.
RC-BH103	1	50		0.0	0.0	0.0	0.0	0.3	0.3	15.0	13.3	0	0		20.0	1026	0	4.10		
RC-BH104	1	50																2.66		Unable to monitor gas concentrations as gas bung open.
RC-BH105	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.1	20.1	0	0		18.0	1023	0	3.12		
WS-BH102	1	50		0.0	0.0	0.0	0.0	0.9	0.9	20.0	20.0	0	0		18.0	1027	0	DRY		
WS-BH103	1	50		0.0	0.0	0.0	0.0	0.5	0.5	19.5	19.5	0	0		18.0	1026	0	DRY		
WS-BH104	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.3	20.2	0	0		18.0	1025	0	DRY		
WS-BH105	1	50		4.3	0.0	0.0	0.0	0.0	0.0	21.0	21.0	0	0		18.0	1026	0	0.73		

GEOTECHNICS
geotechnical and geoenvironmental specialists

FIELDWORK - *In Situ Gas Monitoring - Visit Record*

Project Newport Quinn Phase 2

Client Pinnacle Consulting Engineers Limited

Project No. PN224395

Instrument used

Date 26/09/2022

Meteorological Conditions:

Ground Condition: Dry

Precipitation: None

Wind: Light

Cloud Cover: Cloudy

Atmospheric Pressure Trend: Steady

Location ID	**Pipe Ref.**	**Installation Diameter (mm)**	**Time of Reading** (hh:mm:ss)	**Flow (Peak)** (l/hr)	**Flow (Steady)** (l/hr)	**Methane (Peak)** (% v/v)	**Methane (Steady)** (% v/v)	**Carbon Dioxide (Peak)** (% v/v)	**Carbon Dioxide (Steady)** (% v/v)	**Oxygen (Peak)** (% v/v)	**Oxygen (Steady)** (% v/v)	**Carbon Monoxide** (ppm)	**Hydrogen Sulphide** (ppm)	**PID** (ppm)	**Air Temperature** (°C)	**Atmospheric Pressure** (mb)	**Diff. Pressure** (Pa)	**Depth to Water** (m bgl)	**Depth to Base** (m bgl)	**Remarks**
BH01	1	50		0.0	0.0	0.0	0.0	0.3	0.3	20.0	19.7	0	0		15.0	1005	0	2.63		
BH03	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.4	20.4	0	0		15.0	1005	0	2.13		
BH04A	1	50		22.0	0.0	0.0	0.0	0.0	0.0	20.4	20.4	0	0		15.0	1005	230	2.60		
BH06	1	50		0.0	0.0	0.0	0.0	0.3	0.3	20.3	20.3	0	0		15.0	1006	0	1.79		
BH07	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.5	20.5	0	0		15.0	1005	0	4.95		
BH09	1	50		24.0	0.0	0.0	0.0	0.2	0.2	20.4	20.3	0	0		15.0	1004	240	2.29		
BH10	1	50		0.0	0.0	0.0	0.0	0.2	0.2	19.9	19.9	0	0		15.0	1004	0	2.79		
BH13	1	50													15.0					
BH17A	1	50		15.0	0.0	0.0	0.0	0.0	0.0	20.5	20.5	0	0		15.0	1004	90	3.56		
BH19	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.5	20.5	0	0		15.0	1003	0	3.00		
BH23	1	50		-26.0	0.0	0.0	0.0	0.0	0.0	20.6	20.6	0	0		17.0	1005	206	4.73		
BH25	1	50		0.0	0.0	0.0	0.0	0.0	0.0	19.1	19.1	0	0		17.0	1004	0	3.07		
BH28	1	50		0.8	0.6	0.0	0.0	0.0	0.0	20.6	20.6	0	0		17.0	1005	5	3.50		
BH30	1	50		47.0	0.0	0.0	0.0	0.0	0.0	20.6	20.6	0	0		17.0	1004	640	3.22		
CP-BH101	2	50																1.95		Unable to monitor gas concentrations as installation flooded. Groundwater level measured after opening bung to allow surface water to drain into installation.
CP-BH102	1	50																3.92		Unable to monitor gas concentrations as installation flooded. Groundwater level measured after opening bung to allow surface water to drain into installation.
CP-BH103	1	50																1.36		Unable to monitor gas concentrations as installation flooded. Groundwater level measured after opening bung to allow surface water to drain into installation.
RC-BH101	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.6	20.6	0	0		17.0	1005	0	2.32		
RC-BH102	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.6	20.6	0	0		17.0	1004	0	2.64		
RC-BH103	1	50																2.35		Unable to monitor gas concentrations as installation flooded. Groundwater level measured after opening bung to allow surface water to drain into installation.
RC-BH104	1	50																2.62		Unable to monitor gas concentrations as installation flooded. Groundwater level measured after opening bung to allow surface water to drain into installation.
RC-BH105	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.6	20.6	0	0		15.0	1005	0	3.08		
WS-BH102	1	50		0.0	0.0	0.0	0.0	0.0	0.0	20.6	20.5	0	0		15.0	1005	0	DRY		
WS-BH103	1	50					0.0								15.0					

APPENDIX 8

Laboratory Test Results - Geotechnical

DATA SHEET - Laboratory Test Symbols

Classification and Strength

Symbol	**C - Clay** **M - Silt** (0 - containing organic matter) Plasticity L - Low I - Intermediate H - High V - Very High E - Extremely High
Ip	Plasticity Index
%	% retained on 425 µm sieve, shown under Ip value
w_L	Liquid Limit
w_P	Plastic Limit
NP	Non-Plastic
NAT	Sample tested in natural state
w	Water Content
P_d	Particle Density
Test	**Quick undrained triaxial tests** 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
σ_3	Triaxial Cell Pressure
$\sigma_1 - \sigma_3$	Deviator Stress
##	Excessive Strain
c_u	Undrained Cohesion
c	Cohesion Intercept
ϕ	Angle of Shearing Resistance
Linear Shrink	Linear Shrinkage
Stab add-	Stabiliser which is added

Consolidation

m_v	Coefficient of Volume Compressibility
c_{v50}	Coefficient of Consolidation - Log t
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 SO_4 g/l
In Water	Sulphate content of groundwater, expressed as SO_3 g/l, value in brackets expressed as SO_4 g/l
pH	pH value
Organic content	Organic content expressed as a percentage of dry weight
Chloride	Chloride Ion content expressed as a percentage of dry weight

MCV, Compaction, CBR

MCV	Moisture Condition Value at natural water content
MCC	Moisture Condition Calibration
CCV	Chalk Crushing Value

Compaction

Type	2.5 = 2.5 kg Rammer 4.5 = 4.5 kg Rammer V = Vibrating Hammer
γ_b	Bulk Density
γ_d	Dry Density

CBR California Bearing Ratio

Type	2.5 = Test on Specimen Recompacted using 2.5 kg Rammer 4.5 = As above but using 4.5 kg Rammer V = As above but using Vibrating Hammer M = Test on open drive mould specimen cut in field S = Soaked Specimen
Top	CBR at top of mould
Bottom	CBR at bottom of mould
ND	None Detected
*	In the Sample Description denotes a laboratory only description

Form REP008 Rev 3

Laboratory Test Certificate

Issued To	Geotechnics Ltd The Geotechnical Centre 203 Torrington Avenue Tile Hill Coventry, CV4 9AP	**Date of issue**	01.11.22
		Issue No.	1
		Client Ref. No.	N/A
		Samples / Material Source	
		Samples Recv'd	26.09.22
Testing Start Date	30.09.22	Sample State	As received
Testing Complete	31.10.22	Sampled by	Geotechnics Limited
Comments			

Project No	PN224395
Project Name	Newport Quinn Phase 2.

Summary of Tests

Standard	Test Description	Test Quantity	UKAS
BS EN ISO 17892-1:2014	Water Content	32	Yes
BS EN ISO 17892-12:2018 Cl. 5.3 & 5.5	Liquid Limit and Plastic Limit (4 Points Method)	29	Yes
BS EN ISO 17892-4:2016 Cl. 5.2	Particle Size Distribution by Sieving Method	18	Yes
BS EN ISO 17892-4:2016 Cl. 5.4	Particle Size Distribution by Pipette Method	14	Yes
BS EN ISO 17892-8:2018	Shear Strength by Unconsolidated Undrained Triaxial Test - Single Stage	2	Yes
BS EN ISO 17892-5:2017	Incremental Loading Oedometer	1	Yes
BS 1377-4:1990 Cl. 3.3	2.5 kg Rammer Dry Density/Moisture Content Relationship (Compaction)	7	Yes
BS 1377-4:1990 Cl. 3.5	4.5 kg Rammer Dry Density/Moisture Content Relationship (Compaction)	7	Yes
BS 1377-4:1990 Cl. 7.2	California Bearing Ratio (CBR)	13	Yes
ASTM D5334-14	Determination of Thermal Conductivity of Soil and Soft Rock by Thermal Needle Probe	22	No

Note: Any descriptions, opinions or interpretations are outside the scope of UKAS accreditation.
The results within this report relate only to the samples tested and received from the client.

UKAS TESTING
1365

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

Paul Smart (Laboratory Testing Manager)

GEOTECHNICS
geotechnical and geoenvironmental specialists

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

LABORATORY RESULTS - *Classification and Strength*

Project NEWPORT QUINN PHASE 2 **Project No:** PN224395

Sample					**Classification**					**Strength**					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m^3	σ_3 kN/m^2	$\sigma_1 - \sigma_3$ kN/m^2	c_u kN/m^2	c_{Avg} kN/m^2
BH01	4.80 (4.80)	D	N84040	Brown clayey very sandy GRAVEL (See Test Remarks Sheet for further information)		NST (76%)			15.7						
BH02	6.80 (6.80)	D	N84046	Brown slightly clayey GRAVEL.* (See Test Remarks Sheet for further information)		NST (86%)			12.0						
BH03	2.00- 2.50 (2.00)	B	N84047	Brown slightly gravelly slightly sandy CLAY.	CL	13 (65%)	32	19	10.6						
BH03	5.80 (5.80)	D	N84049	Brown mottled red slightly gravelly silty CLAY.	MH	23 (36%)	53	30	31.8						
BH04A	2.00- 2.50 (2.00)	B	N84051	Brown gravelly sandy CLAY.					11.0						
BH05	2.60 (2.60)	D	N84053	Brown slightly gravelly slightly sandy CLAY.	MV	34 (8%)	77	43	39.5						
BH06	1.20- 1.70 (1.20)	B	N84054	Brown slightly gravelly sandy CLAY.	CL	11 (7%)	26	15	9.3						
BH07	0.50 (0.50)	D	N84055	Brown mottled grey slightly gravelly slightly sandy CLAY.	CL	14 (32%)	31	17	13.5						
BH07	3.00 (3.00)	D	N84059	Brown slightly sandy clayey GRAVEL.					6.3						
BH07	5.05 (5.05)	D	N84060	Red mottled brown slightly sandy slightly gravelly CLAY.					26.2						
BH08	5.00- 5.45 (5.00)	D	N84063	Red mottled brown slightly sandy slightly gravelly CLAY.	CI	21 (14%)	43	22	27.8						
BH09	3.80 (3.80)	D	N84064	Brown slightly sandy slightly gravelly CLAY.	MI	17 (8%)	44	27	27.0						
BH09	4.00- 4.45 (4.00)	UT	N84065	Brown slightly sandy slightly gravelly CLAY.	CI	23 (1%)	49	26	33.3						
BH09	5.45- 5.50 (5.45)	D	N84067	Black mottled brown slightly gravelly CLAY with organic material.		(13%)	156	NP	141						
BH10	3.10 (3.10)	D	N84070	Brown mottled black slightly sandy slightly gravelly CLAY.	MH	20 (12%)	54	34	41.2						
BH10	4.20 (4.20)	D	N84071	Grey mottled brown slightly gravelly slightly sandy CLAY.	CL	11 (9%)	28	17	19.6						
BH10	5.00- 5.45 (5.14)	UT	N84072	Brown slightly gravelly sandy silty CLAY					32.2 <26.2>	SS	1.98	100	152	76	76

Remarks NST - Not suitable for Test
For Standards followed see Laboratory Test Certficate
w% - ^ = Rock water content test; x = Aggregate moisture content test
QUT Water Contents: <Failure Zone>, [After test]

LABORATORY RESULTS - *Classification and Strength*

Project NEWPORT QUINN PHASE 2 **Project No:** PN224395

Sample					**Classification**					**Strength**					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (ρ_d) %	Test	γ_b (γ_d) Mg/m^3	σ_3 kN/m^2	$\sigma_1-\sigma_3$ kN/m^2	c_u kN/m^2	c_{Avg} kN/m^2
BH11	1.20- 1.40 (1.20)	D	N84074	Brown slightly sandy slightly gravelly CLAY with cobbles. (See Test Remarks Sheet for further information)	CL	14 (74%)	32	18	11.3						
BH11	3.00- 3.50 (3.00)	B	N84075	Red mottled brown slightly gravelly slightly sandy CLAY.	MH	26 (34%)	60	34	35.7						
BH13	3.00- 3.45 (3.00)	D	N84081	Brown mottled red and grey slightly sandy slightly gravelly CLAY.	CI	25 (36%)	49	24	20.6						
BH13	4.80 (4.80)	D	N84082	Brown slightly clayey GRAVEL. (See Test Remarks Sheet for further information)		NST (83%)			9.5						
BH14A	2.80 (2.80)	D	N84083	Brown slightly gravelly CLAY.	CL	9 (48%)	24	15	12.1						
BH15	3.00- 3.45 (3.14)	UT	N84086	Firm reddish brown slightly gravelly silty CLAY					23.6 <24.8>	SS	2.00	60	127	64	64
BH15	3.50 (3.50)	D	N84087	Red mottled brown slightly sandy slightly gravelly CLAY. (See Test Remarks Sheet for further information)	CI	19 (61%)	40	21	22.4						
BH17A	2.30 (2.30)	D	N84094	Brown slightly sandy gravelly CLAY. (See Test Remarks Sheet for further information)	CL	17 (58%)	33	16	10.4						
BH17A	4.05 (4.05)	D	N84095	Red mottled brown slightly gravelly slightly sandy CLAY.	CL	17 (38%)	33	16	17.2						
BH18	3.80 (3.80)	D	N84099	Brown slightly gravelly slightly sandy CLAY.	CL	15 (63%)	32	17	11.5						
BH23	4.70 (4.70)	D	N84115	Red mottled brown slightly gravelly CLAY.	CI	15 (1%)	40	25	23.0						
BH24	2.00 (2.00)	D	N84118	Brown slightly gravelly sandy CLAY.	CI	17 (33%)	36	19	9.2						
BH25	1.00 (1.00)	D	N84120	Brown slightly sandy slightly gravelly CLAY.	CI	19 (51%)	41	22	10.9						
BH26	1.80 (1.80)	D	N84123	Brown slightly sandy slightly gravelly CLAY.	CL	15 (48%)	31	16	10.9						
BH26	4.00- 4.45 (4.00)	D	N84126	Brown mottled grey slightly sandy slightly gravelly CLAY. (See Test Remarks Sheet for further information)	MH	23 (12%)	52	29	32.5						
BH29	1.80 (1.80)	D	N84133	Brown gravelly sandy CLAY.	CL	12 (66%)	27	15	8.3						

Remarks NST - Not suitable for Test
For Standards followed see Laboratory Test Certficate
w% - ^ = Rock water content test; x = Aggregate moisture content test
QUT Water Contents: <Failure Zone>, [After test]

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Classification and Strength*

Project NEWPORT QUINN PHASE 2 **Project No:** PN224395

Sample					**Classification**					**Strength**					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (ρ_d) %	Test	γ_b (γ_d) Mg/m^3	σ_3 kN/m^2	$\sigma_1-\sigma_3$ kN/m^2	c_u kN/m^2	c_{Avg} kN/m^2
BH30	3.30 (3.30)	D	N84135	Brown mottled grey slightly gravelly CLAY.	CL	14 (22%)	29	15	14.6						

Remarks

NST - Not suitable for Test
For Standards followed see Laboratory Test Certficate
w% - ^ = Rock water content test; x = Aggregate moisture content test
QUT Water Contents: <Failure Zone>, [After test]

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Atterberg Limit*

Project NEWPORT QUINN PHASE 2 **Project No:** PN224395

Sample					Results							
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Test Type	Point Data		Sym-bol	I_p %	>425 sieve µm	w_L %	w_p %
						Cone Pene.	Water % (Factor)					
BH01	4.80 (4.80)	D	N84040	Brown clayey very sandy GRAVEL (See Test Remarks Sheet for further information) Test Remark: Unsuitable for testing due to insufficient fine material.	Not suitable for Test							
BH02	6.80 (6.80)	D	N84046	Brown slightly clayey GRAVEL.* (See Test Remarks Sheet for further information) Test Remark: Unsuitable for testing due to insufficient fine material.	Not suitable for Test							
BH03	2.00-2.50 (2.00)	B	N84047	Brown slightly gravelly slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CL	13	65%	32	19
BH03	5.80 (5.80)	D	N84049	Brown mottled red slightly gravelly silty CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			MH	23	36%	53	30
BH05	2.60 (2.60)	D	N84053	Brown slightly gravelly slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			MV	34	8%	77	43
BH06	1.20-1.70 (1.20)	B	N84054	Brown slightly gravelly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CL	11	7%	26	15
BH07	0.50 (0.50)	D	N84055	Brown mottled grey slightly gravelly slightly sandy CLAY.	Fall Cone 4pt with decreasing water content, cone type: 80g/30, washed over 425um sieve			CL	14	32%	31	17
BH08	5.00-5.45 (5.00)	D	N84063	Red mottled brown slightly sandy slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	21	14%	43	22
BH09	3.80 (3.80)	D	N84064	Brown slightly sandy slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			MI	17	8%	44	27

Remarks

LABORATORY RESULTS - *Atterberg Limit*

Project NEWPORT QUINN PHASE 2 **Project No:** PN224395

Sample					Results	Point Data						
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Test Type	Cone Pene.	Water % (Factor)	Symbol	I_p %	>425 sieve µm	w_L %	w_p %
BH09	4.00-4.45 (4.00)	UT	N84065	Brown slightly sandy slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	23	1%	49	26
BH09	5.45-5.50 (5.45)	D	N84067	Black mottled brown slightly gravelly CLAY with organic material.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve					13%	156	NP
BH10	3.10 (3.10)	D	N84070	Brown mottled black slightly sandy slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			MH	20	12%	54	34
BH10	4.20 (4.20)	D	N84071	Grey mottled brown slightly gravelly slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CL	11	9%	28	17
BH11	1.20-1.40 (1.20)	D	N84074	Brown slightly sandy slightly gravelly CLAY with cobbles. (See Test Remarks Sheet for further information)	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CL	14	74%	32	18
BH11	3.00-3.50 (3.00)	B	N84075	Red mottled brown slightly gravelly slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			MH	26	34%	60	34
BH13	3.00-3.45 (3.00)	D	N84081	Brown mottled red and grey slightly sandy slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	25	36%	49	24
BH13	4.80 (4.80)	D	N84082	Brown slightly clayey GRAVEL. (See Test Remarks Sheet for further information) Test Remark: Unsuitable for testing due to insufficient fine material.	Not suitable for Test							
BH14A	2.80 (2.80)	D	N84083	Brown slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CL	9	48%	24	15

Remarks

LABORATORY RESULTS - *Atterberg Limit*

Project NEWPORT QUINN PHASE 2 **Project No:** PN224395

Sample					**Results**							
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Test Type	Point Data		Sym-bol	I_p %	>425 sieve µm	w_L %	w_p %
						Cone Pene.	Water % (Factor)					
BH15	3.50 (3.50)	D	N84087	Red mottled brown slightly sandy slightly gravelly CLAY. (See Test Remarks Sheet for further information) Test Remark: 1-point cone Insufficient sample for 4 point test.	Fall Cone 1pt with increasing water content, cone type: 80g/30, washed over 425um sieve	20.2 20.6	36.99 36.79 (1.094)	CI	19	61%	40	21
BH17A	2.30 (2.30)	D	N84094	Brown slightly sandy gravelly CLAY. (See Test Remarks Sheet for further information) Test Remark: 1-point cone Insufficient sample for 4 point test.	Fall Cone 1pt with increasing water content, cone type: 80g/30, washed over 425um sieve	20.0 20.0	30.95 30.57 (1.057)	CL	17	58%	33	16
BH17A	4.05 (4.05)	D	N84095	Red mottled brown slightly gravelly slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CL	17	38%	33	16
BH18	3.80 (3.80)	D	N84099	Brown slightly gravelly slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CL	15	63%	32	17
BH23	4.70 (4.70)	D	N84115	Red mottled brown slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	15	1%	40	25
BH24	2.00 (2.00)	D	N84118	Brown slightly gravelly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	17	33%	36	19
BH25	1.00 (1.00)	D	N84120	Brown slightly sandy slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	19	51%	41	22
BH26	1.80 (1.80)	D	N84123	Brown slightly sandy slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CL	15	48%	31	16
BH26	4.00- 4.45 (4.00)	D	N84126	Brown mottled grey slightly sandy slightly gravelly CLAY. (See Test Remarks Sheet for further information)	Fall Cone 4pt with decreasing water content, cone type: 80g/30, washed over 425um sieve			MH	23	12%	52	29

Remarks AGS

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - Atterberg Limit

Project NEWPORT QUINN PHASE 2 **Project No:** PN224395

Sample					**Results**								
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Test Type	Point Data		Sym-bol	I_p %	>425 sieve µm	w_L %	w_p %
						Cone Pene.	Water % (Factor)					
BH29	1.80 (1.80)	D	N84133	Brown gravelly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CL	12	66%	27	15
BH30	3.30 (3.30)	D	N84135	Brown mottled grey slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CL	14	22%	29	15

Remarks

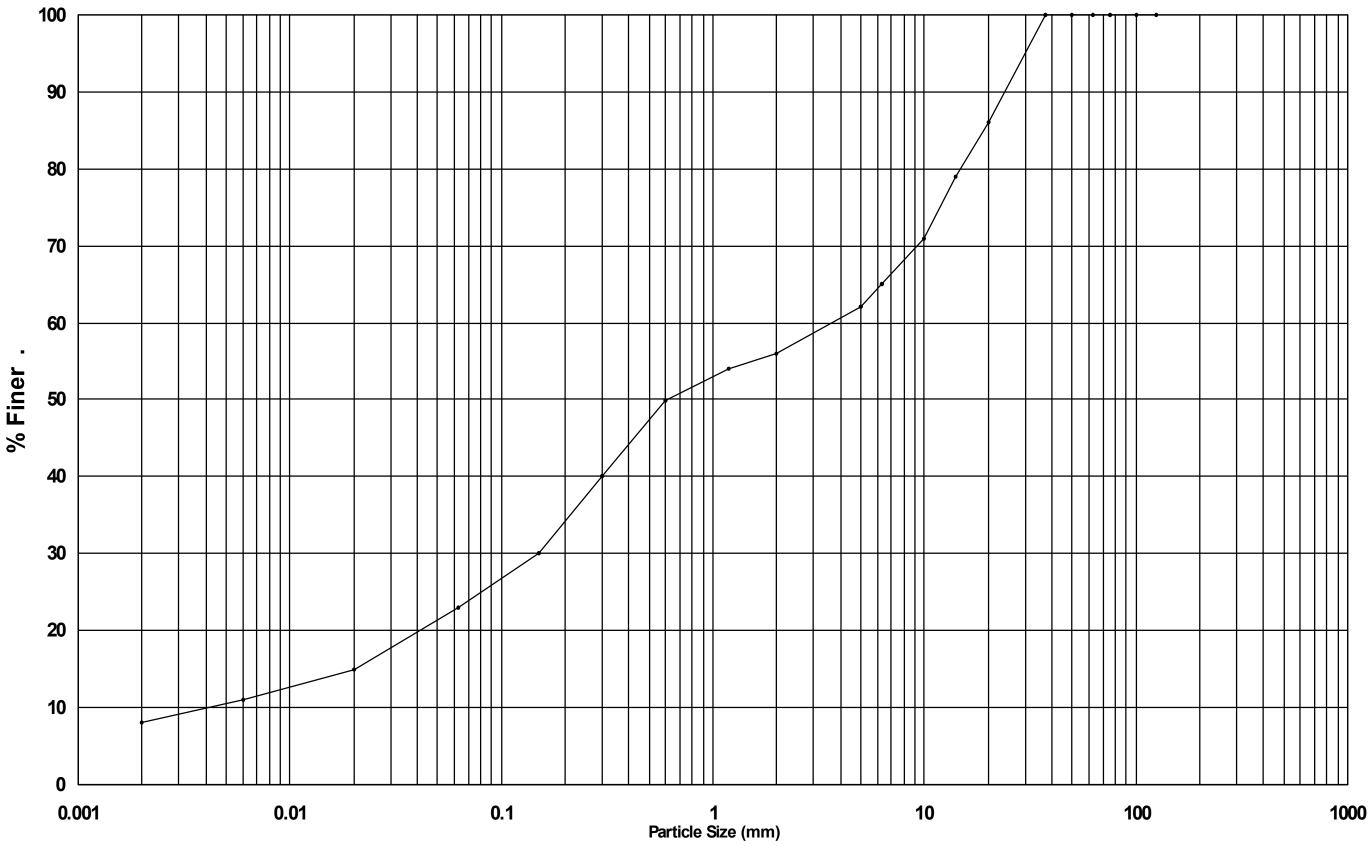
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH01
		Sample Depth	1.20-1.65m
Project No:	PN224395	**Sample Type**	D
		Sample Ref	N84037

Sample Description

Brown sandy gravelly CLAY.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	8
SILT	15
SAND	33
GRAVEL	44
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
20 mm	86
14 mm	79
10 mm	71
6.3 mm	65
5 mm	62
2 mm	56
1.18 mm	54
600 µm	50
300 µm	40
150 µm	30

Size	% Finer
63 µm	23
20 µm	15
6 µm	11
2 µm	8

Uniformity Coefficient	
803.26	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

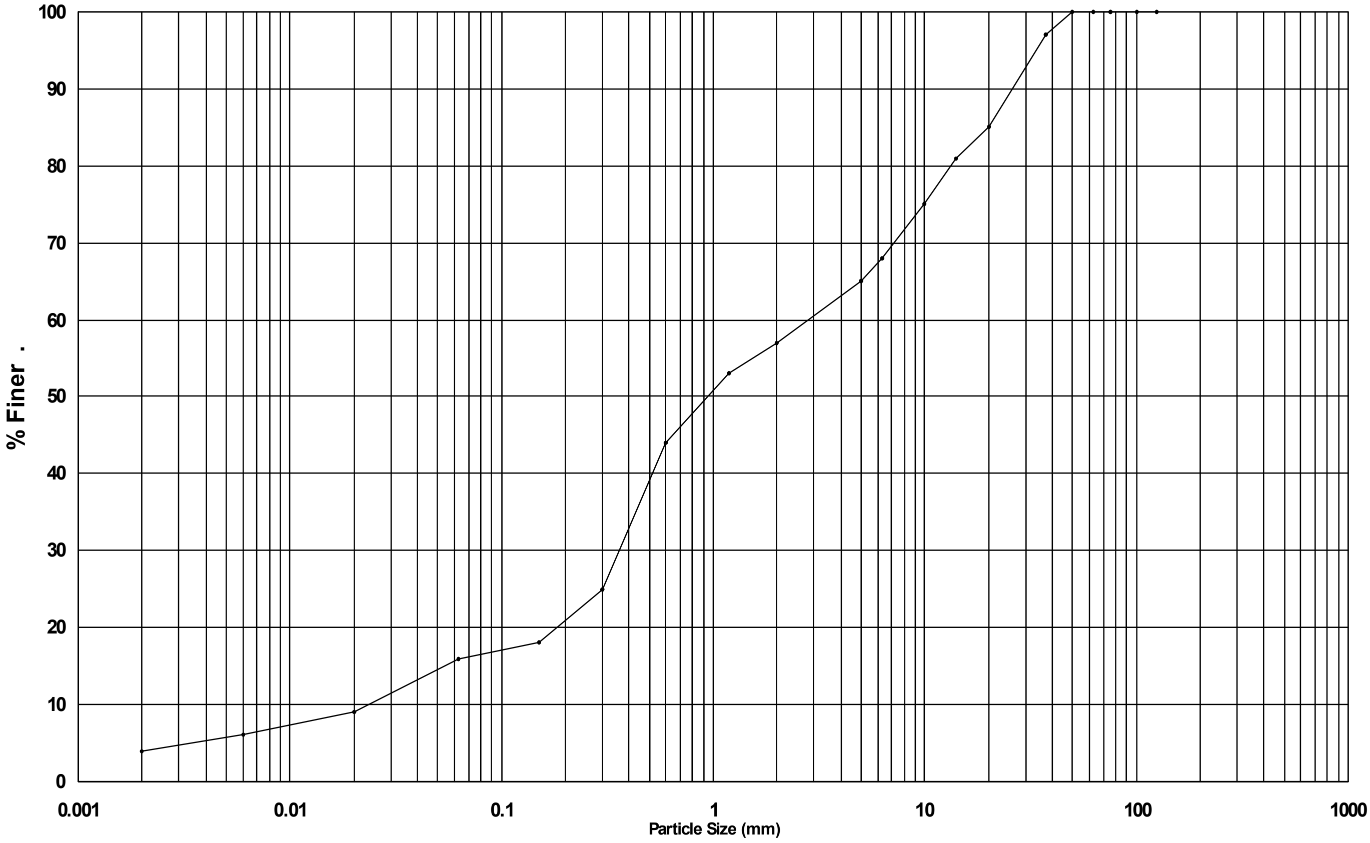
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH01
		Sample Depth	4.00-4.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84039

Sample Description

Brown very sandy GRAVEL with dark red clay pockets.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	4
SILT	12
SAND	41
GRAVEL	43
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	97
20 mm	85
14 mm	81
10 mm	75
6.3 mm	68
5 mm	65
2 mm	57
1.18 mm	53
600 µm	44
300 µm	25
150 µm	18

Size	% Finer
63 µm	16
20 µm	9
6 µm	6
2 µm	4

Uniformity Coefficient	
118.77	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed as "Non Standard" due to sample mass not being in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

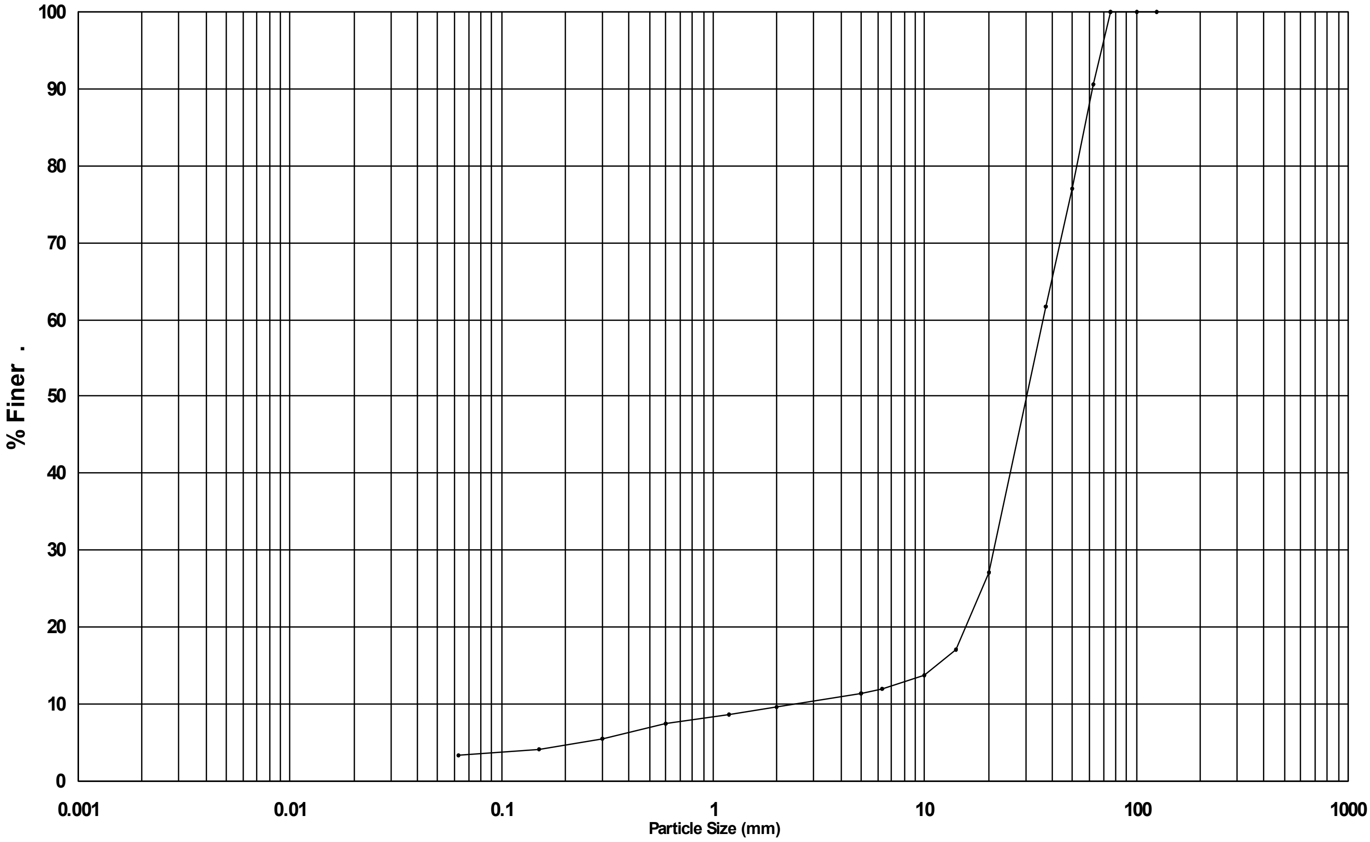
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH02
		Sample Depth	2.00-2.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84043

Sample Description

Brown slightly clayey sandy GRAVEL with cobbles.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
SILT (including CLAY)	3
SAND	7
GRAVEL	81
COBBLES	9
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	91
50 mm	77
37.5 mm	62
20 mm	27
14 mm	17
10 mm	14
6.3 mm	12
5 mm	11
2 mm	10
1.18 mm	9
600 µm	8
300 µm	6
150 µm	4

Size	% Finer
63 µm	3

Uniformity Coefficient	
14.50	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	
Pre-treated with	
% loss on Pre-treatment	
Particle Density	

Remarks Sieve:-Test performed as "Non Standard" due to sample mass not being in accordance with BS EN ISO 17892-4:2016

02/11/2022

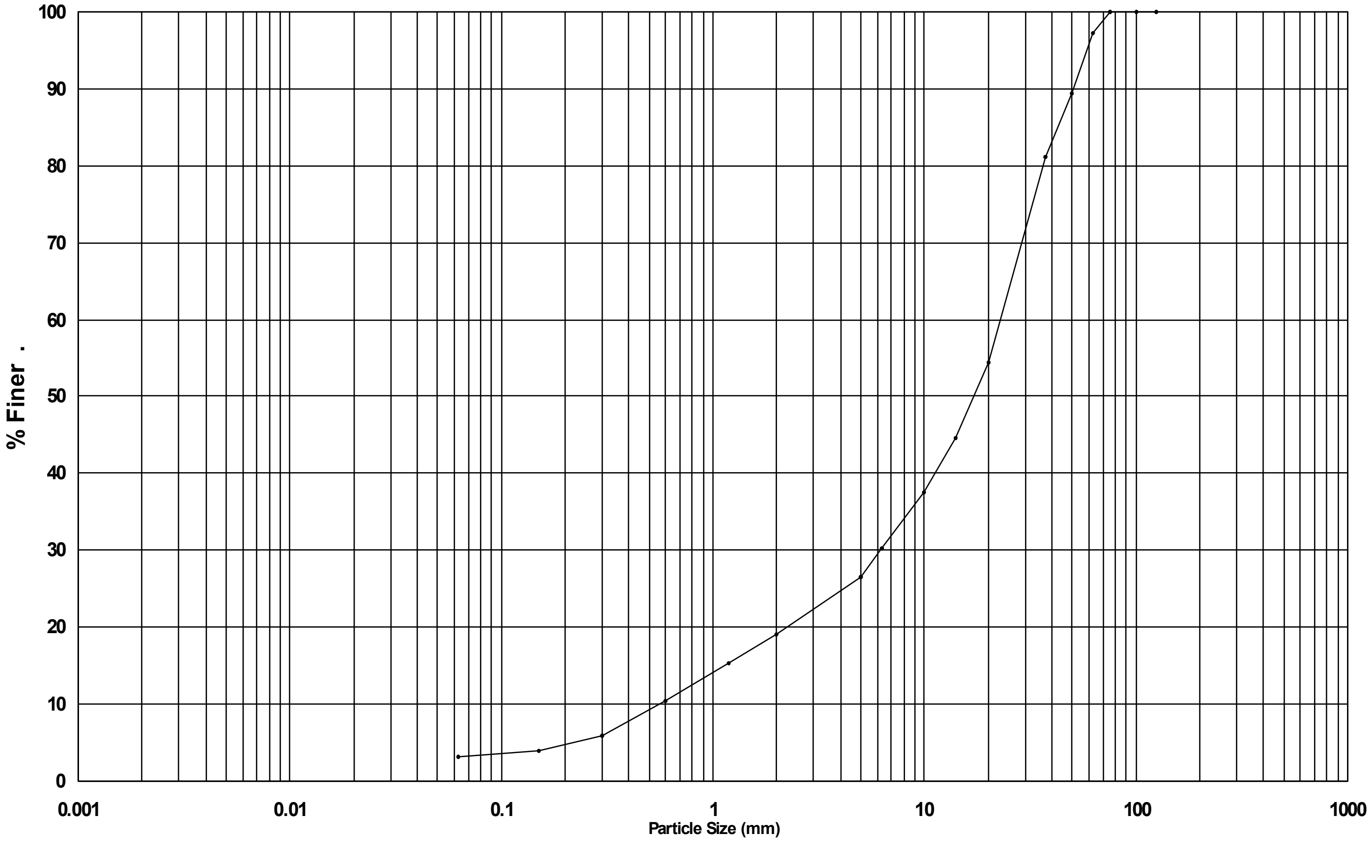
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH02
		Sample Depth	4.00-4.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84045

Sample Description

Dark brown slightly clayey gravelly COBBLES. **



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
SILT (including CLAY)	3
SAND	16
GRAVEL	78
COBBLES	3
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	97
50 mm	89
37.5 mm	81
20 mm	54
14 mm	45
10 mm	37
6.3 mm	30
5 mm	27
2 mm	19
1.18 mm	15
600 µm	10
300 µm	6
150 µm	4

Size	% Finer
63 µm	3

Uniformity Coefficient	
40.35	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	
Pre-treated with	
% loss on Pre-treatment	
Particle Density	

Remarks Sieve:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - Particle Size Distribution

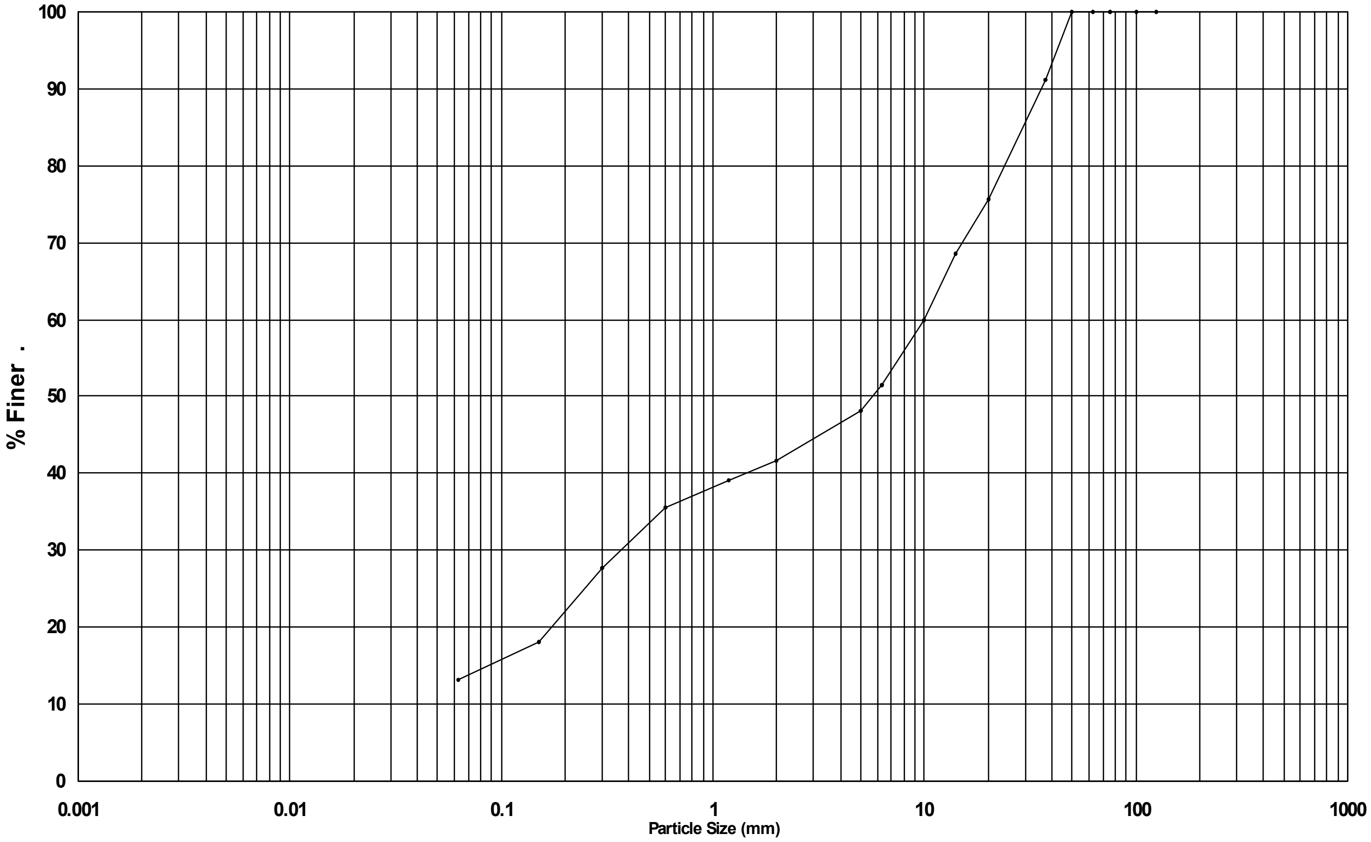
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH03
Sample Depth 3.00-3.50m
Sample Type B
Sample Ref N84048

Sample Description

Brown clayey very sandy GRAVEL.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
SILT (including CLAY)	13
SAND	29
GRAVEL	58
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	91
20 mm	76
14 mm	69
10 mm	60
6.3 mm	51
5 mm	48
2 mm	42
1.18 mm	39
600 µm	36
300 µm	28
150 µm	18

Size	% Finer
63 µm	13

Uniformity Coefficient	
Not Available	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	
Pre-treated with	
% loss on Pre-treatment	
Particle Density	

Remarks Sieve:-Test performed as "Non Standard" due to sample mass not being in accordance with BS EN ISO 17892-4:2016

02/11/2022

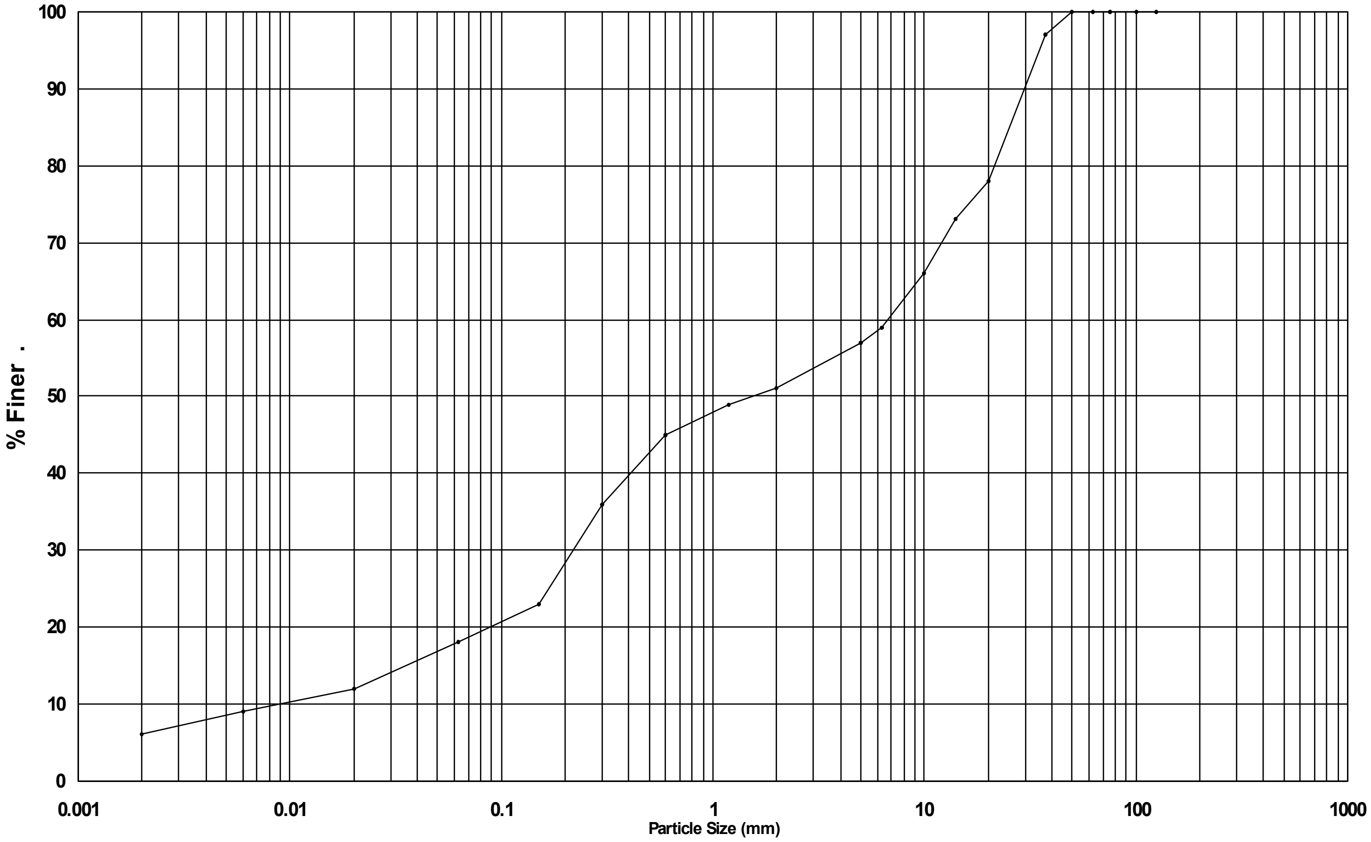
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH07
		Sample Depth	2.00-2.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84058

Sample Description

Brown slightly clayey slightly sandy GRAVEL.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	6
SILT	12
SAND	33
GRAVEL	49
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	97
20 mm	78
14 mm	73
10 mm	66
6.3 mm	59
5 mm	57
2 mm	51
1.18 mm	49
600 µm	45
300 µm	36
150 µm	23

Size	% Finer
63 µm	18
20 µm	12
6 µm	9
2 µm	6

Uniformity Coefficient	
685.74	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed as "Non Standard" due to sample mass not being in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

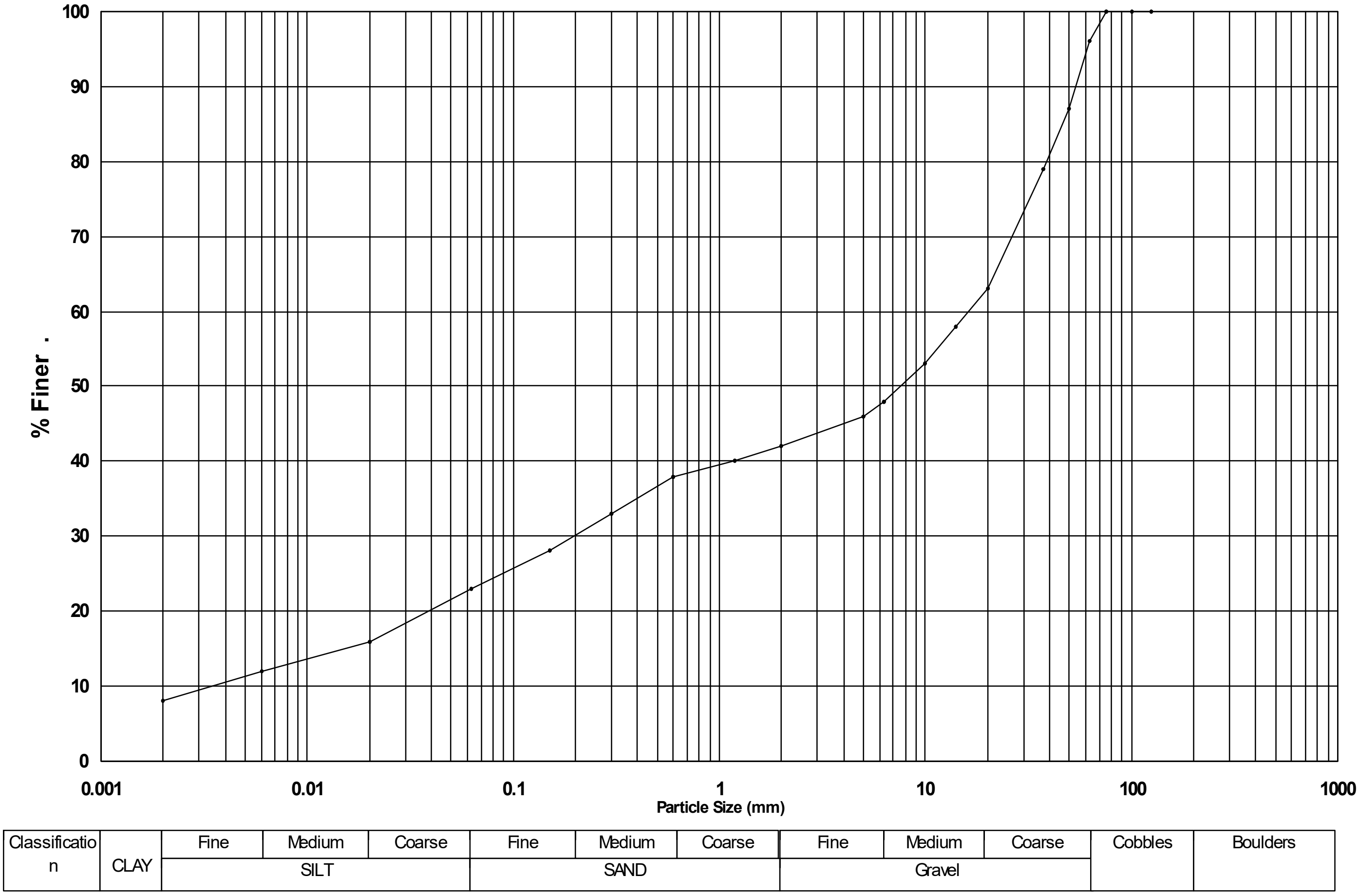
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH08
		Sample Depth	3.00-3.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84062

Sample Description

Brown slightly sandy clayey GRAVEL with cobbles.



Classification	% of each
CLAY	8
SILT	15
SAND	19
GRAVEL	54
COBBLES	4
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	96
50 mm	87
37.5 mm	79
20 mm	63
14 mm	58
10 mm	53
6.3 mm	48
5 mm	46
2 mm	42
1.18 mm	40
600 µm	38
300 µm	33
150 µm	28

Size	% Finer
63 µm	23
20 µm	16
6 µm	12
2 µm	8

Uniformity Coefficient

4787.32

Sieving Method

Wet sieve

Fine Particle Analysis

Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed as "Non Standard" due to sample mass not being in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

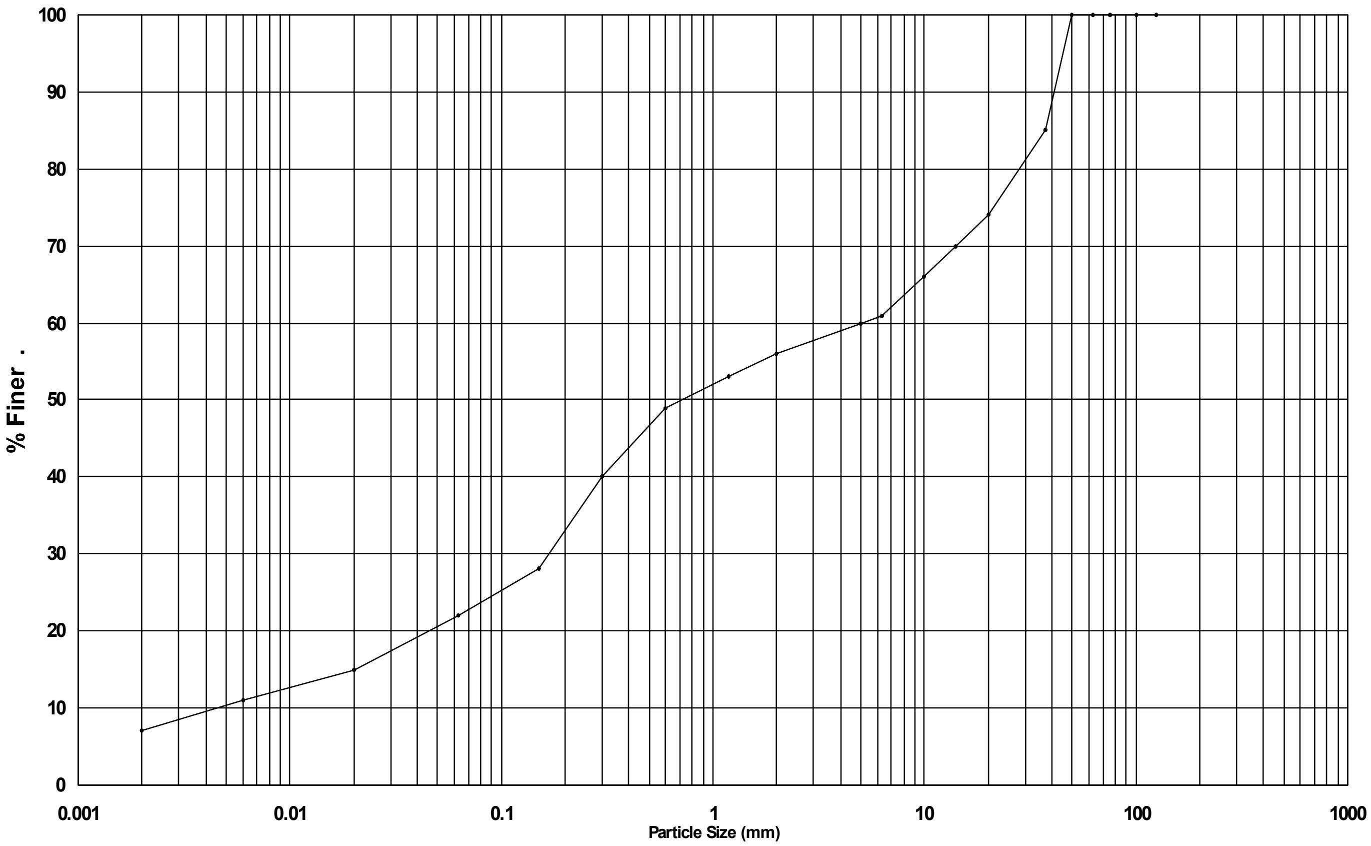
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH10
Sample Depth 2.00-2.50m
Sample Type B
Sample Ref N84069

Sample Description

Brown clayey very sandy GRAVEL.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	7
SILT	15
SAND	34
GRAVEL	44
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	85
20 mm	74
14 mm	70
10 mm	66
6.3 mm	61
5 mm	60
2 mm	56
1.18 mm	53
600 µm	49
300 µm	40
150 µm	28

Size	% Finer
63 µm	22
20 µm	15
6 µm	11
2 µm	7

Uniformity Coefficient

1121.71

Sieving Method

Wet sieve

Fine Particle Analysis

Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed as "Non Standard" due to sample mass not being in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

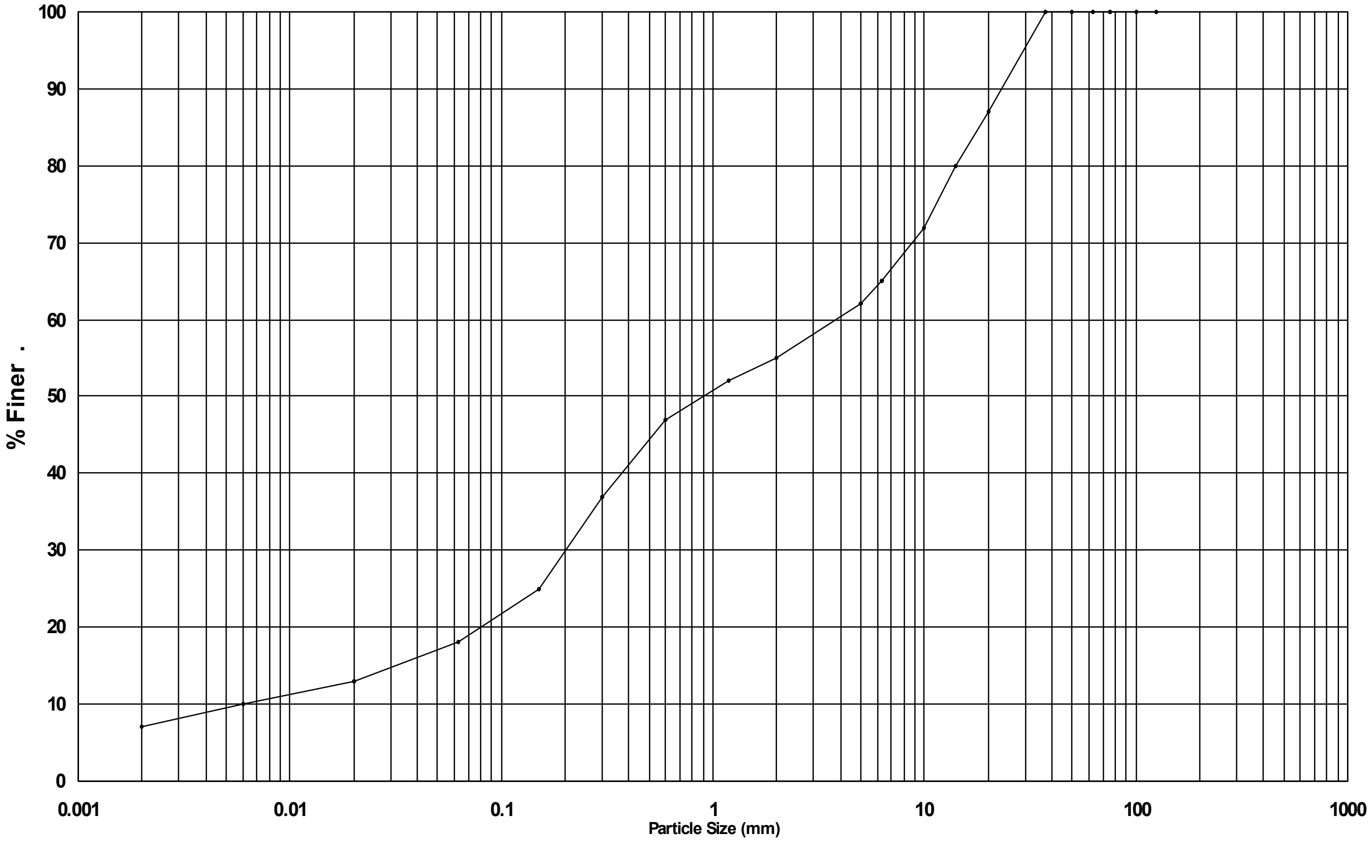
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH12
		Sample Depth	2.00-2.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84078

Sample Description

Brown clayey very sandy GRAVEL.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	7
SILT	11
SAND	37
GRAVEL	45
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
20 mm	87
14 mm	80
10 mm	72
6.3 mm	65
5 mm	62
2 mm	55
1.18 mm	52
600 µm	47
300 µm	37
150 µm	25

Size	% Finer
63 µm	18
20 µm	13
6 µm	10
2 µm	7

Uniformity Coefficient	
538.63	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

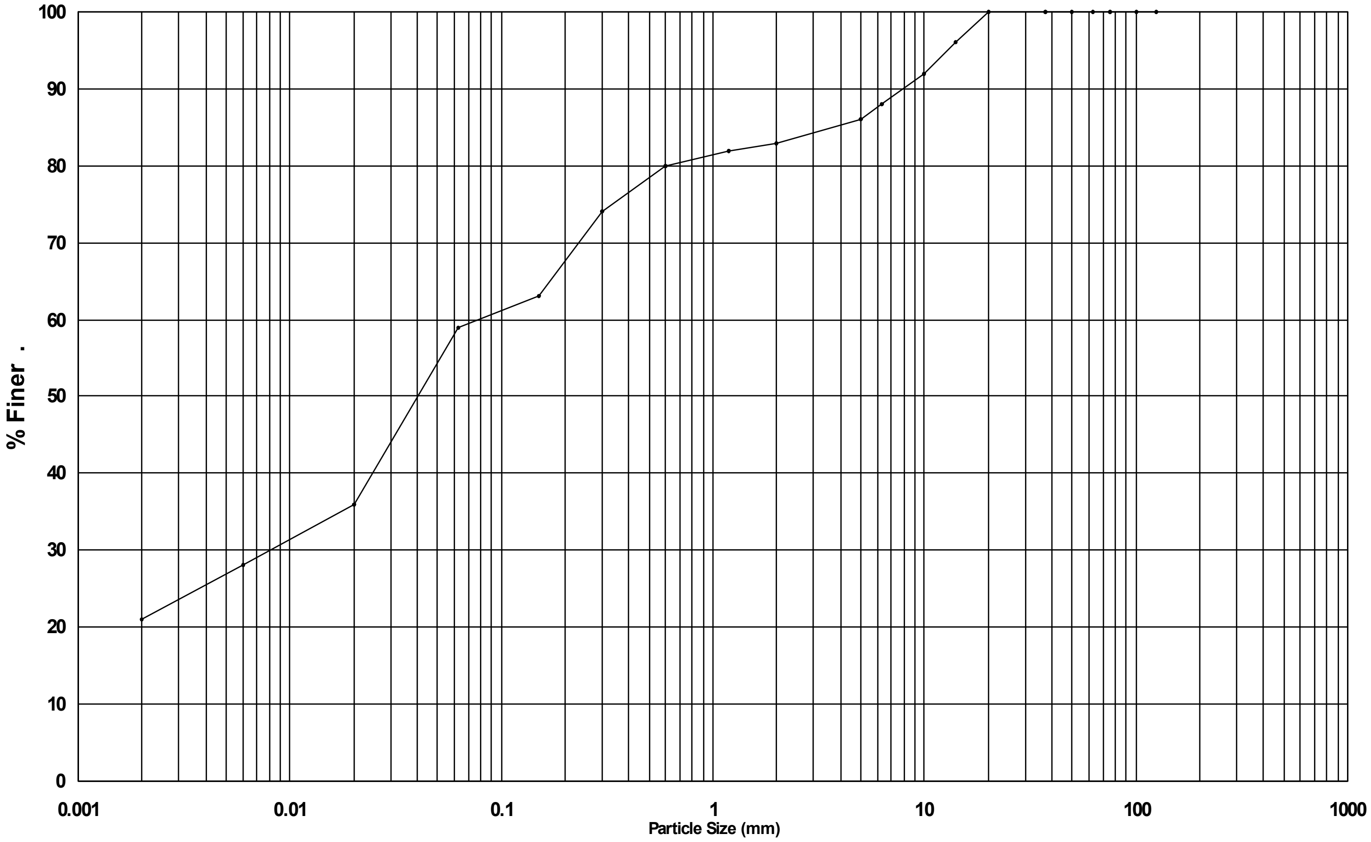
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH15
		Sample Depth	2.00-2.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84085

Sample Description

Brown mottled red slightly sandy slightly gravelly silty CLAY.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	21
SILT	38
SAND	24
GRAVEL	17
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
20 mm	100
14 mm	96
10 mm	92
6.3 mm	88
5 mm	86
2 mm	83
1.18 mm	82
600 µm	80
300 µm	74
150 µm	63

Size	% Finer
63 µm	59
20 µm	36
6 µm	28
2 µm	21

Uniformity Coefficient

Not Available

Sieving Method

Wet sieve

Fine Particle Analysis

Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

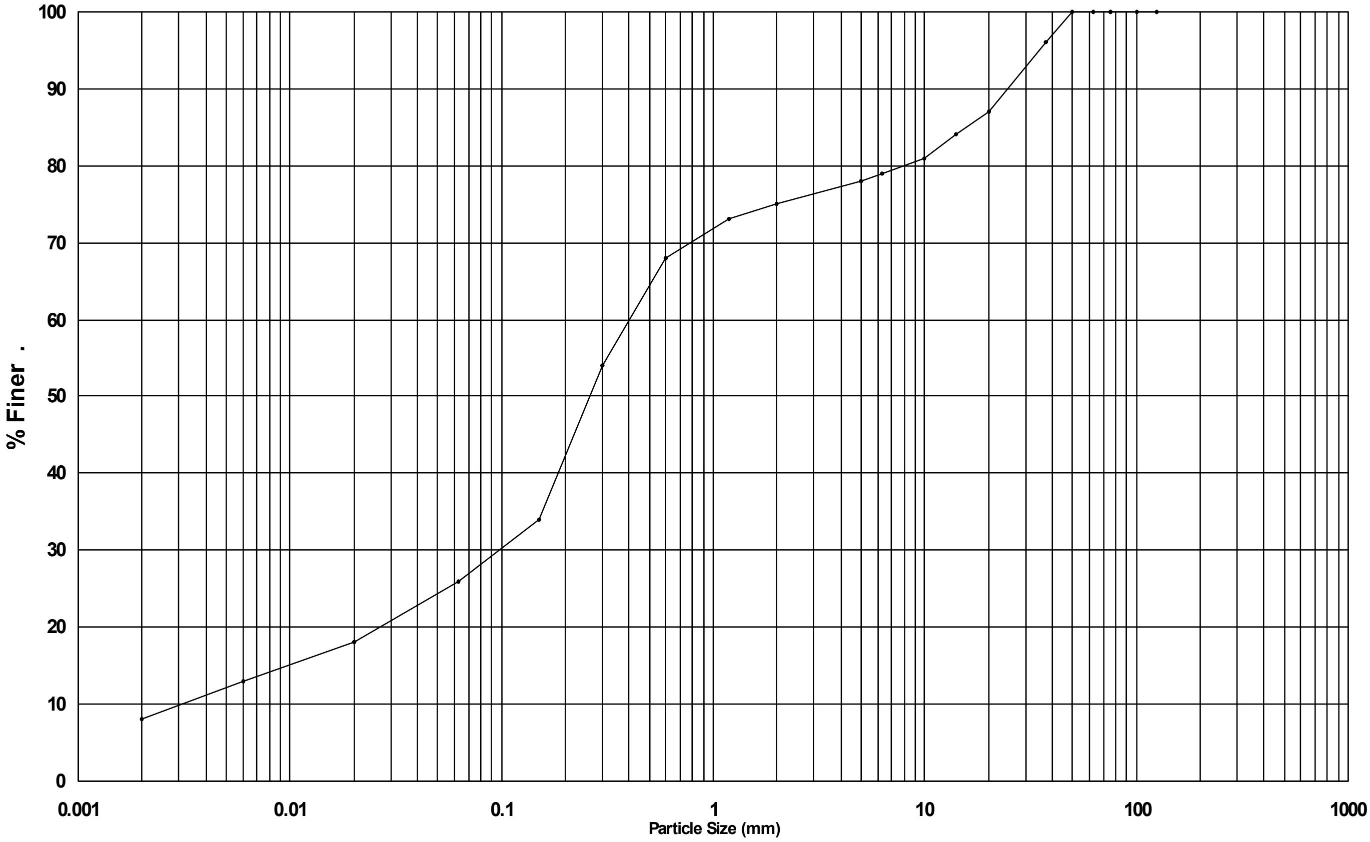
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH16
		Sample Depth	2.00-2.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84089

Sample Description

Brown slightly sandy slightly gravelly clayey SILT.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	8
SILT	18
SAND	49
GRAVEL	25
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	96
20 mm	87
14 mm	84
10 mm	81
6.3 mm	79
5 mm	78
2 mm	75
1.18 mm	73
600 µm	68
300 µm	54
150 µm	34

Size	% Finer
63 µm	26
20 µm	18
6 µm	13
2 µm	8

Uniformity Coefficient	
138.53	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed as "Non Standard" due to sample mass not being in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

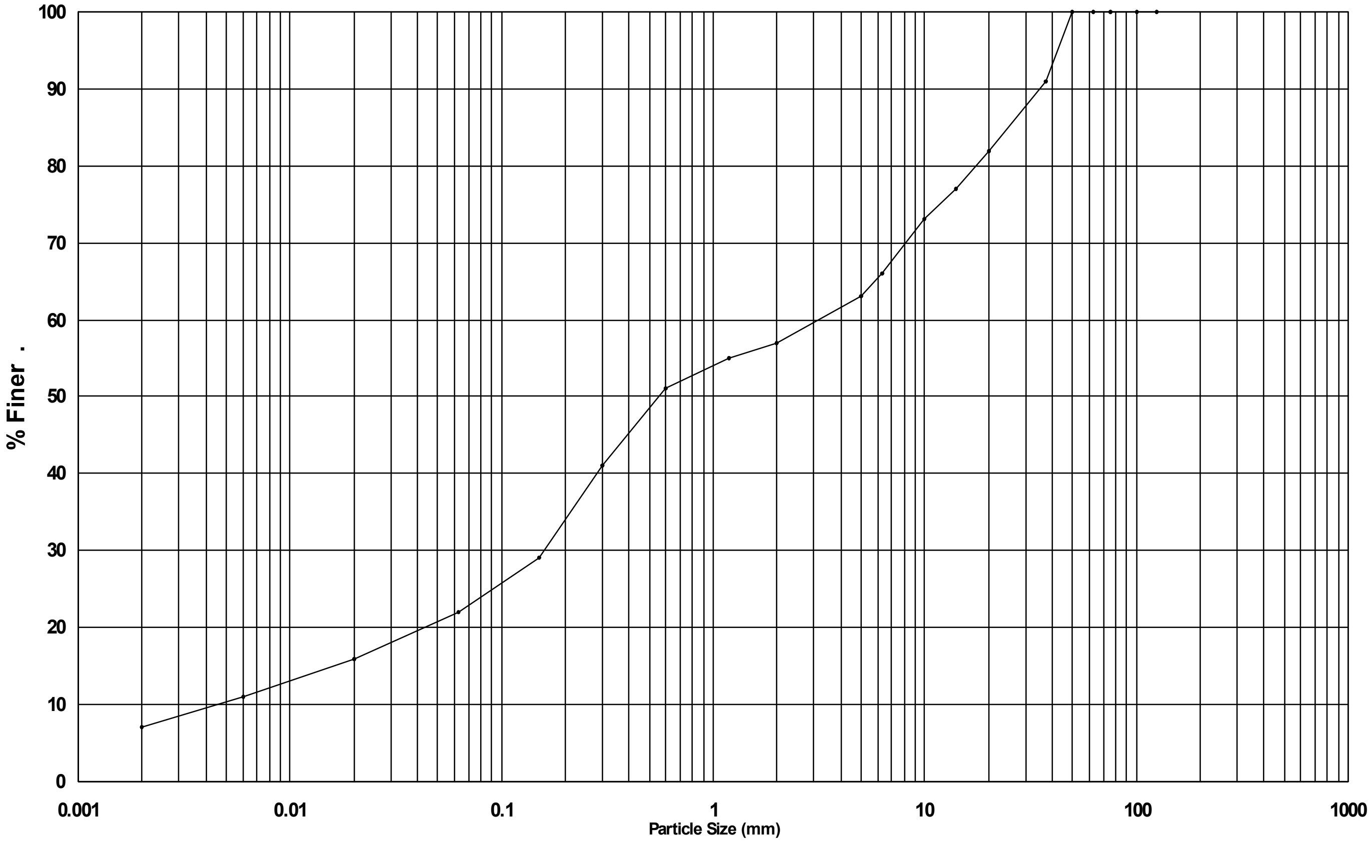
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH18
		Sample Depth	3.00-3.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84098

Sample Description

Brown clayey silty very sandy GRAVEL.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	7
SILT	15
SAND	35
GRAVEL	43
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	91
20 mm	82
14 mm	77
10 mm	73
6.3 mm	66
5 mm	63
2 mm	57
1.18 mm	55
600 µm	51
300 µm	41
150 µm	29

Size	% Finer
63 µm	22
20 µm	16
6 µm	11
2 µm	7

Uniformity Coefficient	
650.19	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed as "Non Standard" due to sample mass not being in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

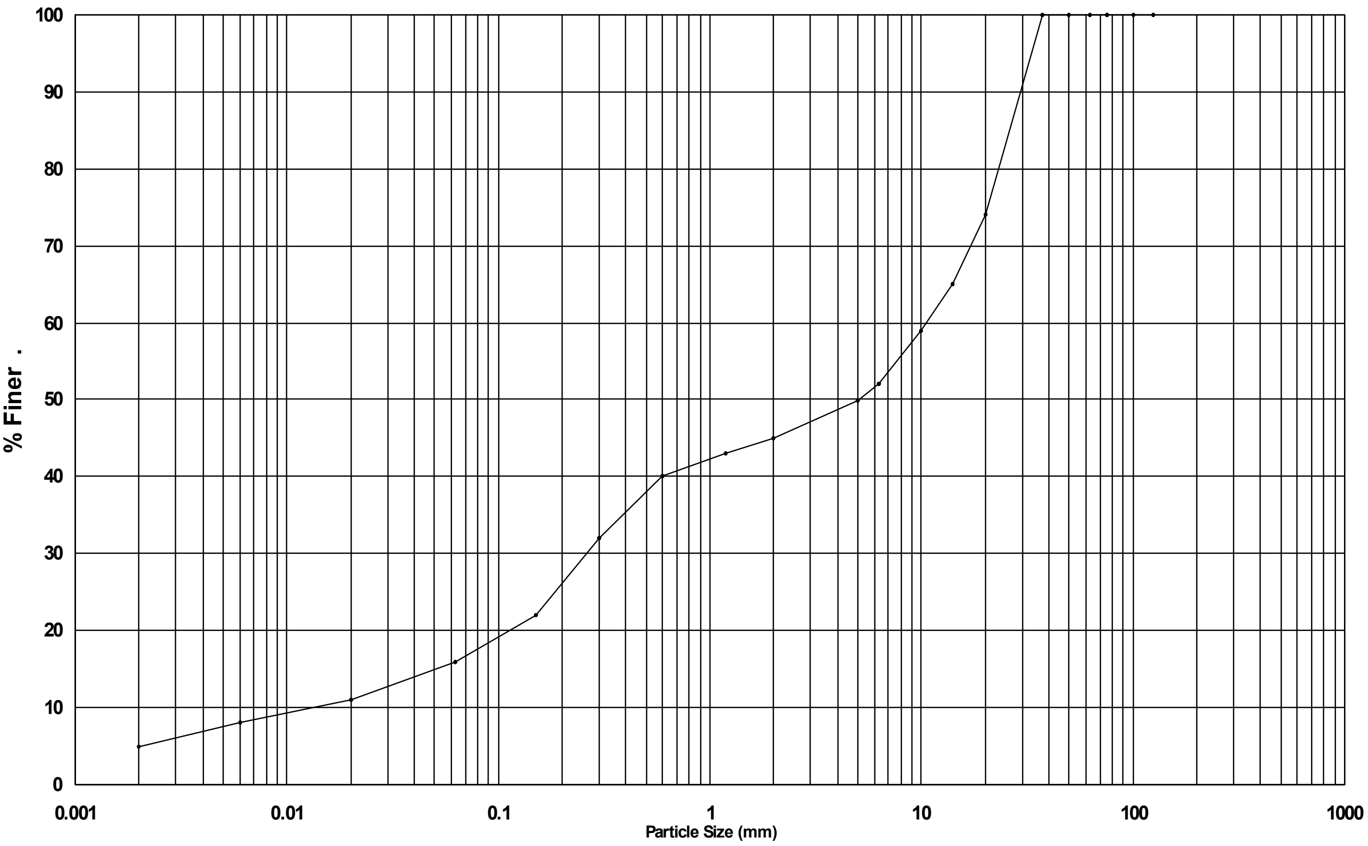
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH19
		Sample Depth	4.00-4.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84102

Sample Description

Brown clayey silty very sandy GRAVEL.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	5
SILT	11
SAND	29
GRAVEL	55
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
20 mm	74
14 mm	65
10 mm	59
6.3 mm	52
5 mm	50
2 mm	45
1.18 mm	43
600 µm	40
300 µm	32
150 µm	22

Size	% Finer
63 µm	16
20 µm	11
6 µm	8
2 µm	5

Uniformity Coefficient	
753.07	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

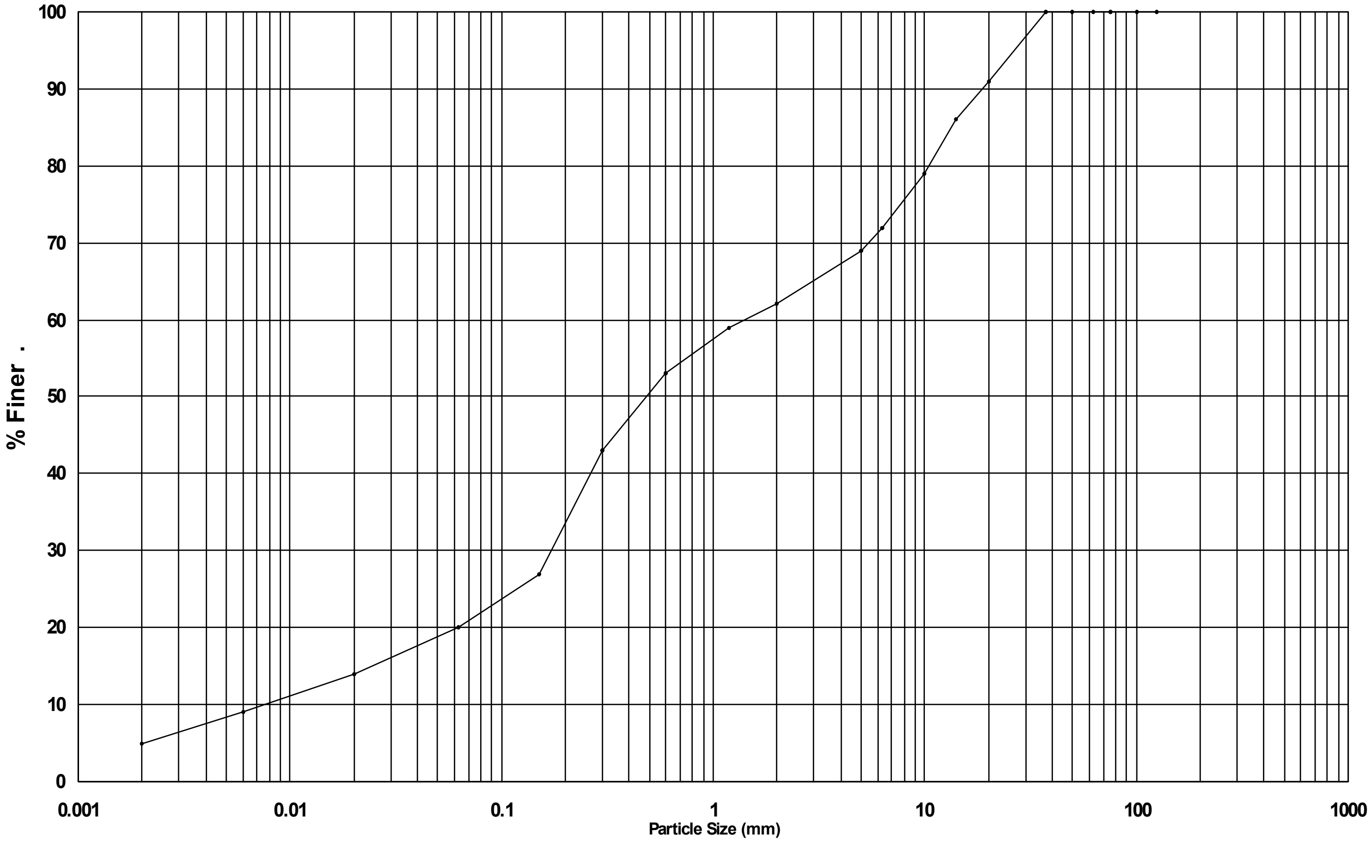
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH20
		Sample Depth	1.20-1.70m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84104

Sample Description

Brown clayey silty very gravelly SAND.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	5
SILT	15
SAND	42
GRAVEL	38
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
20 mm	91
14 mm	86
10 mm	79
6.3 mm	72
5 mm	69
2 mm	62
1.18 mm	59
600 µm	53
300 µm	43
150 µm	27

Size	% Finer
63 µm	20
20 µm	14
6 µm	9
2 µm	5

Uniformity Coefficient	
174.39	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

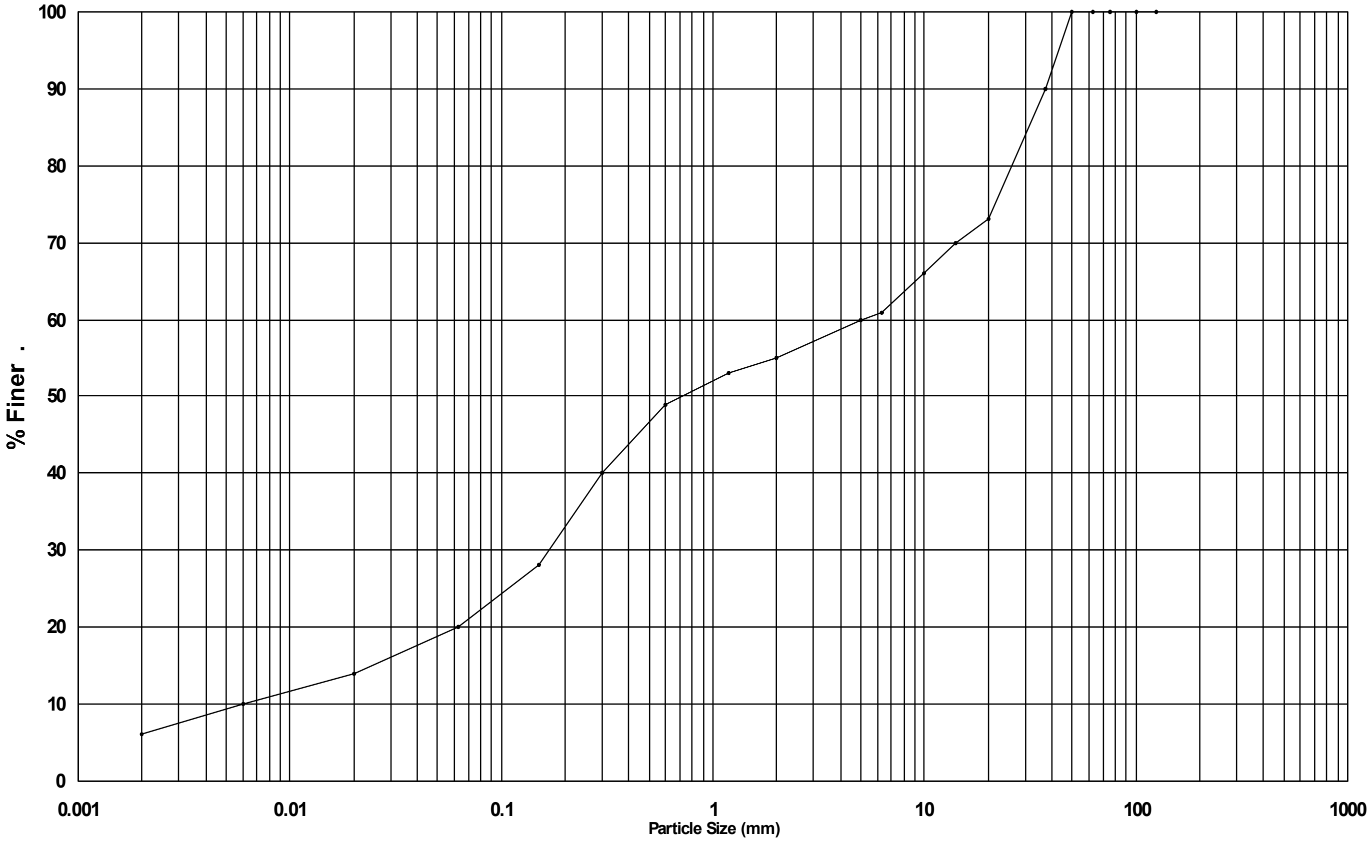
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH21
		Sample Depth	2.00-2.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84107

Sample Description

Brown clayey silty very sandy GRAVEL.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	6
SILT	14
SAND	35
GRAVEL	45
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	90
20 mm	73
14 mm	70
10 mm	66
6.3 mm	61
5 mm	60
2 mm	55
1.18 mm	53
600 µm	49
300 µm	40
150 µm	28

Size	% Finer
63 µm	20
20 µm	14
6 µm	10
2 µm	6

Uniformity Coefficient	
792.36	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed as "Non Standard" due to sample mass not being in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

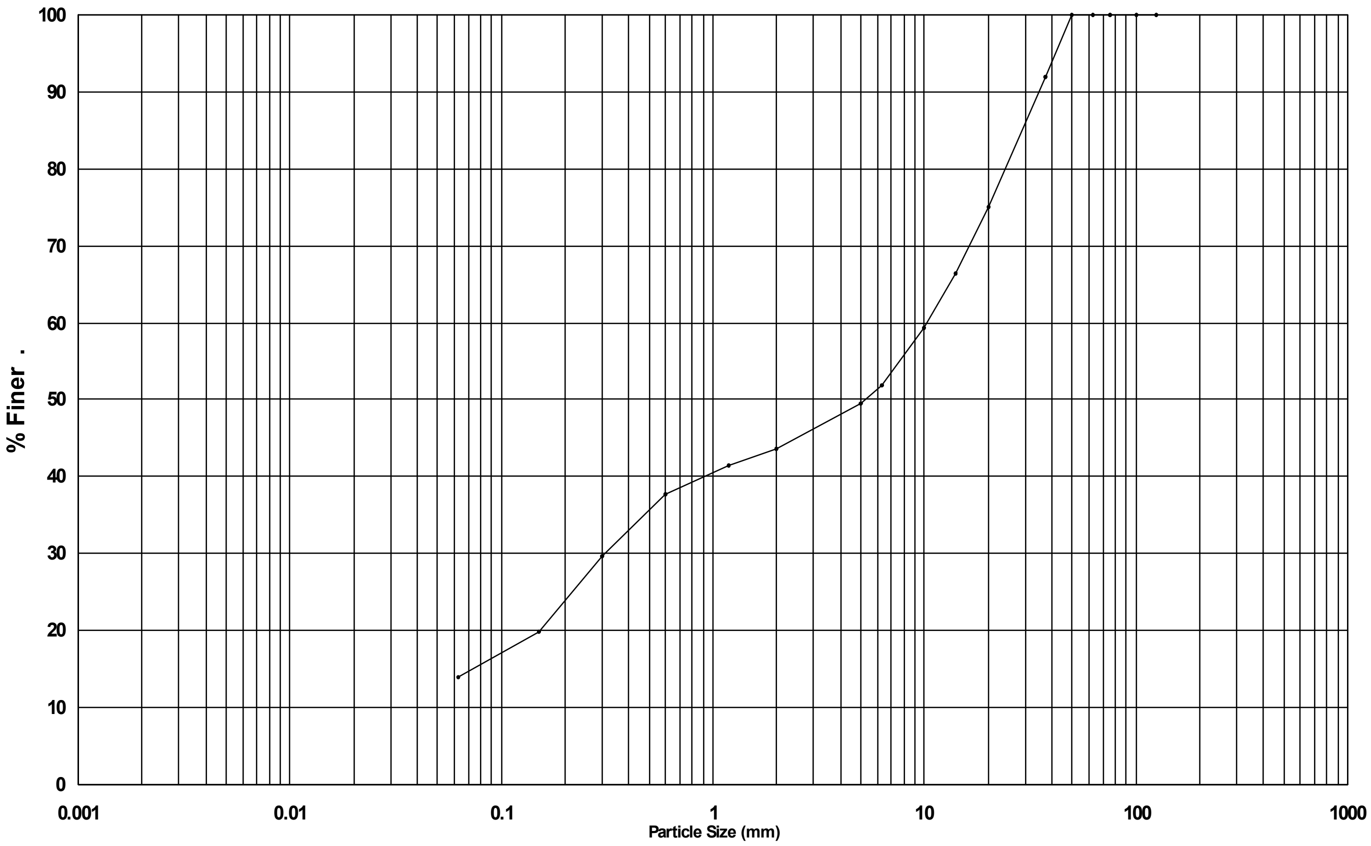
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH22
		Sample Depth	2.00-2.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84109

Sample Description

Brown silty/clayey very sandy GRAVEL



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	**% of each**
SILT (including CLAY)	14
SAND	30
GRAVEL	56
COBBLES	0
BOULDERS	0

Size	**% Finer**
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	92
20 mm	75
14 mm	66
10 mm	59
6.3 mm	52
5 mm	49
2 mm	44
1.18 mm	41
600 µm	38
300 µm	30
150 µm	20

Size	**% Finer**
63 µm	14

Uniformity Coefficient	
Not Available	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	
Pre-treated with	
% loss on Pre-treatment	
Particle Density	

Remarks Sieve:-Test performed as "Non Standard" due to sample mass not being in accordance with BS EN ISO 17892-4:2016

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - Particle Size Distribution

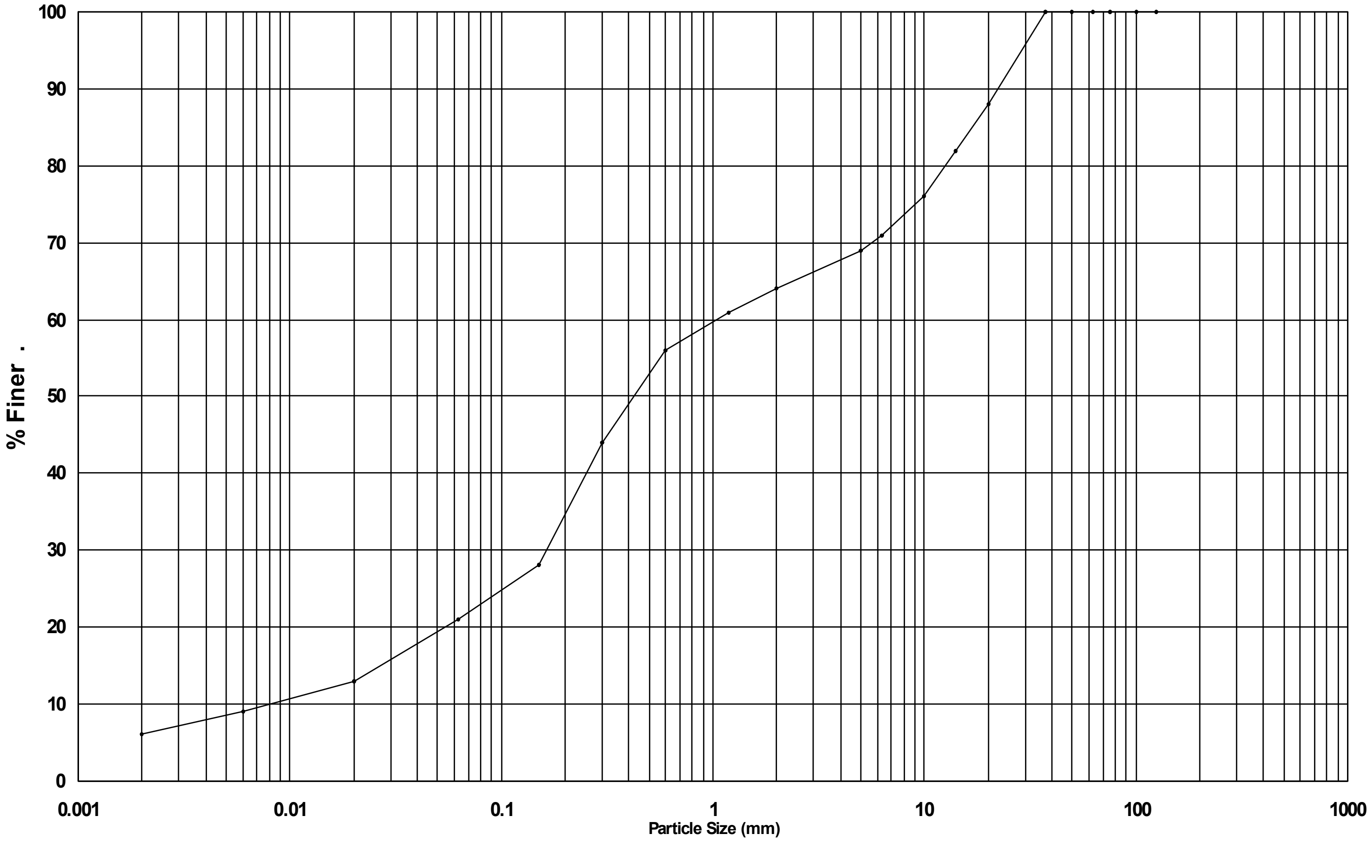
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH23
Sample Depth 3.00-3.50m
Sample Type B
Sample Ref N84114

Sample Description

Brown clayey silty very gravelly SAND.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	6
SILT	15
SAND	43
GRAVEL	36
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
20 mm	88
14 mm	82
10 mm	76
6.3 mm	71
5 mm	69
2 mm	64
1.18 mm	61
600 µm	56
300 µm	44
150 µm	28

Size	% Finer
63 µm	21
20 µm	13
6 µm	9
2 µm	6

Uniformity Coefficient	
133.66	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Particle Size Distribution*

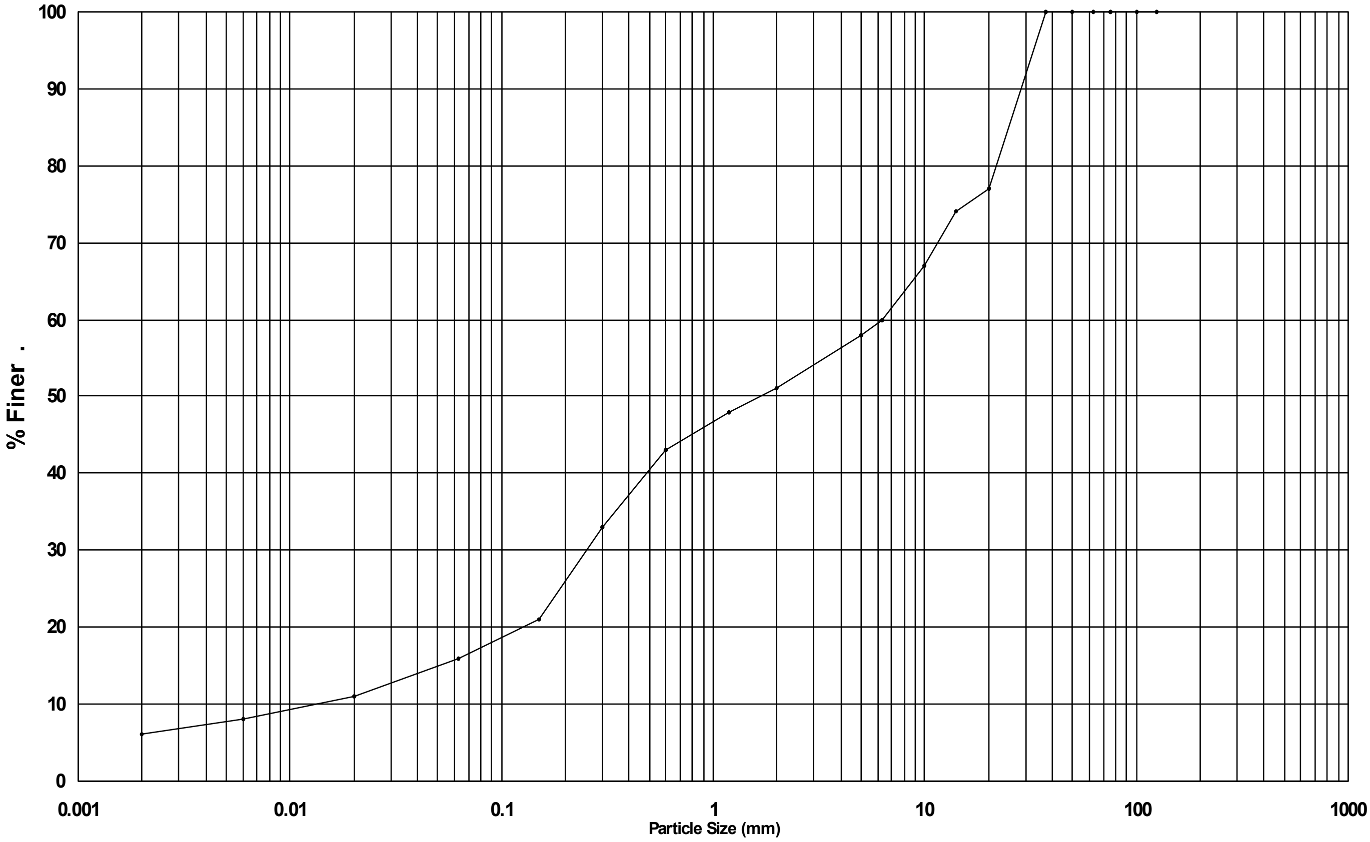
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH27
Sample Depth 1.20-1.70m
Sample Type B
Sample Ref N84128

Sample Description

Brown clayey silty very sandy GRAVEL.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	6
SILT	10
SAND	35
GRAVEL	49
COBBLES	0
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
20 mm	77
14 mm	74
10 mm	67
6.3 mm	60
5 mm	58
2 mm	51
1.18 mm	48
600 µm	43
300 µm	33
150 µm	21

Size	% Finer
63 µm	16
20 µm	11
6 µm	8
2 µm	6

Uniformity Coefficient	
526.38	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Sieve:-Test performed in accordance with BS EN ISO 17892-4:2016
Pipette:-Test performed in accordance with BS EN ISO 17892-4:2016

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *Unconsolidated Undrained Triaxial Test*

Project: NEWPORT QUINN PHASE 2

Project No: PN224395

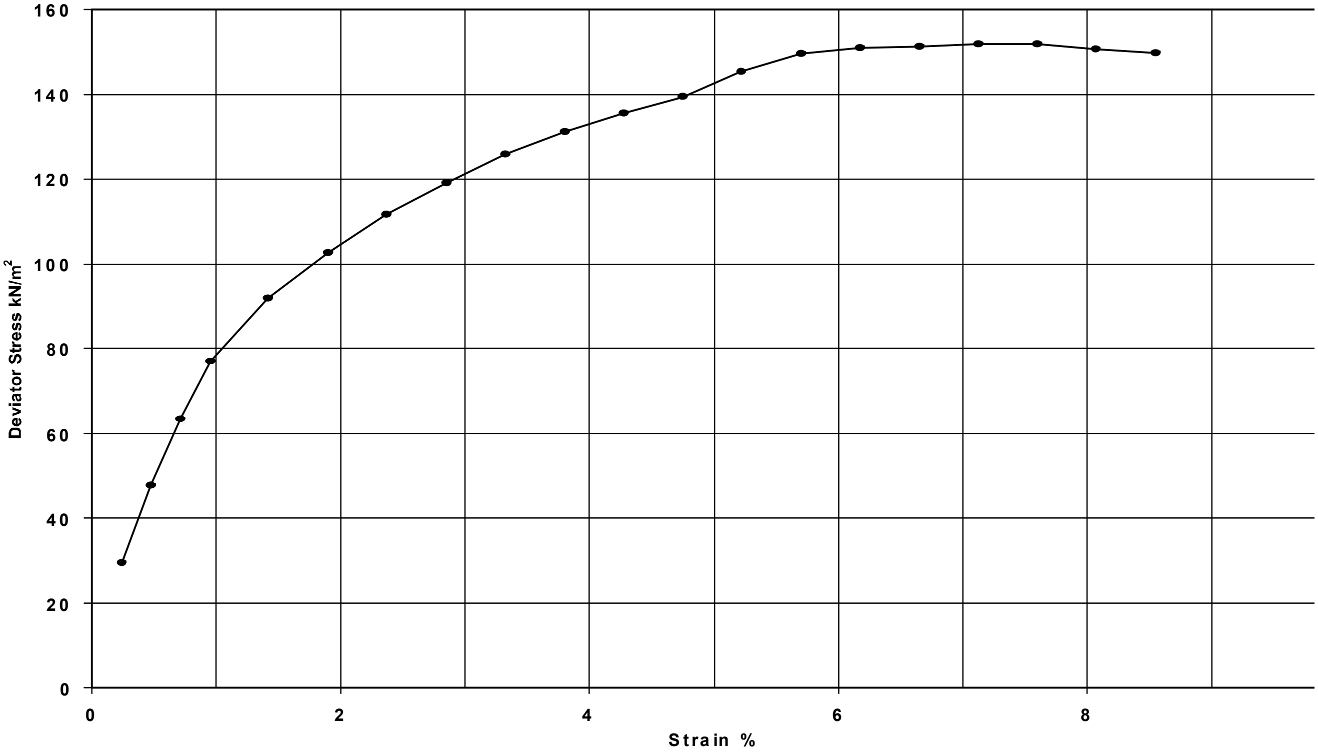
Hole BH10
Sample Depth 5.00-5.45m
Sample Type UT
Sample Ref N84072

Sample Description

The following samples were combined to perform this test:

Brown slightly gravelly sandy silty CLAY

BS EN ISO 17892-8:2018



	Stage 1	Stage 2	Stage 3
Test Type	Single Stage		
Sample Condition	Undisturbed		
Orientation of sample	Vertical		
Initial Diameter (mm)	102.18		
Initial Length (mm)	210.62		
Initial Water Content (%)	32.2		
Initial Bulk Density (Mg/m^3)	1.98		
Initial Dry Density (Mg/m^3)	1.50		
Particle Density (Mg/m^3)	2.65 Assumed		
Cell Pressure (kPa)	100		
'Specimen Height' at start of Shearing Stage (mm)	210.56		
Membrane Thickness/Correction (mm/kPa)	100 / 0.0000		
Rate of Strain (%/min)	1.9		
Corrected Deviator Stress (kPa)	152		
Undrained Shear Strength (kPa)	76		
Strain at Failure (%)	7.6		
Failure Zone Water Content (%)	26.2		
Water Content (after test) (%)			
Mode of Failure	Intermediate		

Strain %	Corrected Deviator Stress kN/m^2	Strain %	Corrected Deviator Stress kN/m^2
0.2	29.4		
0.5	47.6		
0.7	63.4		
0.9	77.0		
1.4	91.9		
1.9	102.5		
2.4	111.6		
2.8	119.1		
3.3	125.7		
3.8	131.2		
4.3	135.5		
4.7	139.4		
5.2	145.3		
5.7	149.6		
6.2	150.9		
6.6	151.3		
7.1	151.7		
7.6	151.7		
8.1	150.6		
8.5	149.7		

Remarks

02/11/2022

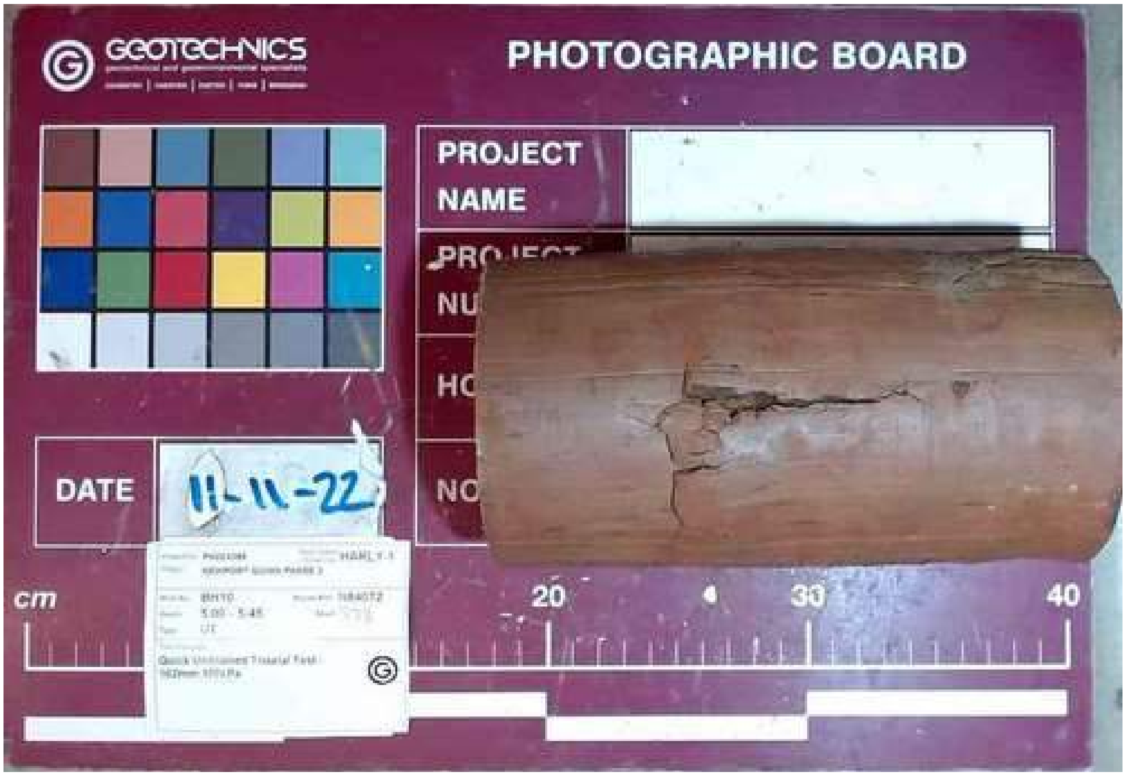
GEOTECHNICS

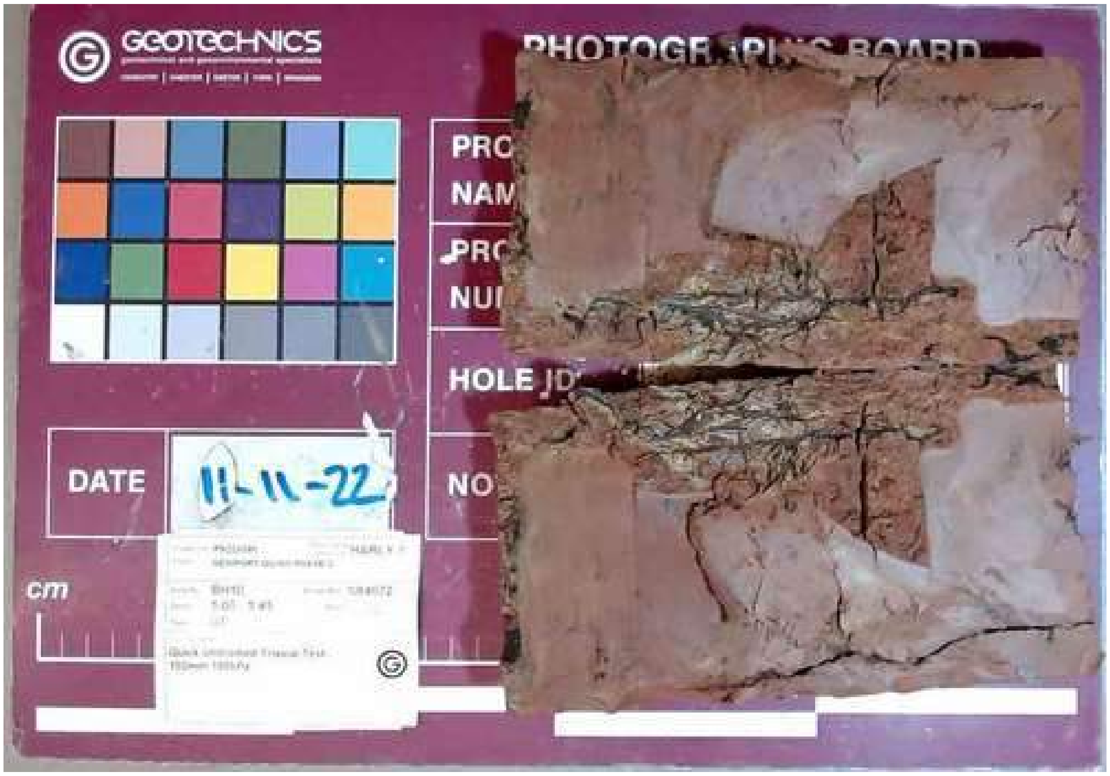
LABORATORY RESULTS - *Unconsolidated Undrained Triaxial Test*

Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH10
Sample Depth 5.00-5.45m
Sample Type UT
Sample Ref N84072





Remarks

02/11/2022

GEOTECHNICS

LABORATORY RESULTS - *Unconsolidated Undrained Triaxial Test*

Project: NEWPORT QUINN PHASE 2

Project No: PN224395

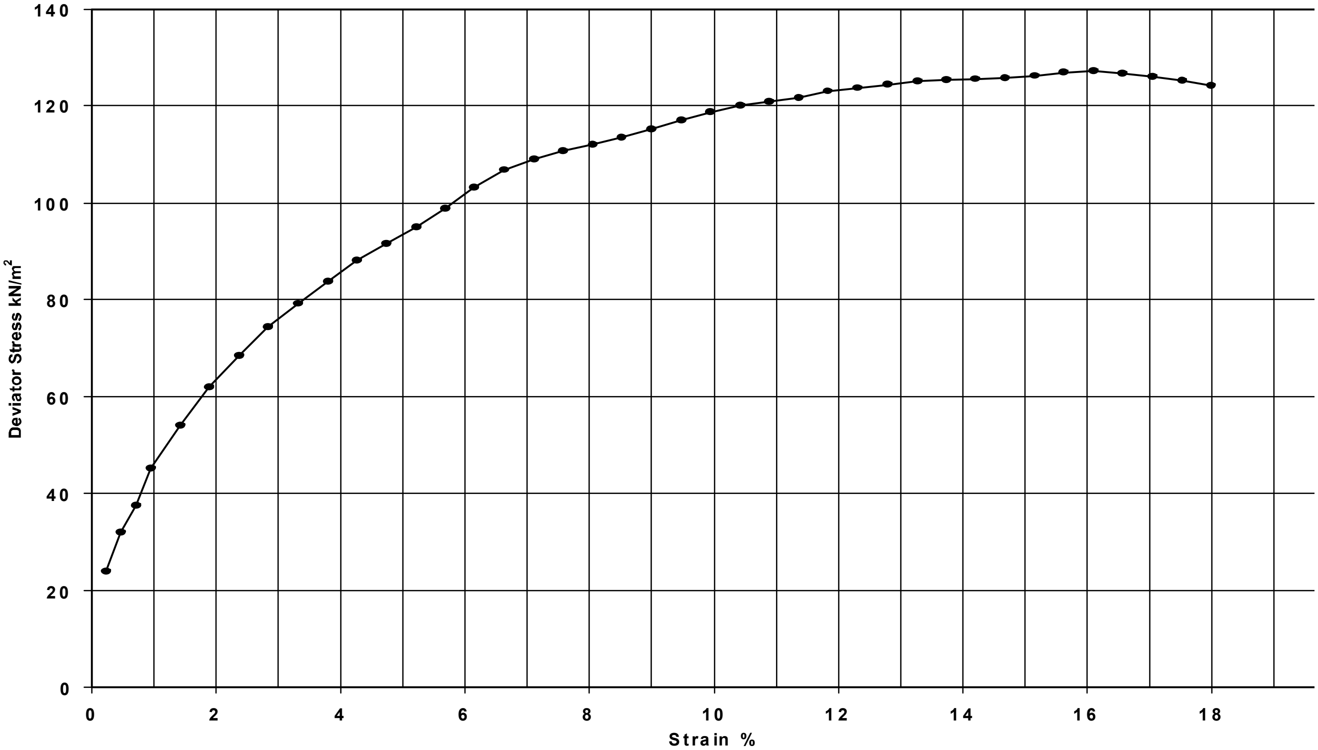
Hole BH15
Sample Depth 3.00-3.45m
Sample Type UT
Sample Ref N84086

Sample Description

The following samples were combined to perform this test:

Firm reddish brown slightly gravelly silty CLAY

BS EN ISO 17892-8:2018



	Stage 1	Stage 2	Stage 3
Test Type	Single Stage		
Sample Condition	Undisturbed		
Orientation of sample	Vertical		
Initial Diameter (mm)	102.34		
Initial Length (mm)	211.24		
Initial Water Content (%)	23.6		
Initial Bulk Density (Mg/m^3)	2.00		
Initial Dry Density (Mg/m^3)	1.62		
Particle Density (Mg/m^3)	2.65 Assumed		
Cell Pressure (kPa)	60		
'Specimen Height' at start of Shearing Stage (mm)	211.19		
Membrane Thickness/Correction (mm/kPa)	100 / 0.0000		
Rate of Strain (%/min)	1.9		
Corrected Deviator Stress (kPa)	127		
Undrained Shear Strength (kPa)	64		
Strain at Failure (%)	16.1		
Failure Zone Water Content (%)	24.8		
Water Content (after test) (%)			
Mode of Failure	Plastic		

Strain %	Corrected Deviator Stress kN/m^2	Strain %	Corrected Deviator Stress kN/m^2
0.2	24.0	9.9	118.7
0.5	32.0	10.4	120.1
0.7	37.4	10.9	121.0
0.9	45.1	11.4	121.7
1.4	54.1	11.8	123.0
1.9	62.0	12.3	123.8
2.4	68.5	12.8	124.5
2.8	74.3	13.3	125.1
3.3	79.2	13.7	125.5
3.8	83.7	14.2	125.6
4.3	88.1	14.7	125.8
4.7	91.5	15.1	126.2
5.2	94.9	15.6	126.9
5.7	98.7	16.1	127.3
6.2	103.2	16.6	126.8
6.6	106.9	17.0	126.1
7.1	109.1	17.5	125.3
7.6	110.7	18.0	124.3
8.0	112.0		
8.5	113.6		
9.0	115.1		
9.5	117.1		

Remarks

02/11/2022

GEOTECHNICS

LABORATORY RESULTS - *Unconsolidated Undrained Triaxial Test*

Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH15

Sample Depth 3.00-3.45m

Sample Type UT

Sample Ref N84086

Remarks

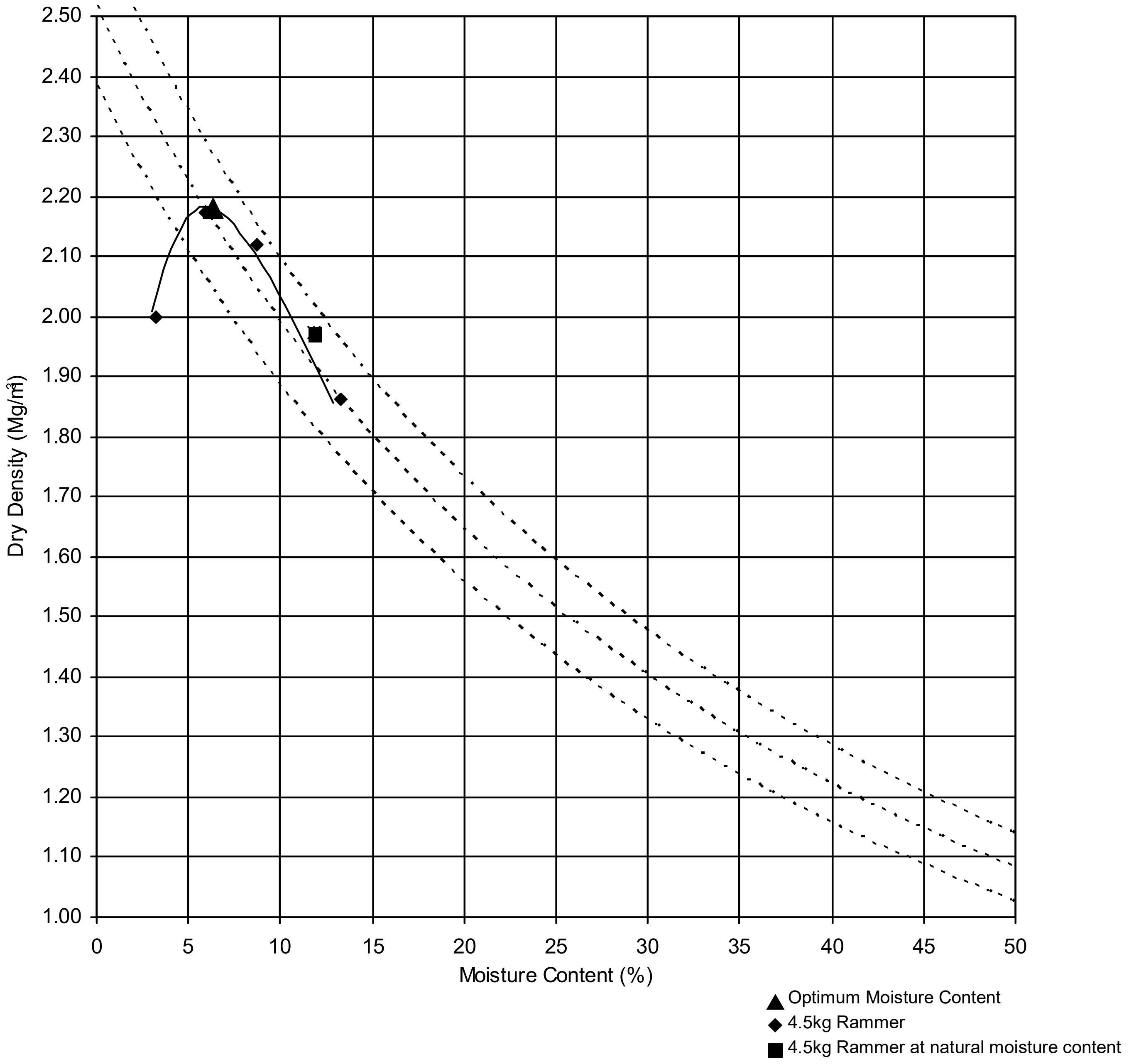
02/11/2022

GEOTECHNICS

Sheet 2 of 2

LABORATORY RESULTS - *Compaction*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH02
		Sample Depth	1.20-1.70m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84042



Optimum Moisture Content	6.3	Particles retained on	37.5mm	14 %
Maximum Dry Density	2.18 Mg/m^3		20mm sieve	23 %

Particle Density	2.65 (Ass'm)	Mg/m^3	Description	Brown slightly gravelly SAND.
Preparation	Single Sample 4.5kg Rammer			

Remarks BS1377 Part 4 1990 : Clause 3.5 and 3.6

GEOTECHNICS
geotechnical and geoenvironmental specialists

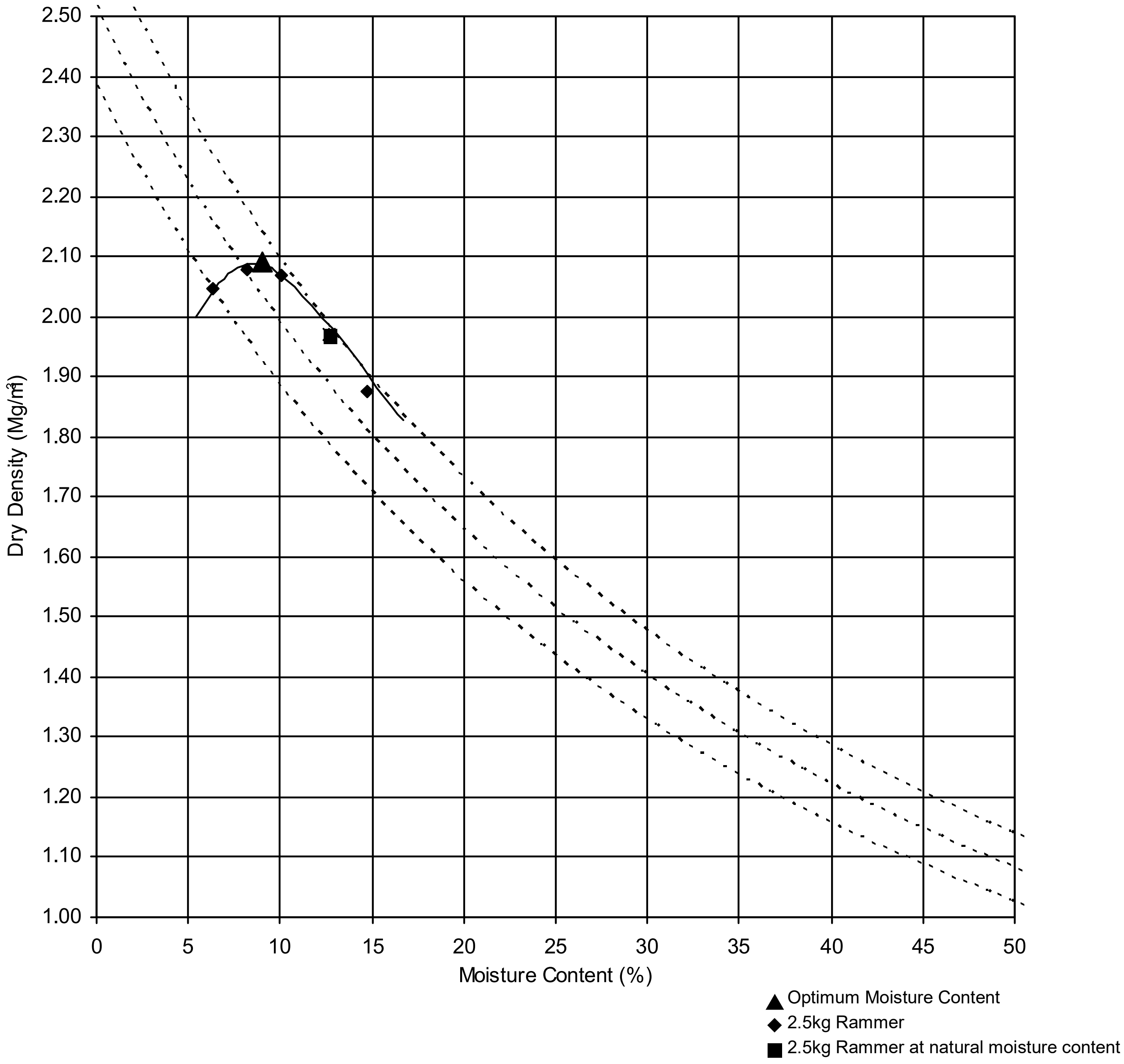
02/11/2022

LABORATORY RESULTS - Compaction

Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH04A
Sample Depth 1.20-1.70m
Sample Type B
Sample Ref N84050



Optimum Moisture Content	9.0
Maximum Dry Density	2.09 Mg/m^3

Particles retained on 37.5mm 3 %
20mm sieve 11 %

Particle Density 2.65 (Ass'm) Mg/m^3
Preparation Single Sample
2.5kg Rammer

Description Brown slightly gravelly sandy CLAY.

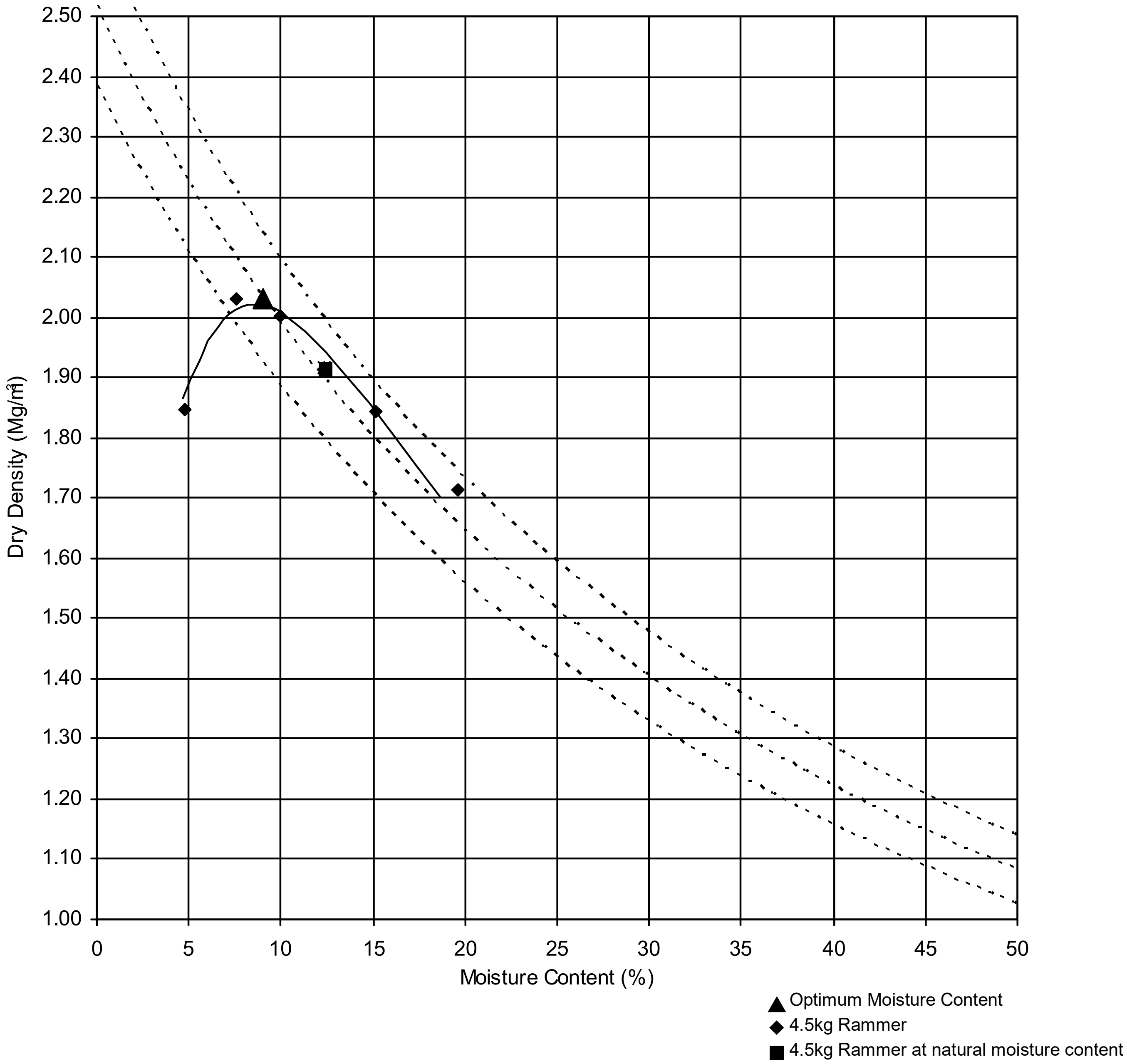
Remarks BS1377 Part 4 1990 : Clause 3.3 and 3.4

GEOTECHNICS
geotechnical and geoenvironmental specialists

02/11/2022

LABORATORY RESULTS - Compaction

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH05
		Sample Depth	2.00-2.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84052



Optimum Moisture Content	9.0		Particles retained on	37.5mm	0 %
Maximum Dry Density	2.03 Mg/m^3			20mm sieve	11 %

Particle Density 2.65 (Ass'm) Mg/m^3

Preparation Single Sample
4.5kg Rammer

Description Brow slightly gravelly slightly sandy CLAY.

Remarks BS1377 Part 4 1990 : Clause 3.5 and 3.6

GEOTECHNICS
geotechnical and geoenvironmental specialists

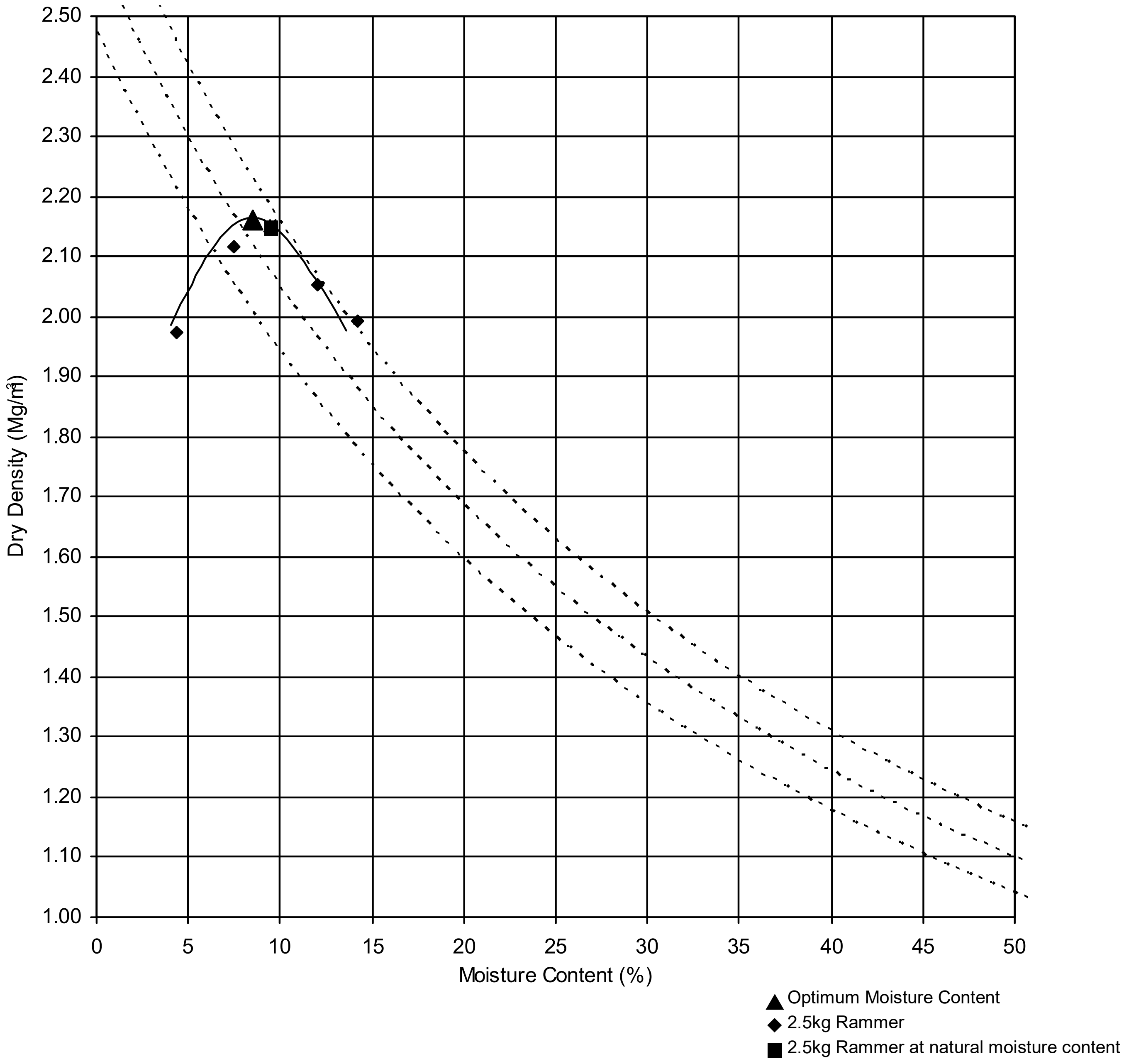
02/11/2022

LABORATORY RESULTS - *Compaction*

Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH08
Sample Depth 1.20-1.70m
Sample Type B
Sample Ref N84061



Optimum Moisture Content	8.5	
Maximum Dry Density	2.16	Mg/m^3
Particle Density	2.75 (Ass'm)	Mg/m^3
Preparation	Single Sample 2.5kg Rammer	

Particles retained on	37.5mm	11 %
	20mm sieve	34 %
Description	Brown slightly sandy clayey GRAVEL.	

Remarks BS1377 Part 4 1990 : Clause 3.3 and 3.4

GEOTECHNICS
geotechnical and geoenvironmental specialists

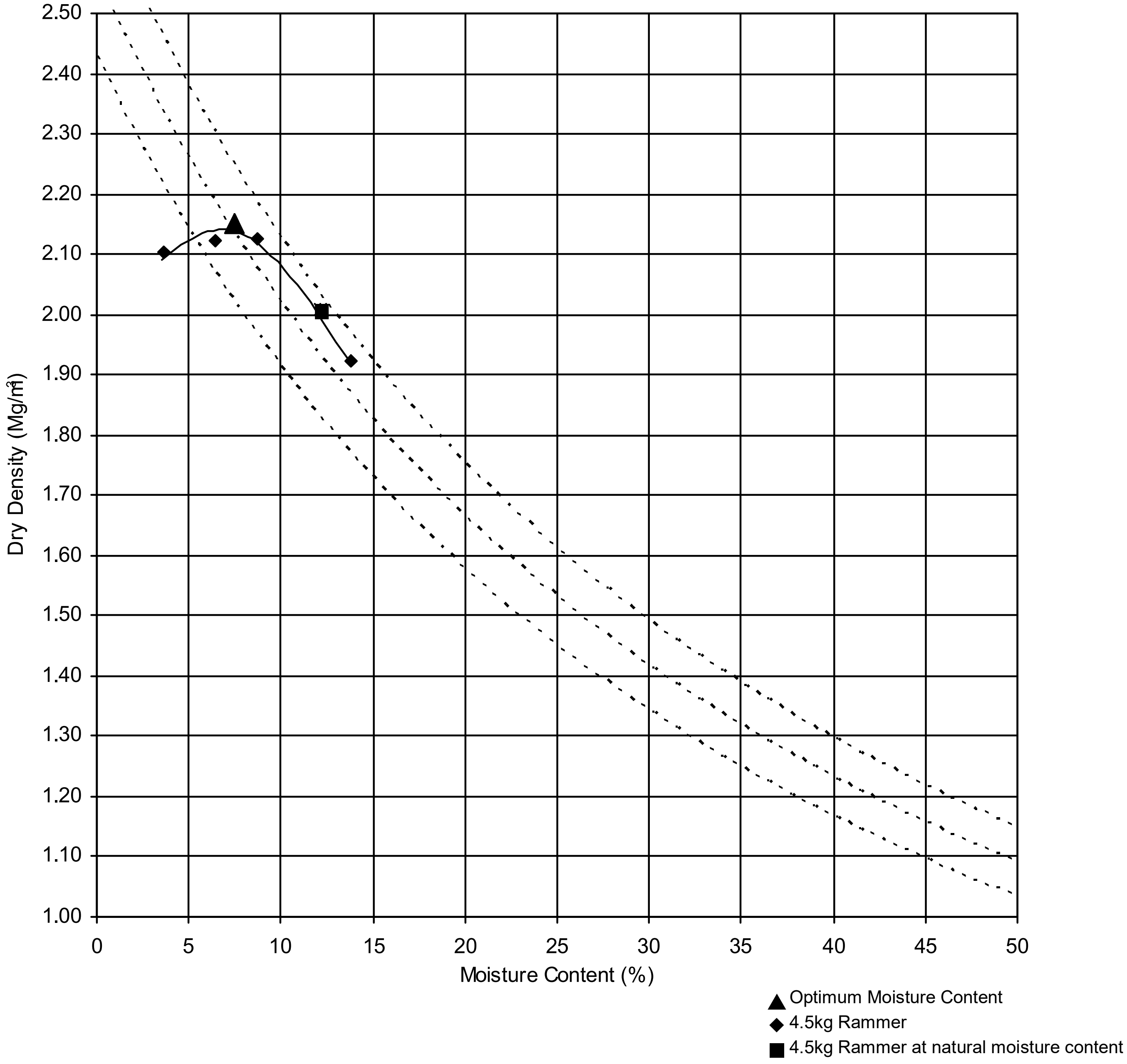
02/11/2022

LABORATORY RESULTS - *Compaction*

Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH13
Sample Depth 1.20-1.70m
Sample Type B
Sample Ref N84079



Optimum Moisture Content	7.5	Particles retained on	37.5mm	5 %
Maximum Dry Density	2.15 Mg/m^3		20mm sieve	13 %

Particle Density 2.70 (Ass'm) Mg/m^3
Preparation Single Sample
4.5kg Rammer

Description Brown slightly gravelly clayey SAND.

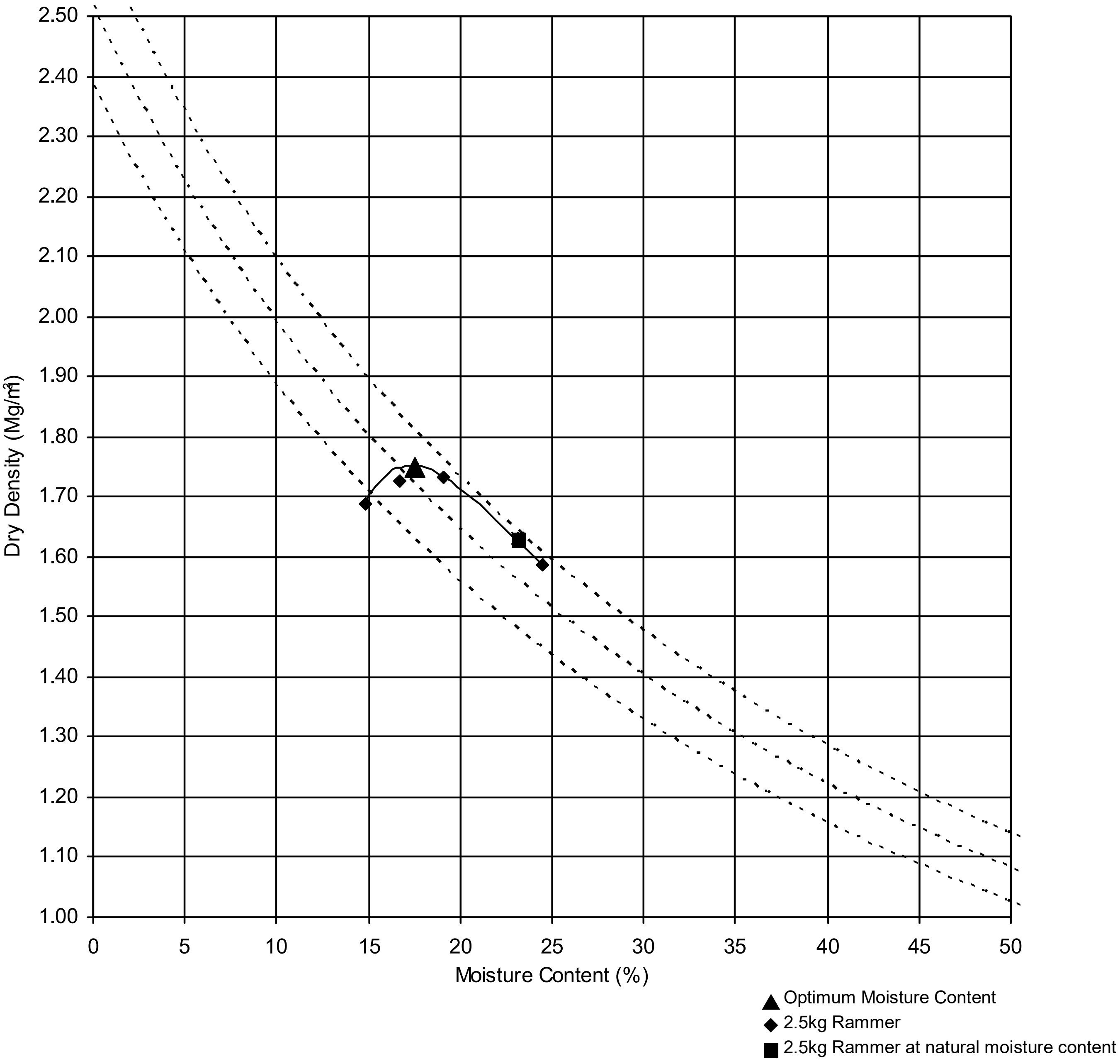
Remarks BS1377 Part 4 1990 : Clause 3.5 and 3.6

GEOTECHNICS
geotechnical and geoenvironmental specialists

02/11/2022

LABORATORY RESULTS - Compaction

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH14A
		Sample Depth	3.00-3.45m
Project No:	PN224395	**Sample Type**	D
		Sample Ref	N84084



Optimum Moisture Content	17.5		Particles retained on	37.5mm	0 %
Maximum Dry Density	1.75 Mg/m^3			20mm sieve	0 %
Particle Density	2.65 (Ass'm)	Mg/m^3	Description	Brown mottled red slightly gravelly CLAY.	
Preparation	Single Sample 2.5kg Rammer				

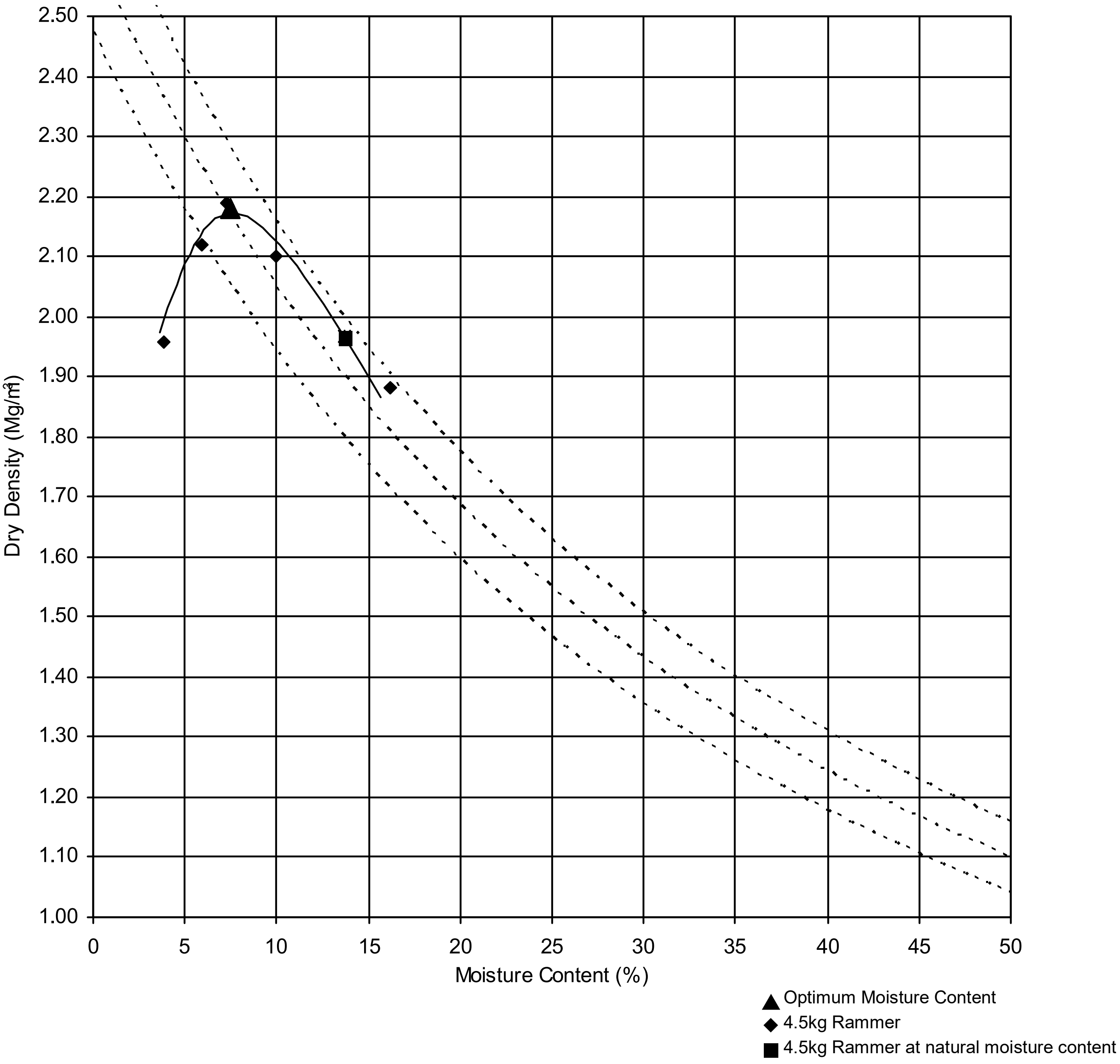
Remarks AGS BS1377 Part 4 1990 : Clause 3.3 and 3.4
Combined with B 4.00-4.50m

GEOTECHNICS
geotechnical and geoenvironmental specialists

02/11/2022

LABORATORY RESULTS - *Compaction*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH16
		Sample Depth	3.00-3.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84090



Optimum Moisture Content	7.5		Particles retained on	37.5mm	18 %
Maximum Dry Density	2.18 Mg/m^3			20mm sieve	27 %
Particle Density	2.75 (Ass'm)	Mg/m^3	Description	Brown slightly sandy slightly gravelly clayey SILT.	
Preparation	Single Sample 4.5kg Rammer				

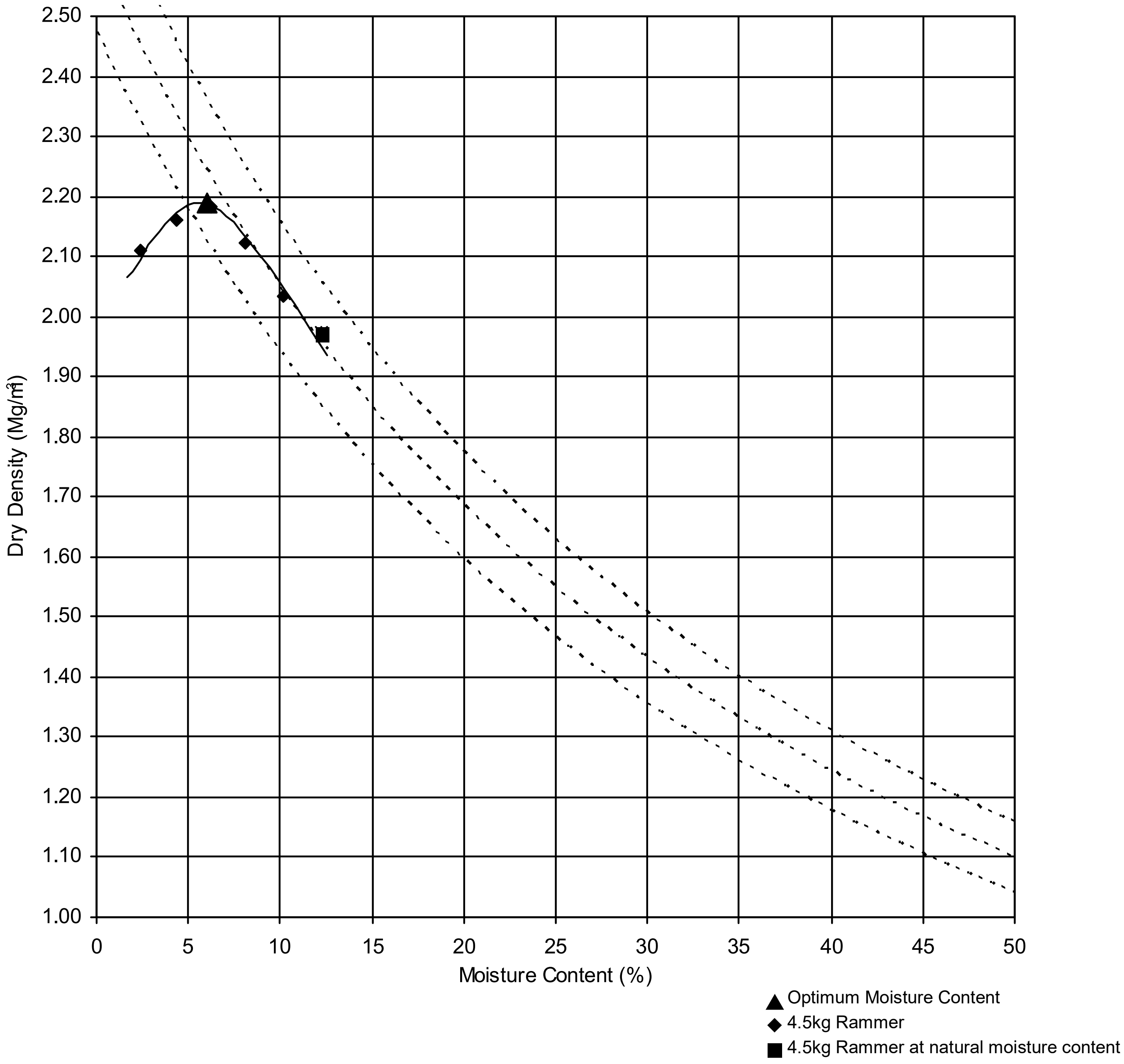
Remarks BS1377 Part 4 1990 : Clause 3.5 and 3.6

geotechnical and geoenvironmental specialists

02/11/2022

LABORATORY RESULTS - *Compaction*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH17A
		Sample Depth	2.00-2.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84093



Optimum Moisture Content	6.0	
Maximum Dry Density	2.19 Mg/m^3	

Particles retained on 37.5mm 5 %

20mm sieve 21 %

Particle Density	2.75 (Ass'm)	Mg/m^3
Preparation	Single Sample 4.5kg Rammer	

Description Brown slightly gravelly slightly sandy CLAY.

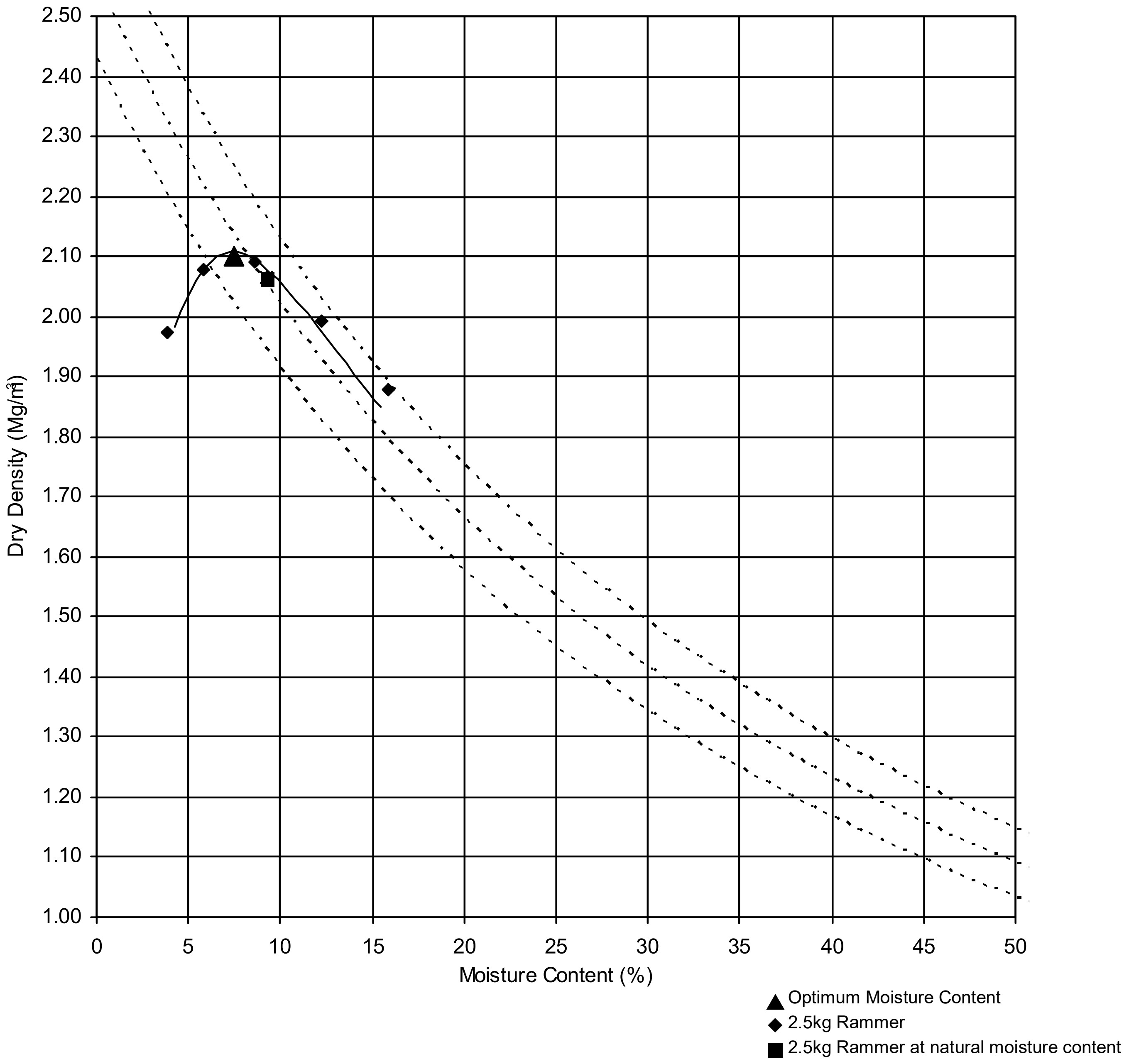
Remarks BS1377 Part 4 1990 : Clause 3.5 and 3.6

GEOTECHNICS geotechnical and geoenvironmental specialists

02/11/2022

LABORATORY RESULTS - Compaction

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH19
		Sample Depth	2.00-2.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84101



Optimum Moisture Content	7.5	Particles retained on	37.5mm	8 %
Maximum Dry Density	2.10 Mg/m^3		20mm sieve	18 %

Particle Density 2.70 (Ass'm) Mg/m^3

Preparation Single Sample
2.5kg Rammer

Description Brown clayey sandy GRAVEL.

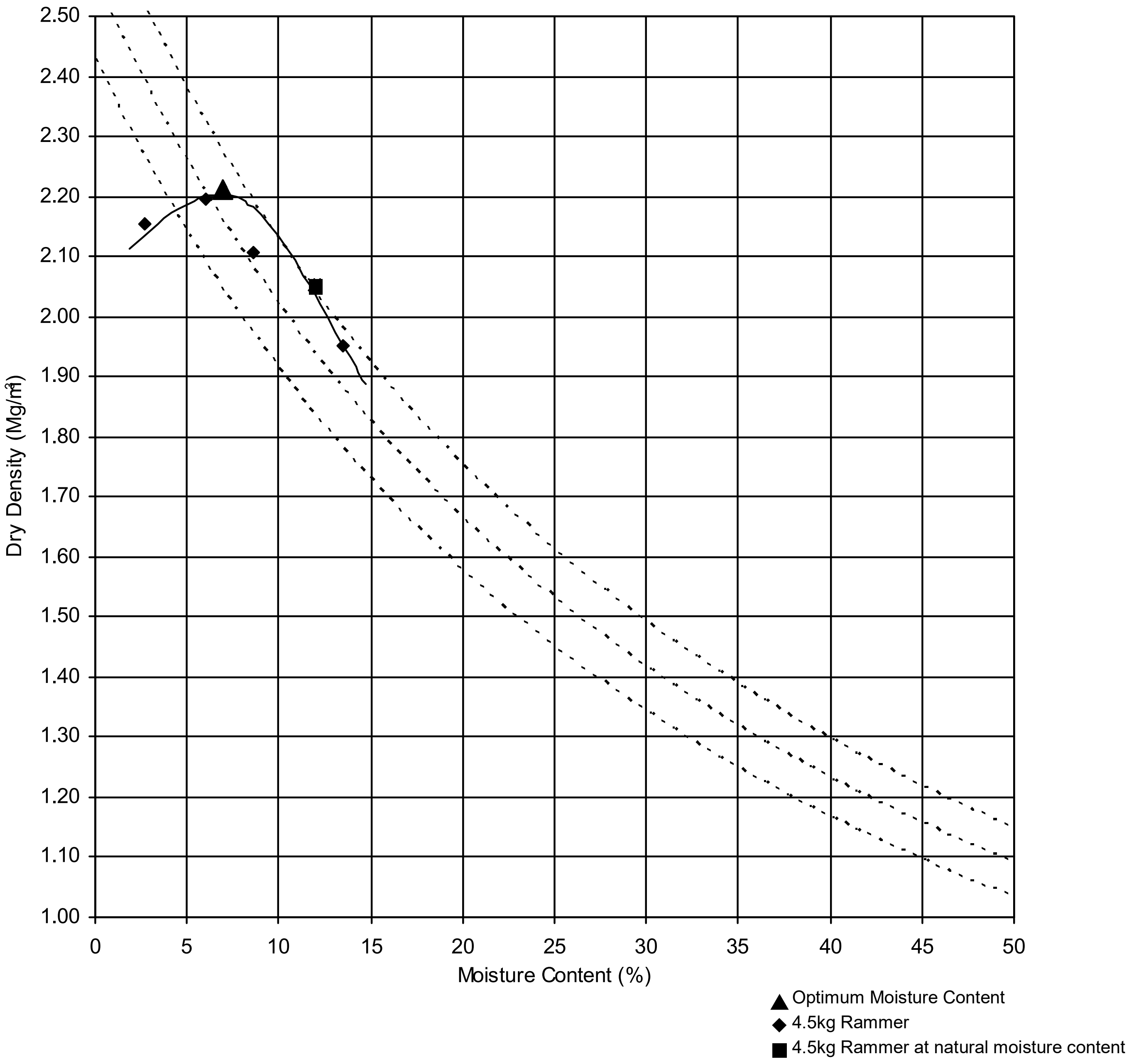
Remarks BS1377 Part 4 1990 : Clause 3.3 and 3.4

GEOTECHNICS
geotechnical and geoenvironmental specialists

02/11/2022

LABORATORY RESULTS - Compaction

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH20
		Sample Depth	3.00-3.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84105



Optimum Moisture Content	7.0		Particles retained on	37.5mm	6 %
Maximum Dry Density	2.21 Mg/m^3			20mm sieve	28 %
Particle Density	2.70 (Ass'm)	Mg/m^3	Description	Brown clayey silty very gravelly SAND.	
Preparation	Single Sample 4.5kg Rammer				

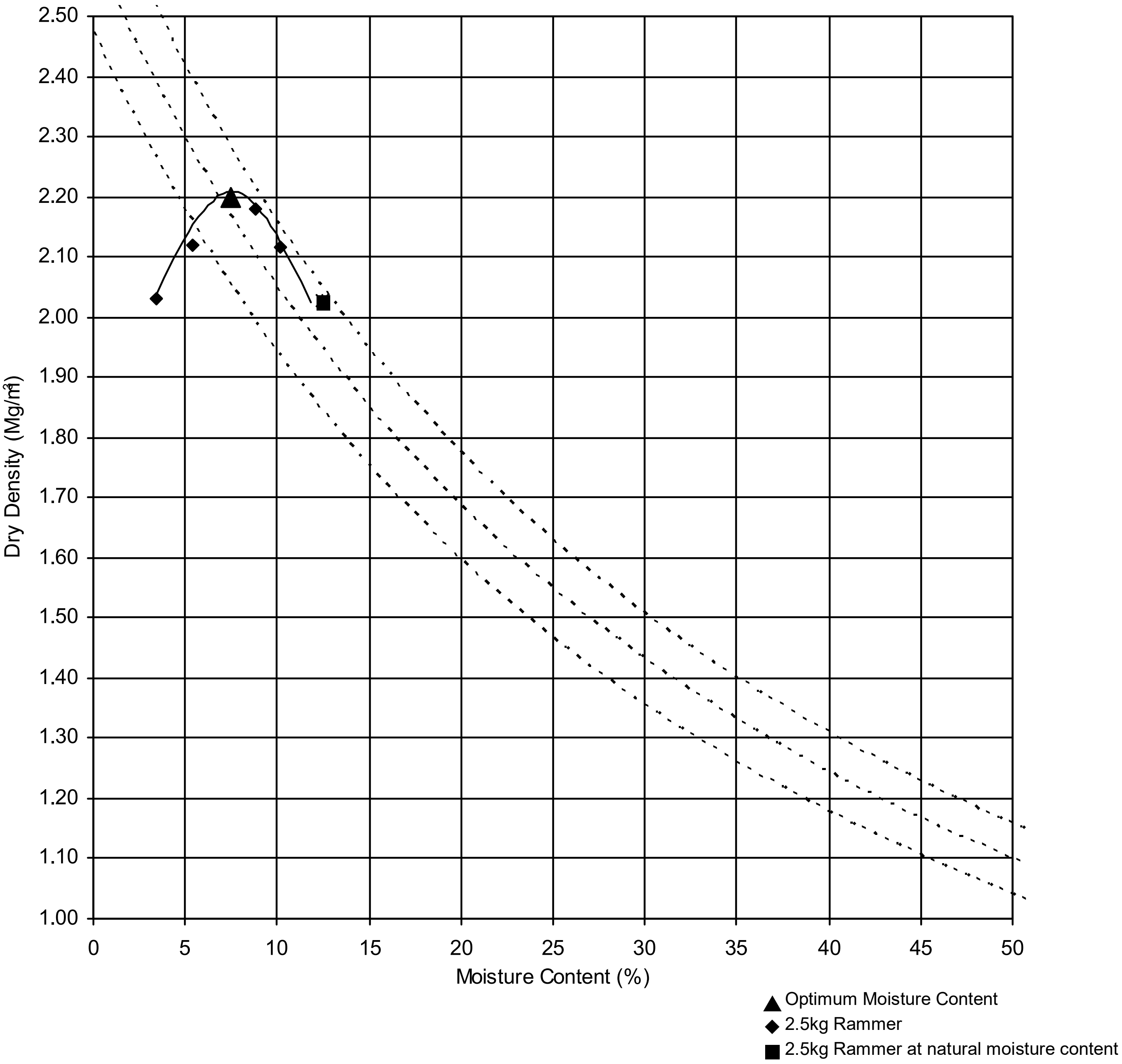
Remarks BS1377 Part 4 1990 : Clause 3.5 and 3.6

GEOTECHNICS
geotechnical and geoenvironmental specialists

02/11/2022

LABORATORY RESULTS - *Compaction*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH24
		Sample Depth	1.20-1.70m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84116



Optimum Moisture Content	7.5	Particles retained on	37.5mm	6 %
Maximum Dry Density	2.20 Mg/m^3		20mm sieve	9 %
Particle Density	2.75 (Ass'm) Mg/m^3	Description	Brown slightly sandy slightly gravelly CLAY with cobbles.	
Preparation	Single Sample 2.5kg Rammer			

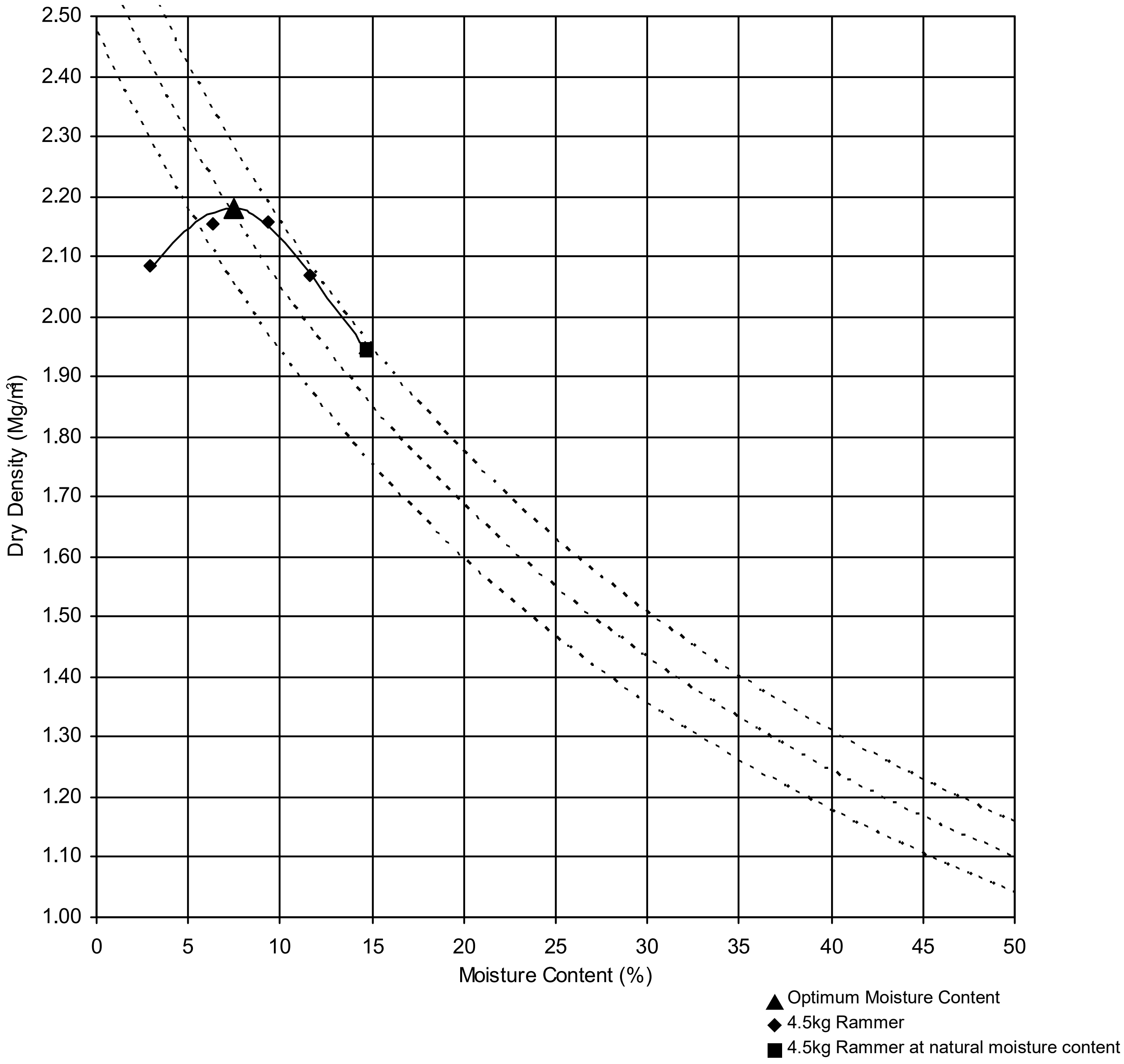
Remarks AGS BS1377 Part 4 1990 : Clause 3.3 and 3.4

GEOTECHNICS
geotechnical and geoenvironmental specialists

02/11/2022

LABORATORY RESULTS - *Compaction*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH25
		Sample Depth	1.20-1.70m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84121



Optimum Moisture Content	7.5	
Maximum Dry Density	2.18 Mg/m^3	

Particles retained on 37.5mm 5 %

20mm sieve 16 %

Particle Density 2.75 (Ass'm) Mg/m^3

Preparation Single Sample
4.5kg Rammer

Description Brown slightly sandy slightly gravelly CLAY.

Remarks AGS BS1377 Part 4 1990 : Clause 3.5 and 3.6

GEOTECHNICS
geotechnical and geoenvironmental specialists

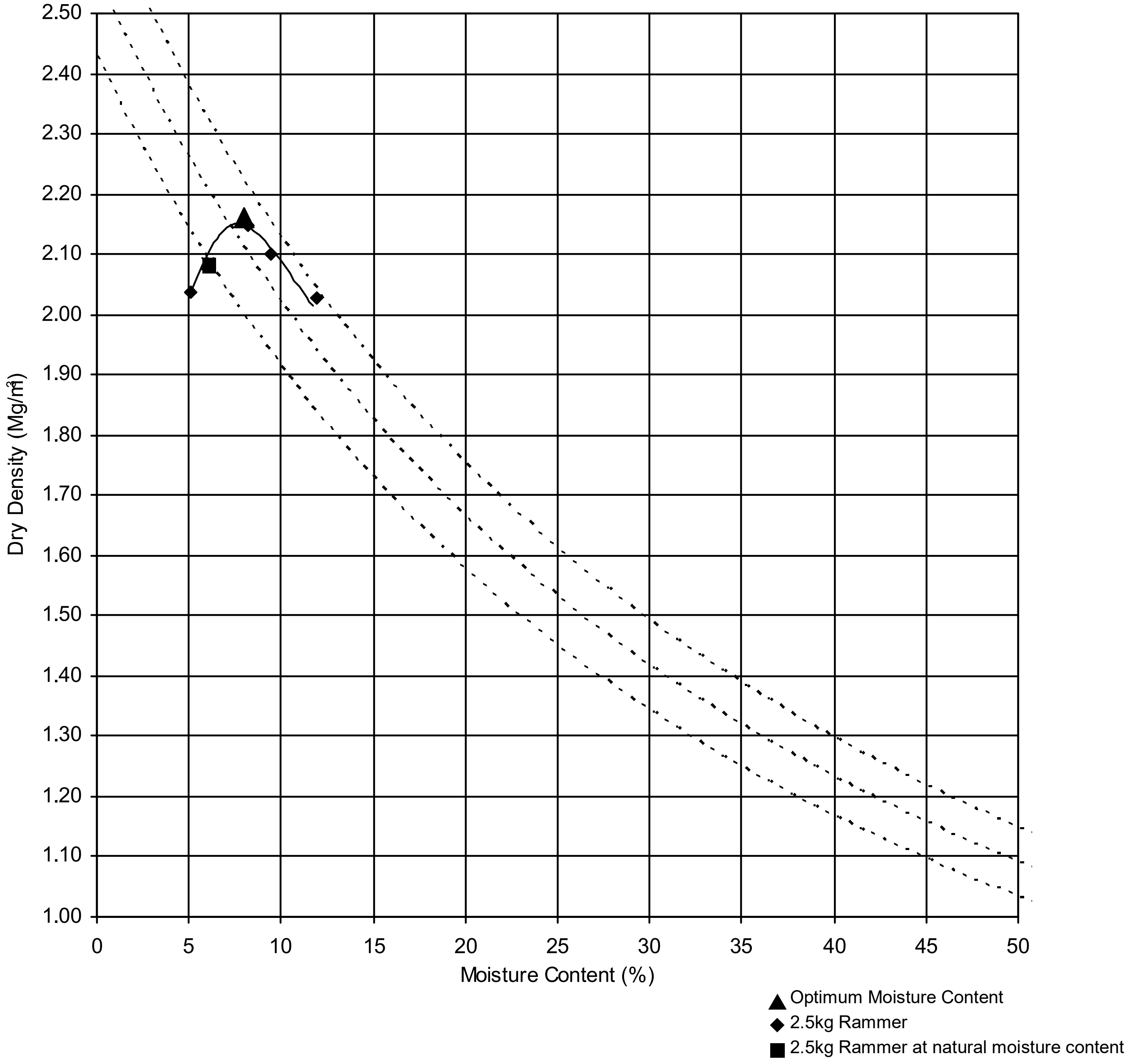
02/11/2022

LABORATORY RESULTS - *Compaction*

Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH27
Sample Depth 0.36-1.20m
Sample Type B
Sample Ref N84127



Optimum Moisture Content 8.0
Maximum Dry Density 2.16 Mg/m^3

Particles retained on 37.5mm 14 %
20mm sieve 30 %

Particle Density 2.70 (Ass'm) Mg/m^3
Preparation Single Sample
2.5kg Rammer

Description Brown gravelly SAND.

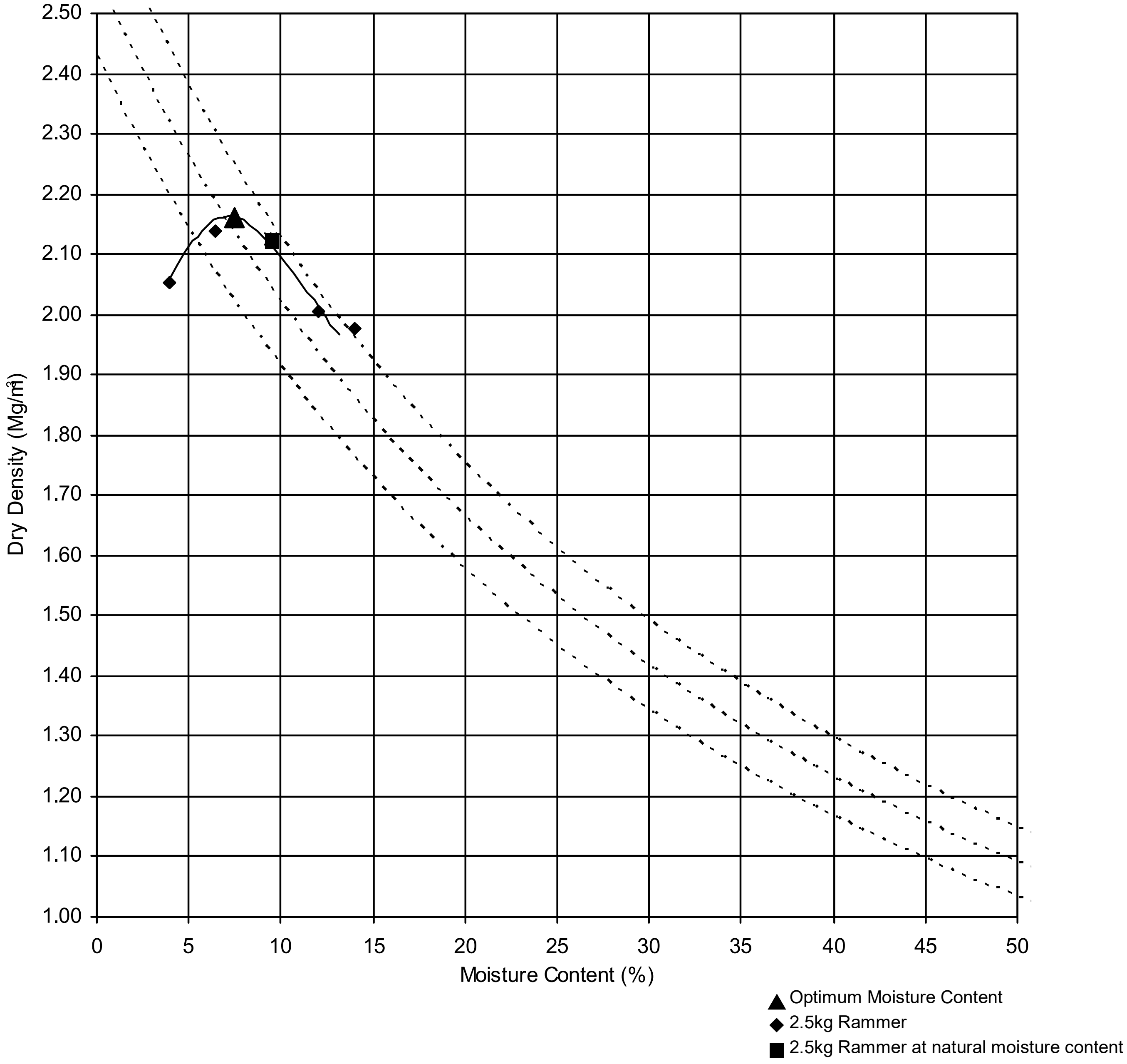
Remarks BS1377 Part 4 1990 : Clause 3.3 and 3.4

GEOTECHNICS
geotechnical and geoenvironmental specialists

02/11/2022

LABORATORY RESULTS - Compaction

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH29
		Sample Depth	2.00-2.50m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84134



Optimum Moisture Content	7.5	Particles retained on	37.5mm	11 %	
Maximum Dry Density	2.16 Mg/m^3		20mm sieve	26 %	

Particle Density	2.70 (Ass'm)	Mg/m^3	Description	Brown gravelly sandy CLAY.
Preparation	Single Sample 2.5kg Rammer			

Remarks BS1377 Part 4 1990 : Clause 3.3 and 3.4

GEOTECHNICS
geotechnical and geoenvironmental specialists

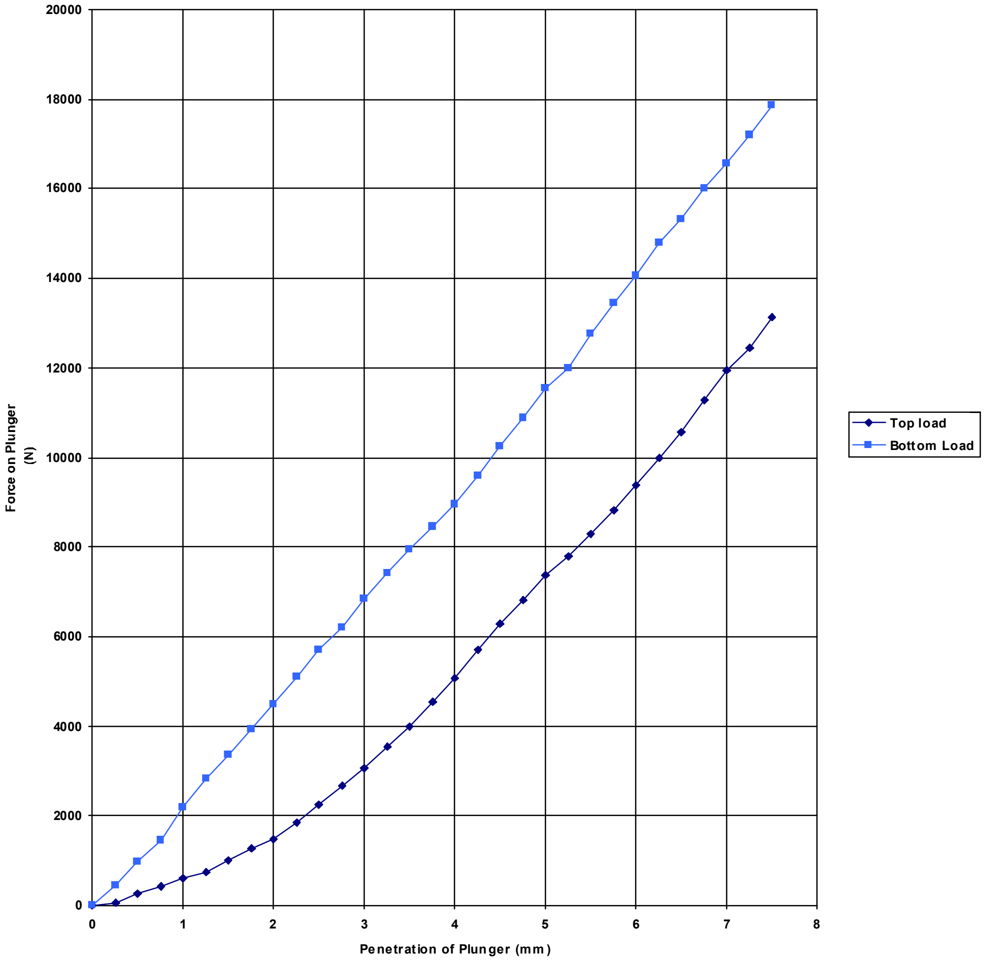
02/11/2022

LABORATORY RESULTS - *CBR Force Penetration*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH01
		Sample Depth	0.50m
Project No:	PN224395	**Sample Type**	D
		Sample Ref	N84035

Sample Description

Reddish brown clayey gravelly SAND.



Penetration	Top (N)	Bottom (N)
0.25mm	54	440
0.50mm	264	987
0.75mm	413	1459
1.00mm	610	2180
1.25mm	740	2814
1.50mm	999	3362
1.75mm	1259	3939
2.00mm	1468	4495
2.25mm	1859	5107
2.50mm	2258	5717
2.75mm	2669	6217
3.00mm	3058	6847
3.25mm	3550	7427
3.50mm	3990	7964
3.75mm	4551	8458

Penetration	Top (N)	Bottom (N)
4.00mm	5065	8947
4.25mm	5696	9594
4.50mm	6284	10249
4.75mm	6828	10892
5.00mm	7370	11556
5.25mm	7802	11998
5.50mm	8289	12749
5.75mm	8820	13453
6.00mm	9388	14066
6.25mm	9981	14784
6.50mm	10561	15327
6.75mm	11292	15999
7.00mm	11942	16554
7.25mm	12453	17208
7.50mm	13143	17866

Test Type	2.5kg		
Method	BS1377 Part 4 1990 : Clause 7.0		
Surcharge		13.60	kg
		27.0	%
Bulk Density	(Mg/m^3)	2.20	
Dry Density	(Mg/m^3)	2.11	
Hand Calculation		No	

CBR	**Top**	**Bottom**
Value	**37**	**58**
w%	**3.1**	**5.4**

Remarks AGS Combined with B 0.20-0.60m

02/11/2022

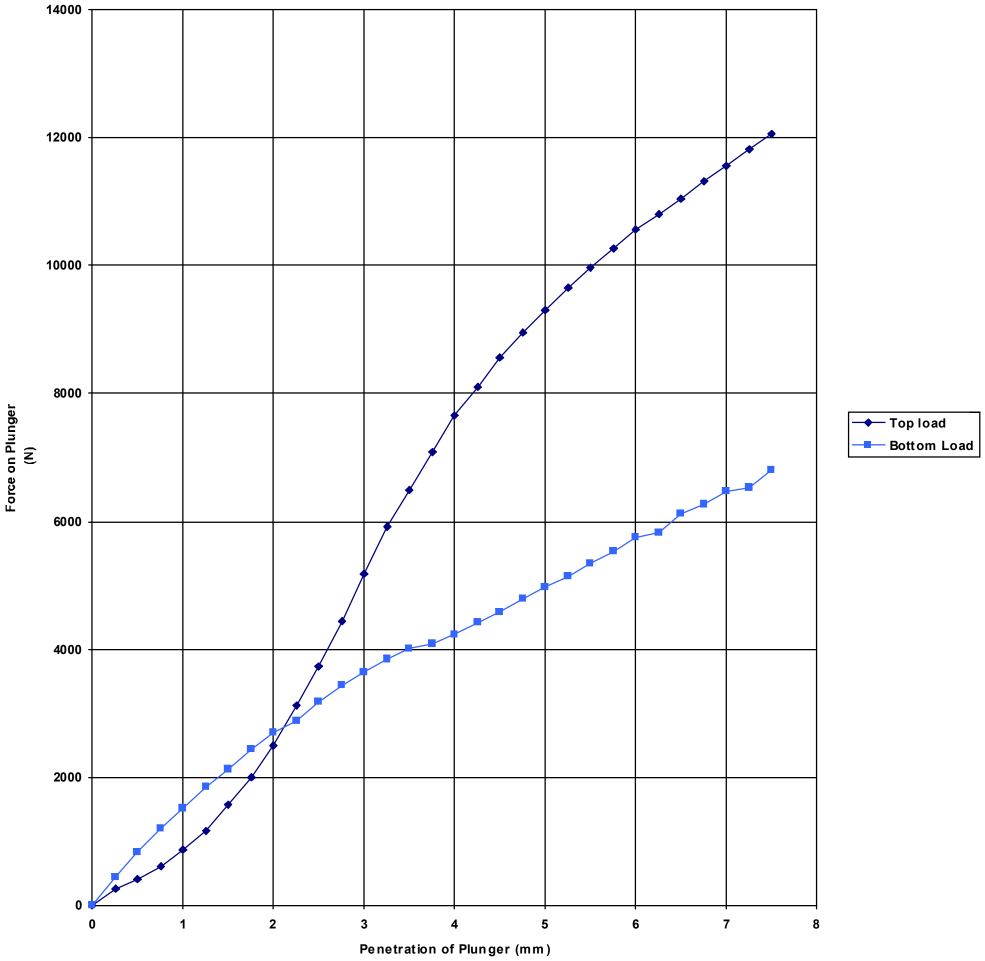
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *CBR Force Penetration*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH01
		Sample Depth	1.20-1.70m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84036

Sample Description

Brown sandy gravelly CLAY



Penetration	Top (N)	Bottom (N)
0.25mm	261	445
0.50mm	403	826
0.75mm	606	1209
1.00mm	871	1519
1.25mm	1169	1843
1.50mm	1569	2130
1.75mm	1997	2437
2.00mm	2500	2697
2.25mm	3117	2884
2.50mm	3727	3186
2.75mm	4437	3433
3.00mm	5173	3644
3.25mm	5918	3854
3.50mm	6489	4015
3.75mm	7092	4090

Penetration	Top (N)	Bottom (N)
4.00mm	7652	4240
4.25mm	8105	4411
4.50mm	8569	4580
4.75mm	8955	4784
5.00mm	9311	4975
5.25mm	9652	5150
5.50mm	9973	5348
5.75mm	10272	5528
6.00mm	10565	5744
6.25mm	10807	5828
6.50mm	11048	6122
6.75mm	11312	6278
7.00mm	11554	6473
7.25mm	11821	6533
7.50mm	12056	6798

Test Type	2.5kg		
Method	BS1377 Part 4 1990 : Clause 7.0		
Surcharge		13.60	kg
		3.3	%
Bulk Density	(Mg/m^3)	2.16	
Dry Density	(Mg/m^3)	2.02	
Hand Calculation		No	

CBR	**Top**	**Bottom**
Value	**47**	**25**
w%	**7.5**	**7.3**

Remarks Combined with B 2.00-2.50m

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *CBR Force Penetration*

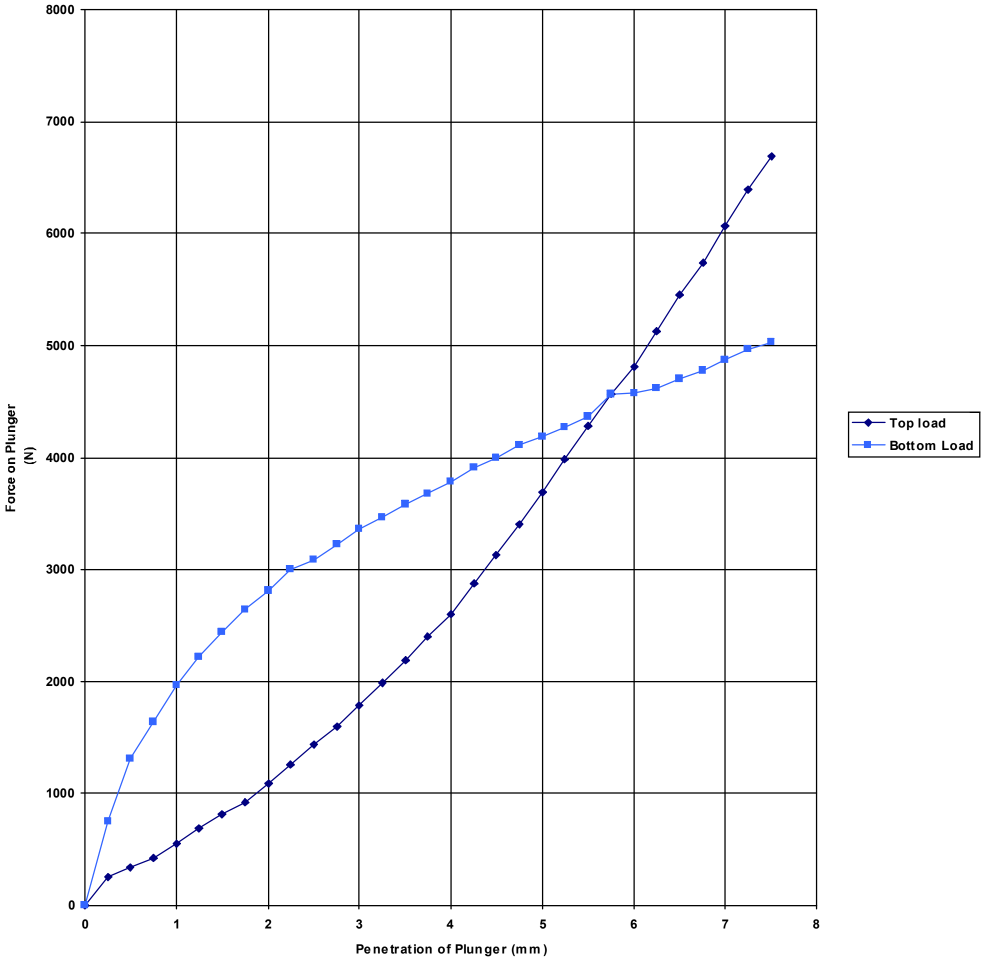
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH02
Sample Depth 0.55-1.20m
Sample Type B
Sample Ref N84041

Sample Description

Brown gravelly SAND with cobbles.



Penetration	Top (N)	Bottom (N)
0.25mm	257	750
0.50mm	333	1309
0.75mm	420	1639
1.00mm	551	1961
1.25mm	690	2222
1.50mm	810	2438
1.75mm	924	2640
2.00mm	1090	2811
2.25mm	1259	3001
2.50mm	1433	3085
2.75mm	1601	3222
3.00mm	1785	3362
3.25mm	1986	3466
3.50mm	2185	3586
3.75mm	2399	3677

Penetration	Top (N)	Bottom (N)
4.00mm	2602	3782
4.25mm	2873	3907
4.50mm	3123	3995
4.75mm	3404	4111
5.00mm	3691	4187
5.25mm	3982	4266
5.50mm	4277	4369
5.75mm	4569	4561
6.00mm	4805	4580
6.25mm	5127	4620
6.50mm	5450	4702
6.75mm	5742	4777
7.00mm	6069	4870
7.25mm	6395	4962
7.50mm	6692	5028

Test Type 2.5kg
Method BS1377 Part 4 1990 : Clause 7.0

Surcharge	13.60	kg
	26.0	%
Bulk Density (Mg/m^3)	2.14	
Dry Density (Mg/m^3)	1.98	
Hand Calculation	No	

CBR	Top	Bottom
Value	18	23
w%	8.0	8.1

Remarks

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *CBR Force Penetration*

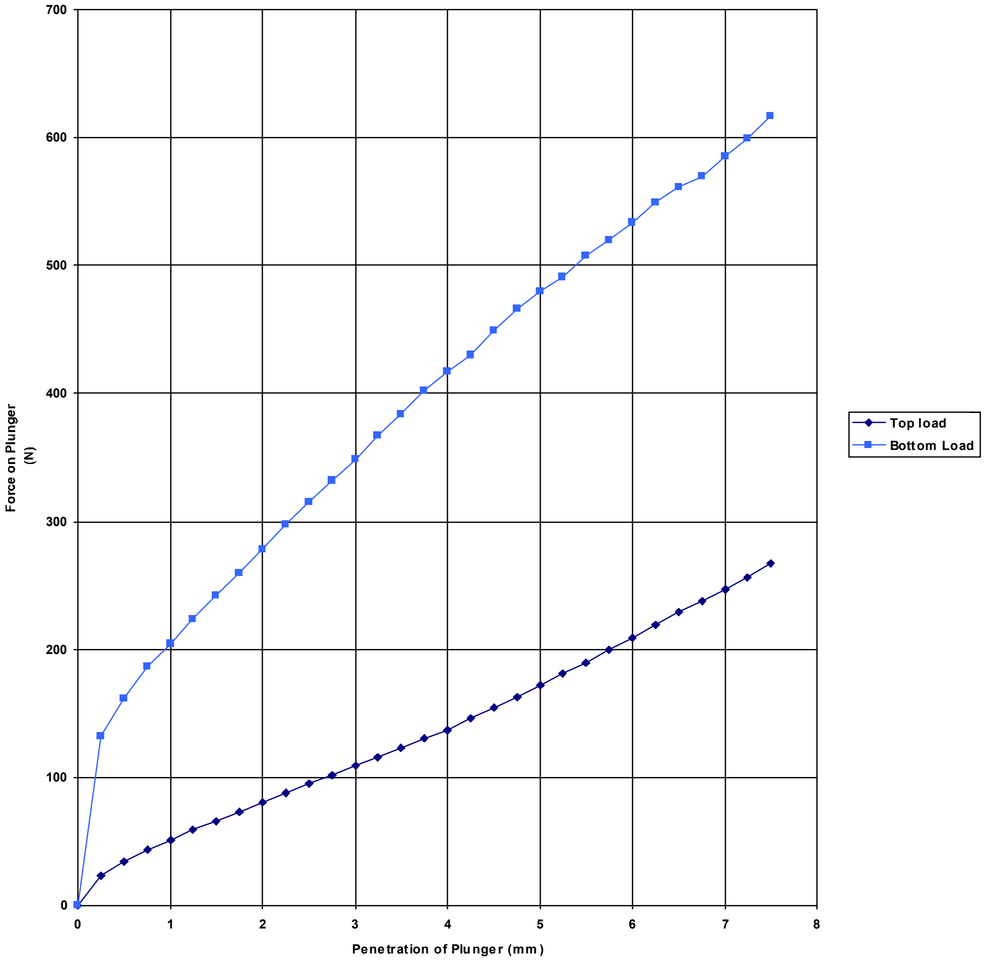
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH06
Sample Depth 1.20-1.70m
Sample Type B
Sample Ref N84054

Sample Description

Brown slightly gravelly sandy CLAY.



Penetration	Top (N)	Bottom (N)
0.25mm	23	132
0.50mm	34	162
0.75mm	43	187
1.00mm	51	204
1.25mm	59	224
1.50mm	66	242
1.75mm	73	260
2.00mm	80	278
2.25mm	88	298
2.50mm	95	315
2.75mm	102	332
3.00mm	109	349
3.25mm	116	367
3.50mm	123	384
3.75mm	130	402

Penetration	Top (N)	Bottom (N)
4.00mm	137	417
4.25mm	146	430
4.50mm	154	449
4.75mm	163	466
5.00mm	172	480
5.25mm	181	491
5.50mm	190	508
5.75mm	200	520
6.00mm	209	534
6.25mm	219	549
6.50mm	229	561
6.75mm	238	570
7.00mm	247	585
7.25mm	256	599
7.50mm	267	617

Test Type	2.5kg	
Method	BS1377 Part 4 1990 : Clause 7.0	
Surcharge	13.60	kg
	20.9	%
Bulk Density (Mg/m^3)	2.28	
Dry Density (Mg/m^3)	2.06	
Hand Calculation	No	

CBR	Top	Bottom
Value	0.86	2.4
w%	11.0	10.4

Remarks

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *CBR Force Penetration*

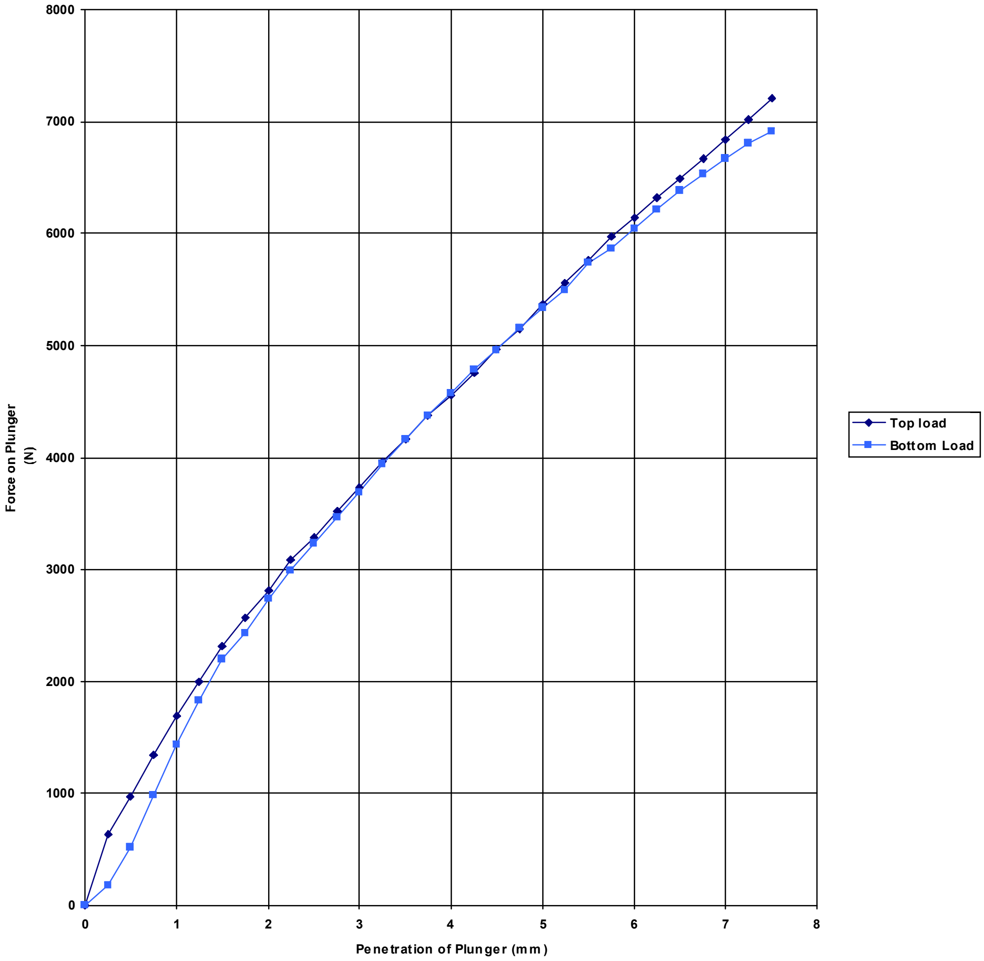
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH07
Sample Depth 0.60-0.90m
Sample Type B
Sample Ref N84056

Sample Description

Brown slightly gravelly SAND.



Penetration	Top (N)	Bottom (N)
0.25mm	631	179
0.50mm	974	521
0.75mm	1345	983
1.00mm	1689	1441
1.25mm	1998	1830
1.50mm	2311	2195
1.75mm	2573	2428
2.00mm	2808	2738
2.25mm	3090	2993
2.50mm	3289	3238
2.75mm	3518	3470
3.00mm	3729	3688
3.25mm	3964	3947
3.50mm	4168	4159
3.75mm	4378	4372

Penetration	Top (N)	Bottom (N)
4.00mm	4553	4576
4.25mm	4752	4783
4.50mm	4963	4960
4.75mm	5145	5159
5.00mm	5367	5341
5.25mm	5555	5500
5.50mm	5757	5739
5.75mm	5969	5865
6.00mm	6140	6041
6.25mm	6319	6212
6.50mm	6490	6386
6.75mm	6666	6526
7.00mm	6838	6666
7.25mm	7013	6803
7.50mm	7211	6911

Test Type	2.5kg	
Method	BS1377 Part 4 1990 : Clause 7.0	
Surcharge	13.60	kg
	21.6	%
Bulk Density (Mg/m^3)	2.20	
Dry Density (Mg/m^3)	2.02	
Hand Calculation	No	

CBR	Top	Bottom
Value	27	27
w%	8.7	9.2

Remarks AGS

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *CBR Force Penetration*

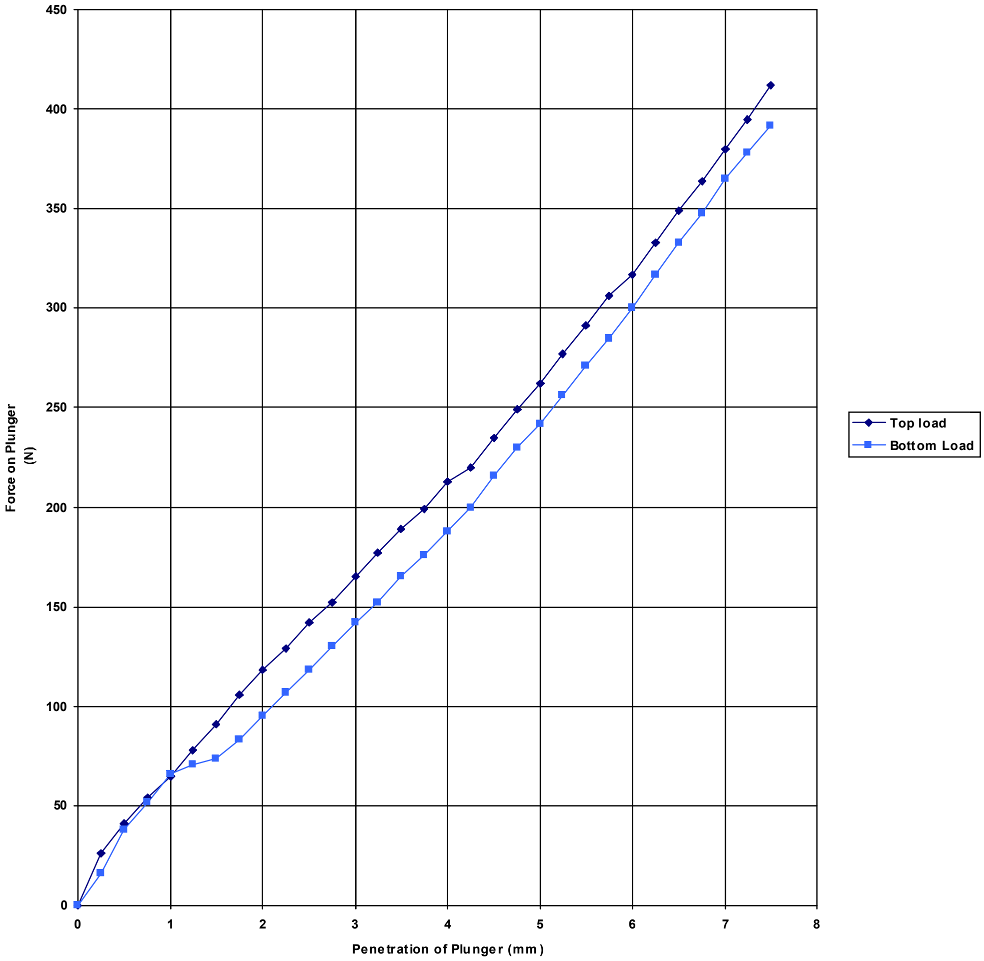
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH12
Sample Depth 1.20-1.70m
Sample Type B
Sample Ref N84077

Sample Description

Brown slightly sandy gravelly CLAY with cobbles.



Penetration	Top (N)	Bottom (N)
0.25mm	26	16
0.50mm	41	38
0.75mm	54	52
1.00mm	65	66
1.25mm	78	71
1.50mm	91	74
1.75mm	106	83
2.00mm	118	95
2.25mm	129	107
2.50mm	142	118
2.75mm	152	130
3.00mm	165	142
3.25mm	177	152
3.50mm	189	165
3.75mm	199	176

Penetration	Top (N)	Bottom (N)
4.00mm	213	188
4.25mm	220	200
4.50mm	235	216
4.75mm	249	230
5.00mm	262	242
5.25mm	277	256
5.50mm	291	271
5.75mm	306	285
6.00mm	317	300
6.25mm	333	317
6.50mm	349	333
6.75mm	364	348
7.00mm	380	365
7.25mm	395	378
7.50mm	412	392

Test Type	2.5kg	
Method	BS1377 Part 4 1990 : Clause 7.0	
Surcharge	13.60	kg
	11.0	%
Bulk Density (Mg/m^3)	2.24	
Dry Density (Mg/m^3)	2.03	
Hand Calculation	No	

CBR	Top	Bottom
Value	1.3	1.2
w%	11.0	10.4

Remarks

02/11/2022

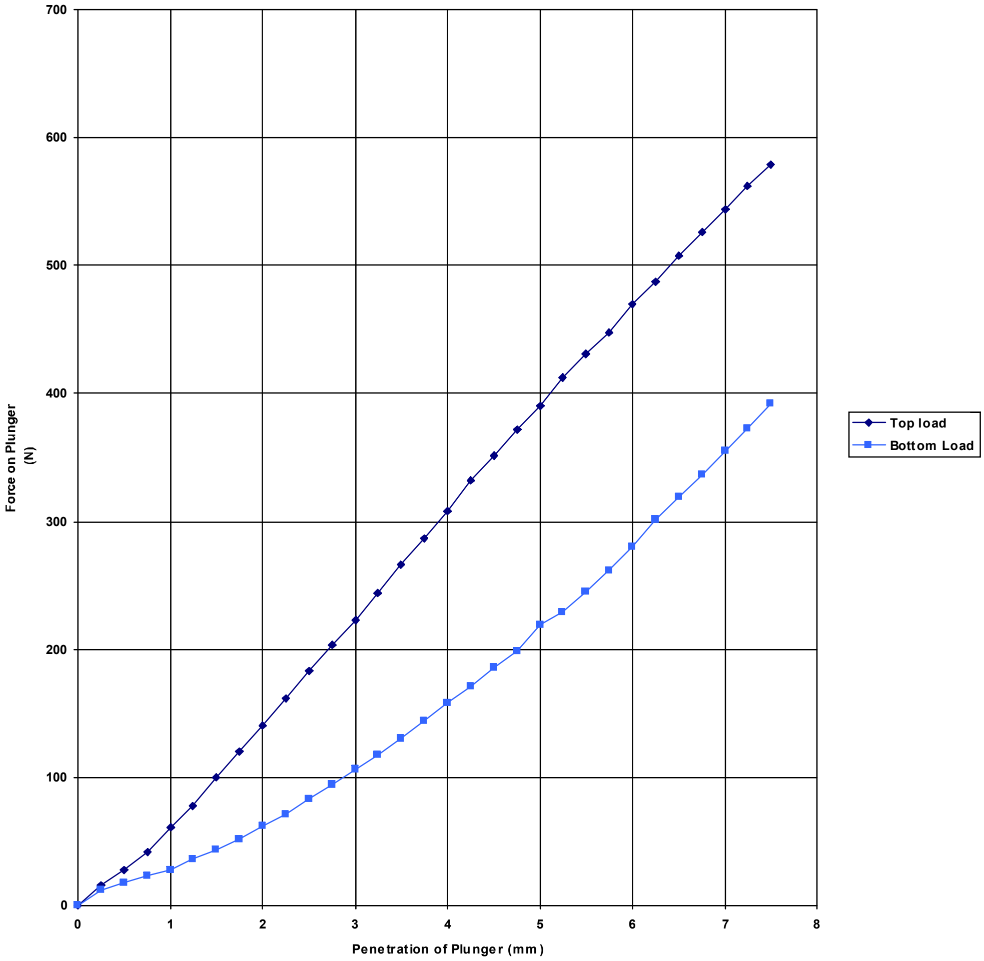
GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *CBR Force Penetration*

Project:	NEWPORT QUINN PHASE 2	**Hole**	BH16
		Sample Depth	1.20-1.70m
Project No:	PN224395	**Sample Type**	B
		Sample Ref	N84088

Sample Description

Brown slightly sandy slightly gravelly clayey SILT.



Penetration	Top (N)	Bottom (N)
0.25mm	16	12
0.50mm	28	18
0.75mm	42	23
1.00mm	61	28
1.25mm	78	36
1.50mm	100	43
1.75mm	120	52
2.00mm	141	62
2.25mm	162	71
2.50mm	183	83
2.75mm	203	94
3.00mm	223	106
3.25mm	244	117
3.50mm	266	130
3.75mm	287	144

Penetration	Top (N)	Bottom (N)
4.00mm	308	158
4.25mm	332	171
4.50mm	351	186
4.75mm	372	199
5.00mm	390	219
5.25mm	412	229
5.50mm	431	245
5.75mm	448	262
6.00mm	470	280
6.25mm	487	301
6.50mm	508	319
6.75mm	526	337
7.00mm	544	355
7.25mm	562	373
7.50mm	579	392

Test Type	2.5kg		
Method	BS1377 Part 4 1990 : Clause 7.0		
Surcharge		13.60	kg
		12.8	%
Bulk Density	(Mg/m^3)	2.16	
Dry Density	(Mg/m^3)	1.89	
Hand Calculation		No	

CBR	**Top**	**Bottom**
Value	**2.0**	**1.1**
w%	**14.7**	**14.4**

Remarks

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *CBR Force Penetration*

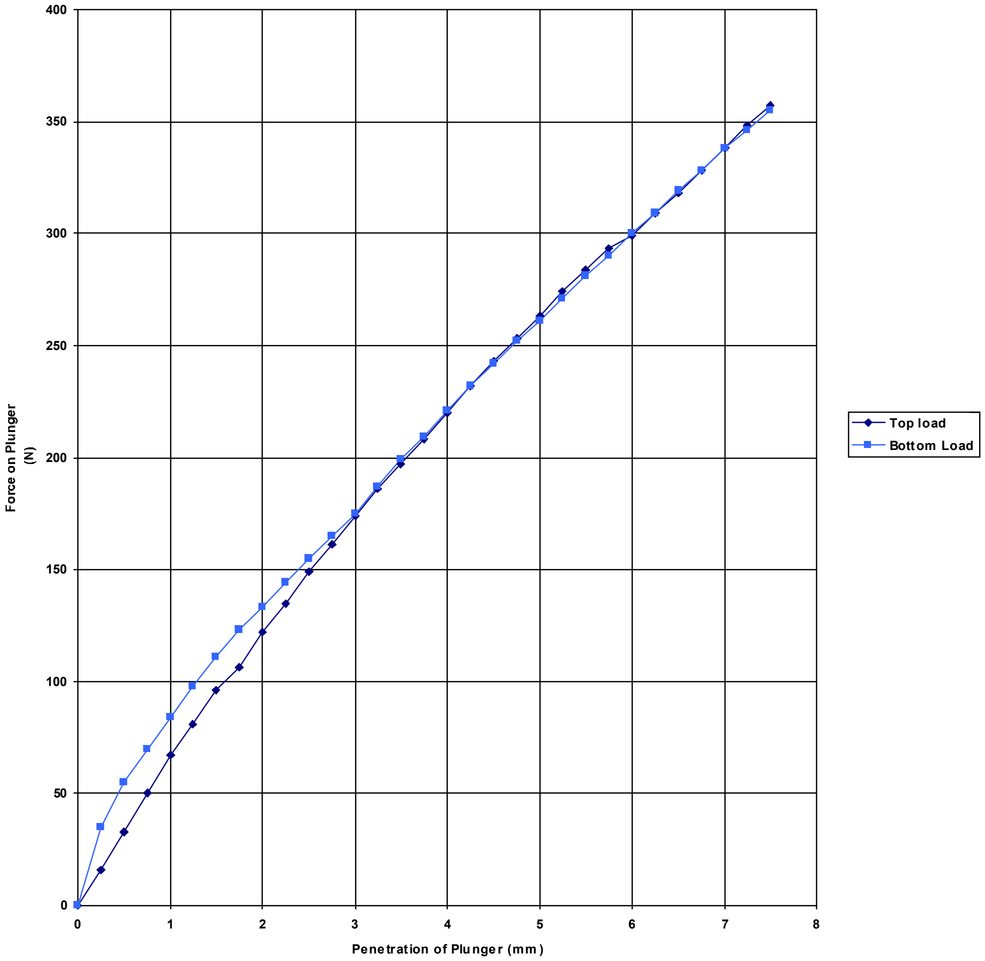
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH18
Sample Depth 1.20-1.70m
Sample Type B
Sample Ref N84096

Sample Description

Brown slightly gravelly CLAY.



Penetration	Top (N)	Bottom (N)
0.25mm	16	35
0.50mm	33	55
0.75mm	50	70
1.00mm	67	84
1.25mm	81	98
1.50mm	96	111
1.75mm	106	123
2.00mm	122	133
2.25mm	135	144
2.50mm	149	155
2.75mm	161	165
3.00mm	174	175
3.25mm	186	187
3.50mm	197	199
3.75mm	208	209

Penetration	Top (N)	Bottom (N)
4.00mm	220	221
4.25mm	232	232
4.50mm	243	242
4.75mm	253	252
5.00mm	263	261
5.25mm	274	271
5.50mm	284	281
5.75mm	293	290
6.00mm	299	300
6.25mm	309	309
6.50mm	318	319
6.75mm	328	328
7.00mm	338	338
7.25mm	348	346
7.50mm	357	355

Test Type	2.5kg	
Method	BS1377 Part 4 1990 : Clause 7.0	
Surcharge	13.60	kg
	6.3	%
Bulk Density (Mg/m^3)	2.24	
Dry Density (Mg/m^3)	1.96	
Hand Calculation	No	

CBR	Top	Bottom
Value	**1.3**	**1.3**
w%	**13.7**	**13.9**

Remarks

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *CBR Force Penetration*

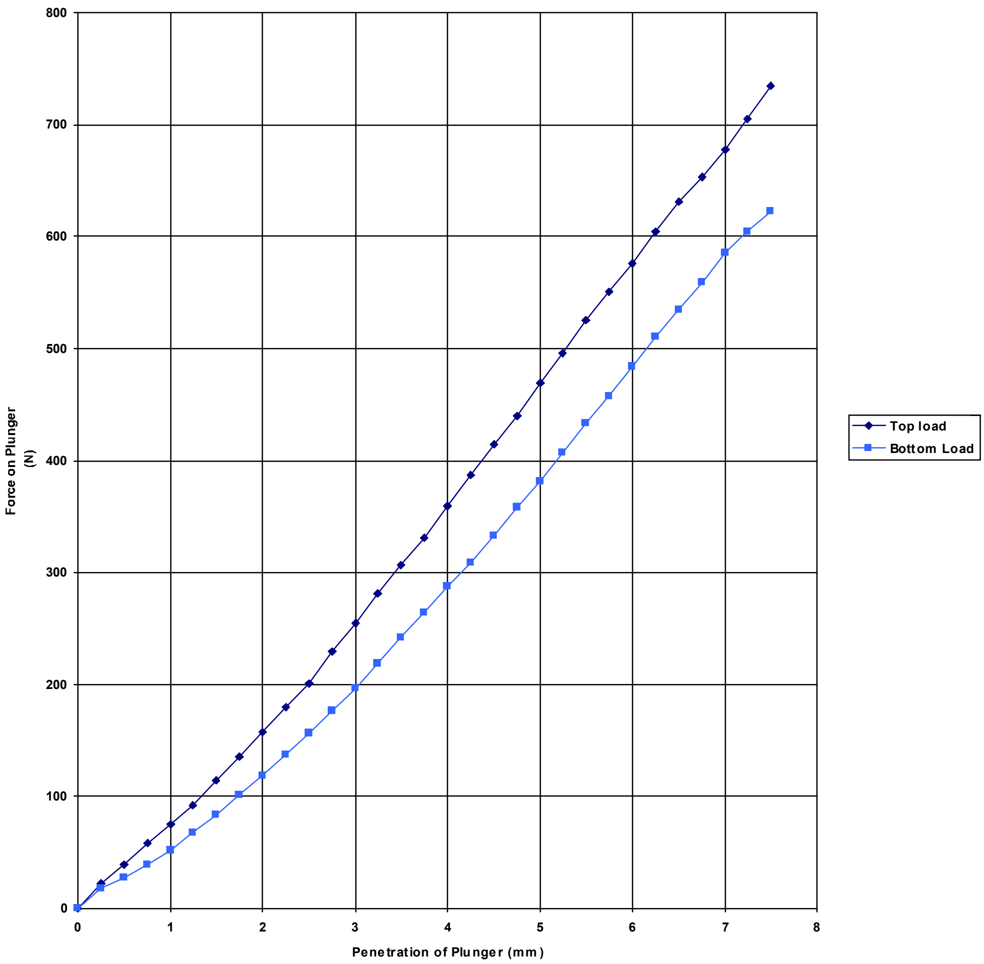
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH21
Sample Depth 1.20-1.70m
Sample Type B
Sample Ref N84106

Sample Description

Brown clayey silty very sandy GRAVEL.



Penetration	Top (N)	Bottom (N)
0.25mm	22	18
0.50mm	39	28
0.75mm	58	39
1.00mm	75	52
1.25mm	92	68
1.50mm	114	84
1.75mm	135	101
2.00mm	157	118
2.25mm	180	137
2.50mm	201	156
2.75mm	229	177
3.00mm	255	197
3.25mm	281	219
3.50mm	307	242
3.75mm	331	264

Penetration	Top (N)	Bottom (N)
4.00mm	359	287
4.25mm	387	309
4.50mm	414	333
4.75mm	440	358
5.00mm	469	382
5.25mm	496	407
5.50mm	525	433
5.75mm	551	458
6.00mm	576	484
6.25mm	604	510
6.50mm	631	535
6.75mm	653	559
7.00mm	677	585
7.25mm	705	605
7.50mm	734	622

Test Type 2.5kg
Method BS1377 Part 4 1990 : Clause 7.0

Surcharge 13.60 kg
16.7 %

Bulk Density (Mg/m^3) 2.29
Dry Density (Mg/m^3) 2.06
Hand Calculation No

CBR	Top	Bottom
Value	2.4	1.9
w%	11.3	10.9

Remarks

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *CBR Force Penetration*

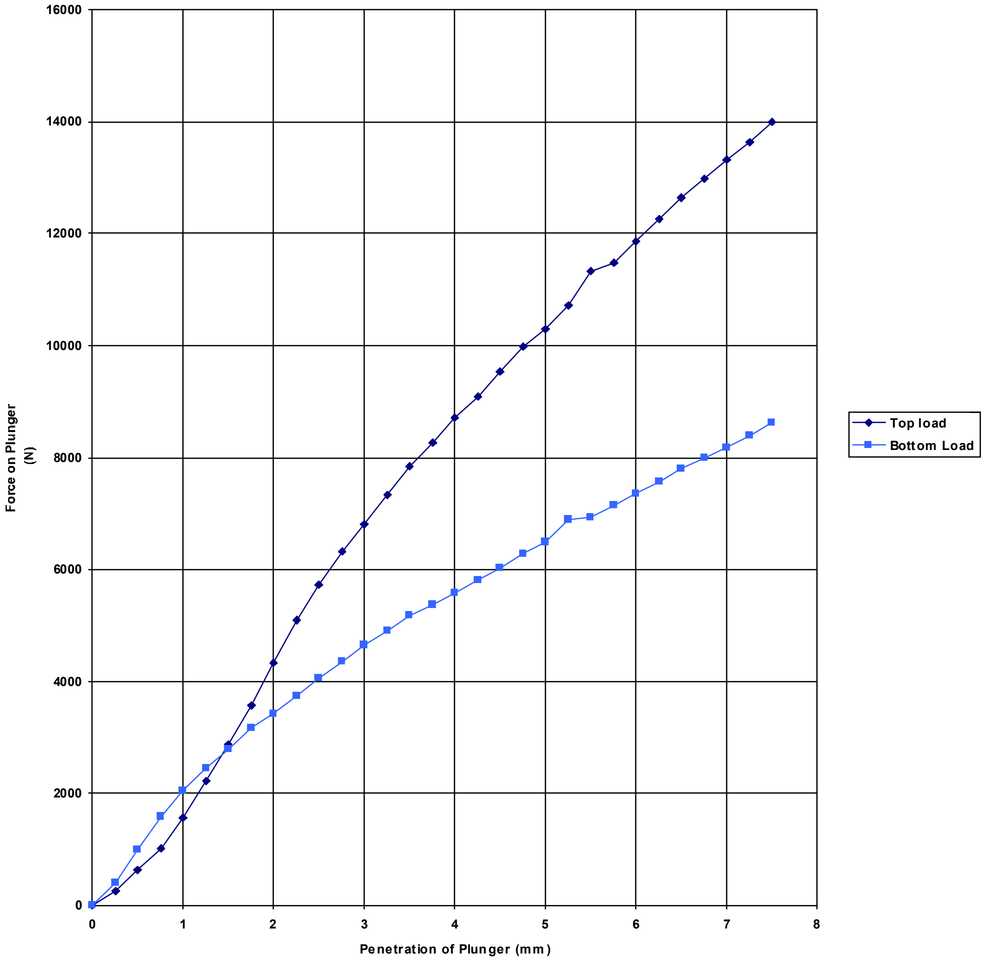
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH22
Sample Depth 0.30-1.20m
Sample Type B
Sample Ref N84138

Sample Description

Brown silty/clayey very sandy GRAVEL



Penetration	Top (N)	Bottom (N)
0.25mm	245	409
0.50mm	629	997
0.75mm	1015	1581
1.00mm	1559	2054
1.25mm	2223	2460
1.50mm	2876	2799
1.75mm	3566	3161
2.00mm	4340	3426
2.25mm	5088	3747
2.50mm	5723	4050
2.75mm	6324	4352
3.00mm	6798	4641
3.25mm	7338	4909
3.50mm	7839	5171
3.75mm	8270	5372

Penetration	Top (N)	Bottom (N)
4.00mm	8699	5584
4.25mm	9097	5810
4.50mm	9540	6022
4.75mm	9972	6276
5.00mm	10292	6484
5.25mm	10708	6898
5.50mm	11329	6928
5.75mm	11469	7148
6.00mm	11852	7352
6.25mm	12250	7566
6.50mm	12642	7790
6.75mm	12969	7995
7.00mm	13318	8174
7.25mm	13640	8401
7.50mm	14001	8615

Test Type 2.5kg
Method BS1377 Part 4 1990 : Clause 7.0

Surcharge 13.60 kg
28.0 %

Bulk Density (Mg/m^3) 2.12
Dry Density (Mg/m^3) 2.01
Hand Calculation No

CBR	**Top**	**Bottom**
Value	**51**	**32**
w%	**5.3**	**5.4**

Remarks

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *CBR Force Penetration*

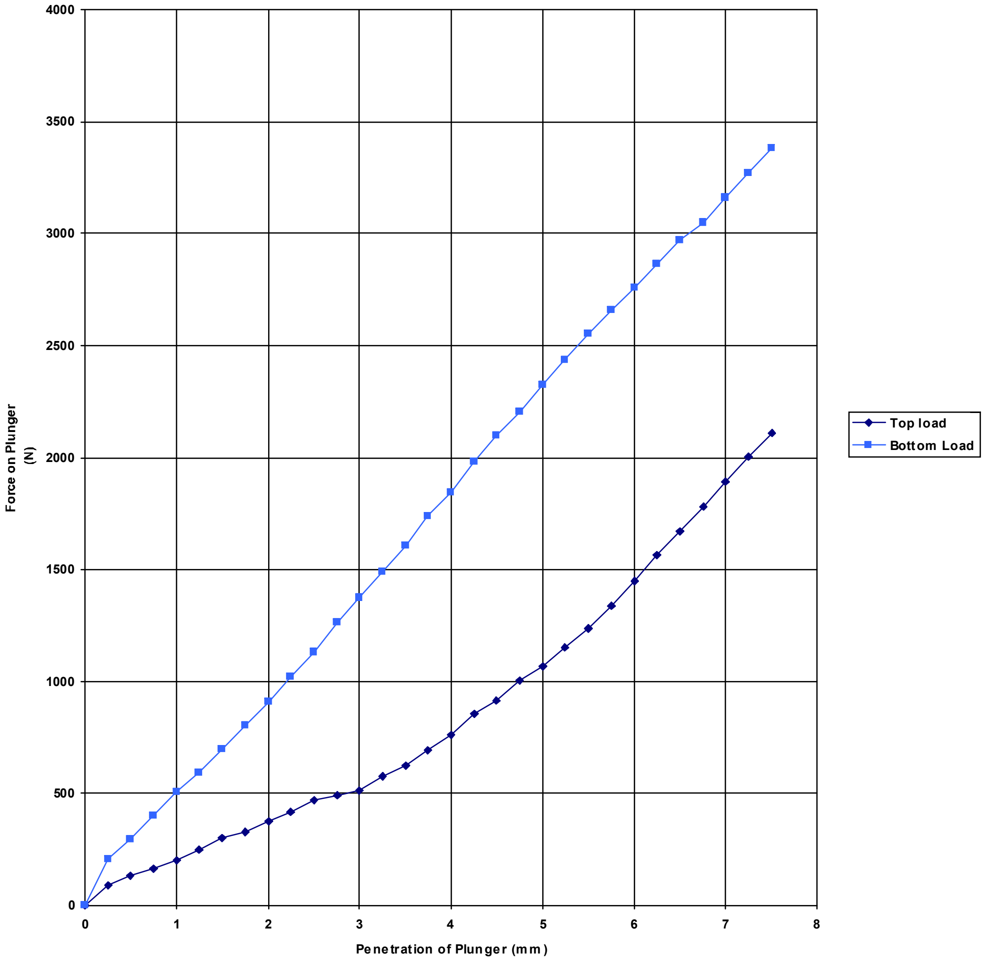
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH23
Sample Depth 1.50-1.80m
Sample Type B
Sample Ref N84112

Sample Description

Brown clayey silty very gravelly SAND.



Penetration	Top (N)	Bottom (N)
0.25mm	90	204
0.50mm	131	298
0.75mm	163	403
1.00mm	202	508
1.25mm	248	594
1.50mm	299	698
1.75mm	330	803
2.00mm	376	908
2.25mm	416	1022
2.50mm	469	1132
2.75mm	490	1262
3.00mm	515	1376
3.25mm	575	1490
3.50mm	623	1605
3.75mm	691	1737

Penetration	Top (N)	Bottom (N)
4.00mm	763	1846
4.25mm	854	1982
4.50mm	916	2096
4.75mm	1004	2205
5.00mm	1069	2323
5.25mm	1152	2434
5.50mm	1237	2550
5.75mm	1339	2656
6.00mm	1448	2759
6.25mm	1563	2862
6.50mm	1672	2971
6.75mm	1781	3050
7.00mm	1894	3161
7.25mm	2004	3272
7.50mm	2106	3380

Test Type	2.5kg		
Method	BS1377 Part 4 1990 : Clause 7.0		
Surcharge		13.60	kg
		27.6	%
Bulk Density	(Mg/m^3)	2.12	
Dry Density	(Mg/m^3)	1.96	
Hand Calculation		No	

CBR	Top	Bottom
Value	5.4	12
w%	8.2	8.2

Remarks

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *CBR Force Penetration*

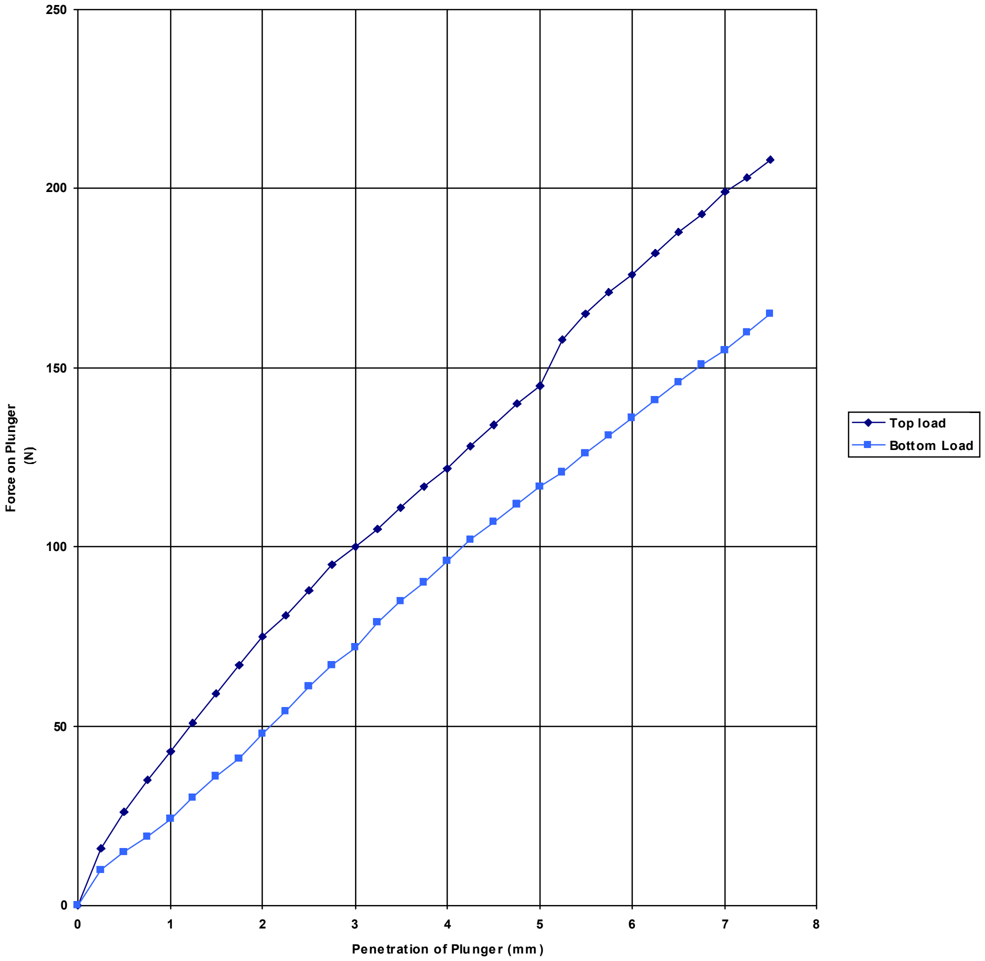
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH26
Sample Depth 2.00-2.50m
Sample Type B
Sample Ref N84124

Sample Description

Brown slightly sandy slightly gravelly CLAY.



Penetration	Top (N)	Bottom (N)
0.25mm	16	10
0.50mm	26	15
0.75mm	35	19
1.00mm	43	24
1.25mm	51	30
1.50mm	59	36
1.75mm	67	41
2.00mm	75	48
2.25mm	81	54
2.50mm	88	61
2.75mm	95	67
3.00mm	100	72
3.25mm	105	79
3.50mm	111	85
3.75mm	117	90

Penetration	Top (N)	Bottom (N)
4.00mm	122	96
4.25mm	128	102
4.50mm	134	107
4.75mm	140	112
5.00mm	145	117
5.25mm	158	121
5.50mm	165	126
5.75mm	171	131
6.00mm	176	136
6.25mm	182	141
6.50mm	188	146
6.75mm	193	151
7.00mm	199	155
7.25mm	203	160
7.50mm	208	165

Test Type 2.5kg
Method BS1377 Part 4 1990 : Clause 7.0

Surcharge 13.60 kg
17.3 %

Bulk Density (Mg/m^3) 2.23
Dry Density (Mg/m^3) 1.97
Hand Calculation No

CBR	Top	Bottom
Value	0.73	0.59
w%	13.2	13.2

Remarks

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *CBR Force Penetration*

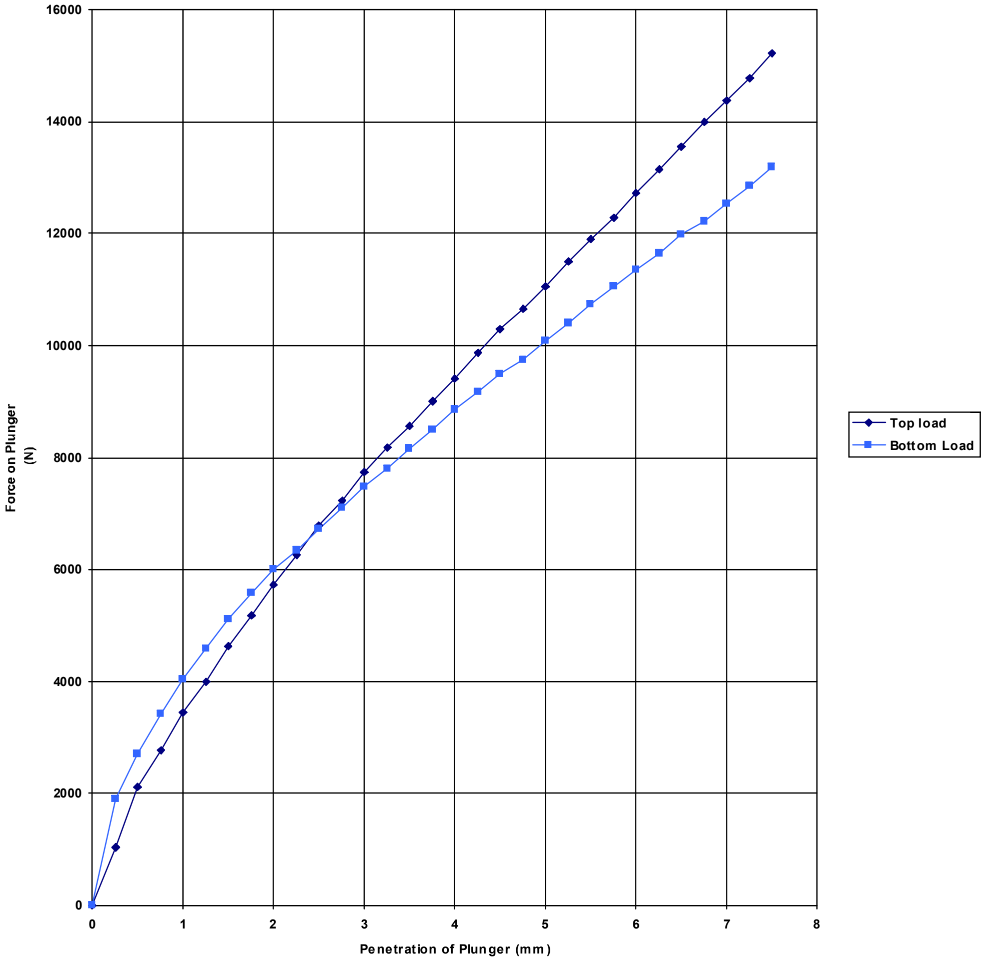
Project: NEWPORT QUINN PHASE 2

Project No: PN224395

Hole BH29
Sample Depth 0.90-1.20m
Sample Type B
Sample Ref N84131

Sample Description

Brown slightly clayey gravelly SAND.



Penetration	Top (N)	Bottom (N)
0.25mm	1034	1892
0.50mm	2110	2705
0.75mm	2776	3414
1.00mm	3450	4038
1.25mm	3996	4584
1.50mm	4620	5115
1.75mm	5182	5575
2.00mm	5726	5997
2.25mm	6255	6338
2.50mm	6778	6722
2.75mm	7230	7099
3.00mm	7742	7472
3.25mm	8171	7801
3.50mm	8567	8151
3.75mm	9009	8492

Penetration	Top (N)	Bottom (N)
4.00mm	9407	8849
4.25mm	9872	9183
4.50mm	10287	9500
4.75mm	10652	9747
5.00mm	11054	10076
5.25mm	11497	10401
5.50mm	11900	10743
5.75mm	12288	11053
6.00mm	12733	11340
6.25mm	13143	11639
6.50mm	13549	11974
6.75mm	13992	12219
7.00mm	14364	12539
7.25mm	14782	12852
7.50mm	15227	13191

Test Type 2.5kg
Method BS1377 Part 4 1990 : Clause 7.0

Surcharge 13.60 kg
41.6 %

Bulk Density (Mg/m^3) 2.20
Dry Density (Mg/m^3) 2.05
Hand Calculation No

CBR	**Top**	**Bottom**
Value	**55**	**51**
w%	**7.2**	**7.0**

Remarks

02/11/2022

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - *MCV, Compaction, CBR*

Project NEWPORT QUINN PHASE 2 **Project No:** PN224395

Sample					MCV		Compaction					CBR				
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	MCV	w %	Type	w (Opt) %	ρ_d Mg/m³	γ_b Mg/m³	γ_d (Max) Mg/m³	Type	Top CBR %	Top w %	Bottom CBR %	Bottom w %
BH01	0.50 (0.50)	D	N84035	Reddish brown clayey gravelly SAND. (See Test Remarks Sheet for further information)						2.20	2.11	2.5kg	37	3.1	58	5.4
BH01	1.20-1.70 (1.20-1.70)	B	N84036	Brown sandy gravelly CLAY (See Test Remarks Sheet for further information)						2.16	2.02	2.5kg	47	7.5	25	7.3
BH02	0.55-1.20 (0.55-1.20)	B	N84041	Brown gravelly SAND with cobbles.						2.14	1.98	2.5kg	18	8.0	23	8.1
BH02	1.20-1.70 (1.20-1.70)	B	N84042	Brown slightly gravelly SAND.			4.5kg	(6.3) 11.8* 13.3 5.9 8.7 3.2	2.65a	 *2.21 2.11 2.30 2.31 2.06	(2.18) *1.97 1.86 2.17 2.12 2.00					
BH04A	1.20-1.70 (1.20-1.70)	B	N84050	Brown slightly gravelly sandy CLAY.			2.5kg	(9.0) 12.6* 14.7 6.3 8.2 10.1	2.65a	 *2.22 2.15 2.18 2.25 2.28	(2.09) *1.97 1.87 2.05 2.08 2.07					
BH05	2.00-2.50 (2.00-2.50)	B	N84052	Brow slightly gravelly slightly sandy CLAY.			4.5kg	(9.0) 12.4* 19.6 7.6 9.9 15.2 4.7	2.65a	 *2.15 2.05 2.19 2.20 2.13 1.94	(2.03) *1.92 1.71 2.03 2.00 1.85 1.85					
BH06	1.20-1.70 (1.20-1.70)	B	N84054	Brown slightly gravelly sandy CLAY.						2.28	2.06	2.5kg	0.86	11.0	2.4	10.4
BH07	0.60-0.90 (0.60-0.90)	B	N84056	Brown slightly gravelly SAND.						2.20	2.02	2.5kg	27	8.7	27	9.2
BH08	1.20-1.70 (1.20-1.70)	B	N84061	Brown slightly sandy clayey GRAVEL.			2.5kg	(8.5) 9.4* 12.0 14.3 4.4 7.5	2.75a	 *2.35 2.30 2.28 2.06 2.27	(2.16) *2.15 2.05 1.99 1.98 2.12					

Remarks

Particle Density - a=assumed, m=measured
w% - * = at natural moisture content; x = aggregate moisture content
# = stabilised, see relevant test plot for details
NST = Not suitable for Test
For Standards followed see Laboratory Test Certficate

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - MCV, Compaction, CBR

Project NEWPORT QUINN PHASE 2 **Project No:** PN224395

Sample					MCV		Compaction					CBR				
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	MCV	w %	Type	w (Opt) %	ρ_d Mg/m^3	γ_b Mg/m^3	γ_d (Max) Mg/m^3	Type	Top		Bottom	
													CBR %	w %	CBR %	w %
BH12	1.20-1.70 (1.20-1.70)	B	N84077	Brown slightly sandy gravelly CLAY with cobbles.						2.24	2.03	2.5kg	1.3	11.0	1.2	10.4
BH13	1.20-1.70 (1.20-1.70)	B	N84079	Brown slightly gravelly clayey SAND.			4.5kg	(7.5)	2.70a		(2.15)					
								12.1*		*2.25	*2.01					
								3.7		2.18	2.10					
								8.7		2.31	2.13					
								13.8		2.19	1.92					
								6.4		2.26	2.12					
BH14A	3.00-3.45 (3.00-3.45)	D	N84084	Brown mottled red slightly gravelly CLAY. (See Test Remarks Sheet for further information)			2.5kg	(17.5)	2.65a		(1.75)					
								23.2*		*2.01	*1.63					
								24.5		1.98	1.59					
								14.9		1.94	1.69					
								16.8		2.02	1.73					
								19.1		2.06	1.73					
BH16	1.20-1.70 (1.20-1.70)	B	N84088	Brown slightly sandy slightly gravelly clayey SILT.						2.16	1.89	2.5kg	2.0	14.7	1.1	14.4
BH16	3.00-3.50 (3.00-3.50)	B	N84090	Brown slightly sandy slightly gravelly clayey SILT.			4.5kg	(7.5)	2.75a		(2.18)					
								13.7*		*2.24	*1.97					
								6.0		2.25	2.12					
								7.3		2.35	2.19					
								10.0		2.31	2.10					
								16.2		2.19	1.88					
								3.8		2.03	1.96					
BH17A	2.00-2.50 (2.00-2.50)	B	N84093	Brown slightly gravelly slightly sandy CLAY.			4.5kg	(6.0)	2.75a		(2.19)					
								6.2		2.32	2.18					
								8.1		2.29	2.12					
								2.4		2.16	2.11					
								12.2*		*2.22	*1.97					
								4.4		2.26	2.16					
								10.2		2.24	2.03					
BH18	1.20-1.70 (1.20-1.70)	B	N84096	Brown slightly gravelly CLAY.						2.24	1.96	2.5kg	1.3	13.7	1.3	13.9
BH19	2.00-2.50 (2.00-2.50)	B	N84101	Brown clayey sandy GRAVEL.			2.5kg	(7.5)	2.70a		(2.10)					
								9.3*		*2.26	*2.07					
								3.9		2.05	1.97					
								5.8		2.20	2.08					
								8.6		2.27	2.09					
								12.3		2.24	1.99					
								15.9		2.18	1.88					

Remarks

Particle Density - a=assumed, m=measured
w% - * = at natural moisture content; x = aggregate moisture content
# = stabilised, see relevant test plot for details
NST = Not suitable for Test
For Standards followed see Laboratory Test Certficate

LABORATORY RESULTS - *MCV, Compaction, CBR*

Project NEWPORT QUINN PHASE 2 **Project No:** PN224395

Sample					**MCV**		**Compaction**					**CBR**				
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	MCV	w %	Type	w (Opt) %	ρ_d Mg/m^3	γ_b Mg/m^3	γ_d (Max) Mg/m^3	Type	Top		Bottom	
													CBR %	w %	CBR %	w %
BH20	3.00-3.50 (3.00-3.50)	B	N84105	Brown clayey silty very gravelly SAND.			4.5kg	(7.0)	2.70a		(2.21)					
								11.9*		*2.30	*2.05					
								2.7		2.21	2.15					
								6.1		2.33	2.19					
								8.6		2.29	2.11					
								13.5		2.21	1.95					
BH21	1.20-1.70 (1.20-1.70)	B	N84106	Brown clayey silty very sandy GRAVEL.						2.29	2.06	2.5kg	2.4	11.3	1.9	10.9
BH22	0.30-1.20 (0.30-1.20)	B	N84138	Brown silty/clayey very sandy GRAVEL						2.12	2.01	2.5kg	51	5.3	32	5.4
BH23	1.50-1.80 (1.50-1.80)	B	N84112	Brown clayey silty very gravelly SAND.						2.12	1.96	2.5kg	5.4	8.2	12	8.2
BH24	1.20-1.70 (1.20-1.70)	B	N84116	Brown slightly sandy slightly gravelly CLAY with cobbles.			2.5kg	(7.5)	2.75a		(2.20)					
								12.5*		*2.28	*2.03					
								3.4		2.10	2.03					
								5.4		2.23	2.12					
								8.8		2.37	2.18					
								10.2		2.33	2.12					
BH25	1.20-1.70 (1.20-1.70)	B	N84121	Brown slightly sandy slightly gravelly CLAY.			4.5kg	(7.5)	2.75a		(2.18)					
								14.6*		*2.23	*1.95					
								2.9		2.15	2.09					
								6.4		2.29	2.15					
								9.3		2.36	2.16					
								11.6		2.31	2.07					
BH26	2.00-2.50 (2.00-2.50)	B	N84124	Brown slightly sandy slightly gravelly CLAY.						2.23	1.97	2.5kg	0.73	13.2	0.59	13.2
BH27	0.36-1.20 (0.36-1.20)	B	N84127	Brown gravelly SAND.			2.5kg	(8.0)	2.70a		(2.16)					
								6.1*		*2.21	*2.09					
								5.0		2.14	2.04					
								8.2		2.33	2.15					
								9.5		2.30	2.10					
								11.9		2.27	2.03					
BH29	0.90-1.20 (0.90-1.20)	B	N84131	Brown slightly clayey gravelly SAND.						2.20	2.05	2.5kg	55	7.2	51	7.0

Remarks

Particle Density - a=assumed, m=measured
w% - * = at natural moisture content; x = aggregate moisture content
# = stabilised, see relevant test plot for details
NST = Not suitable for Test
For Standards followed see Laboratory Test Certficate

GEOTECHNICS
geotechnical and geoenvironmental specialists

LABORATORY RESULTS - MCV, Compaction, CBR

Project NEWPORT QUINN PHASE 2 **Project No:** PN224395

Sample					**MCV**		**Compaction**					**CBR**				
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	MCV	w %	Type	w (Opt) %	ρ_d Mg/m^3	γ_b Mg/m^3	γ_d (Max) Mg/m^3	Type	Top		Bottom	
													CBR %	w %	CBR %	w %
BH29	2.00-	B	N84134	Brown gravelly sandy CLAY.			2.5kg	(7.5)	2.70a		(2.16)					
	2.50							9.5*		*2.33	*2.13					
	(2.00-							12.1		2.25	2.00					
	2.50)							14.0		2.25	1.98					
								3.9		2.13	2.05					
								6.4		2.28	2.14					

Remarks

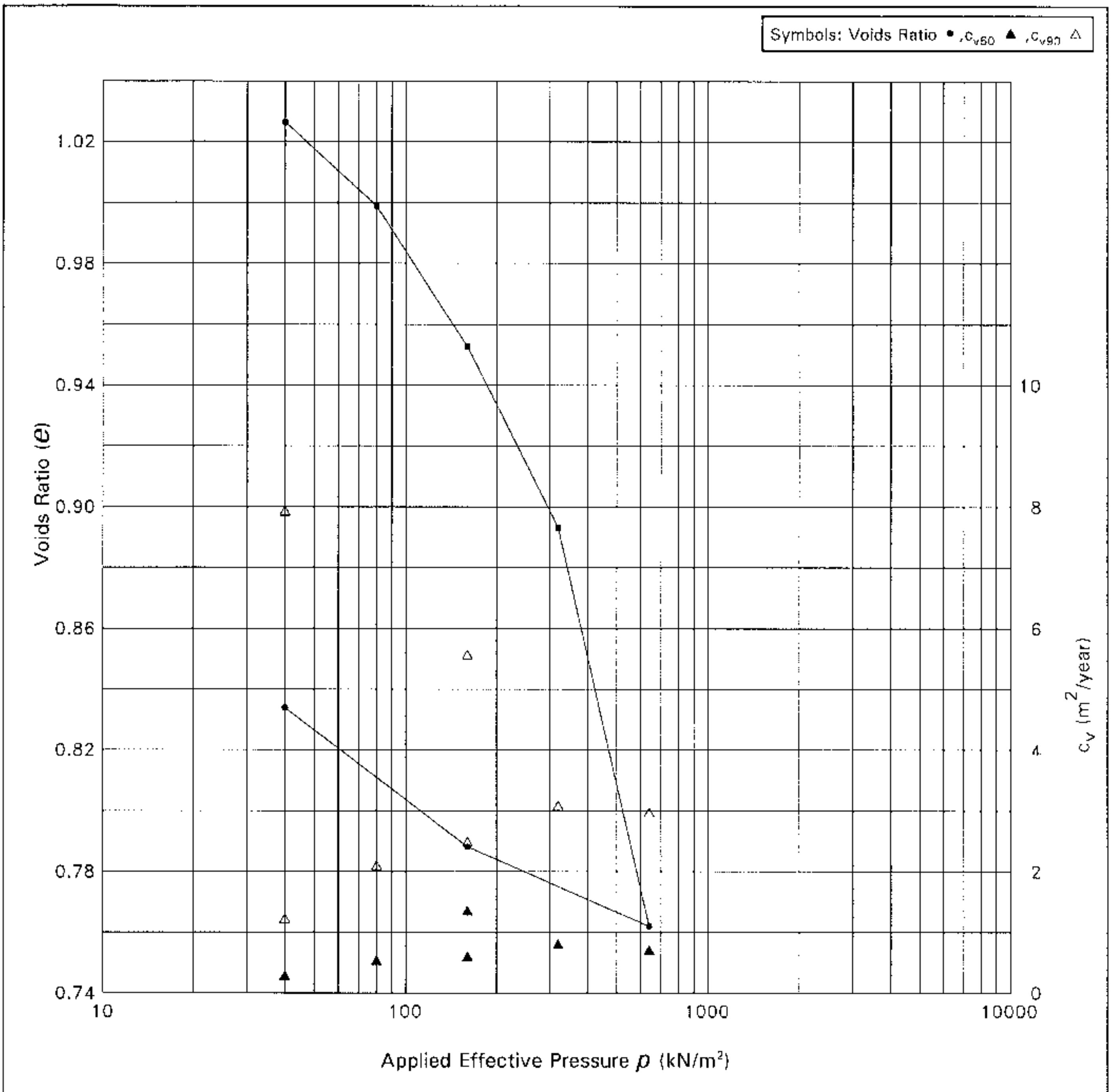
Particle Density - a=assumed, m=measured
w% - * = at natural moisture content; x = aggregate moisture content
# = stabilised, see relevant test plot for details
NST = Not suitable for Test
For Standards followed see Laboratory Test Certficate

LABORATORY RESULTS - *Consolidation e/logp Plot*

Project Newport Quinn

Client

Project No PN224395
Borehole BH09
Sample Depth 4.00 - 4.45 m
Sample Type U



Applied Pressure kN/m^2	0-40	40-80	80-160	160-320	320-640	640-160	160-40			
m_v m^2/MN	0.44	0.34	0.29	0.19	0.22	0.03	0.21			
c_{v50} Log Time m^2/yr	-	0.53	0.60	0.80	0.70	1.35	0.29			
c_{v90} Root Time m^2/yr	-	2.10	2.49	3.08	2.97	5.57	1.22			
Voids Ratio	1.026	0.999	0.953	0.893	0.762	0.788	0.834			

Description
N84065 - Firm reddish brown slightly gravelly silty CLAY

Specimen Diameter	74.550	mm
Initial Height	18.700	mm
Particle Density	2.65 Assumed	
Initial Voids Ratio	1.063	

Initial Water Content	41.35	%
Final Water Content	34.73	%
Initial Saturation	100	%
Initial Bulk Density	1.82	Mg/m^3
Initial Dry Density	1.28	Mg/m^3

Remarks
Laboratory temperature 20°C ± 3°C
Specimen cut vertically from middle of sample
Test performed in accordance with BS EN ISO 17892-5:2017
Average laboratory temperature during test 20°C

geotechnics

LABORATORY REPORT

4043

Contract Number: PSL22/7077

Report Date:	22 November 2022
Client's Reference:	PN224395
Client Name:	Geotechnics 203 Torrington Avenue Tile Hill Coventry CV4 9UT
For the attention of:	**Paul Smart**
Contract Title:	Newport Quinn Phase 2
Date Received:	2/11/2022
Date Commenced:	2/11/2022
Date Completed:	22/11/2022
Notes:	**Opinions and Interpretations are outside the UKAS Accreditation**

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. 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 other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins
(Director)

R Berriman
(Quality Manager)

S Royle
(Laboratory Manager)

L Knight
(Assistant Laboratory Manager)

S Eyre
(Senior Technician)

T Watkins
(Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH09	N84066	UT	5.00	5.45	Dark brown very clayey PEAT.

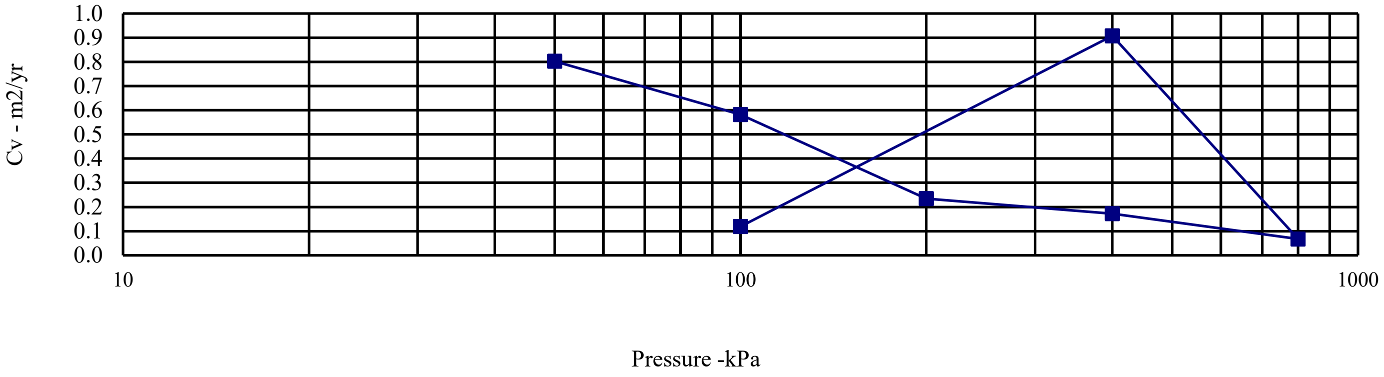
UKAS TESTING 4043	PSL Professional Soils Laboratory	Newport Quinn	**Contract No:** PSL22/7077 **Client Ref:** PN224395

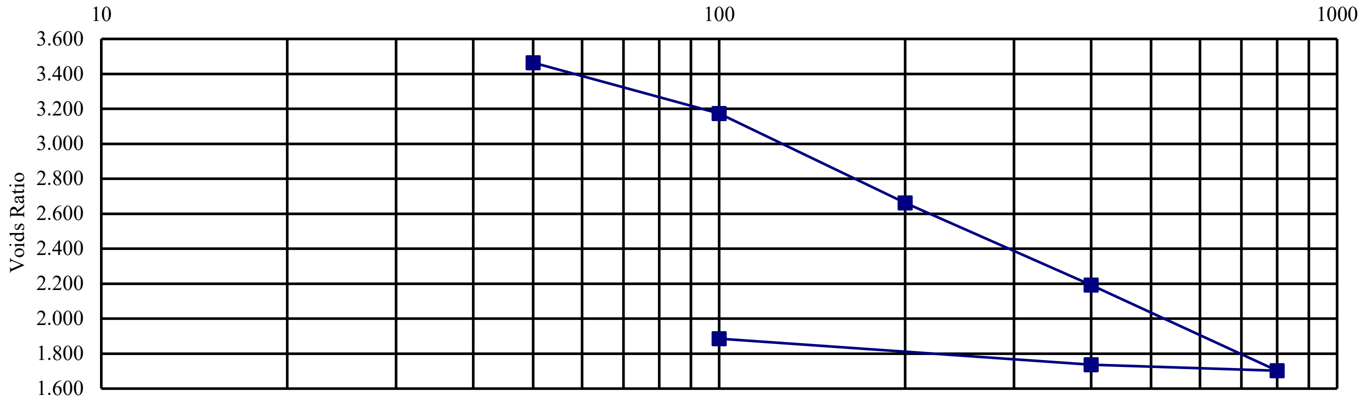
ONE DIMENSIONAL CONSOLIDATION TEST

BS 1377: Part 5: 1990: Clause 3

Hole Number:	**BH09**	**Top Depth (m):**	**5.00**
Sample Number:	**N84066**	**Base Depth (m) :**	**5.45**
Sample Type:	**UT**		

Initial Conditions		Pressure Range		Mv	Cv	Specimen location	
Moisture Content (%):	133	kPa		m2/MN	m2/yr	within tube:	Top
Bulk Density (Mg/m3):	1.28	0	50	1.515	0.803	Method used to	
Dry Density (Mg/m3):	0.55	50	100	1.303	0.582	determine CV:	T90
Voids Ratio:	3.830	100	200	1.223	0.234	Nominal temperature	
Degree of saturation:	91.7	200	400	0.643	0.173	during test ' C:	20
Height (mm):	19.938	400	800	0.383	0.068	Remarks:	
Diameter (mm)	75.01	800	400	0.032	0.908	See summary of soil descriptions	
Particle Density (Mg/m3): Assumed	2.65	400	100	0.182	0.118		





4043

Professional Soils Laboratory

Newport Quinn

Contract No:
PSL22/7077
Client Ref:
PN224395

Certificate of Analysis

Certificate Number	22-18896
Issued:	29-Sep-22
Client	Geotechnics LTD The Geotechnical Centre Unit 1B Borders Ind. Park River Lane Saltney Chester CH4 8RJ
Our Reference	22-18896
Client Reference	PN224395
Order No	ON34492
Contract Title	Newport Quinn Phase 2
Description	28 Soil samples.
Date Received	23-Sep-22
Date Started	23-Sep-22
Date Completed	29-Sep-22
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

Kirk Bridgewood
General Manager

Summary of Chemical Analysis

Soil Samples

Our Ref 22-18896
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2062081	2062082	2062083	2062084	2062085	2062086	2062087	2062088	2062089	2062090	2062091
			.Sample ID	BH01	BH01	BH03	BH04	BH05	BH06	BH10	BH11	BH12	BH14A	BH15
			Depth	1.20	5.80	2.00-2.50	3.00-3.50	1.00	2.00-2.50	1.00	2.00-2.50	1.00	1.80	1.80
			Other ID											
			Sample Type	D	D	D	D	D	D	D	D	D	D	D
			Sampling Date	n/s	10/08/2022	n/s	n/s	n/s	n/s	n/s	n/s	11/08/2022	04/08/2022	02/08/2022
			Sampling 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**											
Metals														
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Inorganics														
pH	DETSC 2008#		pH	7.8	8.8	7.1	8.3	7.9	8.3	8.4	7.1	7.7	10.5	8.0
Organic matter	DETSC 2002#	0.1	%											
Ammonia Aqueous Extract as N	DETSC 2119	10	mg/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Chloride Aqueous Extract	DETSC 2055	1	mg/l	6.8	18	4.7	7.0	13	6.0	4.7	3.7	6.2	23	4.1
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.7	< 1.0	< 1.0	< 1.0	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	15	34	16	14	12	12	27	< 10	12	64	15
Sulphur as S, Total	DETSC 2320	0.01	%	< 0.01	0.02	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.05	< 0.01
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.02	0.04	0.02	0.03	0.02	0.01	0.02	< 0.01	< 0.01	0.07	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis

Soil Samples

Our Ref 22-18896
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2062092	2062093	2062094	2062095	2062096	2062097	2062098	2062099	2062100	2062101	2062102
			.Sample ID	BH18	BH18	BH20	BH21	BH22	BH23	BH24	BH25	BH27	BH28	BH28
			Depth	4.00-4.45	4.80	0.80	5.00-5.45	3.90	1.00	4.00	0.55	1.00	2.70	3.80
			Other ID											
			Sample Type	D	D	D	D	D	D	D	D	D	D	D
			Sampling Date	03/08/2022	03/08/2022	n/s	31/08/2022	02/08/2022	26/07/2022	n/s	28/07/2022	n/s	n/s	29/07/2022
			Sampling 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**											
Metals														
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Inorganics														
pH	DETSC 2008#		pH	7.4	7.0	8.0	7.0	7.3	7.7	8.8	11.1	10.7	7.5	7.0
Organic matter	DETSC 2002#	0.1	%											
Ammonia Aqueous Extract as N	DETSC 2119	10	mg/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Chloride Aqueous Extract	DETSC 2055	1	mg/l	6.4	5.7	4.2	8.3	6.3	15	11	29	5.9	3.5	5.3
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	24	29	32	19	17	13	29	99	13	17	15
Sulphur as S, Total	DETSC 2320	0.01	%	< 0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.21	0.01	< 0.01	< 0.01
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.02	0.02	0.03	0.01	< 0.01	0.02	0.03	0.29	0.02	0.01	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis

Soil Samples

Our Ref 22-18896
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2062103	2062104	2062105	2062106	2062107	2062108
			.Sample ID	BH29	BH29	BH30	BH30	BH09	BH26
			Depth	1.00	4.00	1.00	5.00-5.45	4.50-5.00	4.80
			Other ID						
			Sample Type	D	D	D	D	D	D
			Sampling Date	n/s	28/07/2022	28/07/2022	05/08/2022	n/s	11/08/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10	< 10	< 10	< 10		
Inorganics									
pH	DETSC 2008#		pH	8.5	6.6	7.2	11.2		
Organic matter	DETSC 2002#	0.1	%					0.7	21
Ammonia Aqueous Extract as N	DETSC 2119	10	mg/l	< 10	< 10	< 10	< 10		
Chloride Aqueous Extract	DETSC 2055	1	mg/l	2.1	11	6.3	30		
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0	< 1.0	< 1.0	< 1.0		
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	20	42	25	92		
Sulphur as S, Total	DETSC 2320	0.01	%	< 0.01	< 0.01	< 0.01	0.07		
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.01	0.02	0.01	0.25		

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 22-18896
Client Ref PN224395
Contract Newport Quinn Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2062081	BH01 1.20 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2062082	BH01 5.80 SOIL	10/08/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2062083	BH03 2.00-2.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2062084	BH04 3.00-3.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2062085	BH05 1.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2062086	BH06 2.00-2.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2062087	BH10 1.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2062088	BH11 2.00-2.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2062089	BH12 1.00 SOIL	11/08/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2062090	BH14A 1.80 SOIL	04/08/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2062091	BH15 1.80 SOIL	02/08/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	

Information in Support of the Analytical Results

Our Ref 22-18896
Client Ref PN224395
Contract Newport Quinn Phase 2

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2062092	BH18 4.00-4.45 SOIL	03/08/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2062093	BH18 4.80 SOIL	03/08/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2062094	BH20 0.80 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2062095	BH21 5.00-5.45 SOIL	31/08/22	PT 1L	Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2062096	BH22 3.90 SOIL	02/08/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2062097	BH23 1.00 SOIL	26/07/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2062098	BH24 4.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2062099	BH25 0.55 SOIL	28/07/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2062100	BH27 1.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2062101	BH28 2.70 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2062102	BH28 3.80 SOIL	29/07/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2062103	BH29 1.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	

Information in Support of the Analytical Results

Our Ref 22-18896
Client Ref PN224395
Contract Newport Quinn Phase 2

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2062104	BH29 4.00 SOIL	28/07/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2062105	BH30 1.00 SOIL	28/07/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2062106	BH30 5.00-5.45 SOIL	05/08/22	PT 1L	Anions 2:1 (30 days), Ammonia Aqueous Extract (3 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
2062107	BH09 4.50-5.00 SOIL		PT 1L	Sample date not supplied, Organic Matter (Manual) (28 days)	
2062108	BH26 4.80 SOIL	11/08/22	PT 500ml	Organic Matter (Manual) (28 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.

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

LABORATORY REPORT

4043

Contract Number: PSL22/6080

Report Date: 05 October 2022

Client's Reference: PN224395

Client Name: Geotechnics
203 Torrington Avenue
Tile Hill
Coventry
CV4 9UT

For the attention of: Josh Noble

Contract Title: Newport Quinn Phase 2

Date Received: 21/9/2022
Date Commenced: 21/9/2022
Date Completed: 5/10/2022

Notes: **Opinions and Interpretations are outside the UKAS Accreditation**

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. 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 other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins (Director)	R Berriman (Quality Manager)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH01	8.18		I	Perp	75	30	2250	2864.79	53.52	-	0.71	0.25	1.031	0.26	Valid	
BH01	8.26		A	Perp	80	27	2160	2750.20	52.44	-	0.18	0.07	1.022	0.07	Valid	
BH01	8.61		A	Perp	80	28	2240	2852.06	53.40	-	0.31	0.11	1.030	0.11	Valid	
BH01	8.73		A	Perp	80	28	2240	2852.06	53.40	-	0.27	0.09	1.030	0.10	Valid	
BH01	8.86		A	Perp	80	30	2400	3055.77	55.28	-	0.17	0.06	1.046	0.06	Valid	
BH01	10.70		A	Perp	80	26	2080	2648.34	51.46	-	0.89	0.34	1.013	0.34	Valid	
BH01	12.50		A	Perp	80	28	2240	2852.06	53.40	-	0.30	0.11	1.030	0.11	Valid	
BH01	12.83		A	Perp	80	27	2160	2750.20	52.44	-	0.17	0.06	1.022	0.06	Valid	
BH01	13.05		A	Perp	80	30	2400	3055.77	55.28	-	2.88	0.94	1.046	0.99	Valid	
BH01	13.40		A	Perp	80	32	2560	3259.49	57.09	-	0.84	0.26	1.062	0.27	Valid	
BH01	15.37		A	Perp	80	28	2240	2852.06	53.40	-	1.81	0.63	1.030	0.65	Valid	
BH01	16.42		A	Perp	80	28	2240	2852.06	53.40	-	1.21	0.42	1.030	0.44	Valid	
BH01	18.00		A	Perp	80	25	2000	2546.48	50.46	-	0.88	0.35	1.004	0.35	Valid	
BH01	18.92		A	Perp	80	30	2400	3055.77	55.28	-	1.20	0.39	1.046	0.41	Valid	
BH01	19.95		A	Perp	80	48	3840	4889.24	69.92	-	3.11	0.64	1.163	0.74	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular

4043

Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:

PSL22/6080

Client Ref:

PN224395

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH01	8.26		D	Par	-	80	6400	80.00	-	0.14	0.022	1.236	0.03	Valid	
BH01	8.61		D	Par	-	80	6400	80.00	-	0.22	0.034	1.236	0.04	Valid	
BH01	8.73		D	Par	-	80	6400	80.00	-	0.44	0.069	1.236	0.08	Valid	
BH01	8.86		D	Par	-	80	6400	80.00	-	0.11	0.017	1.236	0.02	Valid	
BH01	10.70		D	Par	-	80	6400	80.00	-	1.00	0.156	1.236	0.19	Valid	
BH01	12.50		D	Par	-	80	6400	80.00	-	0.20	0.031	1.236	0.04	Valid	
BH01	12.83		D	Par	-	80	6400	80.00	-	0.12	0.019	1.236	0.02	Valid	
BH01	13.05		D	Par	-	80	6400	80.00	-	2.63	0.411	1.236	0.51	Valid	
BH01	13.40		D	Par	-	80	6400	80.00	-	0.91	0.142	1.236	0.18	Valid	
BH01	15.37		D	Par	-	80	6400	80.00	-	1.26	0.197	1.236	0.24	Valid	
BH01	16.42		D	Par	-	80	6400	80.00	-	1.03	0.161	1.236	0.20	Valid	
BH01	18.00		D	Par	-	80	6400	80.00	-	0.97	0.152	1.236	0.19	Valid	
BH01	18.92		D	Par	-	80	6400	80.00	-	1.14	0.178	1.236	0.22	Valid	
BH01	19.95		D	Par	-	80	6400	80.00	-	2.78	0.434	1.236	0.54	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

4043

Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:

PSL22/6080

Client Ref:

PN224395

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH04A	5.52		A	Perp	80	38	3040	3870.65	62.21	-	0.22	0.06	1.103	0.06	Valid	
BH04A	5.60		A	Perp	80	47	3760	4787.38	69.19	-	0.17	0.04	1.157	0.04	Valid	
BH04A	5.78		A	Perp	80	40	3200	4074.37	63.83	-	0.22	0.05	1.116	0.06	Valid	
BH04A	6.65		A	Perp	80	38	3040	3870.65	62.21	-	0.11	0.03	1.103	0.03	Valid	
BH04A	6.80		A	Perp	80	39	3120	3972.51	63.03	-	0.38	0.10	1.110	0.11	Valid	
BH04A	8.10		A	Perp	80	42	3360	4278.08	65.41	-	0.18	0.04	1.128	0.05	Valid	
BH04A	9.95		A	Perp	80	28	2240	2852.06	53.40	-	0.27	0.09	1.030	0.10	Valid	
BH04A	10.93		A	Perp	80	25	2000	2546.48	50.46	-	0.18	0.07	1.004	0.07	Valid	
BH04A	12.21		A	Perp	80	28	2240	2852.06	53.40	-	0.28	0.10	1.030	0.10	Valid	
BH04A	14.45		A	Perp	80	30	2400	3055.77	55.28	-	0.74	0.24	1.046	0.25	Valid	
BH04A	15.87		A	Perp	80	30	2400	3055.77	55.28	-	0.37	0.12	1.046	0.13	Valid	
BH04A	16.43		A	Perp	80	28	2240	2852.06	53.40	-	0.80	0.28	1.030	0.29	Valid	
BH04A	17.40		A	Perp	80	34	2720	3463.21	58.85	-	0.14	0.04	1.076	0.04	Valid	
BH04A	19.20		A	Perp	80	38	3040	3870.65	62.21	-	0.20	0.05	1.103	0.06	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular

UKAS TESTING
4043

PSL
Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:
PSL22/6080
Client Ref:
PN224395

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH04A	5.52		D	Par	-	80	6400	80.00	-	0.14	0.022	1.236	0.03	Valid	
BH04A	5.60		D	Par	-	80	6400	80.00	-	0.21	0.033	1.236	0.04	Valid	
BH04A	5.78		D	Par	-	80	6400	80.00	-	0.16	0.025	1.236	0.03	Valid	
BH04A	6.65		D	Par	-	80	6400	80.00	-	0.06	0.009	1.236	0.01	Valid	
BH04A	6.80		D	Par	-	80	6400	80.00	-	0.24	0.038	1.236	0.05	Valid	
BH04A	8.10		D	Par	-	80	6400	80.00	-	0.11	0.017	1.236	0.02	Valid	
BH04A	9.95		D	Par	-	80	6400	80.00	-	0.23	0.036	1.236	0.04	Valid	
BH04A	10.93		D	Par	-	80	6400	80.00	-	0.10	0.016	1.236	0.02	Valid	
BH04A	12.21		D	Par	-	80	6400	80.00	-	0.14	0.022	1.236	0.03	Valid	
BH04A	14.45		D	Par	-	80	6400	80.00	-	0.63	0.098	1.236	0.12	Valid	
BH04A	15.87		D	Par	-	80	6400	80.00	-	0.40	0.063	1.236	0.08	Valid	
BH04A	16.43		D	Par	-	80	6400	80.00	-	0.76	0.119	1.236	0.15	Valid	
BH04A	17.40		D	Par	-	80	6400	80.00	-	0.18	0.028	1.236	0.03	Valid	
BH04A	19.20		D	Par	-	80	6400	80.00	-	0.15	0.023	1.236	0.03	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

UKAS TESTING
4043

PSL
Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:	**PSL22/6080**
Client Ref:	**PN224395**

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH07	7.86		I	Perp	37	24	888	1130.64	33.62	-	0.30	0.27	0.836	0.22	Valid	
BH07	8.32		A	Perp	80	28	2240	2852.06	53.40	-	0.20	0.07	1.030	0.07	Valid	
BH07	9.94		A	Perp	80	27	2160	2750.20	52.44	-	0.18	0.07	1.022	0.07	Valid	
BH07	10.10		I	Perp	32	21	672	855.62	29.25	-	0.21	0.25	0.786	0.19	Valid	
BH07	10.40		A	Perp	80	27	2160	2750.20	52.44	-	0.22	0.08	1.022	0.08	Valid	
BH07	12.69		A	Perp	80	25	2000	2546.48	50.46	-	0.11	0.04	1.004	0.04	Valid	
BH07	13.43		A	Perp	80	28	2240	2852.06	53.40	-	0.22	0.08	1.030	0.08	Valid	
BH07	13.70		A	Perp	80	27	2160	2750.20	52.44	-	0.20	0.07	1.022	0.07	Valid	
BH07	15.27		A	Perp	80	36	2880	3666.93	60.56	-	0.21	0.06	1.090	0.06	Valid	
BH07	15.60		A	Perp	80	48	3840	4889.24	69.92	-	0.26	0.05	1.163	0.06	Valid	
BH07	16.90		A	Perp	80	47	3760	4787.38	69.19	-	0.20	0.04	1.157	0.05	Valid	
BH07	17.21		A	Perp	80	33	2640	3361.35	57.98	-	0.47	0.14	1.069	0.15	Valid	
BH07	18.00		A	Perp	80	27	2160	2750.20	52.44	-	0.18	0.07	1.022	0.07	Valid	
BH07	18.90		A	Perp	80	38	3040	3870.65	62.21	-	0.22	0.06	1.103	0.06	Valid	
BH07	19.85		A	Perp	80	43	3440	4379.94	66.18	-	0.37	0.08	1.134	0.10	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular

4043

Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:	**PSL22/6080**
Client Ref:	**PN224395**

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH07	8.32		D	Par	-	80	6400	80.00	-	0.28	0.044	1.236	0.05	Valid	
BH07	9.94		D	Par	-	80	6400	80.00	-	0.14	0.022	1.236	0.03	Valid	
BH07	10.40		D	Par	-	80	6400	80.00	-	0.17	0.027	1.236	0.03	Valid	
BH07	12.69		D	Par	-	80	6400	80.00	-	0.20	0.031	1.236	0.04	Valid	
BH07	13.43		D	Par	-	80	6400	80.00	-	0.21	0.033	1.236	0.04	Valid	
BH07	13.70		D	Par	-	80	6400	80.00	-	0.16	0.025	1.236	0.03	Valid	
BH07	15.27		D	Par	-	80	6400	80.00	-	0.20	0.031	1.236	0.04	Valid	
BH07	15.60		D	Par	-	80	6400	80.00	-	0.22	0.034	1.236	0.04	Valid	
BH07	16.90		D	Par	-	80	6400	80.00	-	0.21	0.033	1.236	0.04	Valid	
BH07	17.21		D	Par	-	80	6400	80.00	-	0.33	0.052	1.236	0.06	Valid	
BH07	18.00		D	Par	-	80	6400	80.00	-	0.20	0.031	1.236	0.04	Valid	
BH07	18.90		D	Par	-	80	6400	80.00	-	0.23	0.036	1.236	0.04	Valid	
BH07	19.85		D	Par	-	80	6400	80.00	-	0.49	0.077	1.236	0.09	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Newport Quinn Phase 2**	**Contract No:** **PSL22/6080** **Client Ref:** **PN224395**

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH10	6.74		A	Perp	80	28	2240	2852.06	53.40	-	0.77	0.27	1.030	0.28	Valid	
BH10	7.50		A	Perp	80	25	2000	2546.48	50.46	-	1.01	0.40	1.004	0.40	Valid	
BH10	8.45		A	Perp	80	30	2400	3055.77	55.28	-	0.38	0.12	1.046	0.13	Valid	
BH10	8.98		A	Perp	80	31	2480	3157.63	56.19	-	1.01	0.32	1.054	0.34	Valid	
BH10	9.47		A	Perp	80	38	3040	3870.65	62.21	-	0.27	0.07	1.103	0.08	Valid	
BH10	11.30		A	Perp	80	30	2400	3055.77	55.28	-	2.71	0.89	1.046	0.93	Valid	
BH10	11.90		A	Perp	80	31	2480	3157.63	56.19	-	2.37	0.75	1.054	0.79	Valid	
BH10	12.33		A	Perp	80	27	2160	2750.20	52.44	-	1.30	0.47	1.022	0.48	Valid	
BH10	12.82		A	Perp	80	27	2160	2750.20	52.44	-	4.21	1.53	1.022	1.56	Valid	
BH10	13.08		A	Perp	80	28	2240	2852.06	53.40	-	2.01	0.70	1.030	0.73	Valid	
BH10	14.16		A	Perp	80	31	2480	3157.63	56.19	-	1.53	0.48	1.054	0.51	Valid	
BH10	16.20		A	Perp	80	27	2160	2750.20	52.44	-	1.94	0.71	1.022	0.72	Valid	
BH10	17.43		A	Perp	80	30	2400	3055.77	55.28	-	0.88	0.29	1.046	0.30	Valid	
BH10	19.05		A	Perp	80	37	2960	3768.79	61.39	-	1.94	0.51	1.097	0.56	Valid	
BH10	20.24		A	Perp	80	28	2240	2852.06	53.40	-	0.89	0.31	1.030	0.32	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular

UKAS TESTING 4043	PSL Professional Soils Laboratory	Newport Quinn Phase 2	**Contract No:** PSL22/6080 **Client Ref:** PN224395

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH10	6.74		D	Par	-	80	6400	80.00	-	0.11	0.017	1.236	0.02	Valid	
BH10	7.50		D	Par	-	80	6400	80.00	-	0.22	0.034	1.236	0.04	Valid	
BH10	8.45		D	Par	-	80	6400	80.00	-	0.43	0.067	1.236	0.08	Valid	
BH10	8.98		D	Par	-	80	6400	80.00	-	0.88	0.138	1.236	0.17	Valid	
BH10	9.47		D	Par	-	80	6400	80.00	-	0.36	0.056	1.236	0.07	Valid	
BH10	11.30		D	Par	-	80	6400	80.00	-	1.98	0.309	1.236	0.38	Valid	
BH10	11.90		D	Par	-	80	6400	80.00	-	2.45	0.383	1.236	0.47	Valid	
BH10	12.33		D	Par	-	80	6400	80.00	-	1.17	0.183	1.236	0.23	Valid	
BH10	12.82		D	Par	-	80	6400	80.00	-	3.04	0.475	1.236	0.59	Valid	
BH10	13.08		D	Par	-	80	6400	80.00	-	3.85	0.602	1.236	0.74	Valid	
BH10	14.16		D	Par	-	80	6400	80.00	-	1.48	0.231	1.236	0.29	Valid	
BH10	16.20		D	Par	-	80	6400	80.00	-	2.64	0.413	1.236	0.51	Valid	
BH10	17.43		D	Par	-	80	6400	80.00	-	0.71	0.111	1.236	0.14	Valid	
BH10	19.05		D	Par	-	80	6400	80.00	-	1.84	0.288	1.236	0.36	Valid	
BH10	20.24		D	Par	-	80	6400	80.00	-	0.70	0.109	1.236	0.14	Valid	

Note All testing carried out on samples at as received water content   Par = parallel, Perp = perpendicular, U = Random

UKAS TESTING
4043

PSL
Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:
PSL22/6080
Client Ref:
PN224395

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH14A	7.15		A	Perp	80	37	2960	3768.79	61.39	-	0.24	0.06	1.097	0.07	Valid	
BH14A	8.03		A	Perp	80	37	2960	3768.79	61.39	-	0.20	0.05	1.097	0.06	Valid	
BH14A	8.50		A	Perp	80	34	2720	3463.21	58.85	-	0.22	0.06	1.076	0.07	Valid	
BH14A	10.80		A	Perp	80	28	2240	2852.06	53.40	-	0.18	0.06	1.030	0.07	Valid	
BH14A	11.80		A	Perp	80	30	2400	3055.77	55.28	-	0.19	0.06	1.046	0.07	Valid	
BH14A	12.00		A	Perp	80	44	3520	4481.80	66.95	-	0.20	0.04	1.140	0.05	Valid	
BH14A	12.80		A	Perp	80	32	2560	3259.49	57.09	-	0.22	0.07	1.062	0.07	Valid	
BH14A	13.40		A	Perp	80	36	2880	3666.93	60.56	-	0.18	0.05	1.090	0.05	Valid	
BH14A	13.90		A	Perp	80	32	2560	3259.49	57.09	-	0.16	0.05	1.062	0.05	Valid	
BH14A	14.00		A	Perp	80	40	3200	4074.37	63.83	-	0.27	0.07	1.116	0.07	Valid	
BH14A	14.90		I	Perp	72	38	2736	3483.58	59.02	-	0.24	0.07	1.078	0.07	Valid	
BH14A	16.15		A	Perp	80	32	2560	3259.49	57.09	-	0.20	0.06	1.062	0.07	Valid	
BH14A	16.77		A	Perp	80	40	3200	4074.37	63.83	-	0.20	0.05	1.116	0.05	Valid	
BH14A	17.77		A	Perp	80	38	3040	3870.65	62.21	-	0.19	0.05	1.103	0.05	Valid	
BH14A	18.80		A	Perp	80	30	2400	3055.77	55.28	-	0.22	0.07	1.046	0.08	Valid	
BH14A	20.22		A	Perp	80	30	2400	3055.77	55.28	-	0.22	0.07	1.046	0.08	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH14A	7.15		D	Par	-	80	6400	80.00	-	0.22	0.034	1.236	0.04	Valid	
BH14A	8.03		D	Par	-	80	6400	80.00	-	0.16	0.025	1.236	0.03	Valid	
BH14A	8.50		D	Par	-	80	6400	80.00	-	0.19	0.030	1.236	0.04	Valid	
BH14A	10.80		D	Par	-	80	6400	80.00	-	0.16	0.025	1.236	0.03	Valid	
BH14A	11.80		D	Par	-	80	6400	80.00	-	0.15	0.023	1.236	0.03	Valid	
BH14A	12.00		D	Par	-	80	6400	80.00	-	0.18	0.028	1.236	0.03	Valid	
BH14A	12.80		D	Par	-	80	6400	80.00	-	0.17	0.027	1.236	0.03	Valid	
BH14A	13.40		D	Par	-	80	6400	80.00	-	0.11	0.017	1.236	0.02	Valid	
BH14A	13.90		D	Par	-	80	6400	80.00	-	0.14	0.022	1.236	0.03	Valid	
BH14A	14.00		D	Par	-	80	6400	80.00	-	0.19	0.030	1.236	0.04	Valid	
BH14A	16.15		D	Par	-	80	6400	80.00	-	0.11	0.017	1.236	0.02	Valid	
BH14A	16.77		D	Par	-	80	6400	80.00	-	0.18	0.028	1.236	0.03	Valid	
BH14A	17.77		D	Par	-	80	6400	80.00	-	0.17	0.027	1.236	0.03	Valid	
BH14A	18.80		D	Par	-	80	6400	80.00	-	0.24	0.038	1.236	0.05	Valid	
BH14A	20.22		D	Par	-	80	6400	80.00	-	0.14	0.022	1.236	0.03	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

UKAS TESTING 4043

PSL Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:	**PSL22/6080**
Client Ref:	**PN224395**

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH17A	6.50		A	Perp	80	44	3520	4481.80	66.95	-	0.38	0.08	1.140	0.10	Valid	
BH17A	7.05		A	Perp	80	38	3040	3870.65	62.21	-	0.32	0.08	1.103	0.09	Valid	
BH17A	7.60		A	Perp	80	38	3040	3870.65	62.21	-	0.36	0.09	1.103	0.10	Valid	
BH17A	9.30		A	Perp	80	40	3200	4074.37	63.83	-	0.24	0.06	1.116	0.07	Valid	
BH17A	10.25		A	Perp	80	34	2720	3463.21	58.85	-	0.14	0.04	1.076	0.04	Valid	
BH17A	11.40		A	Perp	80	40	3200	4074.37	63.83	-	0.40	0.10	1.116	0.11	Valid	
BH17A	12.00		A	Perp	80	44	3520	4481.80	66.95	-	0.31	0.07	1.140	0.08	Valid	
BH17A	12.50		A	Perp	80	36	2880	3666.93	60.56	-	0.30	0.08	1.090	0.09	Valid	
BH17A	15.80		A	Perp	80	38	3040	3870.65	62.21	-	0.48	0.12	1.103	0.14	Valid	
BH17A	16.15		A	Perp	80	37	2960	3768.79	61.39	-	0.37	0.10	1.097	0.11	Valid	
BH17A	16.60		A	Perp	80	45	3600	4583.66	67.70	-	0.88	0.19	1.146	0.22	Valid	
BH17A	16.95		A	Perp	80	30	2400	3055.77	55.28	-	0.94	0.31	1.046	0.32	Valid	
BH17A	17.43		A	Perp	80	47	3760	4787.38	69.19	-	1.08	0.23	1.157	0.26	Valid	
BH17A	17.80		A	Perp	80	50	4000	5092.96	71.36	-	0.41	0.08	1.174	0.09	Valid	
BH17A	19.64		A	Perp	80	38	3040	3870.65	62.21	-	18.99	4.91	1.103	5.41	Valid	
BH17A	19.85		A	Perp	80	28	2240	2852.06	53.40	-	9.21	3.23	1.030	3.33	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular

UKAS TESTING
4043

PSL
Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:	**PSL22/6080**
Client Ref:	**PN224395**

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH17A	6.50		D	Par	-	80	6400	80.00	-	1.04	0.163	1.236	0.20	Valid	
BH17A	7.05		D	Par	-	80	6400	80.00	-	0.40	0.063	1.236	0.08	Valid	
BH17A	7.60		D	Par	-	80	6400	80.00	-	0.47	0.073	1.236	0.09	Valid	
BH17A	9.30		D	Par	-	80	6400	80.00	-	0.38	0.059	1.236	0.07	Valid	
BH17A	10.25		D	Par	-	80	6400	80.00	-	0.17	0.027	1.236	0.03	Valid	
BH17A	11.40		D	Par	-	80	6400	80.00	-	0.36	0.056	1.236	0.07	Valid	
BH17A	12.00		D	Par	-	80	6400	80.00	-	0.43	0.067	1.236	0.08	Valid	
BH17A	12.50		D	Par	-	80	6400	80.00	-	0.32	0.050	1.236	0.06	Valid	
BH17A	15.80		D	Par	-	80	6400	80.00	-	0.41	0.064	1.236	0.08	Valid	
BH17A	16.15		D	Par	-	80	6400	80.00	-	0.50	0.078	1.236	0.10	Valid	
BH17A	16.60		D	Par	-	80	6400	80.00	-	0.47	0.073	1.236	0.09	Valid	
BH17A	16.95		D	Par	-	80	6400	80.00	-	0.26	0.041	1.236	0.05	Valid	
BH17A	17.43		D	Par	-	80	6400	80.00	-	1.54	0.241	1.236	0.30	Valid	
BH17A	17.80		D	Par	-	80	6400	80.00	-	0.21	0.033	1.236	0.04	Valid	
BH17A	19.64		D	Par	-	80	6400	80.00	-	22.14	3.459	1.236	4.27	Valid	
BH17A	19.85		D	Par	-	80	6400	80.00	-	10.82	1.691	1.236	2.09	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

4043	Professional Soils Laboratory	Newport Quinn Phase 2	**Contract No:** **PSL22/6080** **Client Ref:** **PN224395**

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH23	11.80		A	Perp	80	32	2560	3259.49	57.09	-	0.31	0.10	1.062	0.10	Valid	
BH23	12.48		I	Perp	74	24	1776	2261.27	47.55	-	0.20	0.09	0.978	0.09	Valid	
BH23	12.95		A	Perp	80	40	3200	4074.37	63.83	-	0.27	0.07	1.116	0.07	Valid	
BH23	14.70		A	Perp	80	37	2960	3768.79	61.39	-	0.12	0.03	1.097	0.03	Valid	
BH23	15.15		A	Perp	80	38	3040	3870.65	62.21	-	0.40	0.10	1.103	0.11	Valid	
BH23	15.68		A	Perp	80	30	2400	3055.77	55.28	-	0.30	0.10	1.046	0.10	Valid	
BH23	16.37		A	Perp	80	34	2720	3463.21	58.85	-	0.30	0.09	1.076	0.09	Valid	
BH23	16.90		A	Perp	80	40	3200	4074.37	63.83	-	0.30	0.07	1.116	0.08	Valid	
BH23	17.10		A	Perp	80	38	3040	3870.65	62.21	-	0.20	0.05	1.103	0.06	Valid	
BH23	17.90		A	Perp	80	32	2560	3259.49	57.09	-	0.24	0.07	1.062	0.08	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular

4043

Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:
PSL22/6080
Client Ref:
PN224395

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH23	11.80		D	Par	-	80	6400	80.00	-	0.24	0.038	1.236	0.05	Valid	
BH23	12.95		D	Par	-	80	6400	80.00	-	0.30	0.047	1.236	0.06	Valid	
BH23	14.70		D	Par	-	80	6400	80.00	-	0.11	0.017	1.236	0.02	Valid	
BH23	15.15		D	Par	-	80	6400	80.00	-	0.22	0.034	1.236	0.04	Valid	
BH23	15.68		D	Par	-	80	6400	80.00	-	0.22	0.034	1.236	0.04	Valid	
BH23	16.37		D	Par	-	80	6400	80.00	-	0.29	0.045	1.236	0.06	Valid	
BH23	16.90		D	Par	-	80	6400	80.00	-	0.27	0.042	1.236	0.05	Valid	
BH23	17.10		D	Par	-	80	6400	80.00	-	0.14	0.022	1.236	0.03	Valid	
BH23	17.90		D	Par	-	80	6400	80.00	-	0.26	0.041	1.236	0.05	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

4043	Professional Soils Laboratory	**Newport Quinn Phase 2**	**Contract No:** **PSL22/6080** **Client Ref:** **PN224395**

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH27	6.80		A	Perp	80	37	2960	3768.79	61.39	-	0.23	0.06	1.097	0.07	Valid	
BH27	7.03		A	Perp	80	42	3360	4278.08	65.41	-	0.27	0.06	1.128	0.07	Valid	
BH27	9.65		A	Perp	80	38	3040	3870.65	62.21	-	0.18	0.05	1.103	0.05	Valid	
BH27	12.10		A	Perp	80	38	3040	3870.65	62.21	-	0.70	0.18	1.103	0.20	Valid	
BH27	13.75		A	Perp	80	42	3360	4278.08	65.41	-	0.27	0.06	1.128	0.07	Valid	
BH27	15.47		A	Perp	80	30	2400	3055.77	55.28	-	0.40	0.13	1.046	0.14	Valid	
BH27	16.25		A	Perp	80	40	3200	4074.37	63.83	-	0.20	0.05	1.116	0.05	Valid	
BH27	19.95		A	Perp	80	37	2960	3768.79	61.39	-	0.21	0.06	1.097	0.06	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular

UKAS TESTING
4043

PSL
Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:
PSL22/6080
Client Ref:
PN224395

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH27	6.80		D	Par	-	80	6400	80.00	-	0.20	0.031	1.236	0.04	Valid	
BH27	7.03		D	Par	-	80	6400	80.00	-	0.30	0.047	1.236	0.06	Valid	
BH27	9.65		D	Par	-	80	6400	80.00	-	0.20	0.031	1.236	0.04	Valid	
BH27	12.10		D	Par	-	80	6400	80.00	-	0.53	0.083	1.236	0.10	Valid	
BH27	13.75		D	Par	-	80	6400	80.00	-	0.30	0.047	1.236	0.06	Valid	
BH27	15.47		D	Par	-	80	6400	80.00	-	0.44	0.069	1.236	0.08	Valid	
BH27	16.25		D	Par	-	80	6400	80.00	-	0.14	0.022	1.236	0.03	Valid	
BH27	19.95		D	Par	-	80	6400	80.00	-	0.24	0.038	1.236	0.05	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

UKAS TESTING 4043

PSL

Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:
PSL22/6080
Client Ref:
PN224395

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH28	5.60		A	Perp	80	26	2080	2648.34	51.46	-	0.22	0.08	1.013	0.08	Valid	
BH28	5.70		A	Perp	80	30	2400	3055.77	55.28	-	0.30	0.10	1.046	0.10	Valid	
BH28	9.65		A	Perp	80	27	2160	2750.20	52.44	-	0.16	0.06	1.022	0.06	Valid	
BH28	10.30		A	Perp	80	30	2400	3055.77	55.28	-	0.17	0.06	1.046	0.06	Valid	
BH28	11.15		A	Perp	80	32	2560	3259.49	57.09	-	0.20	0.06	1.062	0.07	Valid	
BH28	12.05		A	Perp	80	40	3200	4074.37	63.83	-	0.18	0.04	1.116	0.05	Valid	
BH28	14.88		A	Perp	80	34	2720	3463.21	58.85	-	0.34	0.10	1.076	0.11	Valid	
BH28	17.00		A	Perp	80	26	2080	2648.34	51.46	-	0.22	0.08	1.013	0.08	Valid	
BH28	19.90		A	Perp	80	40	3200	4074.37	63.83	-	0.24	0.06	1.116	0.07	Valid	

Note All testing carried out on samples at as received water content   Par = parallel, Perp = perpendicular, U = Random   A = Axial, D = Diametral, I = Irregular

UKAS TESTING
4043

PSL
Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:	**PSL22/6080**
Client Ref:	**PN224395**

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH28	5.60		D	Par	-	80	6400	80.00	-	0.21	0.033	1.236	0.04	Valid	
BH28	5.70		D	Par	-	80	6400	80.00	-	0.21	0.033	1.236	0.04	Valid	
BH28	9.65		D	Par	-	80	6400	80.00	-	0.14	0.022	1.236	0.03	Valid	
BH28	10.30		D	Par	-	80	6400	80.00	-	0.12	0.019	1.236	0.02	Valid	
BH28	11.15		D	Par	-	80	6400	80.00	-	0.13	0.020	1.236	0.03	Valid	
BH28	12.05		D	Par	-	80	6400	80.00	-	0.11	0.017	1.236	0.02	Valid	
BH28	14.88		D	Par	-	80	6400	80.00	-	0.22	0.034	1.236	0.04	Valid	
BH28	17.00		D	Par	-	80	6400	80.00	-	0.16	0.025	1.236	0.03	Valid	
BH28	19.90		D	Par	-	80	6400	80.00	-	0.20	0.031	1.236	0.04	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

UKAS TESTING 4043

PSL Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:	**PSL22/6080**
Client Ref:	**PN224395**

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH30	5.75		A	Perp	80	43	3440	4379.94	66.18	-	0.23	0.05	1.134	0.06	Valid	
BH30	7.30		A	Perp	80	50	4000	5092.96	71.36	-	0.22	0.04	1.174	0.05	Valid	
BH30	7.70		A	Perp	80	49	3920	4991.10	70.65	-	0.17	0.03	1.168	0.04	Valid	
BH30	8.85		A	Perp	80	47	3760	4787.38	69.19	-	0.17	0.04	1.157	0.04	Valid	
BH30	9.24		A	Perp	80	37	2960	3768.79	61.39	-	4.99	1.32	1.097	1.45	Valid	
BH30	9.40		A	Perp	80	42	3360	4278.08	65.41	-	7.01	1.64	1.128	1.85	Valid	
BH30	11.88		A	Perp	80	40	3200	4074.37	63.83	-	0.17	0.04	1.116	0.05	Valid	
BH30	15.10		A	Perp	80	32	2560	3259.49	57.09	-	0.15	0.05	1.062	0.05	Valid	
BH30	15.87		A	Perp	80	24	1920	2444.62	49.44	-	0.61	0.25	0.995	0.25	Valid	
BH30	16.75		A	Perp	80	30	2400	3055.77	55.28	-	0.28	0.09	1.046	0.10	Valid	
BH30	17.80		A	Perp	80	40	3200	4074.37	63.83	-	1.30	0.32	1.116	0.36	Valid	
BH30	18.00		A	Perp	80	32	2560	3259.49	57.09	-	1.02	0.31	1.062	0.33	Valid	
BH30	19.15		A	Perp	80	27	2160	2750.20	52.44	-	0.18	0.07	1.022	0.07	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular

UKAS TESTING
4043

PSL
Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:	**PSL22/6080**
Client Ref:	**PN224395**

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH30	5.75		D	Par	-	80	6400	80.00	-	0.21	0.033	1.236	0.04	Valid	
BH30	7.30		D	Par	-	80	6400	80.00	-	0.31	0.048	1.236	0.06	Valid	
BH30	7.70		D	Par	-	80	6400	80.00	-	0.20	0.031	1.236	0.04	Valid	
BH30	8.85		D	Par	-	80	6400	80.00	-	0.22	0.034	1.236	0.04	Valid	
BH30	9.24		D	Par	-	80	6400	80.00	-	5.15	0.805	1.236	0.99	Valid	
BH30	9.40		D	Par	-	80	6400	80.00	-	6.94	1.084	1.236	1.34	Valid	
BH30	11.88		D	Par	-	80	6400	80.00	-	0.14	0.022	1.236	0.03	Valid	
BH30	15.10		D	Par	-	80	6400	80.00	-	0.17	0.027	1.236	0.03	Valid	
BH30	15.87		D	Par	-	80	6400	80.00	-	0.69	0.108	1.236	0.13	Valid	
BH30	16.75		D	Par	-	80	6400	80.00	-	0.24	0.038	1.236	0.05	Valid	
BH30	17.80		D	Par	-	80	6400	80.00	-	1.19	0.186	1.236	0.23	Valid	
BH30	18.00		D	Par	-	80	6400	80.00	-	1.69	0.264	1.236	0.33	Valid	
BH30	19.15		D	Par	-	80	6400	80.00	-	0.14	0.022	1.236	0.03	Valid	

Note All testing carried out on samples at as received water content Par = parallel, Perp = perpendicular, U = Random

4043

Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:
PSL22/6080
Client Ref:
PN224395

DETERMINATION OF UNCONFINED COMPRESSIVE STRENGTH

ISRM Suggested Methods, pp 111 –116, 1981.

Hole Number	Sample Number	Sample Type	Top Depth (m)	Base Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Height Ratio	Initial Mass (g)	Bulk Density (Mg/m)	Moisture Content (%)	Dry Density (Mg/m)	Load Failure (kN)	UCS (MPa)	Failure Mode	Date Tested	Remarks
BH01		C	8.42	8.61	80	160	2.0	1984	2.47	9.2	2.26	20.2	4.0	Brittle	29/09/22	
BH01		C	11.61	11.80	80	160	2.0	1904	2.37	11	2.14	33.2	6.6	Brittle	29/09/22	
BH01		C	14.32	14.50	80	160	2.0	2145	2.67	5.4	2.53	65.2	13.0	Brittle	29/09/22	
BH01		C	15.55	15.70	80	160	2.0	2108	2.62	8.9	2.41	48.2	9.6	Brittle	29/09/22	
BH04A		C	7.93	8.10	80	160	2.0	1898	2.36	15	2.06	22.1	4.4	Brittle	29/09/22	
BH04A		C	12.70	12.90	80	160	2.0	1890	2.35	20	1.96	18.7	3.7	Brittle	29/09/22	
BH07		C	10.23	10.40	80	160	2.0	1924	2.39	13	2.12	22.4	4.5	Brittle	29/09/22	
BH07		C	14.72	15.00	80	160	2.0	2011	2.50	8.5	2.30	28.2	5.6	Brittle	29/09/22	
BH07		C	17.70	17.93	80	160	2.0	1994	2.48	13	2.19	22.6	4.5	Brittle	29/09/22	
BH10		C	9.90	10.10	80	160	2.0	1808	2.25	5.9	2.12	25.6	5.1	Brittle	29/09/22	
BH10		C	10.45	10.58	80	140	1.8	1608	2.28	12	2.04	10.2	2.0	Brittle	29/09/22	
BH10		C	11.53	11.70	80	150	1.9	2100	2.78	5.5	2.64	31.2	6.2	Brittle	29/09/22	
BH10		C	13.70	13.96	80	160	2.0	1998	2.48	7.8	2.30	38.8	7.7	Brittle	29/09/22	
BH10		C	14.70	15.05	80	160	2.0	2184	2.72	4.7	2.59	29.2	5.8	Brittle	29/09/22	
BH10		C	17.90	18.12	80	160	2.0	1881	2.34	7.1	2.18	26.7	5.3	Brittle	29/09/22	
BH14A		C	6.90	7.15	80	160	2.0	2002	2.49	14	2.18	98.7	19.6	Brittle	29/09/22	
BH14A		C	11.15	11.35	80	160	2.0	1987	2.47	23	2.02	19.2	3.8	Brittle	29/09/22	
BH14A		C	13.15	13.40	80	160	2.0	1899	2.36	14	2.07	24.1	4.8	Brittle	29/09/22	
BH14A		C	17.45	17.65	80	160	2.0	2014	2.50	9.7	2.28	26.8	5.3	Brittle	29/09/22	

PSL
Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:
PSL22/6080
Client Ref:
PN224395

DETERMINATION OF UNCONFINED COMPRESSIVE STRENGTH

ISRM Suggested Methods, pp 111 –116, 1981.

Hole Number	Sample Number	Sample Type	Top Depth (m)	Base Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Height Ratio	Initial Mass (g)	Bulk Density (Mg/m)	Moisture Content (%)	Dry Density (Mg/m)	Load Failure (kN)	UCS (MPa)	Failure Mode	Date Tested	Remarks
BH17A		C	7.10	7.47	80	160	2.0	2008	2.50	8.7	2.30	27.1	5.4	Brittle	29/09/22	
BH17A		C	8.62	8.92	80	160	2.0	2014	2.50	15	2.17	10.2	2.0	Brittle	29/09/22	
BH17A		C	11.60	11.95	80	160	2.0	1994	2.48	10	2.25	14.2	2.8	Brittle	29/09/22	
BH17A		C	13.17	13.50	80	160	2.0	2101	2.61	5.1	2.49	38.2	7.6	Brittle	29/09/22	
BH17A		C	14.07	14.50	80	160	2.0	1802	2.24	5.3	2.13	8.2	1.6	Brittle	29/09/22	
BH17A		C	18.50	18.95	80	160	2.0	1788	2.22	6.5	2.09	4.2	0.8	Brittle	29/09/22	
BH23		C	16.10	16.37	80	160	2.0	2002	2.49	14	2.18	20.4	4.1	Brittle	29/09/22	
BH23		C	16.65	16.90	80	160	2.0	1986	2.47	14	2.17	23.7	4.7	Brittle	29/09/22	
BH23		C	17.60	17.90	80	160	2.0	1899	2.36	14	2.06	18.9	3.8	Brittle	29/09/22	
BH27		C	11.60	11.85	80	160	2.0	2000	2.49	9.3	2.27	20.2	4.0	Brittle	29/09/22	
BH27		C	16.70	17.00	80	160	2.0	2006	2.49	13	2.21	27.2	5.4	Brittle	29/09/22	
BH27		C	18.60	18.90	80	160	2.0	2011	2.50	14	2.20	24.8	4.9	Brittle	29/09/22	
BH28		C	8.30	8.55	80	160	2.0	1886	2.34	17	2.01	21.2	4.2	Brittle	29/09/22	
BH28		C	11.50	11.80	80	160	2.0	1883	2.34	15	2.04	18.8	3.7	Brittle	29/09/22	
BH28		C	17.55	17.95	80	160	2.0	1891	2.35	12	2.11	19.1	3.8	Brittle	29/09/22	
BH30		C	5.32	5.75	80	160	2.0	2104	2.62	6.5	2.46	30.2	6.0	Brittle	29/09/22	
BH30		C	11.40	11.60	80	160	2.0	2148	2.67	5.0	2.54	65.7	13.1	Brittle	29/09/22	
BH30		C	14.05	14.30	80	160	2.0	2104	2.62	3.8	2.52	28.2	5.6	Brittle	29/09/22	
BH30		C	15.65	15.85	80	160	2.0	2081	2.59	3.1	2.51	27.1	5.4	Brittle	29/09/22	

PSL
Professional Soils Laboratory

Newport Quinn Phase 2

Contract No:
PSL22/6080
Client Ref:
PN224395

LABORATORY RESULTS - Test Remarks

Project NEWPORT QUINN PHASE 2 **Project No:** PN224395

Sample				**Laboratory Remark**
Hole	Depth (Specimen Depth) m	Type	Sample Ref	
BH01	0.50 (0.50)	D	N84035	CBR Test - Combined with B 0.20-0.60m
BH01	1.20-1.70 (1.20-1.70)	B	N84036	CBR Test - Combined with B 2.00-2.50m
BH01	4.80 (4.80)	D	N84040	Atterberg Limit Test - Unsuitable for testing due to insufficient fine material.
BH02	6.80 (6.80)	D	N84046	Atterberg Limit Test - Unsuitable for testing due to insufficient fine material.
BH11	1.20-1.40 (1.20-1.40)	D	N84074	Water Content Test - WC & PI combined with D 1.80m
BH13	4.80 (4.80)	D	N84082	Atterberg Limit Test - Unsuitable for testing due to insufficient fine material.
BH14A	3.00-3.45 (3.00-3.45)	D	N84084	Compaction 2.5kg - Combined with B 4.00-4.50m
BH15	3.50 (3.50)	D	N84087	Atterberg Limit Test - 1-point cone Insufficient sample for 4 point test.
BH17A	2.30 (2.30)	D	N84094	Atterberg Limit Test - 1-point cone Insufficient sample for 4 point test.
BH26	4.00-4.45 (4.00-4.45)	D	N84126	Water Content Test - WC & PI combined with 5.80m B

Remarks

GEOTECHNICS
geotechnical and geoenvironmental specialists

APPENDIX 9

Laboratory Test Results - Contamination (Soil)

Certificate of Analysis

Certificate Number 22-15257 *Issued:* 16-Aug-22

Client Geotechnics LTD
The Geotechnical Centre
Unit 1B Borders Ind. Park
River Lane
Saltney
Chester
CH4 8RJ

Our Reference 22-15257

Client Reference PN224395

Order No ON34492

Contract Title Newport Quinn Phase 2

Description 6 Soil samples.

Date Received 08-Aug-22

Date Started 08-Aug-22

Date Completed 16-Aug-22

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

Kirk Bridgewood
General Manager

Summary of Chemical Analysis
Soil Samples

Our Ref 22-15257
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2042859	2042860	2042861	2042862	2042863	2042864
			.Sample ID	BH13	BH14	BH22	BH25	BH27	BH29
			Depth	0.50	0.50	1.00	1.00	1.00	1.00
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	02/08/2022	02/08/2022	27/07/2022	29/07/2022	27/07/2022	27/07/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	5.4	5.1	6.4	4.1	5.4	3.4
Barium	DETSC 2301#	1.5	mg/kg	130	480	64	180	60	75
Beryllium	DETSC 2301#	0.2	mg/kg	0.4	0.3	0.6	0.5	0.4	0.8
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.7	3.4	< 0.2	1.8	0.3	1.0
Cadmium	DETSC 2301#	0.1	mg/kg	0.9	1.0	< 0.1	0.6	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	19	1000	13	20	30	7.0
Copper	DETSC 2301#	0.2	mg/kg	12	77	9.7	9.8	9.4	7.7
Lead	DETSC 2301#	0.3	mg/kg	27	27	7.2	16	6.1	3.5
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	17	14	23	12	22	11
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	4.6	< 0.5	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	15	170	16	16	17	7.9
Zinc	DETSC 2301#	1	mg/kg	73	110	47	53	38	32
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >EC10-EC12	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	1.86	< 1.50	< 1.50	1.57
Aliphatic >EC12-EC16	DETSC 3521#	1.2	mg/kg	1.42	< 1.20	3.26	2.48	< 1.20	1.99
Aliphatic >EC16-EC21	DETSC 3521#	1.5	mg/kg	1.70	< 1.50	3.05	2.52	< 1.50	2.38
Aliphatic >EC21-EC35	DETSC 3521#	3.4	mg/kg	< 3.40	< 3.40	< 3.40	< 3.40	< 3.40	< 3.40
Aliphatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	11.76	10.46	< 10.00	< 10.00
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >EC10-EC12	DETSC 3521#	0.9	mg/kg	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Aromatic >EC12-EC16	DETSC 3521#	0.5	mg/kg	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aromatic >EC16-EC21	DETSC 3521#	0.6	mg/kg	1.02	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60
Aromatic >EC21-EC35	DETSC 3521#	1.4	mg/kg	< 1.40	< 1.40	< 1.40	28.49	< 1.40	< 1.40
Aromatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	30.74	< 10.00	< 10.00
TPH Ali/Aro Total C5-C35	DETSC 3521*	10	mg/kg	12.26	11.45	15.36	41.19	11.51	13.11

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-15257
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2042859	2042860	2042861	2042862	2042863	2042864
			.Sample ID	BH13	BH14	BH22	BH25	BH27	BH29
			Depth	0.50	0.50	1.00	1.00	1.00	1.00
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	02/08/2022	02/08/2022	27/07/2022	29/07/2022	27/07/2022	27/07/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
VOCs									
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-15257
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2042859	2042860	2042861	2042862	2042863	2042864
			.Sample ID	BH13	BH14	BH22	BH25	BH27	BH29
			Depth	0.50	0.50	1.00	1.00	1.00	1.00
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	02/08/2022	02/08/2022	27/07/2022	29/07/2022	27/07/2022	27/07/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
SVOCs									
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Acenaphthylene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Acenaphthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Fluorene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-15257
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2042859	2042860	2042861	2042862	2042863	2042864
			.Sample ID	BH13	BH14	BH22	BH25	BH27	BH29
			Depth	0.50	0.50	1.00	1.00	1.00	1.00
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	02/08/2022	02/08/2022	27/07/2022	29/07/2022	27/07/2022	27/07/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Phenanthrene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Anthracene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Pyrene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Benzo(a)anthracene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Chrysene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Benzo(b)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Benzo(k)fluoranthene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Benzo(a)pyrene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Indeno(123cd)pyrene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Dibenzo(ah)anthracene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Benzo(ghi)perylene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1		< 0.1		
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1		< 0.1		

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 22-15257
Client Ref PN224395
Contract Title Newport Quinn Phase 2

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2042859	BH13 0.50	SOIL	NAD	none	Josh Best
2042860	BH14 0.50	SOIL	NAD	none	Josh Best
2042861	BH22 1.00	SOIL	NAD	none	Josh Best
2042862	BH25 1.00	SOIL	NAD	none	Josh Best
2042863	BH27 1.00	SOIL	NAD	none	Josh Best
2042864	BH29 1.00	SOIL	NAD	none	Josh Best

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.

Information in Support of the Analytical Results

Our Ref 22-15257
Client Ref PN224395
Contract Newport Quinn Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2042859	BH13 0.50 SOIL	02/08/22	GJ 250ml x2, GJ 60ml, PT 1L		
2042860	BH14 0.50 SOIL	02/08/22	GJ 250ml x2, GJ 60ml, PT 1L		
2042861	BH22 1.00 SOIL	27/07/22	GJ 250ml x2, GJ 60ml, PT 1L	VOC (7 days)	
2042862	BH25 1.00 SOIL	29/07/22	GJ 250ml x2, GJ 60ml, PT 1L	VOC (7 days)	
2042863	BH27 1.00 SOIL	27/07/22	GJ 250ml x2, GJ 60ml, PT 1L	VOC (7 days)	
2042864	BH29 1.00 SOIL	27/07/22	GJ 250ml x2, GJ 60ml, PT 1L	VOC (7 days)	

Key: G-Glass P-Plastic J-Jar 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

DETS

Certificate of Analysis

Certificate Number 22-15280 *Issued:* 16-Aug-22

Client Geotechnics LTD
The Geotechnical Centre
Unit 1B Borders Ind. Park
River Lane
Saltney
Chester
CH4 8RJ

Our Reference 22-15280

Client Reference PN224395

Order No ON34492

Contract Title Newport Quinn Phase 2

Description One Soil sample.

Date Received 08-Aug-22

Date Started 08-Aug-22

Date Completed 16-Aug-22

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

Kirk Bridgewood
General Manager

ilac-MRA

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 22-15280
Client Ref PN224395
Contract Title Newport Quinn Phase 2

Lab No	2043009
.Sample ID	BH18
Depth	1.00
Other ID	
Sample Type	ES
Sampling Date	03/08/2022
Sampling Time	n/s

Test	**Method**	**LOD**	**Units**	
Metals				
Arsenic	DETSC 2301#	0.2	mg/kg	4.5
Barium	DETSC 2301#	1.5	mg/kg	290
Beryllium	DETSC 2301#	0.2	mg/kg	0.3
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	5.9
Cadmium	DETSC 2301#	0.1	mg/kg	1.1
Chromium	DETSC 2301#	0.15	mg/kg	430
Copper	DETSC 2301#	0.2	mg/kg	61
Lead	DETSC 2301#	0.3	mg/kg	62
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05
Nickel	DETSC 2301#	1	mg/kg	40
Selenium	DETSC 2301#	0.5	mg/kg	1.9
Vanadium	DETSC 2301#	0.8	mg/kg	91
Zinc	DETSC 2301#	1	mg/kg	190
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic >EC10-EC12	DETSC 3521#	1.5	mg/kg	1.91
Aliphatic >EC12-EC16	DETSC 3521#	1.2	mg/kg	< 1.20
Aliphatic >EC16-EC21	DETSC 3521#	1.5	mg/kg	< 1.50
Aliphatic >EC21-EC35	DETSC 3521#	3.4	mg/kg	< 3.40
Aliphatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic >EC10-EC12	DETSC 3521#	0.9	mg/kg	< 0.90
Aromatic >EC12-EC16	DETSC 3521#	0.5	mg/kg	< 0.50
Aromatic >EC16-EC21	DETSC 3521#	0.6	mg/kg	< 0.60
Aromatic >EC21-EC35	DETSC 3521#	1.4	mg/kg	< 1.40
Aromatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00
TPH Ali/Aro Total C5-C35	DETSC 3521*	10	mg/kg	12.36

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-15280
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2043009
			.Sample ID	BH18
			Depth	1.00
			Other ID	
			Sample Type	ES
			Sampling Date	03/08/2022
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
VOCs				
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01

Summary of Chemical Analysis
Soil Samples

Our Ref 22-15280
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2043009
			.Sample ID	BH18
			Depth	1.00
			Other ID	
			Sample Type	ES
			Sampling Date	03/08/2022
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 22-15280
Client Ref PN224395
Contract Title Newport Quinn Phase 2

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2043009	BH18 1.00	SOIL	Chrysotile	Chrysotile present as fibre bundles	D Wilkinson

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.

Information in Support of the Analytical Results

Our Ref 22-15280
Client Ref PN224395
Contract Newport Quinn Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2043009	BH18 1.00 SOIL	03/08/22	GJ 250ml x2, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar 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

Certificate of Analysis

Certificate Number 22-15764 *Issued:* 19-Aug-22

Client Geotechnics LTD
The Geotechnical Centre
Unit 1B Borders Ind. Park
River Lane
Saltney
Chester
CH4 8RJ

Our Reference 22-15764

Client Reference PN224395

Order No ON34492

Contract Title Newport Quinn Phase 2

Description One Soil sample.

Date Received 12-Aug-22

Date Started 12-Aug-22

Date Completed 19-Aug-22

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

Kirk Bridgewood
General Manager

UKAS TESTING 2139

Summary of Chemical Analysis
Soil Samples

Our Ref	22-15764
Client Ref	PN224395
Contract Title	Newport Quinn Phase 2

Lab No	2045230
.Sample ID	BH14A
Depth	2.00
Other ID	
Sample Type	ES
Sampling Date	n/s
Sampling Time	n/s

Test	**Method**	**LOD**	**Units**	
Metals				
Arsenic	DETSC 2301#	0.2	mg/kg	5.2
Barium	DETSC 2301#	1.5	mg/kg	240
Beryllium	DETSC 2301#	0.2	mg/kg	0.4
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.7
Cadmium	DETSC 2301#	0.1	mg/kg	0.6
Chromium	DETSC 2301#	0.15	mg/kg	14
Copper	DETSC 2301#	0.2	mg/kg	34
Lead	DETSC 2301#	0.3	mg/kg	29
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05
Nickel	DETSC 2301#	1	mg/kg	24
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	19
Zinc	DETSC 2301#	1	mg/kg	110
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic >EC10-EC12	DETSC 3521#	1.5	mg/kg	< 1.50
Aliphatic >EC12-EC16	DETSC 3521#	1.2	mg/kg	< 1.20
Aliphatic >EC16-EC21	DETSC 3521#	1.5	mg/kg	< 1.50
Aliphatic >EC21-EC35	DETSC 3521#	3.4	mg/kg	< 3.40
Aliphatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic >EC10-EC12	DETSC 3521#	0.9	mg/kg	< 0.90
Aromatic >EC12-EC16	DETSC 3521#	0.5	mg/kg	< 0.50
Aromatic >EC16-EC21	DETSC 3521#	0.6	mg/kg	< 0.60
Aromatic >EC21-EC35	DETSC 3521#	1.4	mg/kg	< 1.40
Aromatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00
TPH Ali/Aro Total C5-C35	DETSC 3521*	10	mg/kg	12.02

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref	22-15764
Client Ref	PN224395
Contract Title	Newport Quinn Phase 2

Lab No	2045230
.Sample ID	BH14A
Depth	2.00
Other ID	
Sample Type	ES
Sampling Date	n/s
Sampling Time	n/s

Test	**Method**	**LOD**	**Units**	
VOCs				
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-15764
Client Ref PN224395
Contract Title Newport Quinn Phase 2

Lab No	2045230
.Sample ID	BH14A
Depth	2.00
Other ID	
Sample Type	ES
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 22-15764
Client Ref PN224395
Contract Title Newport Quinn Phase 2

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2045230	BH14A 2.00	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.

Information in Support of the Analytical Results

Our Ref 22-15764
Client Ref PN224395
Contract Newport Quinn Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2045230	BH14A 2.00 SOIL		GJ 250ml x2, GJ 60ml, PT 1L	Sample date not supplied, Aliphatics/Aromatics (14 days), Boron (365 days), BTEX (14 days), EPH/Aliphatic/Aromatic (14 days), Mercury (28 days), ICP WS Boron (182 days), Metals ICP (182	

Key: G-Glass P-Plastic J-Jar 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

DETS

Certificate of Analysis

Certificate Number	22-15981
Issued:	30-Aug-22
Client	Geotechnics LTD The Geotechnical Centre Unit 1B Borders Ind. Park River Lane Saltney Chester CH4 8RJ
Our Reference	22-15981
Client Reference	PN224395
Order No	ON34492
Contract Title	Newport Quinn Phase 2
Description	2 Soil samples.
Date Received	16-Aug-22
Date Started	16-Aug-22
Date Completed	30-Aug-22
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

Kirk Bridgewood
General Manager

Summary of Chemical Analysis
Soil Samples

Our Ref 22-15981
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2046349	2046350
			.Sample ID	BH04A	BH10
			Depth	0.60	0.50
			Other ID		
			Sample Type	ES	ES
			Sampling Date	10/08/2022	10/08/2022
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	6.2	4.1
Barium	DETSC 2301#	1.5	mg/kg	390	330
Beryllium	DETSC 2301#	0.2	mg/kg	0.5	0.4
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	< 0.2	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.5
Chromium	DETSC 2301#	0.15	mg/kg	11	18
Copper	DETSC 2301#	0.2	mg/kg	9.5	14
Lead	DETSC 2301#	0.3	mg/kg	14	24
Mercury	DETSC 2325#	0.05	mg/kg	0.07	< 0.05
Nickel	DETSC 2301#	1	mg/kg	20	20
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	16	30
Zinc	DETSC 2301#	1	mg/kg	78	90
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	0.08	0.12
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic >EC10-EC12	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50
Aliphatic >EC12-EC16	DETSC 3521#	1.2	mg/kg	< 1.20	2.68
Aliphatic >EC16-EC21	DETSC 3521#	1.5	mg/kg	< 1.50	2.21
Aliphatic >EC21-EC35	DETSC 3521#	3.4	mg/kg	< 3.40	< 3.40
Aliphatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00	10.42
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic >EC10-EC12	DETSC 3521#	0.9	mg/kg	< 0.90	< 0.90
Aromatic >EC12-EC16	DETSC 3521#	0.5	mg/kg	< 0.50	< 0.50
Aromatic >EC16-EC21	DETSC 3521#	0.6	mg/kg	3.55	1.32
Aromatic >EC21-EC35	DETSC 3521#	1.4	mg/kg	< 1.40	< 1.40
Aromatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00	< 10.00
TPH Ali/Aro Total C5-C35	DETSC 3521*	10	mg/kg	< 10.00	14.86

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-15981
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2046349	2046350
			.Sample ID	BH04A	BH10
			Depth	0.60	0.50
			Other ID		
			Sample Type	ES	ES
			Sampling Date	10/08/2022	10/08/2022
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
VOCs					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-15981
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2046349	2046350
			.Sample ID	BH04A	BH10
			Depth	0.60	0.50
			Other ID		
			Sample Type	ES	ES
			Sampling Date	10/08/2022	10/08/2022
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
SVOCs					
Phenol	DETSC 3433	0.1	mg/kg		< 0.1
Aniline	DETSC 3433*	0.1	mg/kg		< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg		< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg		< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg		< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg		< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg		< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg		< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg		< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg		< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg		< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg		< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg		< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg		< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg		< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg		< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg		< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg		< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg		< 0.1
Acenaphthylene	DETSC 3433	0.1	mg/kg		< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg		< 0.1
Acenaphthene	DETSC 3433	0.1	mg/kg		< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg		< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg		< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg		< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg		< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg		< 0.1

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-15981
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2046349	2046350
			.Sample ID	BH04A	BH10
			Depth	0.60	0.50
			Other ID		
			Sample Type	ES	ES
			Sampling Date	10/08/2022	10/08/2022
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg		< 0.1
Fluorene	DETSC 3433	0.1	mg/kg		< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg		< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg		< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg		< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg		< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg		< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg		< 0.1
Phenanthrene	DETSC 3433	0.1	mg/kg		< 0.1
Anthracene	DETSC 3433	0.1	mg/kg		< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg		< 0.1
Fluoranthene	DETSC 3433	0.1	mg/kg		< 0.1
Pyrene	DETSC 3433	0.1	mg/kg		< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg		< 0.1
Benzo(a)anthracene	DETSC 3433	0.1	mg/kg		< 0.1
Chrysene	DETSC 3433	0.1	mg/kg		< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg		< 0.1
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg		< 0.1
Benzo(b)fluoranthene	DETSC 3433	0.1	mg/kg		< 0.1
Benzo(k)fluoranthene	DETSC 3433	0.1	mg/kg		< 0.1
Benzo(a)pyrene	DETSC 3433	0.1	mg/kg		< 0.1
Indeno(123cd)pyrene	DETSC 3433	0.1	mg/kg		< 0.1
Dibenzo(ah)anthracene	DETSC 3433	0.1	mg/kg		< 0.1
Benzo(ghi)perylene	DETSC 3433	0.1	mg/kg		< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg		< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg		< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg		< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg		< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg		< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg		< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg		< 0.1

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis

Soil Samples

Our Ref 22-15981
Client Ref PN224395
Contract Title Newport Quinn Phase 2

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2046349	BH04A 0.60	SOIL	NAD	none	Ben Rose
2046350	BH10 0.50	SOIL	NAD	none	Ben Rose

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.

Information in Support of the Analytical Results

Our Ref 22-15981
Client Ref PN224395
Contract Newport Quinn Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2046349	BH04A 0.60 SOIL	10/08/22	GJ 250ml x2, GJ 60ml, PT 1L		
2046350	BH10 0.50 SOIL	10/08/22	GJ 250ml x2, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar 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

Certificate of Analysis

Certificate Number	22-16491	*Issued:*	26-Aug-22
Client	Geotechnics LTD The Geotechnical Centre Unit 1B Borders Ind. Park River Lane Saltney Chester CH4 8RJ		
Our Reference	22-16491		
Client Reference	PN224395		
Order No	ON34492		
Contract Title	Newport Quinn Phase 2		
Description	One Soil sample.		
Date Received	22-Aug-22		
Date Started	23-Aug-22		
Date Completed	26-Aug-22		
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

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Soil Samples

Our Ref 22-16491
Client Ref PN224395
Contract Title Newport Quinn Phase 2

Lab No	2049007
.Sample ID	BH11
Depth	2.00
Other ID	4
Sample Type	ES
Sampling Date	16/08/2022
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Arsenic	DETSC 2301#	0.2	mg/kg	8.0
Barium	DETSC 2301#	1.5	mg/kg	57
Beryllium	DETSC 2301#	0.2	mg/kg	0.7
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	24
Copper	DETSC 2301#	0.2	mg/kg	17
Lead	DETSC 2301#	0.3	mg/kg	7.1
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05
Nickel	DETSC 2301#	1	mg/kg	26
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	55
Zinc	DETSC 2301#	1	mg/kg	64
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic >EC10-EC12	DETSC 3521#	1.5	mg/kg	1.70
Aliphatic >EC12-EC16	DETSC 3521#	1.2	mg/kg	2.42
Aliphatic >EC16-EC21	DETSC 3521#	1.5	mg/kg	< 1.50
Aliphatic >EC21-EC35	DETSC 3521#	3.4	mg/kg	< 3.40
Aliphatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic >EC10-EC12	DETSC 3521#	0.9	mg/kg	< 0.90
Aromatic >EC12-EC16	DETSC 3521#	0.5	mg/kg	< 0.50
Aromatic >EC16-EC21	DETSC 3521#	0.6	mg/kg	1.46
Aromatic >EC21-EC35	DETSC 3521#	1.4	mg/kg	< 1.40
Aromatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00
TPH Ali/Aro Total C5-C35	DETSC 3521*	10	mg/kg	14.21

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-16491
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2049007
			.Sample ID	BH11
			Depth	2.00
			Other ID	4
			Sample Type	ES
			Sampling Date	16/08/2022
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
VOCs				
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-16491
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2049007
			.Sample ID	BH11
			Depth	2.00
			Other ID	4
			Sample Type	ES
			Sampling Date	16/08/2022
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 22-16491
Client Ref PN224395
Contract Title Newport Quinn Phase 2

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2049007	BH11 4 2.00	SOIL	NAD	none	Vicky Convery

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.

Information in Support of the Analytical Results

Our Ref	22-16491
Client Ref	PN224395
Contract	Newport Quinn Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2049007	BH11 2.00 SOIL	16/08/22	GJ 250ml, GJ 60ml, PT 500ml		

Key: G-Glass P-Plastic J-Jar 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

Certificate of Analysis

Certificate Number	22-17090	*Issued:*	09-Sep-22
Client	Geotechnics LTD The Geotechnical Centre Unit 1B Borders Ind. Park River Lane Saltney Chester CH4 8RJ		
Our Reference	22-17090		
Client Reference	PN224395		
Order No	ON34492		
Contract Title	Newport Quinn Phase 2		
Description	2 Soil samples.		
Date Received	31-Aug-22		
Date Started	31-Aug-22		
Date Completed	09-Sep-22		
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

Kirk Bridgewood
General Manager

ilac-MRA

UKAS
TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 22-17090
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2052062	2052063
			.Sample ID	BH09	BH20
			Depth	0.30	1.00
			Other ID		
			Sample Type	ES	ES
			Sampling Date	10/08/2022	10/08/2022
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	3.4	21
Barium	DETSC 2301#	1.5	mg/kg	560	560
Beryllium	DETSC 2301#	0.2	mg/kg	0.3	0.5
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	3.9	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	1.3	0.4
Chromium	DETSC 2301#	0.15	mg/kg	210	15
Copper	DETSC 2301#	0.2	mg/kg	46	9.5
Lead	DETSC 2301#	0.3	mg/kg	55	16
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	22	21
Selenium	DETSC 2301#	0.5	mg/kg	1.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	77	24
Zinc	DETSC 2301#	1	mg/kg	200	66
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic >EC10-EC12	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50
Aliphatic >EC12-EC16	DETSC 3521#	1.2	mg/kg	< 1.20	< 1.20
Aliphatic >EC16-EC21	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50
Aliphatic >EC21-EC35	DETSC 3521#	3.4	mg/kg	< 3.40	< 3.40
Aliphatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00	< 10.00
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic >EC10-EC12	DETSC 3521#	0.9	mg/kg	< 0.90	< 0.90
Aromatic >EC12-EC16	DETSC 3521#	0.5	mg/kg	< 0.50	< 0.50
Aromatic >EC16-EC21	DETSC 3521#	0.6	mg/kg	< 0.60	< 0.60
Aromatic >EC21-EC35	DETSC 3521#	1.4	mg/kg	12.49	< 1.40
Aromatic C5-C35	DETSC 3521*	10	mg/kg	14.76	< 10.00
TPH Ali/Aro Total C5-C35	DETSC 3521*	10	mg/kg	23.28	11.48

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-17090
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2052062	2052063
			.Sample ID	BH09	BH20
			Depth	0.30	1.00
			Other ID		
			Sample Type	ES	ES
			Sampling Date	10/08/2022	10/08/2022
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
VOCs					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-17090
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2052062	2052063
			.Sample ID	BH09	BH20
			Depth	0.30	1.00
			Other ID		
			Sample Type	ES	ES
			Sampling Date	10/08/2022	10/08/2022
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Naphthalene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 22-17090
Client Ref PN224395
Contract Title Newport Quinn Phase 2

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2052062	BH09 0.30	SOIL	NAD	none	Ben Rose
2052063	BH20 1.00	SOIL	NAD	none	Ben Rose

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.

Information in Support of the Analytical Results

Our Ref 22-17090
Client Ref PN224395
Contract Newport Quinn Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2052062	BH09 0.30 SOIL	10/08/22	GJ 250ml, GJ 60ml, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), EPH/Aliphatic/Aromatic (14 days), VOC (7 days)	
2052063	BH20 1.00 SOIL	10/08/22	GJ 250ml x2, GJ 60ml, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), EPH/Aliphatic/Aromatic (14 days), VOC (7 days)	

Key: G-Glass P-Plastic J-Jar 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 10

Laboratory Test Results - Contamination (Groundwater)

DETS

Certificate of Analysis

Certificate Number 22-18372 *Issued:* 26-Sep-22

Client Geotechnics LTD
The Geotechnical Centre
Unit 1B Borders Ind. Park
River Lane
Saltney
Chester
CH4 8RJ

Our Reference 22-18372

Client Reference PN214233

Order No ON34492

Contract Title Newport Quinn Phase 2

Description 2 Water samples.

Date Received 16-Sep-22

Date Started 16-Sep-22

Date Completed 26-Sep-22

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

Kirk Bridgewood
General Manager

ilac-MRA

UKAS
TESTING
2139

Summary of Chemical Analysis
Water Samples

Our Ref 22-18372
Client Ref PN214233
Contract Title Newport Quinn Phase 2

Lab No	2058943	2058944
.Sample ID	BH01	BH06
Depth	0.30	0.50
Other ID		
Sample Type	EW	EW
Sampling Date	13/09/2022	13/09/2022
Sampling Time	n/s	n/s

Test	**Method**	**LOD**	**Units**		
Metals					
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	1.1	0.52
Barium, Dissolved	DETSC 2306	0.26	ug/l	640	220
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	31	180
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03
Calcium, Dissolved	DETSC 2306	0.09	mg/l	65	72
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	< 0.4	1.0
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	< 0.09
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	0.8	2.4
Selenium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	2.2	< 0.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	6.7	4.0
Inorganics					
pH	DETSC 2008		pH	7.2	7.3
Dissolved Organic Carbon	DETSC 2085	2	mg/l	< 2.0	2.3
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	3.4
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	16
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	94
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	110
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	< 10	110
PAHs					
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref	22-18372
Client Ref	PN214233
Contract Title	Newport Quinn Phase 2

Test	Method	LOD	Units		
			Lab No	2058943	2058944
			.Sample ID	BH01	BH06
			Depth	0.30	0.50
			Other ID		
			Sample Type	EW	EW
			Sampling Date	13/09/2022	13/09/2022
			Sampling Time	n/s	n/s
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref	22-18372
Client Ref	PN214233
Contract Title	Newport Quinn Phase 2

			Lab No	2058943	2058944
			.Sample ID	BH01	BH06
			Depth	0.30	0.50
			Other ID		
			Sample Type	EW	EW
			Sampling Date	13/09/2022	13/09/2022
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
VOCs					
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 22-18372
Client Ref PN214233
Contract Title Newport Quinn Phase 2

			Lab No	2058943	2058944
			.Sample ID	BH01	BH06
			Depth	0.30	0.50
			Other ID		
			Sample Type	EW	EW
			Sampling Date	13/09/2022	13/09/2022
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1
SVOCs					
Phenol	DETSC 3434*	1	ug/l	< 1.0	
Aniline	DETSC 3434*	1	ug/l	< 1.0	
2-Chlorophenol	DETSC 3434*	1	ug/l	< 1.0	
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0	
2-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 1.0	
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 1.0	
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 1.0	
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 1.0	
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 1.0	
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 1.0	
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 1.0	
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 1.0	
2-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	
3-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	
4-Nitrophenol	DETSC 3434*	1	ug/l	< 1.0	
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 22-18372
Client Ref PN214233
Contract Title Newport Quinn Phase 2

Test	Method	LOD	Units		
			Lab No	2058943	2058944
			.Sample ID	BH01	BH06
			Depth	0.30	0.50
			Other ID		
			Sample Type	EW	EW
			Sampling Date	13/09/2022	13/09/2022
			Sampling Time	n/s	n/s
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	
Carbazole	DETSC 3434*	1	ug/l	< 1.0	
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 22-18372
Client Ref PN214233
Contract Newport Quinn Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2058943	BH01 0.30 WATER	13/09/22	GB 1L x2, GV x2, PB 1L x2	pH/Cond/TDS (1 days)	
2058944	BH06 0.50 WATER	13/09/22	GB 1L x2, GV x2, PB 1L x2	pH/Cond/TDS (1 days)	

Key: G-Glass P-Plastic B-Bottle V-Vial

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.

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

Certificate of Analysis

Certificate Number 22-19512 *Issued:* 07-Oct-22

Client
Geotechnics LTD
The Geotechnical Centre
Unit 1B Borders Ind. Park
River Lane
Saltney
Chester
CH4 8RJ

Our Reference 22-19512

Client Reference PC224395

Order No ON34492

Contract Title Newport Quinn Phase 2

Description 4 Water samples.

Date Received 30-Sep-22

Date Started 30-Sep-22

Date Completed 07-Oct-22

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

Kirk Bridgewood
General Manager

Summary of Chemical Analysis
Water Samples

Our Ref 22-19512
Client Ref PC224395
Contract Title Newport Quinn Phase 2

			Lab No	2065525	2065526	2065527	2065528
			.Sample ID	BH09	BH10	BH17	BH19
			Depth				
			Other ID				
			Sample Type	EW	EW	EW	EW
			Sampling Date	26/09/2022	26/09/2022	26/09/2022	26/09/2022
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Metals							
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	3.9	1.1	1.2	3.7
Barium, Dissolved	DETSC 2306	0.26	ug/l	990	390	290	190
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	520	43	76	610
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	0.14	< 0.03	< 0.03
Calcium, Dissolved	DETSC 2306	0.09	mg/l	110	53	42	90
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.7	2.5	2.1	3.1
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	0.70	1.6	0.14
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	0.03	0.04	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	11	4.2	3.0	7.4
Selenium, Dissolved	DETSC 2306	0.25	ug/l	1.1	13	1.9	0.71
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	< 0.6	1.6	2.3	< 0.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	36	17	27	17
Inorganics							
pH	DETSC 2008		pH	6.3	6.7	7.1	6.8
Dissolved Organic Carbon	DETSC 2085	2	mg/l	40	7.2	3.1	12
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	13	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	17	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	20	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	20	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	71	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	48	16	10	9.8
Aromatic C12-C16	DETSC 3072*	1	ug/l	110	32	22	18
Aromatic C16-C21	DETSC 3072*	1	ug/l	120	34	23	18
Aromatic C21-C35	DETSC 3072*	1	ug/l	58	10	7.4	6.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	340	91	63	52
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	410	91	64	52
PAHs							
Naphthalene	DETSC 3304	0.05	ug/l	0.34	0.06	< 0.05	0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	0.20	0.08	0.05	0.03
Acenaphthene	DETSC 3304	0.01	ug/l	0.19	0.08	0.06	0.04
Fluorene	DETSC 3304	0.01	ug/l	0.15	0.09	0.06	0.05
Phenanthrene	DETSC 3304	0.01	ug/l	0.32	0.18	0.15	0.14

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 22-19512
Client Ref PC224395
Contract Title Newport Quinn Phase 2

			Lab No	2065525	2065526	2065527	2065528
			.Sample ID	BH09	BH10	BH17	BH19
			Depth				
			Other ID				
			Sample Type	EW	EW	EW	EW
			Sampling Date	26/09/2022	26/09/2022	26/09/2022	26/09/2022
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Anthracene	DETSC 3304	0.01	ug/l	0.06	0.04	0.03	0.02
Fluoranthene	DETSC 3304	0.01	ug/l	0.18	0.11	0.10	0.07
Pyrene	DETSC 3304	0.01	ug/l	0.13	0.10	0.14	0.05
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	0.07	0.04	0.03	0.01
Chrysene	DETSC 3304	0.01	ug/l	0.04	0.03	0.02	0.02
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.05	0.03	0.02	0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	0.02	0.01	0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.04	0.02	0.02	0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	0.03	0.02	0.02	0.02
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.02	0.02	0.02	0.01
PAH Total	DETSC 3304	0.2	ug/l	1.9	0.91	0.71	0.54

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water VOC/SVOC Samples

Our Ref	22-19512
Client Ref	PC224395
Contract Title	Newport Quinn Phase 2

			Lab No	2065525	2065526
			.Sample ID	BH09	BH10
			Depth		
			Other ID		
			Sample Type	EW	EW
			Sampling Date	26/09/2022	26/09/2022
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
VOCs					
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water VOC/SVOC Samples

Our Ref 22-19512
Client Ref PC224395
Contract Title Newport Quinn Phase 2

Test	Method	LOD	Units		
			Lab No	2065525	2065526
			.Sample ID	BH09	BH10
			Depth		
			Other ID		
			Sample Type	EW	EW
			Sampling Date	26/09/2022	26/09/2022
			Sampling Time	n/s	n/s
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1
SVOCs					
Phenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Aniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 1.0	< 1.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 1.0	< 1.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 1.0	< 1.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	< 1.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water VOC/SVOC Samples

Our Ref 22-19512
Client Ref PC224395
Contract Title Newport Quinn Phase 2

			Lab No	2065525	2065526
			.Sample ID	BH09	BH10
			Depth		
			Other ID		
			Sample Type	EW	EW
			Sampling Date	26/09/2022	26/09/2022
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 22-19512
Client Ref PC224395
Contract Newport Quinn Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2065525	BH09 WATER	26/09/22	GB 1L x2, GV x2, PB 1L x2	pH/Cond/TDS (1 days)	
2065526	BH10 WATER	26/09/22	GB 1L x2, GV x2, PB 1L x2	pH/Cond/TDS (1 days)	
2065527	BH17 WATER	26/09/22	GB 1L x2, GV x2, PB 1L x2	pH/Cond/TDS (1 days)	
2065528	BH19 WATER	26/09/22	GB 1L x2, GV x2, PB 1L x2	pH/Cond/TDS (1 days)	

Key: G-Glass P-Plastic B-Bottle V-Vial

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.

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

Certificate of Analysis

Certificate Number 22-20262 *Issued:* 17-Oct-22

Client Geotechnics LTD
The Geotechnical Centre
Unit 1B Borders Ind. Park
River Lane
Saltney
Chester
CH4 8RJ

Our Reference 22-20262

Client Reference PN224395

Order No ON34492

Contract Title Newport Quinn Phase 2

Description 4 Water samples.

Date Received 10-Oct-22

Date Started 10-Oct-22

Date Completed 17-Oct-22

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

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Water Samples

Our Ref 22-20262
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2069357	2069358	2069359	2069360
			.Sample ID	BH23	BH25	BH28	BH30
			Depth	5.00-6.00	2.00-3.00	3.00-4.00	2.00-3.00
			Other ID				
			Sample Type	EW	EW	EW	EW
			Sampling Date	05/10/2022	05/10/2022	05/10/2022	05/10/2022
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Metals							
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.70	1.3	0.27	0.79
Barium, Dissolved	DETSC 2306	0.26	ug/l	160	680	110	250
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	38	2100	56	220
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03	0.09
Calcium, Dissolved	DETSC 2306	0.09	mg/l	40	85	38	50
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.64	< 0.25	1.4	2.1
Copper, Dissolved	DETSC 2306	0.4	ug/l	3.4	1.6	1.6	3.1
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	< 0.09	< 0.09	< 0.09
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	0.02	< 0.01	0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	1.6	5.3	0.7	1.4
Selenium, Dissolved	DETSC 2306	0.25	ug/l	7.4	0.67	0.34	0.83
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	1.4	< 0.6	0.7	2.8
Zinc, Dissolved	DETSC 2306	1.3	ug/l	5.7	11	5.4	21
Inorganics							
pH	DETSC 2008		pH	7.6	6.9	7.5	7.5
Dissolved Organic Carbon	DETSC 2085	2	mg/l	4.4	13	6.9	3.7
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10
PAHs							
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	0.01	< 0.01	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 22-20262
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2069357	2069358	2069359	2069360
			.Sample ID	BH23	BH25	BH28	BH30
			Depth	5.00-6.00	2.00-3.00	3.00-4.00	2.00-3.00
			Other ID				
			Sample Type	EW	EW	EW	EW
			Sampling Date	05/10/2022	05/10/2022	05/10/2022	05/10/2022
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.01	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	0.03	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water VOC Samples

Our Ref	22-20262
Client Ref	PN224395
Contract Title	Newport Quinn Phase 2

			Lab No	2069358	2069359	2069360
			.Sample ID	BH25	BH28	BH30
			Depth	2.00-3.00	3.00-4.00	2.00-3.00
			Other ID			
			Sample Type	EW	EW	EW
			Sampling Date	05/10/2022	05/10/2022	05/10/2022
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
VOCs						
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1

Key: * -not accredited. n/s -not supplied.

Summary of Chemical Analysis
Water VOC Samples

Our Ref 22-20262
Client Ref PN224395
Contract Title Newport Quinn Phase 2

			Lab No	2069358	2069359	2069360
			.Sample ID	BH25	BH28	BH30
			Depth	2.00-3.00	3.00-4.00	2.00-3.00
			Other ID			
			Sample Type	EW	EW	EW
			Sampling Date	05/10/2022	05/10/2022	05/10/2022
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 22-20262
Client Ref PN224395
Contract Newport Quinn Phase 2

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2069357	BH23 5.00-6.00 WATER	05/10/22	GB 1L x2, GV x2, PB 1L x2	Aliphatics/Aromatics (4 days), pH/Cond/TDS (1 days), PAH MS (4 days)	
2069358	BH25 2.00-3.00 WATER	05/10/22	GB 1L x2, GV x2, PB 1L x2	Aliphatics/Aromatics (4 days), pH/Cond/TDS (1 days), PAH MS (4 days)	
2069359	BH28 3.00-4.00 WATER	05/10/22	GB 1L x2, GV x2	Aliphatics/Aromatics (4 days), pH/Cond/TDS (1 days), PAH MS (4 days)	
2069360	BH30 2.00-3.00 WATER	05/10/22	GB 1L x2, GV x2, PB 1L x2	Aliphatics/Aromatics (4 days), pH/Cond/TDS (1 days), PAH MS (4 days)	

Key: G-Glass P-Plastic B-Bottle V-Vial

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.

Disposal

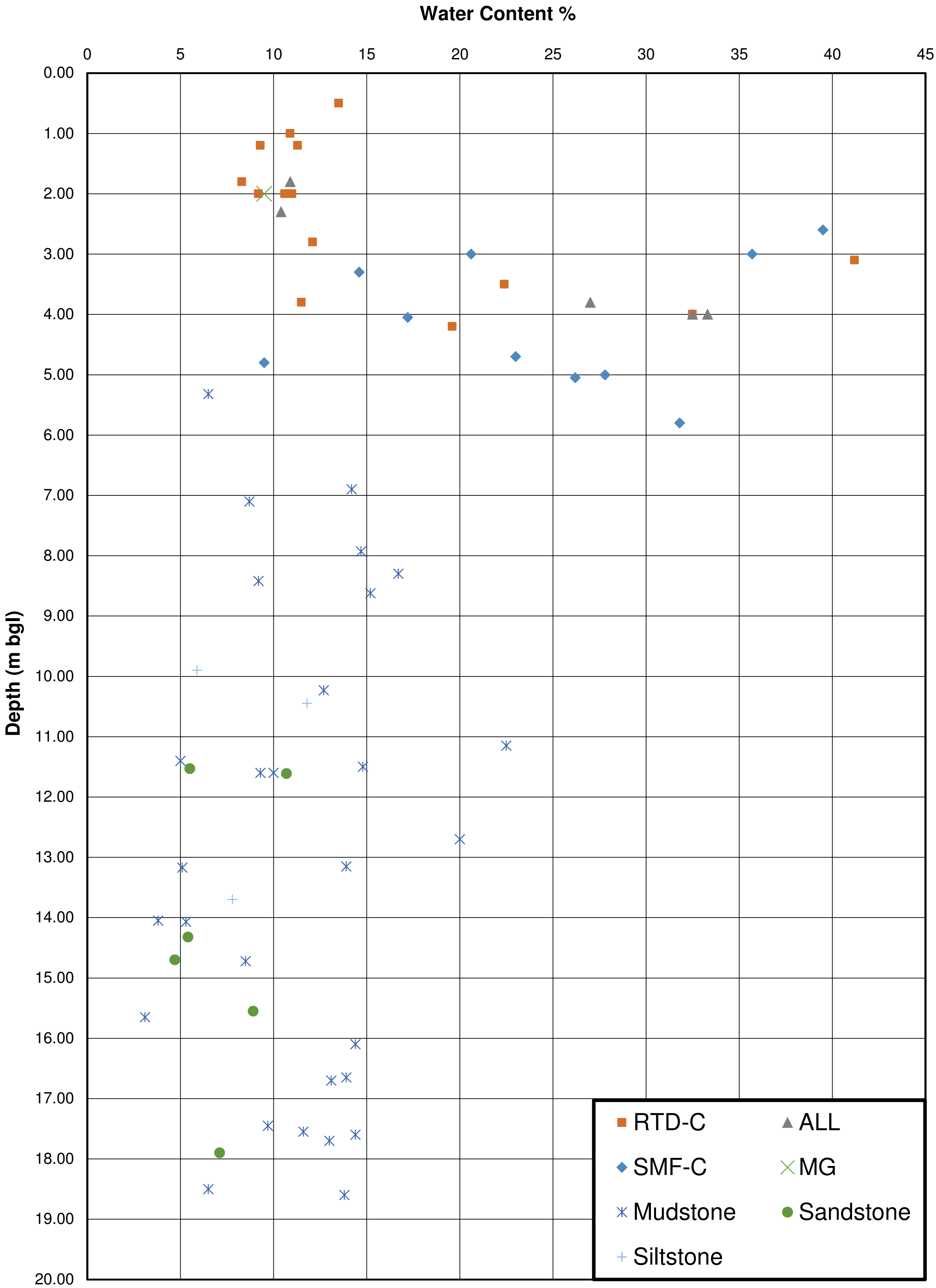
From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

APPENDIX 11

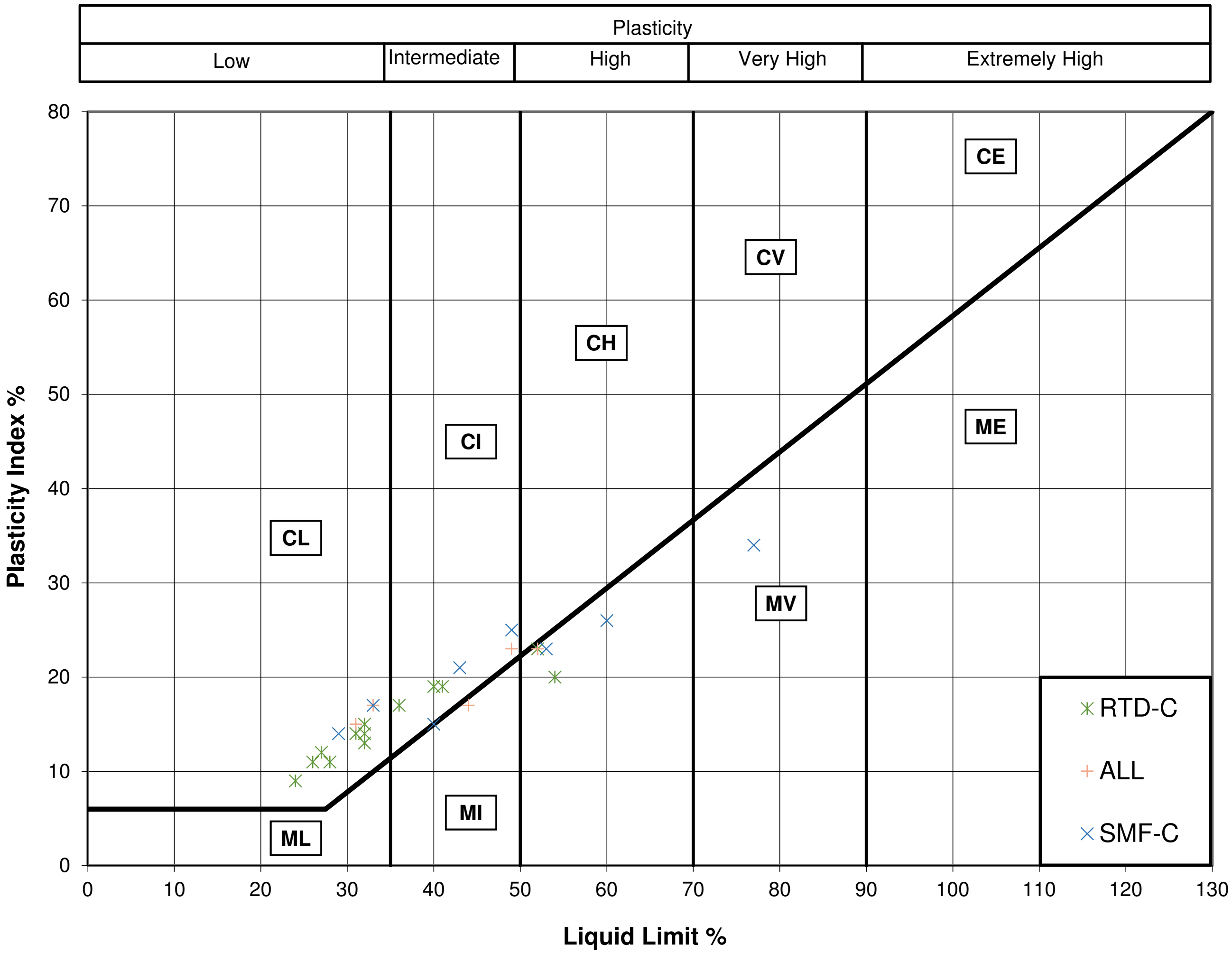
Material Property Plots



Job No	PN224395
Date	16/12/2022
Figure	1

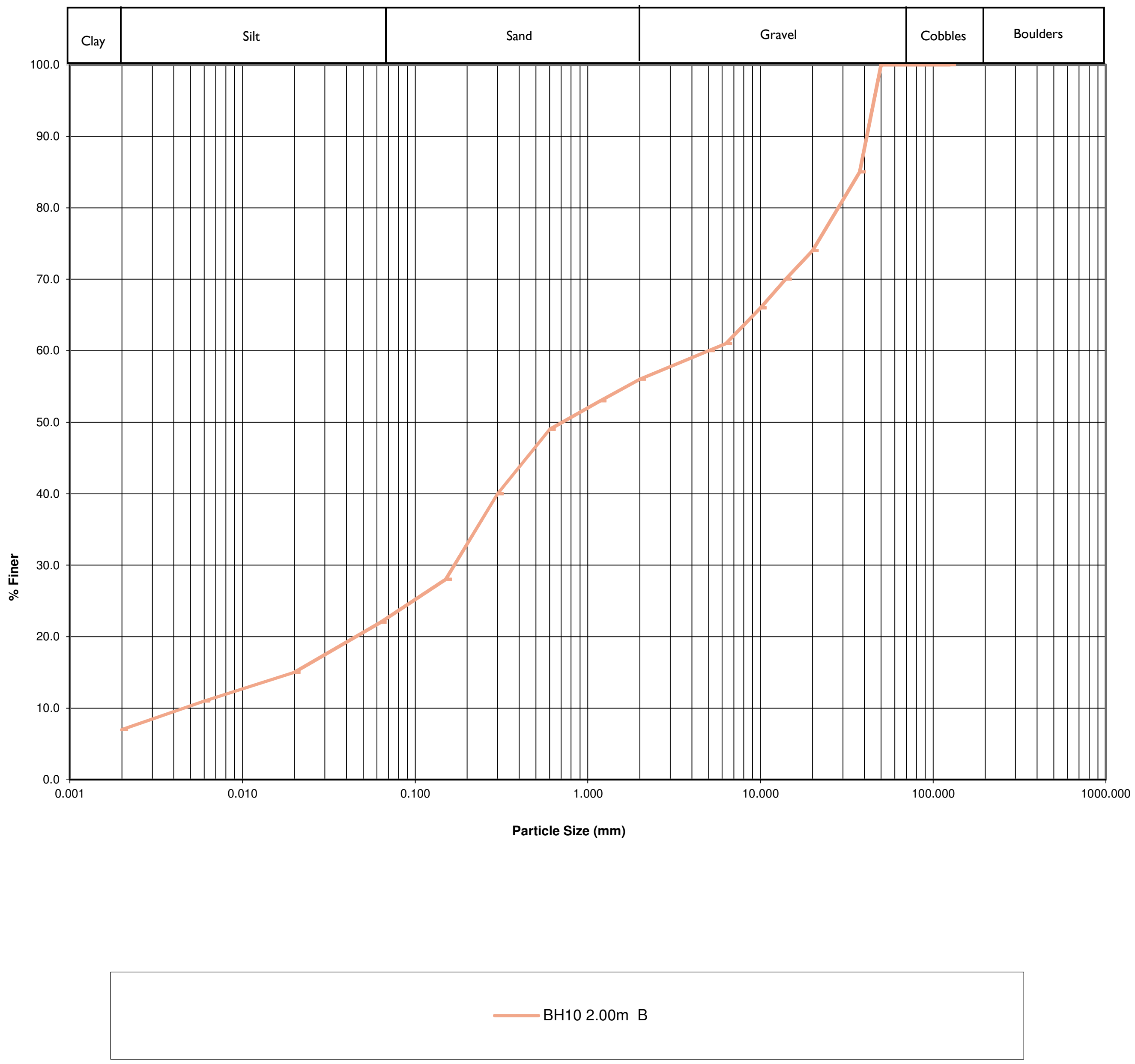
Newport Quinn
Water Content vs Depth Profile

GEOTECHNICS



Soil Type	Plasticity Characteristics
C Clay	L Low
	I Intermediate
M Silt	H High
	V Very High
	E Extremely High

Job No	PN224395	Newport Quinn Plasticity Chart	GEOTECHNICS
Date	16/12/2022		
Figure	2		

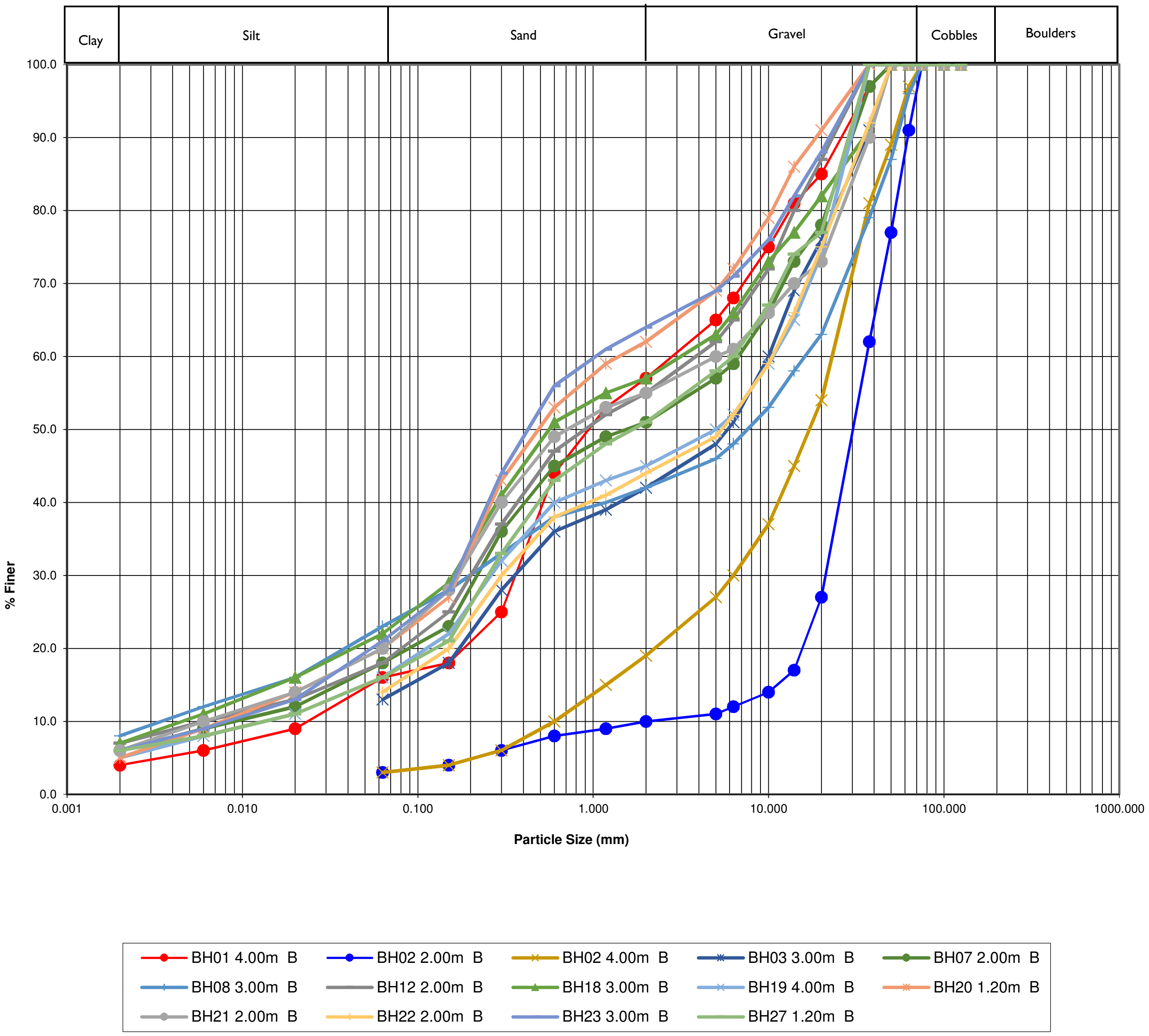


Made Ground

Job No	PN224395
Date	03/01/2023
Figure	3.1

Newport Quinn
Summary of Particle Size Distribution Analyses

GEOTECHNICS

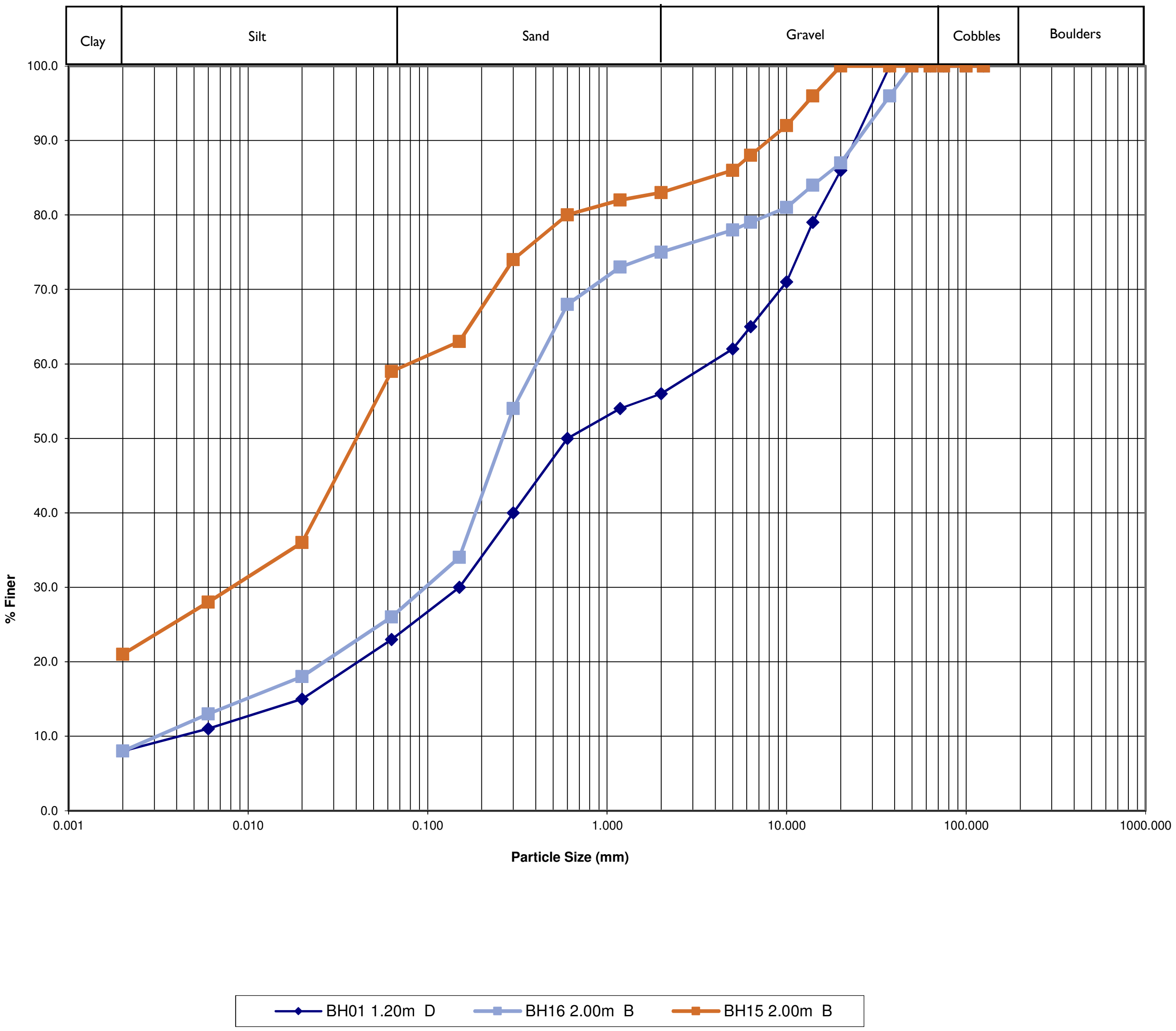


River Terrace Deposits - Granular

Job No	PN224395
Date	03/01/2023
Figure	3.2

Newport Quinn
Summary of Particle Size Distribution Analyses

GEOTECHNICS

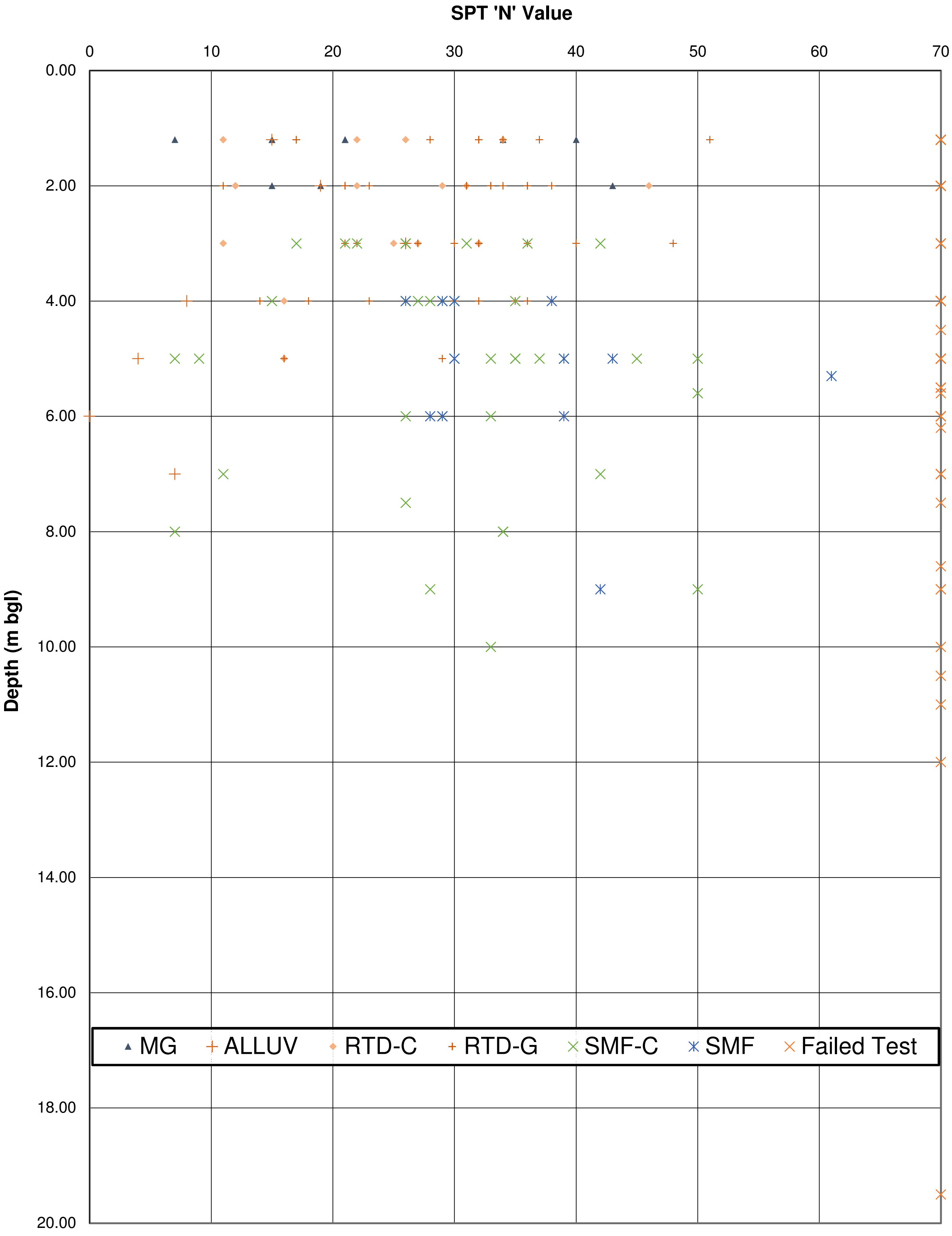


River Terrace Deposits - Cohesive

Job No PN224395
Date 03/01/2023
Figure 3.2

Newport Quinn
Summary of Particle Size Distribution
Analyses

GEOTECHNICS

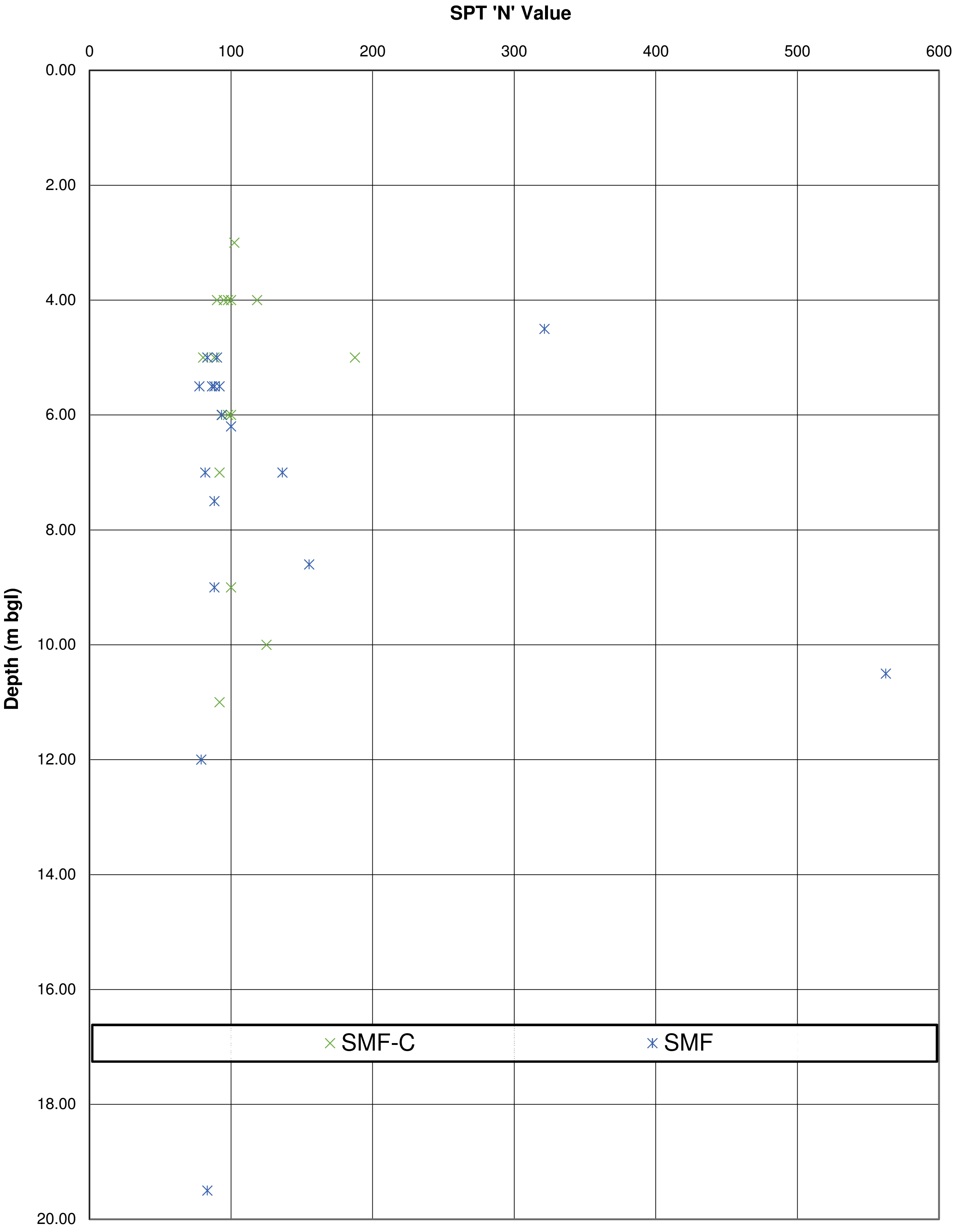


All strata

Job No	PN224395
Date	16/12/2022
Figure	4.1

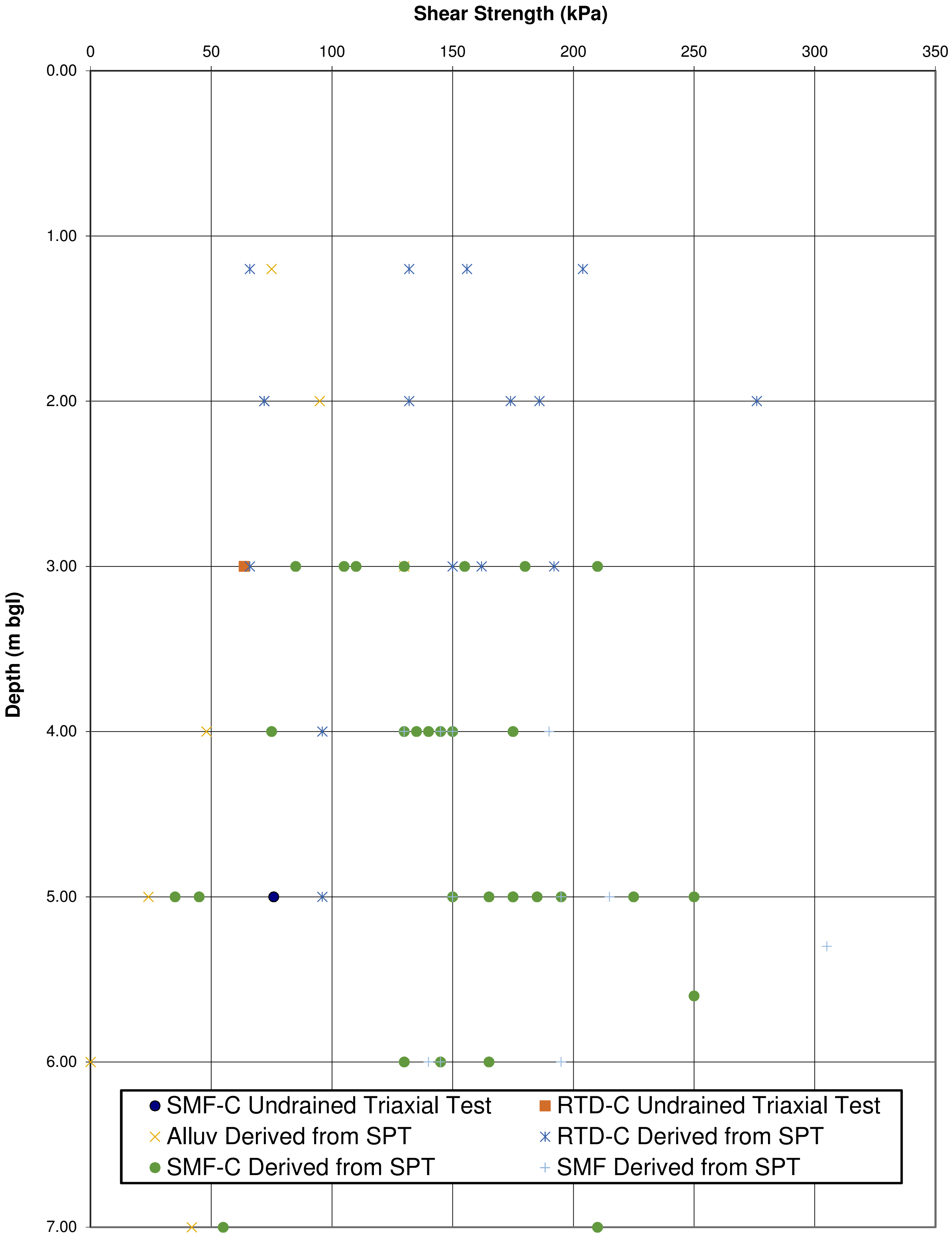
Newport Quinn
SPT vs Depth Profile

GEOTECHNICS



Extrapolated SPT results

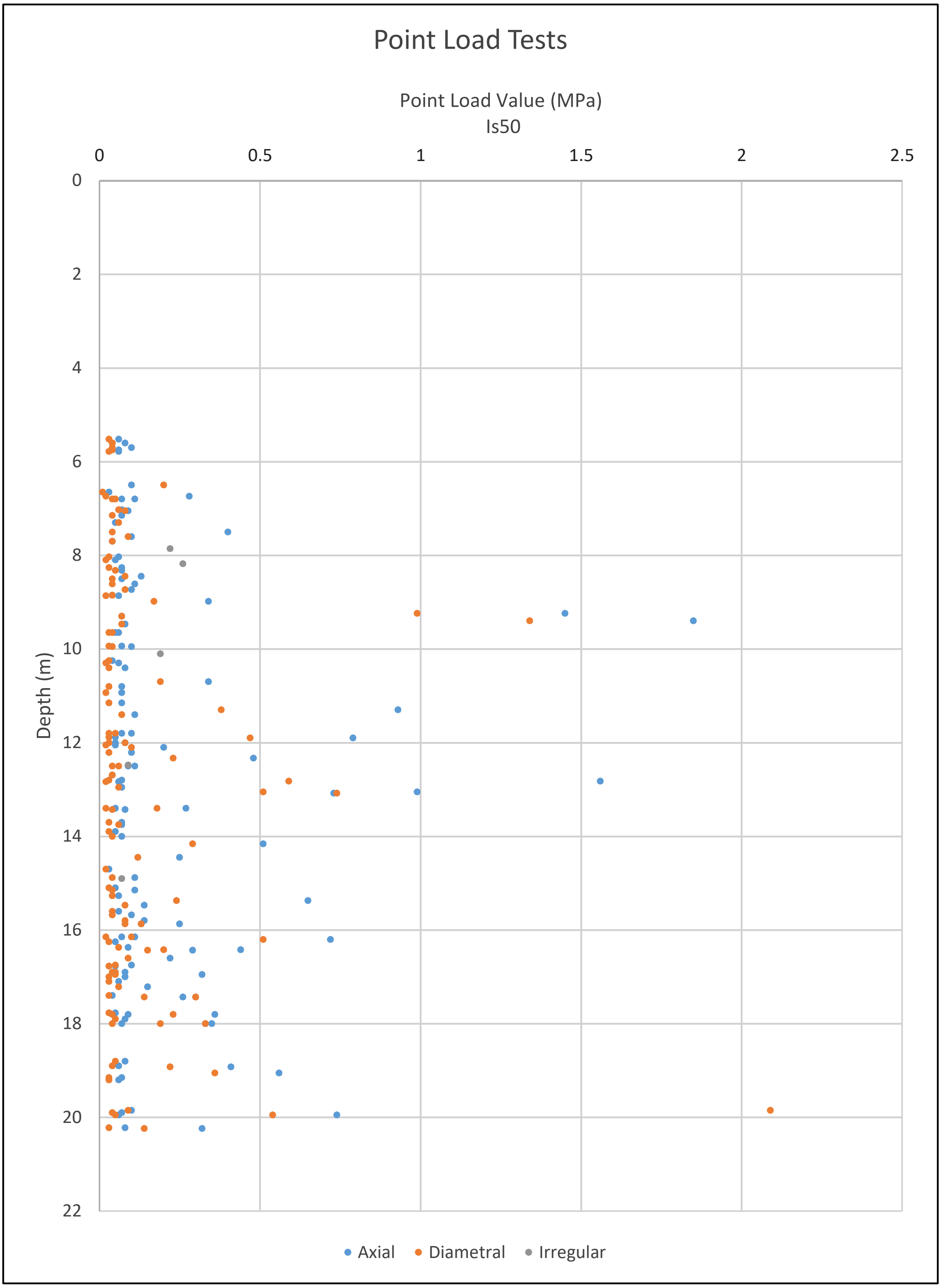
Job No	PN224395	Newport Quinn SPT vs Depth Profile	GEOTECHNICS
Date	05/01/2023		
Figure	4.2		



Job No	PN224395
Date	03/01/2023
Figure	5

Newport Quinn
Shear Strength vs Depth Profile

GEOTECHNICS



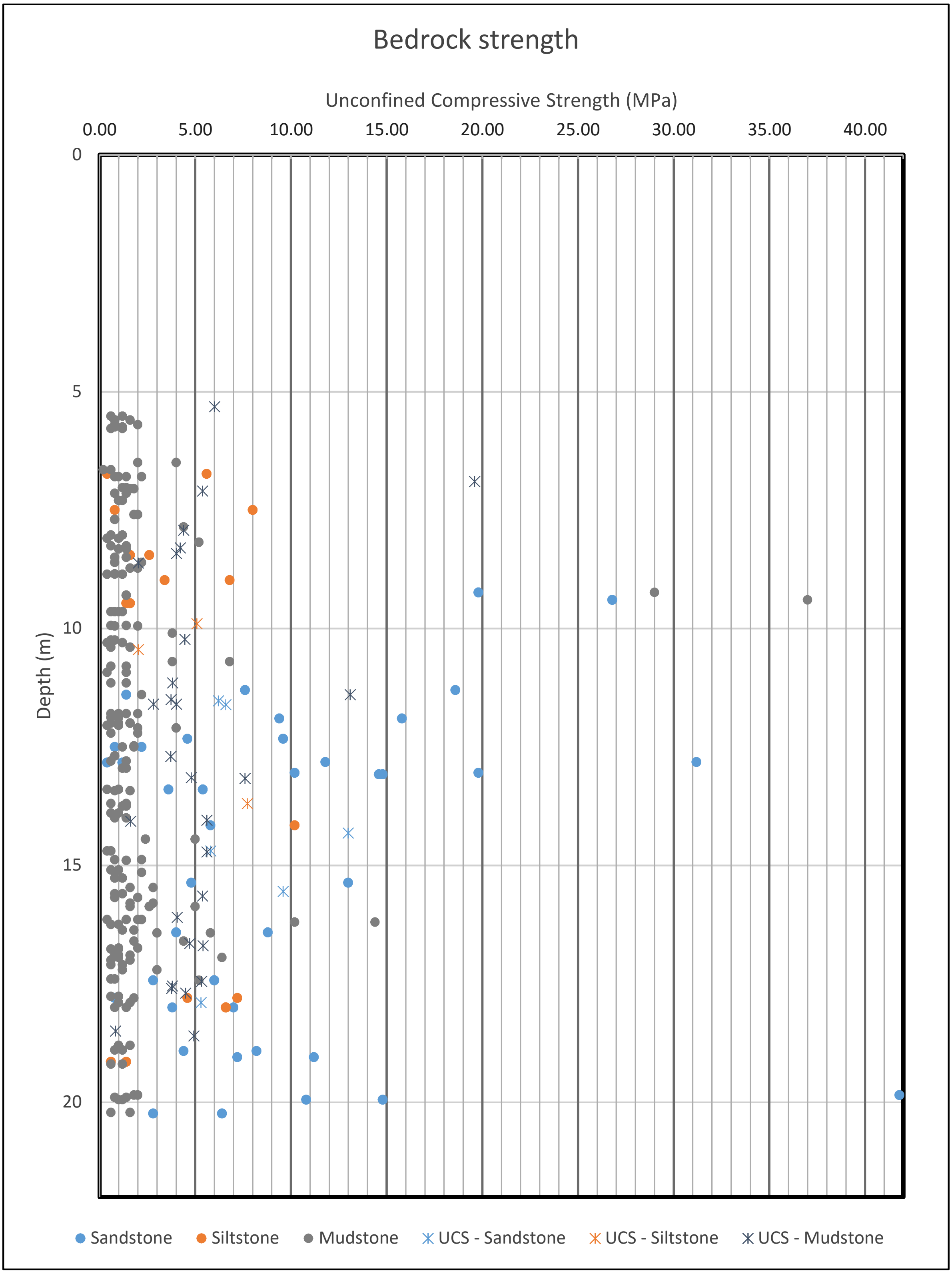
N.B. Point load Is50 values 3.33MPa (19.85m bgl), 4.27MPa (19.64m bgl) and 5.41MPa (19.64m bgl) have been omitted to allow a more appropriate scale.

Job No	PN224395
Date	01/11/2022
Figure	6

Newport Quinn

Point Load Test vs Depth Chart

GEOTECHNICS



Strength derived from point load test results and direct from unconfined compressive strength (UCS) test results.

N.B. Point load derived values 67kPa and 108kPa at 19.64m and 19.85m depth have been omitted to allow more appropriate scale.

Job No	PN224395
Date	01/11/2022
Figure	7

Newport Quinn

Bedrock Strength vs Depth Chart

GEOTECHNICS

DATA SHEET

Project: **Newport Quinn** **Project No.:** **PN224395**

Table 1: Summary of Measured and Derived Material Parameters

Made Ground

Parameter	**Number of Tests**	**Range**	**Average**	**Figure Number**	**Remarks**
Water Content (%)	1	9.5	9.5	1	
Atterberg Limits					No tests. Material mostly granular.
Particle Size Distribution	1			3.1	
% Gravel		44	-		
% Sand		34	-		
% Silt		15	-		
% Clay		7	-		
SPT N Value	13	15 - 43	26	4	Five additional tests did not achieve full penetration.
Chemical Conditions	7				
pH		7.2 - 11.1	8.6		
Ammonia Aqueous Extract as N		<10			
Chloride Aqueous Extract		3.50 - 29.0	13.5		
Nitrate Aqueous Extract as NO_3		<1.0 - 1.7	1.7		
Water soluble sulphate content SO_4 (mg/l)		12 - 99	36.7		
Total Sulphur S (%)		<0.01 - 0.21	0.13		Average excluding <0.01 values.
Total sulphate SO_4 (%)		0.01 - 0.29	0.06		
CBR	1				
Top (%)		37			From laboratory tests. Recompacted at as-received
Bottom (%)		58			moisture content using 2.5 kg rammer.

DATA SHEET

Project: **Newport Quinn** **Project No.:** **PN224395**

Table 2: Summary of Measured and Derived Material Parameters

Alluvium

Parameter	Number of Tests	Range	Average	Figure Number	Remarks
Water Content (%)	4	10.4 - 141	43	1	The water content of 141% was from material descibed as peat.
Atterberg Limits	6			2	One sample was described as peat
Liquid Limit (%)		31 - 160	62		with a liquid limit of 160% and was non-plastic.
Plastic Limit (%)		16 - 29	23		
Plasticity Index (%)		15 - 23	19		
Modified Plasticity Index (%)	5	7 - 23	15		After NHBC Standards, Chapter 4.2
SPT N Value	7	0 - 26	11	4	
Undrained Shear Strength (kN/m²)				5	No direct laboratory tests.
Estimated from SPT N Values		0 - 130	59		After Stroud & Butler (1978)
Organic Content (%)	2	0.7 - 21	11		
Compaction	1				2.5 kg rammer
Optimum moisture content (%)		6.0			
Maximum dry density (Mg/m^3)		2.19			
CBR	2				
Top (%)		0.73 - 18	9.4		From laboratory tests. Recompacted at as-received
Bottom (%)		0.59 - 23	11.8		moisture content using 2.5 kg rammer.
Thermal Conductivity	2				
Thermal Conductivity (W/(m.k))		2.54 - 2.57	2.56		
Thermal Resistivty ((m.k)/W)		0.39	0.39		
Temperature (°C)		19.4 - 20.3	20		

DATA SHEET

Project: Newport Quinn **Project No.:** PN224395

Table 3: Summary of Measured and Derived Material Parameters
River Terrace Deposits - Cohesive

Parameter	Number of Tests	Range	Average	Figure Number	Remarks
Water Content (%)	15	8 - 41	16	1	
Atterberg Limits	14			2	
Liquid Limit (%)		24 - 54	35		
Plastic Limit (%)		15 - 34	20		
Plasticity Index (%)		9 - 23	15		
Modified Plasticity Index (%)	16	4 - 20	9		After NHBC Standards, Chapter 4.2
Particle Size Distribution	3			3.2	
% Cobbles		0	-		
% Gravel		17 - 44	-		
% Sand		24 - 49	-		
% Silt		15 - 38	-		
% Clay		8 - 21	-		
SPT N Value	28	11 - 46	23	4	Twelve tests did not achieve full penetration.
Undrained Shear Strength (kN/m^2)				5	
Undrained Shear Strength (kN/m^2)	1	64			Unconsolidated undrained triaxial test.
Estimated from SPT N Values	16	24 - 276	123		After Stroud & Butler (1978)
Chemical Conditions	8				
pH		7.0 - 8.3	7.63		
Ammonia Aqueous Extract as N		<10			
Chloride Aqueous Extract		3.70 - 7.00	5.55		
Nitrate Aqueous Extract as NO_3		<1.0 - 1.0			
Water soluble sulphate content SO_4 (mg/l)		12 - 29	17.8		
Total Sulphur S (%)		<0.01 - 0.01			
Total sulphate SO_4 (%)		<0.01 - 0.03	0.02		Average excluding <0.01 values.
Compaction	5				2.5 kg rammer
Optimum moisture content (%)		7.5 - 9	8		
Maximum dry density (Mg/m^3)		2.03 - 2.20	2.13		

CBR	5				
Top (%)		0.73 - 47	10		From laboratory tests. Recompacted at as-received
Bottom (%)		0.59 - 25	6		moisture content using 2.5 kg rammer.
Thermal Conductivity	7				
Thermal Conductivity (W/(m.k))		1.24 - 3.37	2.29		
Thermal Resistivty ((m.k)/W)		0.30 - 0.81	0.48		
Temperature (°C)		19.3 - 20.3	19.9		

DATA SHEET

Project: **Newport Quinn** **Project No.:** **PN224395**

Table 4: Summary of Measured and Derived Material Parameters

River Terrace Deposits - Granular

Parameter	**Number of Tests**	**Range**	**Average**	**Figure Number**	**Remarks**
Particle Size Distribution	14			3.2	
% Cobbles		0 - 9	-		
% Gravel		36 - 81	-		
% Sand		7 - 43	-		
% Silt		~10 - 15	-		
% Clay		3 - 14	-		
SPT N Value	47	11 - 51	29	4	Eighteen tests did not achieve full penetration.
Chemical Conditions	5				
pH		7.7 - 10.7	8.58		
Ammonia Aqueous Extract as N		<10			
Chloride Aqueous Extract		2.10 - 6.20	4.50		
Nitrate Aqueous Extract as NO_3		<1.0			
Water soluble sulphate content SO_4 (mg/l)		12 - 32	18.4		
Total Sulphur S (%)		<0.01 - 0.01			
Total sulphate SO_4 (%)		<0.01 - 0.03	0.02		Average excluding <0.01 values.
Compaction	7				2.5 kg rammer
Optimum moisture content (%)		6 - 9	7.5		
Maximum dry density (Mg/m^3)		2.10 - 2.21	2.16		
CBR	7				
Top (%)		1.30 - 55	23		From laboratory tests. Recompacted at as-received
Bottom (%)		1.2 - 51	21		moisture content using 2.5 kg rammer.
Thermal Conductivity	10				
Thermal Conductivity (W/(m.k))		1.80 - 2.78	2.37		
Thermal Resistivty ((m.k)/W)		0.36 - 0.55	0.43		
Temperature (°C)		17.8 - 20.6	19.8		

DATA SHEET

Project: **Newport Quinn** **Project No.:** **PN224395**

Table 5: Summary of Measured and Derived Material Parameters
St. Maughan's Formation - Clay

Parameter	Number of Tests	Range	Average	Figure Number	Remarks
Water Content (%)	9	9.5 - 40	24	1	
Atterberg Limits	7			2	
Liquid Limit (%)		29 - 77	47		
Plastic Limit (%)		15 - 43	26		
Plasticity Index (%)		14 - 34	22		
Modified Plasticity Index (%)	7	11 - 31	17		After NHBC Standards, Chapter 4.2
SPT N Value	55	7 - 50	30	4	Seventeen tests did not achieve full penetration.
Undrained Shear Strength (kN/m²)				5	
Unconsolidated Undrained Triaxial (kN/m²)	1	76	76		Unconsolidated undrained triaxial test.
Estimated from SPT N Values	38	35 - 250	149		After Stroud & Butler (1978)
Chemical Conditions	3				
pH		7.3 - 8.8	8.3		
Ammonia Aqueous Extract as N		<10			
Chloride Aqueous Extract		6.3 - 18	12		
Nitrate Aqueous Extract as NO_3		<1.0			
Water soluble sulphate content SO_4 (mg/l)		17 - 34	27		
Total Sulphur S (%)		<0.01 - 0.02			
Total sulphate SO_4 (%)		<0.01 - 0.40	0.01		Average excluding <0.01 values.
Compaction	1				2.5 kg rammer
Optimum moisture content (%)		18			
Maximum dry density (Mg/m^3)		1.75			
Thermal Conductivity	2				
Thermal Conductivity (W/(m.k))		2.60 - 2.71	2.66		
Thermal Resistivty ((m.k)/W)		0.37 - 0.38	0.38		
Temperature (°C)		17.8 - 20.6	19.1		

DATA SHEET

Project: **Newport Quinn** **Project No.:** **PN224395**

Table 6: Summary of Measured and Derived Parameters
Bedrock - St. Maughan's Formation

Parameter	Number of Tests	Range	Average	Figure Number	Remarks
SPT N Value	29	26 - 61	36	4	Seventeen tests did not achieve full penetration.
Point Load - Sandstone					
Is_{50} (MN/m^2) Axial	9	0.06 - 1.56	0.57		
Is_{50} (MN/m^2) Diametral	25	0.02 - 4.27	0.58		
Point Load - Siltstone					
Is_{50} (MN/m^2) Axial	9	0.07 - 0.51	0.28		
Is_{50} (MN/m^2) Diametral	8	0.02 - 0.33	0.12		
Point Load - Mudstone					
Is_{50} (MN/m^2) Axial	100	0.03 - 5.41	0.21		
Is_{50} (MN/m^2) Diametral	98	0.01 - 0.51	0.06		
Unconfined Compressive Strength					
Sandstone (MN/m^2)	6	5.31 - 13.00	7.75		
Siltstone (MN/m^2)	3	2.03 - 7.72	4.95		
Mudstone (MN/m^2)	29	0.84 - 19.60	5.15		
Moisture Content					
Sandstone (%)	6	4.7 - 10.7	7.1		
Siltstone (%)	3	5.8 - 11.8	8.5		
Mudstone (%)	30	3.1 - 32	12		
Atterberg Limits - Mudstone (Clay)	1			2	
Liquid Limit (%)		53			
Plastic Limit (%)		30			
Plasticity Index (%)		15			
Chemical Conditions	4				
pH		6.6 - 11	8		
Ammonia Aqueous Extract as N		<10			
Chloride Aqueous Extract		5.3 - 30	14		
Nitrate Aqueous Extract as NO_3		<1.0			

Water soluble sulphate content SO_4 (mg/l)		15 - 92	42		
Total Sulphur S (%)		<0.01 - 0.07			
Total sulphate SO_4 (%)		<0.01 - 0.25	0.09		Average excluding <0.01 values.
Thermal Conductivity	1				
Thermal Conductivity (W/(m.k))		1.18			
Thermal Resistivty ((m.k)/W)		0.85			
Temperature (°C)		19.1			

APPENDIX 12

Geological Sections

DATA SHEET - Symbols and Abbreviations used on Records

Sample Types

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

Insitu Testing / Properties

CBRP	CBR using TRL probe
CHP	Constant Head Permeability Test
COND	Electrical conductivity
TC	Thermal Conductivity
TR	Thermal Resistivity
HV	Strength from Hand Vane
ICBR	CBR Test
IDEN	Density Test
IRES	Resistivity Test
MEX	CBR using Mexecone Probe Test
PKR	Packer Permeability Test
PLT	Plate Load Test
PP	Strength from Pocket Penetrometer
Temp	Temperature
VHP	Variable Head Permeability Test
VN	Strength from Insitu Vane
w%	Water content

(All other strengths from undrained triaxial testing)

S	Standard Penetration Test (SPT)
C	SPT with cone
N	SPT Result
-/-	Blows/penetration (mm) after seating drive
-*/- (mm)	Total blows/penetration
( )	Extrapolated value

Groundwater

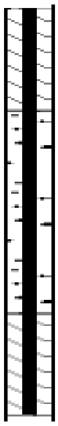
Water Strike	▽
Depth Water Rose To	▼

Instrumentation

Seal

Filter

Seal



Strata — Legend

Made Ground Granular

Made Ground Cohesive

Topsoil

Cobbles and Boulders

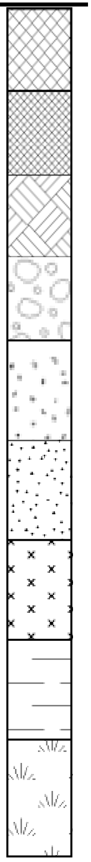
Gravel

Sand

Silt

Clay

Peat



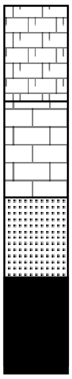
Note: Composite soil types shown by combined symbols

Chalk

Limestone

Sandstone

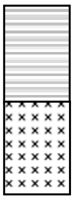
Coal



Strata, Continued

Mudstone

Siltstone

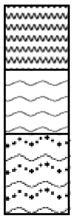


Metamorphic Rock

Fine Grained

Medium Grained

Coarse Grained

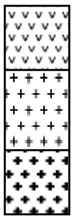


Igneous Rock

Fine Grained

Medium Grained

Coarse Grained



Backfill Materials

Arisings

Bentonite

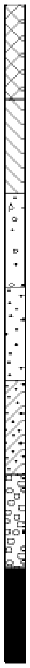
Concrete

Sand

Grout

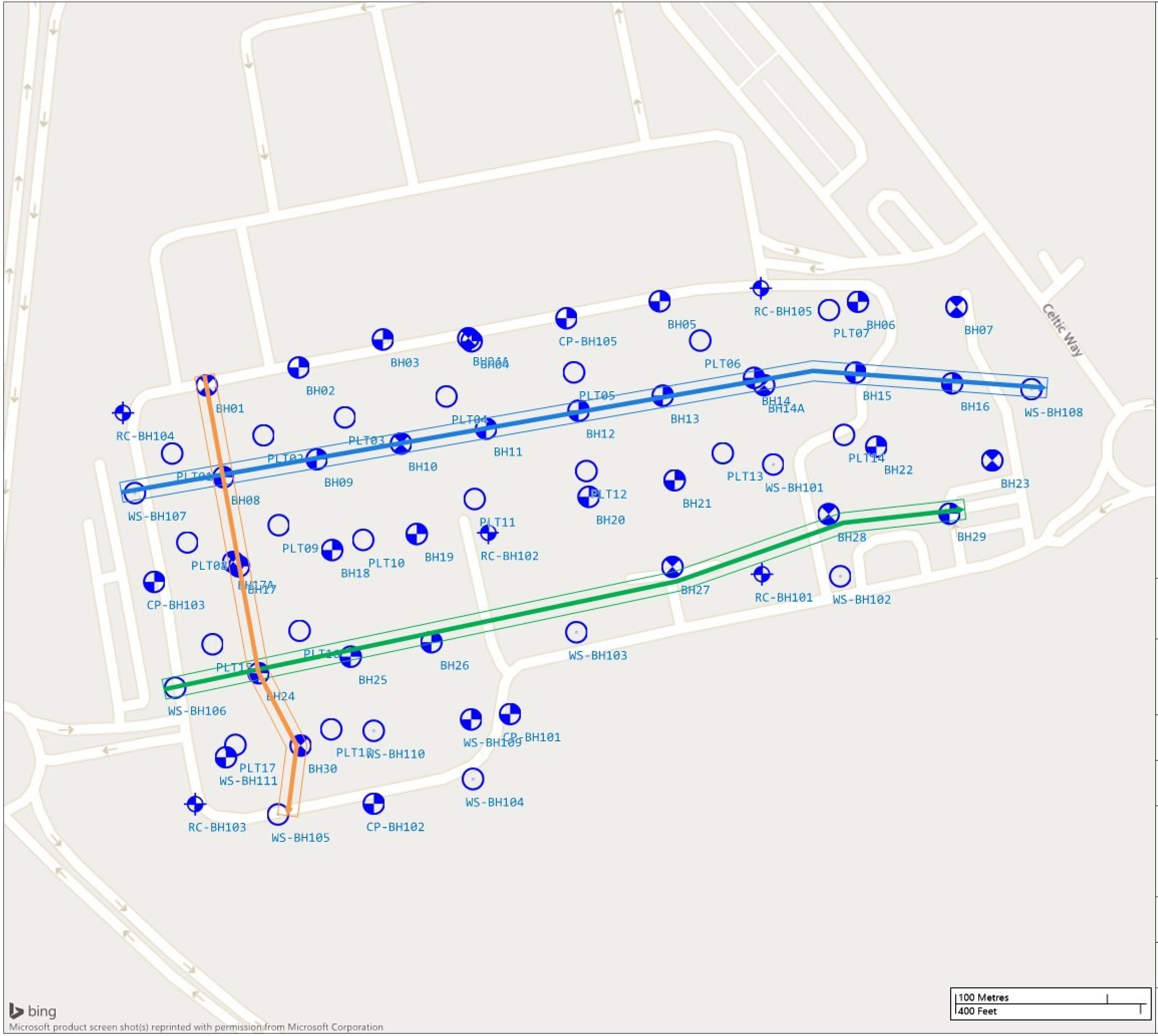
Gravel

Asphalt/Tarmacadam



Rotary Core

RQD	Rock Quality Designation (% of intact core >100mm)
FRACTURE INDEX	Fractures/metre
NI	Non-intact core
NR	No core recovery
AZCL	Assumed zone of core loss



Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation

N

Legend

- Sections - Section line A-A'
- Sections - Section line B-B'
- Sections - Section line C-C'
- Locations By Type - CP
- Locations By Type - CP+RC
- Locations By Type - DS
- Locations By Type - DS+RC
- Locations By Type - PLT

GEOTECHNICS

geotechnical and geoenvironmental specialists

Unit 1B Borders Industrial Park
River Lane
Saltney
Chester CH4 8RJ

Phone: 01244 671117
Email: mail@geotechnics.co.uk
www.geotechnics.co.uk

Engineer:
Pinnacle Consulting Engineers Limited

Client:
Pinnacle Consulting Engineers Limited

Project:
Newport Quinn Phase 2

Drawing Title:
Cross Section Layout with Exploratory Holes

Scale:
1:2500 at A3

Date:
07/02/2023

Project No.:
PN224395

Exploratory Hole Location Plan

Project: **Newport Quinn Phase 2**

Project No.: **PN224395**

Client: **Pinnacle Consulting Engineers Limited**

Title: **Section Line A-A'**

Vertical Scale: **1:200**

Horizontal Scale: **1:3500**

Engineer: **Pinnacle Consulting Engineers Limited**

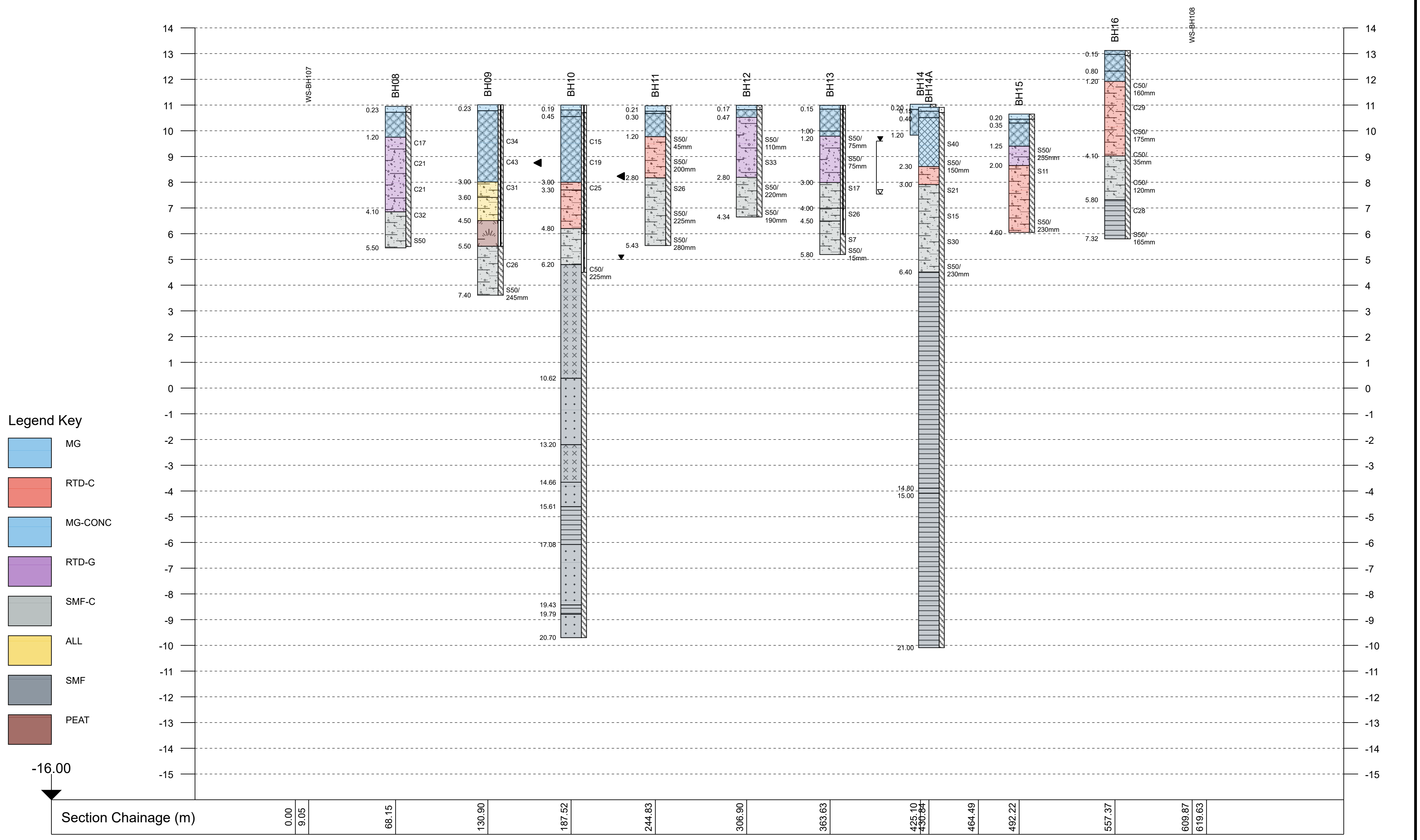
Unit 1B Borders Industrial Park
River Lane
Saltney
Chester CH4 8RJ

Phone: 01244 671117

Email: mail@geotechnics.co.uk

www.geotechnics.co.uk

GEOTECHNICS
geotechnical and geoenvironmental specialists



Project:	**Newport Quinn Phase 2**	Title:	**Section Line B-B'**
		Vertical Scale:	**1:152**
Project No.:	**PN224395**	Horizontal Scale:	**1:3000**
Client:	**Pinnacle Consulting Engineers Limited**	Engineer:	**Pinnacle Consulting Engineers Limited**

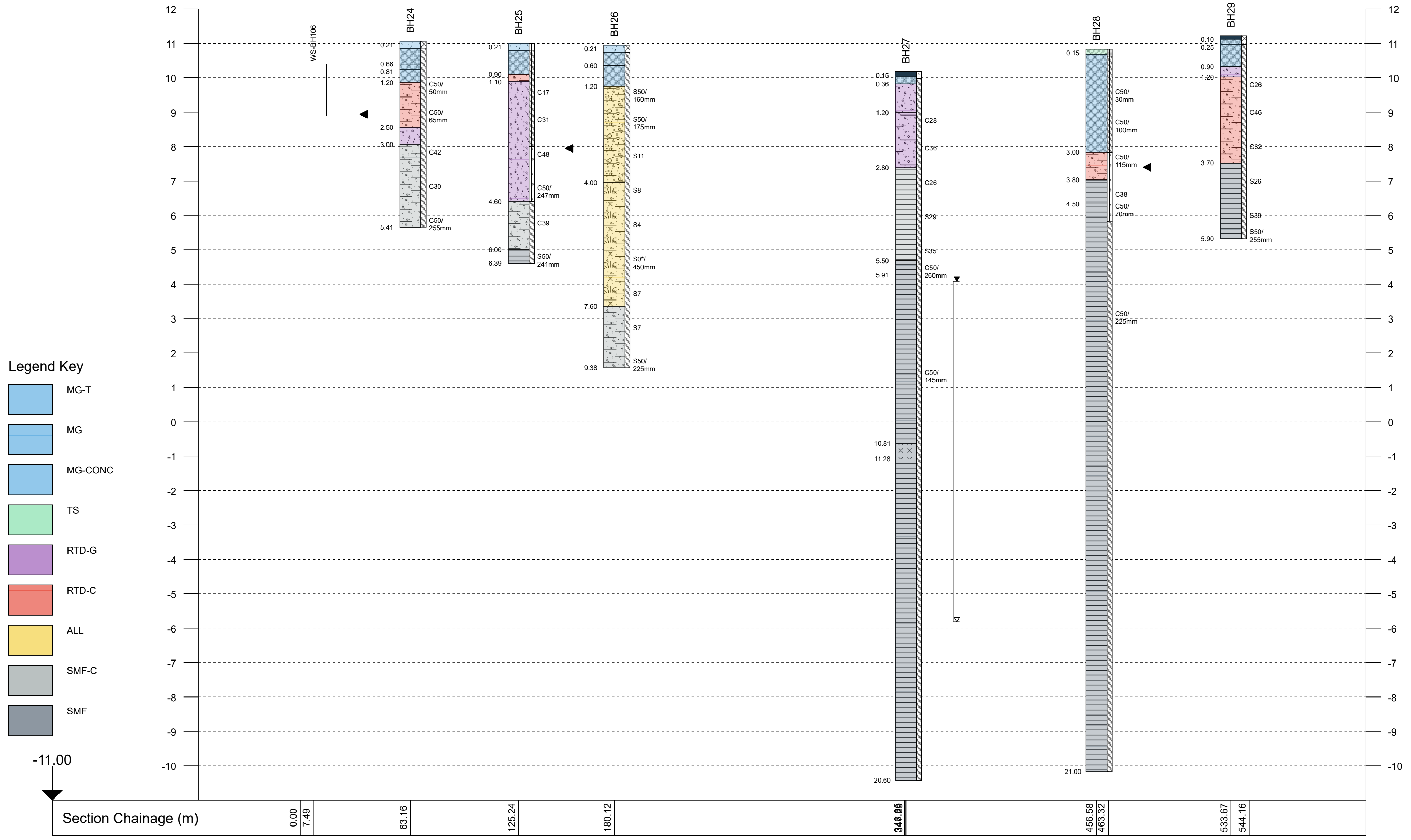
Unit 1B Borders Industrial Park
River Lane
Saltney
Chester CH4 8RJ

Phone: 01244 671117

Email: mail@geotechnics.co.uk

www.geotechnics.co.uk

GEOTECHNICS
geotechnical and geoenvironmental specialists



Project: **Newport Quinn Phase 2**

Project No.: **PN224395**

Client: **Pinnacle Consulting Engineers Limited**

Title: **Section Line C-C'**

Vertical Scale: **1:150**

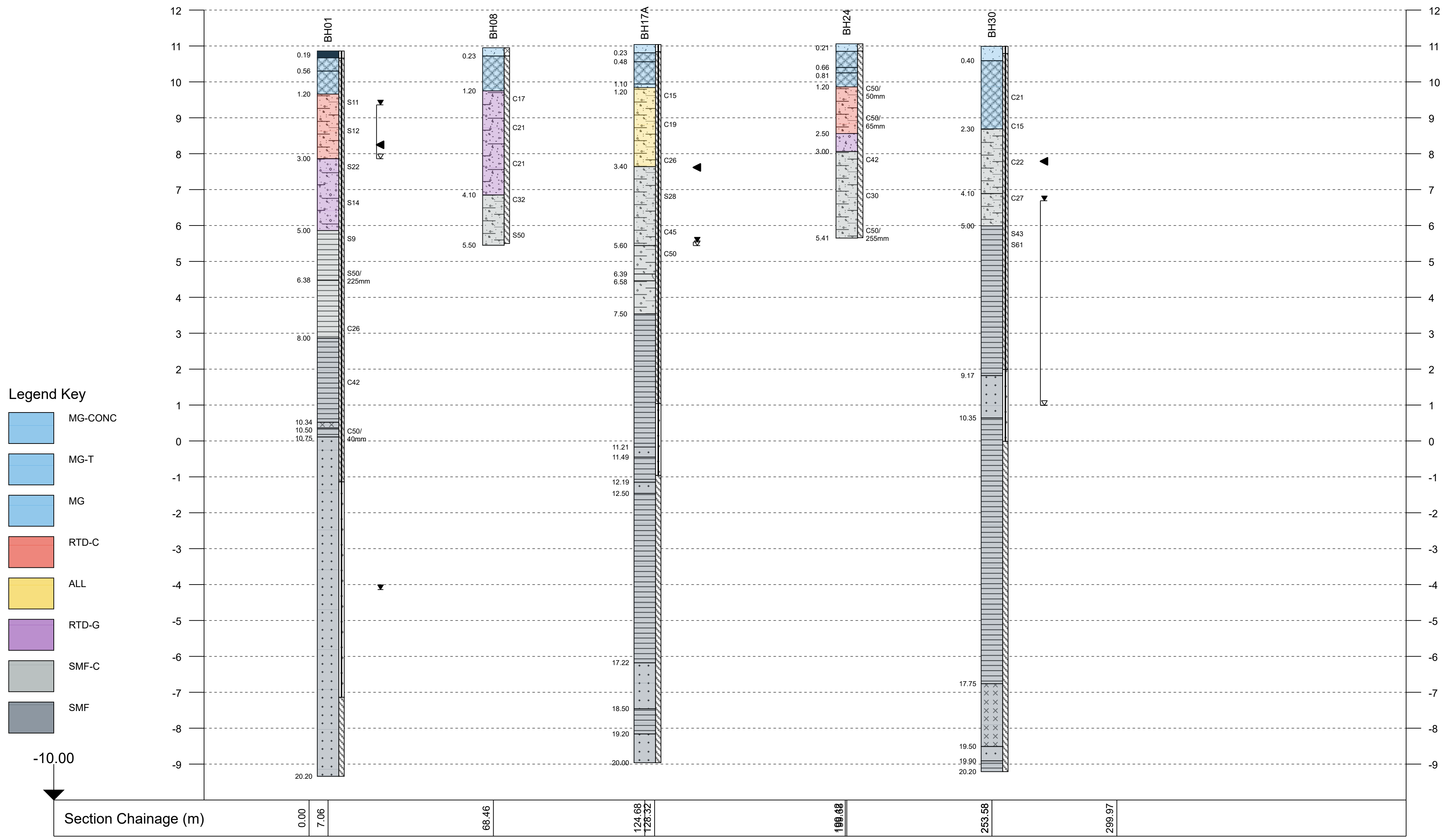
Horizontal Scale: **1:2000**

Engineer: **Pinnacle Consulting Engineers Limited**

Unit 1B Borders Industrial Park
River Lane
Saltney
Chester CH4 8RJ

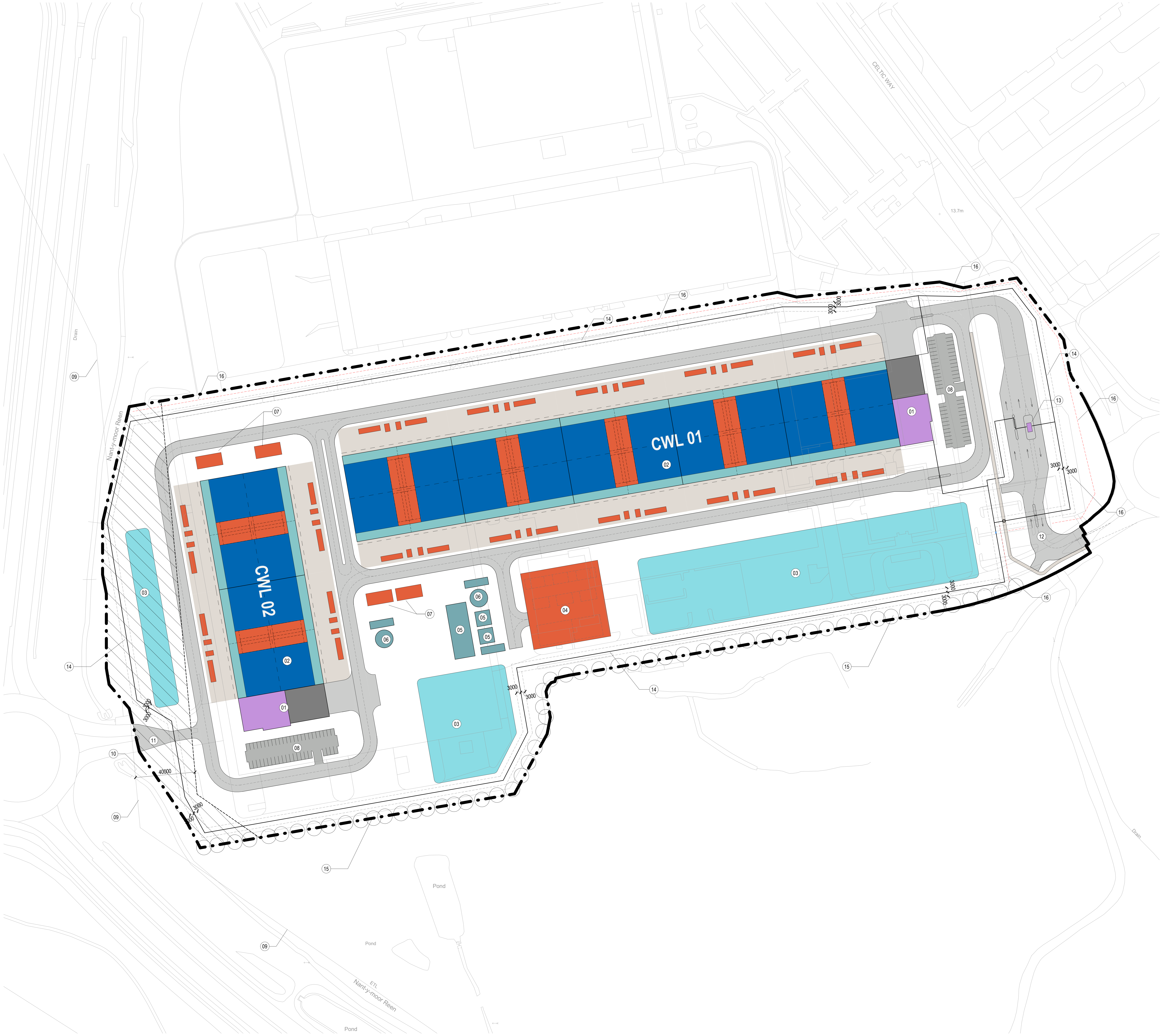
Phone: 01244 671117
Email: mail@geotechnics.co.uk
www.geotechnics.co.uk

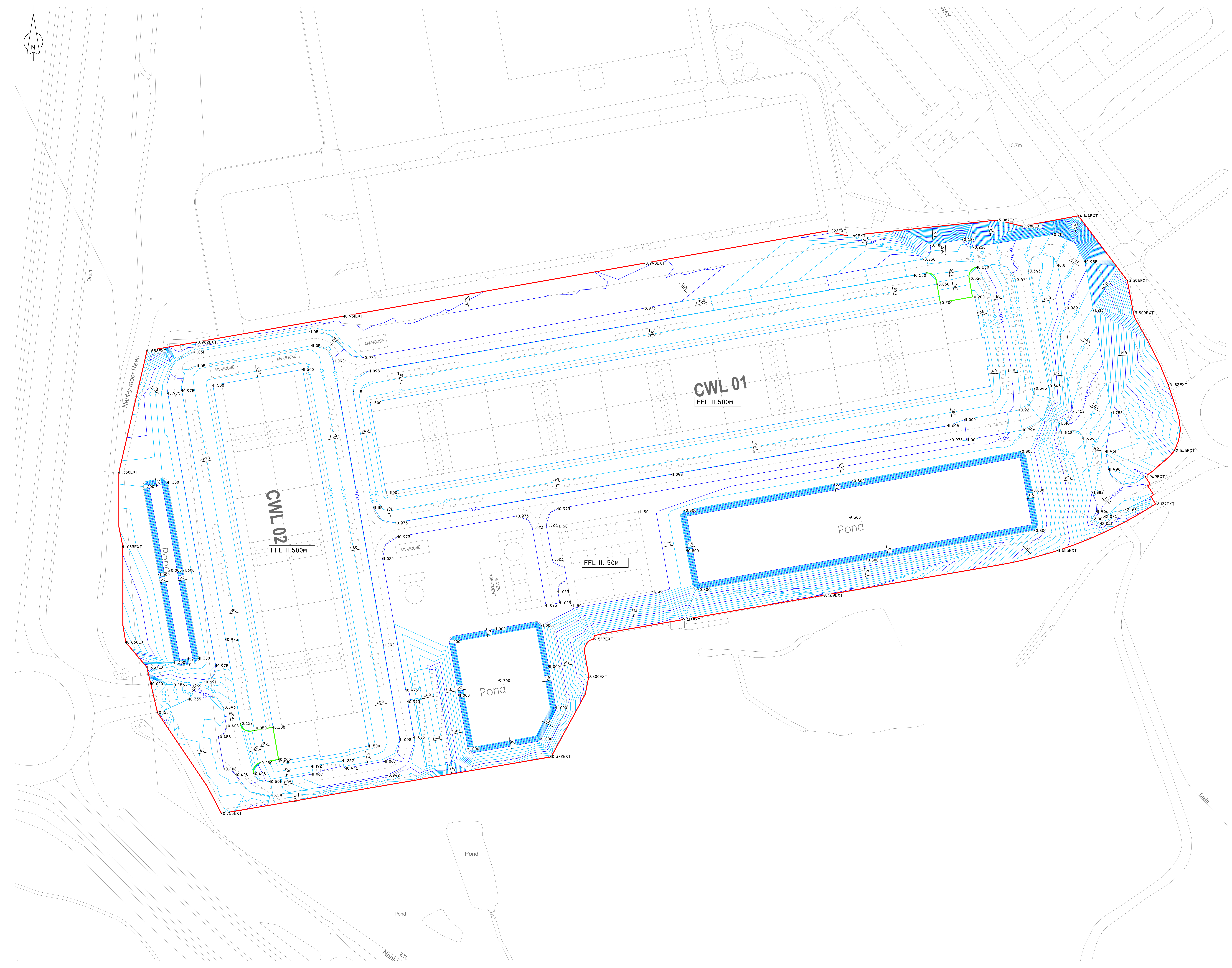
GEOTECHNICS
geotechnical and geoenvironmental specialists



APPENDIX 13

Proposed Layout


CWL 01
CWL 02
01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
3000
40000
Nant-y-moor Reen
Drain
CELTIC WAY
13.7m
Pond
ETL



GENERAL NOTES

1. DO NOT SCALE THIS DRAWING. WORK ONLY TO FIGURED DIMENSIONS.
2. FOR ALL RELEVANT NOTES, REFER TO STRUCTURAL AND CIVIL ENGINEERING PERFORMANCE SPECIFICATION.
3. ANY DISCREPANCIES ARE TO BE REPORTED TO PINNACLE CONSULTING ENGINEERS IMMEDIATELY.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SUB-CONTRACTORS DRAWINGS AND DETAILS.

LEGEND

—	SITE BOUNDARY
×11.500	PROPOSED LEVELS
×EXT 11.000	EXISTING LEVELS
1:68 →	PROPOSED GRADIENT
—11.30—	MINOR CONTOUR (0.100M INTERVALS)
—11.00—	MAJOR CONTOUR (0.500M INTERVALS)
—	RETAINING WALL

0 50MM ON A0 DWG. 50

REV	DESCRIPTION	BY	CHK	DATE
P01	FOR INFORMATION	SC	JJ	03.06.21

CLIENT

PROJECT
NEWPORT SDD MSFT

DRAWING TITLE
LEVELS STRATEGY

PINNACLE
CONSULTING ENGINEERS

ALCHEMY,
BESSEMER ROAD,
WELWYN GARDEN CITY,
HERTS,
AL7 1HE. TELEPHONE: 01707 527 630
NORWICH | LONDON | DUBLIN | THE HAGUE

DRAWING STATUS
INFORMATION

SCALE @ A0	DATE	DRAWN BY	CHECKED
1:750	JUN '21	SC	JJ

DRG NO. C210420-PIN-XX-XX-DR-C-SK011
REVISION P01

REF: -

THIS DRAWING IS INDICATIVE, FOR INFORMATION ONLY.

VOLUMES ARE BASED ON ASSUMPTIONS AND INFORMATION AS STATED AND IS SUBJECT TO CHANGE THROUGH ON GOING SITE INVESTIGATIONS AND DESIGN DEVELOPMENT, AND SHOULD NOT BE USED FOR COSTING

IT IS ASSUMED ALL CUT MATERIAL IS NOT SUITABLE FOR RE-USE AS FILL.
THE CONTRACTOR IS TO SATISFY THEMSELVES THAT ANY CUT & FILL MATERIAL IS SUITABLE FOR RE-USE AS ENGINEERED FILL.

THIS DRAWING IS BASED ON ARCHITECTS DRAWING CWL XX-SK-104 DATED 05/24/21 & TOPOGRAPHY SURVEY BY LASER SURVEYS ON MAY 2021 REF: N1082

FORMATION ALLOWANCES ARE CALCULATED BASED ON A 2.5% CBR VALUE

KEY

XX.XXX = PROPOSED FORMATION LEVELS (BASED ON FORMATION ALLOWANCES TABLE)
XX.XXX = EXISTING LEVELS
X.XXX = DEPTH OF FILL
X.XXX = DEPTH OF CUT

DENOTES AREAS OF FILL
- 🟩 0.900 TO 1.560
- 🟩 0.600 TO 0.900
- 🟩 0.300 TO 0.600
- 🟩 0.000 TO 0.300

DENOTES AREAS OF CUT
- ▨ 0.000 TO -1.500
- ▨ -1.500 TO -3.000
- ▨ -3.000 TO -4.500
- ▨ -4.500 TO -5.394

CUT & FILL VOLUMES

CUT (ABOVE FORMATION LEVEL) = 87,232m³
FILL (BELOW FORMATION LEVEL) = 10,695m³
ESTIMATED ON-SITE ARISING (CUT) = 16,000m³
(FOUNDATIONS, DRAINAGE & SERVICES)

FORMATION ALLOWANCES

1. BUILDING AREA CONSTRUCTION DEPTH
   = 610MM (200MM SLAB + 410MM TYPE 1 FILL)
2. ROADS AND SITE ACCESS CONSTRUCTION DEPTH
   = 960MM (300MM SURFACING + 250MM CAPPING + 410MM TYPE 1)
2. CAR PARKING & HARDSTANDING CONSTRUCTION DEPTH
   = 860MM (200MM SURFACING + 250MM CAPPING + 410MM TYPE 1)
3. LANDSCAPE AREA FORMATION DEPTH
   = 150MM

FIGURES DO NOT INCLUDE THE FOLLOWING:

1. SETTLEMENT
2. BULKING
3. EXISTING GROUND FLOOR SLABS
4. HIGHWAY WORKS
5. HOTSPOT CONTAMINATION REMOVALS
6. ANY EXISTING CONCRETE SLABS TO BE REMOVED, CRUSHED, RE-LAID & COMPACTED

0 50MM ON A0 DWG. 50

REV	DESCRIPTION	BY	CHK	DATE
P01	FOR INFORMATION	SC	JJ	03.06.21

CLIENT

PROJECT
NEWPORT SDD MSFT

DRAWING TITLE
BULK EARTHWORKS ANALYSIS

PINNACLE
CONSULTING ENGINEERS

ALCHEMY,
BESSEMER ROAD,
WELWYN GARDEN CITY,
HERTS,
AL7 1HE. TELEPHONE: 01707 527 630
NORWICH | LONDON | DUBLIN | THE HAGUE

DRAWING STATUS
INFORMATION

SCALE @ A0	DATE	DRAWN BY	CHECKED
1:750	JUN '21	SC	JJ

DRG NO.
C210420-PIN-XX-XX-DR-C-SK011

REVISION
P01

REF: -

APPENDIX 14

Exploratory Hole Location Plan

N

Legend

🟦	Sections - Section line A-A'
🟩	Sections - Section line B-B'
🟧	Sections - Section line C-C'
●	Locations By Type - CP
●	Locations By Type - CP+RC
○	Locations By Type - DS
●	Locations By Type - DS+RC
○	Locations By Type - PLT

GEOTECHNICS
geotechnical and geoenvironmental specialists

Unit 1B Borders Industrial Park
River Lane
Saltney
Chester CH4 8RJ

Phone: 01244 671117
Email: mail@geotechnics.co.uk
www.geotechnics.co.uk

Engineer:
Pinnacle Consulting Engineers Limited

Client:
Pinnacle Consulting Engineers Limited

Project:
Newport Quinn Phase 2

Drawing Title:
Exploratory Hole Location Plan

Scale:
1:2500 **at A3**

Date:
07/02/2023

Project No.:
PN224395

Exploratory Hole Location Plan

APPENDIX 15

Investigation Techniques and General Notes

INVESTIGATION TECHNIQUES

INTRODUCTION

The following brief review of Ground Investigation techniques, generally used as part of most Site Investigations in the UK, summarises their methodology, advantages and limitations. Detailed descriptions of the techniques are available and can be provided on request. This review should be read in conjunction with the accompanying General Notes.

TRIAL PITS

The trial pit is amongst the simplest yet most effective means of identifying shallow ground conditions on a site. Its advantages include simplicity, speed, potential accuracy and cost-effectiveness. The trial pit is most commonly formed using a back-acting excavator which can typically determine ground conditions to some 4 metres below ground level. Hand excavation is often used to locate, expose and detail existing foundations, features or services. In general, it is difficult to extend pits significantly below the water table in predominantly granular soils, where flows can cause instability. Unless otherwise stated, the trial pits will not have been provided with temporary side support during their construction. Under such circumstances, entrance into the pit is not permitted and hence observations will have been made from the ground surface and samples taken from the excavator bucket.

Where access for personnel is required to allow close observation of the exposed strata, the taking of samples and the carrying out of in situ tests, the sides of the trial pits (Observation Pits in BS 5930:2015) will be made safe using temporary supports or the sides battered back to a stable angle. Some limited access to such Trial Pits (Observation Pits) at depths less than 1m may be allowed in stable conditions or where the sides are benched or battered back to a safe angle.

Trends in strata type, level and thickness can be determined, shear surfaces identified and the behaviour of plant, excavation sides and excavated materials can be related to the construction process. They are particularly valuable in land slip investigations. Some types of in situ test can be undertaken in such pits and large disturbed or block samples obtained.

CABLE PERCUSSION BORING

The light Cable Percussion technique of soft ground boring, typically at a diameter of 150mm, is a well-established simple and flexible method of boring vertical holes and generally allows data to be obtained in respect of strata conditions other than rock. A tubular cutter (for cohesive soils) or shell with a flap valve (for granular soils) is repeatedly lifted and dropped using a winch and rope operating from an "A" frame. Soil which enters these tools is regularly removed and either sampled for subsequent examination or test, or laid to one side for later removal off site and licensed disposal or, if permitted by the Client, use as backfill. Steel casing will have been used to prevent collapse of the borehole sides where necessary. A degree of disturbance of soil and mixing of layers is inevitable and the presence of very thin layers of different soils within a particular stratum may not be identified. Changes in strata type can only be detected on recognition of a change in soil samples at the surface, after the interface has been passed. For the foregoing reasons, depth measurements should not be considered to be more accurate than 0.10 metre. The technique can determine ground conditions to depths in excess of 30 metres under suitable circumstances and usually causes less surface disturbance than trial pitting.

In cohesive soils cylindrical samples are retrieved by driving or pushing in 100mm nominal diameter tubes. In soft soils, piston sampling or vane testing may be undertaken. In granular soils and often in cohesive materials, in situ Standard Penetration Tests (SPT's) are performed. The SPT records the number of standard blows required to drive a 50mm diameter open or cone ended probe for 300mm after an initial 150mm penetration. A modified method of recording is used in denser strata. Small disturbed samples are obtained throughout.

ROTARY DRILLING

Rotary Drilling to produce cores by rotating an annular diamond-impregnated tube or barrel into the ground is the technique most appropriate to the forming of site investigation boreholes through rock or other hard strata. It has the advantage of being able to be used vertically or at an angle. Core diameters of less than 100mm are most common for site investigation purposes. Core is normally retrieved in plastic lining tubes. A flushing fluid such as air, water or foam is used to cool the bit and carry cuttings to the surface. Depths in excess of 60 metres can be achieved under suitable circumstances using rotary techniques, with minimal surface disturbance.

Examination of cores allows detailed rock description and generally enables angled discontinuity surfaces to be observed. However, vertical holes do not necessarily reveal the presence of vertical or near-vertical fissures or joint discontinuities. The core type and/or techniques used will depend on the ground conditions. Where open hole rotary drilling is employed, descriptions of strata result from examination at the surface of small particles ejected from the borehole in the flushing medium. In consequence, no indication of fissuring, bedding, consistency or degree of weathering can be obtained.

DYNAMIC SAMPLING

This technique involves the driving of an open-ended tube into the ground and retrieval of the soil which enters the tube. It was previously called window or windowless sampling. The term "window sample" arose from the original device which had a "window" or slot cut into the side of the tube through which samples were taken. This was superseded by the use of a thin-walled plastic liner to retrieve the soil sample from within a sampler (windowless sampling) which has a solid wall. Line diameters range from 36 to 86mm. Such samples can be used for qualitative logging, selection of samples for classification and chemical analysis and for obtaining a rudimentary assessment of strength.

Driving devices can be hand-held or machine mounted and the drive tubes are typically in 1m lengths. Depending on the type of rig used, the hole formed can be cased to prevent collapse of the borehole sides. Where the type of rig does not allow the insertion of casing, the success of this technique can be limited when soils and groundwater conditions are such that the sides of the hole collapse on withdrawal of the sampler. Obstructions within the ground, the density of the material or its strength can also limit the depth and rate of penetration of this light-weight investigation technique. Nevertheless, it is a valuable tool where access is constrained such as within buildings or on embankments. Depths of up to 10m can be achieved in suitable circumstances depending on the rig type but depths of 5m to 6m are more common.

EXPLORATORY HOLE RECORDS

The data obtained by these techniques are generally presented on Trial Pit, Borehole, Drillhole or Dynamic Sample Records. The descriptions of strata result from information gathered from a number of sources which may include published geological data, preliminary field observations and descriptions, in situ test results, laboratory test results and specimen descriptions. A key to the symbols and abbreviations used accompanies the records. The descriptions on the exploratory hole records accommodate but may not necessarily be identical to those on any preliminary records or the laboratory summaries.

The records show ground conditions at the exploratory hole locations. The degree to which they can be used to represent conditions between or beyond such holes, however, is a matter for geological interpretation rather than factual reporting and the associated uncertainties must be recognised.

DYNAMIC PROBING

This technique typically measures the number of blows of a standard weight falling over a standard height to advance a cone-ended rod over sequential standard distances (typically 100mm). Some devices measure the penetration of the probe per standard blow. It is essentially a profiling tool and is best used in conjunction with other investigation techniques where site-specific correlation can be used to delineate the distribution of soft or loose soils or the upper horizon of a dense or strong layer such as rock.

Both machine-driven and hand-driven equipment is available, the selection depending upon access restrictions and the depth of penetration required. It is particularly useful where access for larger equipment is not available, disturbance is to be minimised or where there are cost constraints. No samples are recovered and some techniques leave a sacrificial cone head in the ground. As with other lightweight techniques, progress is limited in strong or dense soils. The results are presented both numerically and graphically. Depths of up to 10m are commonly achieved in suitable circumstances.

The hand-driven DCP probing device has been calibrated by the Highways Agency to provide a profile of CBR values over a range of depths.

INSTRUMENTATION

The most common form of instrument used in site investigation is either the standpipe or else the standpipe piezometer which can be installed in investigation holes. They are used to facilitate monitoring of groundwater levels and water sampling over a period of time following site work. Normally a standpipe would be formed using rigid plastic tubing which has been perforated or slotted over much of its length whilst a standpipe piezometer would have a filter tip which would be placed at a selected level and the hole sealed above and sometimes below to isolate the zone of interest. Groundwater levels are determined using an electronic "dip meter" to measure the depth to the water surface from ground level. Piezometers can also be used to measure permeability. They are simple and inexpensive instruments for long term monitoring but response times can limit their use in tidal areas and access to the ground surface at each instrument is necessary. Remote reading requires more sophisticated hydraulic, electronic or pneumatic equipment.

Settlement can be monitored using surface or buried target plates whilst lateral movement over a range of depths is monitored using slip indicator or inclinometer equipment.

GENERAL NOTES

1. The report is prepared for the exclusive use of the Client named in the document and copyright subsists with Geotechnics Limited. Prior written permission must be obtained to reproduce all or part of the report. It is prepared on the understanding that its contents are only disclosed to parties directly involved in the current investigation, preparation and development of the site.

2. Further copies may be obtained with the Client's written permission, from Geotechnics Limited with whom the master copy of the document will be retained.

3. The report and/or opinion is prepared for the specific purpose stated in the document and in relation to the nature and extent of proposals made available to Geotechnics Limited at that time. Re-consideration will be necessary should those details change. The recommendations should not be used for other schemes on or adjacent to the site without further reference to Geotechnics Limited.

4. The assessment of the significance of the factual data, where called for, is provided to assist the Client and their Engineer and/or Advisers in the preparation of their designs.

5. The report is based on the ground conditions encountered in the exploratory holes together with the results of field and laboratory testing in the context of the proposed development. The data from any commissioned desk study and site reconnaissance are also drawn upon. There may be special conditions appertaining to the site, however, which are not revealed by the investigation and which may not be taken into account in the report.

6. Methods of construction and/or design other than those proposed by the designers or referred to in the report may require consideration during the evolution of the proposals and further assessment of the geotechnical and any geoenvironmental data would be required to provide discussion and evaluations appropriate to these methods.

7. The accuracy of results reported depends upon the technique of measurement, investigation and test used and these values should not be regarded necessarily as characteristics of the strata as a whole (see accompanying notes on Investigation Techniques). Where such measurements are critical, the technique of investigation will need to be reviewed and supplementary investigation undertaken in accordance with the advice of the Company where necessary.

8. The samples selected for laboratory test are prepared and tested in accordance with the relevant Clauses and Parts of BS EN ISO 17892 and BS 1377 Parts 1 to 8, where appropriate, in Geotechnics Limited's UKAS accredited Laboratory, where possible. A list of tests is given.

9. Tests requiring the use of another laboratory having UKAS accreditation where possible are identified.

10. Any unavoidable variations from specified procedures are identified in the report.

11. Specimens are cut vertically, where this is relevant and can be identified, unless otherwise stated

12. All the data required by the test procedures are recorded on individual test sheets but the results in the report are presented in summary form to aid understanding and assimilation for design purposes. Where all details are required, these can be made available.

13. Whilst the report may express an opinion on possible configurations of strata between or beyond exploratory holes, or on the possible presence of features based on either visual, verbal, written, cartographical, photographic or published evidence, this is for guidance only and no liability can be accepted for its accuracy.

14. The Code of Practice for Ground Investigations – BS 5930:2015 calls for man-made soils to be described as Anthropogenic Ground with soils placed in an un-controlled manner classified as Made Ground and soils placed in a controlled manner as Fill. In view of the difficulty in always accurately determining the origin of man-made soils in exploratory holes, Geotechnics Limited classify such materials as Made Ground. Where soils can be clearly identified as being placed in a controlled manner then further classification of the soils as Fill has been added to the Exploratory Hole Records.

15. Classification of man-made soils is based on the inspection of retrieved samples or exposed excavations. Where it is obvious that foreign matter such as paper, plastic or metal is present, classification is clear. Frequently, however, for man-made soils that arise from the adjacent ground or from the backfilling of excavations, their visual characteristics can closely resemble those of undisturbed ground. Other evidence such as site history, exploratory hole location or other tests may need to be drawn upon to provide clarification. For these reasons, classification of soils on the exploratory hole records as either Made Ground or naturally occurring strata, the boundary between them and any interpretation that this gives rise to should be regarded as provisional and subject to re-evaluation in the light of further data.

16. The classification of materials as Topsoil is generally based on visual description and should not be interpreted to mean that the material so described complies with the criteria for Topsoil used in BS 3882:2015. Specific testing would be necessary where such a definition is a requirement.

17. Ground conditions should be monitored during the construction of the works and the report should be re-evaluated in the light of these data by the supervising geotechnical engineers.

18. Any comments on groundwater conditions are based on observations made at the time of the investigation, unless specifically stated otherwise. It should be noted, however, that the observations are subject to the method and speed of boring, drilling or excavation and that groundwater levels will vary due to seasonal or other effects.

19. Any bearing capacities for conventional spread foundations which are given in the report and interpreted from the investigation are for bases at a minimum depth of 1m below finished ground level in naturally occurring strata and at broadly similar levels throughout individual structures, unless otherwise stated. Typically they are based on serviceability criteria taking account of an assessment of the shear strength and/or density data obtained by the investigation. The foundations should be designed in accordance with the good practice embodied in BS 8004:2015 - Foundations, supplemented for housing by NHBC Standards. Foundation design is an iterative process and bearing pressures may need adjustment or other measures may need to be taken in the context of final layouts and levels prior to finalisation of proposals.

20. Unless specifically stated, the investigation does not take account of the possible effects of mineral extraction or of gases from fill or natural sources within, below or outside the site.

21. The costs or economic viability of the proposals referred to in the report, or of the solutions put forward to any problems encountered, will depend on very many factors in addition to geotechnical or geoenvironmental considerations and hence their evaluation is outside the scope of the report.