SR3786-VR-P2 VALIDATION REPORT
OCTOBER 2023

For land at

OWL LANE, CHIDSWELL, WAKEFIELD

Prepared for

BARRATT & DAVID WILSON HOMES, YORKSHIRE WEST

REPORT NUMBER:	SR3786-VR-P2	**REPORT STATUS:**	FINAL
REPORT TYPE:	VALIDATION REPORT FOR REMEDIAL AND PREPARATORY WORKS		
REPORT DATE:	OCTOBER 2023		
SITE:	OWL LANE, CHIDSWELL, WAKEFIELD		
PREPARED FOR:	BARRATT & DAVID WILSON HOMES, YORKSHIRE WEST		
PREPARED BY:	SIRIUS REMEDIATION LTD 4245 PARK APPROACH THORPE PARK LEEDS LS15 8GB		

VALIDATION REPORT on PREPARATORY EARTHWORKS

for

OWL LANE, CHIDSWELL

(Phase 2)

Prepared for

BARRATT & DAVID WILSON HOMES, YORKSHIRE WEST

APPENDICES

APPENDIX A FIGURES AND DRAWINGS

Drawing No.	Title	Scale
SR3786/VR/P2/01	Site Location Plan	1:25,000
SR3786/VR/P2/02	Proposed Development Layout	1:1,500
CDW-WSP-XX-XX-DR-GE-000601	Foundation Plan Sheet 1 of 2	1:500
CDW-WSP-XX-XX-DR-GE-000602	Foundation Plan Sheet 2 of 2	1:500
SR3786/VR/P2/03	Remediation Works Phasing Plan	1:1,500
SR3786/VR/P2/04	Base of Excavation	1:500
SR3786/VR/P2/05	As Built Survey and Constraints Plan	1:500
SR3786/VR/P2/06	Geotechnical Testing Locations Plan	1:500

APPENDIX B SITE PHOTOGRAPHIC RECORD

APPENDIX C REGULATORY CORRESPONDENCE

APPENDIX D LABORATORY GEOTECHNICAL TESTING CERTIFICATES

APPENDIX E IN-SITU GEOTECHNCAL TESTING CERTIFICATES

1. INTRODUCTION

1.1. Background

Barratt & David Wilson Homes, Yorkshire West (Barratt Homes) commissioned Sirius Remediation Limited (Sirius) to undertake preparatory earthworks on land at Chidswell, off Owl Lane, Dewsbury (Wakefield) to facilitate their proposed residential development project. A site location plan, Drawing No. SR3786/VR/P2/01 and a site development layout plan, Drawing No. SR3786/VR/P2/02, are presented in Appendix A.

The project is divided into two phases of earthworks which comprise the following:

- Phase 1 – Comprising plots 1 to 133, 202 to 221 and 223 to 260 – (Completed March 2022).
- Phase 2 – Comprising plots 134 to 193, 200, 201, and 222 (excluding plots 161 to 168 – Show homes constructed and plots 194 to 199 – Former compound materials not cleared to allow for the remedial works, discussed further in Section 5).

This validation report covers only those works undertaken on Phase 2 of this development. Drawing No. SR3786/VR/P2/03, presented in Appendix A, illustrates the extent of the Phase 2 works and the development layout. It should be noted that engineering works were completed by Sirius for plots 202 to 221 during the Phase 1 works. However, Sirius was required to retrim this area during the Phase 2 re-visit works following stockpile removal.

The site will be developed for residential end-use involving the construction of 246 low-rise residential dwellings with private gardens, and 14 apartment blocks with associated access roads, car parking and infrastructure including one area of public open space (POS). It is understood that plots 148 to 154 and 201 to 222 will be supported on piled foundations as the depth to competent natural strata precludes the use of strip/ trench fill foundations. For the remaining site, residential plots will be supported on foundations comprising conventional strip/trench fill foundations. The appointed foundation designer, WSP, has indicated the proposed foundations per plot which have been outlined in WSP Drawing Numbers CDW-WSP-XX-XX-DR-GE-000601 and CDW-WSP-XX-XX-DR-GE-000602, included in Appendix A. Although, it is likely these drawings are now outdated.

It should be noted that the placement of suitable topsoil and subsoil for the gardens/soft landscape areas of the site does not form part of the preparatory works. This shall be undertaken by others as part of the subsequent civil and construction works; therefore, this is not included within this validation report.

1.2. Regulatory Context

Planning application documents submitted to, and approved by Kirklees Council for the site are referenced under application number 2019/62/92787/E. Copies of the relevant regulatory correspondence are presented in Appendix C.

1.3. Terms of Reference

The principal sources of information used in the execution of the preparatory earthworks are listed below and should be read in conjunction with this report:

- Groundtech Consulting. Permanent Gas Assessment – Chidswell Lane, Chidswell. Letter Report. Dated 30 April 2018.
- Groundtech Consulting. Phase II Geo-Environmental Report. Report Reference: 17047/117. Dated 7 December 2018.
- Groundtech Consulting. Supplementary Coal Mining Risk Assessment. Report Reference: GRO-17047-2021. Dated 15 January 2021.
- Groundtech Consulting. Supplementary Topsoil Appraisal. Report Reference: GRO-17047-1952. Dated 2 February 2021.
- Sirius Remediation. Earthworks Specification. Report Reference: SR3786-ES. Dated June 2021.
- Sirius Remediation. Remediation Statement. Report Reference: SR3786-RS. Dated June 2021.

1.4. Aims of the Enabling Earthworks

The main aims of the remedial earthworks were as follows:

- To discharge the relevant planning conditions pertaining to contaminated land;
- To minimise risks to human health receptors (site workers and residents) and the environment whilst undertaking the works;
- To construct a development platform (to agreed levels and gradients) suitable for subsequent construction of the proposed development and associated infrastructure;
- To satisfy the Local Planning Authority (LPA) environmental health department and National House Building Council (NHBC) that the remedial earthworks will provide a site ready and suitable for the proposed development; and

- In the interests of sustainability, to promote the re-use of site-won materials where possible if they are suitable for the proposed end-use.

1.5. Parties to the Works

The principal parties to the remedial and preparatory earthworks include:

- **Barratt & David Wilson Homes Yorkshire West:** Landowner and Developer.
- **Sirius Remediation Limited**: Design and build contractor for the remedial and preparatory works.
- **Kirklees Council:** Local Planning and Highways Authority.
- **NHBC:** Building Warranty Provider.

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2. BACKGROUND

2.1. Introduction

This section provides pertinent pre-earthworks background information for the site. Further detail can be found in the relevant site reports that are listed in Section 1.3.

2.2. Site Details and Description

Table 2-1: Site Overview

Location	The site is located in Chidswell, off Owl Lane, approximately 2km north-east of Dewsbury town centre. The national grid reference for the approximate centre of the site is 426577, 422766.
Site Area and Description (Pre-Earthworks)	The site is approximately 7.7 hectares in area and represents a rectangular parcel of land with a triangular area protruding from the south-west corner. The eastern part of the site is approximately level before sloping down-gradient in a south-westerly direction. The north-eastern part of the site is approximately 15m higher in elevation than the western part.
Previous Land Use	Undeveloped land of open agricultural fields.
Ground Conditions	Made ground is shown to the east of the site associated with colliery spoils and an infilled railway cutting. No superficial deposits are indicated to underlie the site. The solid geology comprises of the Pennine Middle Coal Measures. The Top Haigh Coal Measures and the Low Haigh Coal seam both outcrop on the site. The underlying geology of the site is comprised of the following: • 0.23 to 0.55m below ground level (bgl) – Reworked TOPSOIL and occasional MADE GROUND present across the site. • 0.71 to 1.8m bgl – Residual firm to stiff CLAY with, locally gravelly SAND present towards the north-east of the site. • 0.35 to 1.8m bgl – weak to very weak MUDSTONE, locally very weak SANDSTONE in the north-east at depths of between 0.35m and 0.9m bgl [Pennine Lower Coal Measures]. Occasional coal seams present.
Hydrology and Hydrogeology	The bedrock in this area is classified by the Environment Agency as a Secondary 'A' Aquifer. These are generally aquifers formerly classed as minor aquifers. A tertiary river forms the southern corner boundary of the site before entering a culvert beneath Owl Lane. No groundwater strikes were observed during the Groundtech site investigation.
Mining and Quarrying	The Top Haigh Moor Coal seam was proven to underlie the site at a shallow depth of <30m bgl. Additionally, the 14-Yard Coal seam was proven to crop out in an approximate north-south direction in the eastern third of the site. The typical seam thickness was: Top Haigh Moor 0.5m to 1.2m; and, 14-Yard seam 0.1m to 0.6m. A Coal Authority recorded mineshaft, Ref. 428424-017, was reported to be present near the south-western boundary.

2.3. Contamination Considerations

The intrusive works identified no visual or olfactory evidence of contamination in the Phase 2 area. However, the site investigations determined that reworked topsoil was not suitable for retention at shallow depth within private gardens, but that it may be retained on-site and/or used within areas of public open space and surplus materials disposed off-site to an appropriately licensed waste facility.

2.4. Hazardous Ground Gases

The site investigations and permanent gas assessment conducted by Groundtech Consulting gave a GSV value for carbon dioxide of 0.78l/hr, which falls within the Green traffic light zone, therefore it can be determined that ground gas protection measures are not required for the site in accordance with CIRIA C665 (Situation B – Low-rise housing with a ventilated underfloor and Table 8.7 Traffic light system for a 150mm void).

Basic radon protection measures are required for this site in accordance with BRE 211.

2.5. Invasive Plant Species

No invasive species were encountered during the phase 2 works.

3. SITE WORKS

3.1. General

The remedial earthworks were undertaken in accordance with the Sirius Remediation Statement (Ref. SR3786-RS) and Sirius Earthworks Strategy (SR3786-ES) to provide a suitable platform for the proposed development. The final remediated formation at the site was reprofiled by Sirius to the following agreed reduced levels:

Plots:	500mm below finished floor level (FFL).
Highways:	630mm below finished road level (FRL).
Externals:	350mm below finished level (FL).

The works described herein have been carried out by Sirius as Principal Contractor and were supervised throughout the duration of the contract by a Resident Engineer (RE). A photographic record of the enabling and remedial earthworks was taken during the works, a selection of which is presented in Appendix B.

3.2. Scope of Works

The main elements of the preparatory works are set out below, and discussed in more detail in subsequent sections of this report:

- Confirmatory/supplementary service location works, where necessary.
- Site wide (Phase 2) removal of contaminated topsoil and disposal at a suitable waste disposal facility, with an agreed volume of this topsoil left for the client for use in POS areas.
- Inspection of exposed formations following soil strip for visual evidence of potential historical mine workings.
- Removal of shallow coal where encountered, to a depth of greater than 1m below finished ground levels in garden areas only.
- Carry out a watching brief for the presence of any previously undetected contamination.
- Cut and fill of natural ground soils to establish the site formation.
- Reinstatement with site won natural ground soils placed and compacted in accordance with the Earthworks Specification (Ref: SR3786-ES, dated June 2021).

- Installation of surface water management bunds to prevent run-off from the site onto neighbouring land and/or water courses.
- Laboratory and in-situ geotechnical testing in accordance with the earthworks specification to demonstrate satisfactory earthworks performance.
- Undertake regular surveys during the works to facilitate production of and "base of excavation (BOE)" (Drawing No. SR3786/VR/P2/04) and "as-built" (Drawing No. SR3786/VR/P2/05) drawings upon completion of works.
- Preparation of a validation report on completion of the works, by a suitably experienced geo-environmental engineer, providing a record of the works undertaken, including results of all testing carried out, to confirm that the remedial and preparatory earthworks have been undertaken in accordance with the remediation statement, regulatory requirements, and demonstrate that the site has been restored to a condition suitable for the intended end-use.

In addition, during the construction phase, the following works are required to be undertaken by others:

- Placement of suitable topsoil and subsoil in gardens.

3.3. Contract Programme

Preparatory earthworks were carried out over a period of 5 weeks, starting week commencing 17 July 2023 and finishing the week commencing 21 August 2023.

The works were undertaken in accordance with a project-specific health and safety plan compiled by Sirius, fully in accordance with the requirements of the current Construction (Design and Management) Regulations. Periodic QHSE (Quality, Health & Safety and Environmental) audits were routinely undertaken throughout the works by Sirius.

3.4. Preparation Works

Site Security

Adoption of Barratt Homes, compound and fencing throughout the works to delineate the Sirius work area.

Services

The existing below-ground drainage services and associated manholes were carefully exposed and marked-out to prevent damage during remedial earthworks.

Surface water management plan (SWMP)

A surface water runoff bund composed of site-won impermeable general fill was built-up along the eastern site boundary (plots 144 to 159), plots 182 to 183 and the south-western corner plots 160, 169 and 170, to prevent off-site flooding (see Photograph 02 in Appendix B). The location of these bunds is shown on Drawing No. SR3786/VR/PR/05.

Materials Management

The remediation works were undertaken under a CL:AIRE Development Industry Code of Practice Materials Management Plan (MMP); the MMP was declared to CL:AIRE prior to the commencement of earthworks.

3.5. Earthworks (Including Inspections for Potential Historical Mine Workings)

Topsoil was stripped from across the whole of the Phase 2 development area. A stockpile of topsoil (approx. 911m^3) was left at a location requested by the client (ref Drawing No. SR3786/VR/P2/05). The remaining topsoil was disposed offsite by Sirius.

Following the topsoil strip exposed formations were inspected for the potential presence of historical mine features and coal in the near-surface (see Photograph 04, Appendix B).

Following completion of excavation and inspection works, the clean natural ground formation was “cut” where high (elevated above earthworks formation) to establish earthworks formation with clean natural ground soil arisings used to “fill” areas which were low (below desired earthworks formation).

Areas constituting the greatest depth of fill (up to approximately 2m) included plots 147, 148 and 149 along the eastern site boundary. The only other area with a greater depth of fill (approximately 2.3m) included plots 208 to 211. However, ground engineering works were completed in this area during the Phase 1 works and these plots were only re-trimmed to agreed previous remediated levels during the Phase 2 works.

Significant areas of cut were localised to areas where shallow coal was removed, and included 2.4m of cut within gardens of plots 136 and 137. This material was subsequently placed at depth within plots 150 and 151 with a suitable cover of 1.9m to 2.0m provided. Elsewhere on site, predominantly in the north/northeast, levels were cut by an average of approximately 1m.

3.6. Contamination Considerations

Previously identified contamination was remediated during the Phase 1 works (refer to Report No. SR3786-VR) and no additional contamination was identified within the Phase 2 area.

Nevertheless, the site RE maintained a watching brief throughout the works, to confirm the absence of unidentified contamination.

3.7. Shallow Coal

In Section 1.11 of the Sirius Earthworks Specification (Ref: SR3786-ES, dated June 2021), it states that where shallow coal is present at a depth of less than 1m below finished ground level in gardens, it must be excavated and replaced. The coal arisings can then be placed elsewhere at depth on the site or removed offsite.

During cut and fill earthworks, shallow coal with a maximum thickness of approximately 1m was encountered within the north-eastern area of the site. When comparing the location of the encountered coal seam to Drawing No. 17047 02 within Report No. 17047/117, the coal is understood to be representative of the Top Haigh Moor coal seam.

Areas of shallow coal were excavated and removed from the gardens of plots 136 and 137 (see Photograph 04 in Appendix B). This material was subsequently relocated at depth within plots 150 and 151 and covered by placing and compacting 1.9m to 2.0m of natural ground arisings to re-establish the earthworks formation. The areas where shallow coal was removed and deposited at a suitable depth are shown on the BOE Drawing No. SR3786/VR/P2/04, presented in Appendix A.

4. EARTHWORKS

4.1. General

All earthworks were undertaken in accordance with the Sirius Earthworks Specification (Ref: SR3786-ES, dated June 2021) using conventional earthworks plant including: 360º tracked excavators; dozer; dumper trucks; and self-propelled smooth-drum vibratory roller with a mass per metre width of between 2,900kg and 3,600kg (see Photograph 03 in Appendix B).

Several plant items (tracked excavators and dozer) were equipped with Trimble 3D Grade Control technology designed for “live” cut/fill operation, which incorporates the earthworks design model, thereby enabling automatic establishment of earthworks formation.

In accordance with the earthworks specification, in areas requiring 2m (max) turnover and fill, soils were engineered by excavation (where required), placement and compaction in controlled layers using the vibratory roller. A compaction site trial was undertaken to confirm the number of passes required to achieve satisfactory compaction and in-situ geotechnical testing was periodically undertaken during earthworks to demonstrate satisfactory performance (see Photograph 05 in Appendix B). The compaction site trial confirmed that six passes of the roller were sufficient to achieve effective compaction. Table 6/4 of the Series 600, Earthworks, of the Specification for Highway Works, recommends 200mm layers with four passes of the vibratory roller for the classification of materials being engineered. However, following the compaction trial, it was evident that to achieve >95% compaction and between 5% and 10% air-voids, 6 passes of the roller were required. The results of the trial are included in Table 4-3 of Section 4.2.

As earthworks progressed, periodic surveys were undertaken to enable the preparation of a drawing showing ‘as-built’ formation which are shown on Drawing No. SR3786/VR/P2/05 in Appendix A.

4.2. Geotechnical Laboratory Testing

Classification Tests

Geotechnical testing and assessment of representative samples of soils at the site was carried out by Professional Soil Laboratories (PSL), an independent UKAS accredited laboratory. Testing undertaken included particle size distribution (PSD), moisture content (mc), particle density (PD), liquid (LL) and plastic (PL) limits, and 2.5kg compaction testing.

Laboratory geotechnical testing was undertaken in accordance with BS1377: Part 2 – 1990, the results of which are summarised in Table 4-1 and Table 4-2. Classification was in accordance with Table 6/2 of the Specification for Highways Works (SHW), Series 600.

Table 4-1: Results of Classification Testing on Site-Won General Fill

Sample Ref.	Source Area	Grading - Soil Fraction (%)				Class	Description
		Cobbles	Gravel	Sand	Fines		
GF101	From Phase 1 surplus stockpile	0	34	9	57	2C	Brown slightly sandy slightly gravelly CLAY.
GF102		0	48	6	46	2C	Brown slightly sandy gravelly CLAY.
GF103		5	23	12	60	2C	Brown slightly sandy slightly gravelly CLAY with low cobble content (clay of intermediate plasticity).

* N.B. Descriptions in accordance with BS5930/BS EN ISO 14688-1 and 14688-2.

A total of 5 bulk samples, representative of site-won natural ground soils, were submitted for testing with results of PSD testing undertaken on three of these samples confirming a classification of Class 2C cohesive soils.

Atterberg limits testing showed these soils to be generally of intermediate plasticity. In soil fraction terms, gradings consistently showed the main constituent to be fine particles which is to be expected of these cohesive soils.

Table 4-2: Results of Laboratory Geotechnical Testing on Site Won General Fill

Sample Ref.	Class	Atterberg Limits (%)			Moisture (%)		PD	MDD	Plasticity
		LL	PL	PI	Actual	OMC	Mg/m^3	Mg/m^3	
GF101	2C	-	-	-	18	18	2.63	1.77	-
GF102	2C	-	-	-	17	14	2.65	1.89	-
GF103	2C	45	23	22	18	18	2.62	1.75	Intermediate
GF104	2C	-	-	-	12	18	2.67	1.74	-
GF105	2C	-	-	-	16	19	2.69	1.76	-

* OMC means Optimum Moisture Content; PD means Particle Density; MDD means Maximum Dry Density.

Compaction Tests

Results of laboratory 2.5kg compaction testing on Class 2C samples showed natural MC was close to or equal to the OMC. MDD and PD were reasonably consistent, with mean values of 1.76Mg/m^3 and 2.65Mg/m^3, respectively.

The PSL test certificates containing results of the geotechnical laboratory testing are presented as Report No.s PSL6655 and PSL6975, in Appendix D.

Compaction Site Trials

To confirm site specific requirements, in accordance with the earthwork's specification, a compaction site trial was undertaken on the Class 2C fill. The results of this trial compaction are shown in

Table 4-3. The density and moisture contents of the fill within the trial pad were determined by sand replacement density (SRD) tests following increments in number of passes of roller and compared to results of laboratory compaction testing the same soils. The earthworks specification requires greater than 95% effective compaction, and results of compaction trial confirmed this to be achievable with six passes of the vibratory roller and this achieved <10% air voids.

Results from the compaction trial pad are included in PSL Report No. PSL5980, in Appendix E.

Table 4-3: Results on Compaction Trials on Site-Won Class 2C General Fill

Test Ref.	Number of Passes	Date	Moisture Content (%)	Particle Density & MDD (Mg/m^3)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	MDD (%)	Air Voids (%)
ST1-2	2	21.07.23	15	GF101, GF103, GF104 & GF105 2.65 & 1.76	1.78	1.55	88.07	18.26
ST1-2			16		1.75	1.51	85.80	18.86
ST1-4	4		18		1.96	1.66	94.32	7.48
ST1-4			18		1.95	1.65	93.75	8.04
ST1-6	6		17		2.01	1.71	97.16	6.40
ST1-6			16		1.99	1.72	97.73	7.57
ST1-8	8		15		1.91	1.66	94.32	12.46
ST1-8			15		1.90	1.65	93.75	12.99
ST1-10	10		16		1.84	1.59	90.34	14.56
ST1-10			15		1.88	1.63	92.61	14.04

4.3. In-Situ Geotechnical Testing

In-situ geotechnical testing was conducted to confirm the integrity of earthworks performance and was undertaken in accordance with the earthworks specification. The testing comprised of:

- Sand Replacement Density (SRD) testing for determination of moisture content and in-situ density achieved in the field through compaction and calculation of air voids;
- Plate Bearing Test (PBT) for calculation of CBR values on the completed highways formation;
- Hand Shear Vane testing (HSV) for undrained shear strength measurements; and
- Dynamic Cone Penetrometer (DCP) testing for calculation of characteristic CBR values on general fill.

The locations of in-situ testing are shown on Drawing No.SR3786/VR/P2/06, presented in Appendix A. Laboratory test reports for in-situ geotechnical testing and DCP record sheets are presented in Appendix E.

Sand Replacement Density (SRD) Testing

As earthworks progressed, SRD testing was undertaken to determine the in-situ density of soils engineered by placement and compaction in the field and to facilitate the assessment of effective compaction relative to the maximum dry density achieved by the laboratory compaction testing (discussed in Section 4.2). Test results are presented in Table 4-4.

In total, 65 SRD tests were undertaken across areas of the site requiring fill with results showing effective compaction of greater than 95% in all tests, with a mean of 98.73%. Air voids were generally around 10%.

A representative mean MDD of 1.76Mg/m^3 and a PD of 2.65Mg/m^3 (from laboratory 2.5kg proctor test) were used to calculate the MDD and Air Voids within Table 4-4.

Table 4-4: Results of SRD Testing on Re-engineered Site-Won General Fill

Test Ref.	Date	Moisture Content (%)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	MDD (%)	Air Voids (%)
SRD1	09.08.23	15	1.93	1.68	95.73	11.40
SRD4		19	2.02	1.70	96.87	3.55
SRD6		15	1.93	1.68	95.73	11.40
SRD7		18	1.95	1.65	94.02	8.04
SRD8		15	1.93	1.68	95.73	11.40
SRD9		15	1.88	1.63	92.88	14.04
SRD10		17	1.90	1.62	92.31	11.33
SRD11		15	1.94	1.69	96.30	10.88
SRD12		16	1.90	1.64	93.45	11.87
SRD13		20	1.94	1.62	92.31	6.47
SRD14		15	1.93	1.68	95.73	11.40
SRD15		18	1.96	1.66	94.59	7.48
SRD16		19	1.93	1.62	92.31	8.09
SRD17	09.08.23	17	1.99	1.70	96.87	6.95
SRD18		15	1.94	1.69	96.30	10.88
SRD19	10.08.23	14	1.97	1.73	98.58	10.50
SRD20		11	1.94	1.75	99.72	14.71
SRD21		14	1.96	1.72	98.01	11.01
SRD22		12	1.93	1.72	98.01	14.45
SRD23		12	1.91	1.71	97.44	14.95
SRD24		13	2.02	1.79	101.99	9.18
SRD25		11	2.01	1.81	103.13	11.79
SRD26		12	1.95	1.74	99.15	13.46
SRD27		13	1.92	1.70	96.87	13.75
SRD28		14	1.90	1.67	95.16	13.60
SRD29		11	1.96	1.77	100.85	13.74
SRD30		11	1.95	1.73	98.58	15.69

Test Ref.	Date	Moisture Content (%)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	MDD (%)	Air Voids (%)
SRD31		15	1.94	1.69	96.30	10.88
SRD32		12	1.9	1.7	96.87	15.45
SRD33		13	1.91	1.69	96.30	14.26
SRD34		15	2.04	1.77	100.85	6.66
SRD35		14	1.97	1.73	98.58	10.50
SRD36		11	1.99	1.79	101.99	12.76
SRD37		14	2.05	1.8	102.56	6.88
SRD38		11	2.02	1.82	103.70	11.30
SRD39	11.08.23	12	2.00	1.79	101.99	10.97
SRD40		15	1.99	1.73	98.58	8.77
SRD41		11	1.92	1.73	98.58	15.69
SRD42		12	1.90	1.7	96.87	15.45
SRD43		15	2.12	1.84	104.84	2.97
SRD44		14	2.04	1.79	101.99	7.39
SRD45		12	1.95	1.74	99.15	13.46
SRD46		13	1.93	1.71	97.44	13.24
SRD47		15	1.98	1.72	98.01	9.29
SRD48		14	2.05	1.80	102.56	6.88
SRD49		14	2.09	1.83	104.27	5.32
SRD50	22.08.23	13	1.97	1.74	99.15	11.72
SRD51		10	2.00	1.82	103.70	13.12
SRD52		15	2.03	1.77	100.85	6.66
SRD53		15	2.01	1.75	99.72	7.71
SRD54		13	1.99	1.76	100.28	10.70
SRD55		12	2.05	1.83	104.27	8.98
SRD56		13	2.03	1.80	102.56	8.68
SRD57		10	2.02	1.84	104.84	12.17
SRD R1	11.08.23	11	1.88	1.69	96.30	17.64
SRD R2		12	1.89	1.69	96.30	15.95
SRD R3		13	2.03	1.8	102.56	8.68
SRD R4		12	1.97	1.76	100.28	12.46
SRD R5	11.08.23	15	1.93	1.68	95.73	11.40
SRD R6		11	2.00	1.8	102.56	12.28
SRD R7		14	2.03	1.78	101.42	7.91
SRD R8		11	1.96	1.77	100.85	13.74

Plate Bearing Testing (PBT) – Single Cycle

Within the footprint of the proposed highways associated with the development, single-cycle PBTs were undertaken on the completed remediated formation of the highway at approximate 25m intervals, in areas of both cut and fill, for calculation of CBR values. The majority of the highway and subsequently the majority of the testing was in areas of cut. Results for PBTs are presented in Table 4-5. All plate bearing tests were undertaken using a 610mm diameter plate.

Table 4-5: Results of Single-Cycle PBTs along Completed Highways Formation

Test Ref.	Test Date	Approximate Depth of Fill (m)	Maximum Deformation (mm)	Calculated CBR Value (%)
PBT1	09.08.23	Cut	2.13	6.1
PBT2		Cut	1.07	>14.5
PBT3		< 0.3m Fill	1.16	>14.5
PBT4		< 0.3m Fill	1.36	12.4
PBT5		~ 1.0m Fill	1.76	7.5
PBT6		~ 1.5 – 2.0 m Fill	1.99	6.1
PBT7		~ 1.2m Fill	1.43	11.1
PBT8		~1.0m Fill	1.99	6.2

A total of 8 PBTs were undertaken on the remediated formation of highways for the calculation of CBR values. Results for all of the plate tests showed calculated CBR values exceeding the minimum 3% required CBR value on engineered fills, thereby demonstrating the suitability of earthworks.

In areas not requiring engineered fill, CBR tests were undertaken on the cut formation to provide the client with some understanding of the natural ground conditions and CBR results are only reflective of the ground conditions encountered at the time of testing.

Hand Shear Vane (HSV) Testing

During the course of the earthworks, HSV testing was undertaken on freshly compacted general fill for assessment of the undrained shear strength of the engineered cohesive soils. In total, 43 tests were undertaken, and the test results are presented in Table 4-6. All HSVs were conducted on 8 August 2023.

Table 4-6: Results of HSV Testing on Re-engineered Cohesive Soils

Test Ref.	Area/ Plots	Hand Shear Vane Result (kPa)			
		A	B	C	Mean
HSV1	138	136	99	126	**120**
HSV2	136/137	150	150	150	**150**
HSV3	134/135	122	134	150	**135**
HSV4	139-141	135	129	132	**132**
HSV5	142	150	150	150	**150**
HSV6	143	110	136	150	**132**
HSV7	144	135	99	128	**121**
HSV8	145	150	148	150	**149**
HSV9	146	135	124	150	**136**
HSV10	147	56	146	149	**117**
HSV11	148	116	100	123	**113**
HSV12	149	110	113	97	**107**
HSV13	150	150	150	150	**150**

Test Ref.	Area/ Plots	Hand Shear Vane Result (kPa)			
		A	B	C	Mean
HSV14	151	118	100	121	**113**
HSV15	152	150	150	150	**150**
HSV16	210	88	95	130	**104**
HSV17	209	86	84	98	**89**
HSV18	208	150	150	136	**145**
HSV19	207	55	64	60	**60**
HSV20	206	130	110	115	**118**
HSV21	205	150	150	150	**150**
HSV22	204	70	115	98	**94**
HSV23	203	150	150	150	**150**
HSV24	202	103	86	100	**96**
HSV25	201	88	86	92	**89**
HSV26	153	94	75	85	**85**
HSV27	154	126	80	100	**102**
HSV28	155	120	112	118	**117**
HSV29	156	111	108	102	**107**
HSV30	157	122	120	115	**119**
HSV31	158	99	100	95	**98**
HSV32	159	90	58	67	**72**
HSV33	172/173	150	150	150	**150**
HSV34	174/175	64	66	62	**64**
HSV35	176-178	88	78	85	**84**
HSV36	184	113	122	120	**118**
HSV37	187	98	82	95	**92**
HSV38	188	92	81	87	**87**
HSV39	189	110	110	108	**109**
HSV40	190	75	87	83	**82**
HSV41	192	67	60	59	**62**
HSV42	193	60	64	70	**65**
HSV43	Road South – near Plot 202	110	112	108	**110**

Results of the HSV testing show undrained shear strengths ranging from 60kPa to 150kPa with an overall mean of 111kPa. Results of HSV testing provide further evidence of effective earthworks performance.

Dynamic Cone Penetrometer (DCP) Testing

DCP testing was undertaken within the footprint of plots and at 25m centres along the highway where the remedial formation was completed to the required elevation (see Photograph 14 in Appendix B). This test is adopted as a technique for evaluation of characteristic CBR values, and thereby another method of assessing the earthworks performance. Results of DCP testing are summarised in Table 4-7.

Table 4-7: Results of DCP Testing on Re-engineered General Fill

Characteristic CBR Values Derived from DCP Testing			
Test Ref.	**Date**	**Location**	**Derived Characteristic CBR (%)**
DCP01	03.08.23	Plot 138	4.8
DCP02		Plot 136/137	5.0
DCP03		Plot 134/135	7.6
DCP04		Plot 139-141	6.8
DCP05		Plot 142	17.6
DCP06		Plot 143	6.1
DCP07		Plot 144	6.7
DCP08		Plot 145	17.9
DCP09		Plot 146	10.1
DCP10		Plot 147	8.2
DCP11		Plot 148	12.4
DCP12		Plot 149	7.5
DCP13		Plot 150	7.6
DCP14		Plot 151	14.6
DCP15		Plot 152	7.9
DCP16		Plot 210	9.8
DCP17		Plot 209	8.5
DCP18		Plot 208	17.7
DCP19		Plot 207	10.6
DCP20		Plot 206	7.5
DCP21		Plot 205	5.8
DCP22		Plot 204	13.0
DCP23		Plot 203	8.3
DCP24		Plot 202	10.2
DCP25		Plot 201	11.1
DCP26		Plot 153	6.0
DCP27		Plot 154	8.0
DCP28		Plot 155	5.8
DCP29		Plot 156	7.4
DCP30		Plot 157	7.9
DCP31	07.08.23	Plot 158	3.7
DCP32	07.08.23	Plot 159	4.8
DCP33		Plot 160	8.0
DCP34		Plot 172/173	6.5
DCP35		Plot 174/175	8.2
DCP36		Plot 176-178	5.8
DCP37		Plot 179-180	4.1
DCP38		Plot 183	5.4
DCP39		Plot 184-186	4.2
DCP40		Plot 187	5.9
DCP41		Plot 188	4.2
DCP42		Plot 189	6.2
DCP43		Plot 190-192	9.9
DCP44		Plot 193	5.6

Characteristic CBR Values Derived from DCP Testing			
Test Ref.	**Date**	**Location**	**Derived Characteristic CBR (%)**
DCP45		Plot 181	4.6
DCP46		Road South - 1	4.2
DCP47		Road South - 2	9.4
DCP48		Road South - 3	5.3
DCP49		Road South - 4	13.5
DCP50		Road South - 5	12.3
DCP51		Road South - 6	14.0
DCP52		Road South - 7	10.3
DCP53		Road South - 8	9.6

In total, 53 DCP tests were undertaken with calculated characteristic CBR values ranging from 3.7% to 17.9% with a characteristic CBR mean of 8.4%, thereby providing further evidence of effective earthworks performance.

An overview of the finished development platform is shown in Photographs 13, 15 and 16, in Appendix B.

5. CONSTRAINTS

Two primary constraints remain at the site following completion of the remedial earthworks, as follows:

i. An area to the east of plots 172 to 174 contained a building materials laydown area (see Photograph 07 in Appendix B) and therefore Sirius could not access this area during earthworks activities.

ii. An area covering plots 194 to 199 within Phase 2 formed a compound area for groundworkers and the materials and fencing remained on site during the Sirius Phase 2 works. Therefore, once this area is cleared of obstructions, this will need to be retrimmed and levels verified.

The above constraints are shown on Drawing No. SR3786/VR/P2/05, presented in Appendix A.

6. CONCLUSIONS

This validation report demonstrates that the earthworks undertaken on the Barratt & David Wilson Homes residential development on land at Chidswell, off Owl Lane, Dewsbury (Wakefield) have been satisfactorily completed in accordance with the Sirius Remediation Statement and Earthworks Specification.

Previous investigations deemed the topsoil unsuitable for re-use at shallow depths within private gardens, and as such, the majority of topsoil was removed from the site during these works. Following the removal of these soils, Phase 2 will not require a clean cover system to be placed during the construction phase. A small stockpile of the remaining topsoil was left in Phase 2 for use in POS areas only by others.

Where exposed by Sirius, natural ground soils have been inspected for the potential presence of historical mine workings with no mining features identified by these inspections. Whilst these inspections provide a good indication of the presence of mine entries, diligence should be maintained during development excavations, and advice sought should suspect features be identified. Where shallow coal was identified in the gardens of plots 136 and 137 during these works, the coal was subsequently removed and re-located, as discussed in Section 3.7.

Cut and fill operations have profiled the site in accordance with the remedial formation design. In areas of fill, the site won natural ground soils have been engineered in accordance with the earthwork's specification. Areas where deeper fill was placed are described in Section 3.5.

Geotechnical testing has confirmed that the material has been placed and compacted in accordance with the earthworks specification, leaving a site suitable to meet its design requirements.

Some areas were not accessible to Sirius for the proposed works required in Phase 2, therefore these areas must be completed prior to building and are discussed in Section 7.

7. FURTHER WORKS REQUIRED

Subsequent to the earthworks undertaken to date by Sirius, some additional works will need to be undertaken as groundworks and construction works progress to ensure that the whole site is suitable for the proposed intended residential end use. These works are:

- Placement of texturally and chemically suitable subsoil and topsoil within gardens and areas of soft landscaping as appropriate during the construction phase of works.
- Previous site assessments have recommended that Basic Radon gas protection measures are required for this site, these will need to be validated by an independent contractor to confirm its suitability and effectiveness.
- All subsoil and topsoil for use within the development should be clean and free of foreign debris, building waste materials, timber, or other deleterious matter. The soils will need to be established using clean imported and/or approved site-won soils validated in accordance with the requirements detailed in Table 1: Sampling and Testing Matrix for Site-Won Topsoil and Subsoil, of the remediation statement.

APPENDIX A

DRAWINGS

NOTES

○ Site Location

REVISION	
0	For Information
A	>>
B	>>
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SIRIUS GEOTECHNICAL LTD
4245 Park Approach, Thorpe Park, Leeds LS15 8GB
www.thesiriusgroup.com
TEL: 0113 264 9960
FAX: 0113 264 9962

CLIENT: **Barratt & David Wilson Homes Yorkshire West**

SITE: **Owl Lane, Chidswell (Phase 2)**

DRAWING TITLE: **Site Location Plan**

DRAWING NO.	REVISION NO.
SR3786/VR/P2/01	**0**

DRAWN BY	APPROVED BY
MF	**JH**

DATE	SCALE	
September 2023	**1:25,000**	**A4**

NOTES

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CLIENT

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SITE

**Owl Lane,
Chidswell (Phase 2)**

DRAWING TITLE

Site Layout Plan

DRAWING NO.	REVISION NO.
SR3786/VR/P2/02	0
DRAWN BY: MF	APPROVED BY: JH

DATE	SCALE	PAPER SIZE
September 2023	1:1,500	A3

NOTES

- Phase 1
- Phase 2
- Plots and associated infrastructure constructed prior to phase 2 works commencing
- Former Compound Area

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SITE

Owl Lane, Chidswell (Phase 2)

DRAWING TITLE

Remediation Works Phasing Plan

DRAWING NO.	REVISION NO.
SR3786/VR/P2/03	0
DRAWN BY	APPROVED BY
MF	JH
DATE	SCALE	PAPER SIZE
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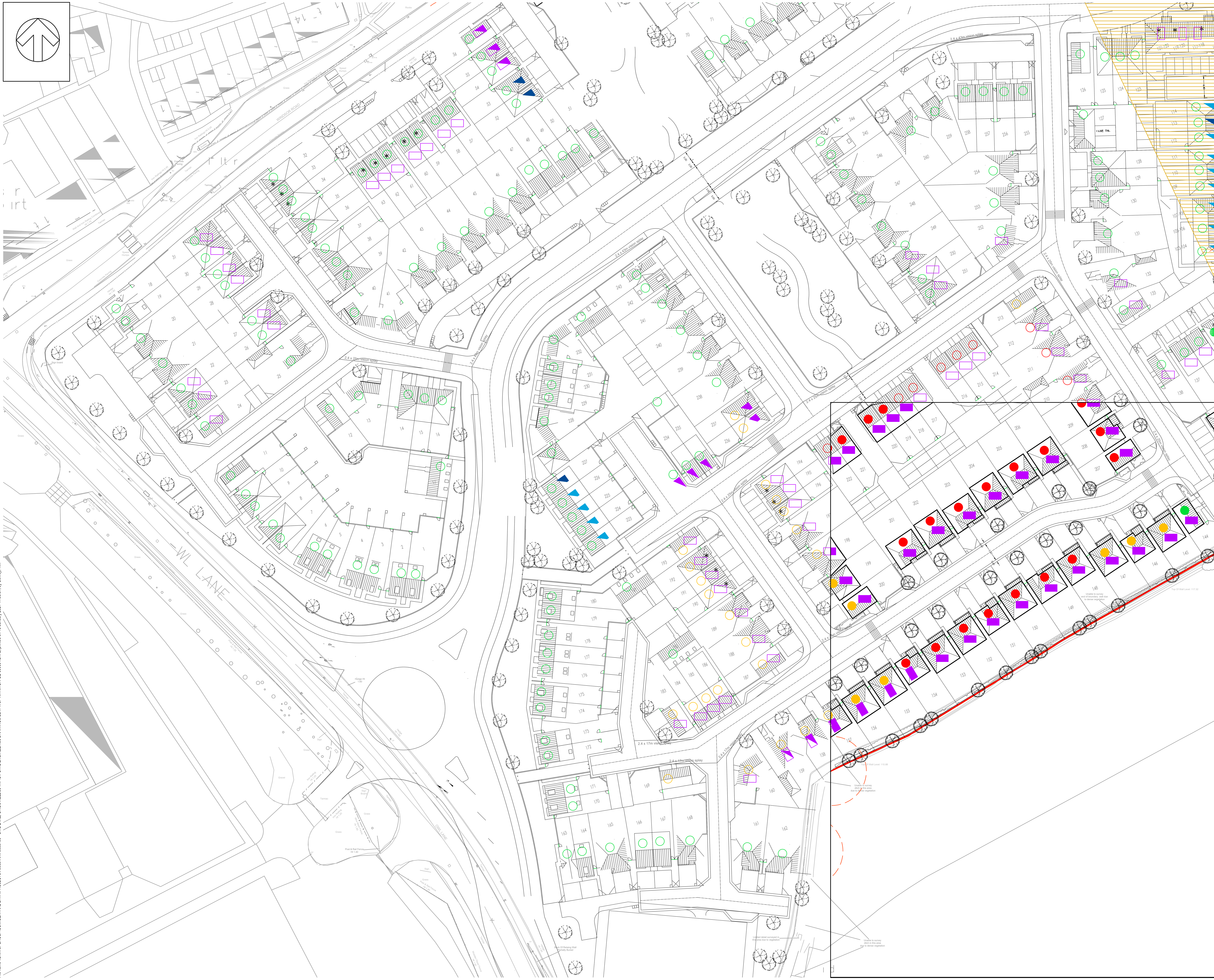

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P03	18/01/2021	TC	LATEST LAYOUT ADDED AND FOUNDATIONS AMENDED TO SUIT	DB	DB
P02	31/07/2020	DB	ROUNDABOUT LAYOUT AMENDED	DB	DB
P01	30/03/2020	MW	FIRST ISSUE	DB	DB

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ARCHITECT:
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SITE/PROJECT:
OWL LANE, CHIDSWELL

TITLE:
FOUNDATION PLAN
SHEET 1 OF 2

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1:500	DB	DB

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
70065703	FS	LC	July 20

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CLIENT:
BDW HOMES WEST YORKSHIRE

ARCHITECT:
PARKER PEEL ARCHITECTURAL

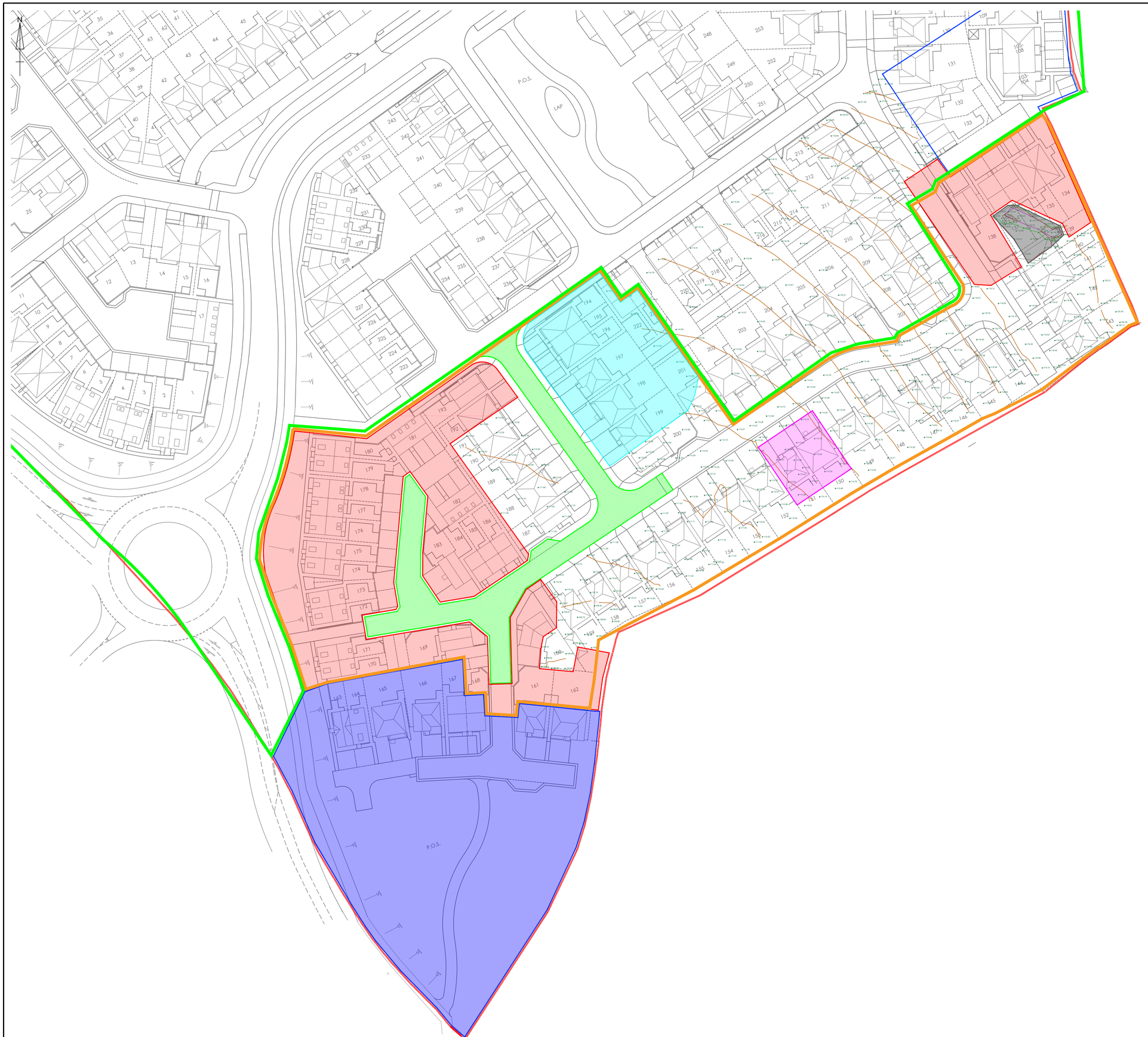
SITE/PROJECT:
OWL LANE, CHIDSWELL

TITLE:
FOUNDATION PLAN
SHEET 2 OF 2

SCALE @ A1:	CHECKED:	APPROVED:
1:500	DB	DB

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
70065703	FS	LC	July 20

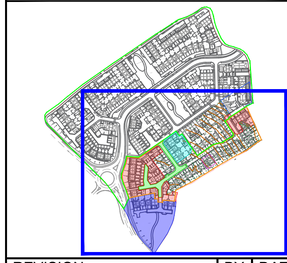
DRAWING No: CDW-WSP-XX-XX-DR-GE-000602 REV: P03



NOTES

- Contour 1m interval
- Site boundary
- Phase 1 boundary
- Phase 2 boundary
- Top of batter
- Bottom of batter
- Refer to As Built drawing: "SR3786/VR/P2/05"
- Plots and associated infrastructure constructed prior to phase 2 works commencing
- Roads built
- Areas where surface coal was removed
- Approximate location where coal was placed at 1.2 - 1.9m below formation
- Former compound area

Development layout taken from:
SS 230126 CDW-WSP-XX-XX-M2-C-0001



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SITE

Owl Lane, Chidswell (Phase 2)

DRAWING TITLE

Base of Excavation

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SR3786/VR/P2/04	0
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DATE	SCALE	PAPER SIZE
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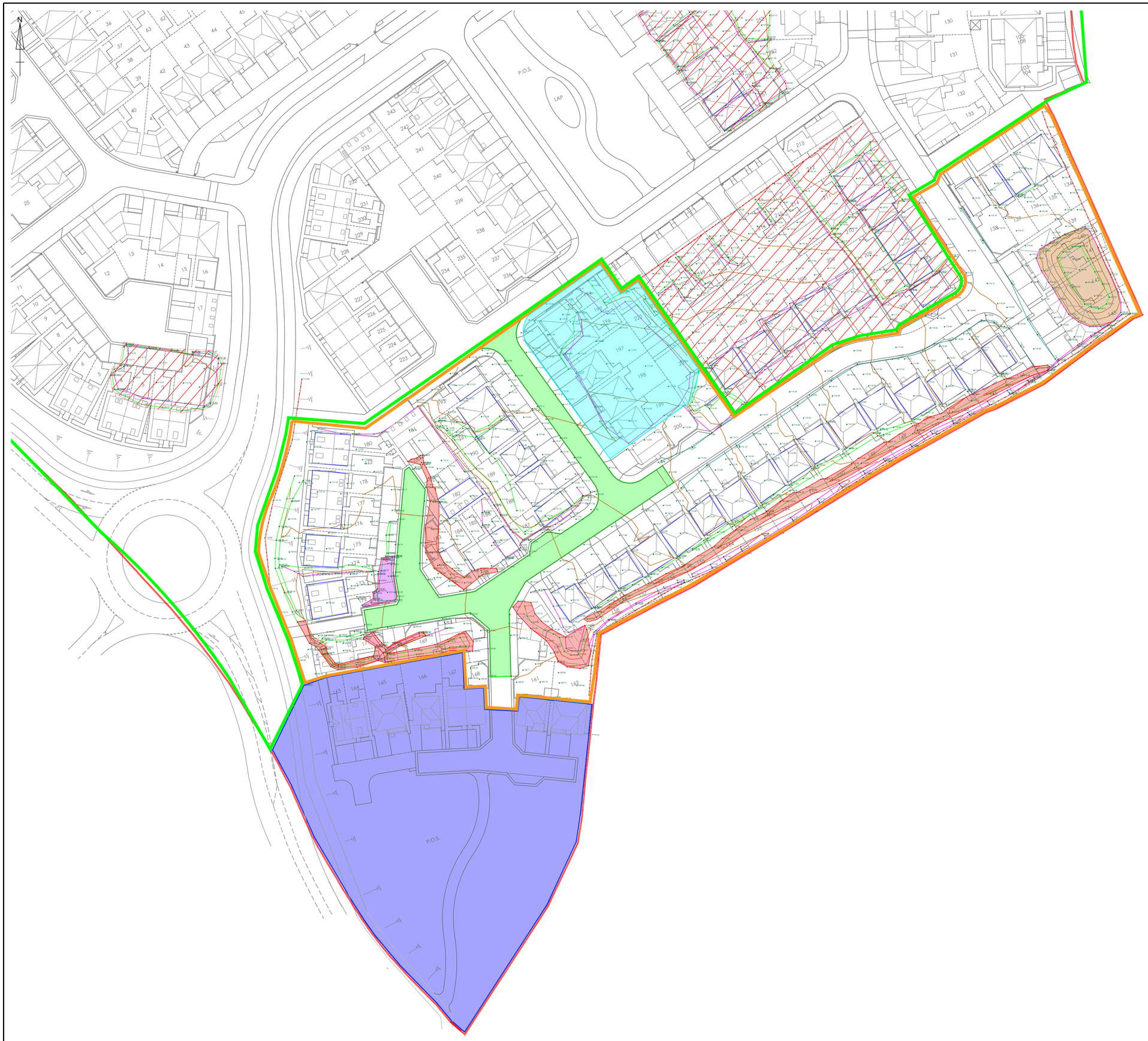


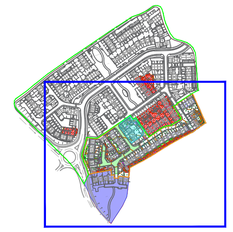
NOTES

- Contour 1m interval
- Site boundary
- Phase 1 boundary
- Phase 2 boundary
- Surveyed fenceline
- Top of batter
- Bottom of batter
- Plot outline
- Road outline
- Topsoil stockpile - Volume: 911m³
- SWMP bunds (155m³ to be used as backfill for southern retaining wall)
- Roads built
- Retrim following stockpiles removal

Constraints:

- Material laydown area
- Former compound area
- Plots and associated infrastructure constructed prior to phase 2 works commencing

Development layout taken from:
SS 230126 CDW-WSP-XX-XX-M2-C-0001



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SITE

Owl Lane, Chidswell (Phase 2)

DRAWING TITLE

As Built Survey and Constraints Plan

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SR3786/VR/P2/05	0

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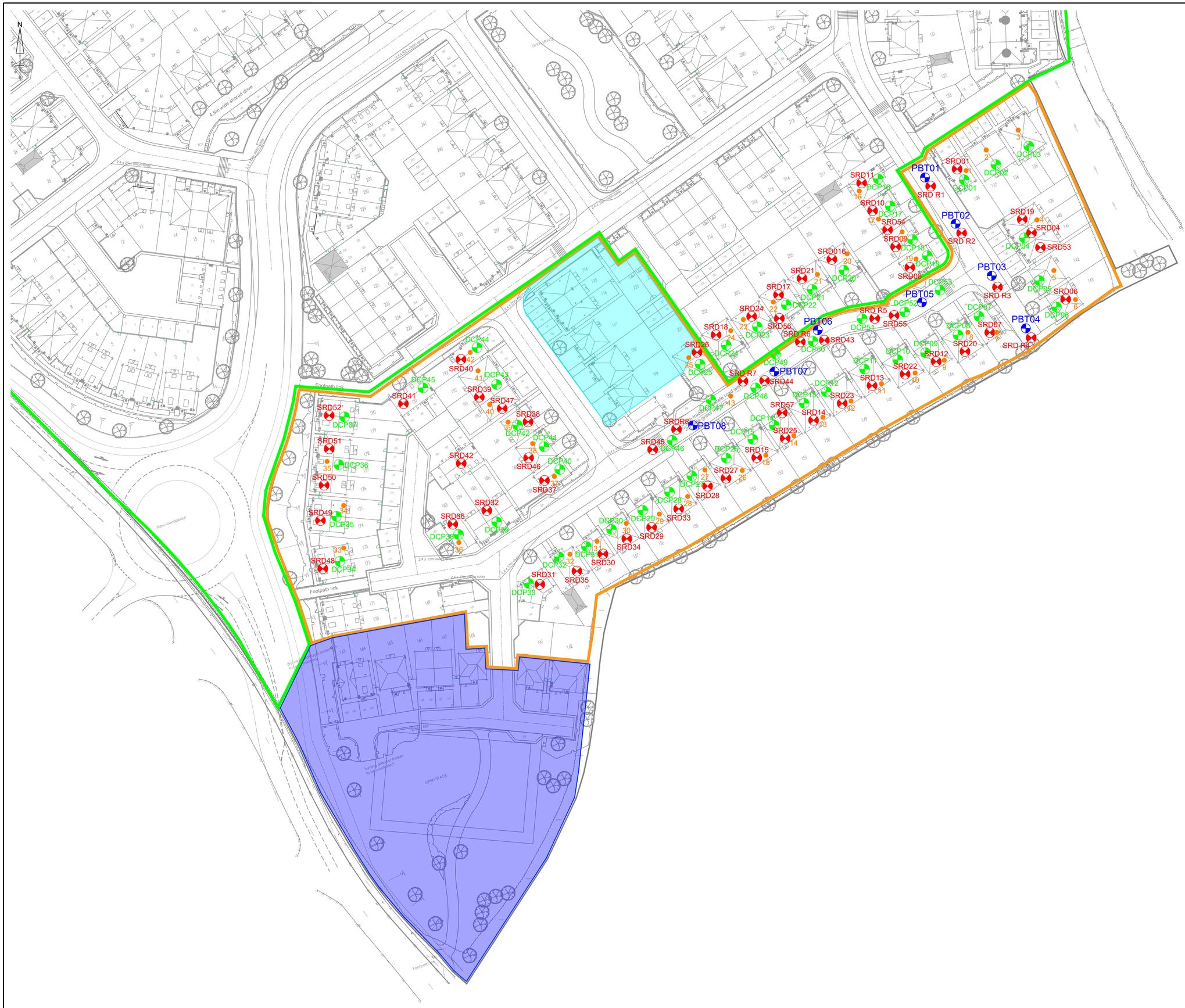
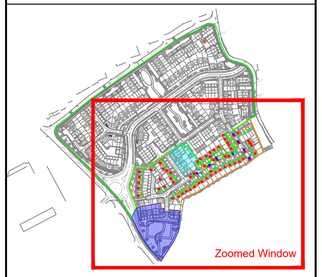


NOTES

- Phase 1 boundary
- Phase 2 boundary
- Plots and associated infrastructure constructed prior to phase 2 works commencing
- Former Compound Area
- Plate Bearing Test (PBT) Location
- Sand Replacement Test (SRD) Location
- Dynamic Cone Penetrometer (DCP) Test Location
- Hand Shear Vane (HSV) Test Location

N.B. Some geotechnical testing was completed within the Phase 1 boundary (Plots 201 to 210) following the removal of a pre-existing stockpile and subsequent retrimming of this area during phase 2 works.



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SITE

Owl Lane, Chidswell (Phase 2)

DRAWING TITLE

Geotechnical Testing Locations Plan

DRAWING NO.	REVISION NO.
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September 2023	1:500	A1

APPENDIX B

SITE PHOTOGRAPHIC RECORD

SR3786-VR-P2. Site Photographic Record. October 2023.

Photograph 01: Initial topsoil strip (17.07.23).

Photograph 02: Surface water runoff management bund located along the eastern boundary of the Phase 2 site (17.07.23).

SR3786-VR-P2. Site Photographic Record. October 2023.

Photograph 03: Cut and fill operations with compaction of engineered fill (18.07.23).

Photograph 04: Coal removal in gardens of Plot numbers 136/137 as per Drawing No. SR3786/VR/P2/05 (20.07.23).

SR3786-VR-P2. Site Photographic Record. October 2023.

Photograph 05: Compaction Trial Pad on site-won fill (20.07.23).

Photograph 06: Development layout showing plots in cut and fill along the eastern site boundary (26.07.23).

Photograph 07: Material laydown area in the southwest of the Phase 2 site (18.08.23).

SR3786-VR-P2. Site Photographic Record. October 2023.

Photograph 08: Coal removed from gardens (top left) and stockpiled topsoil (top right) (25.07.23).

Photograph 09: Cut and fill operations in the northeast of the site and topsoil stockpile (top left) (25.07.23).

SR3786-VR-P2. Site Photographic Record. October 2023.

Photograph 10: Area of cut northern site (25.07.23).

Photograph 11: Plot layout looking north-northeast (03.08.23).

SR3786-VR-P2. Site Photographic Record. October 2023.

Photograph 12: Looking southwest over the finished site (03.08.23).

Photograph 13: Looking northeast over the finished site (07.08.23).

SR3786-VR-P2. Site Photographic Record. October 2023.

Photograph 14: Dynamic Cone Penetrometer testing of engineered ground within proposed highway (07.08.23).

Photograph 15: Site development at finished remediated level (08.08.23).

SR3786-VR-P2. Site Photographic Record. October 2023.

Photograph 16: Slope formed in cut separating plots 207-210 from plots 201-206 (08.08.23).

APPENDIX C

REGULATORY CORRESPONDENCE

Town and Country Planning (Development Management Procedure) (England) Order 2015

PLANNING PERMISSION FOR DEVELOPMENT

NOTE: This approval should be read in conjunction with an Agreement made under Section 106 of the Town and Country Planning Act 1990

Application Number: 2019/62/92787/E

To: Paul Butler
PB Planning Ltd
PO Box 827
York
YO31 6EE

For: BARRATT HOMES

In pursuance of its powers under the above-mentioned Act and Order the KIRKLEES COUNCIL (hereinafter called "The Council") as Local Planning Authority hereby permits:-

ERECTION OF 260 DWELLINGS WITH OPEN SPACE, LANDSCAPING AND ASSOCIATED INFRASTRUCTURE

At: LAND AT OWL LANE, CHIDSWELL, DEWSBURY

In accordance with the plan(s) and applications submitted to the Council on 29-Aug-2019, subject to the condition(s) specified hereunder:-

1. The development hereby permitted shall be begun within three years of the date of this permission.
Reason: Pursuant to the requirements of Section 51 of the Planning and Compulsory Purchase Act 2004.

2. The development hereby permitted shall be carried out in complete accordance with the plans and specifications schedule listed in this decision notice, except as may be specified in the conditions attached to this permission, which shall in all cases take precedence.
Reason: For the avoidance of doubt as to what is being permitted and in the interests of visual amenity, residential amenity and other matters relevant to planning and to accord with the Kirklees Local Plan and the National Planning Policy Framework.

3. Prior to the commencement of development (including ground works) a Construction (Environmental) Management Plan (C(E)MP) shall be submitted to and approved in writing by the Local Planning Authority. The C(E)MP shall include pre-development road condition surveys, a timetable of all works, and details of:

- any phasing of development;
- point(s) of access for construction traffic;
- construction vehicle sizes and routes;
- times of vehicle movements;
- parking for construction workers;
- signage;
- wheel washing facilities within the site;
- street sweeping;
- dust suppression measures;
- measures to control noise and vibration from construction-related activities;
- artificial lighting to be used during construction;
- hours of works;
- engagement with the developers of the adjacent site ref: MXS7 to discuss any additional measures required in relation to cumulative impacts (should construction be carried out at both sites during the same period); and
- details of engagement with local residents and occupants (or their representatives) before the submission of the C(E)MP and during the period of construction.

The development shall be carried out strictly in accordance with the C(E)MP so approved throughout the period of construction and no change therefrom shall take place without the prior written consent of the Local Planning Authority. Upon completion of the development, post-development road condition surveys and a schedule of remedial works shall be submitted to and approved in writing by the Local Planning Authority, and the approved remedial works shall be carried out following the completion of all construction works related to the development.
Reason: In the interests of amenity, to ensure the highway is not obstructed, in the interests of highway safety, and to accord with Policies LP21, LP24 and LP52 of the Kirklees Local Plan.
This pre-commencement condition is necessary to ensure measures to avoid obstruction to the wider highway network, to avoid increased risks to highway safety, and to prevent or minimise amenity impacts are devised and agreed at an appropriate stage of the development process.

4. Prior to the commencement of development (including ground works) details of temporary surface water drainage for the construction phase (after soil and vegetation

strip) shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall:

- detail phasing of the development and phasing of temporary drainage provision; and
- include methods of preventing silt, debris and contaminants entering existing drainage systems and watercourses and how flooding of adjacent land is prevented.

The temporary works shall be implemented in accordance with the approved scheme and phasing. No phase of the development shall be commenced until the temporary works approved for that phase have been completed. The approved temporary drainage scheme shall be retained until the approved permanent surface water drainage system is in place and functioning in accordance with written notification to the Local Planning Authority.

Reason: To ensure the risk of flooding does not increase during the construction phase, to limit the siltation of any on- or off-site surface water features, and to accord with Policy LP27 of the Kirklees Local Plan.

This pre-commencement condition is necessary to ensure measures to avoid increased flood risk are devised and agreed at an appropriate stage of the development process.

5. Prior to the first use of the approved vehicular access points, vegetation and boundary treatments shall be set back to the rear of the proposed visibility splays as shown on approved plan ref: 1820-SI-01 rev W. The visibility splays shall be cleared and kept clear of all obstructions to visibility above 0.6m measured from the ground thereafter.

Reason: To ensure adequate intervisibility is provided and maintained in the interests of pedestrian and highway safety and to accord with Policy LP21 of the Kirklees Local Plan.

This pre-commencement condition is necessary to ensure that adequate visibility is provided to enable works vehicles to enter and exit the site.

6. Prior to the commencement of development (including ground works), a scheme detailing the proposed final designs of the Owl Lane roundabout and spine road shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall include details of crossings, the spine road's verges and shared cycle/footways, details of swept paths for a 11.85m refuse vehicle, full sections, drainage details, street lighting, signing, surface finishes and the treatment of sight lines, together with an independent safety audit covering all aspects of this work. No more than 59 dwellings (specifically, units 52 to 69, 82 to 102 and 103 to 122 as shown on approved plan ref: 1820-SI-01 rev W or a larger number and/or other units if agreed in writing by the Local Planning Authority following the submission of details of temporary access arrangements to dwellings) shall be occupied until the Owl Lane roundabout and spine road (up to the point where it meets Chidswell Lane) have been completed in accordance with the approved scheme unless otherwise agreed in writing by the Local Planning Authority. Unless otherwise agreed in writing by the Local Planning Authority, units 103 to 122 shall not be occupied until the adjacent footway to Chidswell Lane (as shown on approved plan ref: 1820-SI-01 rev W) has been completed.

Reason: In the interests of highway safety and to achieve a satisfactory layout in accordance with Policies LP20 and LP21 of the Kirklees Local Plan and the National Planning Policy Framework.

This pre-commencement condition is necessary to ensure that details of roads and junctions are agreed at an appropriate stage of the development process.

7. Prior to development commencing on the superstructure of any dwelling hereby approved, a detailed scheme for the provision of infrastructure improvements for use by cyclists between the Leeds Road / Challenge Way / John Ormesby VC Way junction (the Shaw Cross junction) and the development hereby approved shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall include construction specifications, details of surface finishes and any white lining and signing, an independent safety audit covering all aspects of this work, and details of the delivery of the scheme under an appropriate Section 278 approval. Unless otherwise agreed in writing by the Local Planning Authority, no more than 100 dwellings of the development hereby approved shall be occupied prior to the implementation of the approved scheme.
Reason: To ensure residents of the development are encouraged to use sustainable forms of transport and to mitigate the highway and air quality impacts of the development in accordance with policies LP20, LP21, LP24, LP47, LP51 and LP52 of the Kirklees Local Plan, chapters 9 and 15 of the National Planning Policy Framework, and the West Yorkshire Low Emissions Strategy.

8. Prior to the commencement of development (including ground works), a scheme detailing the proposed internal adoptable roads (other than the Owl Lane roundabout and spine road) shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall include details of swept paths for a 11.85m refuse vehicle, full sections, drainage details, street lighting, signing, surface finishes and the treatment of sight lines, together with an independent safety audit covering all aspects of this work. The development shall be completed in accordance with the approved scheme. No part of the development shall be brought into use until the internal adoptable roads for that part of the development have been completed in accordance with the approved plans and details or unless otherwise agreed in writing by the Local Planning Authority.
Reason: In the interests of highway safety and to achieve a satisfactory layout in accordance with Policies LP20 and LP21 of the Kirklees Local Plan and the National Planning Policy Framework.
This pre-commencement condition is necessary to ensure that details of internal adoptable roads are agreed at an appropriate stage of the development process.

9. Prior to the commencement of development (including ground works), a scheme detailing street lighting to all private (unadopted) roads/drives/courtyards shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall not include low-level or bollard lighting. No dwellings accessed from a private (unadopted) road/drive/courtyard shall be brought into use until the street lighting so approved for that road/drive/courtyard has been installed and brought into use, and the street lighting shall be retained as such thereafter.
Reason: In the interests of residential amenity, highway safety, creating a safer, more sustainable neighbourhood and reducing the risk of crime and anti-social behaviour, and to accord with Policies LP21, LP24 and LP47 of the Kirklees Local Plan and chapters 8 and 12 of the National Planning Policy Framework.
This pre-commencement condition is necessary to ensure that details of internal private (unadopted) roads/drives/courtyards are agreed at an appropriate stage of the development process.

10. Prior to development commencing on the superstructure of any dwelling hereby approved, the design and construction details of any permanent highway retaining structures (and any temporary highway retaining structures that may be deemed necessary) shall be submitted to and approved in writing by the Local Planning Authority. The details shall include a design statement, all necessary ground investigations on which design assumptions are based, method statements for both temporary and permanent works and removal of any bulk excavations, together with structural calculations and all associated safety measures for the protection of adjacent public highways, footpaths, culverts, adjoining land and areas of public access. The development shall be completed in accordance with the approved details before any of the dwellings are occupied and shall be retained as such thereafter.
Reason: To ensure that any new retaining structures do not compromise the stability of the highway in the interests of highway safety and to accord with Policy LP21 of the Kirklees Local Plan.

11. Prior to the first occupation of any specified dwelling hereby approved, the approved vehicle parking areas for that dwelling shall be surfaced and drained in accordance with the Driveway Specifications (approved plan ref: MISC.003 rev B), and shall thereafter retained throughout the lifetime of the development.
Reason: In the interests of highway safety and to achieve a satisfactory layout in accordance with Policies LP20 and LP21 of the Kirklees Local Plan.

12. Prior to the first occupation of those dwellings hereby approved which do not have a garage, details of secure, covered and conveniently-located cycle parking for use by residents of that dwelling shall be submitted to and approved in writing by the Local Planning Authority. The development shall be implemented in accordance with the details so approved and the cycle parking shall be retained thereafter unless otherwise agreed in writing by the Local Planning Authority.
Reason: In the interests of visual amenity and encouraging the use of sustainable transport modes, and to accord with policies LP20, LP21, LP22 and LP24 of the Kirklees Local Plan.

13. Prior to development commencing on the superstructure of any dwelling hereby approved, a scheme detailing the dedicated facilities to be provided for charging electric

vehicles and other ultra-low emission vehicles shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall provide one Standard Electric Vehicle Charging point (of a minimum output of 16A/3.5kW) for each residential unit that has a dedicated parking space. Dwellings and parking spaces that are to be provided with charging points shall not be brought into use until the charging points are installed and operational. The charging points installed shall be retained thereafter.
Reason: To ensure residents of the development are encouraged to use low-carbon and more sustainable forms of transport and to mitigate the air quality impacts of the development in accordance with policies LP20, LP24, LP47, LP51 and LP52 of the Kirklees Local Plan, chapters 9 and 15 of the National Planning Policy Framework, and the West Yorkshire Low Emissions Strategy.

14. Prior to the commencement of superstructure works, details of storage and access for collection of wastes from the residential units hereby approved, and details of management of waste collection points, shall be submitted to and approved in writing by the Local Planning Authority. The details shall confirm that waste collection points shall not obstruct access to private driveways, and shall include details of management measures and measures to discourage flytipping on site. For each dwelling, the works and arrangements comprising the approved details shall be implemented prior to first occupation of that dwelling and shall be so retained thereafter unless otherwise agreed in writing by the Local Planning Authority.
Reason: In the interests of visual and residential amenity and highway safety, to assist in achieving sustainable development, and to accord with Policies LP21 and LP24 of the Kirklees Local Plan.

15. Where implementation of the development hereby approved is to be phased, and/or any of the dwellings hereby approved are to become occupied prior to the completion of the development, details of temporary arrangements for the storage and collection of wastes from those residential units, and details of temporary arrangements for the management of waste collection points, shall be submitted to and approved in writing by the Local Planning Authority prior to the first occupation of those residential units. The temporary arrangements so approved shall be implemented prior to the first occupation of those residential units and shall be so retained thereafter for the duration of the construction works unless otherwise agreed in writing by the Local Planning Authority.
Reason: To ensure satisfactory arrangements are implemented in relation to waste during the construction phase, in the interests of visual and residential amenity and highway safety, to assist in achieving sustainable development, and to accord with Policies LP21 and LP24 of the Kirklees Local Plan.

16. Prior to the commencement of development (including ground works), details of remedial and/or mitigatory measures (designed with reference to the recommendations at section 10.0 of the Phase II Geo-Environmental Report (Groundtech Consulting, 17047/117, rev 1.1, 07/12/2018)) related to the site's coal mining legacy shall be submitted to and approved in writing by the Local Planning Authority. The development hereby approved shall be carried out in accordance with the details so approved.
Reason: To minimise risk associated with the area's mining legacy in accordance with Policy LP53 of the Kirklees Local Plan.
This pre-commencement condition is necessary to ensure that details of remedial and/or mitigatory measures related to the site's coal mining legacy are agreed at an appropriate stage of the development process.

17. The site shall be developed with separate systems of drainage for foul and surface water on- and off-site.
Reason: To ensure the effective disposal of surface water from the development so as to avoid an increase in flood risk and so as to accord with Policies LP27 and LP28 of the Kirklees Local Plan and chapter 14 of the National Planning Policy Framework.

18. Prior to the commencement of development (including ground works) a drainage scheme restricting the rate of surface water discharge from the site to a maximum of 22l/s shall be submitted to and approved in writing by Local Planning Authority. The drainage scheme shall be designed to attenuate flows generated by the critical 1 in 100-year storm event with a 30% allowance for climate change as a minimum requirement. The scheme shall include a trash screen replacement approved by the Lead Local Flood Authority. The scheme shall include a detailed maintenance and management regime for the storage facility including the flow restriction, and shall include details confirming that the storage facility can support vehicular loads associated with any temporary or permanent access or parking to be provided above it. There shall be no piped discharge of surface water from the development and no part of the development shall be brought into use until the flow restriction and attenuation works and upgraded trash screen comprising the approved scheme have been completed. The approved maintenance and management scheme shall be implemented thereafter.
Reason: To ensure the effective disposal of surface water from the development so as to avoid an increase in flood risk and so as to accord with Policies LP27 and LP28 of the Kirklees Local Plan and chapter 14 of the National Planning Policy Framework.
This pre-commencement condition is necessary to ensure that details of drainage are agreed at an appropriate stage of the development process.

19. Prior to the commencement of development (including ground works) an assessment of the effects of 1 in 100 year storm events, with an additional allowance for climate change, exceedance events and blockage scenarios, on drainage infrastructure and surface water run-off pre- and post-development between the development and the surrounding area, in both directions, shall be submitted to and approved in writing by the Local Planning Authority. Cross-sections incorporating property and curtilage immediate adjacent to private driveways shall be submitted and these shall demonstrate that water will not enter curtilage and that the route will be contained on roads and driveways. No part of the development shall be brought into use (dwellings shall not be occupied) until the works comprising the approved scheme have been completed and such approved scheme shall be retained thereafter.
Reason: To ensure the effective disposal of surface water from the development so as to avoid an increase in flood risk and so as to accord with Policies LP27 and LP28 of the Kirklees Local Plan and chapter 14 of the National Planning Policy Framework.
This pre-commencement condition is necessary to ensure that details of drainage are agreed at an appropriate stage of the development process.

20. Prior to the commencement of development (including ground works, but excluding works required to inform a site investigation report), a further Phase II Intrusive Site Investigation Report shall be submitted to and approved in writing by the Local Planning Authority.
Reason: To ensure unacceptable risks to human health and the environment are identified and removed, and to ensure that the development is safely completed in accordance with the requirements of Policy LP53 of the Kirklees Local Plan and paragraphs 178 and 179 of the National Planning Policy Framework.
This pre-commencement condition is necessary to ensure that contamination is identified and suitable remediation measures are agreed at an appropriate stage of the development process.

21. Prior to the commencement of development (including ground works, but excluding works required to inform a site investigation report) and if required following the submission and approval of details pursuant to condition 20, a Remediation Strategy shall be submitted to and approved in writing by the Local Planning Authority. The Remediation Strategy shall include a timetable for the implementation and completion of the approved remediation measures.
Reason: To ensure unacceptable risks to human health and the environment are identified and removed, and to ensure that the development is safely completed in accordance with the requirements of Policy LP53 of the Kirklees Local Plan and paragraphs 178 and 179 of the National Planning Policy Framework.
This pre-commencement condition is necessary to ensure that contamination is identified and suitable remediation measures are agreed at an appropriate stage of the development process.

22. Remediation of the site shall be carried out and completed in accordance with the Remediation Strategy approved pursuant to condition 21. In the event that remediation is unable to proceed in accordance with the approved Remediation Strategy or contamination not previously considered (in the Preliminary Risk Assessment (Groundtech Consulting, 17047/091, 09/11/2017), Permanent Gas Assessment (Groundtech Consulting, 17047/198, 30/04/2018), Phase II Geo-Environmental Report (Groundtech Consulting, 17047/117, rev 1.1, 07/12/2018) or the further Phase II Intrusive Site Investigation Report required under condition 20) is identified or encountered on site, all works on site (save for site investigation works) shall cease immediately and the Local Planning Authority shall be notified in writing within two working days. Unless otherwise agreed in writing with the Local Planning Authority, works shall not recommence until proposed revisions to the Remediation Strategy have been submitted to and approved in writing by the Local Planning Authority. Remediation of the site shall thereafter be carried out in accordance with the approved revised Remediation Strategy.
Reason: To ensure unacceptable risks to human health and the environment are identified and removed, and to ensure that the development is safely completed in accordance with the requirements of Policy LP53 of the Kirklees Local Plan and paragraphs 178 and 179 of the National Planning Policy Framework.
This pre-commencement condition is necessary to ensure that contamination is identified and suitable remediation measures are agreed at an appropriate stage of the development process.

23. Following completion of any measures identified in the approved Remediation Strategy or any approved revised Remediation Strategy, a Validation Report shall be submitted to the Local Planning Authority. Unless otherwise agreed in writing with the Local Planning Authority, no part of the site shall be brought into use until such time as the remediation measures for the whole site have been completed in accordance with the approved Remediation Strategy or the approved revised Remediation Strategy and a Validation Report in respect of those remediation measures has been approved in writing by the Local Planning Authority. Where validation has been submitted and approved in phases
for different areas of the site, a Final Validation Summary Report shall be submitted to and approved in writing by the Local Planning Authority.
Reason: To ensure unacceptable risks to human health and the environment are identified and removed, and to ensure that the development is safely completed in accordance with the requirements of Policy LP53 of the Kirklees Local Plan and paragraphs 178 and 179 of the National Planning Policy Framework.

24. Prior to the commencement of superstructure works, a report specifying the measures to be taken to protect the development from noise from roads, the adjacent rugby ground and other uses shall be submitted to and approved in writing by the Local Planning Authority. The report shall detail the proposed attenuation/design necessary to protect the amenity of the occupants of the new residences (including ventilation if required).
Unless otherwise agreed in writing with the Local Planning Authority none of the dwellings hereby approved shall be occupied until all works specified in the approved report have been carried out in full. The approved works shall be retained thereafter.
Reason: In the interests of amenity and to accord with Policies LP24 and LP52 of the Kirklees Local Plan.

25. Prior to any part of the development hereby approved being brought into first use, a further Air Quality Impact Assessment shall be submitted to and approved in writing by the Local Planning Authority. The assessment shall:

- Determine the impact that the development will have on air quality (taking into consideration any cumulative impact from other local developments);
- Include a calculation of the monetary damages from the development; and
- Include a fully-costed mitigation plan detailing the proposed low emission mitigation measures. The monetary value of the damages should be reflected in money spent on the low emission mitigation measures

The approved low emission mitigation measures shall be implemented before the development is brought into first use and shall be retained thereafter.
Reason: In the interests of maintaining local air quality and to accord with policies PLP20, LP24, PLP47, PLP51 and PLP52 and the National Planning Policy Framework.

26. Prior to the commencement of superstructure works, details of all hard and soft landscaping shall be submitted to and approved in writing by the Local Planning Authority. These shall include:

- Details of existing and proposed levels, and regrading;
- Species schedule and planting plans;
- Details of initial aftercare and long-term maintenance;
- Details of monitoring and remedial measures, including replacement of any trees, shrubs or planting that fails or becomes diseased within the first five years from completion;
- Details (including samples, if requested), of paving and other hard surface materials;
- Details of all on-site open spaces (including details of their purpose and management), footpaths through those spaces (including details of gradients, any handrails, and construction methods), and play equipment and furniture;
- Full details of planting (including species and heights) intended to minimise the effects of light pollution upon residents of the residential units hereby approved along Owl Lane;
- An amended layout and details of soft landscaping in front of units 103 to 114 (as numbered on approved plan ref: 1820-SI-01 rev W);
- Full details of planting (including species and heights) intended to achieve an appropriate buffer along the site's southern boundary adjacent to the green belt; and

- Details of how soft landscaping has been designed to prevent and deter crime and anti-social behaviour.

No part of the development hereby approved shall be occupied until all hard and soft landscaping has been implemented in accordance with the approved details unless otherwise agreed in writing by the Local Planning Authority. All approved landscaping shall be retained thereafter in accordance with the approved details and approved long-term maintenance, monitoring and remedial arrangements.
Reason: In the interests of local ecological value and visual amenity, to ensure high quality open spaces are provided, to ensure an appropriate green belt buffer is provided, in the interests of creating a safer, more sustainable neighbourhood and reducing the risk of crime and anti-social behaviour, and to accord with Policies LP24, LP30, LP32, LP33, LP47 and LP63 of the Kirklees Local Plan, and chapters 8, 12 and 15 of the National Planning Policy Framework.

27. Prior to the commencement of superstructure works, details of all external materials to be used shall be submitted to the Local Planning Authority, and samples shall be left on site for the inspection and approval in writing of the Local Planning Authority. The development shall be carried out in accordance with the approved details and no materials other than those approved in accordance with this condition shall be used.
Reason: In the interests of visual amenity and to accord with Policy LP24 of the Kirklees Local Plan and the National Planning Policy Framework.

28. The temporary sales centre and its associated access, parking, lighting, bollards, signage and landscaping (as shown on approved plan ref: SAL 02 rev A (corrected version received 26/05/2021)) shall be removed upon the commencement of the use of the sales arena referred to in condition 29 and the land shall be made ready for development in accordance with the drawings and details hereby approved.
Reason: In the interests of visual amenity, and to accord with Policy LP24 of the Kirklees Local Plan.

29. The sales arena and its associated access, parking, lighting, bollards, signage and landscaping (as shown on approved plans ref: SAL 01 rev B and EX-01) shall be retained for only as long as required for the sale of dwellings forming part of the development, and for a maximum of 12 months or a longer period to be agreed in writing by the Local Planning Authority. Thereafter the “sacrificial sales centre” (as annotated on approved plan ref: SAL 01 rev B), its parking and its access from Owl Lane shall be removed, the land shall be reinstated and made ready for development and for the provision of open space in accordance with the drawings and details hereby approved, and the use of units 165 to 168 as show dwellings shall cease.
Reason: In the interests of visual amenity, to ensure the adjacent open space is provided in full, and to accord with Policies LP24 and LP63 of the Kirklees Local Plan.

30. Prior to the commencement of superstructure works, notwithstanding what is shown on the drawings hereby approved, details (including sections and details of levels) of all boundary treatments, and any retaining walls and gabions, shall be submitted to and approved in writing by the Local Planning Authority. The details shall correspond with measures relating to flood routing to be submitted pursuant to condition 19, shall be designed to prevent and deter crime and anti-social behaviour, and shall provide for the movement of hedgehogs. The development shall be implemented in accordance with the details so approved. The approved works shall be retained thereafter.
Reason: In the interests of visual amenity, highways safety and biodiversity, to minimise flood risk, to ensure the amenities of existing neighbouring residential units and the residential units hereby approved are protected, in the interests of creating a safer, more sustainable neighbourhood and reducing the risk of crime and anti-social behaviour, and to accord with Policies LP21, LP24, LP27, LP30 and LP47 of the Kirklees Local Plan and the National Planning Policy Framework.

31. Prior to the first occupation of any dwelling with external lighting (other than street lighting), details of the external lighting for that dwelling shall be submitted to and approved in writing by the Local Planning Authority. The external lighting shall be designed to avoid harm to residential amenity, increased highway safety risk, risk of creating opportunities for crime and anti-social behaviour, and disturbance to wildlife. All external lighting shall be installed in accordance with the details (including specifications and locations) so approved, and the external lighting shall be maintained thereafter in accordance with the approved details. Under no circumstances should any other external lighting be installed without prior written consent from the Local Planning Authority.
Reason: In the interests of residential amenity and highway safety, to prevent significant ecological harm, to safeguard habitat, in the interests of creating a safer, more sustainable neighbourhood and reducing the risk of crime and anti-social behaviour, and to accord with Policies LP21, LP24, LP30 and LP47 of the Kirklees Local Plan and the National Planning Policy Framework.

32. Other than where indicated on the drawings hereby approved, and other than in relation to elevations not facing a highway, no cables, plumbing, foul pipes, vents, burglar alarm boxes, and/or CCTV cameras or related equipment and installations shall be located or fixed to any external elevation(s) of the development hereby approved. Should any such equipment or installations be considered necessary, details of these shall be submitted to and approved in writing by the Local Planning Authority. Thereafter the development shall be completed in accordance with the details so approved.
Reason: In the interests of visual amenity and to accord with Policy LP24 of the Kirklees Local Plan.

33. Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) (England) Order 2015 as amended (or any Order revoking or re-enacting that Order with or without modification) no development included within Classes A, D and E of Part 1 and Class A of Part 2 of Schedule 2 to that Order shall be carried out without the prior written consent of the Local Planning Authority.
Reason: In the interests of visual amenity and to ensure the amenities of existing neighbouring residential units and the residential units hereby approved are protected in accordance with Policy LP24 of the Kirklees Local Plan and the National Planning Policy Framework.

34. Prior to the commencement of development (including ground works), a Biodiversity Enhancement and Management Plan (BEMP) shall be submitted to and agreed in writing by the Local Planning Authority. The BEMP shall ensure that no less than a 10% biodiversity net gain (i.e., 10% above the 15.84 habitat units and 4.44 hedgerow units baseline set out in the Biodiversity Net Gain Assessment (BSG Ecology, P21-098, 05/03/2021)) is achieved post-development, and shall include the following:

- Description and evaluation of features to be managed and enhanced;
- Details of the extent and location/area of proposed enhancement works on appropriate scale maps and plans;
- Details corresponding with details to be submitted pursuant to condition 26;
- Details of ecological trends and constraints on site that might influence management;
- Aims and Objectives of management;
- Appropriate management actions for achieving the Aims and Objectives;
- An annual work programme (to cover an initial five-year period capable of being rolled forward over a period of 30 years);
- Details of the management body or organisation responsible for implementation of the BEMP; and
- Details of an ongoing monitoring programme and remedial measures.

The BEMP will be reviewed and updated every five years and implemented for a minimum of 30 years. The BEMP shall include details of the legal and funding mechanisms by which the long-term implementation of the BEMP will be secured by the developer with the management body responsible for its delivery. The BEMP shall also set out (where the results from the monitoring show that the Aims and Objectives of the BEMP are not being met) how contingencies and/or remedial action will be identified, agreed and implemented so that the development still delivers the fully-functioning biodiversity objectives of the originally-approved BEMP. The development shall be implemented in accordance with the approved BEMP and all measures and features shall be retained in that manner thereafter.
Reason: To secure mitigation and compensation for the ecological effects resulting from loss of habitat and to secure a net biodiversity gain in line with policy LP30 of the Kirklees Local Plan and chapter 15 of the National Planning Policy Framework.
This pre-commencement condition is necessary to ensure that measures to ensure adequate enhancement and a biodiversity net gain (based on biodiversity metric calculations which require data relating to the site's pre-development condition) are agreed at an appropriate stage of the development process.

35. Prior to the commencement of development (including ground works), a Biodiversity Gain Plan (BGP) shall be submitted to and approved in writing by the Local Planning Authority. The BGP shall demonstrate a measurable biodiversity net gain and shall include:

- Details of the measures taken or to be taken to minimise the adverse effect of the development on the biodiversity of the onsite habitat and any other habitat;
- The pre-development biodiversity value of the onsite habitat, measured using the Biodiversity Metric 2.0 (or latest version, if available);
- The post-development biodiversity value of the onsite habitat, measured using the Biodiversity Metric 2.0 (or latest version, if available);
- Details of any offsite habitat enhancement required to achieve a biodiversity net gain, including pre-development and target biodiversity value.

The BGP shall inform the BEMP referred to under condition 34.
Reason: To secure mitigation and compensation for the ecological effects resulting from loss of habitat and to secure a net biodiversity gain in line with policy LP30 of the Kirklees Local Plan and chapter 15 of the National Planning Policy Framework.
This pre-commencement condition is necessary to ensure that measures to ensure adequate enhancement and a biodiversity net gain (based on biodiversity metric calculations which require data relating to the site's pre-development condition) are agreed at an appropriate stage of the development process.

36. No removal of hedgerows, trees or shrubs shall take place between 1st March and 31st August inclusive, unless authorised in writing by the Local Planning Authority in response to evidence to be submitted to the Local Planning Authority demonstrating that no birds will be harmed and/or that there are appropriate measures in place to protect nesting bird interest on site.
Reason: To prevent significant ecological harm to birds, their eggs, nests and young and to accord with Policy LP30 of the Kirklees Local Plan and chapter 15 of the National Planning Policy Framework.

37. Prior to the commencement of development (including ground works, but excluding works required in relation to archaeological investigation), a report of the findings of archaeological trial trenching shall be submitted to and approved in writing by the Local Planning Authority. The report shall include post-investigation assessment and proposals for the subsequent analysis, publication and dissemination, and deposition of resulting material.
Reason: To ensure buried heritage assets are appropriately recorded and protected and to accord with policy LP35 of the Kirklees Local Plan and chapter 16 of the National Planning Policy Framework.
This pre-commencement condition is necessary as intrusive works on site have the potential to damage or disturb buried heritage assets.

NOTE: This permission is subject to conditions requiring the submission of further and/or amended information prior to commencement of development or at other points during the development process. To assist in the prompt discharge of conditions, you may wish to submit separate Discharge of Conditions applications for each of those conditions that require submissions. This may be particularly advisable where your submissions are likely to require extensive consultation, consideration of complex technical matters, and/or negotiation. Alternatively, grouping submissions relevant to a specific topic, or interrelated topics (for example, pursuant to highways-related conditions) under a single application, and/or grouping submissions pursuant to pre-commencement, pre-superstructure and pre-occupation conditions, may assist prompt discharge. For further advice on conditions-stage submissions, please contact the case officer.

NOTE: All contamination reports shall be prepared in accordance with CLR11, PPS23 and the Council's Advice for Development documents or any subsequent revisions of those documents.

NOTE: To minimise noise disturbance at nearby premises it is generally recommended that activities relating to the erection, construction, alteration, repair or maintenance of buildings, structures or roads shall not take place outside the hours of 07.30 and 18.30 hours Mondays to Fridays, and 08.00 and 13.00 hours on Saturdays, with no working Sundays or Public Holidays. These hours should be referred to in any Construction Environmental Management Plan to be submitted to the Local Planning Authority for approval. In some cases, different site-specific hours of operation may be appropriate. Under the Control of Pollution Act 1974 (Section 60), Kirklees Environment and Transportation Services can control noise from construction sites by serving a notice. This notice can specify the hours during which work may be carried out.

NOTE: A Standard electric vehicle charging point is one which is capable of providing a continuous supply of at least 16A (3.5kW). A 32A (7kW) supply is, however more likely to be futureproof. Standard charging points for single residential properties that meet the requirements specified in the latest version of "Minimum technical specification – Electric Vehicle Homecharge Scheme (EVHS)" by the Office for Low Emission Vehicles would be acceptable. Charging points that provide Mode 3 charging with a continuous output of least 16A (3.5kW) and have Type 2 sockets would be acceptable. The electrical supply of the final installation should allow the charging equipment to operate at full rated capacity. For developments where some or all of the parking is likely to be used for shorter stay parking (30mins to 4 hours) then Fast (7-23kW) or Rapid (43kW+) charging points may be more appropriate. If Fast or Rapid charging points are proposed together with restrictions on the times that vehicles are allowed to be parked at these points then a lower number of charging points may be acceptable. The installation must comply with all applicable electrical requirements in force at the time of installation.

NOTE: The granting of planning permission does not authorise the carrying out of works within the highway, for which the written permission of the Council as Highway Authority is required. You are required to consult the Council with regard to obtaining this permission and approval of the construction specification. Please also note that the construction of vehicle crossings within the highway is deemed to be major works for the purposes of the New Roads and Street Works Act 1991 (Section 84 and 85). Interference with the highway without such permission is an offence which could lead to prosecution.

NOTE: To discuss road adoption arrangements under Section 38 of the Highways Act 1980, please contact Highway Adoptions on 01484 221000 or highways.section38@kirklees.gov.uk.

NOTE: All new storm water attenuation tanks / pipes / culverts with internal diameter / spans exceeding 0.9m must be located off the adoptable highway where possible. Any decision to locate these facilities within the adoptable highway footprint must be accompanied with a full risk evaluation report with particular reference to their proposed inspection, structural assessment and maintenance regime in compliance with the CDM Regulations 2015 requirements. Furthermore, all new precast pipes / culverts /storage tanks proposed for use within the footprint of an adoptable highway must comply with the Specification for Highway Works (SHW-Series 500 or 2500) and/or must be accredited with a BBA (The British Board of Agrément Roads and Bridges) or HAPAS (Highway Authority Product Approval Scheme) or equivalent certificate. The adopting authority (i.e. Yorkshire Water) will also be required to produce and submit a legally-binding undertaking to the Highway Authority explicitly stating that they have a full understanding of their obligations in relation to the systematic and cyclical inspection and structural assessment of any attenuation structure located within the highway footprint, in full compliance with the Well-managed Highway Infrastructure – A Code of Practice 2016 or any corresponding superseding document thereafter.

NOTE: References to "(as amended)" documents in the plans and specifications schedule below reflect the amendments made during the life of the application. Not all documents were updated to reflect these amendments.

Plans and specifications schedule:

Plan/document type	Reference	Version	Date received
Location plan	1820-SI-03		29/08/2019
Site Layout Plan	1820-SI-01	rev W	18/06/2021
Planning Layout (as amended)	1820-SI-04	rev M	18/01/2021
Chidswell House Type Booklet	1820-HT-01B	rev B	12/01/2021
Foundations plan (as amended)	OWL-WSP-XX-XX-DR-GE-000601	rev P03	23/10/2020
External Works / Site	CDW-WSP-XX-XX-	rev P04	23/10/2020

Levels Plan (sheet 1 of 2) (as amended)	DR-C-000001		
External Works / Site Levels Plan (sheet 2 of 2) (as amended)	CDW-WSP-XX-XX-DR-C-000002	rev P04	23/10/2020
Feasibility Drainage Design (sheet 1 of 2) (as amended)	CDW-WSP-XX-XX-DR-C-000501	rev P04	23/10/2020
External Works / Site Levels Plan (sheet 2 of 2) (as amended)	CDW-WSP-XX-XX-DR-C-000502	rev P01	23/10/2020
Streetscene A-A and C-C – Owl Lane Frontage	1820-SS-02B	rev B	18/01/2021
Affordable Housing	1820-SI-05A	rev A	20/01/2021
Drainage Exceedance Plan / Flood Routing	CHD_FE_01		15/01/2021
Driveway Specifications	MISC.003	rev B	17/05/2021
Proposed Chidswell Lane Access Arrangement	6590-0126	rev P03	16/06/2021
Landscape Masterplan	3558/1	rev F	20/01/2021
Chidswell LAP	18702.01		26/01/2021
Chidswell LEAP	18702.02		26/01/2021
Tank Sections A-A B-B	CHD_SD_01	rev A	26/01/2021
Tank Sections C-C	CHD_SD_02		24/02/2021
Tank Sections D-D	CHD_SD_03		11/06/2021
Sales Arena Layout	SAL 01	rev B	26/05/2021
Sales Arena External Works	EX-01		11/06/2021
Temporary Sales Arena Layout	SAL 02	rev A (corrected version received 26/05/2021)	26/05/2021
Planning Statement (as amended)	PB Planning, August 2019		29/08/2019
Design and Access Statement (as amended)	Parker Peel Architectural, 182-RE-01, August 2019		29/08/2019
Statement of Community Involvement	Royal Pilgrim Communications, August 2019		29/08/2019
Transport Assessment (as amended)	Via Solutions, 18159, 19/08/2019	issue 3	29/08/2019
Technical Note 1: Highways	Via Solutions, 21/11/2019		22/11/2019
Technical Note 2:	Via Solutions,		16/12/2019

Highways	16/12/2019		
Technical Note 3: Highways	Via Solutions, 13/07/2020		14/07/2020
Residential Travel Plan (as amended)	Via Solutions, 18159, 19/08/2019	issue 2	29/08/2019
Foul and Surface Water Drainage Strategy (as amended)	ARP, 1048/109r2, 30/10/2017		29/08/2019
Watercourse survey	Octane, 16/11/2020		17/12/2020
Watercourse survey plan	Octane, 26/11/2020		17/12/2020
Arboricultural Report (as amended)	BWB, July 2019		29/08/2019
Preliminary Ecological Appraisal Report	Brooks Ecological, R-4282-01A, August 2019		29/08/2019
Biodiversity Net Gain Assessment	BSG Ecology, P21-098, 05/03/2021		11/05/2021
Health Impact Assessment (as amended)	Savills, October 2019		21/10/2019
Noise Assessment (as amended)	SLR, 410.04993.00050, October 2019		24/10//2019
Noise response (regarding rugby noise)	SLR, 410.04993.00050, 23/10/2019		24/10/2019
Noise response	SLR, 410.04993.00050, 18/11/2020		24/11/2020
Air Quality Assessment (as amended)	SLR, 410.04993.00050, October 2019	rev 3	23/10/2019
Air quality response	SLR, 410.04993.00050, 12/11/2020		24/11/2020
Air quality response	SLR, 410.04993.00050, 27/05/2021		27/05/2021
Archaeology and Heritage Desk Based Assessment	MAP Archaeological Practice, MAP 5.38.2019, 05/11/2019	version A	14/10/2020
Specification for a Pre-determination Archaeological Evaluation by Trial Trenching	West Yorkshire Archaeology Advisory Service, December 2019		14/10/2020
Phase II Geo-Environmental Report	Groundtech Consulting,	rev 1.1	29/08/2019

	17047/117, 07/12/2018		
Preliminary Risk Assessment	Groundtech Consulting, 17047/091, 09/11/2017		09/10/2019
Permanent Gas Assessment	Groundtech Consulting, 17047/198, 30/04/2018		09/10/2019
Response regarding combustible soils	Groundtech Consulting, GRO-17047-1964, 19/11/2020		26/11/2020
Minerals Statement	Groundtech Consulting, 17047/922, 08/08/2019		29/08/2019

Pursuant to article 35 (2) of the Town and Country Planning (Development Management Procedure) Order 2015 and the National Planning Policy Framework, the Local Planning Authority have, where possible, made a pre-application advice service available, complied with the Kirklees Development Management Charter 2015, and otherwise actively engaged with the applicant in dealing with the application. During the life of the application the case officer undertook negotiations with the applicant to secure further information and drawings relating to quantum, layout, highways, drainage, biodiversity, archaeology, noise, air quality, site contamination, unit sizes, affordable housing and other planning matters. The Council proactively engaged with the applicant in order to ensure relevant planning matters were addressed..

Building Regulations Approval is required for most work involving building operations and/or structural alterations. It is the applicant's responsibility to find out if the work permitted by this planning permission needs approval under the Building Regulations, and if necessary to submit an application. If you are not the applicant can you please ensure the applicant is aware of this requirement. Contact Building Control on Telephone: (01484) 221550 for more information.

It is the applicant's responsibility to find out whether any works approved by this planning permission, which involve excavating or working near public highway and any highway structures including retaining walls, will require written approval from the Council's Highways Structures Section. Please contact the Highways Structures Section on Tel No. 01484-221000 Ext 74199 for further advice on this matter.

Details Reserved by Condition

- **This permission has been granted subject to conditions. Some of the conditions may require you to submit further details. These conditions normally contain the wording "*submitted to and approved in writing by the Local Planning Authority*".**

- **You can apply online for approval of these details at the Planning Portals website at www.planningportal.gov.uk. Alternatively the forms and supporting guidance for submitting an application can be found online at www.kirklees.gov.uk/planning.**

- **This Authority recognises the need to ensure that you are able to develop the site as effectively and flexibly as possible. However, at the same time it must ensure that development is in accordance with the terms of the planning conditions and legal agreement and the expectations of elected members and local residents set through the decision process.**

- **You should note the triggers for compliance with the conditions of this planning permission. This Authority is committed to processing applications to discharge conditions in a timely manner. It is important to ensure that submissions are made as far in advance of the trigger to allow time for adequate consultation, discussion and in some circumstances publicity.**

- **It is important that applications to discharge conditions are accompanied by sufficient information to enable this Authority and its consultees to fully consider and determine the proposals. Whilst officers will endeavour to negotiate solutions, failure to provide a comprehensive submission may result in delay and refusal of the application.**

- **If you commence work without discharging conditions you are at risk of enforcement action and invalidating your permission if the planning condition is a pre commencement condition.**

Development within a Coal Mining Area

The proposed development lies within an area that has been defined by the Coal Authority as containing potential hazards arising from former coal mining activity at the surface or shallow depth. These hazards can include: mine entries (shafts and adits); shallow coal workings; geological features (fissures and break lines); mine gas and former surface mining sites. Although such hazards are seldom readily visible, they can often be present and problems can occur in the future, particularly as a result of new development taking place.

It is recommended that information outlining how former mining activities may affect the proposed development, along with any mitigation measures required (for example the need for gas protection measures within the foundations), is submitted alongside any subsequent application for Building Regulations approval (if relevant).

Any form of development over or within the influencing distance of a mine entry can be dangerous and raises significant land stability and public safety risks. As a general precautionary principle, the Coal Authority considers that the building over or within the influencing distance of a mine entry should be avoided. In exceptional circumstance where this is unavoidable, expert advice must be sought to ensure that a suitable engineering design which takes into account all the relevant safety and environmental risk factors, including mine gas and mine-water. Your attention is drawn to the Coal Authority Policy in relation to new development and mine entries available at: www.gov.uk/government/publications/building-on-or-within-the-influencing-distance-of-mine-entries

Any intrusive activities which disturb or enter any coal seams, coal mine workings or coal mine entries (shafts and adits) requires a Coal Authority Permit. Such activities could include site investigation boreholes, excavations for foundations, piling activities, other ground works and any subsequent treatment of coal mine workings and coal mine entries for ground stability purposes. Failure to obtain a Coal Authority Permit for such activities is trespass, with the potential for court action.

If any coal mining features are unexpectedly encountered during development, this should be reported immediately to the Coal Authority on 0345 762 6848. Further information is available on the Coal Authority website at: www.gov.uk/government/organisations/the-coal-authority

Digital Infrastructure: Fibre To The Property (FTTP)

Access to affordable and reliable broadband is necessary for Kirklees' residents, businesses, and visitors to take advantage of the growing digital economy and 'digital by default' services. Fibre optic cables direct to a property (FTTP) is the most reliable way of delivering high speed broadband connectivity and allows for gigabit internet speeds. Access to high quality digital infrastructure provides the foundations for, amongst other things:

- Economic prosperity – workforces that are digitally-literate enables business to thrive.
- Digital literacy – digital literacy and skills increase employability and people can exploit the internet for transactional, social, entertainment and learning purposes.
- New services – digital delivery can lower costs and provide innovative public and health services more conveniently.

It is therefore advised that digital infrastructure, including FTTP, and its benefits for the development be considered from the earliest feasible stage. Methods include working with Internet Service Providers to install digital infrastructure alongside other utilities or providing pre-infrastructure allowing for speeder installation at a later date.

To discuss the benefits that FTTP may have for your development, please contact Carl Tinson in Kirklees Council's Digital Team at carl.tinson@kirklees.gov.uk.

Note: The provision of fibre infrastructure is often available from certain telecommunications providers free of charge for development over a certain scale, provided that sufficient notice is given. Notice periods are typically at least 12 months prior to first occupation. In some cases, providers may request a contribution from the developer.

Note: Where no telecommunications provider has been secured to provide fibre infrastructure by the time of highway construction, it is advised that additional dedicated telecommunications ducting is incorporated alongside other utilities to enable the efficient and cost effective provision of fibre infrastructure in the future.

The application has been publicised by notice(s) in the vicinity of the site. It is respectfully requested that the notice(s) now be removed and responsibly disposed of to avoid harm to the appearance of the area

Appeals to the Secretary of State

- **If you are aggrieved by the decision of your local planning authority to grant it subject to conditions, then you can appeal to the Secretary of State under section 78 of the Town and Country Planning Act 1990.**
- **If an enforcement notice is served relating to the same or substantially the same land and development as in your application and if you want to appeal against your Local Planning Authority's decision on your application, then you must do so within:**

  i) 28 days of the date of service of the enforcement notice, or
  ii) within the specified period, starting on the date of this notice,

  whichever period expires earlier.

- **If you want to appeal against your Local Planning Authority's decision then you must do so within the specified period, starting on the date of this notice.**

- **The "specified period" is 12 weeks where the development relates to a "minor commercial application" as defined within the Town and Country Planning (Development Management Procedure) Order 2010 (as amended), or 6 months in any other case.**
- **Appeals must be made using a form which you can get from the Secretary of State at Temple Quay House, 2 The Square, Temple Quay, Bristol BS1 6PN (Tel: 0303 444 5000) or online at https://www.gov.uk/planning-inspectorate. Further information on the Planning Appeal process can be found online at the Planning Inspectorates website https://www.gov.uk/government/organisations/planning-inspectorate.**
- **You must use the correct Planning Appeal Form when making your appeal. If requesting forms from the Planning Inspectorate, please state the type of application that the appeal relates to so they can send you the appeal form you require.**
- **The Secretary of State can allow a longer period for giving notice of an appeal, but he will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal.**
- **The Secretary of State need not consider an appeal if it seems to him that the local planning authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.**
- **In practice, the Secretary of State does not refuse to consider appeals solely because the local planning authority based their decision on a direction given by him.**

Please note, only the applicant possesses the right of appeal.

Purchase Notices

- **If either the local planning authority or the Secretary of State refuses permission to develop land or grants it subject to conditions, the owner may claim that he can neither put the land to a reasonably beneficial use in its existing state nor render the land capable of a reasonably beneficial use by the carrying out of any development which has been or would be permitted.**

In these circumstances, the owner may serve a purchase notice on the Council. This notice will require the Council to purchase his interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990.

An important part of improving our service is to review your feedback on the way that we have dealt with your planning application(s). Please take a couple of minutes to email your comments to dc.admin@kirklees.gov.uk so that we can work on continually improving our customer service. Thank you.

Dated: 24-Jun-2021

David Shepherd
Strategic Director Growth and Regeneration

Application Plans

The decision notice indicates which plan/s relate to the decision.

Plans can be viewed on the Planning and Building Control web site:

http://www.kirklees.gov.uk/business/planning/planning.asp

If a paper copy of the decided plan is required please email:

dc.admin@kirklees.gov.uk

or telephone 01484 414746 with the application number.

There may be a charge for this service.

Address to which all communications should be sent:

Planning, Strategic Investment Service,
PO Box B93, Civic Centre 3, Off Market Street, Huddersfield, HD1 2JR

The Coal Authority

Application for an incidental coal agreement
(permission to dig and carry away coal in the course of non-mining activities)

The complete application form (either as a pdf or hard copy) should be sent to us at licensing&permissions@coal.gov.uk or

Licensing Team
The Coal Authority
200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

Please complete the following information. If there is insufficient space in a relevant box please indicate and append the additional details.

1. Applicant

Name of organisation/company	SIRIUS REMEDIATION LTD.
Name of primary contact	PHILIP HUGHES
Address	RUSSEL HOUSE MILL ROAD LANGLET MOOR DURHAM
Email	
Contact number	
Company number (if appropriate)	N/A.

Consultant for purposes of managing the application *(if any)*

Name of organisation/company	SIRIUS REMEDIATION LTD

Name of primary contact	PHILIP HUGHES
Address	RUSSEL HOUSE MILL ROAD LANGLEY MOOR DURHAM DH7 8HJ
Email	
Contact number	
Company number (if appropriate)	

Legal representative *(if any)*

Name of organisation/company	
Name of primary contact	
Address	
Email	
Contact number	
Company number (if appropriate)	

2. General information

2.1 *Site details*

Please provide the following information (appended to the application where necessary):

Name given to the proposed Agreement applied for	CHIDSWELL LANE
National grid reference of the centre of the application area	426577 422766
The application area in hectares	7.7 hectares
The reference number(s) of any Coal Authority Permit to Enter and Disturb Coal Mining Interests and/or Mining Report which has been obtained in relation to the development	N/A.

		Appended	
An Ordnance Survey based plan showing the features described to the right *(on a scale suitable for accurately delineating those features)*	The application area defined by a red line	☑	ATTACHED AND SEE LINK TO PLANNING APPLICATION
	Details of the extent and depth of seams to be excavated	☑	
	The area of the whole development in relation to the area of coal to be excavated	☑	DRAWING ATTACHED
	The location of the proposed structures / earthworks to be constructed on the site	☑	SEE LINK TO PLANNING APPLICATION UNDER "PLANS"
	Surface and major sub-surface structures and services within and adjacent to the site that are not to be re-located as part of the development		

The information to be provided above must demonstrate that the proposed coal extraction is limited to that which is necessary to allow the development to proceed

2.2 *Coal recovery*

Please provide the following information:

The coal seam name(s) (if known)	LOW HAIGH COAL (LHC) TOP HAIGH MOOR COAL (THMC)
The expected thickness of the coal seam(s)	LHC = 0.5m THMC = 0.9m TO 1.38m
The anticipated amount of coal to recovered in tonnes	300 tonnes
The anticipated coal quality and market (if known)	N/A.
The proposed start date and duration of the coal excavation operations	3RD AUGUST 2021

2.3 Planning permission

Please provide details of planning permission for the development including:

The name of the Planning Authority	KIRKLEES COUNCIL
The date of the planning permission	24TH JUNE 2021

Details in the permission relating to the coaling operation **including evidence of the requirement and consent to remove the coal**	CONDITION 16. REQUEST FOR ADDITIONAL COAL RISK ASSESSMENT. REPORT: GRO 17047-2021
A copy of (or the relevant electronic link to) the planning consent for the development	APPLICATION NUMBER 2019/62/92787/E. ATTACHED.
Link	kirklees.gov.uk/beta/planning-applications/search-for-planning-applications/detail.aspx?id=2019%2f92787

2.3 *Mine entries and mine workings*

Please provide details of old mine entries and old workings expected to be encountered during coal extraction operations together with proposals for treating them in accordance with the appropriate current standards[1]. Details of any desk study and site investigation confirming this information should be provided, normally by reference to the Coal Authority's Permitting process.
ATTACHED - SUPPLEMENTARY COAL MINING RISK ASSESSMENT. CHIDSWELL LANE, CHIDSWELL, BARRATT AND DAVID WILSON HOMES (YORKSHIRE WEST) LTD. JANUARY 2021. REPORT REF. GRO 17047-2021 TWO COAL SEAMS UNDERLIE THE SITE. SHAFT CONSTRUCTION CONSIDERED UNLIKELY. COAL PRESENT ON LOW QUALITY AND UNLIKELY WORKED. PRESENCE OF MINE ENTRIES CONSIDERED UNLIKELY.

2.5 *Safety and environment*

Please provide proposals to address environmental and safety issues, both operationally and to the public[2], including copies of the relevant Risk Assessments and details of measures the applicant will take to prevent or remedy:

Spontaneous combustion of coal	COAL TO BE STACKED IN LAYERS, SUBJECT TO MECHANICAL EXCAVATION, AND SUBJECT TO WATER SPRAYING
Uncontrolled emissions of mine gas or water	GROUNDWATER BELOW COAL SEAMS. NOT EXPECTED TO EXCAVATE TO WATER TABLE. LOW GROUND GAS POTENTIAL
Subsidence or instability including collapse of shallow mine workings or mine entries	NO EVIDENCE OF WORKINGS OR ADITS NOTED.

1 Applicants should be conversant with all current applicable legislation and be familiar with and take account of the advice and references contained in publications relevant to the circumstances from authorities such as :-

British Drilling Association (BDA) – Health & Safety Manual for Land Drilling 2015.

Construction Industry Research & Information Association (CIRIA) – C758D , Abandoned Mine workings Manual.

Planning Policy Guidance Notes – PPG 14 (1990): Development on Unstable Land & PPG 14 Annex 2 (2002): Subsidence and Planning.

British Standards Institute – Code of Practice For Site Investigations – BS5930:2015

2 Former coal mine workings can contain both mine gas and water, sometimes under pressure and it is an offence under the Water Industry Act 1991 to leave an artesian borehole running to waste. Contractors should be competent and have the necessary experience to enter mine workings.

Guidance on managing the risk from hazardous gases when carry out operations near coal and former coal mine workings (including shafts and adits) has now been published and is available to download (free of charge) from the Coal Authority's website.

Any other hazard directly or indirectly caused by or related to the proposed activities	No.

It should be noted that the effects of any works may extend beyond the site boundary and the measures should cover both the duration of the works and after completion of the works

3. Payment for incidental coal and security

3.1 Proceeds from any coal sold under the provisions of an Incidental Coal Agreement are retained by the Agreement holder but under the provisions of the Agreement we require a payment for the coal dug and carried away.

3.2 We charge a standard royalty per tonne of coal produced.

3.3 If we revise our charges these Guidance Notes will be revised and the information will be published on our website (https://www.gov.uk/government/organisations/the-coal-authority).

3.4 In certain cases we may require security for liabilities including, but not limited to, default on such items as production related payments for the coal, treatment of shafts and adits and the sealing of old workings in excavated faces. Security will be on a site specific basis and discussed with the Applicant during the processing of the application.

4. Declaration

The applicant as named in Section 1 above, hereby:

(a) submits an application to the Coal Authority as described above
(b) certifies that the information provided is correct and not misleading
(c) certifies that the required application fee has been paid to the Coal Authority

Print name	PHILIP HUGHES	Date	29.07.2021

APPENDIX D

LABORATORY GEOTECHNICAL TESTING RESULTS

LABORATORY REPORT

Contract Number: PSL23/6655

Report Date: 14 August 2023

Client's Reference: SR3786

Client Name: Sirius Leeds
4245 Park Approach
Century Way
Thorpe Park
Leeds
LS15 8GB

For the attention of: Jack Holdsworth

Contract Title: Chidswell (Phase 2)

Date Received: 9/8/2023
Date Commenced: 9/8/2023
Date Completed: 11/8/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
GF101		B			Class 2C
GF102		B			Class 2C
GF103		B			Class 2C

UKAS TESTING 4043

PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell (Phase 2)

Contract No:
PSL23/6655
Client Ref:
SR3786

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
GF101		B			18		2.63					
GF102		B			17		2.65					
GF103		B			18		2.62	45	23	22	68	Intermediate Plasticity CI

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell (Phase 2)

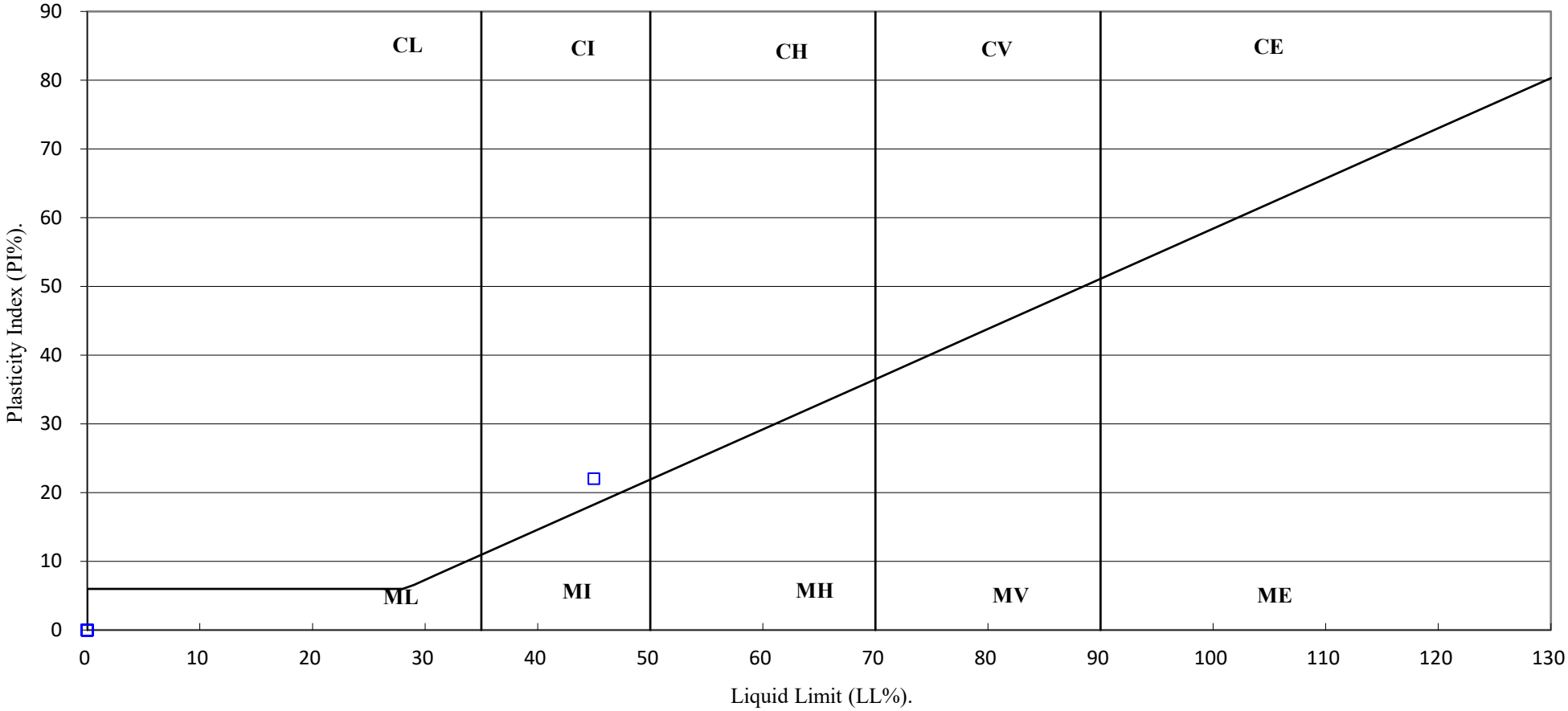
Contract No:

PSL23/6655

Client Ref:

SR3786

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	Chidswell (Phase 2)	Contract No: PSL23/6655 Client Ref: SR3786

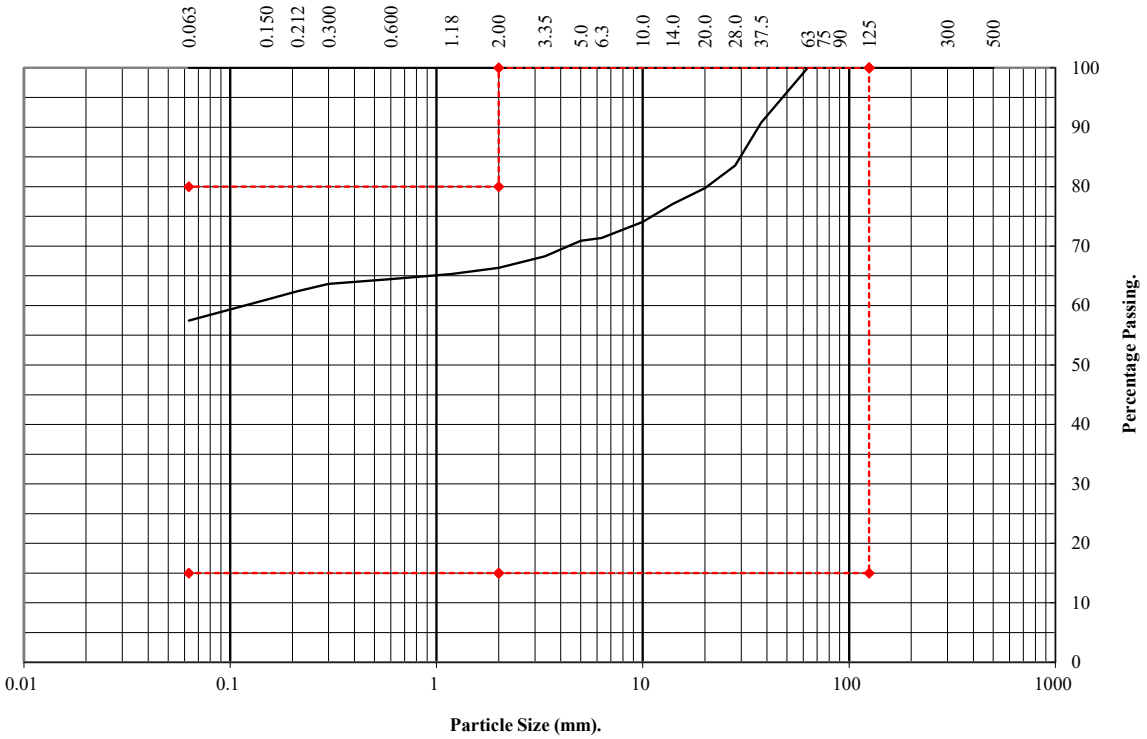
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Reference **GF101** **Classification Type:** **2C**



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements Lower	Upper
500	100		
300	100		
125	100	100	100
90	100		
75	100		
63	100		
37.5	91		
28	84		
20	80		
14	77		
10	74		
6.3	71		
5	71		
3.35	68		
2	66	15	80
1.18	65		
0.6	64		
0.3	64		
0.212	62		
0.15	61		
0.063	57	15	80

Remarks:
SHW Series 600 Table 6/2 :
Class 2C

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell (Phase 2)

Contract No.:
PSL23/6655
Client Ref:
SR3786

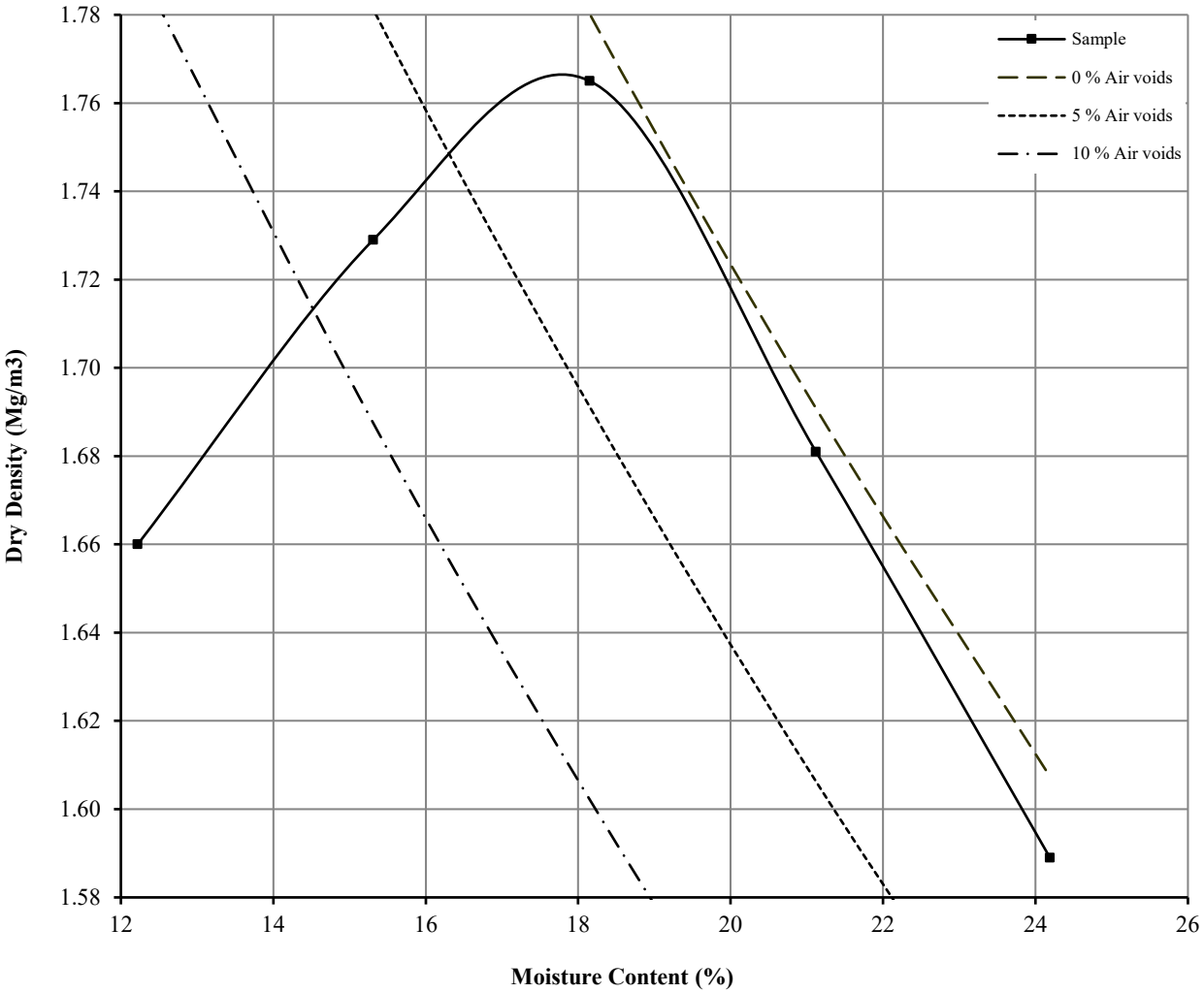
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.4 : 1990

Hole Number: GF101 **Top Depth (m) :**

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		18	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.63	Measured	Material Retained on 37.5 mm Test Sieve (%):		9
Maximum Dry Density (Mg/m3):		1.77	Material Retained on 20.0 mm Test Sieve (%):		11
Optimum Moisture Content (%):		18			
Remarks See summary of soil descriptions					

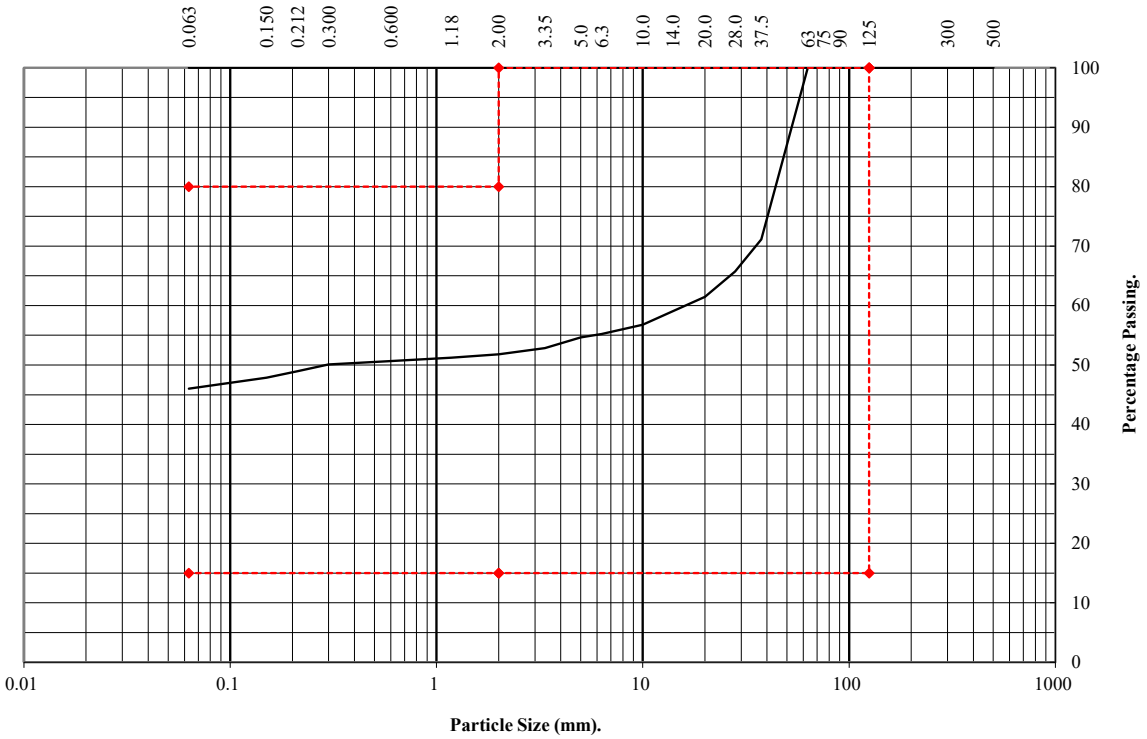
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Reference **GF102** **Classification Type:** **2C**



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements Lower	Upper
500	100		
300	100		
125	100	100	100
90	100		
75	100		
63	100		
37.5	71		
28	66		
20	61		
14	59		
10	57		
6.3	55		
5	55		
3.35	53		
2	52	15	80
1.18	51		
0.6	51		
0.3	50		
0.212	49		
0.15	48		
0.063	46	15	80

Remarks:
SHW Series 600 Table 6/2 :
Class 2C

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell (Phase 2)

Contract No.:
PSL23/6655
Client Ref:
SR3786

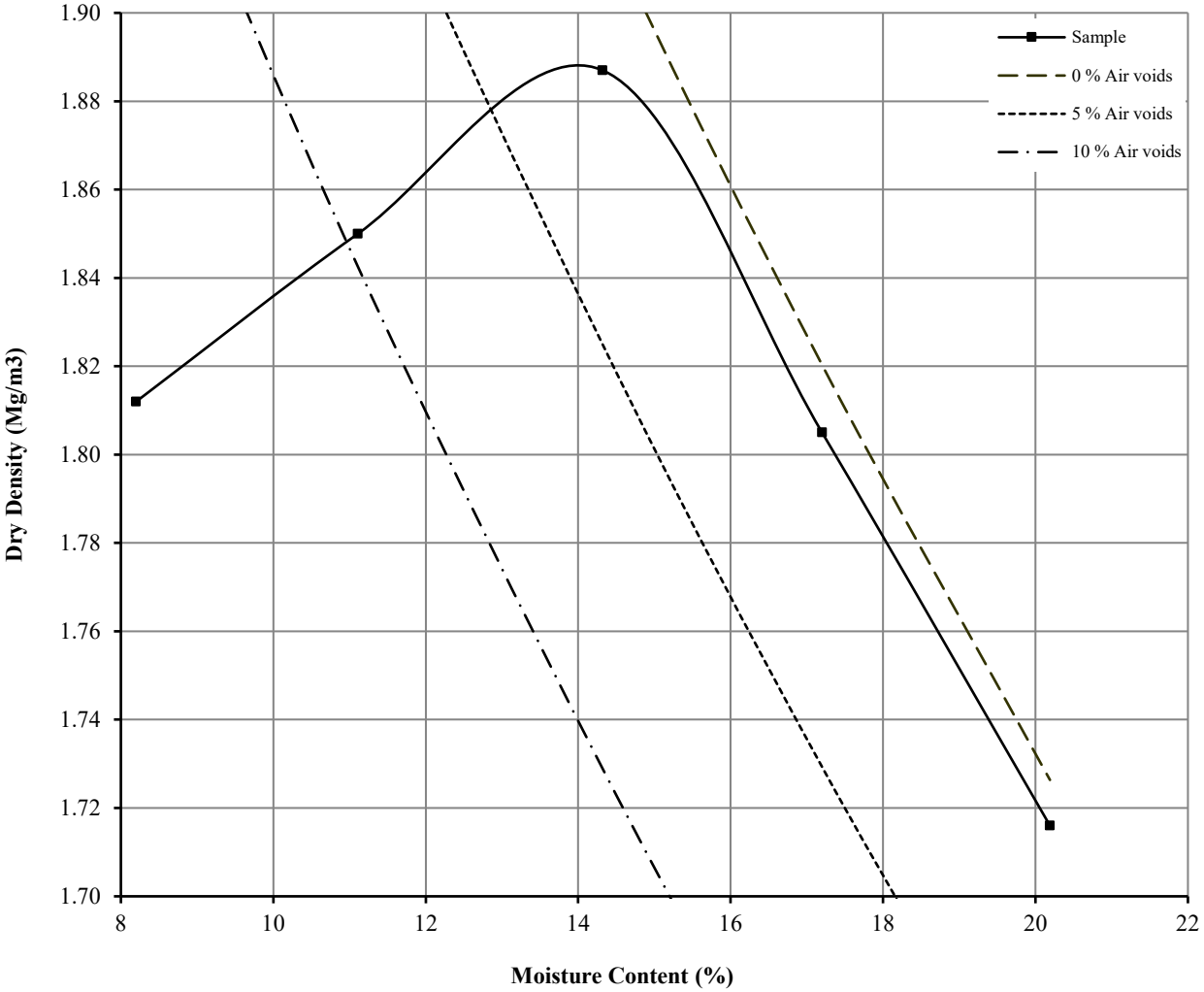
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number: GF102 **Top Depth (m) :**

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		17	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Measured	Material Retained on 37.5 mm Test Sieve (%):		29
Maximum Dry Density (Mg/m3):		1.89	Material Retained on 20.0 mm Test Sieve (%):		10
Optimum Moisture Content (%):		14			
Remarks See summary of soil descriptions					

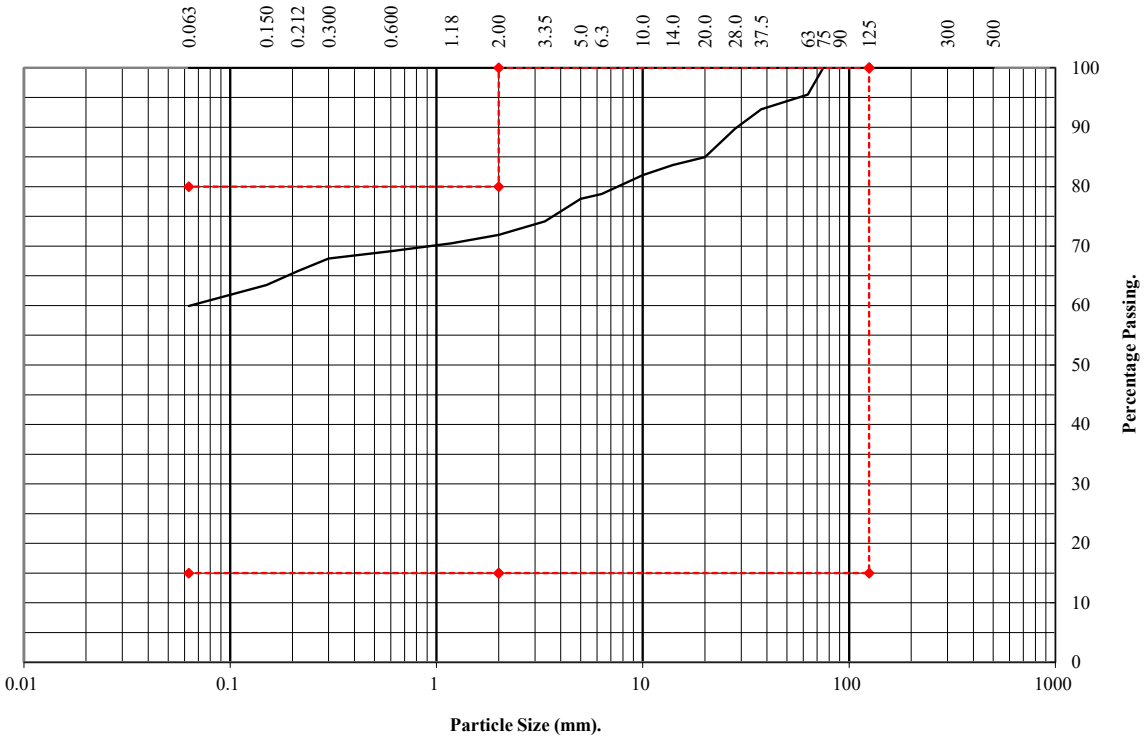
PARTICLE SIZE DISTRIBUTION TEST

BS1377:Part 2:1990

Wet Sieve: Clause 9.2

Classification for Acceptable Earthworks Materials

Sample Reference **GF103** **Classification Type:** **2C**



BS Test Sieve mm	Percentage Passing %	Table 6/2 Grading Requirements Lower	Upper
500	100		
300	100		
125	100	100	100
90	100		
75	100		
63	95		
37.5	93		
28	90		
20	85		
14	84		
10	82		
6.3	79		
5	78		
3.35	74		
2	72	15	80
1.18	70		
0.6	69		
0.3	68		
0.212	66		
0.15	63		
0.063	60	15	80

Remarks:
SHW Series 600 Table 6/2 :
Class 2C

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell (Phase 2)

Contract No.:
PSL23/6655
Client Ref:
SR3786

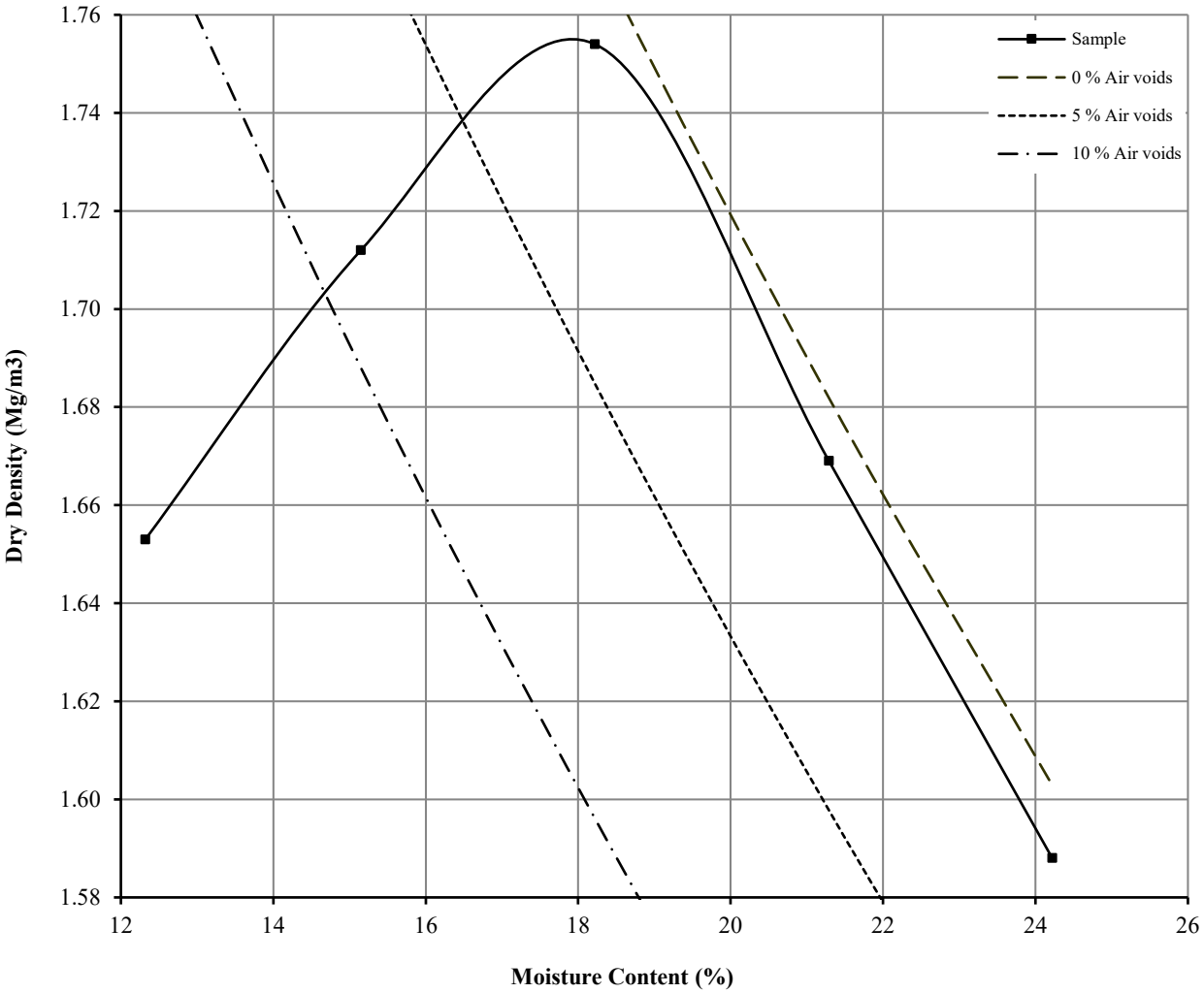
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.4 : 1990

Hole Number: GF103 **Top Depth (m) :**

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		18	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.62	Measured	Material Retained on 37.5 mm Test Sieve (%):		7
Maximum Dry Density (Mg/m3):		1.75	Material Retained on 20.0 mm Test Sieve (%):		8
Optimum Moisture Content (%):		18			
Remarks See summary of soil descriptions					

LABORATORY REPORT

Contract Number: PSL23/6975

Report Date: 12 September 2023

Client's Reference: SR3786

Client Name: Sirius Leeds
4245 Park Approach
Century Way
Thorpe Park
Leeds
LS15 8GB

For the attention of: Jack Holdsworth

Contract Title: Chidswell (Phase 2)

Date Received: 21/8/2023
Date Commenced: 21/8/2023
Date Completed: 12/9/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
GF104		B			Class 2C
GF105		B			Class 2C

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell (Phase 2)	Contract No:
	PSL23/6975
	Client Ref:
	SR3786

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
GF104		B			12		2.67					
GF105		B			16		2.69					

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell (Phase 2)

Contract No:

PSL23/6975

Client Ref:

SR3786

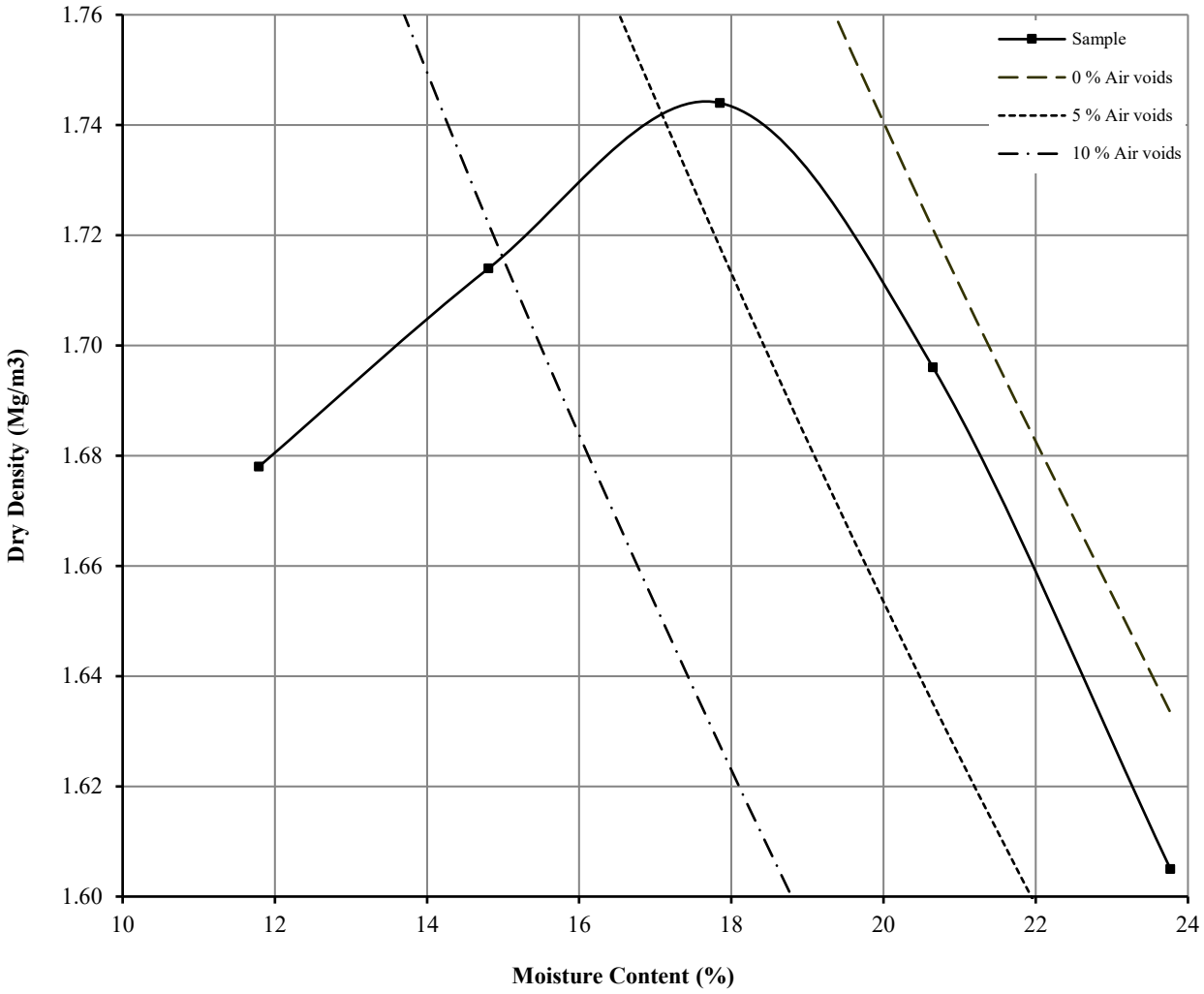
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.4 : 1990

Hole Number: GF104 **Top Depth (m) :**

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		12	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.67	Measured	Material Retained on 37.5 mm Test Sieve (%):		3
Maximum Dry Density (Mg/m3):		1.74	Material Retained on 20.0 mm Test Sieve (%):		9
Optimum Moisture Content (%):		18			
Remarks See summary of soil descriptions					

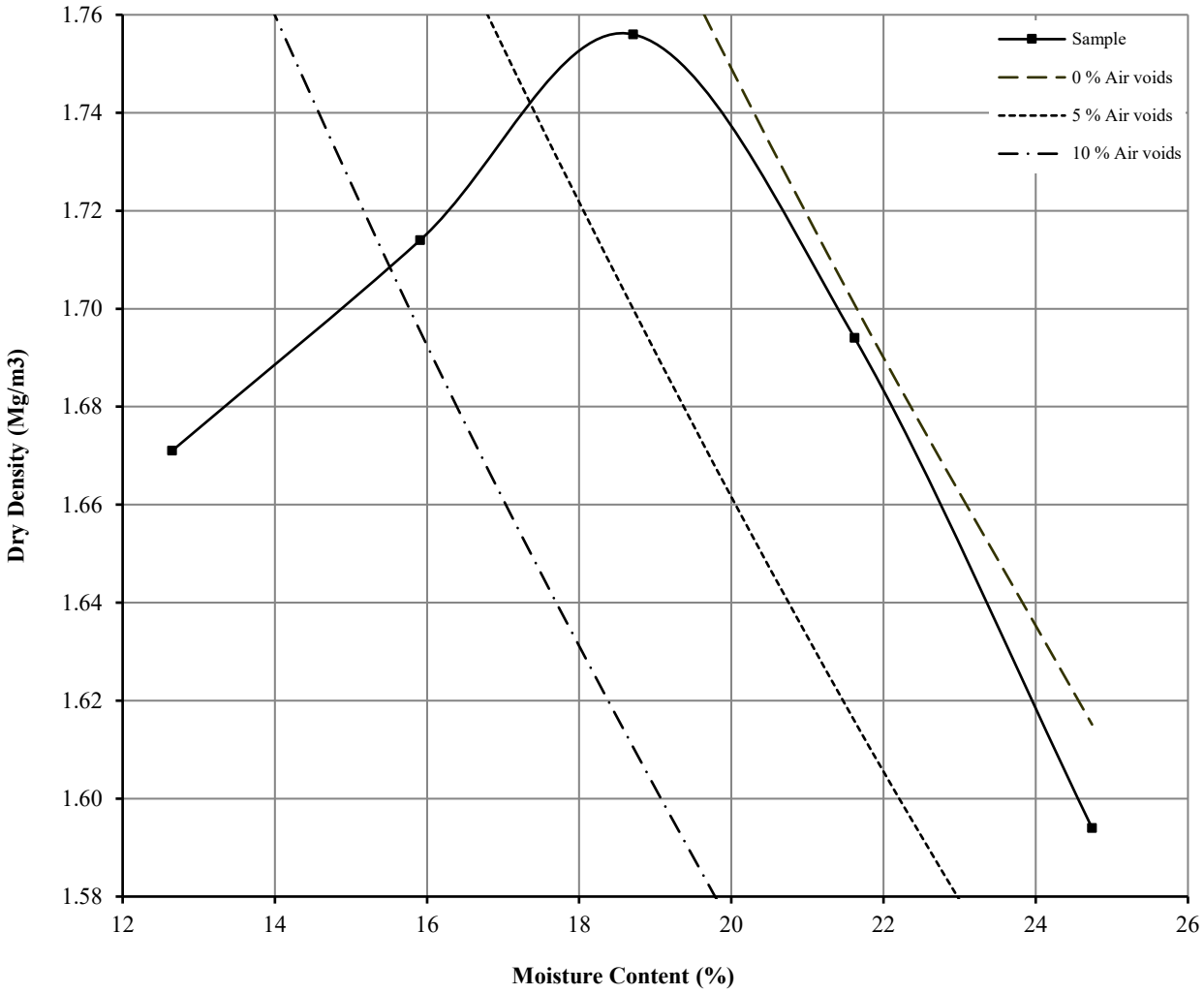
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.4 : 1990

Hole Number: GF105 **Top Depth (m) :**

Sample Number: **Base Depth (m) :**

Sample Type: B



Initial Moisture Content:		16	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.69	Measured	Material Retained on 37.5 mm Test Sieve (%):		3
Maximum Dry Density (Mg/m3):		1.76	Material Retained on 20.0 mm Test Sieve (%):		7
Optimum Moisture Content (%):		19			
Remarks See summary of soil descriptions					

APPENDIX E

IN-SITU GEOTECHNICAL TESTING RESULTS

LABORATORY REPORT

Contract Number: PSL23/5980

Report Date: 21 July 2023

Client's Reference:

Client Name: Sirius
4245 Park Approach
Century Way
Thorpe Park
Leeds
LS15 8GB

For the attention of: Jack Holdsworth

Contract Title: Owl Lane, Chidswell

Date Received: 20/7/2023
Date Commenced: 20/7/2023
Date Completed: 21/7/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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

SUMMARY OF INSITU TESTS

BS1377 : PART : 9 : 1990

Position Number	Layer Number	Sample Number	Depth (m)	Date Tested	Moisture Content %	Bulk Density Mg/m^3 Clause 2.2	Dry Density Mg/m^3 Clause 2.2	Remarks
STI-2				20/07/2023	15	1.78	1.55	Class 2C
STI-2				20/07/2023	16	1.75	1.51	Class 2C
STI-4				20/07/2023	18	1.96	1.66	Class 2C
STI-4				20/07/2023	18	1.95	1.65	Class 2C
STI-6				20/07/2023	17	2.01	1.71	Class 2C
STI-6				20/07/2023	16	1.99	1.72	Class 2C
STI-8				20/07/2023	15	1.91	1.66	Class 2C
STI-8				20/07/2023	15	1.90	1.65	Class 2C
STI-10				20/07/2023	16	1.84	1.59	Class 2C
STI-10				20/07/2023	15	1.88	1.63	Class 2C

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Owl Lane,Chidswell

Contract No:

PSL23/5980

Client Ref:

LABORATORY REPORT

Contract Number: PSL23/6579

Report Date: 09 August 2023

Client's Reference:

Client Name: Sirius Durham
Suite 2, Russel House
Mill Road
Langley Moor
Durham
DH7 8HJ

For the attention of: Angela Gregory

Contract Title: Chidswell Lane, Dewsbury

Date Received: 8/8/2023
Date Commenced: 8/8/2023
Date Completed: 9/8/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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)

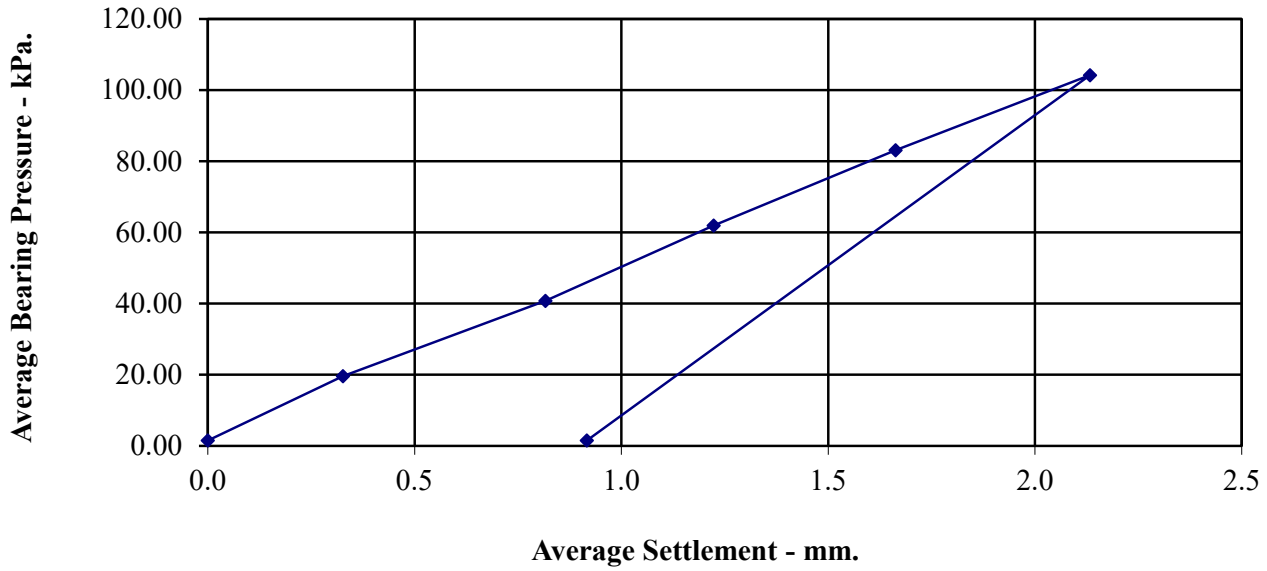
5 – 7 Hexthorpe Road,
Hexthorpe,
Doncaster,
DN4 0AR

VERTICAL DEFORMATION TESTS.

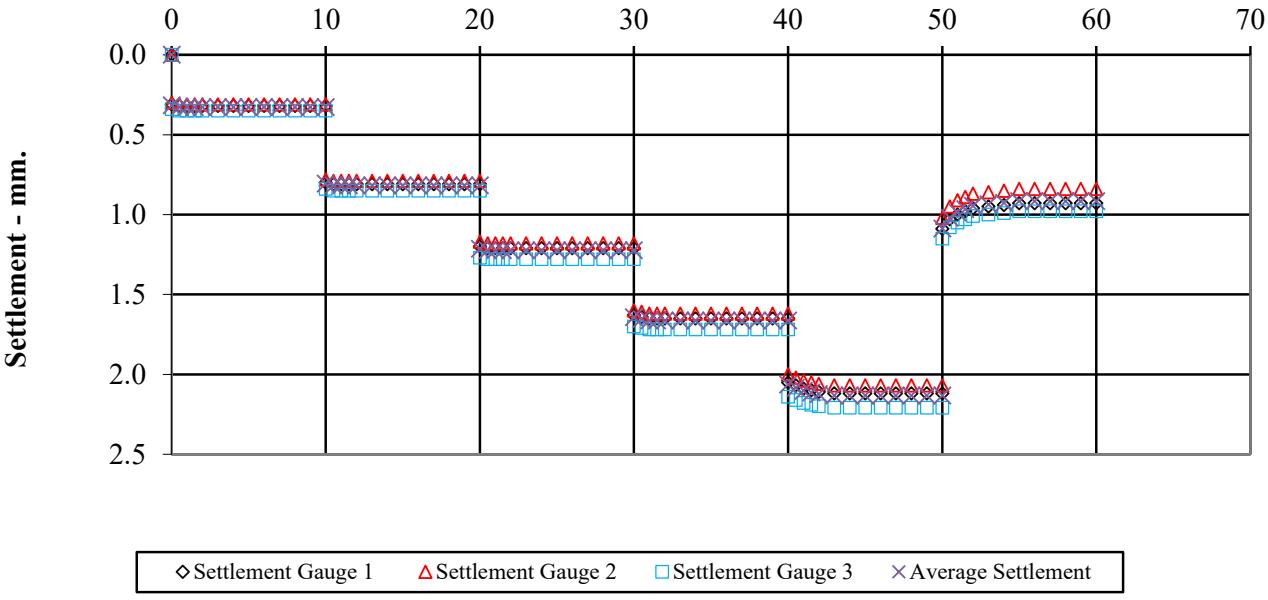
BS 1377 : Part 9 : 1990.

Date of Test:	**08-Aug-23**	**Test Ref:**	**PBT 1**
Grid Ref:		**Depth (m):**	**GL**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa):	**104.22**
Maximum Deformation (mm):	**2.13**
Plate Area (m2):	**0.2922**
Description:	**Class 2C**



Time - minutes.



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell Lane, Dewsbury

Contract No:
PSL23/6579
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

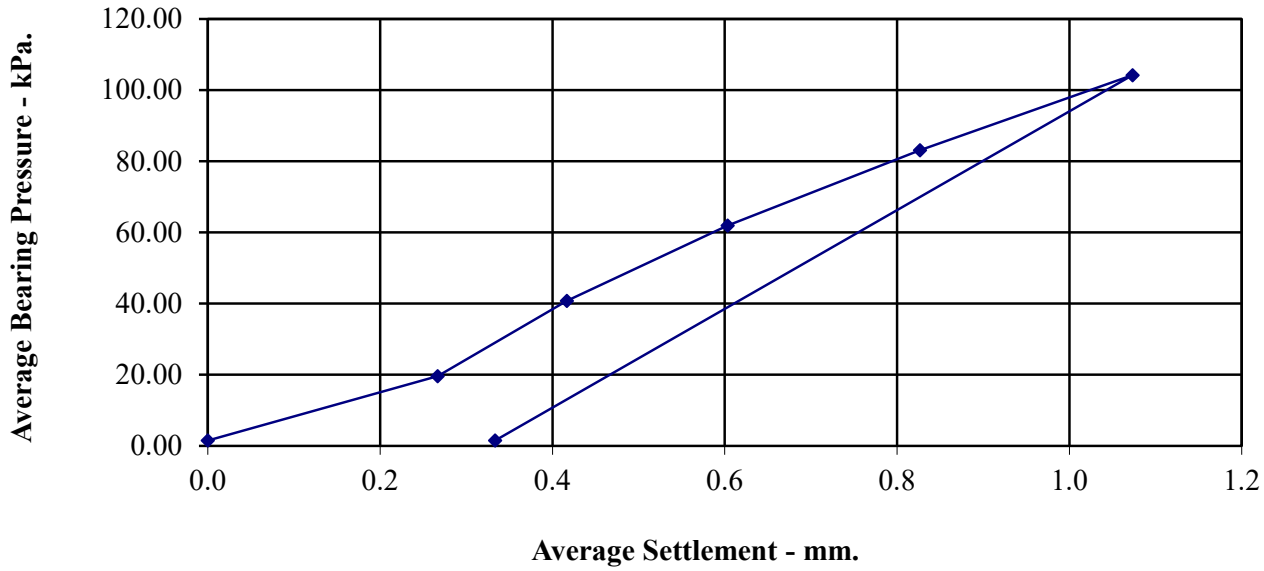
Date of Test	**8-Aug-23**	
Test Ref	**PBT 1**	
Depth (m)	**GL**	
Grid Ref		
Layer		
Comments		
Description	**Class 2C**	
Maximum Deflection	**2.13**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**63**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**41.3**	**kN/m^2/mm**
CBR Value	**6.1**	**%**

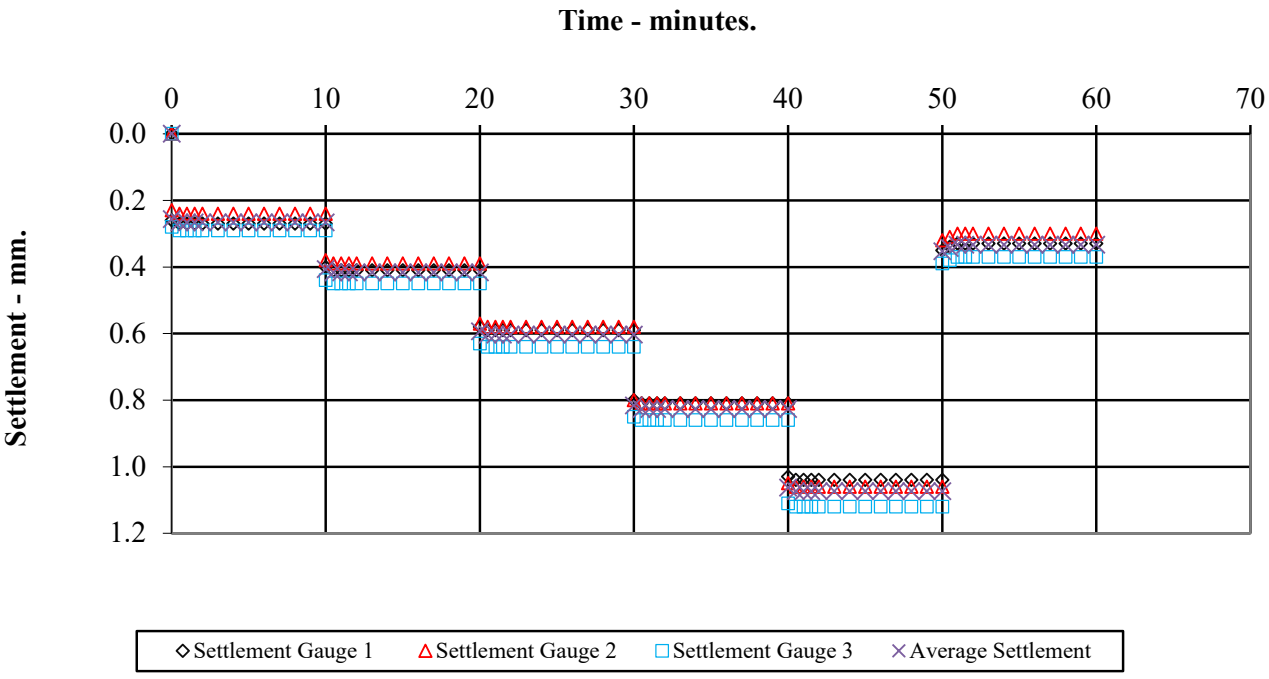
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**08-Aug-23**	**Test Ref:**	**PBT 2**
Grid Ref:		**Depth (m):**	**GL**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa):	**104.22**
Maximum Deformation (mm):	**1.07**
Plate Area (m2):	**0.2922**
Description:	**Class 2C**





UKAS TESTING 4043	**Chidswell Lane, Dewsbury**	**Contract No:** PSL23/6579
PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY		**Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

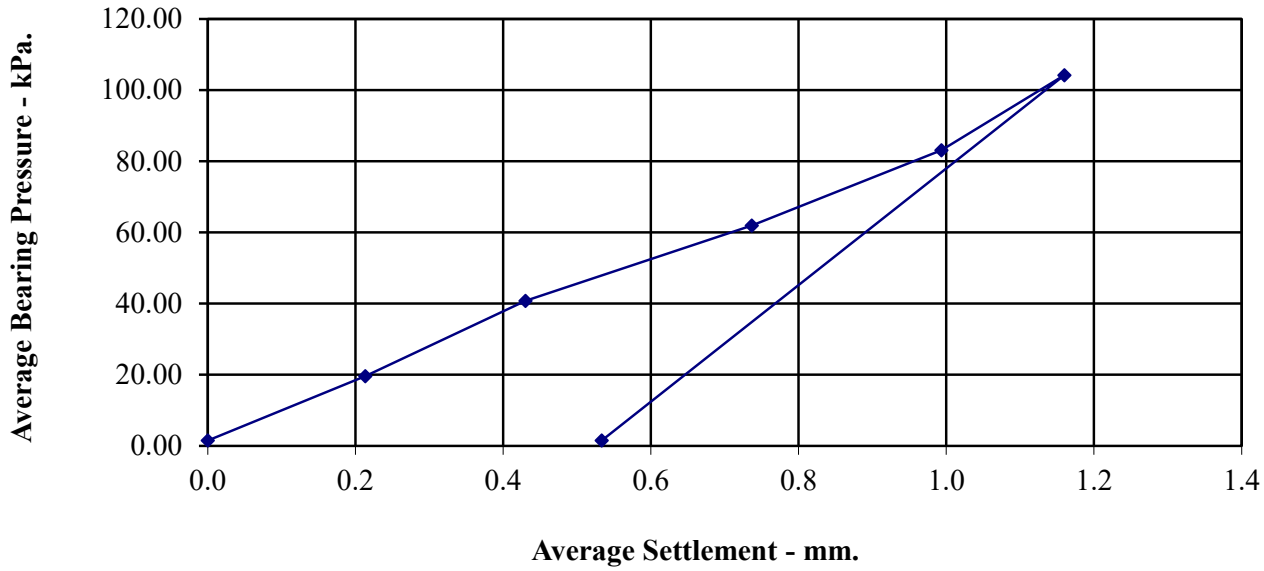
Date of Test	**8-Aug-23**	
Test Ref	**PBT 2**	
Depth (m)	**GL**	
Grid Ref		
Layer		
Comments		
Description	**Class 2C**	
Maximum Deflection	**1.07**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.07mm	**104**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**> 68.1**	**kN/m^2/mm**
CBR Value	**> 14.5**	**%**

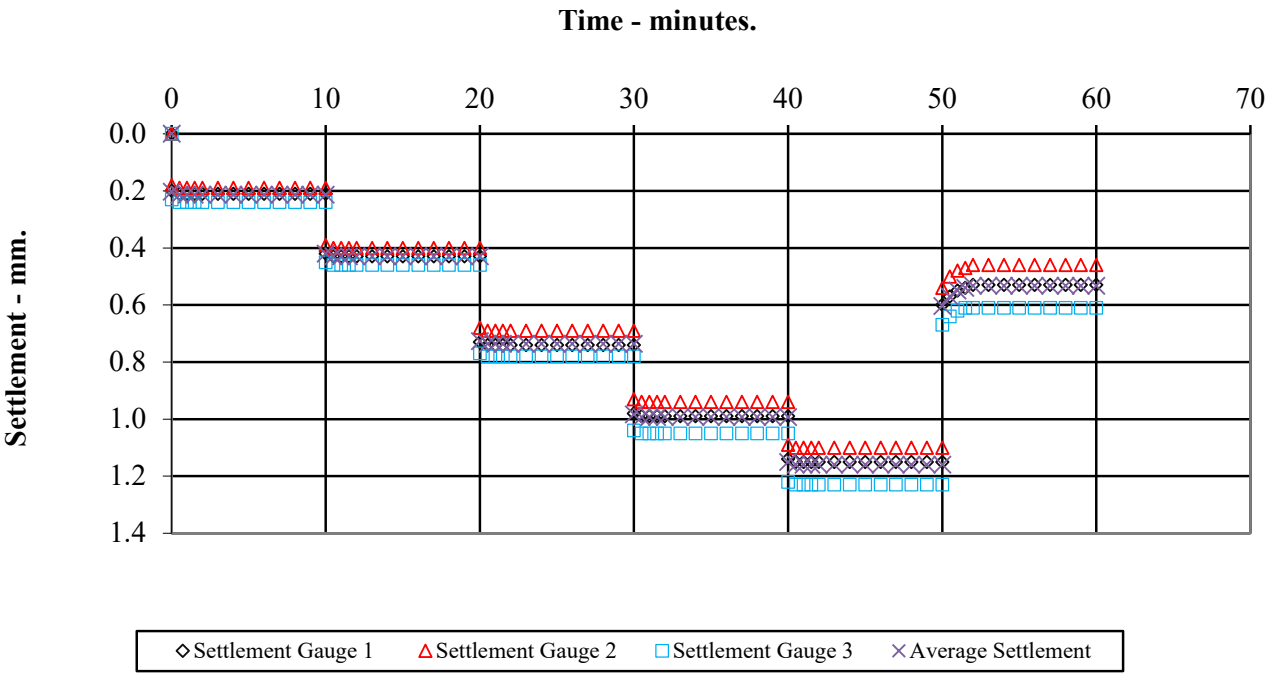
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**08-Aug-23**	**Test Ref:**	**PBT 3**
Grid Ref:		**Depth (m):**	**GL**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa):	**104.22**
Maximum Deformation (mm):	**1.16**
Plate Area (m2):	**0.2922**
Description:	**Class 2C**





UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell Lane, Dewsbury

Contract No:
PSL23/6579
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

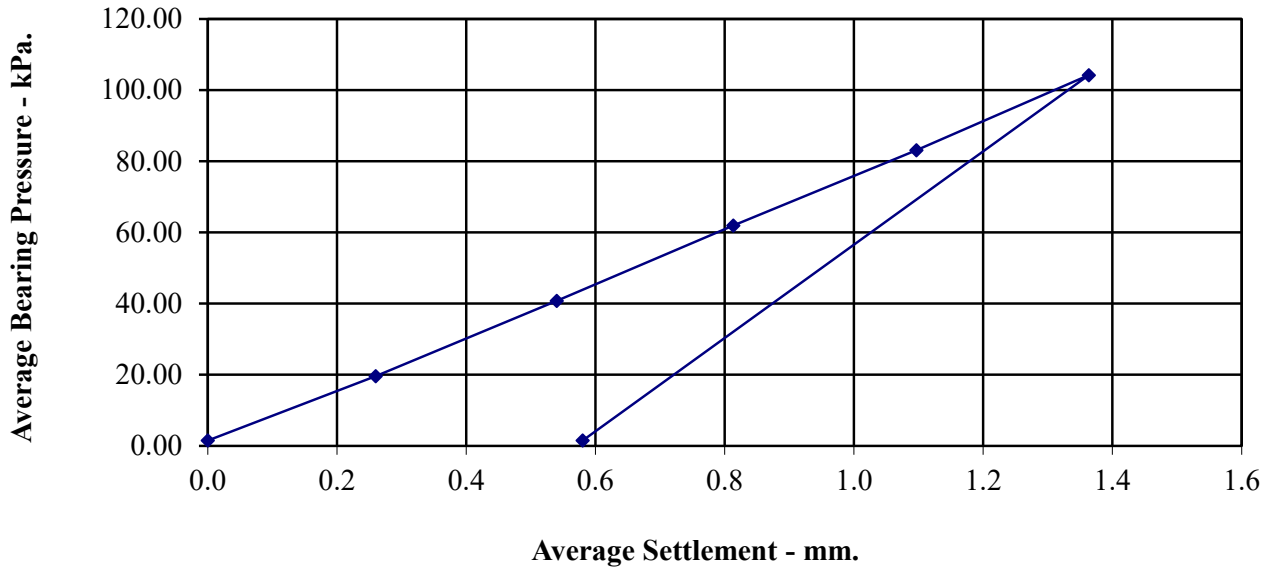
Date of Test	**8-Aug-23**	
Test Ref	**PBT 3**	
Depth (m)	**GL**	
Grid Ref		
Layer		
Comments		
Description	**Class 2C**	
Maximum Deflection	**1.16**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.16mm	**104**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**> 68.1**	**kN/m^2/mm**
CBR Value	**> 14.5**	**%**

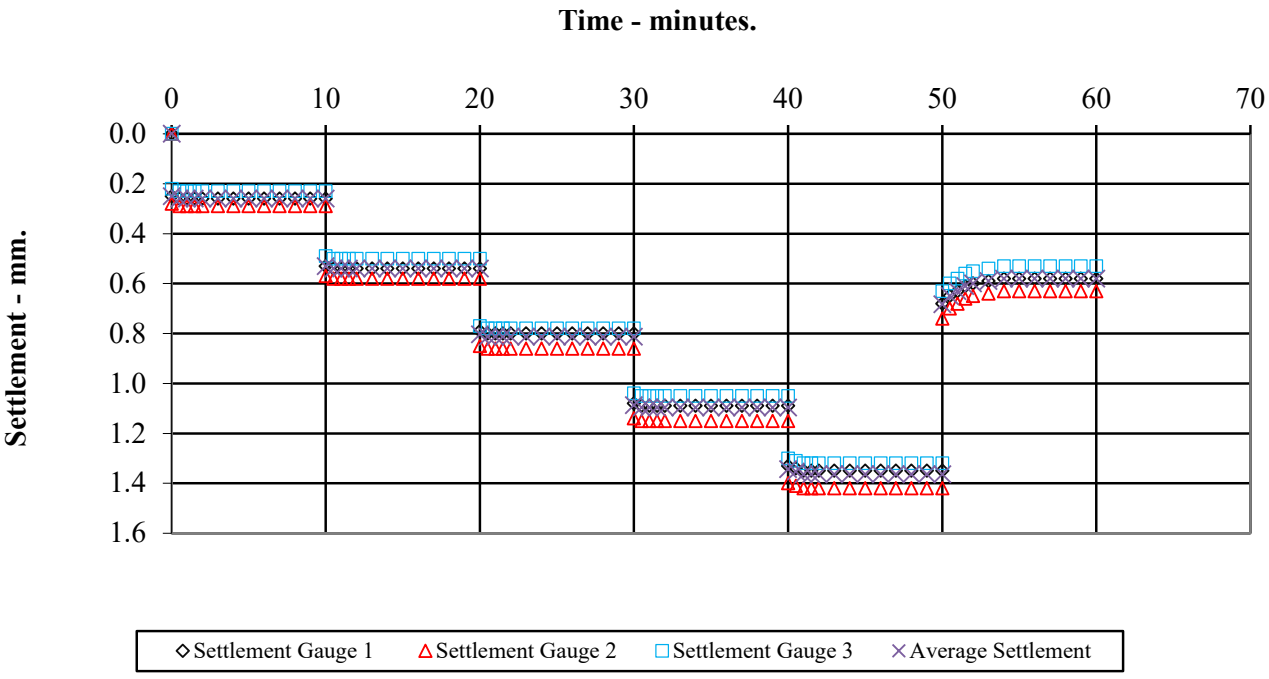
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**08-Aug-23**	**Test Ref:**	**PBT 4**
Grid Ref:		**Depth (m):**	**GL**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa):	**104.22**
Maximum Deformation (mm):	**1.36**
Plate Area (m2):	**0.2922**
Description:	**Class 2C**





UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell Lane, Dewsbury

Contract No:
PSL23/6579
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

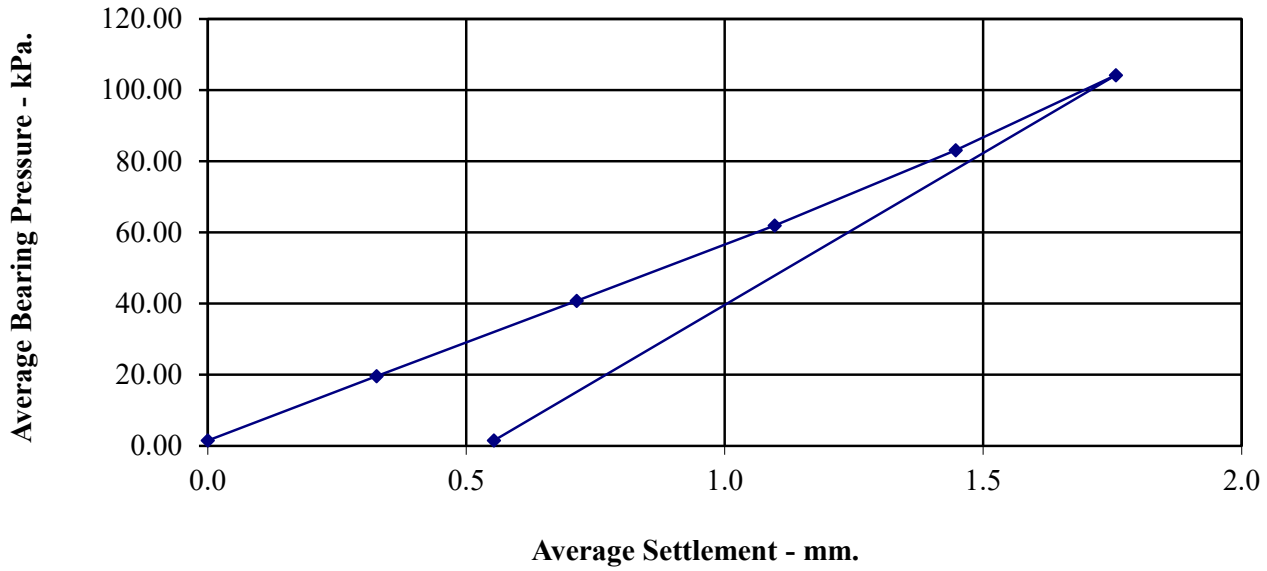
Date of Test	**8-Aug-23**	
Test Ref	**PBT 4**	
Depth (m)	**GL**	
Grid Ref		
Layer		
Comments		
Description	**Class 2C**	
Maximum Deflection	**1.36**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**95**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**62.2**	**kN/m^2/mm**
CBR Value	**12.4**	**%**

VERTICAL DEFORMATION TESTS.

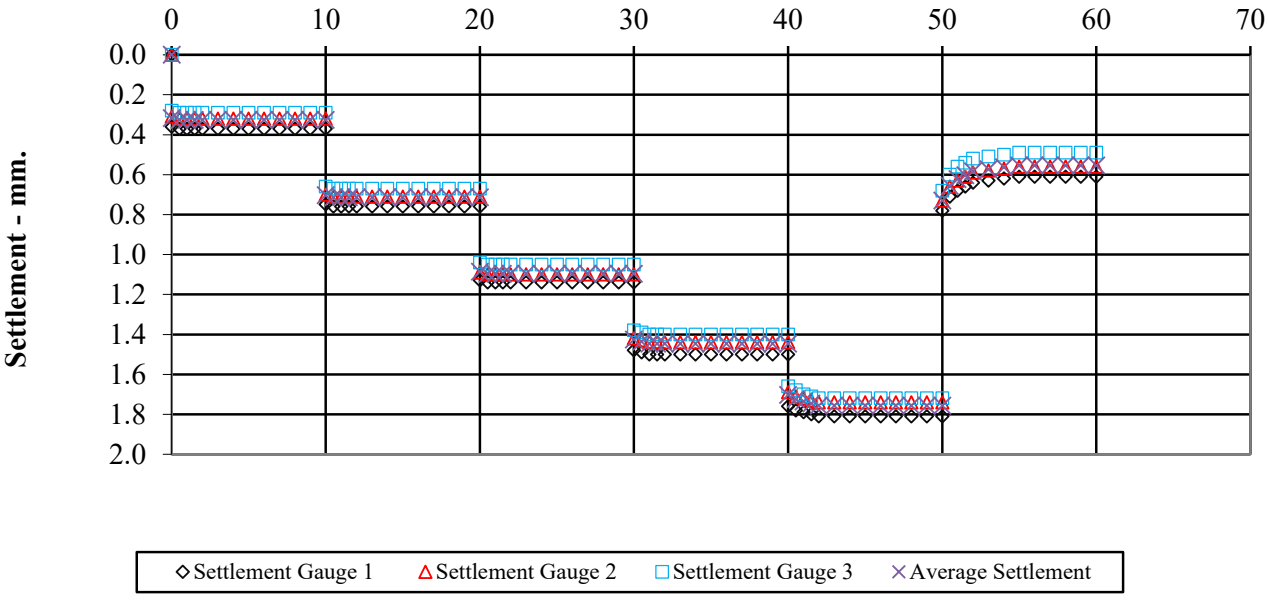
BS 1377 : Part 9 : 1990.

Date of Test:	**08-Aug-23**	**Test Ref:**	**PBT 5**
Grid Ref:		**Depth (m):**	**GL**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa):	**104.22**
Maximum Deformation (mm):	**1.76**
Plate Area (m2):	**0.2922**
Description:	**Class 2C**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Chidswell Lane, Dewsbury**	**Contract No:** PSL23/6579 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

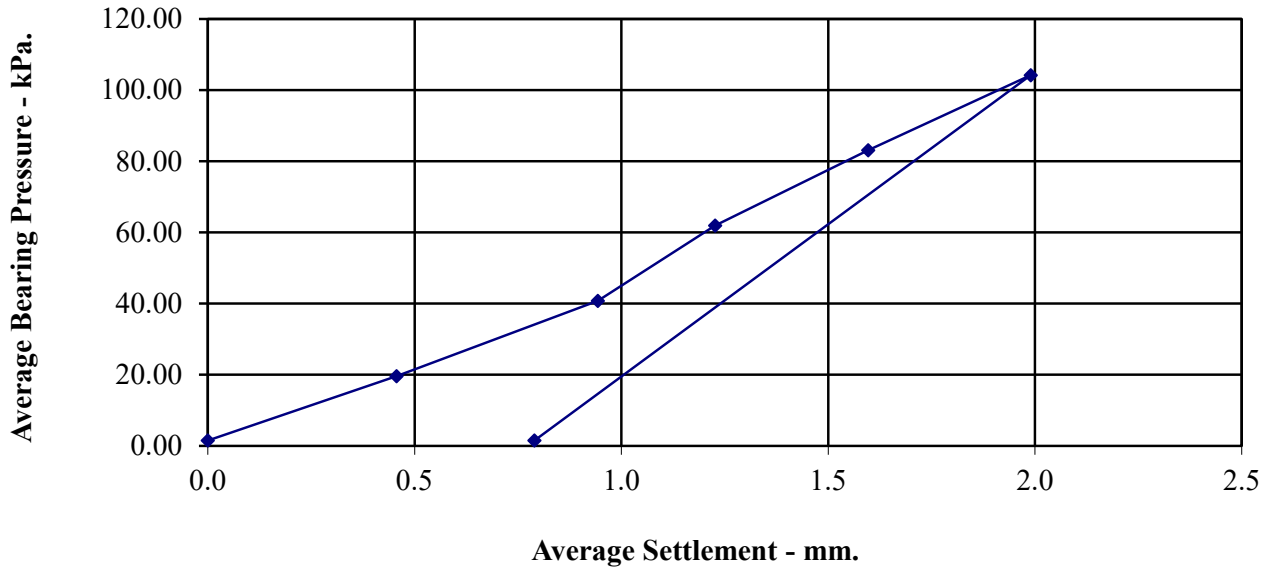
Date of Test	**8-Aug-23**	
Test Ref	**PBT 5**	
Depth (m)	**GL**	
Grid Ref		
Layer		
Comments		
Description	**Class 2C**	
Maximum Deflection	**1.76**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**71**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**46.5**	**kN/m^2/mm**
CBR Value	**7.5**	**%**

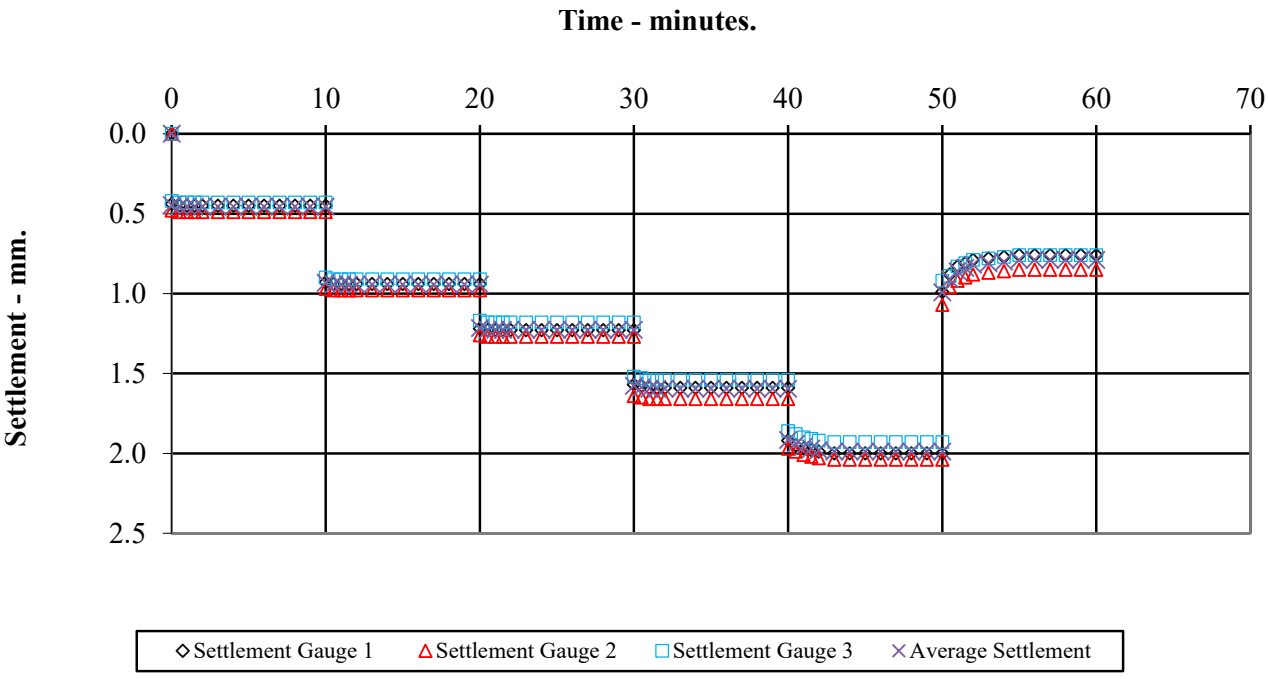
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**08-Aug-23**	**Test Ref:**	**PBT 6**
Grid Ref:		**Depth (m):**	**GL**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa):	**104.22**
Maximum Deformation (mm):	**1.99**
Plate Area (m2):	**0.2922**
Description:	**Class 2C**





UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell Lane, Dewsbury

Contract No:
PSL23/6579
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

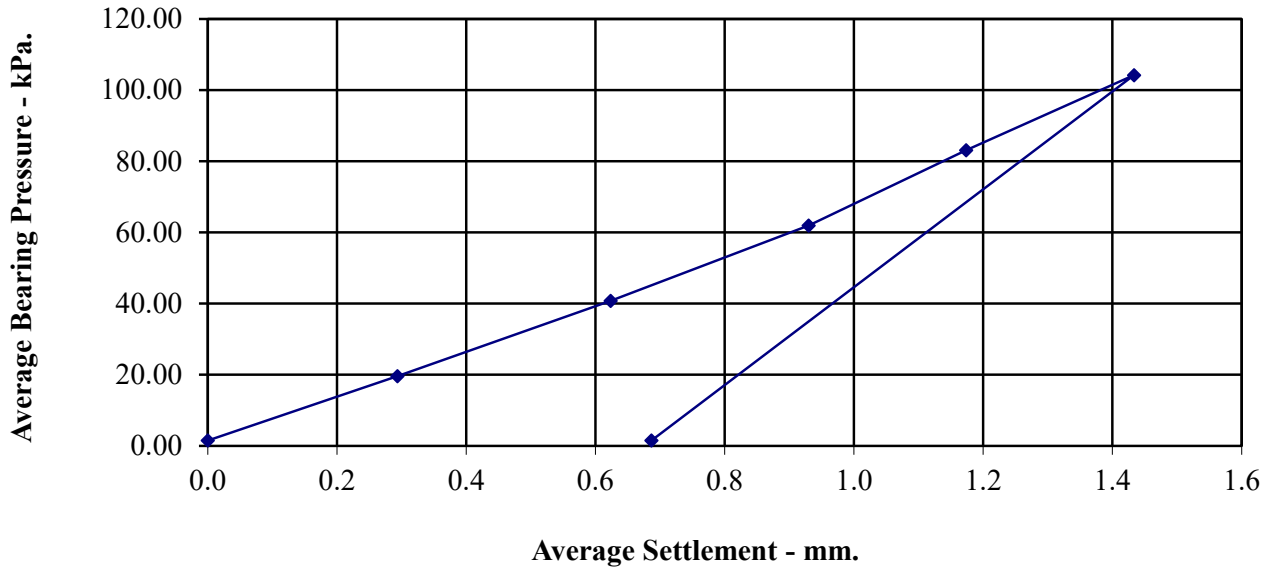
Date of Test	**8-Aug-23**	
Test Ref	**PBT 6**	
Depth (m)	**GL**	
Grid Ref		
Layer		
Comments		
Description	**Class 2C**	
Maximum Deflection	**1.99**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**63**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**41.3**	**$kN/m^2/mm$**
CBR Value	**6.1**	**%**

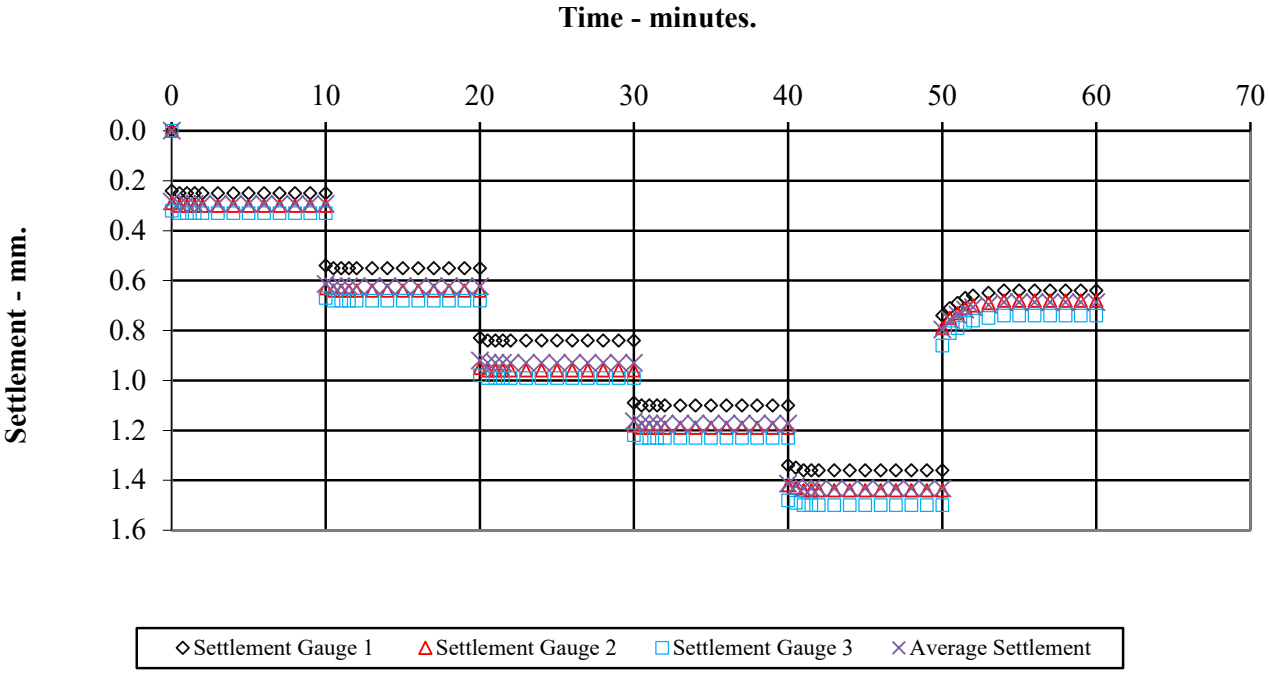
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**08-Aug-23**	**Test Ref:**	**PBT 7**
Grid Ref:		**Depth (m):**	**GL**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa):	**104.22**
Maximum Deformation (mm):	**1.43**
Plate Area (m2):	**0.2922**
Description:	**Class 2C**





UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Chidswell Lane, Dewsbury**	**Contract No:** PSL23/6579 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

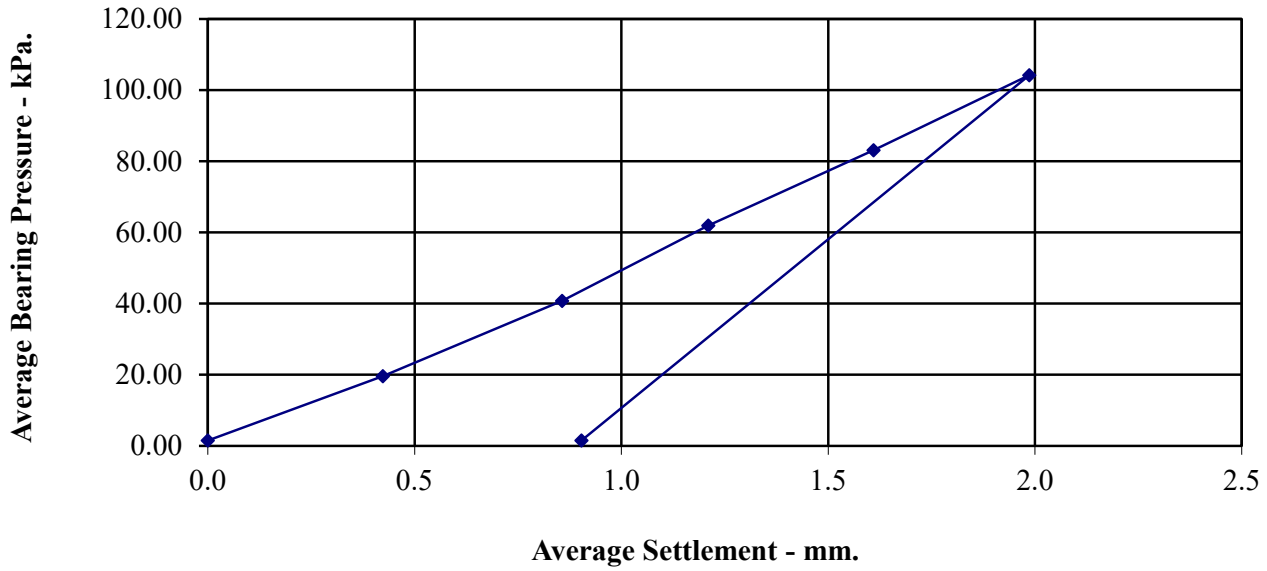
Date of Test	**8-Aug-23**	
Test Ref	**PBT 7**	
Depth (m)	**GL**	
Grid Ref		
Layer		
Comments		
Description	**Class 2C**	
Maximum Deflection	**1.43**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**89**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**58.3**	**kN/m^2/mm**
CBR Value	**11.1**	**%**

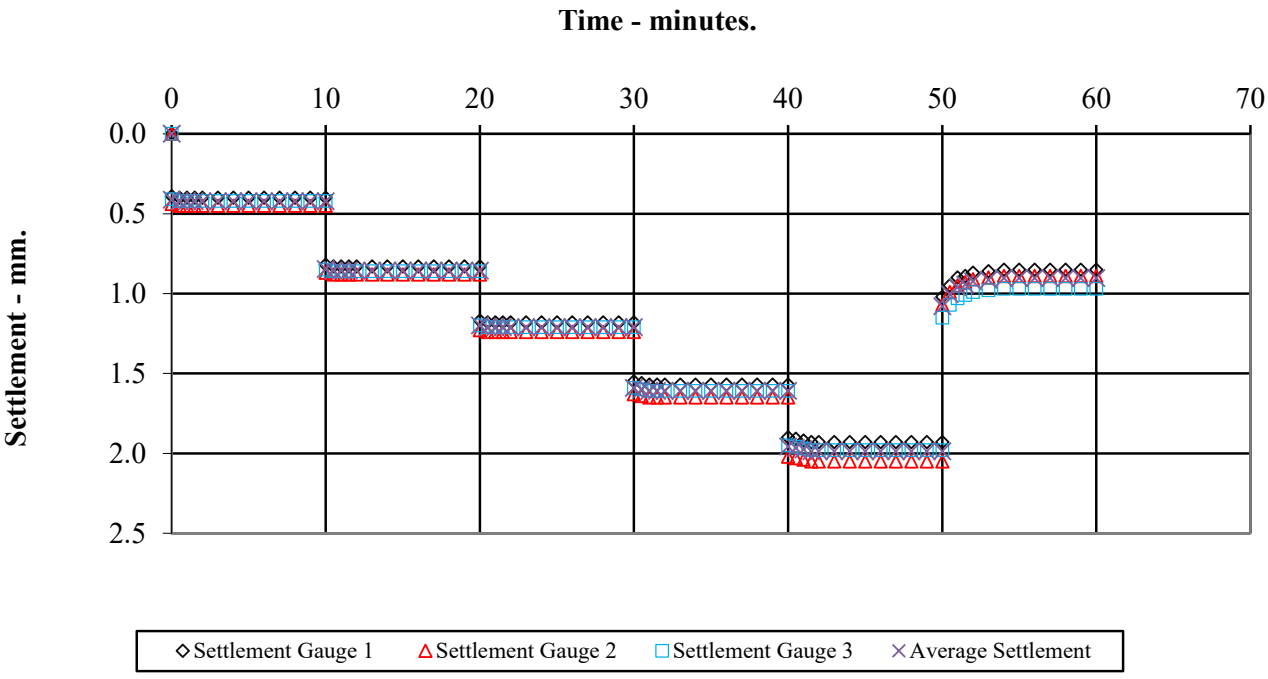
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**08-Aug-23**	**Test Ref:**	**PBT 8**
Grid Ref:		**Depth (m):**	**GL**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa):	**104.22**
Maximum Deformation (mm):	**1.99**
Plate Area (m2):	**0.2922**
Description:	**Class 2C**





UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell Lane, Dewsbury

Contract No:
PSL23/6579
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	**8-Aug-23**	
Test Ref	**PBT 8**	
Depth (m)	**GL**	
Grid Ref		
Layer		
Comments		
Description	**Class 2C**	
Maximum Deflection	**1.99**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**64**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**41.8**	**$kN/m^2/mm$**
CBR Value	**6.2**	**%**

LABORATORY REPORT

Contract Number: PSL23/6719

Report Date: 10 August 2023

Client's Reference:

Client Name: Sirius
Suite 2, Russel House
Mill Road
Langley Moor
Durham
DH7 8HJ

For the attention of: Jack Holdsworth

Contract Title: Chidswell Lane, Dewsbury

Date Received: 9/8/2023
Date Commenced: 9/8/2023
Date Completed: 10/8/2023

Notes: **Opinions and Interpretations are outside the UKAS Accreditation**

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

SUMMARY OF INSITU TESTS

BS1377 : PART : 9 : 1990

Position Number	Layer Number	Sample Number	Depth (m)	Date Tested	Moisture Content %	Bulk Density Mg/m^3 Clause 2.2	Dry Density Mg/m^3 Clause 2.2	Remarks
1				09/08/2023	15	1.93	1.68	
4				09/08/2023	19	2.02	1.70	
6				09/08/2023	15	1.93	1.68	
7				09/08/2023	18	1.95	1.65	
8				09/08/2023	15	1.93	1.68	
9				09/08/2023	15	1.88	1.63	
10				09/08/2023	17	1.90	1.62	
11				09/08/2023	15	1.94	1.69	
12				09/08/2023	16	1.90	1.64	
13				09/08/2023	20	1.94	1.62	
14				09/08/2023	15	1.93	1.68	
15				09/08/2023	18	1.96	1.66	
16				09/08/2023	19	1.93	1.62	
17				09/08/2023	17	1.99	1.70	
18				09/08/2023	15	1.94	1.69	

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell Lane, Dewsbury

Contract No:

PSL23/6719

Client Ref:

LABORATORY REPORT

Contract Number: PSL23/6739

Report Date: 11 August 2023

Client's Reference:

Client Name: Sirius
Suite 2, Russel House
Mill Road
Langley Moor
Durham
DH7 8HJ

For the attention of: Angela Gregory

Contract Title: Chidswell Lane, Dewsbury

Date Received: 10/8/2023
Date Commenced: 10/8/2023
Date Completed: 11/8/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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

SUMMARY OF INSITU TESTS

BS1377 : PART : 9 : 1990

Position Number	Layer Number	Sample Number	Depth (m)	Date Tested	Moisture Content %	Bulk Density Mg/m^3 Clause 2.2	Dry Density Mg/m^3 Clause 2.2	Remarks
SRD 19				10/08/2023	14	1.97	1.73	Class 2C
SRD 20				10/08/2023	11	1.94	1.75	Class 2C
SRD 21				10/08/2023	14	1.96	1.72	Class 2C
SRD 22				10/08/2023	12	1.93	1.72	Class 2C
SRD 23				10/08/2023	12	1.91	1.71	Class 2C
SRD 24				10/08/2023	13	2.02	1.79	Class 2C
SRD 25				10/08/2023	11	2.01	1.81	Class 2C
SRD 26				10/08/2023	12	1.95	1.74	Class 2C
SRD 27				10/08/2023	13	1.92	1.70	Class 2C
SRD 28				10/08/2023	14	1.90	1.67	Class 2C
SRD 29				10/08/2023	11	1.96	1.77	Class 2C
SRD 30				10/08/2023	11	1.95	1.76	Class 2C
SRD 31				10/08/2023	15	1.94	1.69	Class 2C
SRD 32				10/08/2023	12	1.90	1.70	Class 2C
SRD 33				10/08/2023	13	1.91	1.69	Class 2C
SRD 34				10/08/2023	15	2.04	1.77	Class 2C
SRD 35				10/08/2023	14	1.97	1.73	Class 2C

LABORATORY REPORT

Contract Number: PSL23/6767

Report Date: 14 August 2023

Client's Reference:

Client Name: Sirius
Suite 2, Russel House
Mill Road
Langley Moor
Durham
DH7 8HJ

For the attention of: Angela Gregory

Contract Title: Chidswell Lane, Dewsbury

Date Received: 11/8/2023
Date Commenced: 11/8/2023
Date Completed: 14/8/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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

SUMMARY OF INSITU TESTS

BS1377 : PART : 9 : 1990

Position Number	Layer Number	Sample Number	Depth (m)	Date Tested	Moisture Content %	Bulk Density Mg/m^3 Clause 2.2	Dry Density Mg/m^3 Clause 2.2	Remarks
SRD 36				11/08/2023	11	1.99	1.79	Class 2C
SRD 37				11/08/2023	14	2.05	1.80	Class 2C
SRD 38				11/08/2023	11	2.02	1.82	Class 2C
SRD 39				11/08/2023	12	2.00	1.79	Class 2C
SRD 40				11/08/2023	15	1.99	1.73	Class 2C
SRD 41				11/08/2023	11	1.92	1.73	Class 2C
SRD 42				11/08/2023	12	1.90	1.70	Class 2C
SRD R1				11/08/2023	11	1.88	1.69	Class 2C
SRD R2				11/08/2023	12	1.89	1.69	Class 2C
SRD R3				11/08/2023	13	2.03	1.80	Class 2C
SRD R4				11/08/2023	12	1.97	1.76	Class 2C
SRD R5				11/08/2023	15	1.93	1.68	Class 2C
SRD R6				11/08/2023	11	2.00	1.80	Class 2C
SRD R7				11/08/2023	14	2.03	1.78	Class 2C
SRD R8				11/08/2023	11	1.96	1.77	Class 2C

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Chidswell Lane, Dewsbury

Contract No:

PSL23/6767

Client Ref:

LABORATORY REPORT

Contract Number: PSL23/7033

Report Date: 23 August 2023

Client's Reference:

Client Name: Sirius Remediation
Suite 2, Russell House
Mill Road
Langley Moor
Durham
DH7 8HJ

For the attention of: Maxine Thompson

Contract Title: Chidswell (Phase 2)

Date Received: 22/8/2023
Date Commenced: 22/8/2023
Date Completed: 23/8/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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

SUMMARY OF INSITU TESTS

BS1377 : PART : 9 : 1990

Position Number	Layer Number	Sample Number	Depth (m)	Date Tested	Moisture Content %	Bulk Density Mg/m^3 Clause 2.2	Dry Density Mg/m^3 Clause 2.2	Remarks
SRD 43					15	2.12	1.84	Class 2C
SRD 44					14	2.04	1.79	Class 2C
SRD 45					12	1.95	1.74	Class 2C
SRD 46					13	1.93	1.71	Class 2C
SRD 47					15	1.98	1.72	Class 2C
SRD 48					14	2.05	1.80	Class 2C
SRD 49					14	2.09	1.83	Class 2C
SRD 50					13	1.97	1.74	Class 2C
SRD 51					10	2.00	1.82	Class 2C
SRD 52					15	2.03	1.77	Class 2C
SRD 53					15	2.01	1.75	Class 2C
SRD 54					13	1.99	1.76	Class 2C
SRD 55					12	2.05	1.83	Class 2C
SRD 56					13	2.03	1.80	Class 2C
SRD 57					10	2.02	1.84	Class 2C

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w: www.thesiriusgroup.com

SIRIUS REMEDIATION - DCP Record

SITE:

Chidswell (Phase 2).

Barratt and David Wilson Homes, Yorkshire West. Development off Owl Lane.
WF5 9AU.

DATE OF ISSUE:

Aug-23

Number of Certificates: 53

Testing Period: 03.08.2023

to

07.08.2023

Test Engineers:	*M.Thompson*

Test No.	Date Tested	Test Location ID	Material	Derived CBR (%)
DCP01	03.08.2023	Plot 138	Class 2C Engineered Fill	4.8
DCP02	03.08.2023	Plot 136/137	Class 2C Engineered Fill	5.0
DCP03	03.08.2023	Plot 134/135	Class 2C Engineered Fill	7.6
DCP04	03.08.2023	Plot 139-141	Class 2C Engineered Fill	6.8
DCP05	03.08.2023	Plot 142	Class 2C Engineered Fill	17.6
DCP06	03.08.2023	Plot 143	Class 2C Engineered Fill	6.1
DCP07	03.08.2023	Plot 144	Class 2C Engineered Fill	6.7
DCP08	03.08.2023	Plot 145	Class 2C Engineered Fill	17.9
DCP09	03.08.2023	Plot 146	Class 2C Engineered Fill	10.1
DCP10	03.08.2023	Plot 147	Class 2C Engineered Fill	8.2
DCP11	03.08.2023	Plot 148	Class 2C Engineered Fill	12.4
DCP12	03.08.2023	Plot 149	Class 2C Engineered Fill	7.5
DCP13	03.08.2023	Plot 150	Class 2C Engineered Fill	7.6
DCP14	03.08.2023	Plot 151	Class 2C Engineered Fill	14.6
DCP15	03.08.2023	Plot 152	Class 2C Engineered Fill	7.9
DCP16	03.08.2023	Plot 210	Class 2C Engineered Fill	9.8
DCP17	03.08.2023	Plot 209	Class 2C Engineered Fill	8.5
DCP18	03.08.2023	Plot 208	Class 2C Engineered Fill	17.7
DCP19	03.08.2023	Plot 207	Class 2C Engineered Fill	10.6
DCP20	03.08.2023	Plot 206	Class 2C Engineered Fill	7.5
DCP21	03.08.2023	Plot 205	Class 2C Engineered Fill	5.8
DCP22	03.08.2023	Plot 204	Class 2C Engineered Fill	13.0
DCP23	03.08.2023	Plot 203	Class 2C Engineered Fill	8.3
DCP24	03.08.2023	Plot 202	Class 2C Engineered Fill	10.2
DCP25	03.08.2023	Plot 201	Class 2C Engineered Fill	11.1
DCP26	03.08.2023	Plot 153	Class 2C Engineered Fill	6.0
DCP27	03.08.2023	Plot 154	Class 2C Engineered Fill	8.0
DCP28	03.08.2023	Plot 155	Class 2C Engineered Fill	5.8
DCP29	03.08.2023	Plot 156	Class 2C Engineered Fill	7.4
DCP30	03.08.2023	Plot 157	Class 2C Engineered Fill	7.9
DCP31	07.08.2023	Plot 158	Class 2C Engineered Fill	3.7
DCP32	07.08.2023	Plot 159	Class 2C Engineered Fill	4.8
DCP33	07.08.2023	Plot 160	Class 2C Engineered Fill	8.0
DCP34	07.08.2023	Plot 172/173	Class 2C Engineered Fill	6.5
DCP35	07.08.2023	Plot 174/175	Class 2C Engineered Fill	8.2
DCP36	07.08.2023	Plot 176-178	Class 2C Engineered Fill	5.8
DCP37	07.08.2023	Plot 179-180	Class 2C Engineered Fill	4.1
DCP38	07.08.2023	Plot 183	Class 2C Engineered Fill	5.4
DCP39	07.08.2023	Plot 184-186	Class 2C Engineered Fill	4.2
DCP40	07.08.2023	Plot 187	Class 2C Engineered Fill	5.9
DCP41	07.08.2023	Plot 188	Class 2C Engineered Fill	4.2
DCP42	07.08.2023	Plot 189	Class 2C Engineered Fill	6.2
DCP43	07.08.2023	Plot 190-192	Class 2C Engineered Fill	9.9
DCP44	07.08.2023	Plot 193	Class 2C Engineered Fill	5.6
DCP45	07.08.2023	Plot 181	Class 2C Engineered Fill	4.6
DCP46	07.08.2023	Road South - 1	Class 2C Engineered Fill	4.2
DCP47	07.08.2023	Road South - 2	Class 2C Engineered Fill	9.4
DCP48	07.08.2023	Road South - 3	Class 2C Engineered Fill	5.3
DCP49	07.08.2023	Road South - 4	Class 2C Engineered Fill	13.5
DCP50	07.08.2023	Road South - 5	Class 2C Engineered Fill	12.3
DCP51	07.08.2023	Road South - 6	Class 2C Engineered Fill	14.0
DCP52	07.08.2023	Road South - 7	Class 2C Engineered Fill	10.3
DCP53	07.08.2023	Road South - 8	Class 2C Engineered Fill	9.6

Summary	
Mean CBR (%)	8.4
Max CBR (%)	17.9
Min CBR (%)	3.7
No. of DCPS	53

Sirius
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Thorpe Park,
Leeds, LS15 8GB
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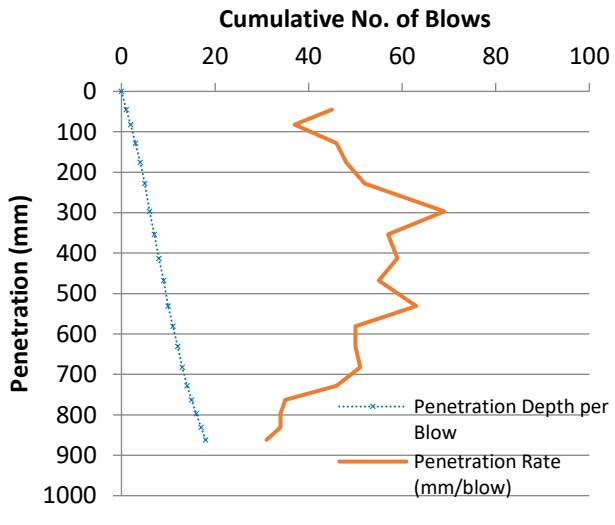
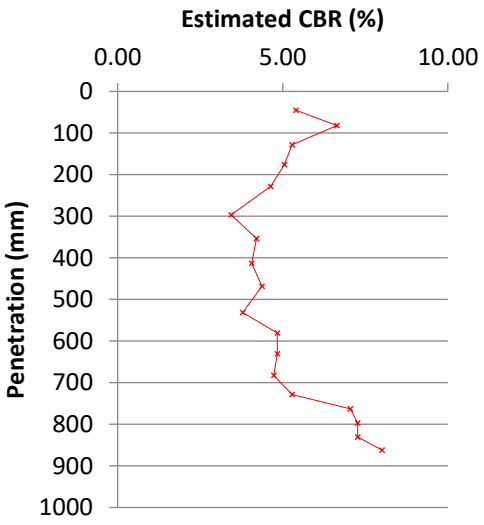
e: info@thesiriusgroup.com
w: www.thesiriusgroup.com

Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 138**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	88	0			
1	1	1	133	45	45	45	5.40
2	1	2	170	82	37	37	6.64
3	1	3	216	128	46	46	5.28
4	1	4	264	176	48	48	5.05
5	1	5	316	228	52	52	4.64
6	1	6	385	297	69	69	3.44
7	1	7	442	354	57	57	4.21
8	1	8	501	413	59	59	4.06
9	1	9	556	468	55	55	4.37
10	1	10	619	531	63	63	3.79
11	1	11	669	581	50	50	4.83
12	1	12	719	631	50	50	4.83
13	1	13	770	682	51	51	4.73
14	1	14	816	728	46	46	5.28
15	1	15	851	763	35	35	7.05
16	1	16	885	797	34	34	7.26
17	1	17	919	831	34	34	7.26
18	1	18	950	862	31	31	8.01





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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Leeds, LS15 8GB
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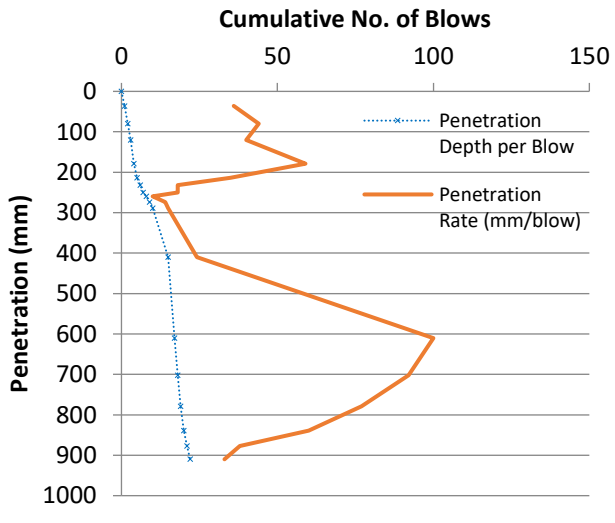
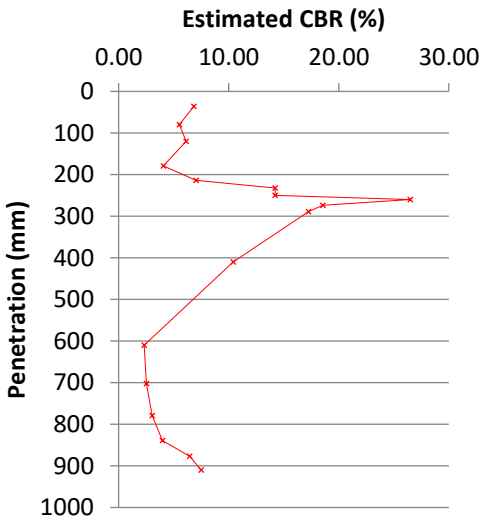
w: www.thesiriusgroup.com

Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 136/137**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	50	0			
1	1	1	86	36	36	36	6.84
2	1	2	130	80	44	44	5.53
3	1	3	170	120	40	40	6.12
4	1	4	229	179	59	59	4.06
5	1	5	264	214	35	35	7.05
6	1	6	282	232	18	18	14.23
7	1	7	300	250	18	18	14.23
8	1	8	310	260	10	10	26.49
9	1	9	324	274	14	14	18.56
10	1	10	339	289	15	15	17.25
11	5	15	460	410	121	24	10.41
12	2	17	660	610	200	100	2.32
13	1	18	752	702	92	92	2.54
14	1	19	829	779	77	77	3.06
15	1	20	889	839	60	60	3.99
16	1	21	927	877	38	38	6.46
17	1	22	960	910	33	33	7.50
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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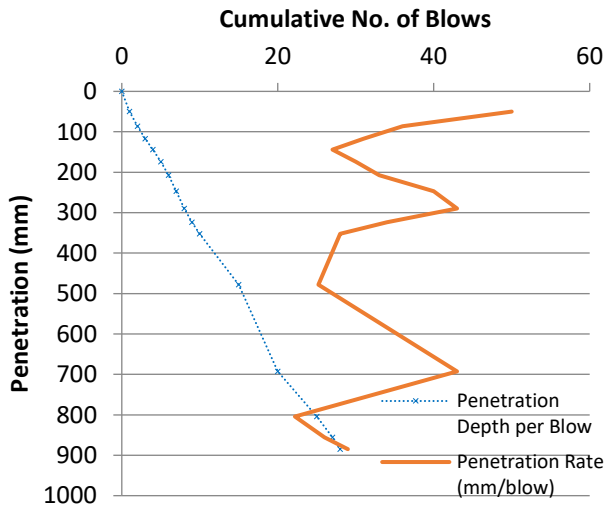
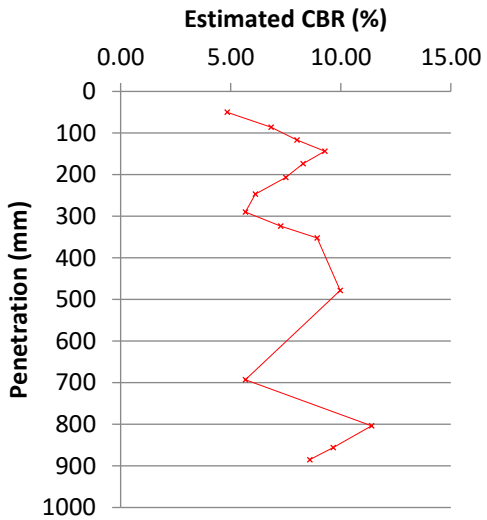
Thorpe Park,
Leeds, LS15 8GB
t: 0113 2649960
e: info@thesiriusgroup.com
w: www.thesiriusgroup.com

Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 134/135**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	56	0			
1	1	1	106	50	50	50	4.83
2	1	2	142	86	36	36	6.84
3	1	3	173	117	31	31	8.01
4	1	4	200	144	27	27	9.27
5	1	5	230	174	30	30	8.29
6	1	6	263	207	33	33	7.50
7	1	7	303	247	40	40	6.12
8	1	8	346	290	43	43	5.67
9	1	9	380	324	34	34	7.26
10	1	10	408	352	28	28	8.92
11	5	15	534	478	126	25	9.97
12	5	20	749	693	215	43	5.67
13	5	25	860	804	111	22	11.40
14	2	27	912	856	52	26	9.65
15	1	28	941	885	29	29	8.59
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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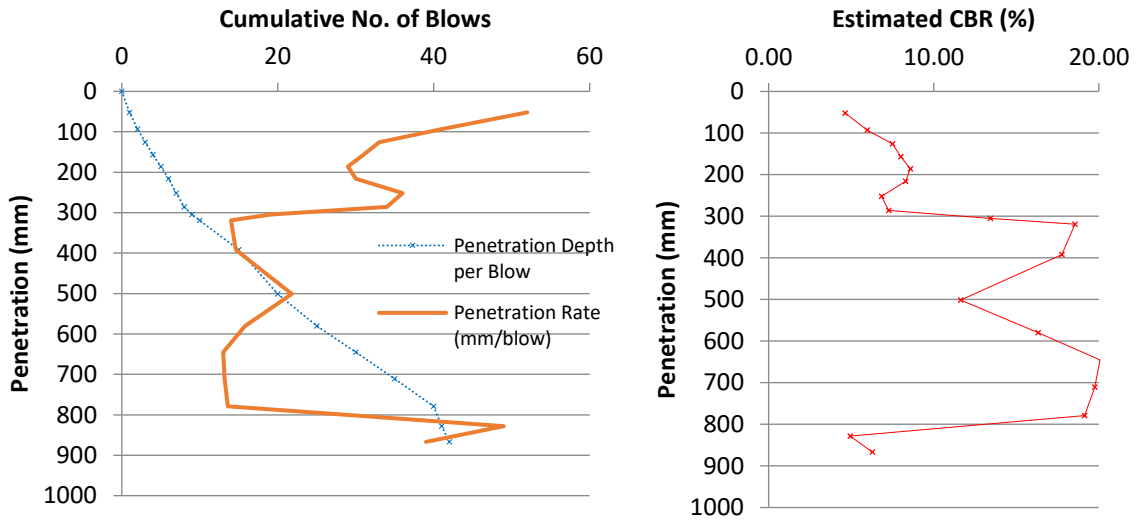
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 139-141**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	52	0			
1	1	1	104	52	52	52	4.64
2	1	2	145	93	41	41	5.96
3	1	3	178	126	33	33	7.50
4	1	4	209	157	31	31	8.01
5	1	5	238	186	29	29	8.59
6	1	6	268	216	30	30	8.29
7	1	7	304	252	36	36	6.84
8	1	8	338	286	34	34	7.26
9	1	9	357	305	19	19	13.44
10	1	10	371	319	14	14	18.56
11	5	15	444	392	73	15	17.75
12	5	20	553	501	109	22	11.62
13	5	25	632	580	79	16	16.33
14	5	30	697	645	65	13	20.07
15	5	35	763	711	66	13	19.75
16	5	40	831	779	68	14	19.14
17	1	41	880	828	49	49	4.94
18	1	42	919	867	39	39	6.28
19							
20							



*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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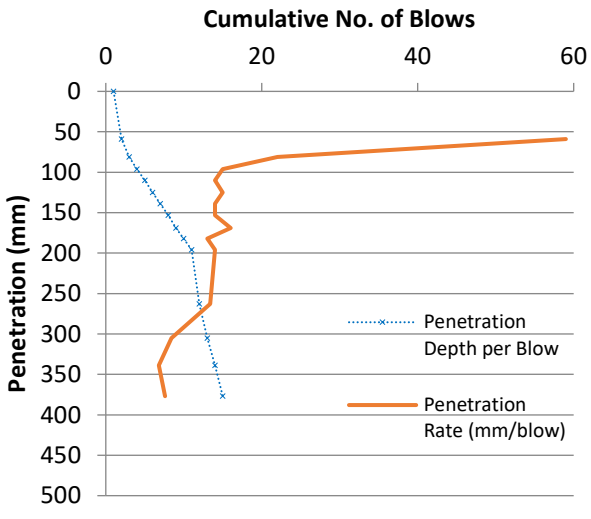
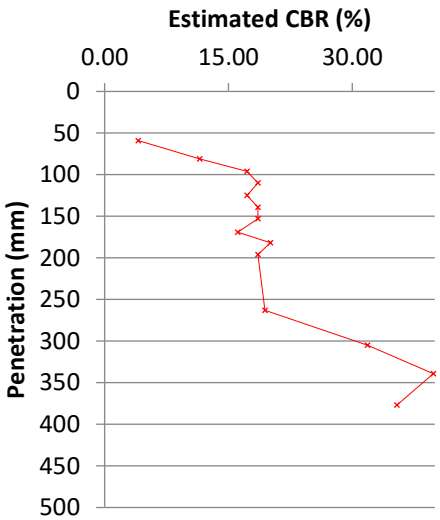
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 142**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	71	0			
1	1	1	130	59	59	59	4.06
2	1	2	152	81	22	22	11.51
3	1	3	167	96	15	15	17.25
4	1	4	181	110	14	14	18.56
5	1	5	196	125	15	15	17.25
6	1	6	210	139	14	14	18.56
7	1	7	224	153	14	14	18.56
8	1	8	240	169	16	16	16.12
9	1	9	253	182	13	13	20.07
10	1	10	267	196	14	14	18.56
11	5	15	334	263	67	13	19.44
12	5	20	376	305	42	8	31.84
13	5	25	410	339	34	7	39.81
14	5	30	448	377	38	8	35.40
15							
16		**Hit obstruction. Test terminated.**					
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
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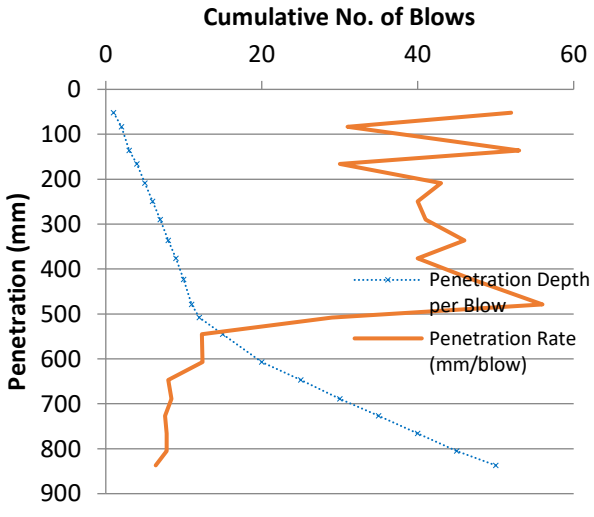
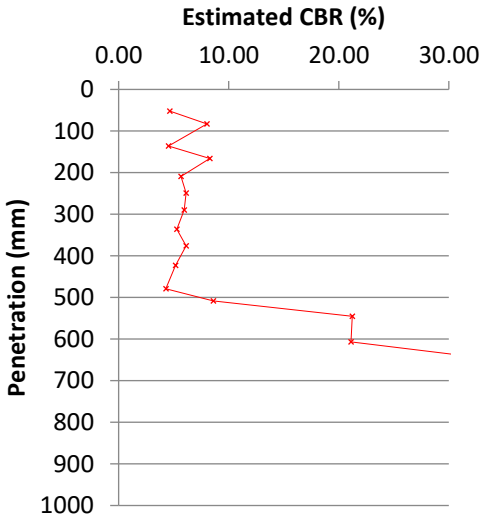
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 143**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	53	0			
1	1	1	105	52	52	52	4.64
2	1	2	136	83	31	31	8.01
3	1	3	189	136	53	53	4.54
4	1	4	219	166	30	30	8.29
5	1	5	262	209	43	43	5.67
6	1	6	302	249	40	40	6.12
7	1	7	343	290	41	41	5.96
8	1	8	389	336	46	46	5.28
9	1	9	429	376	40	40	6.12
10	1	10	476	423	47	47	5.16
11	1	11	532	479	56	56	4.29
12	1	12	561	508	29	29	8.59
13	3	15	598	545	37	12	21.22
14	5	20	660	607	62	12	21.10
15	5	25	700	647	40	8	33.53
16	5	30	742	689	42	8	31.84
17	5	35	780	727	38	8	35.40
18	5	40	819	766	39	8	34.44
19	5	45	858	805	39	8	34.44
20	5	50	890	837	32	6	42.45





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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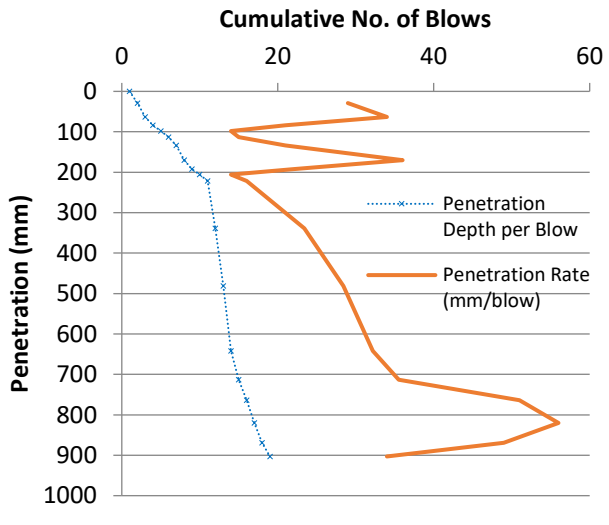
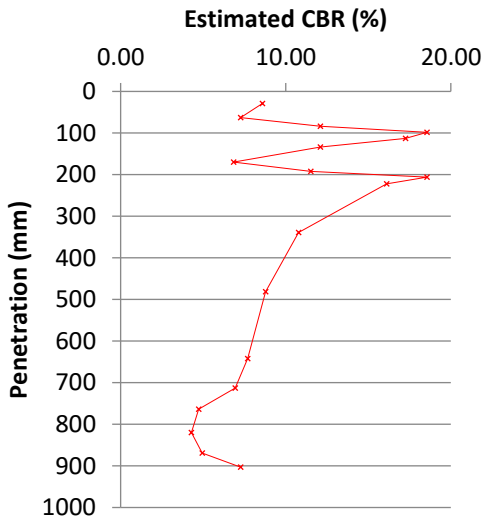
w: www.thesiriusgroup.com

Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 144**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	40	0			
1	1	1	69	29	29	29	8.59
2	1	2	103	63	34	34	7.26
3	1	3	124	84	21	21	12.09
4	1	4	138	98	14	14	18.56
5	1	5	153	113	15	15	17.25
6	1	6	174	134	21	21	12.09
7	1	7	210	170	36	36	6.84
8	1	8	232	192	22	22	11.51
9	1	9	246	206	14	14	18.56
10	1	10	262	222	16	16	16.12
11	5	15	379	339	117	23	10.78
12	5	20	521	481	142	28	8.79
13	5	25	682	642	161	32	7.69
14	2	27	753	713	71	36	6.94
15	1	28	804	764	51	51	4.73
16	1	29	860	820	56	56	4.29
17	1	30	909	869	49	49	4.94
18	1	31	943	903	34	34	7.26
19		**Hit obstruction. Test terminated.**					
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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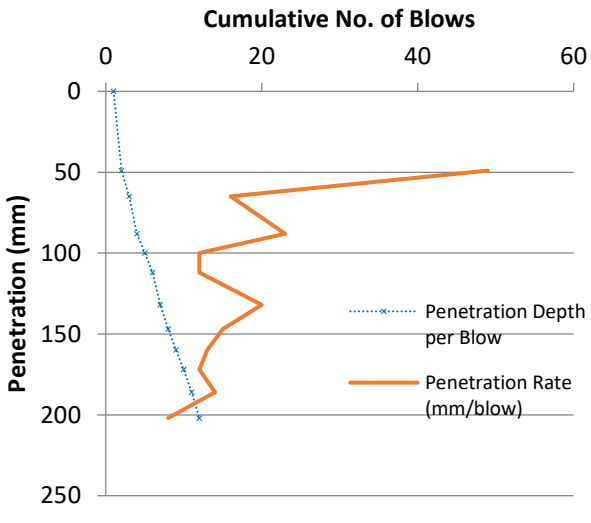
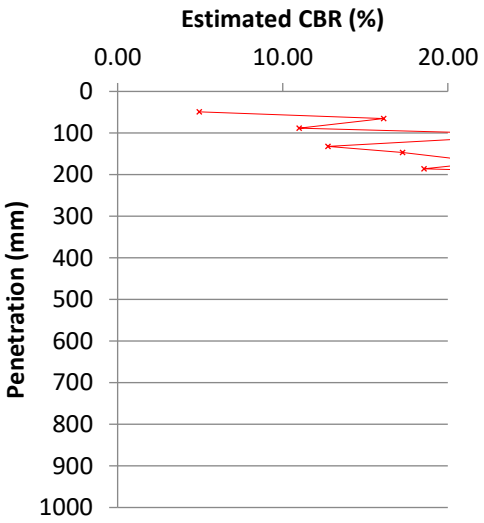
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 145**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	40	0			
1	1	1	89	49	49	49	4.94
2	1	2	105	65	16	16	16.12
3	1	3	128	88	23	23	10.98
4	1	4	140	100	12	12	21.84
5	1	5	152	112	12	12	21.84
6	1	6	172	132	20	20	12.73
7	1	7	187	147	15	15	17.25
8	1	8	200	160	13	13	20.07
9	1	9	212	172	12	12	21.84
10	1	10	226	186	14	14	18.56
11	2	12	242	202	16	8	33.53
12							
13		**Hit obstruction. Test terminated.**					
14							
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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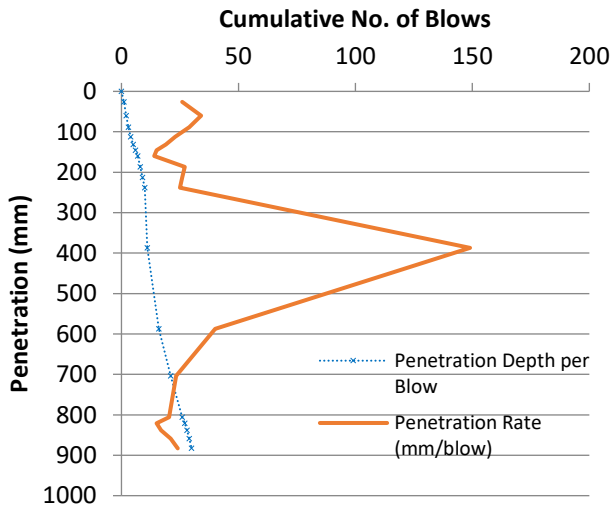
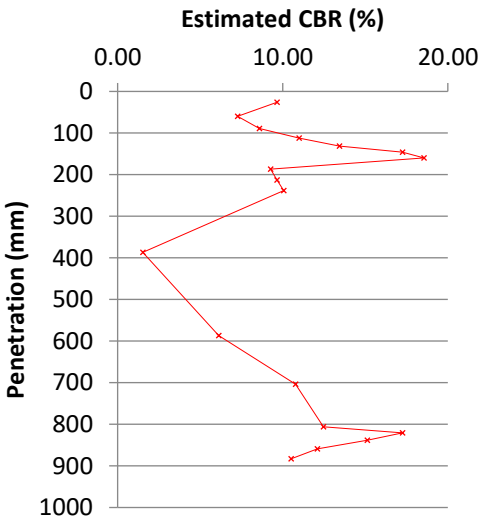
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 146**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	62	0			
1	1	1	88	26	26	26	9.65
2	1	2	122	60	34	34	7.26
3	1	3	151	89	29	29	8.59
4	1	4	174	112	23	23	10.98
5	1	5	193	131	19	19	13.44
6	1	6	208	146	15	15	17.25
7	1	7	222	160	14	14	18.56
8	1	8	249	187	27	27	9.27
9	1	9	275	213	26	26	9.65
10	1	10	300	238	25	25	10.05
11	1	11	449	387	149	149	1.52
12	5	16	649	587	200	40	6.12
13	5	21	766	704	117	23	10.78
14	5	26	868	806	102	20	12.47
15	1	27	883	821	15	15	17.25
16	1	28	900	838	17	17	15.12
17	1	29	921	859	21	21	12.09
18	1	30	945	883	24	24	10.50
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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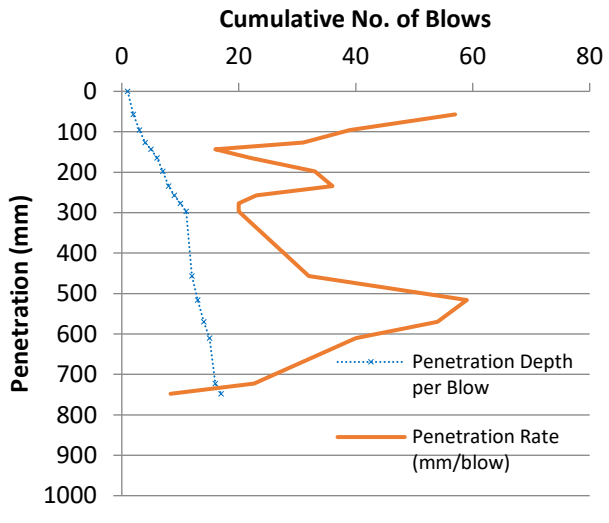
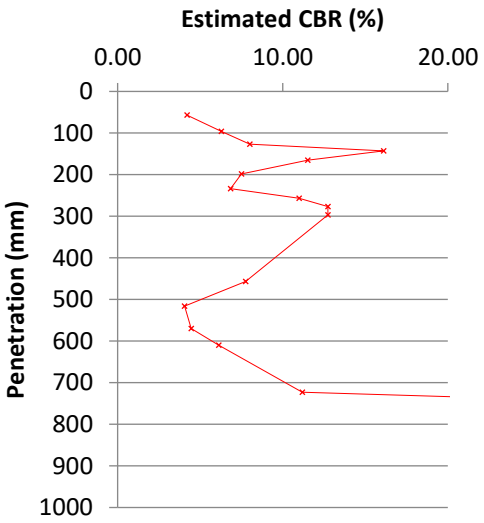
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 147**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	46	0			
1	1	1	103	57	57	57	4.21
2	1	2	142	96	39	39	6.28
3	1	3	173	127	31	31	8.01
4	1	4	189	143	16	16	16.12
5	1	5	211	165	22	22	11.51
6	1	6	244	198	33	33	7.50
7	1	7	280	234	36	36	6.84
8	1	8	303	257	23	23	10.98
9	1	9	323	277	20	20	12.73
10	1	10	343	297	20	20	12.73
11	5	15	503	457	160	32	7.75
12	1	16	562	516	59	59	4.06
13	1	17	616	570	54	54	4.46
14	1	18	656	610	40	40	6.12
15	5	23	769	723	113	23	11.19
16	3	26	794	748	25	8	32.11
17							
18		**Hit obstruction. Test terminated.**					
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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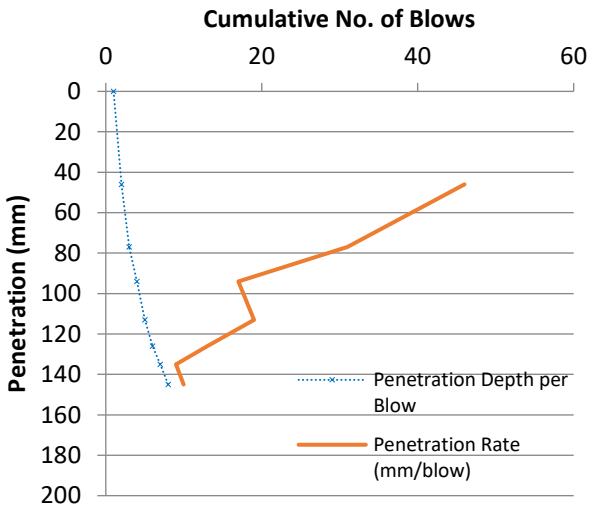
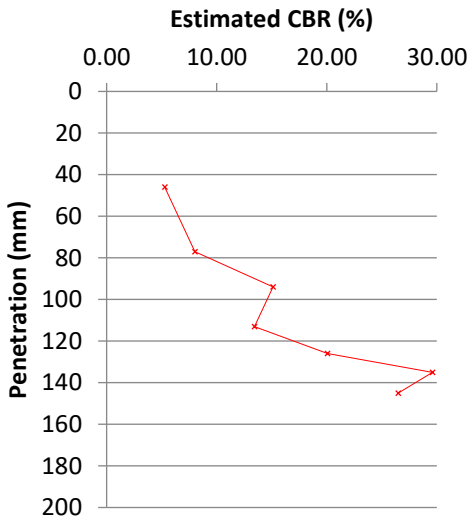
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 148**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	65	0			
1	1	1	111	46	46	46	5.28
2	1	2	142	77	31	31	8.01
3	1	3	159	94	17	17	15.12
4	1	4	178	113	19	19	13.44
5	1	5	191	126	13	13	20.07
6	1	6	200	135	9	9	29.61
7	1	7	210	145	10	10	26.49
8							
9		**Hit obstruction. Test terminated.**					
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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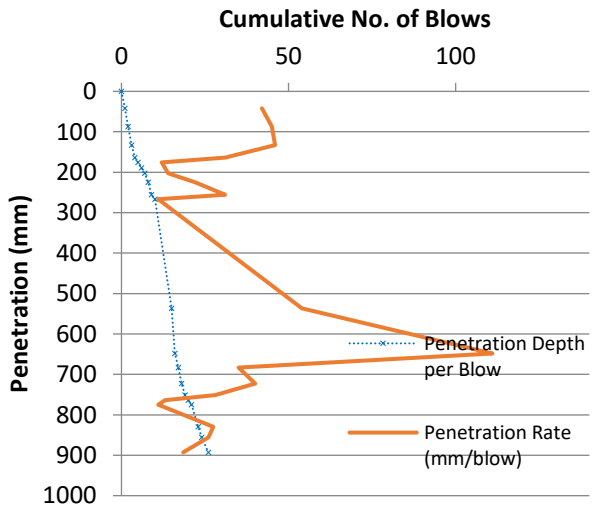
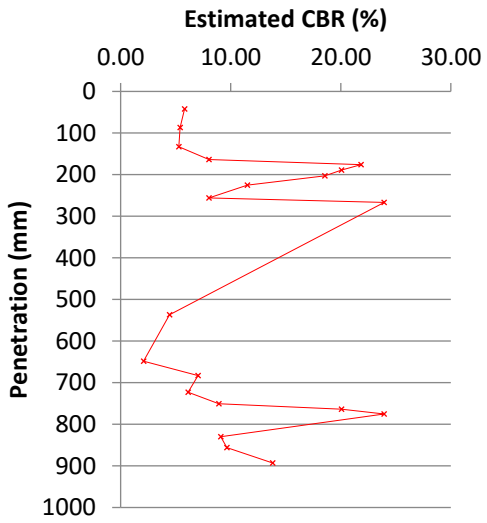
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 149**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	56	0			
1	1	1	98	42	42	42	5.81
2	1	2	143	87	45	45	5.40
3	1	3	189	133	46	46	5.28
4	1	4	220	164	31	31	8.01
5	1	5	232	176	12	12	21.84
6	1	6	245	189	13	13	20.07
7	1	7	259	203	14	14	18.56
8	1	8	281	225	22	22	11.51
9	1	9	312	256	31	31	8.01
10	1	10	323	267	11	11	23.95
11	5	15	593	537	270	54	4.46
12	1	16	704	648	111	111	2.08
13	1	17	739	683	35	35	7.05
14	1	18	779	723	40	40	6.12
15	1	19	807	751	28	28	8.92
16	1	20	820	764	13	13	20.07
17	1	21	831	775	11	11	23.95
18	2	23	886	830	55	28	9.09
19	1	24	912	856	26	26	9.65
20	2	26	949	893	37	19	13.82





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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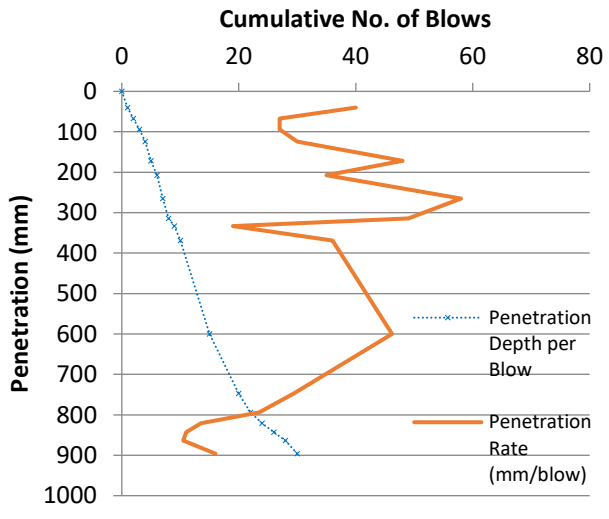
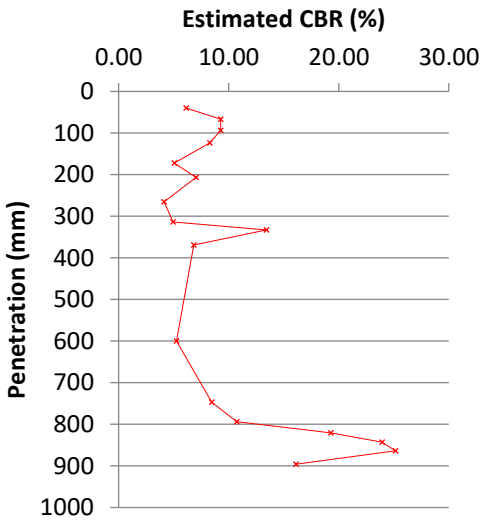
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 150**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	37	0			
1	1	1	77	40	40	40	6.12
2	1	2	104	67	27	27	9.27
3	1	3	131	94	27	27	9.27
4	1	4	161	124	30	30	8.29
5	1	5	209	172	48	48	5.05
6	1	6	244	207	35	35	7.05
7	1	7	302	265	58	58	4.13
8	1	8	351	314	49	49	4.94
9	1	9	370	333	19	19	13.44
10	1	10	406	369	36	36	6.84
11	5	15	637	600	231	46	5.25
12	5	20	784	747	147	29	8.47
13	2	22	831	794	47	24	10.73
14	2	24	858	821	27	14	19.29
15	2	26	880	843	22	11	23.95
16	2	28	901	864	21	11	25.15
17	2	30	933	896	32	16	16.12
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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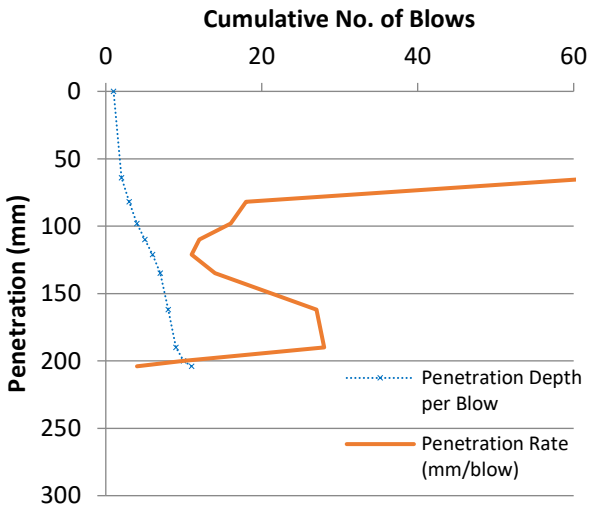
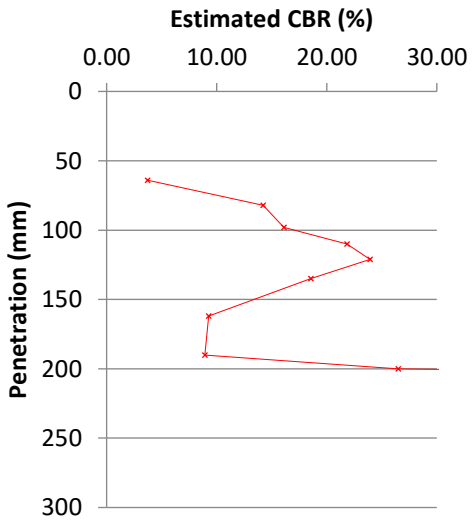
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 151**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	42	0			
1	1	1	106	64	64	64	3.72
2	1	2	124	82	18	18	14.23
3	1	3	140	98	16	16	16.12
4	1	4	152	110	12	12	21.84
5	1	5	163	121	11	11	23.95
6	1	6	177	135	14	14	18.56
7	1	7	204	162	27	27	9.27
8	1	8	232	190	28	28	8.92
9	1	9	242	200	10	10	26.49
10	1	10	246	204	4	4	69.76
11							
12		**Hit obstruction. Test terminated.**					
13							
14							
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
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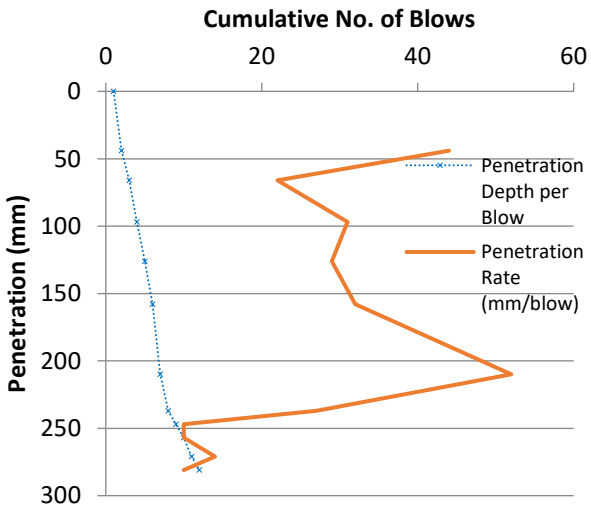
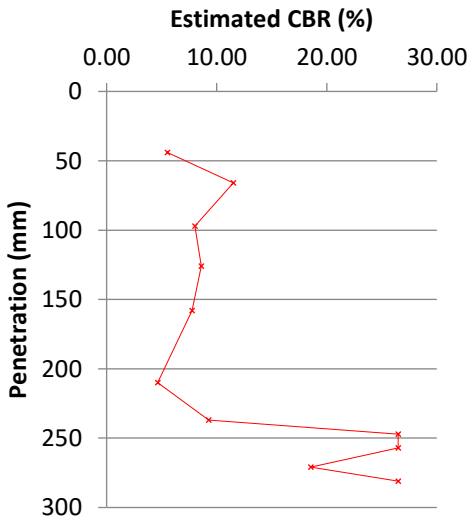
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 152**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	33	0			
1	1	1	77	44	44	44	5.53
2	1	2	99	66	22	22	11.51
3	1	3	130	97	31	31	8.01
4	1	4	159	126	29	29	8.59
5	1	5	191	158	32	32	7.75
6	1	6	243	210	52	52	4.64
7	1	7	270	237	27	27	9.27
8	1	8	280	247	10	10	26.49
9	1	9	290	257	10	10	26.49
10	1	10	304	271	14	14	18.56
11	1	11	314	281	10	10	26.49
12							
13		**Hit obstruction. Test terminated.**					
14							
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
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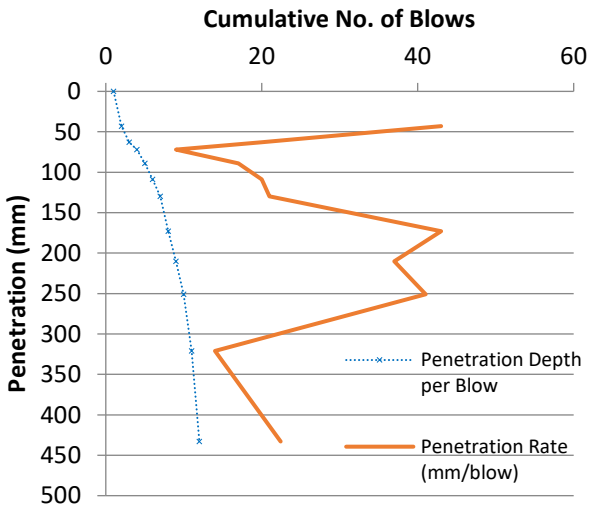
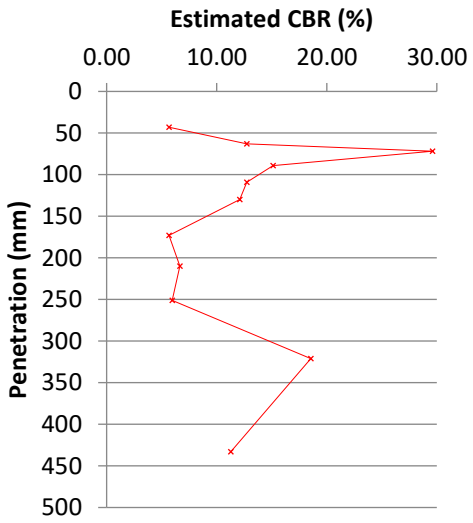
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 210**

TRL Dynamic Cone Penetrometer Test Report

(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	60	0			
1	1	1	103	43	43	43	5.67
2	1	2	123	63	20	20	12.73
3	1	3	132	72	9	9	29.61
4	1	4	149	89	17	17	15.12
5	1	5	169	109	20	20	12.73
6	1	6	190	130	21	21	12.09
7	1	7	233	173	43	43	5.67
8	1	8	270	210	37	37	6.64
9	1	9	311	251	41	41	5.96
10	5	14	381	321	70	14	18.56
11	5	19	493	433	112	22	11.29
12							
13		**Hit obstruction. Test terminated.**					
14							
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
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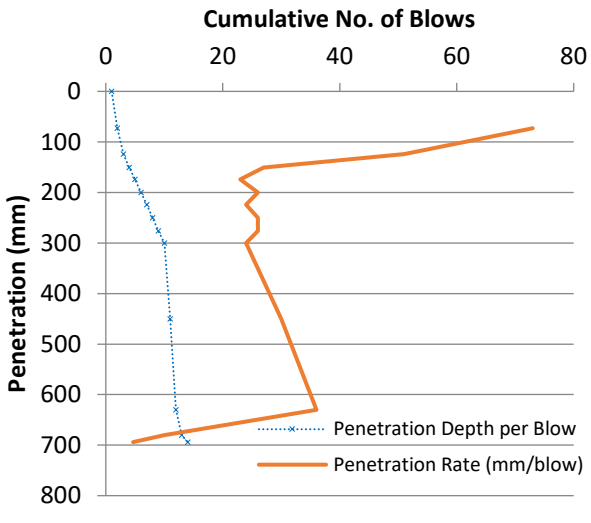
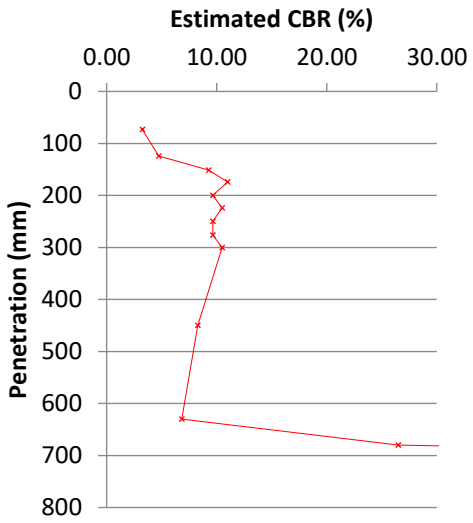
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 209**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	59	0			
1	1	1	132	73	73	73	3.24
2	1	2	183	124	51	51	4.73
3	1	3	210	151	27	27	9.27
4	1	4	233	174	23	23	10.98
5	1	5	259	200	26	26	9.65
6	1	6	283	224	24	24	10.50
7	1	7	309	250	26	26	9.65
8	1	8	335	276	26	26	9.65
9	1	9	359	300	24	24	10.50
10	5	14	509	450	150	30	8.29
11	5	19	689	630	180	36	6.84
12	5	24	739	680	50	10	26.49
13	3	27	753	694	14	5	59.27
14							
15		**Hit obstruction. Test terminated.**					
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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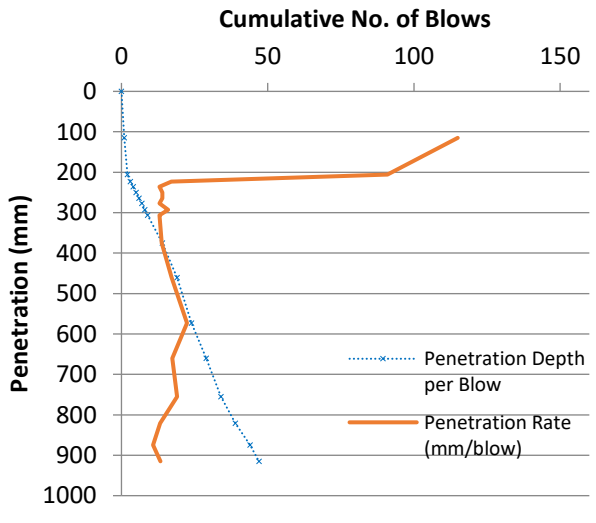
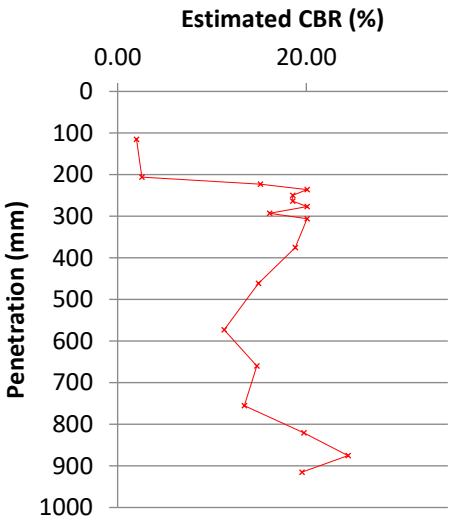
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 208**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	36	0			
1	1	1	151	115	115	115	2.00
2	1	2	242	206	91	91	2.57
3	1	3	259	223	17	17	15.12
4	1	4	272	236	13	13	20.07
5	1	5	286	250	14	14	18.56
6	1	6	300	264	14	14	18.56
7	1	7	313	277	13	13	20.07
8	1	8	329	293	16	16	16.12
9	1	9	342	306	13	13	20.07
10	5	14	411	375	69	14	18.84
11	5	19	497	461	86	17	14.93
12	5	24	609	573	112	22	11.29
13	5	29	696	660	87	17	14.75
14	5	34	791	755	95	19	13.44
15	5	39	857	821	66	13	19.75
16	5	44	911	875	54	11	24.42
17	3	47	951	915	40	13	19.54
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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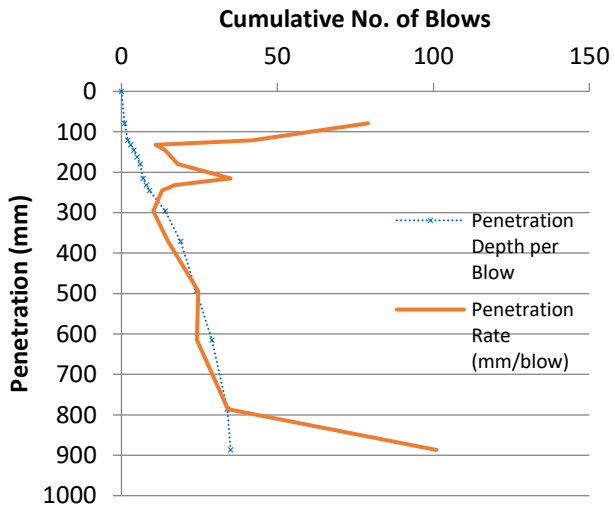
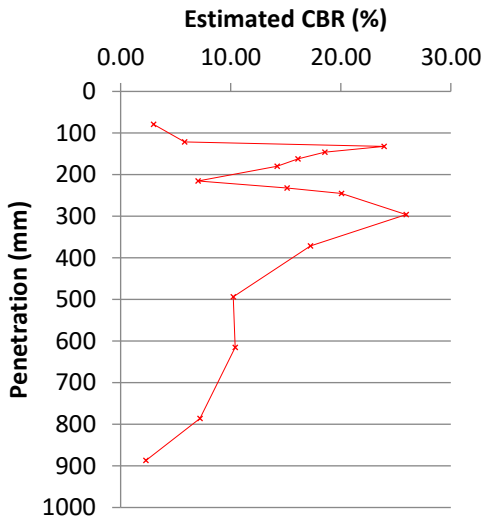
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 207**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	58	0			
1	1	1	137	79	79	79	2.98
2	1	2	179	121	42	42	5.81
3	1	3	190	132	11	11	23.95
4	1	4	204	146	14	14	18.56
5	1	5	220	162	16	16	16.12
6	1	6	238	180	18	18	14.23
7	1	7	273	215	35	35	7.05
8	1	8	290	232	17	17	15.12
9	1	9	303	245	13	13	20.07
10	5	14	354	296	51	10	25.94
11	5	19	429	371	75	15	17.25
12	5	24	552	494	123	25	10.23
13	5	29	673	615	121	24	10.41
14	5	34	844	786	171	34	7.22
15	1	35	945	887	101	101	2.30
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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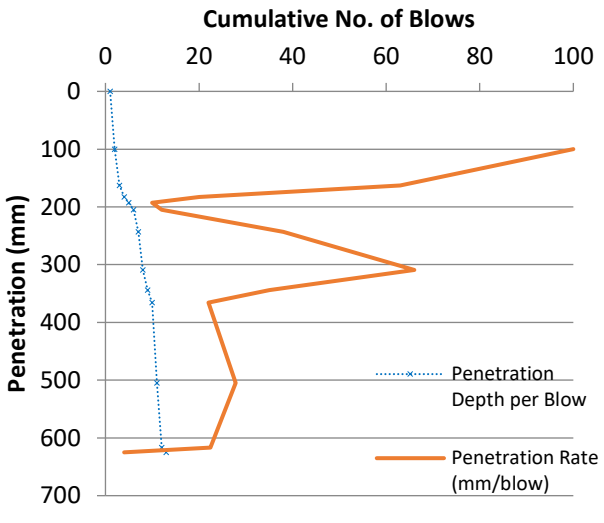
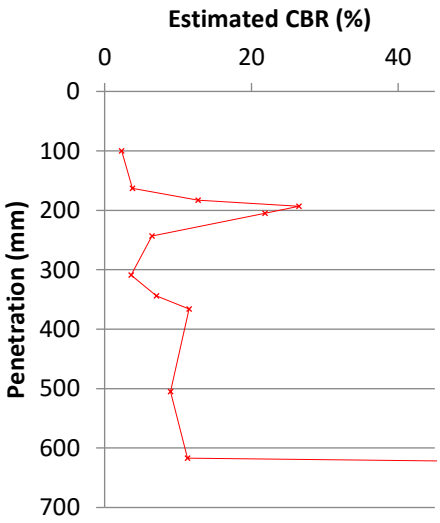
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 206**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	50	0			
1	1	1	150	100	100	100	2.32
2	1	2	213	163	63	63	3.79
3	1	3	233	183	20	20	12.73
4	1	4	243	193	10	10	26.49
5	1	5	255	205	12	12	21.84
6	1	6	293	243	38	38	6.46
7	1	7	359	309	66	66	3.60
8	1	8	394	344	35	35	7.05
9	1	9	416	366	22	22	11.51
10	5	14	555	505	139	28	8.99
11	5	19	667	617	112	22	11.29
12	2	21	675	625	8	4	69.76
13							
14		**Hit obstruction. Test terminated.**					
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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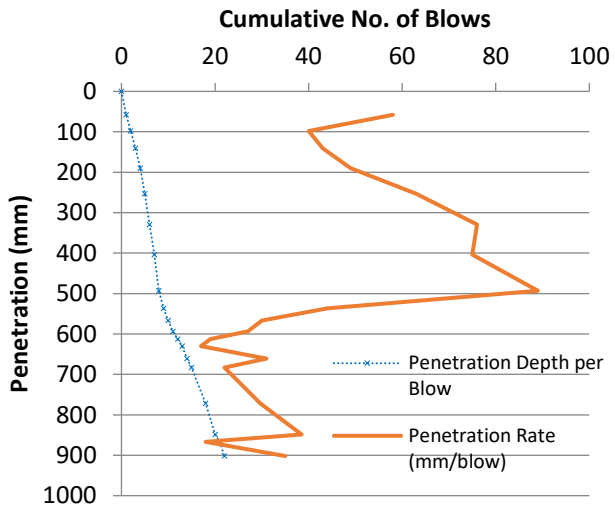
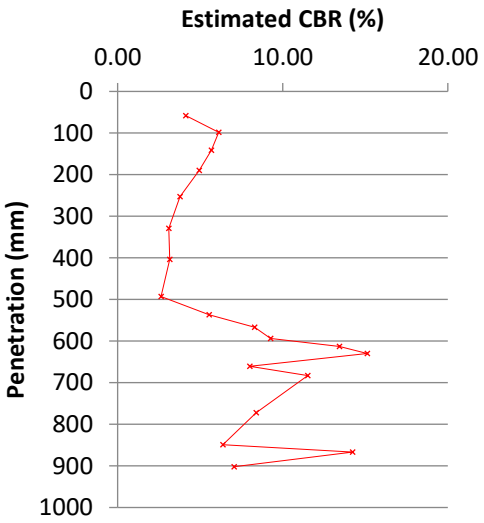
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 205**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	52	0			
1	1	1	110	58	58	58	4.13
2	1	2	150	98	40	40	6.12
3	1	3	193	141	43	43	5.67
4	1	4	242	190	49	49	4.94
5	1	5	305	253	63	63	3.79
6	1	6	381	329	76	76	3.10
7	1	7	456	404	75	75	3.15
8	1	8	545	493	89	89	2.63
9	1	9	589	537	44	44	5.53
10	1	10	619	567	30	30	8.29
11	1	11	646	594	27	27	9.27
12	1	12	665	613	19	19	13.44
13	1	13	682	630	17	17	15.12
14	1	14	713	661	31	31	8.01
15	1	15	735	683	22	22	11.51
16	3	18	824	772	89	30	8.39
17	2	20	901	849	77	39	6.37
18	1	21	919	867	18	18	14.23
19	1	22	954	902	35	35	7.05
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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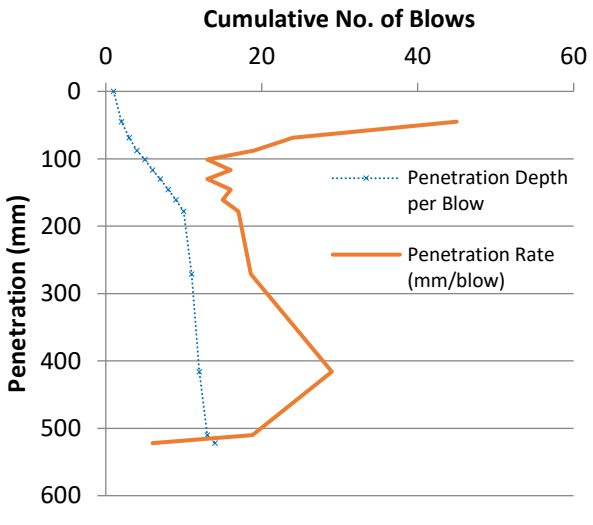
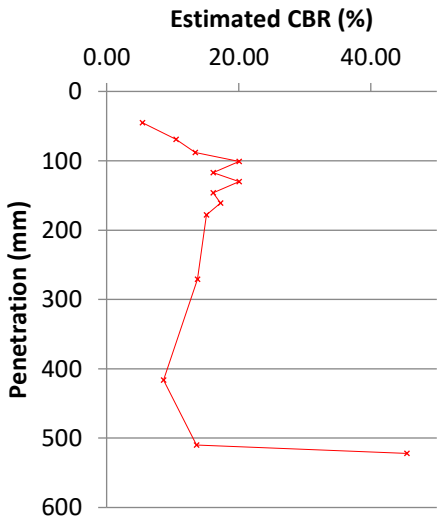
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 204**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	35	0			
1	1	1	80	45	45	45	5.40
2	1	2	104	69	24	24	10.50
3	1	3	123	88	19	19	13.44
4	1	4	136	101	13	13	20.07
5	1	5	152	117	16	16	16.12
6	1	6	165	130	13	13	20.07
7	1	7	181	146	16	16	16.12
8	1	8	196	161	15	15	17.25
9	1	9	213	178	17	17	15.12
10	5	14	306	271	93	19	13.74
11	5	19	451	416	145	29	8.59
12	5	24	545	510	94	19	13.59
13	2	26	557	522	12	6	45.45
14							
15		**Hit obstruction. Test terminated.**					
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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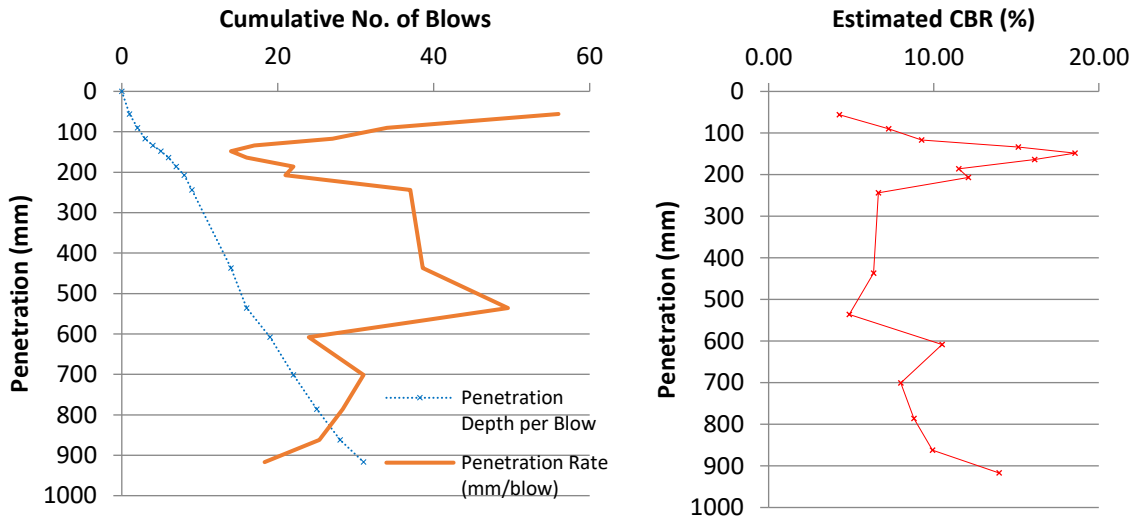
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 203**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	35	0			
1	1	1	91	56	56	56	4.29
2	1	2	125	90	34	34	7.26
3	1	3	152	117	27	27	9.27
4	1	4	169	134	17	17	15.12
5	1	5	183	148	14	14	18.56
6	1	6	199	164	16	16	16.12
7	1	7	221	186	22	22	11.51
8	1	8	242	207	21	21	12.09
9	1	9	279	244	37	37	6.64
10	5	14	472	437	193	39	6.35
11	2	16	571	536	99	50	4.88
12	3	19	643	608	72	24	10.50
13	3	22	736	701	93	31	8.01
14	3	25	821	786	85	28	8.81
15	3	28	897	862	76	25	9.92
16	3	31	952	917	55	18	13.96
17							
18							
19							
20							



*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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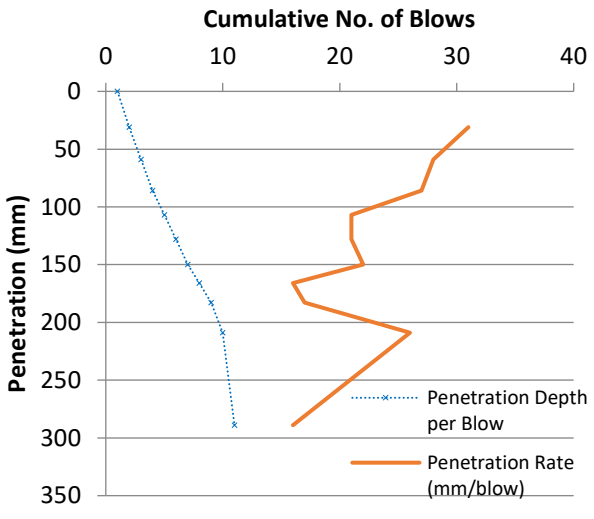
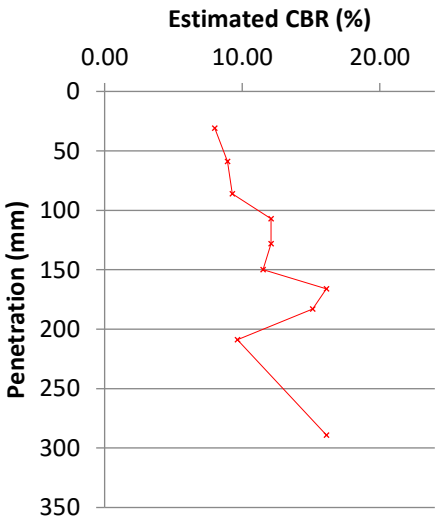
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 202**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	33	0			
1	1	1	64	31	31	31	8.01
2	1	2	92	59	28	28	8.92
3	1	3	119	86	27	27	9.27
4	1	4	140	107	21	21	12.09
5	1	5	161	128	21	21	12.09
6	1	6	183	150	22	22	11.51
7	1	7	199	166	16	16	16.12
8	1	8	216	183	17	17	15.12
9	1	9	242	209	26	26	9.65
10	5	14	322	289	80	16	16.12
11							
12		**Hit obstruction. Test terminated.**					
13							
14							
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
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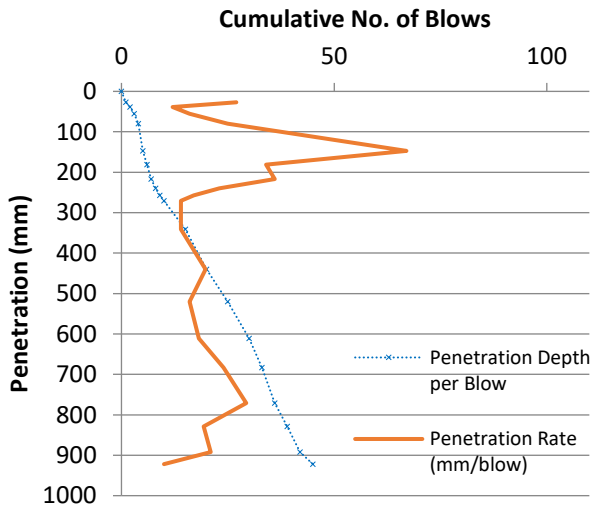
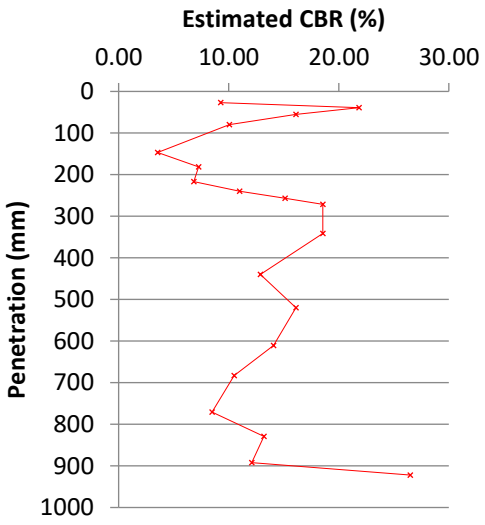
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 201**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	32	0			
1	1	1	59	27	27	27	9.27
2	1	2	71	39	12	12	21.84
3	1	3	87	55	16	16	16.12
4	1	4	112	80	25	25	10.05
5	1	5	179	147	67	67	3.55
6	1	6	213	181	34	34	7.26
7	1	7	249	217	36	36	6.84
8	1	8	272	240	23	23	10.98
9	1	9	289	257	17	17	15.12
10	1	10	303	271	14	14	18.56
11	5	15	373	341	70	14	18.56
12	5	20	472	440	99	20	12.87
13	5	25	552	520	80	16	16.12
14	5	30	643	611	91	18	14.06
15	3	33	715	683	72	24	10.50
16	3	36	803	771	88	29	8.49
17	3	39	861	829	58	19	13.19
18	3	42	924	892	63	21	12.09
19	3	45	954	922	30	10	26.49
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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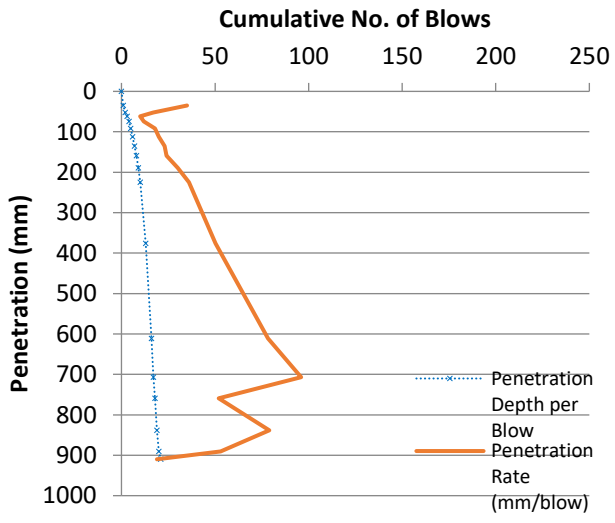
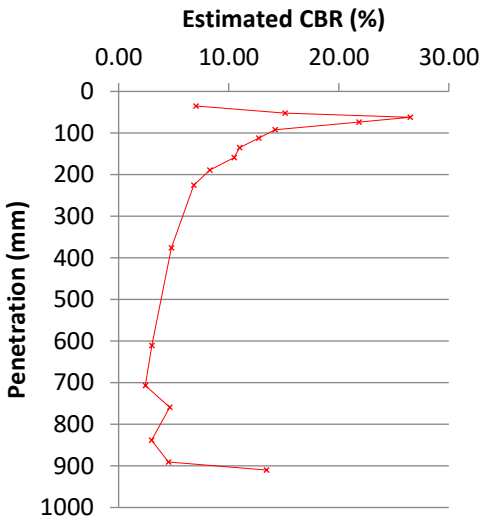
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 153**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	32	0			
1	1	1	67	35	35	35	7.05
2	1	2	84	52	17	17	15.12
3	1	3	94	62	10	10	26.49
4	1	4	106	74	12	12	21.84
5	1	5	124	92	18	18	14.23
6	1	6	144	112	20	20	12.73
7	1	7	167	135	23	23	10.98
8	1	8	191	159	24	24	10.50
9	1	9	221	189	30	30	8.29
10	1	10	257	225	36	36	6.84
11	3	13	408	376	151	50	4.80
12	3	16	643	611	235	78	3.01
13	1	17	739	707	96	96	2.43
14	1	18	791	759	52	52	4.64
15	1	19	870	838	79	79	2.98
16	1	20	923	891	53	53	4.54
17	1	21	942	910	19	19	13.44
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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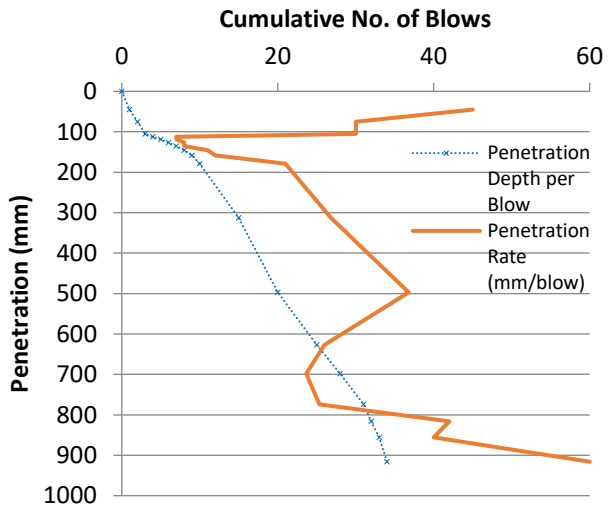
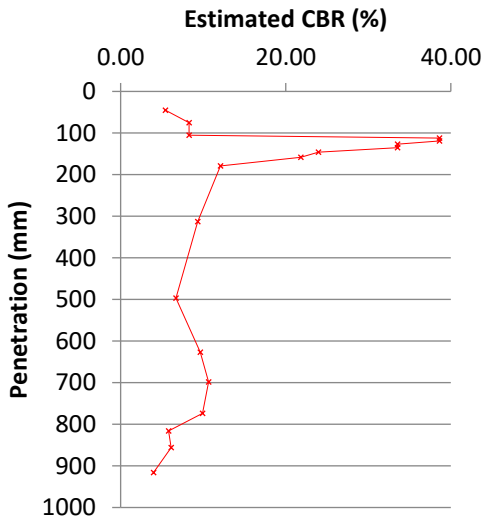
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 154**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	34	0			
1	1	1	79	45	45	45	5.40
2	1	2	109	75	30	30	8.29
3	1	3	139	105	30	30	8.29
4	1	4	146	112	7	7	38.61
5	1	5	153	119	7	7	38.61
6	1	6	161	127	8	8	33.53
7	1	7	169	135	8	8	33.53
8	1	8	180	146	11	11	23.95
9	1	9	192	158	12	12	21.84
10	1	10	213	179	21	21	12.09
11	5	15	347	313	134	27	9.34
12	5	20	531	497	184	37	6.68
13	5	25	661	627	130	26	9.65
14	3	28	732	698	71	24	10.65
15	3	31	808	774	76	25	9.92
16	1	32	850	816	42	42	5.81
17	1	33	890	856	40	40	6.12
18	1	34	950	916	60	60	3.99
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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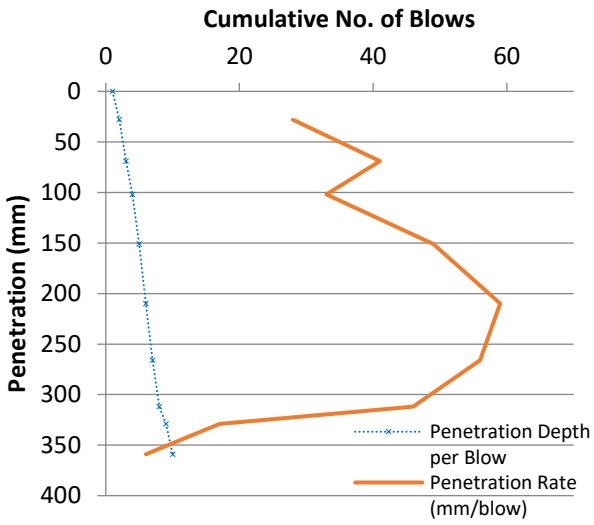
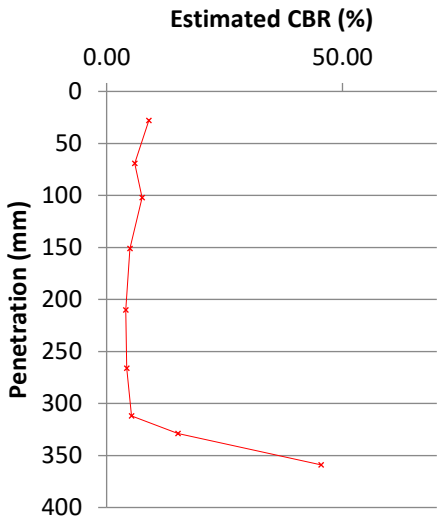
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 155**

TRL Dynamic Cone Penetrometer Test Report

(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	31	0			
1	1	1	59	28	28	28	8.92
2	1	2	100	69	41	41	5.96
3	1	3	133	102	33	33	7.50
4	1	4	182	151	49	49	4.94
5	1	5	241	210	59	59	4.06
6	1	6	297	266	56	56	4.29
7	1	7	343	312	46	46	5.28
8	1	8	360	329	17	17	15.12
9	5	13	390	359	30	6	45.45
10							
11		**Hit obstruction. Test terminated.**					
12							
13							
14							
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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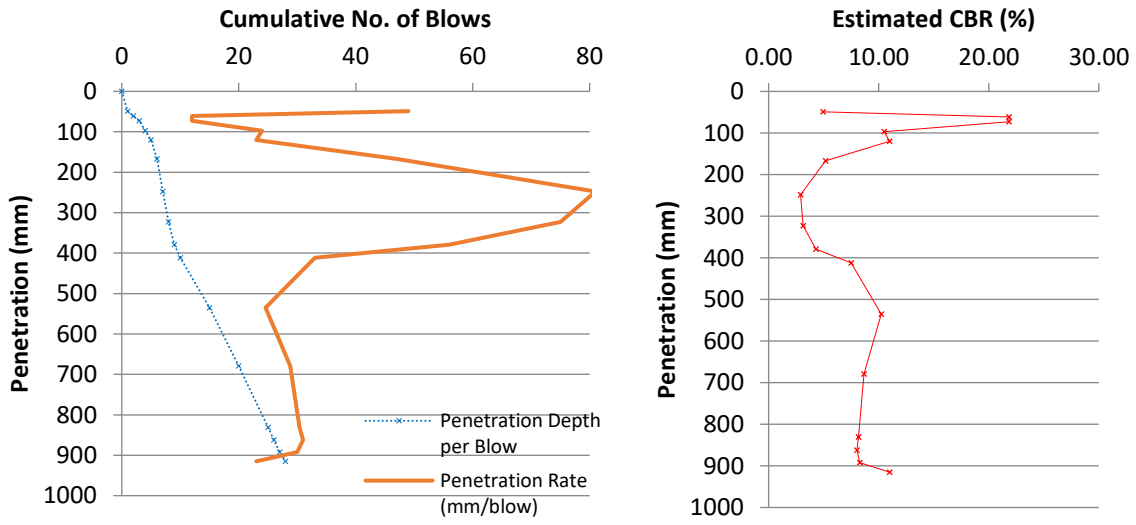
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 156**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	33	0			
1	1	1	82	49	49	49	4.94
2	1	2	94	61	12	12	21.84
3	1	3	106	73	12	12	21.84
4	1	4	130	97	24	24	10.50
5	1	5	153	120	23	23	10.98
6	1	6	200	167	47	47	5.16
7	1	7	281	248	81	81	2.90
8	1	8	356	323	75	75	3.15
9	1	9	412	379	56	56	4.29
10	1	10	445	412	33	33	7.50
11	5	15	568	535	123	25	10.23
12	5	20	712	679	144	29	8.66
13	5	25	864	831	152	30	8.18
14	1	26	895	862	31	31	8.01
15	1	27	925	892	30	30	8.29
16	1	28	948	915	23	23	10.98
17							
18							
19							
20							



*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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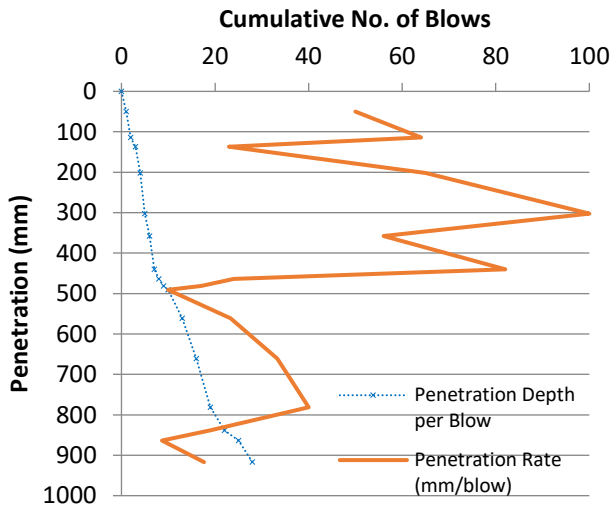
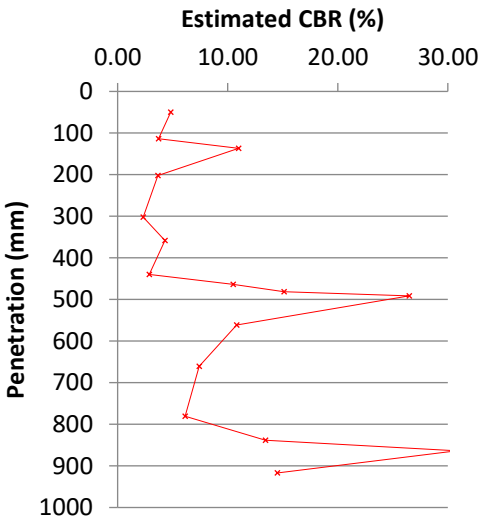
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**03.08.2023**
Checked by:	**J. Holdsworth**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 157**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	39	0			
1	1	1	89	50	50	50	4.83
2	1	2	153	114	64	64	3.72
3	1	3	176	137	23	23	10.98
4	1	4	241	202	65	65	3.66
5	1	5	341	302	100	100	2.32
6	1	6	397	358	56	56	4.29
7	1	7	479	440	82	82	2.86
8	1	8	503	464	24	24	10.50
9	1	9	520	481	17	17	15.12
10	1	10	530	491	10	10	26.49
11	3	13	600	561	70	23	10.82
12	3	16	700	661	100	33	7.42
13	3	19	820	781	120	40	6.12
14	3	22	877	838	57	19	13.44
15	3	25	903	864	26	9	30.81
16	3	28	956	917	53	18	14.51
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 158**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	33	0			
1	1	1	64	31	31	31	8.01
2	1	2	93	60	29	29	8.59
3	1	3	171	138	78	78	3.02
4	1	4	254	221	83	83	2.83
5	1	5	321	288	67	67	3.55
6	1	6	384	351	63	63	3.79
7	1	7	449	416	65	65	3.66
8	1	8	512	479	63	63	3.79
9	1	9	583	550	71	71	3.34
10	1	10	674	641	91	91	2.57
11	1	11	716	683	42	42	5.81
12	1	12	791	758	75	75	3.15
13	1	13	839	806	48	48	5.05
14	1	14	904	871	65	65	3.66
15	1	15	939	906	35	35	7.05
16	1	16	956	923	17	17	15.12
17							
18							
19							
20							

*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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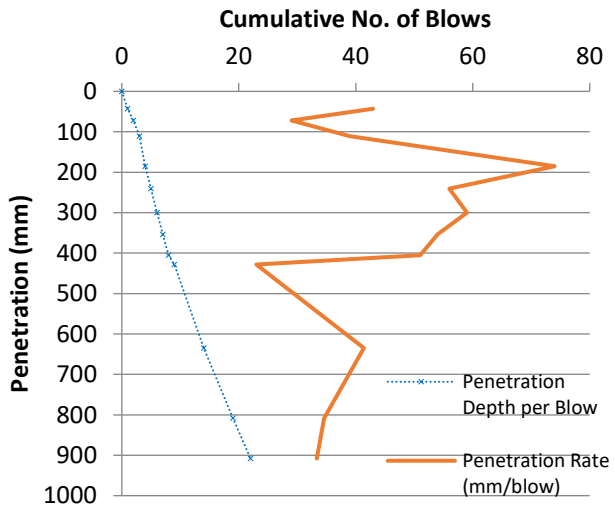
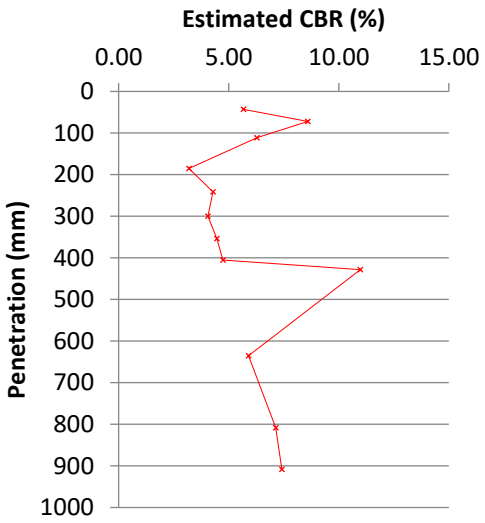
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 159**

TRL Dynamic Cone Penetrometer Test Report

(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	41	0			
1	1	1	84	43	43	43	5.67
2	1	2	113	72	29	29	8.59
3	1	3	152	111	39	39	6.28
4	1	4	226	185	74	74	3.19
5	1	5	282	241	56	56	4.29
6	1	6	341	300	59	59	4.06
7	1	7	395	354	54	54	4.46
8	1	8	446	405	51	51	4.73
9	1	9	469	428	23	23	10.98
10	5	14	676	635	207	41	5.90
11	5	19	849	808	173	35	7.13
12	3	22	949	908	100	33	7.42
13							
14							
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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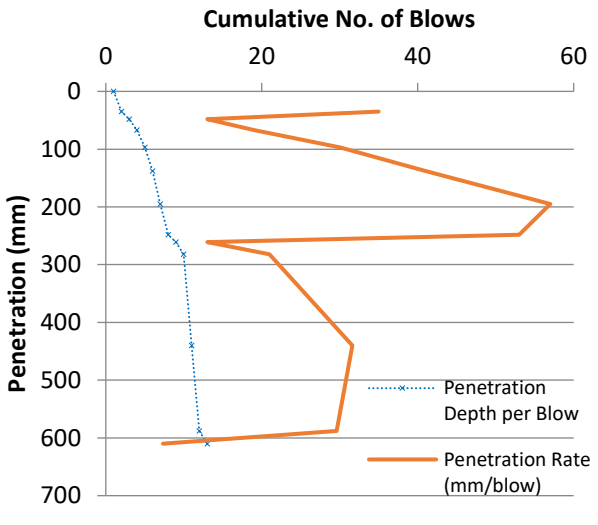
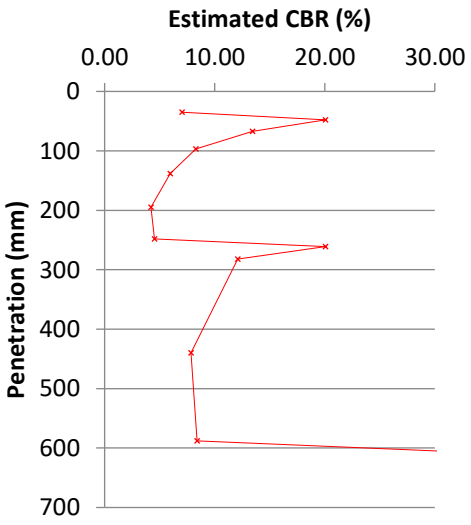
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 160**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	35	0			
1	1	1	70	35	35	35	7.05
2	1	2	83	48	13	13	20.07
3	1	3	102	67	19	19	13.44
4	1	4	132	97	30	30	8.29
5	1	5	173	138	41	41	5.96
6	1	6	230	195	57	57	4.21
7	1	7	283	248	53	53	4.54
8	1	8	296	261	13	13	20.07
9	1	9	317	282	21	21	12.09
10	5	14	475	440	158	32	7.85
11	5	19	623	588	148	30	8.41
12	3	22	645	610	22	7	36.76
13							
14		**Hit obstruction. Test terminated.**					
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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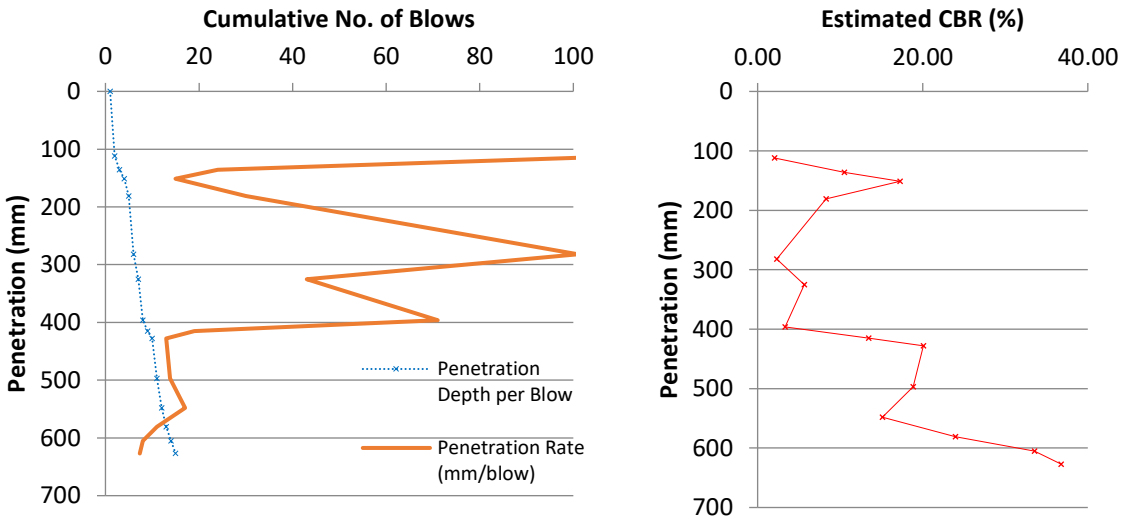
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 172/173**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	54	0			
1	1	1	166	112	112	112	2.06
2	1	2	190	136	24	24	10.50
3	1	3	205	151	15	15	17.25
4	1	4	235	181	30	30	8.29
5	1	5	336	282	101	101	2.30
6	1	6	379	325	43	43	5.67
7	1	7	450	396	71	71	3.34
8	1	8	469	415	19	19	13.44
9	1	9	482	428	13	13	20.07
10	5	14	551	497	69	14	18.84
11	3	17	602	548	51	17	15.12
12	3	20	635	581	33	11	23.95
13	3	23	659	605	24	8	33.53
14	3	26	681	627	22	7	36.76
15							
16		**Hit obstruction. Test terminated.**					
17							
18							
19							
20							



*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
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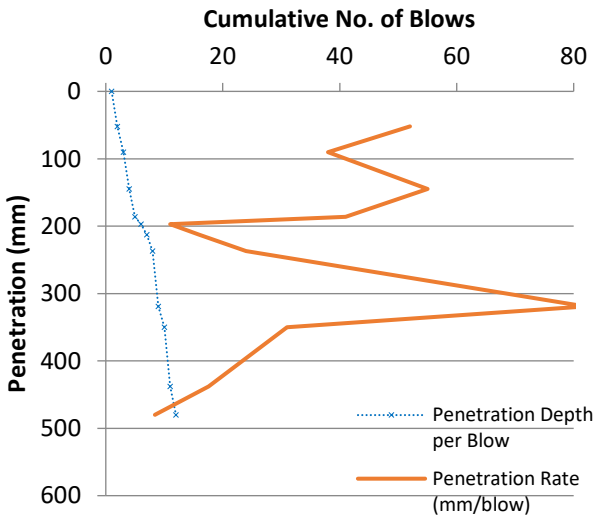
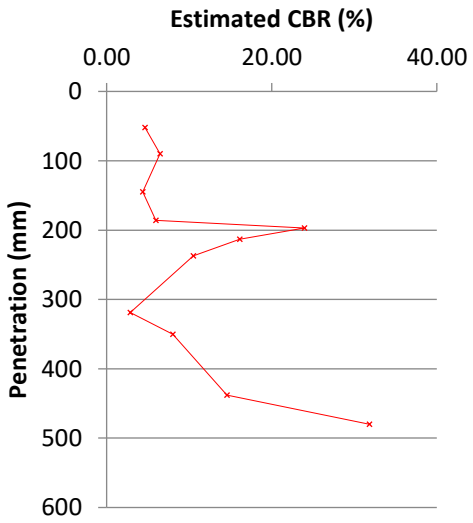
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 174/175**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	42	0			
1	1	1	94	52	52	52	4.64
2	1	2	132	90	38	38	6.46
3	1	3	187	145	55	55	4.37
4	1	4	228	186	41	41	5.96
5	1	5	239	197	11	11	23.95
6	1	6	255	213	16	16	16.12
7	1	7	279	237	24	24	10.50
8	1	8	361	319	82	82	2.86
9	1	9	392	350	31	31	8.01
10	5	14	480	438	88	18	14.57
11	5	19	522	480	42	8	31.84
12							
13		**Hit obstruction. Test terminated.**					
14							
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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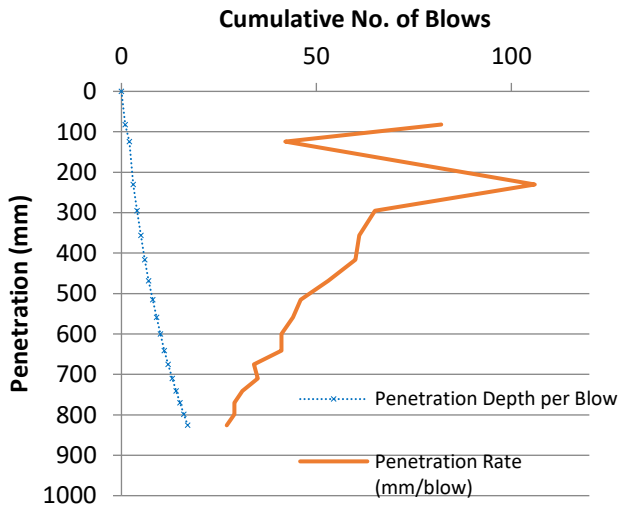
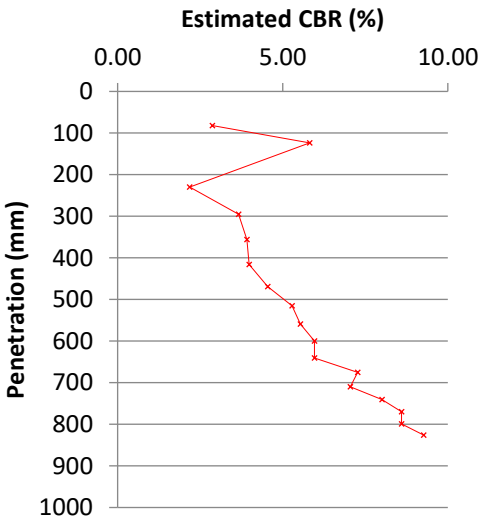
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 176-178**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	130	0			
1	1	1	212	82	82	82	2.86
2	1	2	254	124	42	42	5.81
3	1	3	360	230	106	106	2.18
4	1	4	425	295	65	65	3.66
5	1	5	486	356	61	61	3.92
6	1	6	546	416	60	60	3.99
7	1	7	599	469	53	53	4.54
8	1	8	645	515	46	46	5.28
9	1	9	689	559	44	44	5.53
10	1	10	730	600	41	41	5.96
11	1	11	771	641	41	41	5.96
12	1	12	805	675	34	34	7.26
13	1	13	840	710	35	35	7.05
14	1	14	871	741	31	31	8.01
15	1	15	900	770	29	29	8.59
16	1	16	929	799	29	29	8.59
17	1	17	956	826	27	27	9.27
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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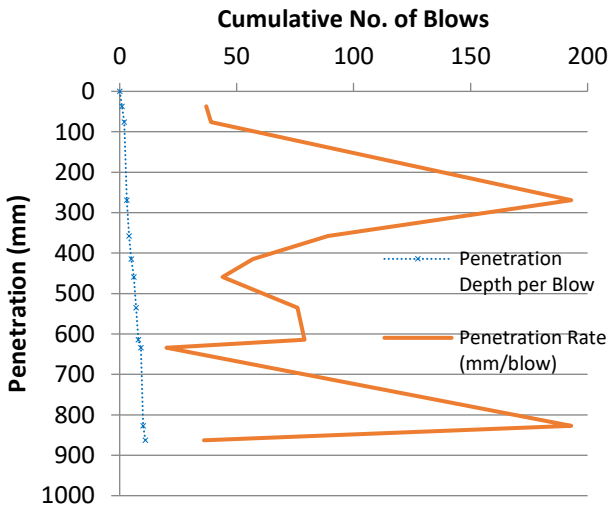
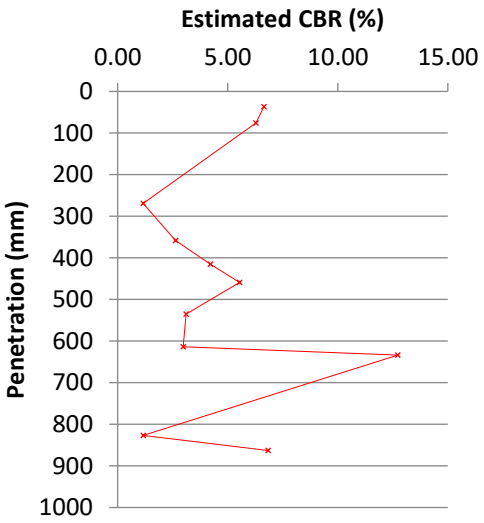
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 179-180**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	85	0			
1	1	1	122	37	37	37	6.64
2	1	2	161	76	39	39	6.28
3	1	3	354	269	193	193	1.16
4	1	4	443	358	89	89	2.63
5	1	5	500	415	57	57	4.21
6	1	6	544	459	44	44	5.53
7	1	7	620	535	76	76	3.10
8	1	8	699	614	79	79	2.98
9	1	9	719	634	20	20	12.73
10	1	10	912	827	193	193	1.16
11	1	11	948	863	36	36	6.84
12							
13							
14							
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
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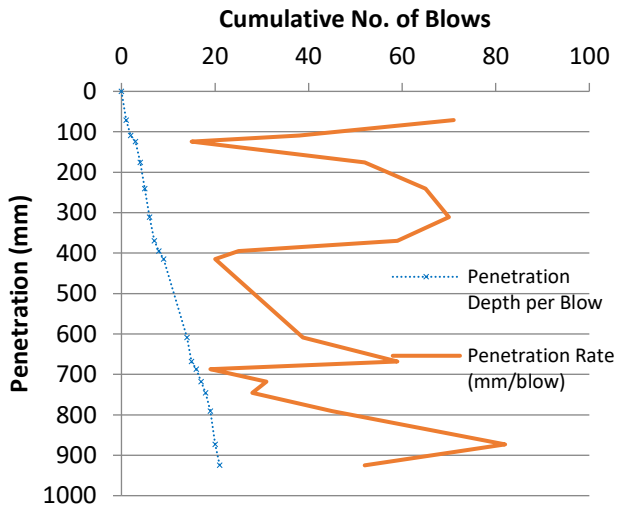
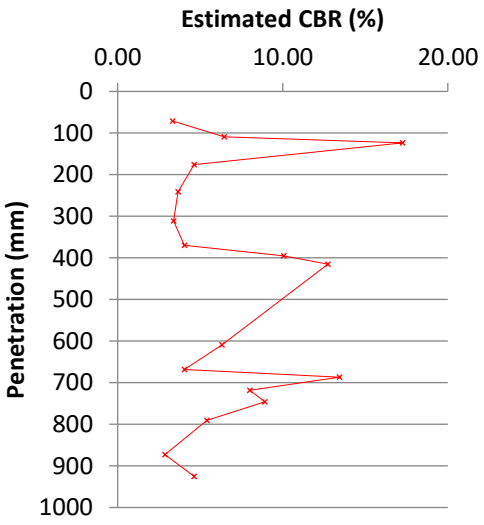
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 183**

TRL Dynamic Cone Penetrometer Test Report

(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	30	0			
1	1	1	101	71	71	71	3.34
2	1	2	139	109	38	38	6.46
3	1	3	154	124	15	15	17.25
4	1	4	206	176	52	52	4.64
5	1	5	271	241	65	65	3.66
6	1	6	341	311	70	70	3.39
7	1	7	400	370	59	59	4.06
8	1	8	425	395	25	25	10.05
9	1	9	445	415	20	20	12.73
10	5	14	639	609	194	39	6.32
11	1	15	698	668	59	59	4.06
12	1	16	717	687	19	19	13.44
13	1	17	748	718	31	31	8.01
14	1	18	776	746	28	28	8.92
15	1	19	821	791	45	45	5.40
16	1	20	903	873	82	82	2.86
17	1	21	955	925	52	52	4.64
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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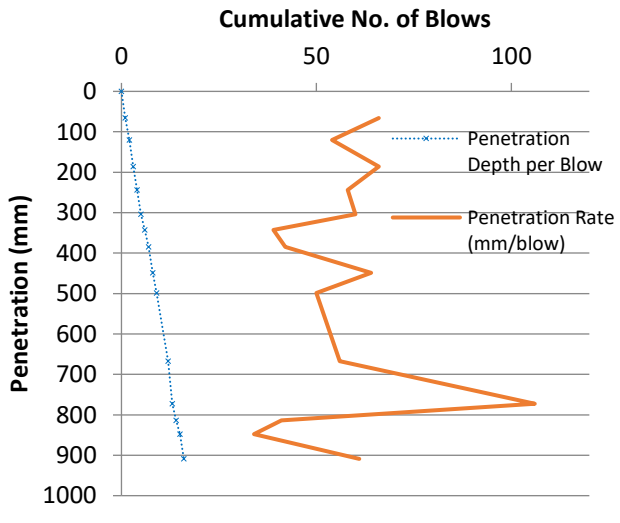
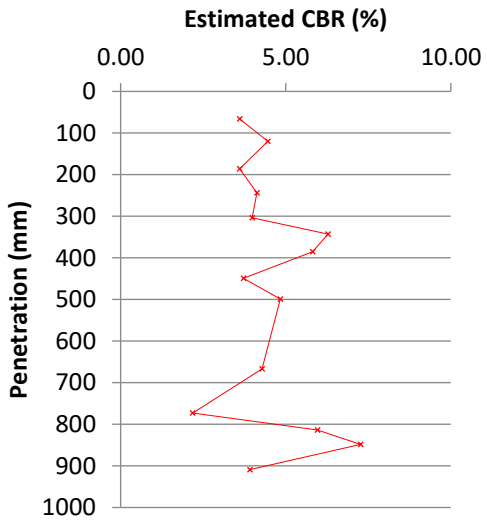
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 184-186**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	46	0			
1	1	1	112	66	66	66	3.60
2	1	2	166	120	54	54	4.46
3	1	3	232	186	66	66	3.60
4	1	4	290	244	58	58	4.13
5	1	5	350	304	60	60	3.99
6	1	6	389	343	39	39	6.28
7	1	7	431	385	42	42	5.81
8	1	8	495	449	64	64	3.72
9	1	9	545	499	50	50	4.83
10	3	12	713	667	168	56	4.29
11	1	13	819	773	106	106	2.18
12	1	14	860	814	41	41	5.96
13	1	15	894	848	34	34	7.26
14	1	16	955	909	61	61	3.92
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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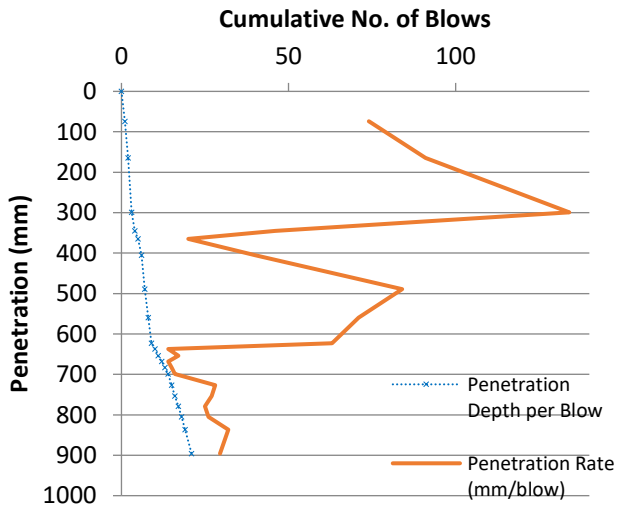
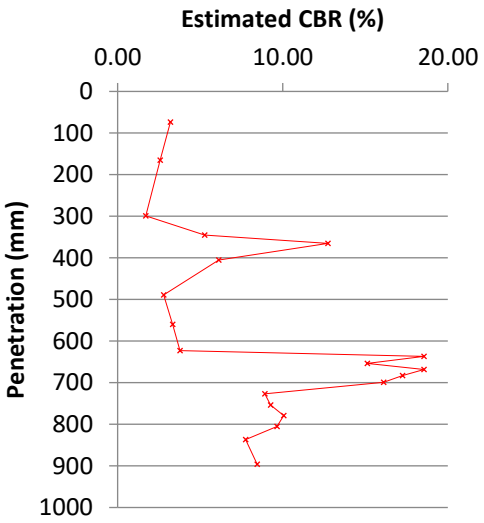
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 187**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	46	0			
1	1	1	120	74	74	74	3.19
2	1	2	211	165	91	91	2.57
3	1	3	345	299	134	134	1.70
4	1	4	391	345	46	46	5.28
5	1	5	411	365	20	20	12.73
6	1	6	451	405	40	40	6.12
7	1	7	535	489	84	84	2.79
8	1	8	606	560	71	71	3.34
9	1	9	669	623	63	63	3.79
10	1	10	683	637	14	14	18.56
11	1	11	700	654	17	17	15.12
12	1	12	714	668	14	14	18.56
13	1	13	729	683	15	15	17.25
14	1	14	745	699	16	16	16.12
15	1	15	773	727	28	28	8.92
16	1	16	800	754	27	27	9.27
17	1	17	825	779	25	25	10.05
18	1	18	851	805	26	26	9.65
19	1	19	883	837	32	32	7.75
20	2	21	942	896	59	30	8.44





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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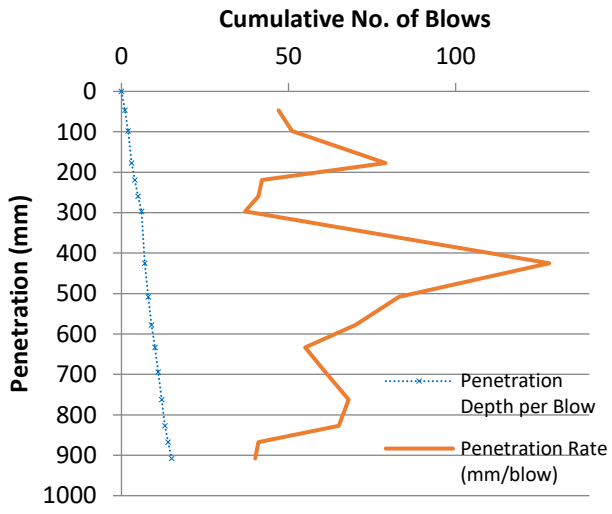
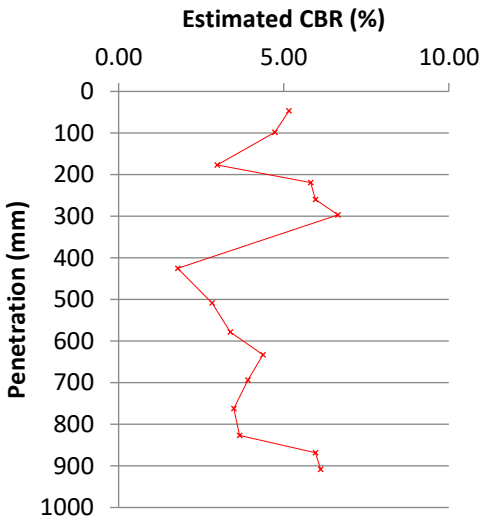
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 188**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	45	0			
1	1	1	92	47	47	47	5.16
2	1	2	143	98	51	51	4.73
3	1	3	222	177	79	79	2.98
4	1	4	264	219	42	42	5.81
5	1	5	305	260	41	41	5.96
6	1	6	342	297	37	37	6.64
7	1	7	470	425	128	128	1.79
8	1	8	553	508	83	83	2.83
9	1	9	623	578	70	70	3.39
10	1	10	678	633	55	55	4.37
11	1	11	739	694	61	61	3.92
12	1	12	807	762	68	68	3.49
13	1	13	872	827	65	65	3.66
14	1	14	913	868	41	41	5.96
15	1	15	953	908	40	40	6.12
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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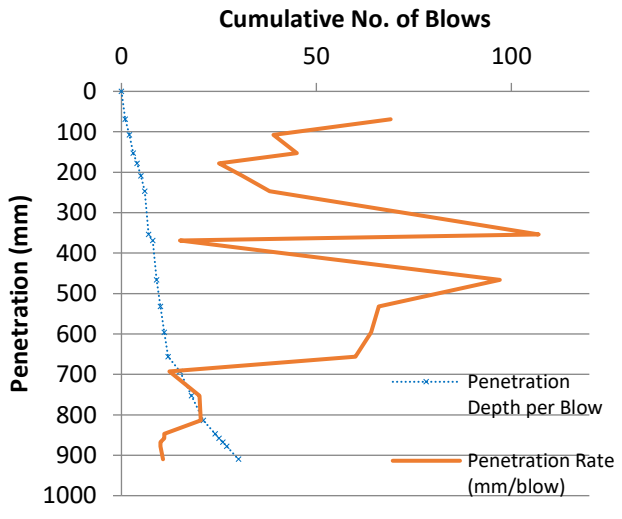
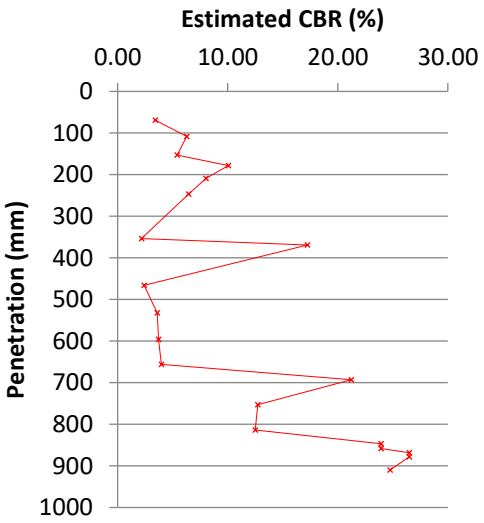
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 189**

TRL Dynamic Cone Penetrometer Test Report

(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	35	0			
1	1	1	104	69	69	69	3.44
2	1	2	143	108	39	39	6.28
3	1	3	188	153	45	45	5.40
4	1	4	213	178	25	25	10.05
5	1	5	244	209	31	31	8.01
6	1	6	282	247	38	38	6.46
7	1	7	389	354	107	107	2.16
8	1	8	404	369	15	15	17.25
9	1	9	501	466	97	97	2.40
10	1	10	567	532	66	66	3.60
11	1	11	631	596	64	64	3.72
12	1	12	691	656	60	60	3.99
13	3	15	728	693	37	12	21.22
14	3	18	788	753	60	20	12.73
15	3	21	849	814	61	20	12.51
16	3	24	882	847	33	11	23.95
17	1	25	893	858	11	11	23.95
18	1	26	903	868	10	10	26.49
19	1	27	913	878	10	10	26.49
20	3	30	945	910	32	11	24.74





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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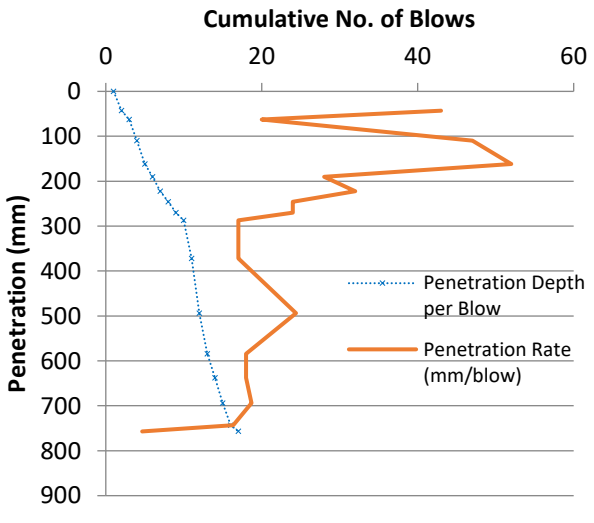
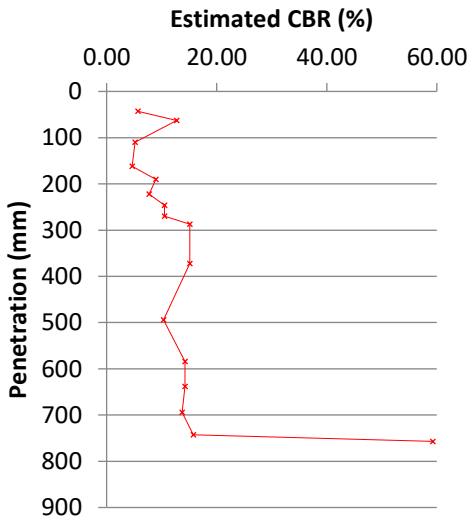
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 190-192**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	67	0			
1	1	1	110	43	43	43	5.67
2	1	2	130	63	20	20	12.73
3	1	3	177	110	47	47	5.16
4	1	4	229	162	52	52	4.64
5	1	5	257	190	28	28	8.92
6	1	6	289	222	32	32	7.75
7	1	7	313	246	24	24	10.50
8	1	8	337	270	24	24	10.50
9	1	9	354	287	17	17	15.12
10	5	14	439	372	85	17	15.12
11	5	19	561	494	122	24	10.32
12	5	24	651	584	90	18	14.23
13	3	27	705	638	54	18	14.23
14	3	30	761	694	56	19	13.69
15	3	33	810	743	49	16	15.77
16	3	36	824	757	14	5	59.27
17							
18		**Hit obstruction. Test terminated.**					
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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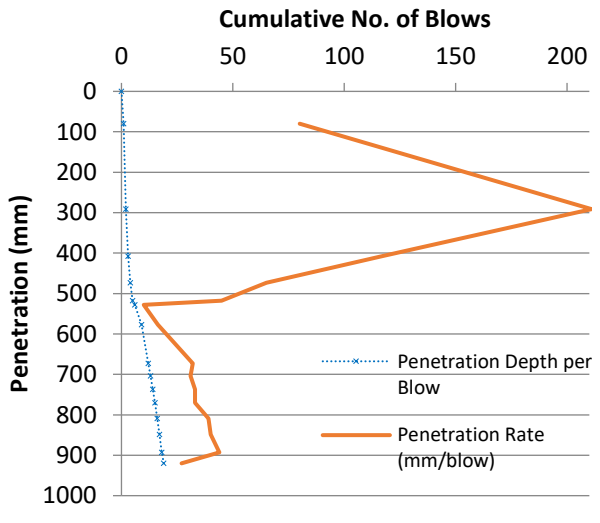
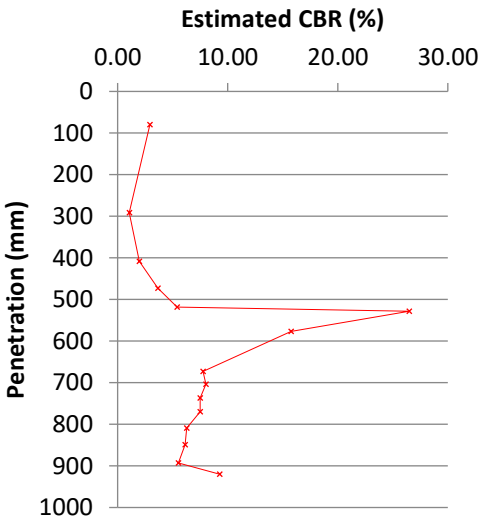
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 193**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	32	0			
1	1	1	112	80	80	80	2.94
2	1	2	323	291	211	211	1.05
3	1	3	440	408	117	117	1.97
4	1	4	505	473	65	65	3.66
5	1	5	550	518	45	45	5.40
6	1	6	560	528	10	10	26.49
7	3	9	609	577	49	16	15.77
8	3	12	705	673	96	32	7.75
9	1	13	736	704	31	31	8.01
10	1	14	769	737	33	33	7.50
11	1	15	802	770	33	33	7.50
12	1	16	841	809	39	39	6.28
13	1	17	881	849	40	40	6.12
14	1	18	925	893	44	44	5.53
15	1	19	952	920	27	27	9.27
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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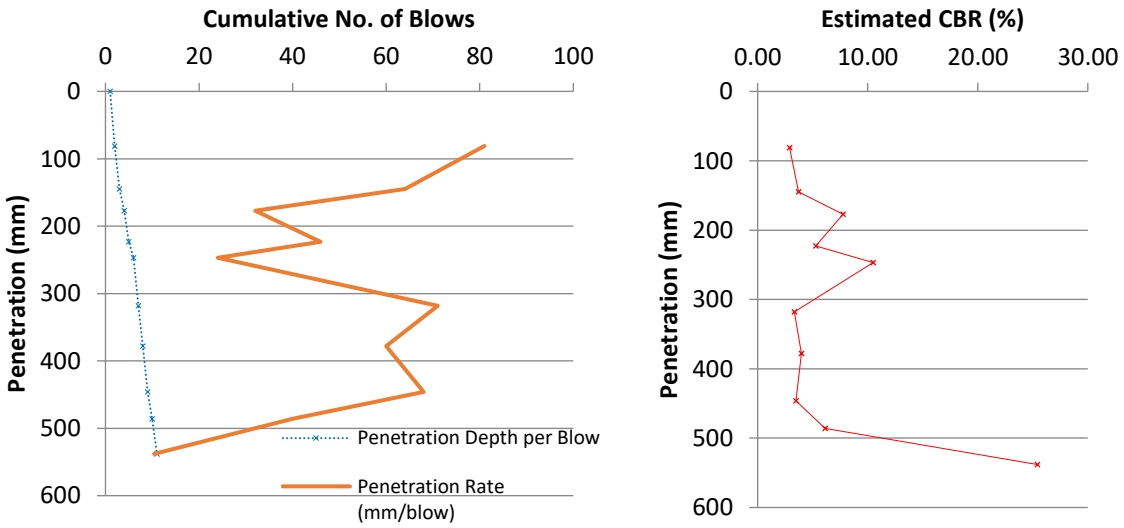
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Plot 181**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	56	0			
1	1	1	137	81	81	81	2.90
2	1	2	201	145	64	64	3.72
3	1	3	233	177	32	32	7.75
4	1	4	279	223	46	46	5.28
5	1	5	303	247	24	24	10.50
6	1	6	374	318	71	71	3.34
7	1	7	434	378	60	60	3.99
8	1	8	502	446	68	68	3.49
9	1	9	542	486	40	40	6.12
10	5	14	594	538	52	10	25.41
11							
12		**Hit obstruction. Test terminated.**					
13							
14							
15							
16							
17							
18							
19							
20							



*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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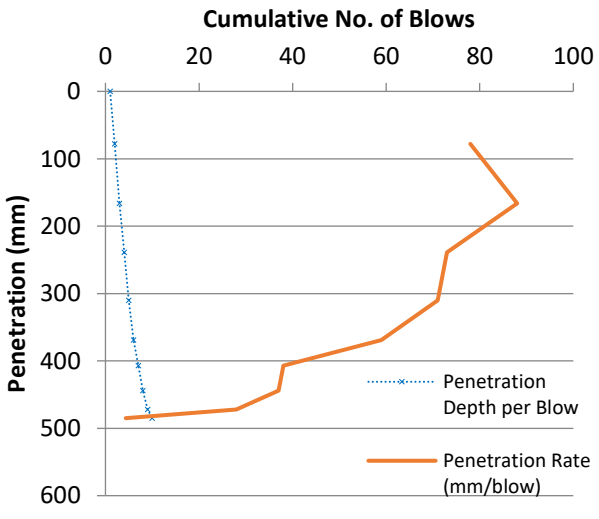
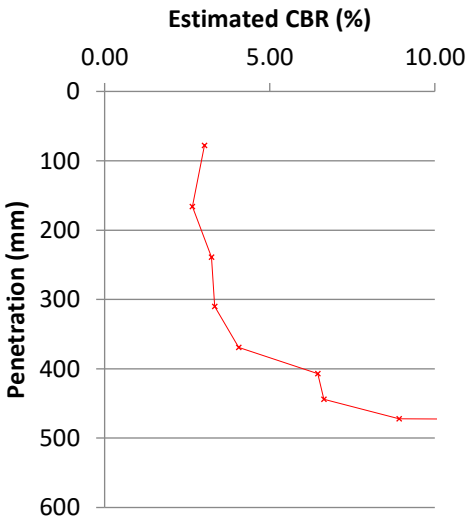
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Road South - 1**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	66	0			
1	1	1	144	78	78	78	3.02
2	1	2	232	166	88	88	2.66
3	1	3	305	239	73	73	3.24
4	1	4	376	310	71	71	3.34
5	1	5	435	369	59	59	4.06
6	1	6	473	407	38	38	6.46
7	1	7	510	444	37	37	6.64
8	1	8	538	472	28	28	8.92
9	3	11	551	485	13	4	64.10
10							
11		**Hit obstruction. Test terminated.**					
12							
13							
14							
15							
16							
17							
18							
19							
20							





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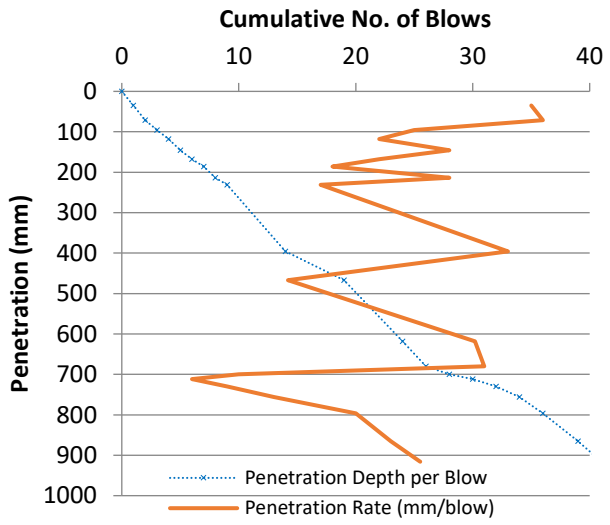
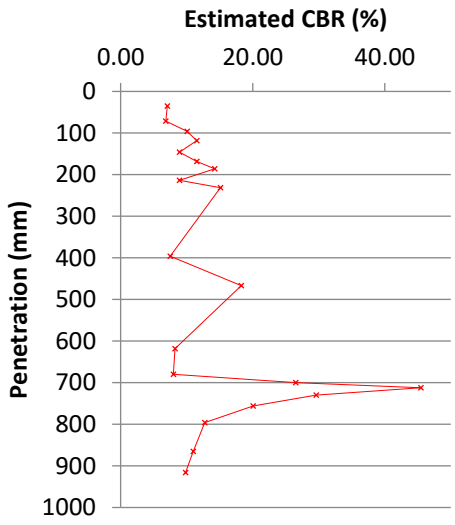
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Road South - 2**

TRL Dynamic Cone Penetrometer Test Report

(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	34	0			
1	1	1	69	35	35	35	7.05
2	1	2	105	71	36	36	6.84
3	1	3	130	96	25	25	10.05
4	1	4	152	118	22	22	11.51
5	1	5	180	146	28	28	8.92
6	1	6	202	168	22	22	11.51
7	1	7	220	186	18	18	14.23
8	1	8	248	214	28	28	8.92
9	1	9	265	231	17	17	15.12
10	5	14	430	396	165	33	7.50
11	5	19	501	467	71	14	18.28
12	5	24	652	618	151	30	8.23
13	2	26	714	680	62	31	8.01
14	2	28	734	700	20	10	26.49
15	2	30	746	712	12	6	45.45
16	2	32	764	730	18	9	29.61
17	2	34	790	756	26	13	20.07
18	2	36	830	796	40	20	12.73
19	3	39	899	865	69	23	10.98
20	2	41	950	916	51	26	9.85





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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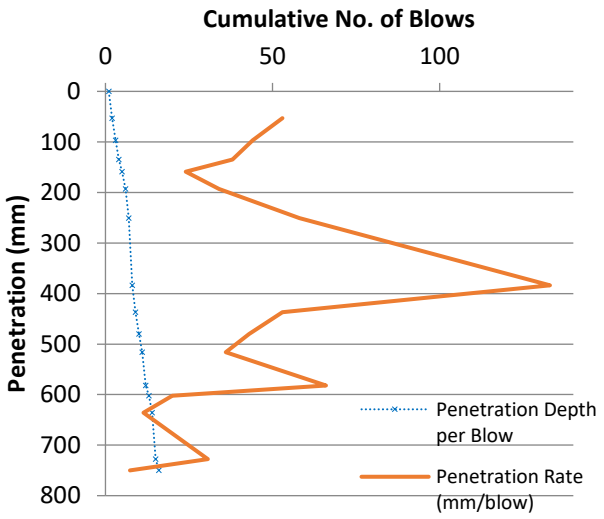
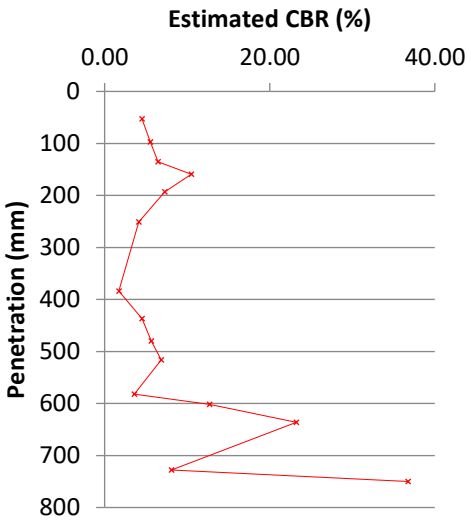
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Road South - 3**

TRL Dynamic Cone Penetrometer Test Report

(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	43	0			
1	1	1	96	53	53	53	4.54
2	1	2	140	97	44	44	5.53
3	1	3	178	135	38	38	6.46
4	1	4	202	159	24	24	10.50
5	1	5	236	193	34	34	7.26
6	1	6	294	251	58	58	4.13
7	1	7	427	384	133	133	1.72
8	1	8	480	437	53	53	4.54
9	1	9	523	480	43	43	5.67
10	1	10	559	516	36	36	6.84
11	1	11	625	582	66	66	3.60
12	1	12	645	602	20	20	12.73
13	3	15	679	636	34	11	23.20
14	3	18	771	728	92	31	8.10
15	3	21	793	750	22	7	36.76
16							
17		**Hit obstruction. Test terminated.**					
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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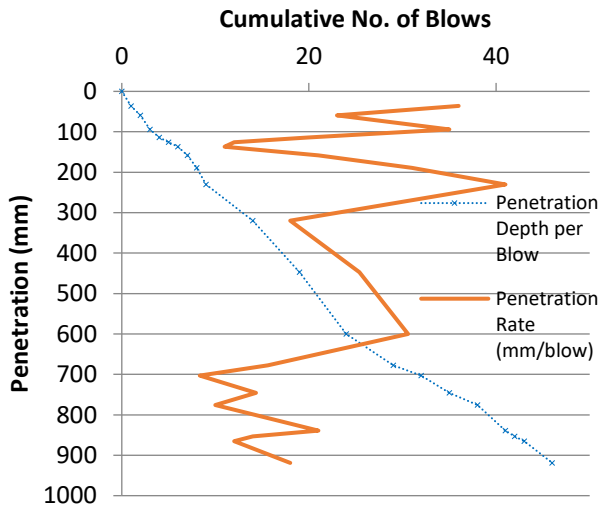
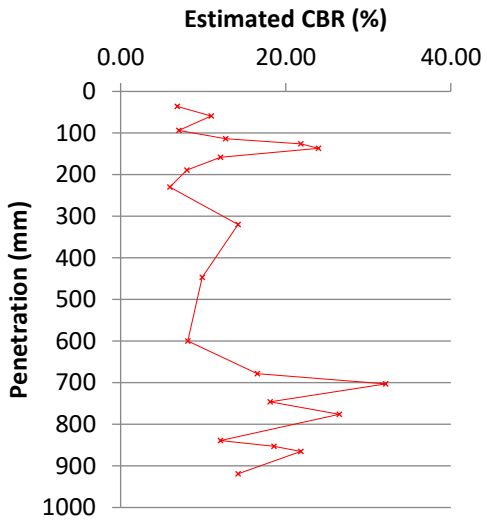
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Road South - 4**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	36	0			
1	1	1	72	36	36	36	6.84
2	1	2	95	59	23	23	10.98
3	1	3	130	94	35	35	7.05
4	1	4	150	114	20	20	12.73
5	1	5	162	126	12	12	21.84
6	1	6	173	137	11	11	23.95
7	1	7	194	158	21	21	12.09
8	1	8	225	189	31	31	8.01
9	1	9	266	230	41	41	5.96
10	5	14	356	320	90	18	14.23
11	5	19	483	447	127	25	9.89
12	5	24	636	600	153	31	8.12
13	5	29	714	678	78	16	16.55
14	3	32	739	703	25	8	32.11
15	3	35	782	746	43	14	18.10
16	3	38	812	776	30	10	26.49
17	3	41	875	839	63	21	12.09
18	1	42	889	853	14	14	18.56
19	1	43	901	865	12	12	21.84
20	3	46	955	919	54	18	14.23





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
Ref - Interim Advice Note 73/06 Revision 1 (2009) Design Guidance for Road Pavement Foundations (Draft HD25)

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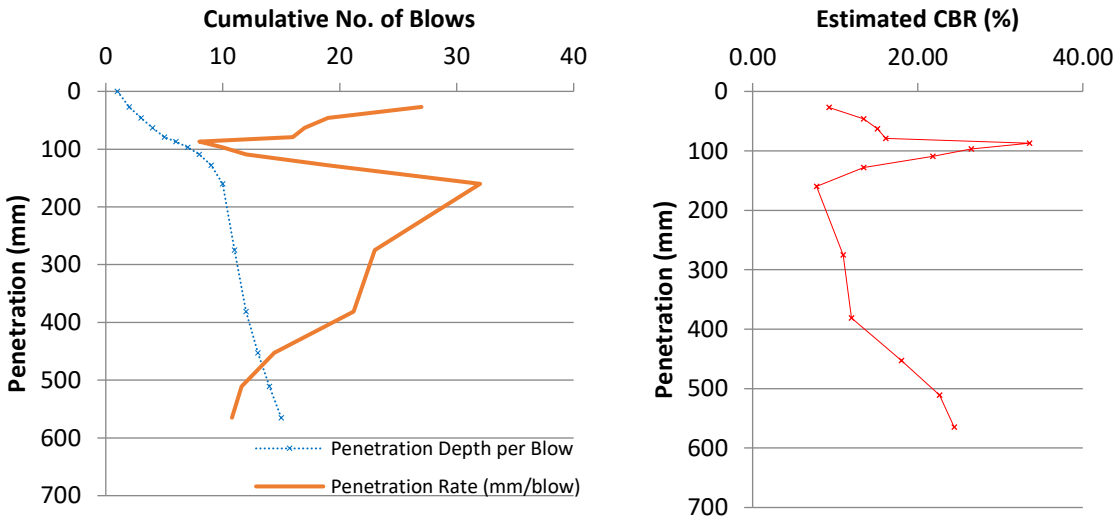
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Road South - 5**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	43	0			
1	1	1	70	27	27	27	9.27
2	1	2	89	46	19	19	13.44
3	1	3	106	63	17	17	15.12
4	1	4	122	79	16	16	16.12
5	1	5	130	87	8	8	33.53
6	1	6	140	97	10	10	26.49
7	1	7	152	109	12	12	21.84
8	1	8	171	128	19	19	13.44
9	1	9	203	160	32	32	7.75
10	5	14	318	275	115	23	10.98
11	5	19	424	381	106	21	11.97
12	5	24	496	453	72	14	18.01
13	5	29	554	511	58	12	22.64
14	5	34	608	565	54	11	24.42
15							
16		**Hit obstruction. Test terminated.**					
17							
18							
19							
20							



*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
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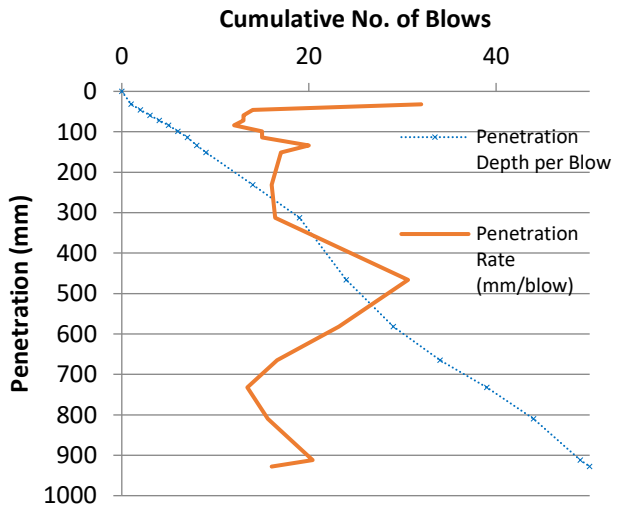
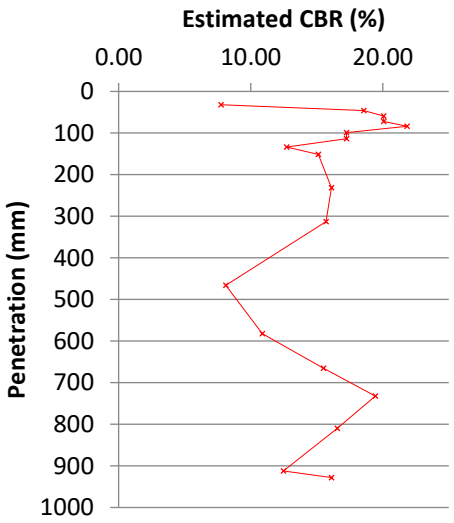
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Road South - 6**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	30	0			
1	1	1	62	32	32	32	7.75
2	1	2	76	46	14	14	18.56
3	1	3	89	59	13	13	20.07
4	1	4	102	72	13	13	20.07
5	1	5	114	84	12	12	21.84
6	1	6	129	99	15	15	17.25
7	1	7	144	114	15	15	17.25
8	1	8	164	134	20	20	12.73
9	1	9	181	151	17	17	15.12
10	5	14	261	231	80	16	16.12
11	5	19	343	313	82	16	15.70
12	5	24	496	466	153	31	8.12
13	5	29	612	582	116	23	10.88
14	5	34	695	665	83	17	15.50
15	5	39	762	732	67	13	19.44
16	5	44	840	810	78	16	16.55
17	5	49	942	912	102	20	12.47
18	1	50	958	928	16	16	16.12
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
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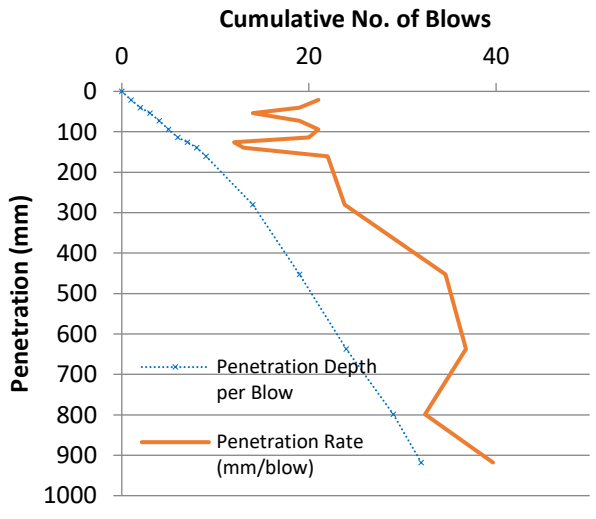
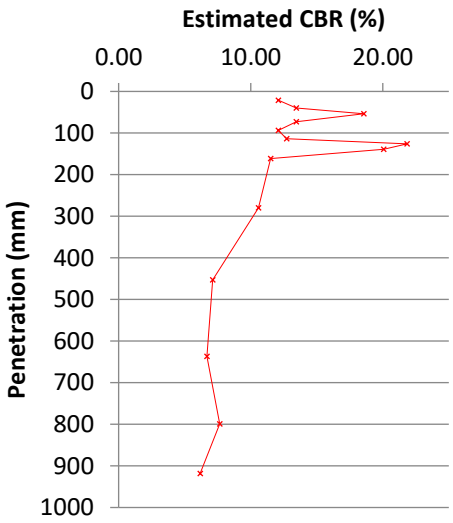
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Road South - 7**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	36	0			
1	1	1	57	21	21	21	12.09
2	1	2	76	40	19	19	13.44
3	1	3	90	54	14	14	18.56
4	1	4	109	73	19	19	13.44
5	1	5	130	94	21	21	12.09
6	1	6	150	114	20	20	12.73
7	1	7	162	126	12	12	21.84
8	1	8	175	139	13	13	20.07
9	1	9	197	161	22	22	11.51
10	5	14	316	280	119	24	10.59
11	5	19	489	453	173	35	7.13
12	5	24	673	637	184	37	6.68
13	5	29	835	799	162	32	7.64
14	3	32	954	918	119	40	6.17
15							
16							
17							
18							
19							
20							





*Calculation of CBR: estimated from the following TRL relationship: Log10(CBR) = 2.48 - 1.057 x Log10 (mm/blow)
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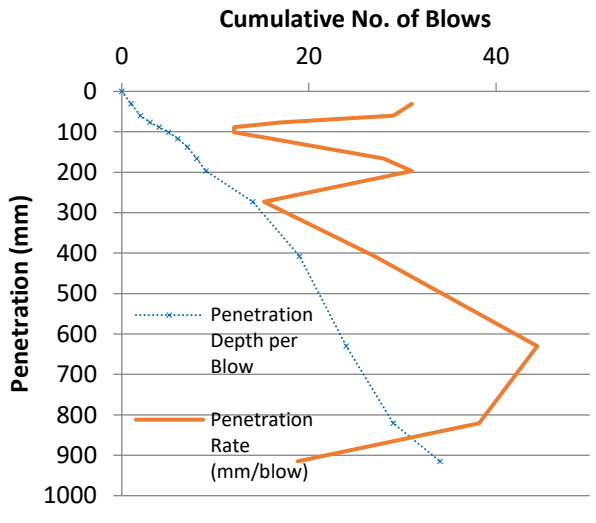
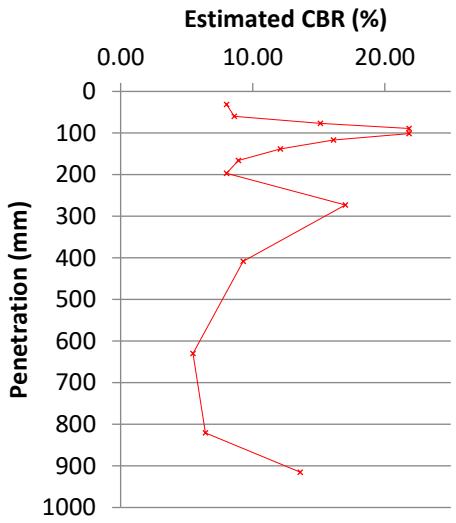
Site Name:	**Chidswell (Phase 2)**
Project Number:	**SR3786**
Date tested (by):	**07.08.2023**
Checked by:	**M. Thompson**
Material description:	**Class 2C Engineered Fill**
Test location:	**Road South - 8**

TRL Dynamic Cone Penetrometer Test Report
(in-situ measurement of the structural properties of unbound materials)

Layer No.	No. of blows	Cumulative No. of blows	Penetration depth (mm)	Actual penetration depth (mm)	Depth tested (mm)	Pen rate (mm/blow)	Approx. CBR (%)*
Zero reading		0	45	0			
1	1	1	76	31	31	31	8.01
2	1	2	105	60	29	29	8.59
3	1	3	122	77	17	17	15.12
4	1	4	134	89	12	12	21.84
5	1	5	146	101	12	12	21.84
6	1	6	162	117	16	16	16.12
7	1	7	183	138	21	21	12.09
8	1	8	211	166	28	28	8.92
9	1	9	242	197	31	31	8.01
10	5	14	318	273	76	15	17.01
11	5	19	453	408	135	27	9.27
12	5	24	675	630	222	44	5.48
13	5	29	866	821	191	38	6.42
14	5	34	960	915	94	19	13.59
15							
16							
17							
18							
19							
20							





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