



Land at Granny Lane, Mirfield For Miller Homes Yorkshire

Report no: 2935/3

Date: November 2023



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Appendix B : Correspondence

From	Date	Content
Kirklees Council	24 th November 2022	Approval of Remediation Statement 2935/2D

Appendix C : Site photographs

Appendix D : Geotechnical test results

D (i)	CBR test results
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E (i)	Paddock topsoil
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FOREWORD (verification report)

This report has been prepared for the sole internal use and reliance of the Client named on page 1. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Lithos Consulting Limited (Lithos); such authorisation not to be unreasonably withheld. If any unauthorised third party comes into possession of this report, they rely on it at their peril and the authors owe them no duty of care and skill.

This report has been reviewed by a Competent Person, as defined in the National Planning Policy Framework. We ensure that all projects are managed by individuals with necessary experience, relevant qualifications, and current membership of a relevant professional organisation. Records of engineers, project managers and reviewers involved in this project are maintained by us. Lithos QA/QC procedures for all our work forms an integral part of our ISO9001 accreditation and as such is regularly audited.

The report should be read in its entirety, including all associated drawings and appendices. Lithos cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context.

The findings and opinions conveyed in this report (including review of any third-party reports) are based on information obtained from a variety of sources as detailed within this report, and which Lithos believes are reliable. Reasonable care and skill has been applied in examining the information obtained. Nevertheless, Lithos cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

The report represents the findings and opinions of experienced geoenvironmental consultants. Lithos does not provide legal advice and the advice of lawyers may also be required.

Lithos standard terms and conditions apply to the report, a copy of the terms and conditions is available on request.

VERIFICATION REPORT
for the
REMEDIATION & PREPARATORY WORKS
of land at
GRANNY LANE, MIRFIELD

1 INTRODUCTION

1.1 The commission and brief

1.1.1 Lithos Consulting Limited (Lithos) has been commissioned by Miller Homes Yorkshire to prepare a Verification Report for land off Granny Lane, Mirfield.

1.1.2 Lithos have already issued the following reports:

- Geoenvironmental Appraisal: Land at Granny Lane, Mirfield. Report No. 2935/1A dated May 2019.
- Granny Lane, Mirfield – Post-demolition investigation. Letter Report Ref. 035/2935/SRJ/cc dated 22nd April 2022.
- Remediation Statement: Land at Granny Lane, Mirfield. Report No. 2935/2D, dated November 2022.

1.1.3 Copies of the above reports were forwarded to Kirklees Council and their comments were taken into account. Relevant correspondence from Kirklees is included in Appendix B to this report.

1.1.4 Remediation and preparatory works described in this report were undertaken by Miller's groundworker, B Gallagher Construction (BGC), under the part-time supervision of Lithos. These works started in August 2022 and were completed by October 2023.

1.1.5 The purpose of this document is to:

- Summarise the background to the works
- Describe the remediation and ground preparatory works undertaken
- Describe any additions and variations to the works outlined in the Remediation Strategy
- Confirm that the site has been rendered suitable for the proposed redevelopment

1.2 The Proposed development

1.2.1 The proposed development comprises detached, semi-detached and terraced houses forming a total of 67 new dwellings, as shown on Drawing 2935/11 in Appendix A.

1.2.2 The houses will be founded on shallow strip or deepened trench fill footings. Access to the development will be from Granny Lane to the north.

1.2.3 The Local Planning Authority has agreed planning permission for redevelopment of this site, via Appeal Decision APP/Z4718/W/21/3279040. There are several Conditions associated with remediation, most notably:

- Condition 14: Remediation of the site shall be carried out and completed in accordance with the Remediation Strategy approved pursuant to Condition 13.
- Condition 15: 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.

1.2.4 This report should satisfy the above Conditions.

2 BACKGROUND

2.1 Site description and history

2.1.1 Site details are summarised below:

Detail	Remarks
NGR	SE 207 190
Areas	2.2 ha (5.4 acres)
Access	Off Granny Lane
Description	Prior to commencement of development the site comprised three separate fields with a small car parking area and a single storey building (recently demolished) in the far east. An unmade track crosses the northeast from Granny Lane to the car park. The majority of the site has remained undeveloped, with small buildings only present in the far east.

2.1.2 The site location, and salient features prior to commencement of development, are shown on Drawings 2935/1 and 2935/2 in Appendix A.

2.2 Ground investigation

2.2.1 Fieldwork was supervised in three phases by Lithos: Phase 1 was undertaken between the 13th December 2017 and the 16th January 2018; Phase 2 was undertaken on the 25th April 2019 and Phase 3 was undertaken on the 5th April 2022. Phases 1 and 2 area detailed in Geoenvironmental Appraisal 2935/1A; Phase 3 is detailed in post-demolition letter report 035/2935/SRJ/cc.

Made ground

2.2.2 **Made ground** encountered across the site comprised:

- **Made ground topsoil**, clayey topsoil with gravel of rare brick, metal, coal and ceramic encountered in the north and east to between 0.2m and 0.4m depth (typically 0.3m).
- **Hardcore**: encountered in the far east comprising sandy gravel or tarmac, brick, limestone and concrete to between 0.1m and 0.5m depth.
- **Brickfill**: encountered in the far east, typically beneath Hardcore to between 0.25m and 0.5m depth. Also encountered in the north of the paddock (TP06 & BH02) to between 0.4m and 1.1m depth (typically 300mm thick). Comprises gravelly clay and clayey gravel of predominantly brick with rare mudstone, concrete and coal encountered.
- **Reworked Natural Ground**: encountered in the north to between 0.7m and 2.0m depth comprising clay with gravel of mixed lithologies including rare brick, coal and ceramic.
- **Granular Made Ground**: clayey gravel of predominantly mudstone and coal with rare brick and ceramic encountered in the north east (TPs 06, 12, 201 & 202) to between 1.0 & 1.6m depth and within the paddock (TP's 105, 106 & 207) between 2.3 and 2.7m depth.
- **Cohesive Made Ground**: encountered in a single exploratory hole (BH02) to 2.3m depth comprising clay with gravel of coal and mudstone.

2.2.3 Made ground was typically restricted to the paddock and area of hardstanding in the east and northeast of site. The approximate extent of made ground is shown on Drawing 2395/11 in Appendix A.

Natural ground

2.2.4 **Natural ground** was encountered in the majority of exploratory holes, and typically comprised:

- **Topsoil:** clayey, friable topsoil was identified across the site to a typical depth of 300mm.
- **Cohesive Alluvial Fan Deposits:** typically firm to stiff slightly sandy gravelly clay, encountered in the majority of exploratory holes to between 0.6m and 3.0m depth (typically 1.8m).
- **Granular Alluvial Fan Deposits:** medium dense and dense slightly clayey sandy gravel with occasional cobbles (locally gravelly sand) encountered across the site beneath the clays to between 11.5m and 13.7m depth (average 12.7m). Locally interbedded with the clays in the uppermost 3m.
- **Coal Measures:** Weak grey mudstone encountered in BH01 at 13.7m depth.

Summary of contamination

2.2.5 No visual or olfactory evidence of organic contamination was noted during site work. However, 15 of 31 samples of made ground and topsoil tested for a range of potential contaminants (including pH, metals, asbestos, speciated PAH & banded TPH) yielded elevated concentrations of arsenic (12 samples), copper (1 sample) and nickel (1 sample), detected within Topsoil, Made Ground Topsoil, Brickfill and Granular Made Ground.

2.2.6 During excavation of TP102, fragments of fibrous cement sheeting were identified within the Hardcore from 0.1m to 0.3m depth. A sample of the cement sheeting and a sample of the surrounding soil matrix were subject to an asbestos ID. The cement sheeting returned a positive ID for chrysotile fibres, but no asbestos was identified within the soil matrix.

2.2.7 None of the other 34 samples of soil tested returned positive asbestos IDs.

2.2.8 Elevated concentrations of TPH (DRO & LRO fractions) and benzo(a)pyrene were detected within the Hardcore beneath and around the former building. Benzo(a)pyrene was also identified within a single sample of Made Ground Topsoil from the small paddock.

2.2.9 Testing of topsoil across the site suggests the material is chemically suitable for re-use, with the exception of topsoil within the smaller paddock.

2.2.10 Topsoil within the small paddock is considered suitable for re-use within the areas of proposed public open space (POS) only. The majority of this topsoil is already located in areas of POS. This topsoil should however not be retained within the proposed play area in the northeastern POS.

2.2.11 Significantly elevated contaminant concentrations have only been recorded in the following materials / locations:

- Made Ground Topsoil within the small paddock in the northeast.
- Hardcore / Granular Made Ground present at surface beneath & around the former building.
- Brickfill / Granular Made Ground present at depth in the northeast of the site (TP06, TP105 & TP207). However, these materials were all located at least 600mm depth beneath uncontaminated Reworked Natural Ground.

2.2.12 The Revised Conceptual Site Model is presented as Drawing 2935/7 in Appendix A.

3 OVERVIEW OF PREPARATORY AND REMEDIATION WORKS

3.1 Aims

3.1.1 The aims of the remediation works were to:

- Remove/treat ground contamination in order to protect environmental receptors, and render the site suitable for the proposed development
- Satisfy the requirements of the Local Planning Authority and warranty provider

3.2 Scope of works

3.2.1 The Remediation Strategy detailed the works necessary to enable residential development at the site, most notably:

- General site clearance of surface materials and vegetation
- Topsoil strip, including segregation of contaminated topsoil from the paddock area
- Demolition of buildings and removal of below ground obstructions
- Excavation & redistribution of hardcore surfacing present in the east of the site
- Provision of a minimum 600mm thick cover layer of 'clean' soils in all garden & landscaped areas underlain by residual made ground (Brickfill or Granular Made Ground)
- Supervision of the works by a suitably qualified consultant, to include detailed records, testing requirements, etc

4 DETAILS OF REMEDIATION WORKS

4.1 Site clearance

4.1.1 All trees to be retained were identified and protected by fencing in accordance with BS5837: 2012.

4.1.2 Topsoil from the former paddock area, previously known to be contaminated with benzo(a)pyrene, was stripped and placed in a single stockpile protected by orange barrier fencing.

4.1.3 Topsoil from the remainder of the site was then stripped and placed in a separate stockpile, for subsequent re-use within the development.

4.1.4 Further testing of the paddock topsoil was undertaken to confirm the remediation requirements. In order to obtain a more representative dataset, 12 further representative samples of this Made Ground Topsoil were obtained.

4.1.5 However, during this sampling exercise a number of fragments of suspected asbestos containing materials (ACMs; cement sheet) were recovered.

4.1.6 Each of the additional samples was scheduled for analysis for asbestos identification and speciated PAH. The results, presented in Appendix E (i), indicated that:

- Benzo(a)pyrene concentrations ranged between 0.4 mg/kg & 11 mg/kg, with 4 of the 12 recorded concentrations above the Tier 1 assessment criteria for domestic gardens (5 mg/kg).
- The suspected ACM fragments did contain asbestos (chrysotile) in the form of the cement.
- Two of the soil samples tested positive for the presence of asbestos; subsequent quantification analysis recorded asbestos concentrations of < 0.001% in both cases.

4.1.7 The contaminated topsoil arising from the former paddock area was removed from site.

4.2 CBR testing of new road corridors

4.2.1 Geoenvironmental Appraisal 2935/1A identified that ground conditions beneath the site typically comprised topsoil (c. 300mm thick), and locally made ground / existing fill, overlying Residual Soils (cohesive and granular Alluvial Fan Deposits), underlain by Coal Measures Bedrock (Mudstone, Sandstone or Siltstone).

4.2.2 In-situ testing undertaken for the Geoenvironmental Appraisal yielded an average California Bearing Ration (CBR) value of 2%.

4.2.3 Further CBR values have been determined, either via in-situ CBR tests (BS1377: 1990: Part 9: Clause 4.3) or plate load tests (BS1377: 1990: Part 9: Clause 4.1), at 18 locations (nominal 25m intervals) along the proposed new adoptable highways.

4.2.4 The testing was undertaken by experienced Technicians from Professional Soils Laboratory, under the supervision of Lithos. Each plate test comprised a single cycle of loading, with five equal incremental pressures up to maximum applied pressures of either 257 kPa or 322 kPa.

4.2.5 The tests were undertaken mainly on undisturbed natural Residual Soils exposed following removal of the topsoil. Six tests in the northeast of the site were undertaken on existing made ground materials.

4.2.6 The results of the plate load tests have been used to derive equivalent CBR values using the method detailed in Section 7.14 of the Highways Agency Interim Advice Note 73/06 Revision 1 (2009).

4.2.7 The results are summarised in Table 1 in Annex I and the laboratory test certificates are presented in Appendix D (i). The test locations are shown on BGC's CBR-Tests drawing copied to Appendix A.

4.2.8 The plate load tests recorded CBR values between 5.2% and in excess of 65% and the in-situ CBR tests recorded CBR values of 6.0% and 6.1%.

4.2.9 Bryan G Hall's Pavement Details and Typical Sections drawing (Ref. 17/417/700/001 Rev. H) indicates that, for CBR values exceeding 5%, a road construction comprising 210mm Capping and 240mm Sub-base will be appropriate. This should be agreed with the Local Authority highways department, particularly where the sub-grade material comprises made ground.

4.3 Redistribution of contaminated made ground & topsoil

4.3.1 It is understood that the majority of the made ground (Brickfill & Granular Made Ground) has been retained on site, beneath a minimum 600mm cover of uncontaminated topsoil and subsoil, beneath the gardens of plots 38 to 41 and also around the surface water attenuation tank located within the public open space (POS) area immediately to the west of the site entrance.

4.3.2 Lithos witnessed the excavation of trial pits in the following areas, to confirm the satisfactory redistribution of the Brickfill and Granular Made Ground materials:

- Plots 38 to 41
- Plots 31 to 37
- Around the surface water attenuation tank located within the public open space (POS) to the west of the site entrance

4.3.3 Plot 31 was not accessible at this time, as it was in use as a material storage area.

- 4.3.4 The locations of these inspection pits are shown on the Remediation Plan presented as Drawing 2935/12 in Appendix A to this report. The ground conditions encountered are detailed in Table 2 in Annex I and inspection pit photos are presented in Appendix C.
- 4.3.5 These inspection pits confirmed that no residual made ground was present within 600mm of the finished garden / POS surface.

5 CONCLUSIONS

- 5.1 The remediation works agreed with Kirklees Council have been carried out to date in accordance with Lithos' Remediation Statement Ref. 2935/2D with variations as detailed in this report.
- 5.2 Most notably inspection pits still need to be excavated in the garden of plot 31, to confirm that no residual made ground remains within 600mm of the finished surface.
- 5.3 A selection of photographs of the works is presented in Appendix C.



ANNEX I
TABLES

Table 1: CBR Test Summary

Test Ref.	Test Location (approximate)	Method	Material	Date	CBR value (%)	Moisture content (%)
1A	Road 1 chainage 25m	PLT	Existing made ground	09/08/2022	19	-
1B	Road 1 chainage 50m	PLT	Existing made ground	09/08/2022	12	-
2A	Road 2 chainage 25m	PLT	In-situ natural clay strata	09/08/2022	21	-
2B	Road 2 chainage 50m	PLT	Existing made ground	09/08/2022	8.3	-
2C	Road 2 chainage 75m	PLT	Existing made ground	09/08/2022	> 44	-
2D	Road 2 chainage 100m	PLT	Existing made ground	09/08/2022	18	-
2E	Road 2 chainage 125m	PLT	In-situ natural clay strata	08/08/2022	24	-
2F	Road 2 chainage 150m	PLT	In-situ natural clay strata	08/08/2022	26	-
2G	Road 2 chainage 175m	PLT	In-situ natural clay strata	08/08/2022	16	-
2H	Road 2 chainage 200m	PLT	In-situ natural clay strata	09/08/2022	24	-
3A	Road 3 chainage 25m	PLT	Existing made ground	09/08/2022	5.2	-
3B	Road 3 chainage 50m	CBR	In-situ natural clay strata	08/08/2022	6.1	12
3C	Road 3 chainage 75m	CBR	In-situ natural clay strata	08/08/2022	6.0	5.4
3D	Road 3 chainage 100m	PLT	In-situ natural clay strata	08/08/2022	> 65	-
3E	Road 3 chainage 125m	PLT	In-situ natural clay strata	08/08/2022	9.6	-
3F	Road 3 chainage 150m	PLT	In-situ natural clay strata	08/08/2022	29	-
3G	Road 3 chainage 175m	PLT	In-situ natural clay strata	08/08/2022	> 44	-
3H	Road 3 chainage 200m	PLT	In-situ natural clay strata	08/08/2022	12	-

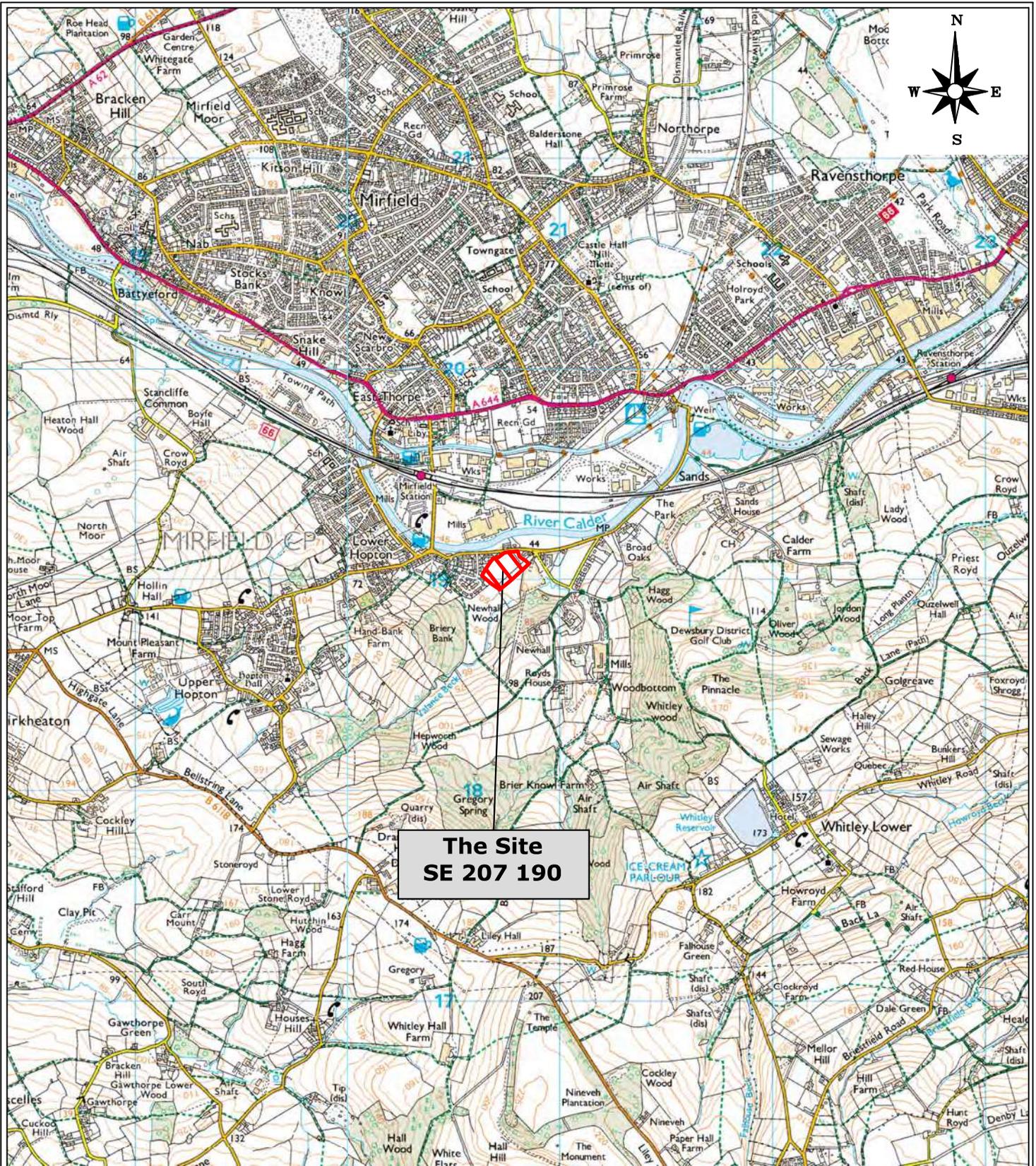
Table 2: Summary of inspection pit ground conditions

Hole ID	Ground conditions	Remarks
Plot 31		No access as area in use as construction compound
Plot 33	Reworked natural clay (subsoil) to 1.05m over in-situ natural clay to 1.20m	Existing ground level 0.55m below finished level; topsoil & subsoil to be placed
Plot 35	Reworked natural clay (subsoil) to 0.90m over in-situ natural clay to 1.10m	Existing ground level 0.50m below finished level; topsoil & subsoil to be placed
Plot 37	Reworked natural clay (subsoil) to 0.70m over in-situ natural clay to 0.80m	Existing ground level 0.10m below finished level; topsoil to be placed
Plot 38	Reworked natural clay (subsoil) to 0.55m over Cohesive Made Ground	Existing ground level 0.25m below finished level; topsoil to be placed
Plot 39	Cohesive Made Ground present at 0.70m depth below finished level	Existing ground level 0.70m below finished level; topsoil & subsoil to be placed
Plot 41	In-situ natural clay at 0.70m depth below finished level	Existing ground level 0.70m below finished level
POS IP1	Grass over topsoil to 0.30m over reworked natural clay (subsoil) to 0.60m	
POS IP2	Grass over topsoil to 0.50m over reworked natural clay (subsoil) to 0.60m	
POS IP3	Grass over topsoil to 0.20m over reworked natural clay (subsoil) to 0.60m	
POS IP4	Grass over topsoil to 0.20m over reworked natural clay (subsoil) to 0.60m	
POS IP5	Grass over topsoil to 0.25m over reworked natural clay (subsoil) to 0.65m	

Note: all depths taken below finished ground level



APPENDIX A
DRAWINGS



**The Site
SE 207 190**

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CLIENT

**MILLER HOMES
YORKSHIRE**

JOB TITLE

**GRANNY LANE,
MIRFIELD**

DRAWING TITLE

**SITE LOCATION
PLAN**

DRAWN

LEW

DATE

12 12 17

CHECKED

MJT

DATE

12 12 17

STATUS

FOR COMMENT

DRAFT

FOR APPROVAL

FINAL

SCALE

1:25,000

SHEET

A4

DRAWING NO.

2935/1

REVISION

NOTES

- GRASS (GRAZING LAND)
- BUILDING
- ABOVE GROUND STORAGE TANK
- HARDCORE SURFACING
- ROUGH GRASSLAND
- CONCRETE HARDSTAND
- PUBLISHED OUTCROP OF SHERTCLIFFE COAL
- APPROXIMATE FOOTPRINT OF FORMER BUILDING (1993-2017)
- AREA OF SMALL PADDOCK
- LINE OF BT/TELECOMMS UTILITY
- APPROXIMATE SITE BOUNDARY

NOTE: THIS UTILITY LOCATION IS BASED ON THE RECORDS FOR CONSTRUCTION PURPOSES. WORK SHOULD BE ASSUMED THAT ALL UTILITIES SHOWN HERE ARE SHOWN FOR INFORMATION ONLY. THE CLIENT SHOULD VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO ANY EXCAVATION. APPROXIMATE SITE BOUNDARY.

REV	DESCRIPTION	DATE
A	ADDITION OF SMALL PADDOCK HATCHING	16/01/2020



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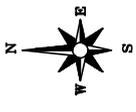
MILLER HOMES
YORKSHIRE

GRANNY LANE,
MIRFIELD

SITE FEATURES

DATE	STATUS
12 12 17	FOR COMMENT
12 12 17	FOR APPROVAL
12 12 17	DRAFT
12 12 17	FINAL

SCALE	1:1000	SHEET	A3	DRAWING NO.	2935/3	VERSION	A
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River Calder

Residential

Granny Lane

Small Paddock

Sheep Ings Farm

Shertcliffe Coal

Residential

Hedgerow

Hedgerow

Storage area

Hedgerow

Scrubland

Open Fields

NOTES

REV	DESCRIPTION	DATE
B	RECEPTOR REFERENCES CORRECTED	16/07/2022
A	ADDITION OF B(a)P HOT-SPOT ENCOUNTERED IN TP102	16/05/2019



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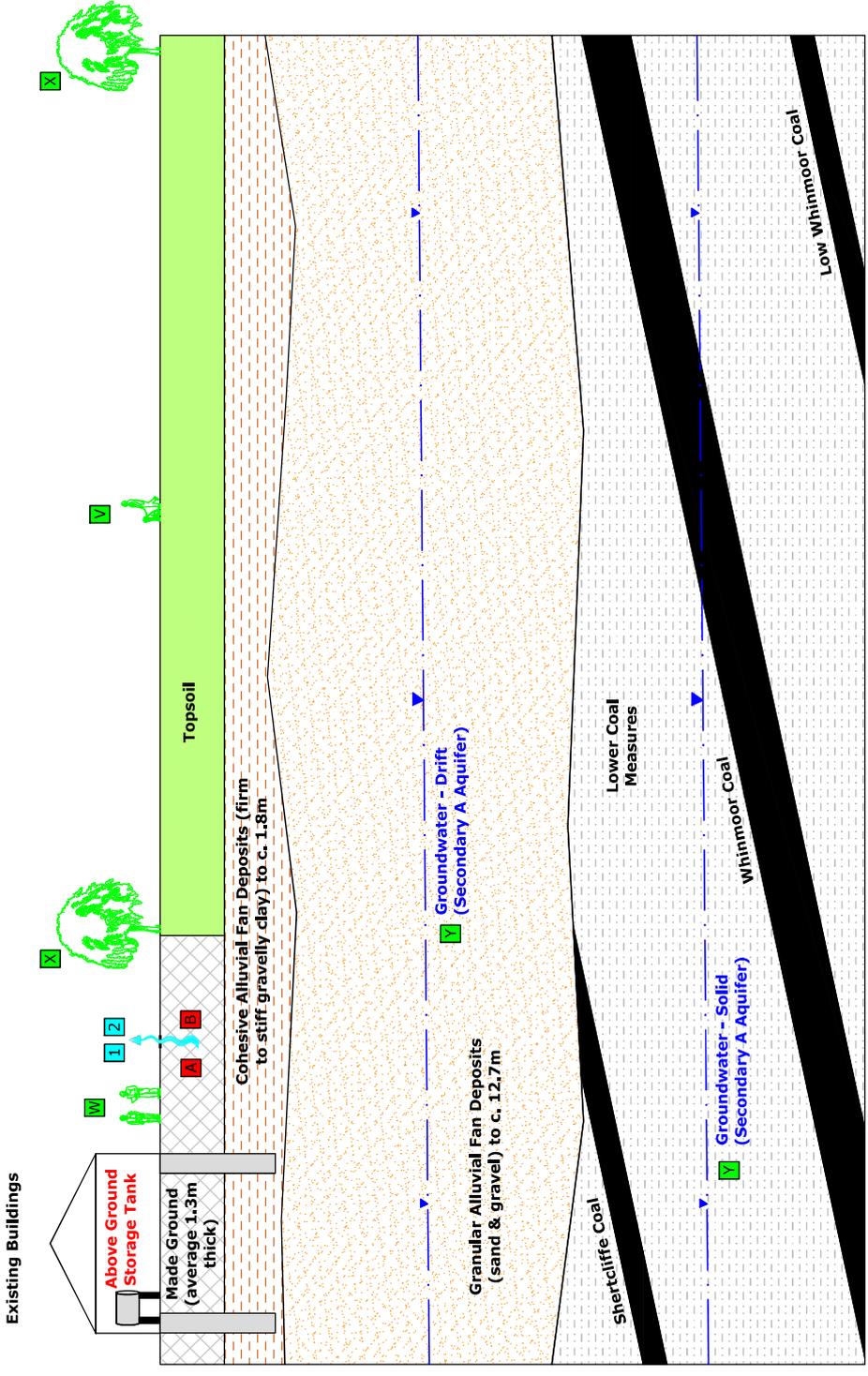
MILLER HOMES
YORKSHIRE

GRANNY LANE,
MIRFIELD

REVISOR'S TITLE
REVISED CONCEPTUAL SITE MODEL

STATUS	DATE	FOR COMMENT	FOR APPROVAL
LEW	16/05/19	<input type="checkbox"/>	<input type="checkbox"/>
MJT	31/01/17	<input type="checkbox"/>	<input checked="" type="checkbox"/>

SCALE	Not to scale	SHEET	A3	DRAWING NO.	2935/7	REVISION	B
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RECEPTORS
<input checked="" type="checkbox"/> END USERS (RESIDENTS)
<input checked="" type="checkbox"/> SITE WORKERS
<input checked="" type="checkbox"/> VEGETATION
<input checked="" type="checkbox"/> GROUNDWATER

PATHWAYS
<input checked="" type="checkbox"/> 1 DERMAL CONTACT
<input checked="" type="checkbox"/> 2 INGESTION/INHALATION

SOURCES
<input checked="" type="checkbox"/> A MADE GROUND (INORGANICS & ORGANICS)
<input checked="" type="checkbox"/> B B(a)P HOT-SPOT (MADE GROUND TOPSOIL; TP102)



NOTES

- AREA OF DEEP MADE GROUND (>600mm)
- AREA OF SHALLOW MADE GROUND (<600mm)

REV	DESCRIPTION	DATE



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TITLE

MILLER HOMES
YORKSHIRE

PROJECT

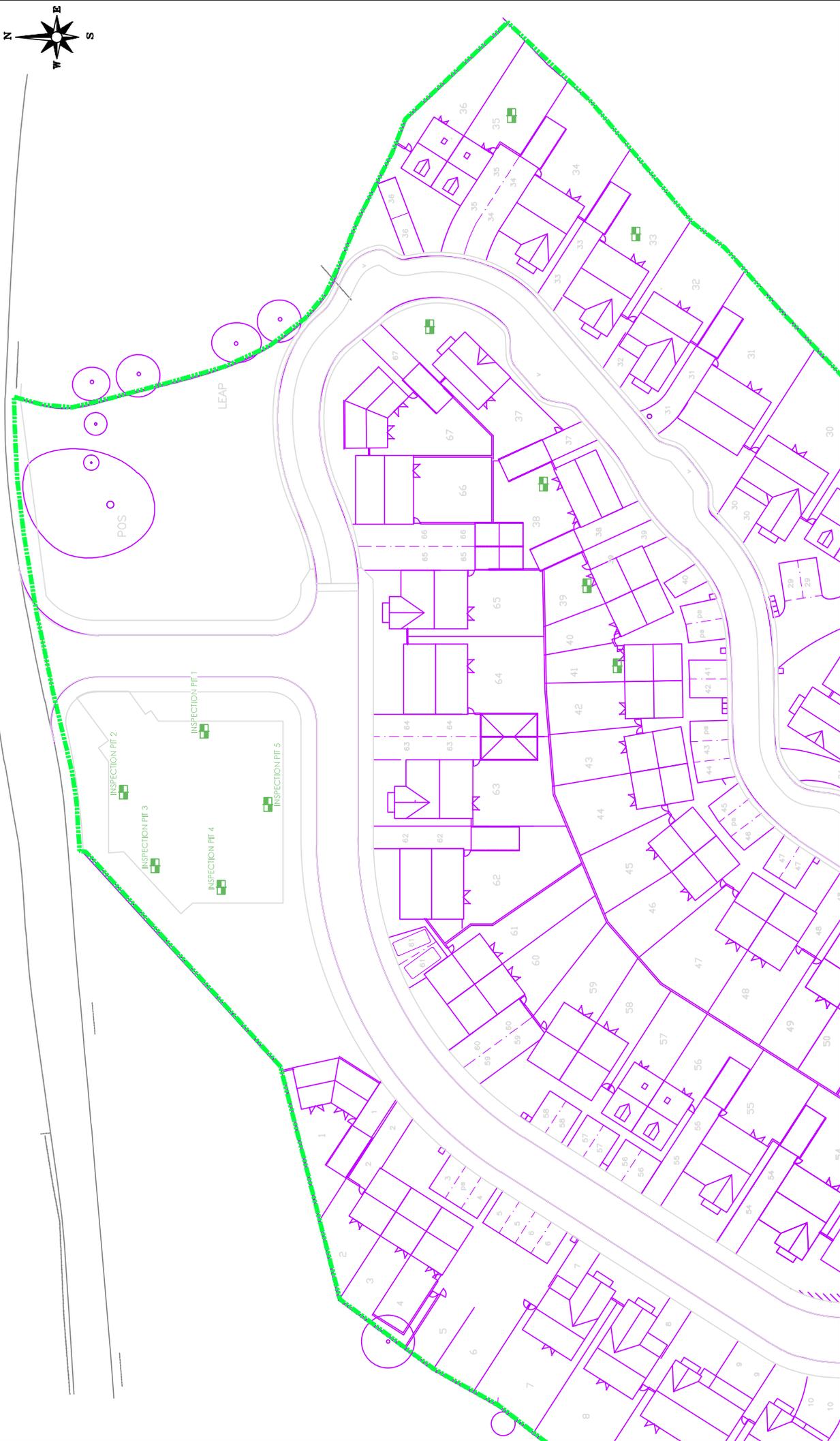
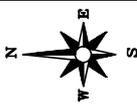
GRANNY LANE,
MIRFIELD

DRAWING TITLE

EXTENT OF MADE GROUND

STATUS	DATE	FOR COMMENT	FOR APPROVAL
CC	06/04/2022	<input type="checkbox"/>	<input checked="" type="checkbox"/>
SRJ	06/04/2022	<input type="checkbox"/>	<input type="checkbox"/>

SCALE	1:1000	SHEET	A3	DRAWING NO.	2935/11	STORED	-
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STATUS		<input type="checkbox"/> FOR COMMENT	<input type="checkbox"/> FOR APPROVAL	<input type="checkbox"/> DRAFT	<input checked="" type="checkbox"/> FINAL
DRAWN	KSE	DATE	17/10/2023		
APPROVED	SRJ	DATE	30/11/2023		
SCALE	1:500	SHEET	A3		
DRAWING NO.	2935/12				

REV.	DISCUSSION	DATE

REMEDICATION PLAN

GRANNY LANE,
MIRFIELD

MILLER HOMES
YORKSHIRE

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www.lithos.co.uk
Tel 01937 545330

Notes:

NOIS

C			
B			
A		10/06/2022	

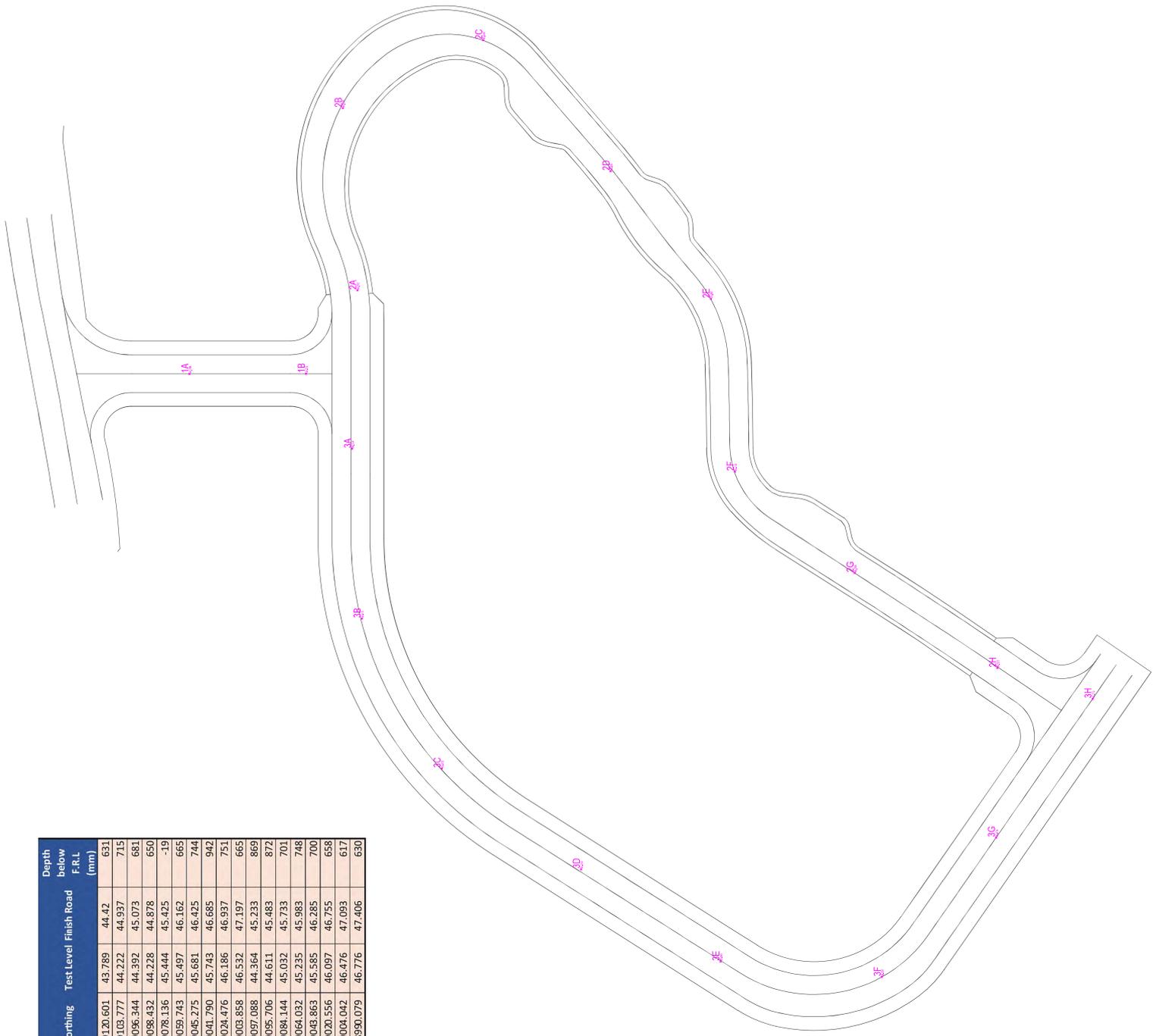
REV	DESCRIPTION	BY	DATE

B Gallagher Construction
 Rutlipool House,
 Unit 1, Knowlthorpe Gate,
 111 Knowlthorpe Road,
 York YO1 2AB
 0113 246 1979
 www.bgalgallagher.co.uk

CLIENT: Miller Homes, Yorkshire

SHEET:	GRANNYLANE MIRFIELD
TITLE:	CBR-TESTS
SCALE:	AS SHOWN
DATE:	10/06/2022
PROJECT NO.:	BC
REVISION:	BC

Location	Easting	Northing	Test Level	Finish Road	Depth below F.R.L. (mm)
1A	420766.954	419120.601	43.789	44.42	631
1B	420766.995	419103.777	44.222	44.937	715
2A	420779.132	419096.344	44.392	45.073	681
2B	420805.685	419098.432	44.228	44.878	650
2C	420815.583	419078.136	45.444	45.425	-19
2D	420796.473	419099.743	45.497	46.162	665
2E	420777.895	419045.275	45.681	46.425	744
2F	420752.761	419041.790	45.743	46.685	942
2G	420737.969	419024.476	46.186	46.937	751
2H	420724.117	419003.858	46.532	47.197	665
3A	420756.056	419097.088	44.364	45.233	869
3B	420731.326	419095.706	44.611	45.483	872
3C	420709.523	419084.144	45.032	45.733	701
3D	420694.828	419064.032	45.235	45.983	748
3E	420681.381	419043.863	45.585	46.285	700
3F	420679.133	419020.556	46.097	46.755	658
3G	420699.416	419004.042	46.476	47.093	617
3H	420719.638	418990.079	46.776	47.406	630



APPENDIX B
CORRESPONDENCE

Consultation Response from: KC Environmental Health (Pollution & Noise Control)		
2022/92076 - Land south of, Granny Lane, Mirfield, WF14 8LA		
Discharge of conditions 12 (Phase II Intrusive Site Investigation Report) and 13 (Remediation Strategy) of previous permission 2019/91467 (appeal APP/Z4718/W/21/3279040) for erection of 67 dwellings with associated access and parking		
Date Responded: 24 th November 2022	Responding Officer: Natalie Heaney	Responding Ref: WK/202220803
<p>Condition 13 - Remediation Strategy Further to our comments dated 29th July 2022 on the Remediation Statement by Lithos Consulting, dated May 2022 (Ref: 2935/2B), the applicant has now submitted a Remediation Statement by Lithos Consulting, dated November 2022 (Ref: 2935/2D) to discharge Condition 13. The report includes geotechnical information, which is outside the remit of Environmental Health, this consultation response therefore only relates to the land contamination aspects of the report.</p> <p>We have read the Remediation Statement by Lithos Consulting, dated November 2022 (Ref: 2935/2D). The report now clarifies that topsoil from the paddock area is not suitable for reuse in the proposed play area however is suitable for re-use in public open space elsewhere on site. A revised conceptual site model has also been provided and the report confirms where Brickfill or Granular Made Ground development arisings are redistributed beneath gardens or POS on site 600mm clean cover will be applied. Revised and detailed verification proposals are also provided in Section 2.11 of the report.</p> <p>We accept the Remediation Statement by Lithos Consulting, dated November 2022 (Ref: 2935/2D) and therefore recommend that Condition 13 is discharged.</p> <p><u>Recommendations</u> Condition 13 - Remediation Strategy We accept the Remediation Statement by Lithos Consulting, dated November 2022 (Ref: 2935/2D) and therefore recommend that Condition 13 is discharged.</p>		



APPENDIX C
SITE PHOTOGRAPHS



Photo 1 Eastern corner of site following demolition of stables & workshop building



Photo 2 Eastern corner of site following demolition of stables & workshop building



Photo 3 ACM fragments encountered during topsoil strip from paddock



Photo 4 ACM fragments encountered during topsoil strip from paddock



Photo 5 General site strip



Photo 6 General site strip



Photo 7 Uncontaminated topsoil stockpile



Photo 8 Reduced level dig for CBR test



Photo 9 Excavation for surface water attenuation tank



Photo 10 Installation of surface water attenuation tank



Photo 11 Plot 33 inspection pit



Photo 12 Plot 35 inspection pit



Photo 13 Plot 37 inspection pit



Photo 14 Plot 38 inspection pit



Photo 15 Plot 39 inspection pit



Photo 16 Plot 41 inspection pit



Photo 17 POS Inspection Pit 1



Photo 18 POS Inspection Pit 2



Photo 19 POS Inspection Pit 3



Photo 20 POS Inspection Pit 4



Photo 21 POS Inspection Pit 5



APPENDIX D
GEOTECHNICAL TEST RESULTS

APPENDIX D (i)
CBR TEST RESULTS



LABORATORY REPORT



4043

Contract Number: PSL22/5192

Report Date: 10 August 2022

Client's Reference:

Client Name: Lithos Consulting
Parkhill
Walton Road
Wetherby
North Yorkshire
LS22 5DZ

For the attention of: Steve James

Contract Title: Granny Lane, Mirfield

Date Received: 8/8/2022
Date Commenced: 8/8/2022
Date Completed: 10/8/2022

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins
(Director)

R Berriman
(Quality Manager)

S Royle
(Laboratory Manager)

L Knight
(Senior Technician)

S Eyre
(Senior Technician)


T Watkins
(Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
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rberriman@prosoils.co.uk

Page 1 of

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: **09-Aug-22**

Test Ref: **1A**

Grid Ref:

Depth (m): **FL**

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

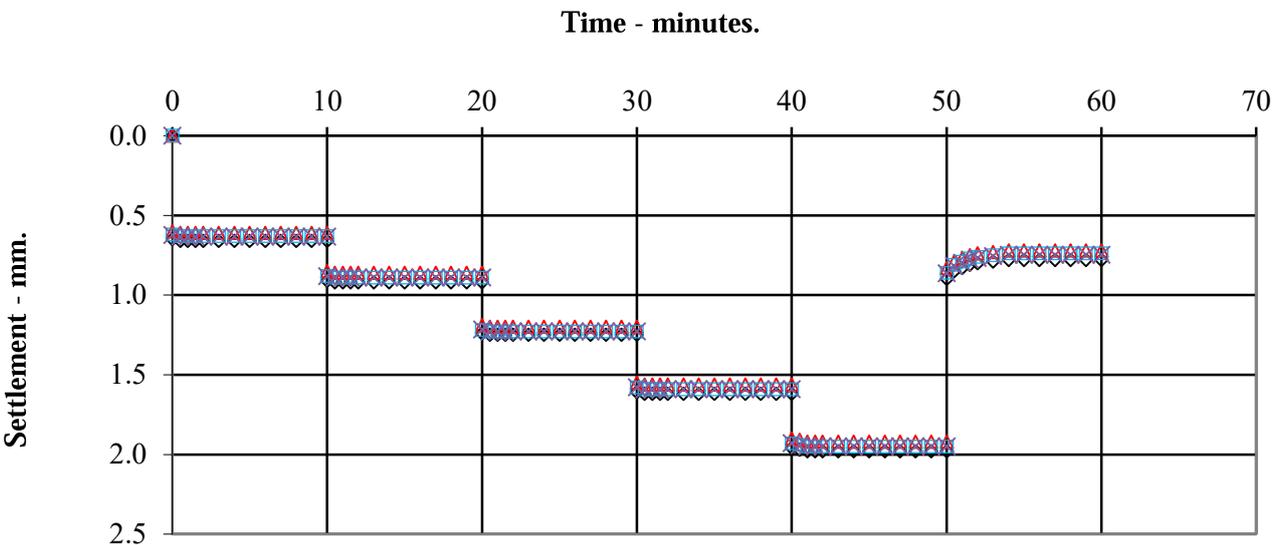
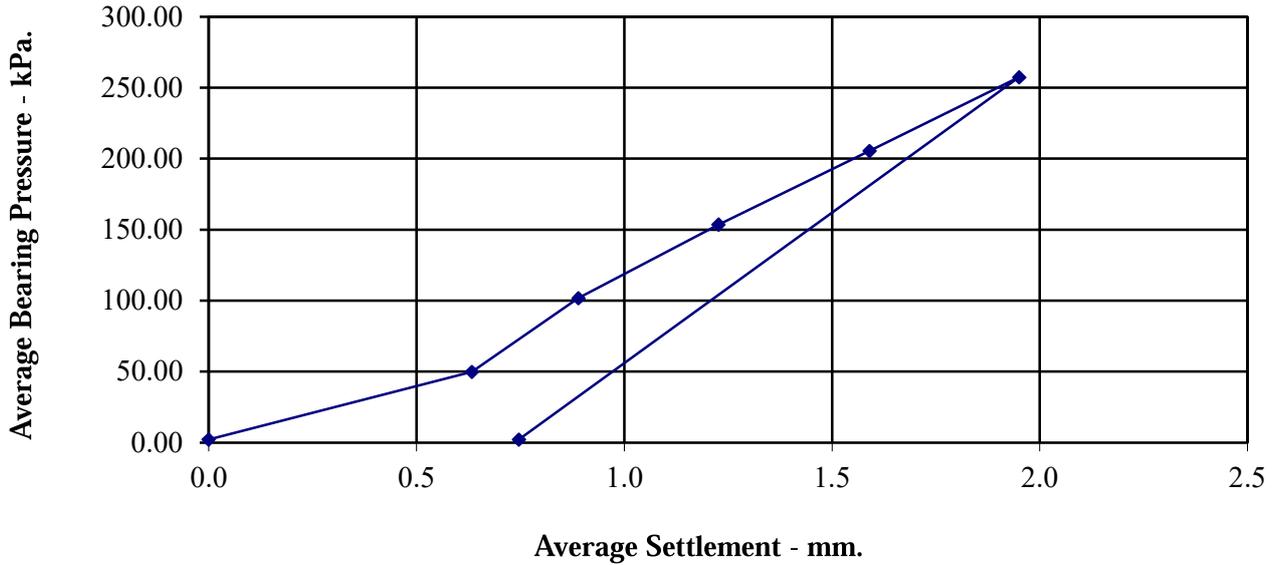
1.95

Plate Area (m²):

0.1626

Description:

MADE GROUND.



◇ Settlement Gauge 1
△ Settlement Gauge 2
□ Settlement Gauge 3
× Average Settlement



Granny Lane, Mirfield

Contract No:

PSL22/5192

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	9-Aug-22
Test Ref	1A
Depth (m)	FL
Grid Ref	
Layer	
Comments	

Description	MADE GROUND.
-------------	--------------

Maximum Deflection	1.95	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	157	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
K₇₆₂(modulus of subgrade reaction) calculated using 1.25mm settlement	79.0	kN/m²/mm
CBR Value	18.7	%



Granny Lane, Mirfield

Contract No:

PSL22/5192

Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 09-Aug-22

Test Ref: 1B

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

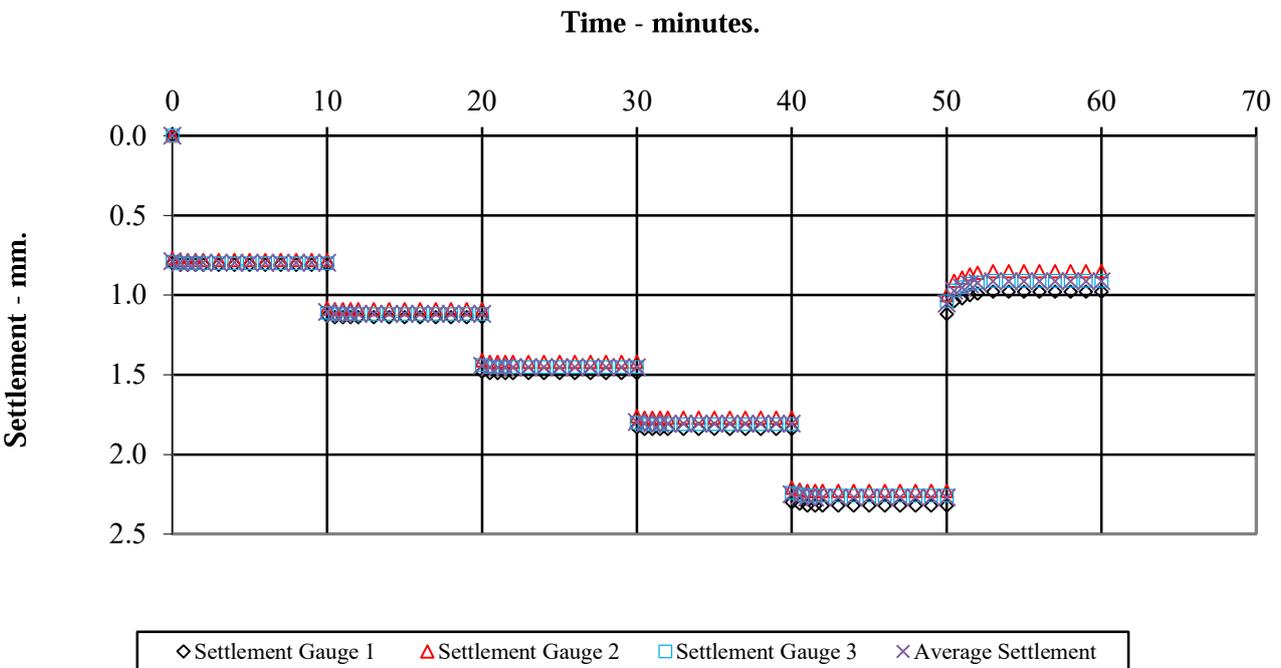
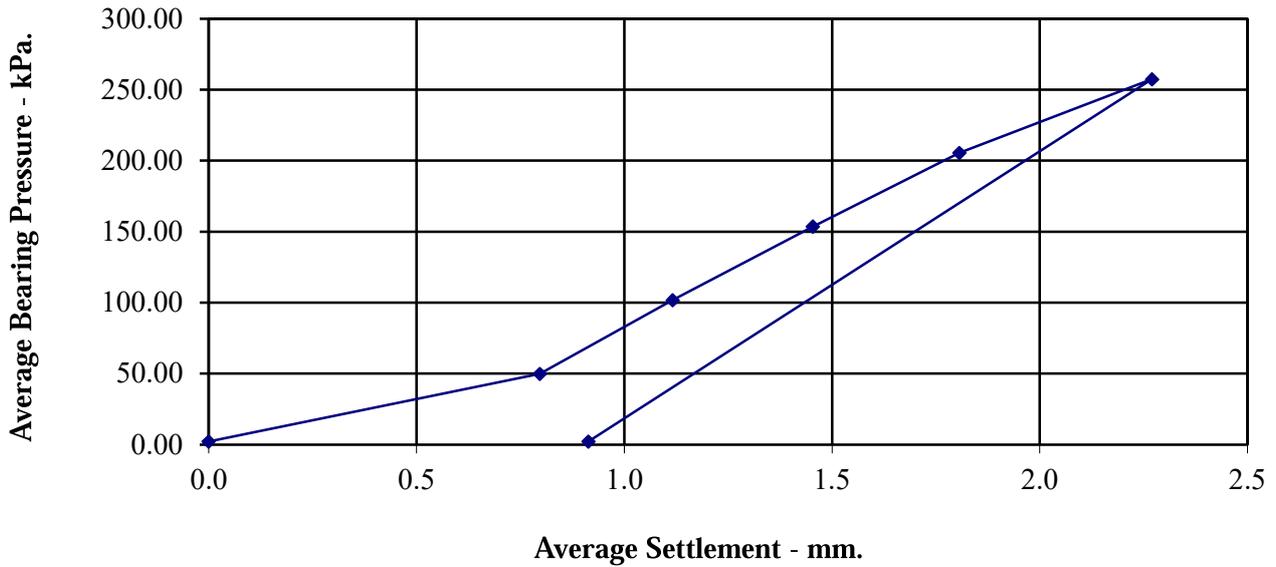
2.27

Plate Area (m²):

0.1626

Description:

Brown slightly gravelly slightly sandy CLAY.



Granny Lane, Mirfield

Contract No:

PSL22/5192

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	9-Aug-22	
Test Ref	1B	
Depth (m)	FL	
Grid Ref		
Layer		
Comments		
 Description	 Brown slightly gravelly slightly sandy CLAY.	
 Maximum Deflection	2.27	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	122	kN/m²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
 K₇₆₂(modulus of subgrade reaction) calculated using 1.25mm settlement	61.5	kN/m²/mm
 CBR Value	12.2	%



Granny Lane, Mirfield

Contract No:

PSL22/5192

Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 09-Aug-22

Test Ref: 2A

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

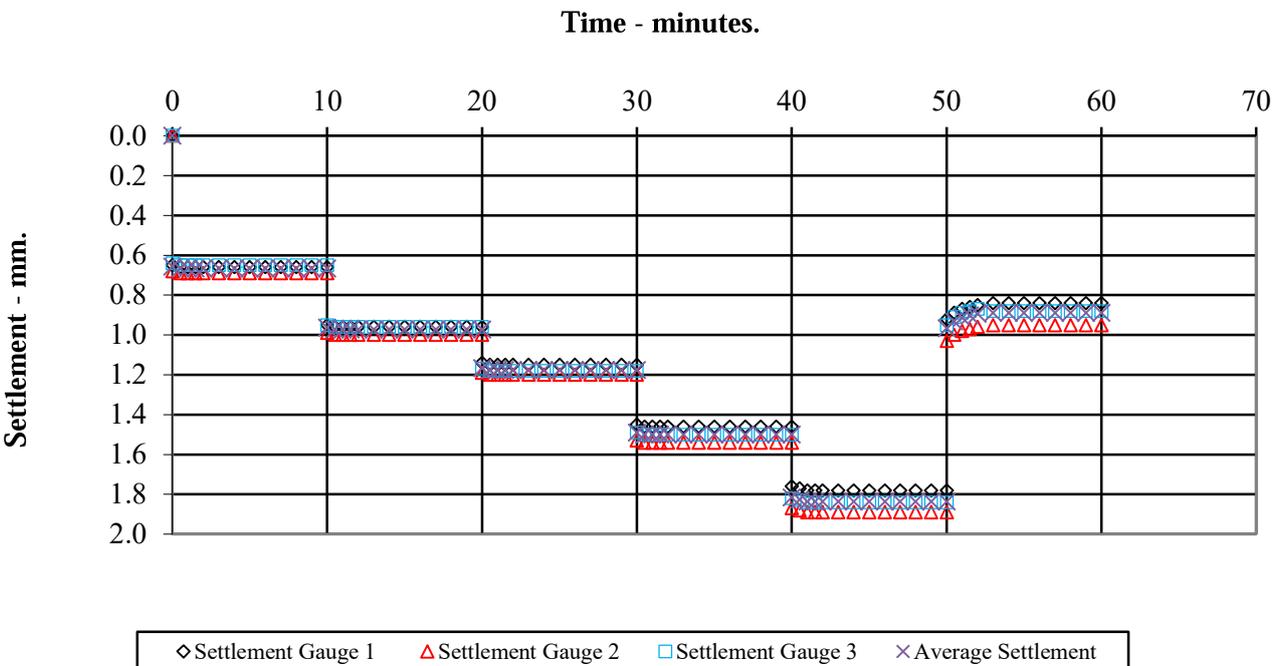
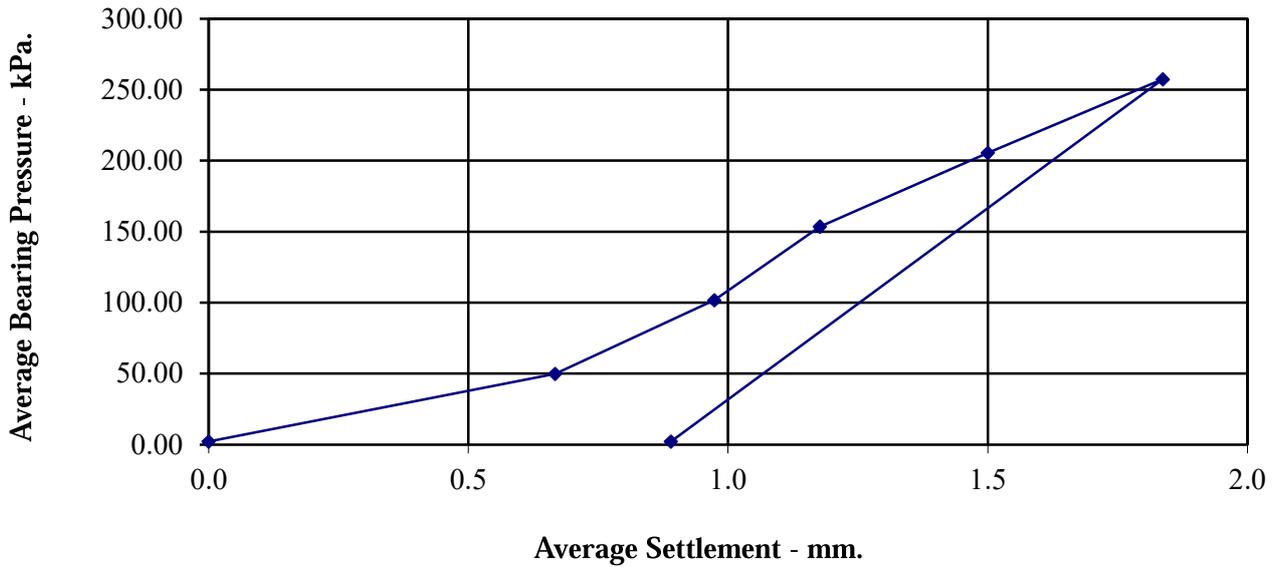
1.84

Plate Area (m²):

0.1626

Description:

Brown slightly gravelly slightly sandy CLAY.



Granny Lane, Mirfield

Contract No:

PSL22/5192

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	9-Aug-22	
Test Ref	2A	
Depth (m)	FL	
Grid Ref		
Layer		
Comments		
 Description	 Brown slightly gravelly slightly sandy CLAY.	
Maximum Deflection	1.84	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	165	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
 K ₇₆₂ (modulus of subgrade reaction) calculated using 1.25mm settlement	83.2	kN/m ² /mm
 CBR Value	20.5	%



Granny Lane, Mirfield

Contract No:
PSL22/5192
Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 09-Aug-22

Test Ref: 2B

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

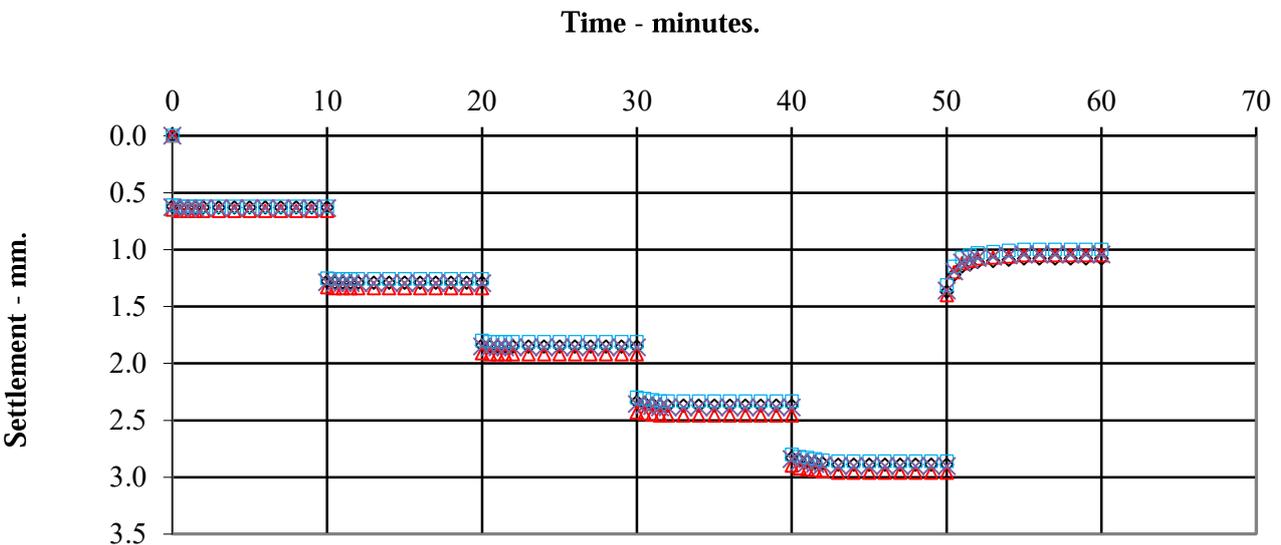
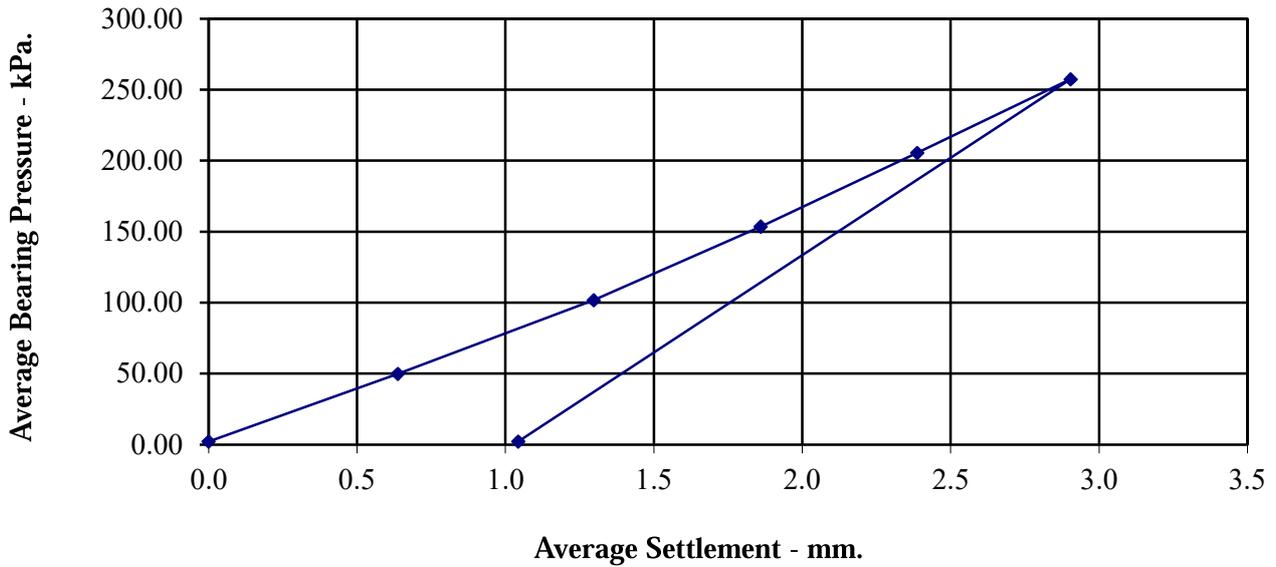
2.90

Plate Area (m²):

0.1626

Description:

MADE GROUND.



◇ Settlement Gauge 1
△ Settlement Gauge 2
□ Settlement Gauge 3
× Average Settlement



Granny Lane, Mirfield

Contract No:

PSL22/5192

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	9-Aug-22
Test Ref	2B
Depth (m)	FL
Grid Ref	
Layer	
Comments	

Description	MADE GROUND.
-------------	--------------

Maximum Deflection	2.90	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	98	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
K₇₆₂(modulus of subgrade reaction) calculated using 1.25mm settlement	49.3	kN/m²/mm
CBR Value	8.3	%



Granny Lane, Mirfield

Contract No:
PSL22/5192
Client Ref:

VERTICAL DEFORMATION TESTS.

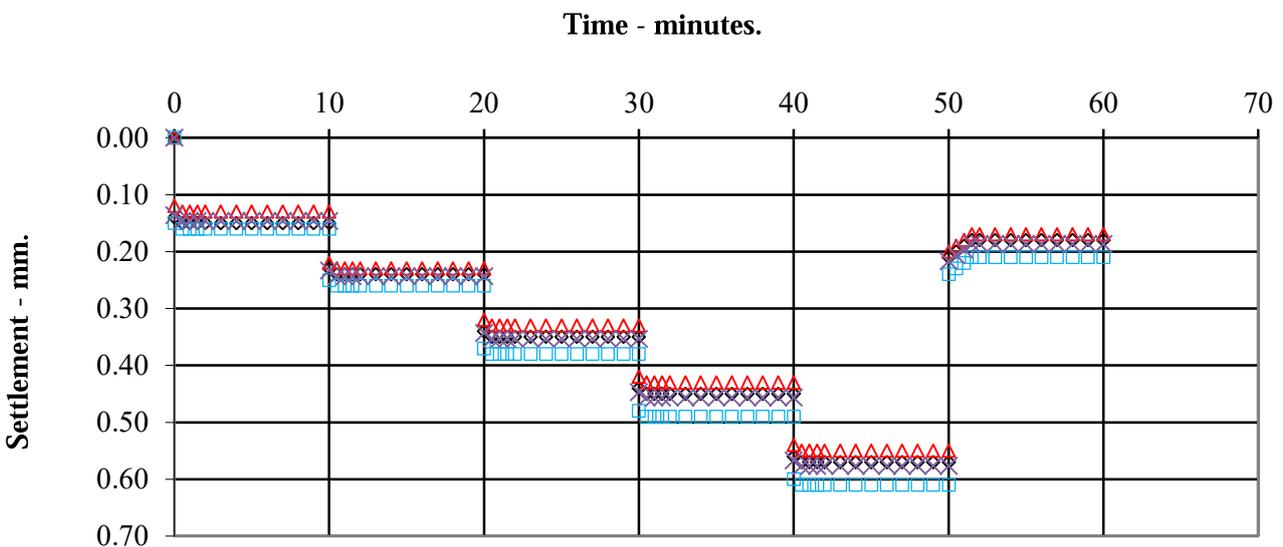
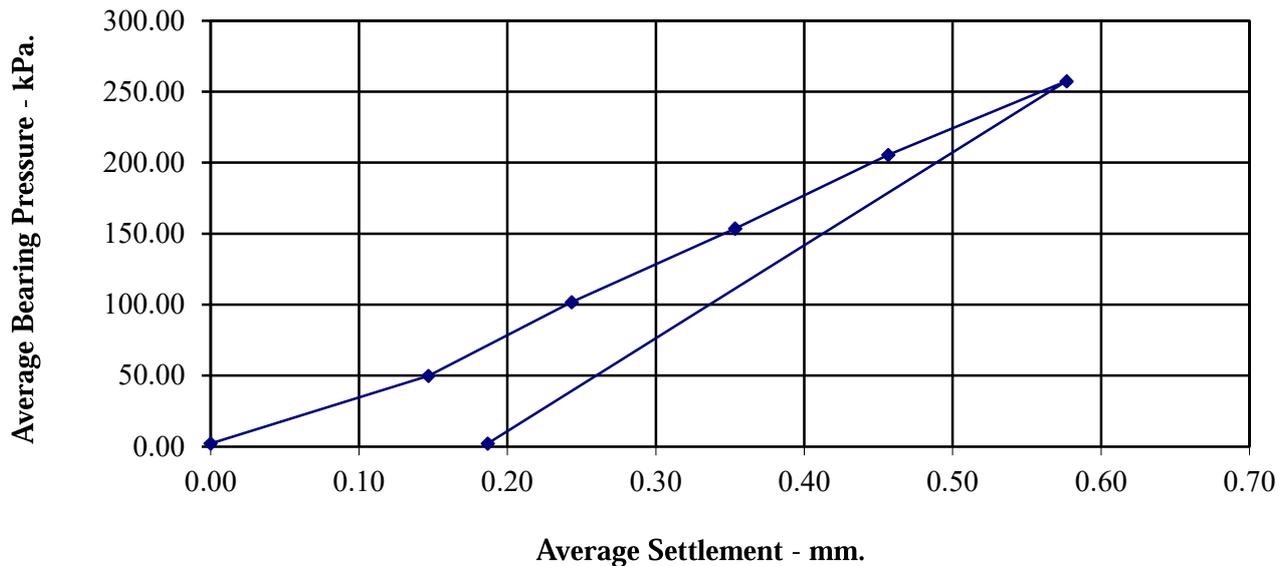
BS 1377 : Part 9 : 1990.

Date of Test: **09-Aug-22** Test Ref: **2C**

Grid Ref: Depth (m): **FL**

Layer: Comments:

Maximum Applied Pressure (kPa): **257.43**
 Maximum Deformation (mm): **0.58**
 Plate Area (m²): **0.1626**
 Description: **MADE GROUND.**



◇ Settlement Gauge 1
△ Settlement Gauge 2
□ Settlement Gauge 3
× Average Settlement



Granny Lane, Mirfield

Contract No:
PSL22/5192
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	9-Aug-22
Test Ref	2C
Depth (m)	FL
Grid Ref	
Layer	
Comments	

Description	MADE GROUND.
-------------	--------------

Maximum Deflection	0.58	mm
Deflection required for CBR value	1.25	mm
Load at 0.58mm	257	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
K₇₆₂(modulus of subgrade reaction) calculated using 1.25mm settlement	> 129.6	kN/m²/mm
CBR Value	> 44.2	%



Granny Lane, Mirfield

Contract No:
PSL22/5192
Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 09-Aug-22

Test Ref: 2D

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

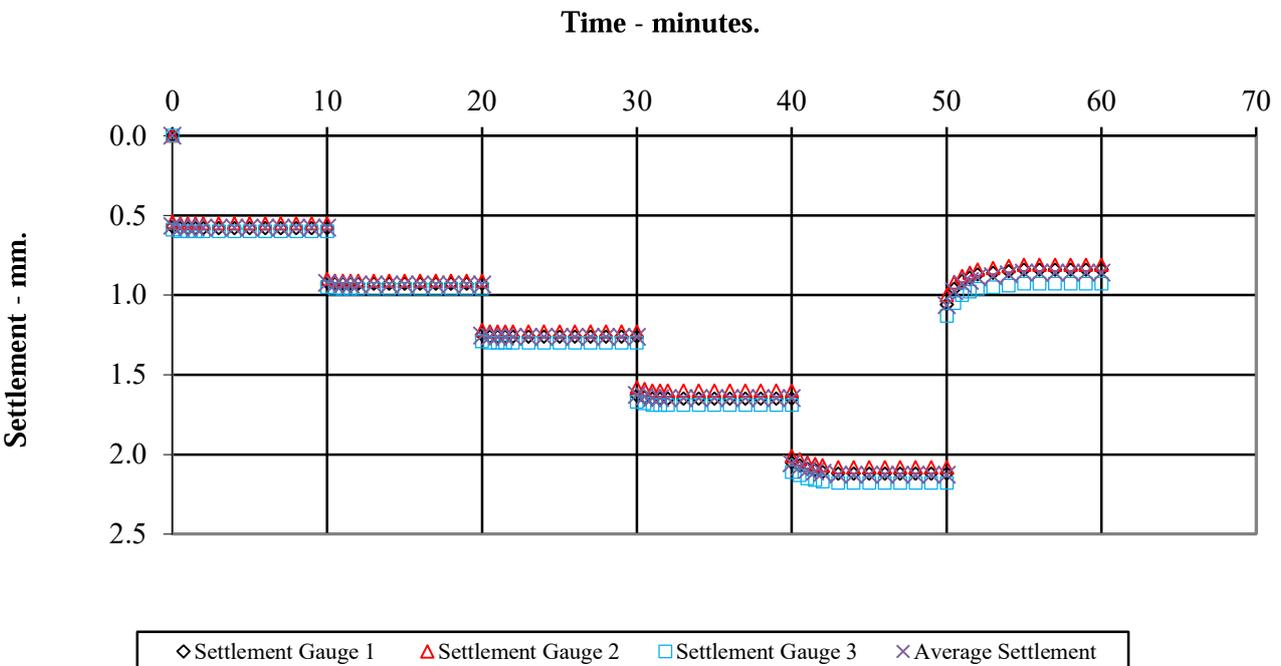
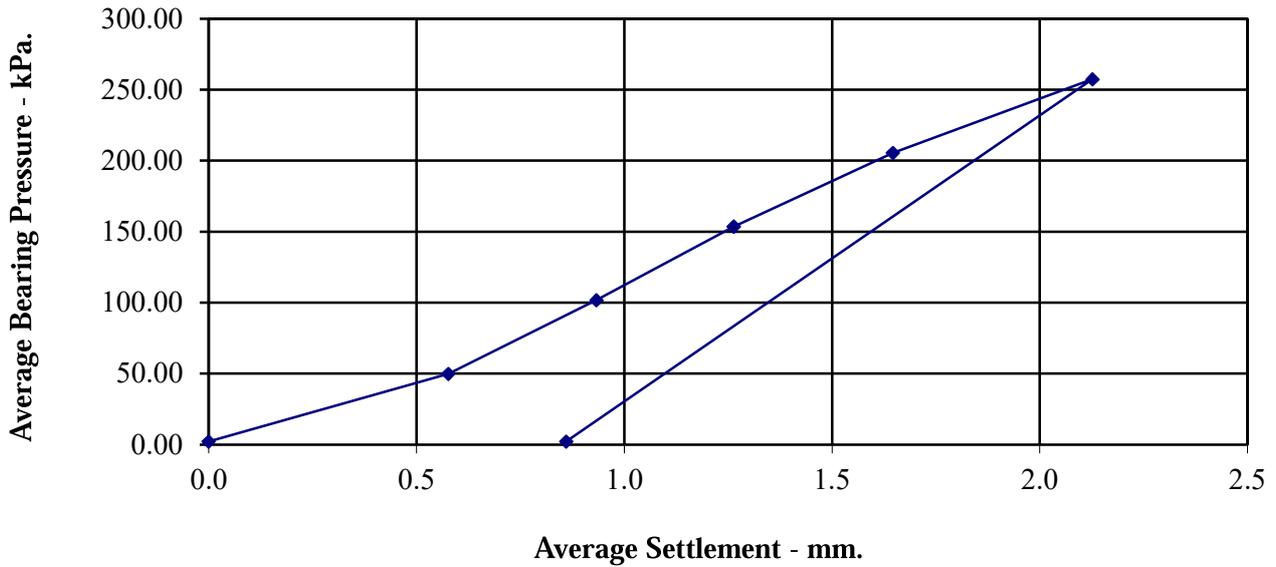
2.13

Plate Area (m²):

0.1626

Description:

MADE GROUND.



Granny Lane, Mirfield

Contract No:

PSL22/5192

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	9-Aug-22
Test Ref	2D
Depth (m)	FL
Grid Ref	
Layer	
Comments	

Description	MADE GROUND.
-------------	--------------

Maximum Deflection	2.13	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	152	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
K₇₆₂(modulus of subgrade reaction) calculated using 1.25mm settlement	76.3	kN/m²/mm
CBR Value	17.6	%



Granny Lane, Mirfield

Contract No:

PSL22/5192

Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 08-Aug-22

Test Ref: 2E

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

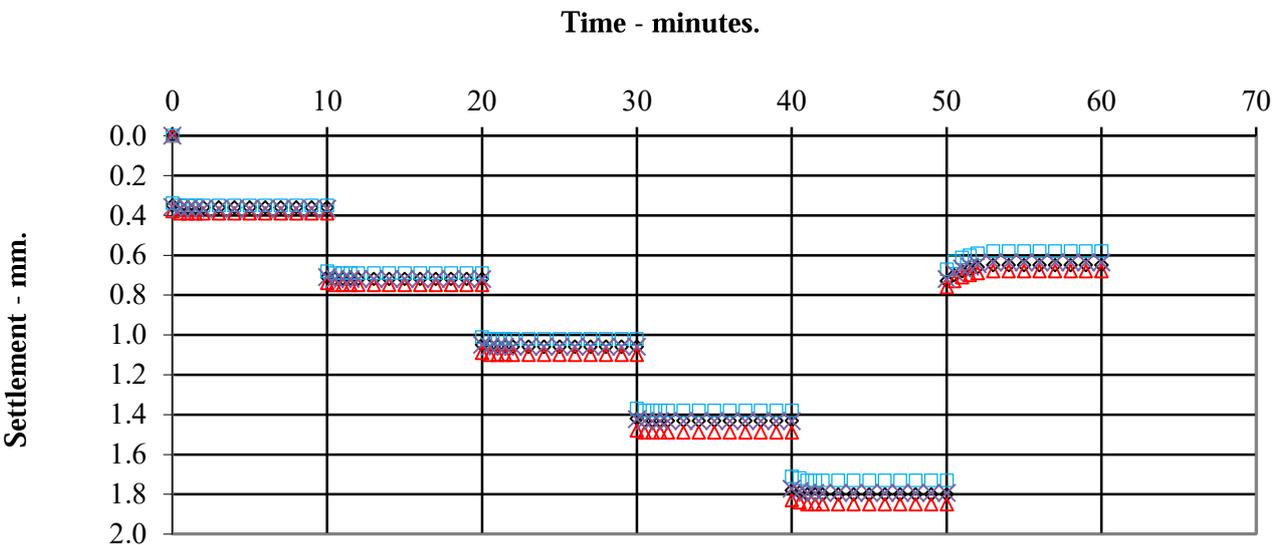
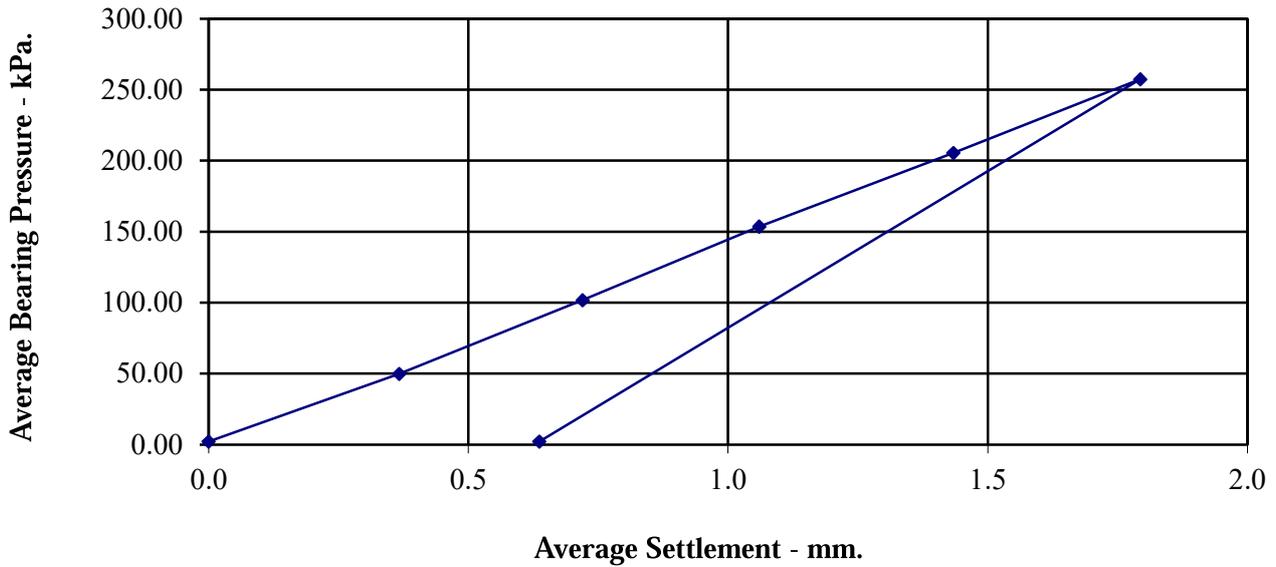
1.79

Plate Area (m²):

0.1626

Description:

Brown slightly gravelly slightly sandy CLAY.



◇ Settlement Gauge 1
△ Settlement Gauge 2
□ Settlement Gauge 3
× Average Settlement



Granny Lane, Mirfield

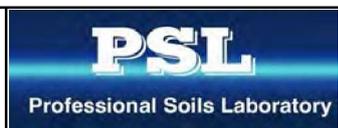
Contract No:

PSL22/5192

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-22	
Test Ref	2E	
Depth (m)	FL	
Grid Ref		
Layer		
Comments		
 Description	 Brown slightly gravelly slightly sandy CLAY.	
 Maximum Deflection	1.79	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	180	kN/m²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
 K₇₆₂(modulus of subgrade reaction) calculated using 1.25mm settlement	 90.6	 kN/m²/mm
 CBR Value	 23.8	 %



Granny Lane, Mirfield

Contract No:
PSL22/5192
Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 08-Aug-22

Test Ref: 2F

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

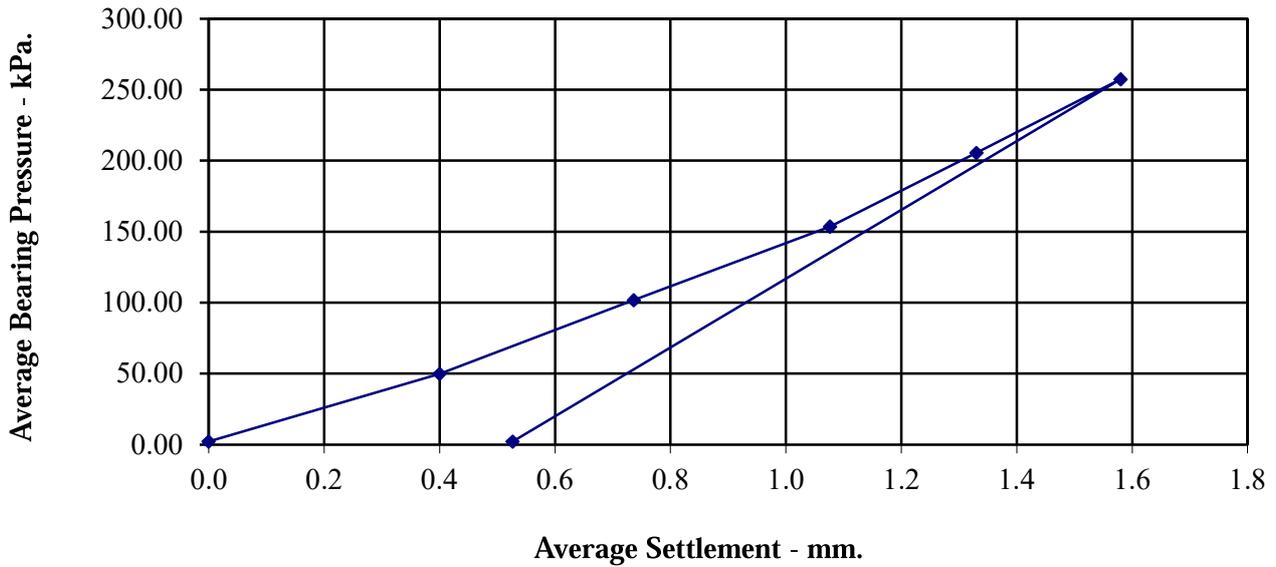
1.58

Plate Area (m²):

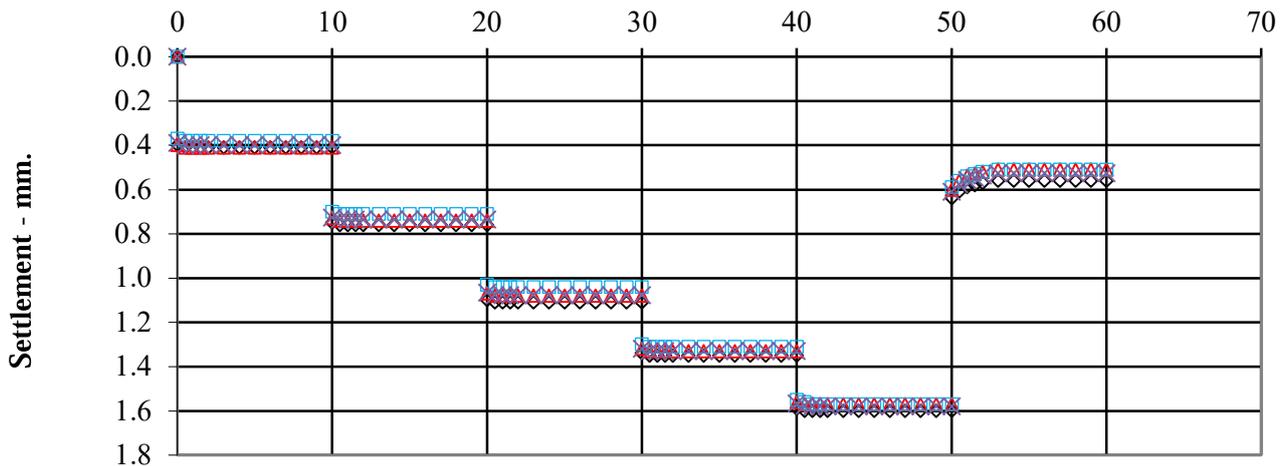
0.1626

Description:

Brown slightly gravelly slightly sandy CLAY.



Time - minutes.



◇ Settlement Gauge 1
△ Settlement Gauge 2
□ Settlement Gauge 3
× Average Settlement



Granny Lane, Mirfield

Contract No:

PSL22/5192

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-22	
Test Ref	2F	
Depth (m)	FL	
Grid Ref		
Layer		
Comments		
 Description	 Brown slightly gravelly slightly sandy CLAY.	
 Maximum Deflection	1.58	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	189	kN/m²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
 K₇₆₂(modulus of subgrade reaction) calculated using 1.25mm settlement	95.2	kN/m²/mm
 CBR Value	25.9	%



Granny Lane, Mirfield

Contract No:
PSL22/5192
Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 08-Aug-22

Test Ref: 2G

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

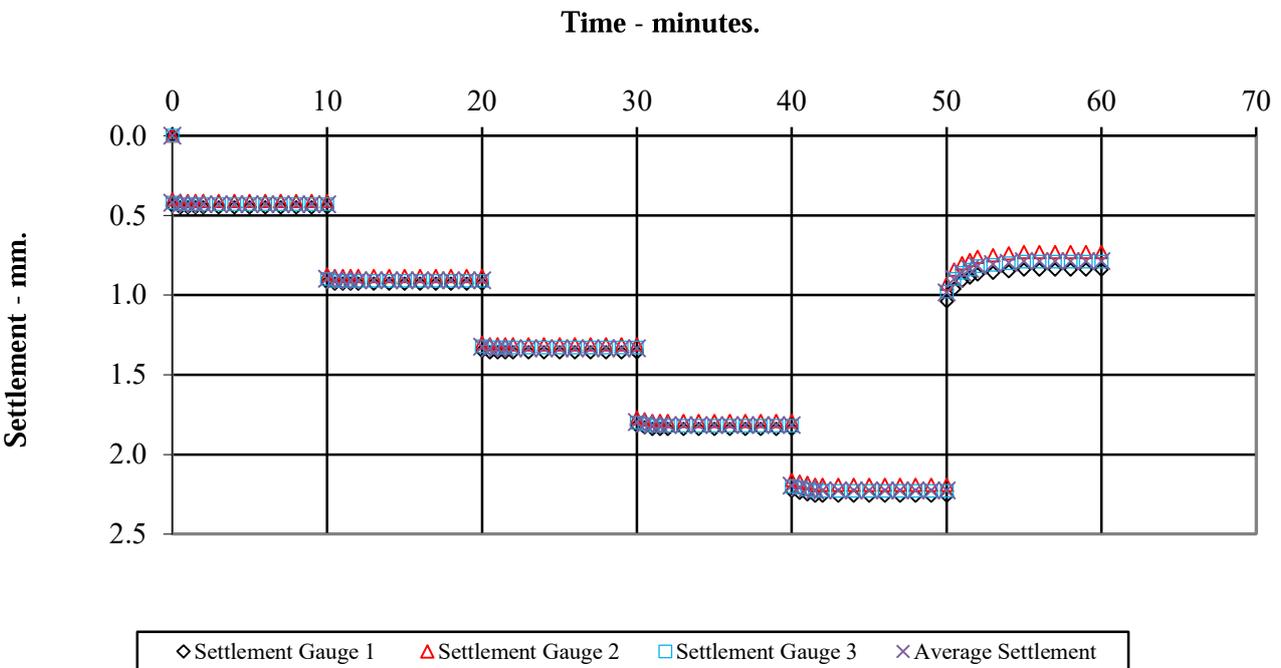
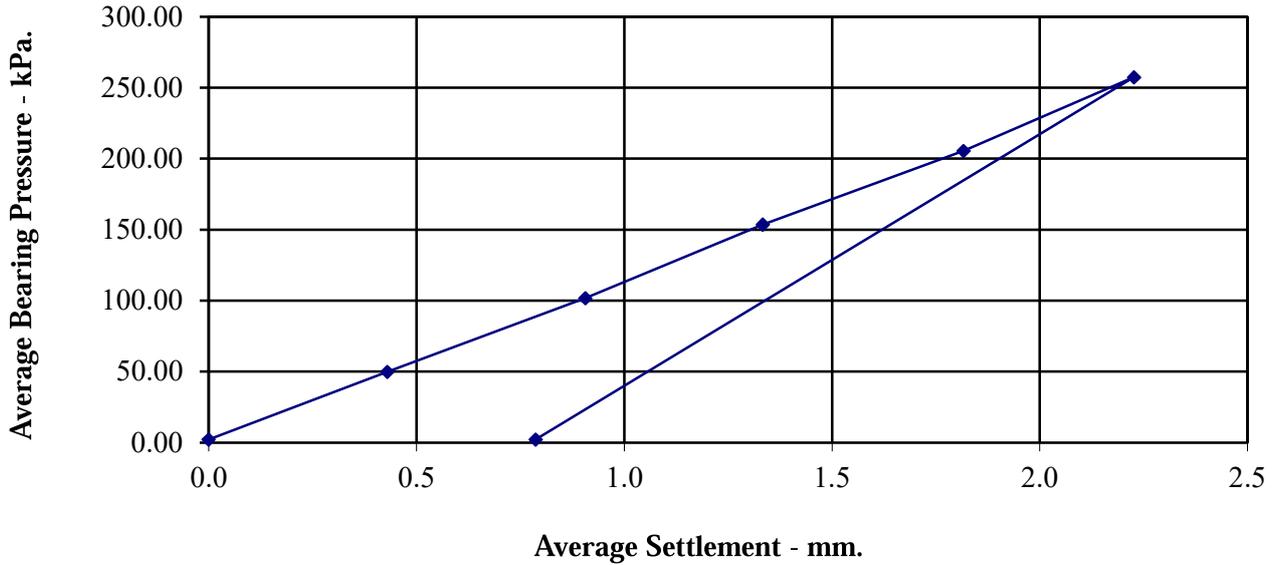
2.23

Plate Area (m²):

0.1626

Description:

Brown slightly gravelly slightly sandy CLAY.



Granny Lane, Mirfield

Contract No:

PSL22/5192

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-22	
Test Ref	2G	
Depth (m)	FL	
Grid Ref		
Layer		
Comments		
 Description	 Brown slightly gravelly slightly sandy CLAY.	
 Maximum Deflection	2.23	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	143	kN/m²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
 K₇₆₂(modulus of subgrade reaction) calculated using 1.25mm settlement	72.2	kN/m²/mm
 CBR Value	16.0	%



Granny Lane, Mirfield

Contract No:
PSL22/5192
Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 09-Aug-22

Test Ref: 2H

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

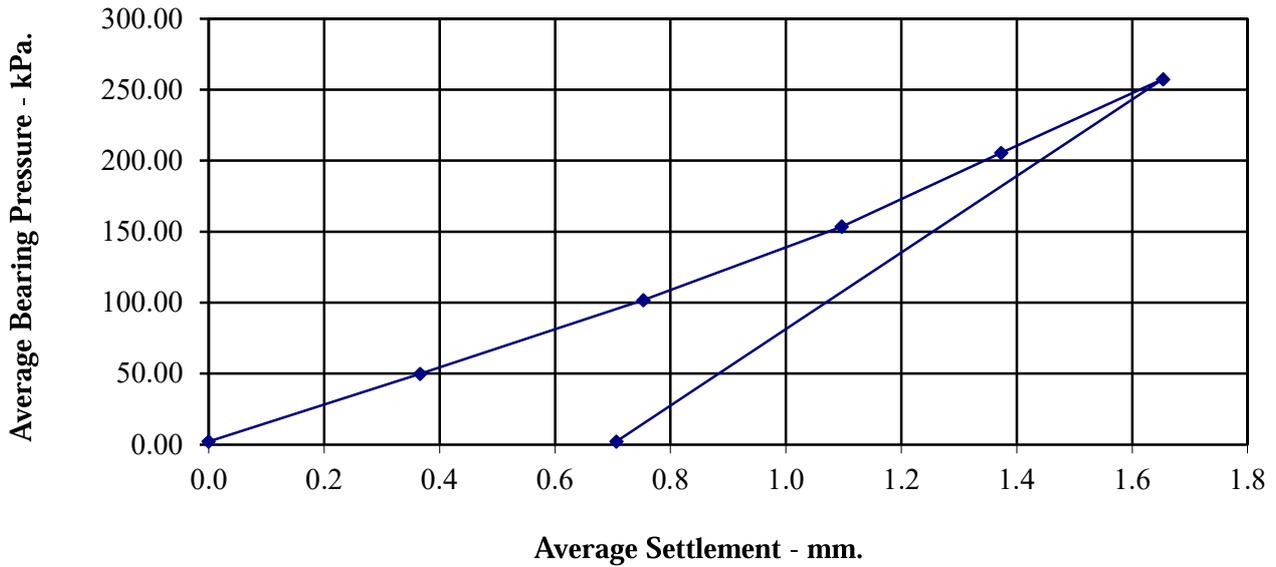
1.65

Plate Area (m²):

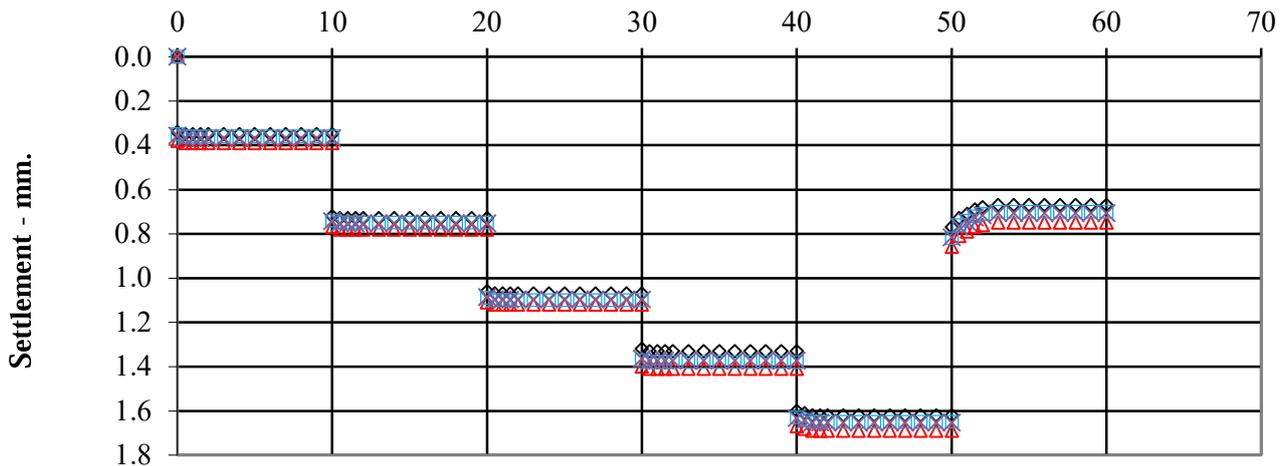
0.1626

Description:

Brown slightly gravelly slightly sandy CLAY.



Time - minutes.



◇ Settlement Gauge 1
△ Settlement Gauge 2
□ Settlement Gauge 3
× Average Settlement



Granny Lane, Mirfield

Contract No:

PSL22/5192

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	9-Aug-22	
Test Ref	2H	
Depth (m)	FL	
Grid Ref		
Layer		
Comments		
 Description	 Brown slightly gravelly slightly sandy CLAY.	
 Maximum Deflection	1.65	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	182	kN/m²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
 K₇₆₂(modulus of subgrade reaction) calculated using 1.25mm settlement	 91.8	 kN/m²/mm
 CBR Value	 24.3	 %



Granny Lane, Mirfield

Contract No:
PSL22/5192
Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 09-Aug-22

Test Ref: 3A

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

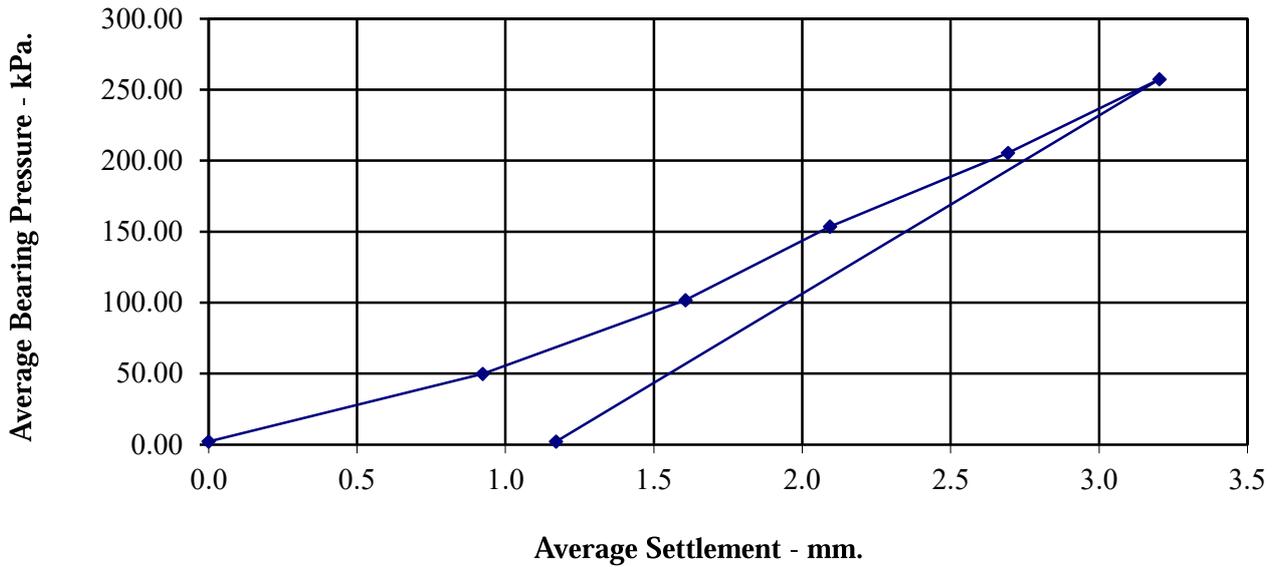
3.20

Plate Area (m²):

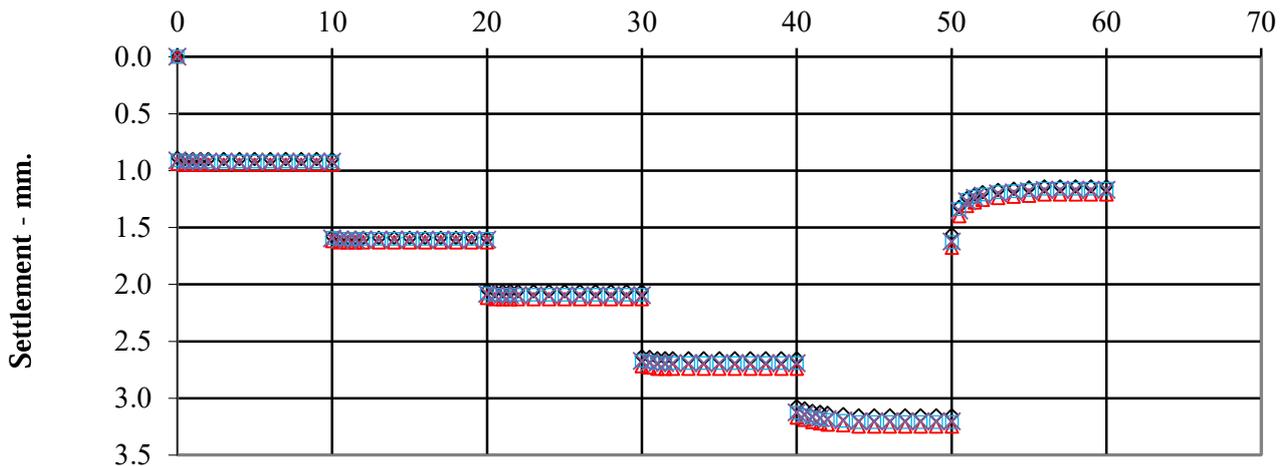
0.1626

Description:

MADE GROUND.



Time - minutes.



◇ Settlement Gauge 1
△ Settlement Gauge 2
□ Settlement Gauge 3
× Average Settlement



Granny Lane, Mirfield

Contract No:

PSL22/5192

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	9-Aug-22
Test Ref	3A
Depth (m)	FL
Grid Ref	
Layer	
Comments	

Description	MADE GROUND.
-------------	--------------

Maximum Deflection	3.20	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	75	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
K₇₆₂(modulus of subgrade reaction) calculated using 1.25mm settlement	37.5	kN/m²/mm
CBR Value	5.2	%



Granny Lane, Mirfield

Contract No:

PSL22/5192

Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 08-Aug-22

Test Ref: 3D

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

322.31

Maximum Deformation (mm):

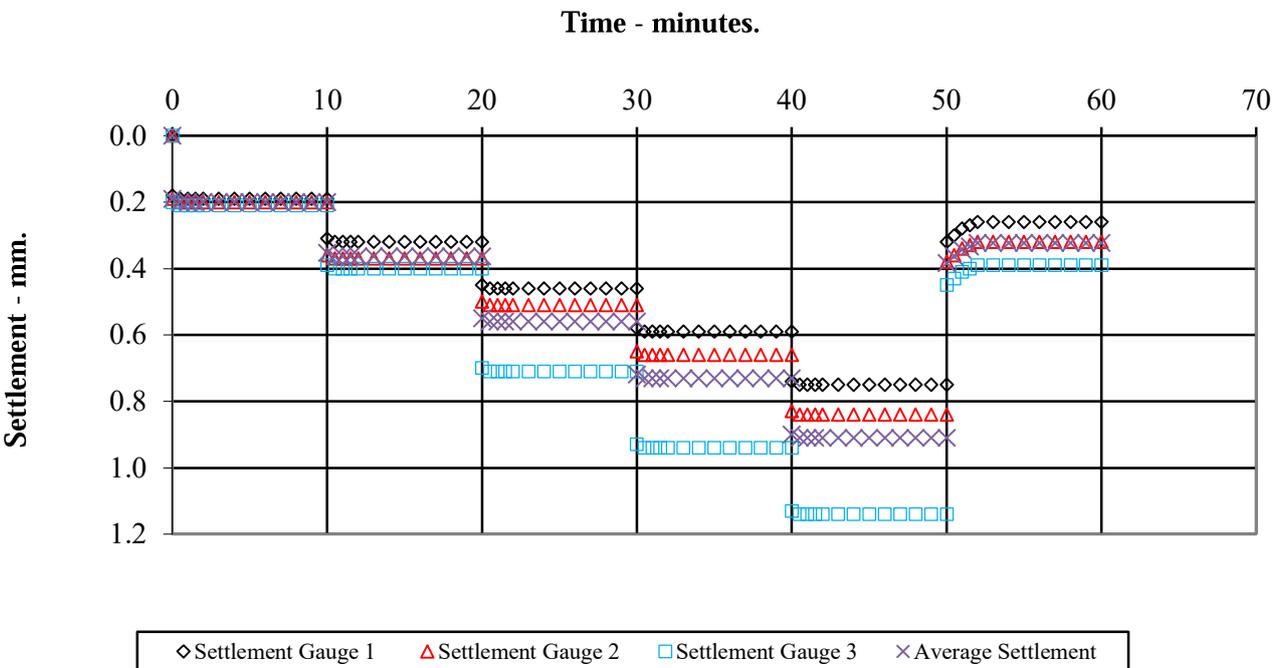
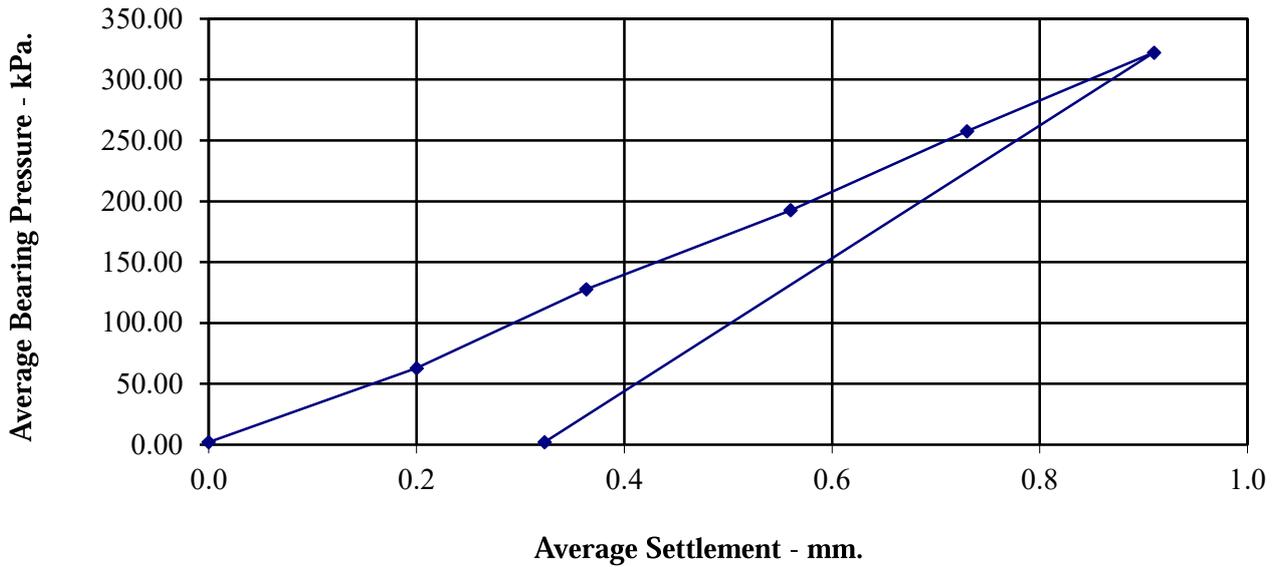
0.91

Plate Area (m²):

0.1626

Description:

Brown slightly gravelly slightly sandy CLAY.



Granny Lane, Mirfield

Contract No:

PSL22/5192

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-22	
Test Ref	3D	
Depth (m)	FL	
Grid Ref		
Layer		
Comments		
 Description	 Brown slightly gravelly slightly sandy CLAY.	
 Maximum Deflection	0.91	mm
Deflection required for CBR value	1.25	mm
Load at 0.91mm	322	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
 K ₇₆₂ (modulus of subgrade reaction) calculated using 1.25mm settlement	> 162.2	kN/m ² /mm
 CBR Value	> 65.2	%



Granny Lane, Mirfield

Contract No:

PSL22/5192

Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 08-Aug-22

Test Ref: 3E

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

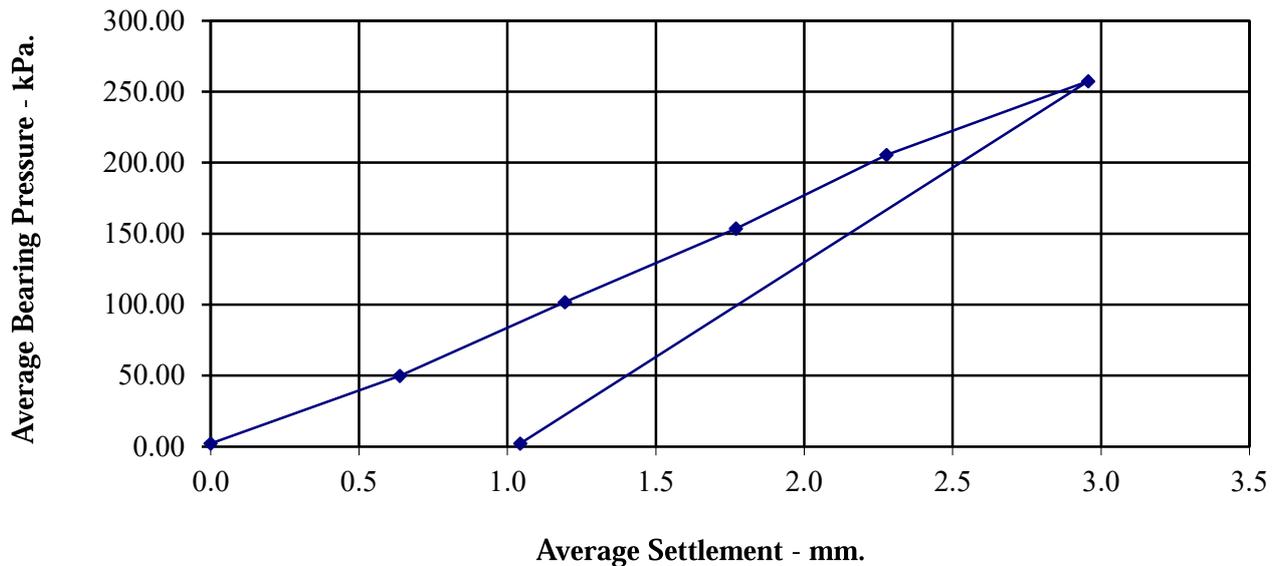
2.96

Plate Area (m²):

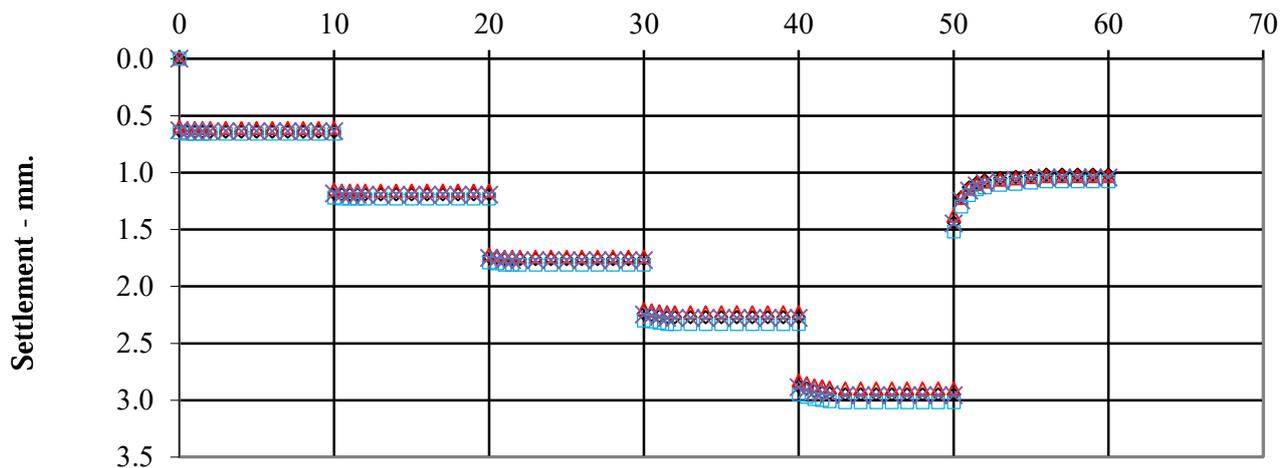
0.1626

Description:

Brown slightly gravelly slightly sandy CLAY.



Time - minutes.



◇ Settlement Gauge 1
△ Settlement Gauge 2
□ Settlement Gauge 3
× Average Settlement



Granny Lane, Mirfield

Contract No:

PSL22/5192

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-22	
Test Ref	3E	
Depth (m)	FL	
Grid Ref		
Layer		
Comments		
 Description	 Brown slightly gravelly slightly sandy CLAY.	
 Maximum Deflection	2.96	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	107	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
 K ₇₆₂ (modulus of subgrade reaction) calculated using 1.25mm settlement	53.8	kN/m ² /mm
 CBR Value	9.6	%



Granny Lane, Mirfield

Contract No:
PSL22/5192
Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 08-Aug-22

Test Ref: 3F

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

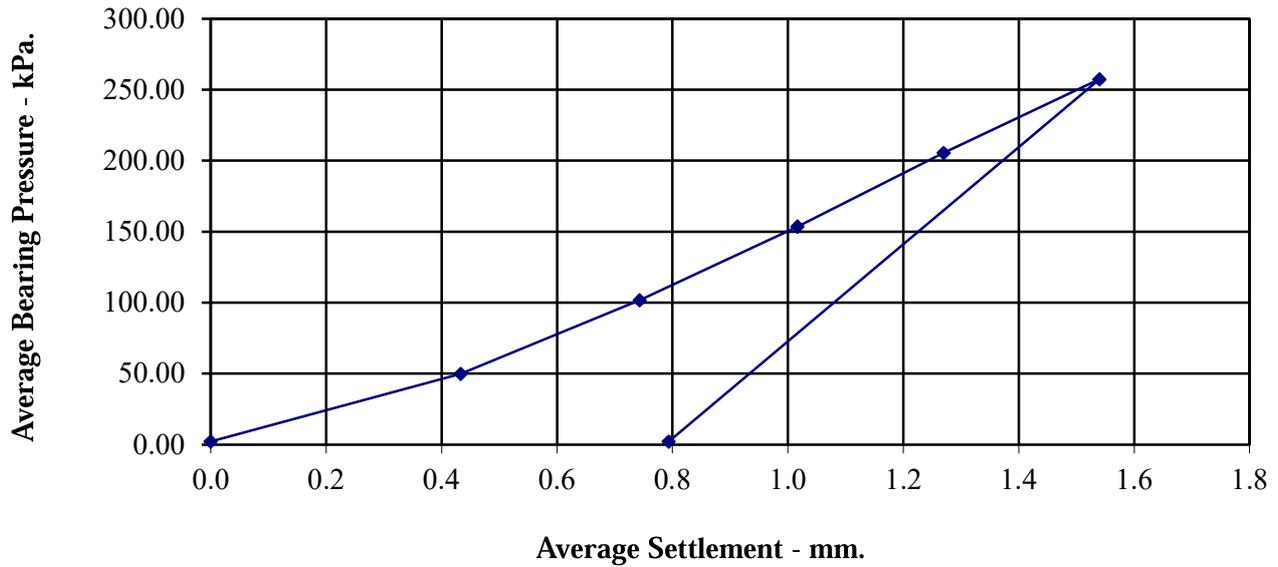
1.54

Plate Area (m²):

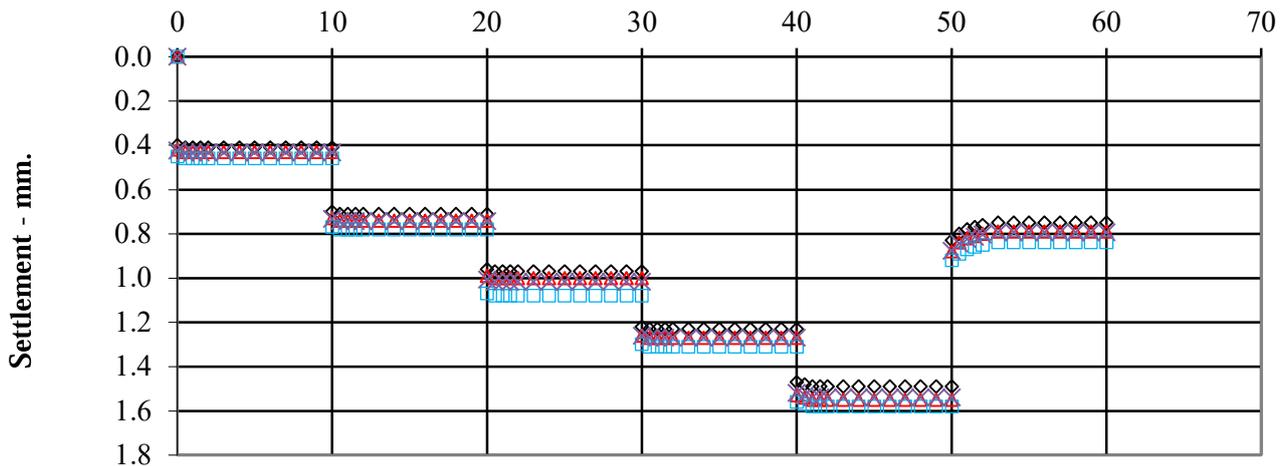
0.1626

Description:

Brown slightly gravelly slightly sandy CLAY.



Time - minutes.



◇ Settlement Gauge 1
△ Settlement Gauge 2
□ Settlement Gauge 3
× Average Settlement



Granny Lane, Mirfield

Contract No:

PSL22/5192

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-22	
Test Ref	3F	
Depth (m)	FL	
Grid Ref		
Layer		
Comments		
 Description	 Brown slightly gravelly slightly sandy CLAY.	
 Maximum Deflection	1.54	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	201	kN/m²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
 K₇₆₂(modulus of subgrade reaction) calculated using 1.25mm settlement	101.4	kN/m²/mm
 CBR Value	28.9	%



Granny Lane, Mirfield

Contract No:

PSL22/5192

Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 08-Aug-22

Test Ref: 3G

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

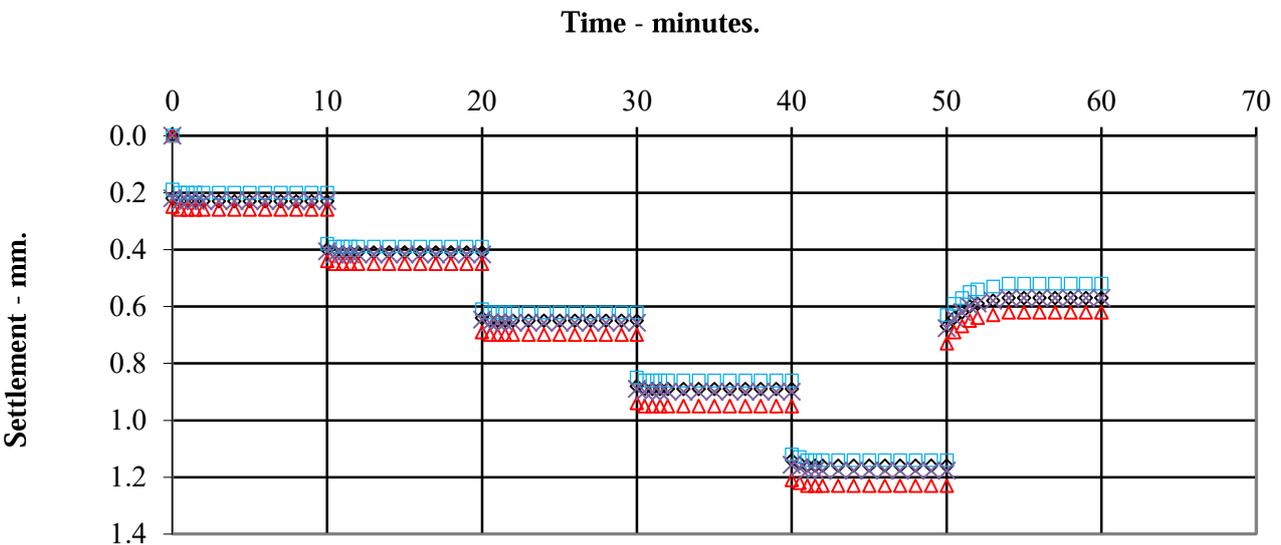
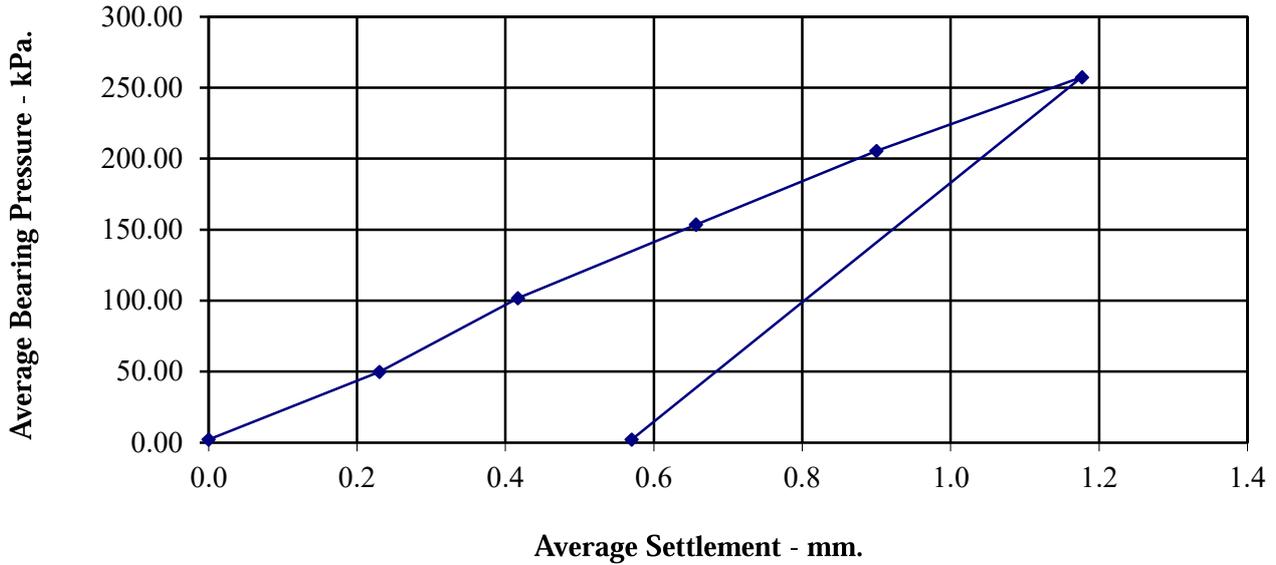
1.18

Plate Area (m²):

0.1626

Description:

Brown slightly gravelly slightly sandy CLAY.



◇ Settlement Gauge 1
△ Settlement Gauge 2
□ Settlement Gauge 3
× Average Settlement



Granny Lane, Mirfield

Contract No:

PSL22/5192

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-22	
Test Ref	3G	
Depth (m)	FL	
Grid Ref		
Layer		
Comments		
 Description	 Brown slightly gravelly slightly sandy CLAY.	
 Maximum Deflection	1.18	mm
Deflection required for CBR value	1.25	mm
Load at 1.18mm	257	kN/m ²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
 K ₇₆₂ (modulus of subgrade reaction) calculated using 1.25mm settlement	> 129.6	kN/m ² /mm
 CBR Value	> 44.2	%



Granny Lane, Mirfield

Contract No:
PSL22/5192
Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 08-Aug-22

Test Ref: 3H

Grid Ref:

Depth (m): FL

Layer:

Comments:

Maximum Applied Pressure (kPa):

257.43

Maximum Deformation (mm):

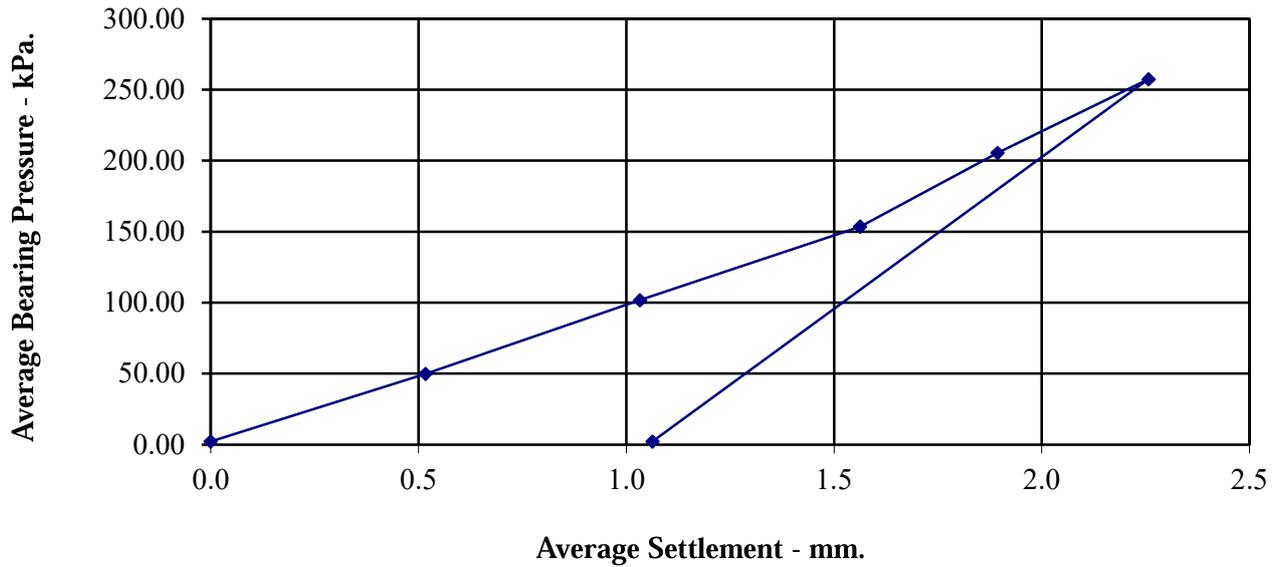
2.26

Plate Area (m²):

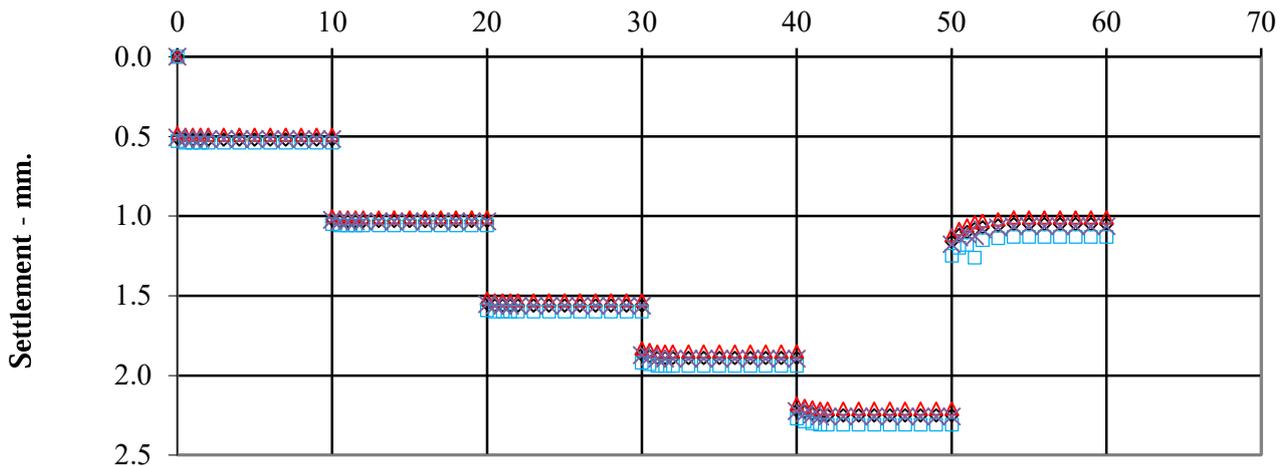
0.1626

Description:

Brown slightly gravelly slightly sandy CLAY.



Time - minutes.



◇ Settlement Gauge 1
△ Settlement Gauge 2
□ Settlement Gauge 3
× Average Settlement



Granny Lane, Mirfield

Contract No:

PSL22/5192

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-22	
Test Ref	3H	
Depth (m)	FL	
Grid Ref		
Layer		
Comments		
 Description	 Brown slightly gravelly slightly sandy CLAY.	
 Maximum Deflection	2.26	mm
Deflection required for CBR value	1.25	mm
Load at 1.25mm	123	kN/m²
Plate diameter	455	mm
Conversion factor for plate diameter	0.629	
 K₇₆₂(modulus of subgrade reaction) calculated using 1.25mm settlement	61.9	kN/m²/mm
 CBR Value	12.3	%



Granny Lane, Mirfield

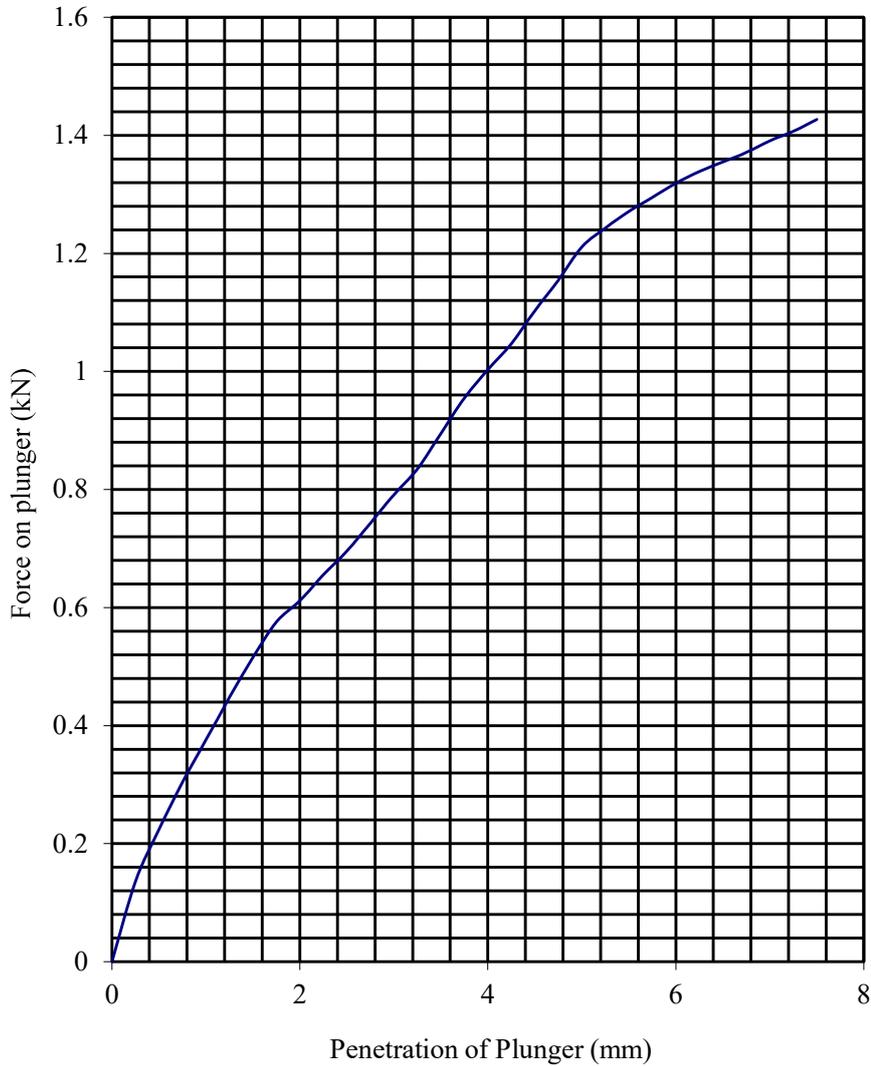
Contract No:
PSL22/5192
Client Ref:

Insitu California Bearing Ratio Test.

BS 1377 : Part 9 : 1990 Clause 4.3

Position Number: 3B

Depth (m): GL



Initial Sample Conditions	Method of Test	Insitu	C.B.R. Value %	6.1
Test Date	08-Aug-22	Estimated Percentage above 20mm:	0	Moisture Content:
Remarks:	Brown slightly gravelly slightly sandy CLAY.			
Required CBR Value:	N/A	Passed /Failed	N/A	



Granny Lane, Mirfield

Contract No:

PSL22/5192

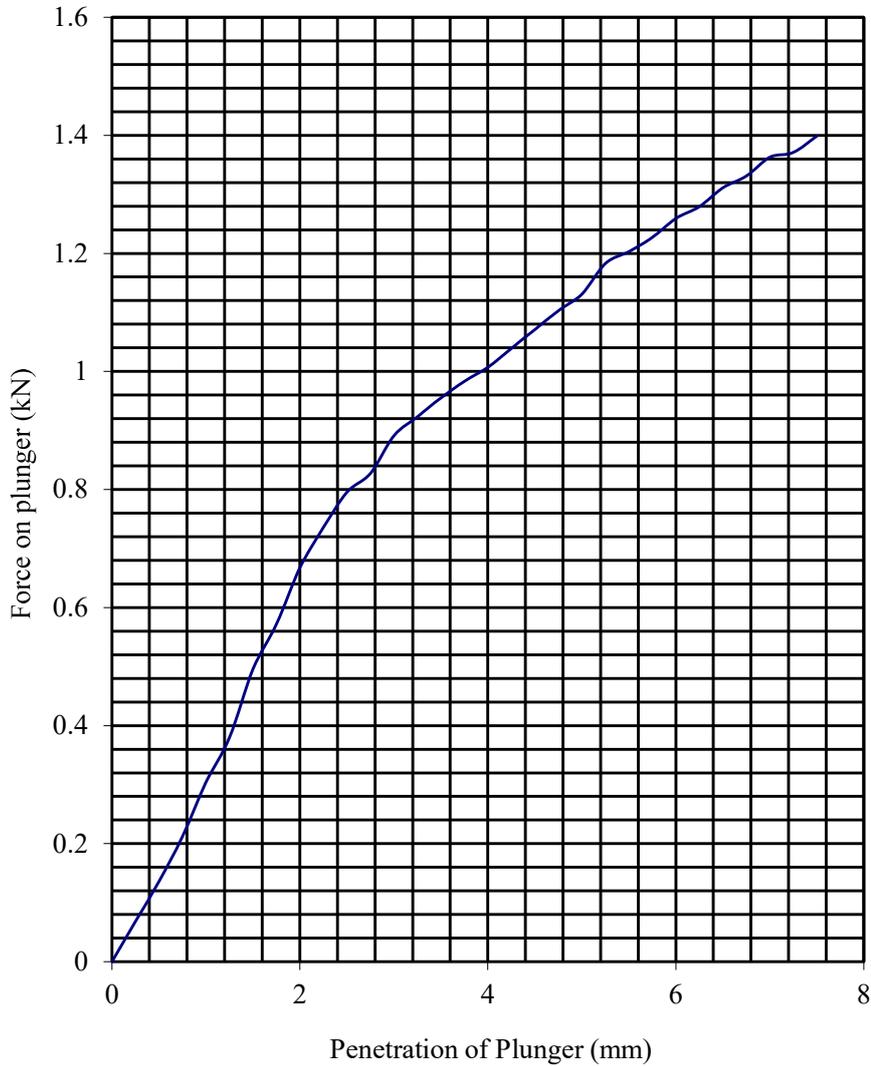
Client Ref:

Insitu California Bearing Ratio Test.

BS 1377 : Part 9 : 1990 Clause 4.3

Position Number: 3C

Depth (m): GL



Initial Sample Conditions	Method of Test	Insitu	C.B.R. Value %	6.0
Test Date	08-Aug-22	Estimated Percentage above 20mm:	0	Moisture Content:
Remarks:	Brown slightly gravelly slightly sandy CLAY.			
Required CBR Value:	N/A	Passed /Failed	N/A	



Granny Lane, Mirfield

Contract No:

PSL22/5192

Client Ref:

APPENDIX E
CHEMICAL LABORATORY TEST RESULTS

APPENDIX E (i)
PADDOCK TOPSOIL



DETS

Certificate of Analysis

Certificate Number 22-16553

Issued: 31-Aug-22

Client Lithos Consulting Ltd
Parkhill
Walton Rd
Wetherby
LS22 5DZ

Our Reference 22-16553

Client Reference 2935

Order No 19561/2935/008

Contract Title Granny Lane, Mirfield

Description 12 Soil samples, 2 Misc samples.

Date Received 23-Aug-22

Date Started 23-Aug-22

Date Completed 31-Aug-22

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

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

Approved By



Kirk Bridgewood
General Manager



2139



Summary of Chemical Analysis

Soil/Misc Samples

Our Ref 22-16553

Client Ref 2935

Contract Title Granny Lane, Mirfield

Lab No	2049368	2049369	2049370	2049371	2049372	2049373
	Paddock T/S					
Sample ID	- S1	- S2	- S3	- S4	- S5	- S6
Depth						
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	0.07	0.18	0.15	0.74	1.5	0.14
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05	0.06	0.04	< 0.50	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.09	0.86	0.18	1.5	3.9	0.48
Fluorene	DETSC 3303	0.03	mg/kg	0.07	0.63	0.18	1.1	2.6	0.30
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.80	5.9	1.7	8.8	25	3.5
Anthracene	DETSC 3303	0.03	mg/kg	0.17	1.4	0.31	2.0	6.3	0.81
Fluoranthene	DETSC 3303#	0.03	mg/kg	1.6	7.9	2.2	9.6	32	5.2
Pyrene	DETSC 3303#	0.03	mg/kg	1.4	7.2	1.9	8.6	29	4.7
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.46	2.4	0.57	2.6	9.8	1.8
Chrysene	DETSC 3303	0.03	mg/kg	0.73	2.8	0.89	2.9	11	1.9
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.60	2.7	0.77	2.6	10	2.3
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.26	1.1	0.29	0.97	4.2	0.81
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.43	2.2	0.58	2.0	8.9	1.7
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.15	0.67	0.18	0.56	2.7	0.44
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.03	0.18	0.05	0.15	0.61	0.12
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.16	0.71	0.17	0.57	2.7	0.43
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	7.0	37	10	45	150	25



Summary of Chemical Analysis

Soil/Misc Samples

Our Ref 22-16553

Client Ref 2935

Contract Title Granny Lane, Mirfield

Lab No	2049374	2049375	2049376	2049377	2049378	2049379
Sample ID	Paddock T/S - S7	Paddock T/S - S8	Paddock T/S - S9	Paddock T/S - S10	Paddock T/S - S11	Paddock T/S - S12
Depth						
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	0.22	0.35	0.46	0.62	0.15	0.22
Acenaphthylene	DETSC 3303#	0.03	mg/kg	0.22	0.36	0.10	0.05	0.19	0.31
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.73	1.1	0.90	1.1	0.36	0.92
Fluorene	DETSC 3303	0.03	mg/kg	0.54	0.82	0.70	0.77	0.27	0.72
Phenanthrene	DETSC 3303#	0.03	mg/kg	5.4	8.6	6.0	5.7	2.5	6.7
Anthracene	DETSC 3303	0.03	mg/kg	1.6	2.4	1.6	1.3	0.76	2.0
Fluoranthene	DETSC 3303#	0.03	mg/kg	9.0	18	8.5	6.4	5.5	13
Pyrene	DETSC 3303#	0.03	mg/kg	8.2	17	7.9	5.7	5.4	12
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	4.8	8.1	3.6	1.9	2.7	7.1
Chrysene	DETSC 3303	0.03	mg/kg	4.1	8.5	3.8	2.2	2.9	6.5
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	7.6	13	5.4	2.7	5.3	11
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	2.3	5.1	2.0	0.90	1.9	3.4
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	6.3	11	4.2	2.0	4.5	8.9
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	1.9	4.2	1.5	0.61	1.7	2.7
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.44	1.0	0.38	0.17	0.40	0.87
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	2.2	4.9	1.8	0.73	1.9	3.3
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	55	100	49	33	36	80

Summary of Asbestos Analysis

Soil Samples

Our Ref 22-16553

Client Ref 2935

Contract Title Granny Lane, Mirfield

Material

Lab No	Sample ID	Sample Location	Material Type*	Result	Comment*	Analyst
2049368	Paddock T/S - S1		SOIL	NAD	none	Michael Kay
2049369	Paddock T/S - S2		SOIL	NAD	none	Michael Kay
2049370	Paddock T/S - S3		SOIL	NAD	none	Michael Kay
2049371	Paddock T/S - S4		SOIL	NAD	none	Michael Kay
2049372	Paddock T/S - S5		SOIL	Chrysotile	Bundles of chrysotile	Michael Kay
2049373	Paddock T/S - S6		SOIL	NAD	none	Michael Kay
2049374	Paddock T/S - S7		SOIL	NAD	none	Michael Kay
2049375	Paddock T/S - S8		SOIL	NAD	none	Michael Kay
2049376	Paddock T/S - S9		SOIL	NAD	none	Michael Kay
2049377	Paddock T/S - S10		SOIL	Chrysotile	Bundles of chrysotile	Michael Kay
2049378	Paddock T/S - S11		SOIL	NAD	none	Michael Kay
2049379	Paddock T/S - S12		SOIL	NAD	none	Michael Kay
2049380	Paddock Asbestos S1		Cement	Chrysotile	none	Michael Kay
2049381	Paddock Asbestos S2		Cement	Chrysotile	none	Michael Kay

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

Information in Support of the Analytical Results

Our Ref 22-16553
 Client Ref 2935
 Contract Granny Lane, Mirfield

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2049368	Paddock T/S - S1 SOIL		GJ 250ml, PT 1L	Sample date not supplied, Naphthalene (14 days), PAH MS (14 days)	
2049369	Paddock T/S - S2 SOIL		GJ 250ml	Sample date not supplied, Naphthalene (14 days), PAH MS (14 days)	
2049370	Paddock T/S - S3 SOIL		GJ 250ml	Sample date not supplied, Naphthalene (14 days), PAH MS (14 days)	
2049371	Paddock T/S - S4 SOIL		GJ 250ml	Sample date not supplied, Naphthalene (14 days), PAH MS (14 days)	
2049372	Paddock T/S - S5 SOIL		GJ 250ml, PT 1L	Sample date not supplied, Naphthalene (14 days), PAH MS (14 days)	
2049373	Paddock T/S - S6 SOIL		GJ 250ml	Sample date not supplied, Naphthalene (14 days), PAH MS (14 days)	
2049374	Paddock T/S - S7 SOIL		GJ 250ml, PT 1L	Sample date not supplied, Naphthalene (14 days), PAH MS (14 days)	
2049375	Paddock T/S - S8 SOIL		GJ 250ml	Sample date not supplied, Naphthalene (14 days), PAH MS (14 days)	
2049376	Paddock T/S - S9 SOIL		GJ 250ml	Sample date not supplied, Naphthalene (14 days), PAH MS (14 days)	
2049377	Paddock T/S - S10 SOIL		GJ 250ml, PT 1L	Sample date not supplied, Naphthalene (14 days), PAH MS (14 days)	
2049378	Paddock T/S - S11 SOIL		GJ 250ml	Sample date not supplied, Naphthalene (14 days), PAH MS (14 days)	
2049379	Paddock T/S - S12 SOIL		GJ 250ml	Sample date not supplied, Naphthalene (14 days), PAH MS (14 days)	
2049380	Paddock Asbestos S1 MISC		PT 1L		
2049381	Paddock Asbestos S2 MISC		PT 1L		

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

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

Soil Analysis Notes

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

Disposal

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

Information in Support of the Analytical Results

Our Ref 22-16553
Client Ref 2935
Contract Granny Lane, Mirfield
End of Report



Certificate of Analysis

Certificate Number 22-17147

Issued: 05-Sep-22

Client Lithos Consulting Ltd
Parkhill
Walton Rd
Wetherby
LS22 5DZ

Our Reference 22-17147

Client Reference 2935

Order No 19561/2935/008

Contract Title Granny Lane, Mirfield

Description 2 Soil samples.

Date Received 23-Aug-22

Date Started 31-Aug-22

Date Completed 05-Sep-22

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

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

Approved By

A handwritten signature in black ink, appearing to read 'Kirk Bridgewood'.

Kirk Bridgewood
General Manager



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Summary of Asbestos Analysis

Samples

Our Ref 22-17147

Client Ref 2935

Contract Title Granny Lane, Mirfield

Lab No	Sample ID	Sample Location	Material Type	Result	Comment*	Analyst
--------	-----------	-----------------	---------------	--------	----------	---------

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

Summary of Asbestos Quantification Analysis

Soil Samples

Our Ref 22-17147

Client Ref 2935

Contract Title Granny Lane, Mirfield

Lab No	2052330	2052331
Sample ID	Paddock T/S - S5	Paddock T/S - S10
Depth		
Other ID		
Sample Type		
Sampling Date	n/s	n/s
Sampling Time		

Test	Method	Units		
Total Mass% Asbestos (a+b+c)	DETSC 1102	Mass %	< 0.001	< 0.001
Gravimetric Quantification (a)	DETSC 1102	Mass %	na	na
Detailed Gravimetric Quantification (b)	DETSC 1102	Mass %	<0.001	<0.001
Quantification by PCOM (c)	DETSC 1102	Mass %	na	na
Potentially Respirable Fibres (d)	DETSC 1102	Fibres/g	na	na

Breakdown of Gravimetric Analysis (a)

Mass of Sample		g	32.19	471.86
ACMs present*		type		
Mass of ACM in sample		g		
% ACM by mass		%		
% asbestos in ACM		%		
% asbestos in sample		%		

Breakdown of Detailed Gravimetric Analysis (b)

% Amphibole bundles in sample		Mass %	na	na
% Chrysotile bundles in sample		Mass %	<0.001	<0.001

Breakdown of PCOM Analysis (c)

% Amphibole fibres in sample		Mass %	na	na
% Chrysotile fibres in sample		Mass %	na	na

Breakdown of Potentially Respirable Fibre Analysis (d)

Amphibole fibres		Fibres/g	na	na
Chrysotile fibres		Fibres/g	na	na

* Denotes test or material description outside of UKAS accreditation.
 % asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264.
 Recommended sample size for quantification is approximately 1kg
 # denotes deviating sample

Information in Support of the Analytical Results

Our Ref 22-17147
 Client Ref 2935
 Contract Granny Lane, Mirfield

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
2052330	Paddock T/S - S5 SOIL		GJ 250ml, PT 1L		
2052331	Paddock T/S - S10 SOIL		GJ 250ml, PT 1L		

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

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

Disposal

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

End of Report