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REDACTED

Re: C9907A, Proposed Retaining Wall, Land off Westgate, Cleckheaton – Updated Factual Site Investigation Letter Report

Further to undertaking additional site investigation works in relation to a proposed retaining wall at the above-named site, we are pleased to report on the findings.

This letter report supersedes the previous version, ref. C9907/AMG/1039, dated 2nd February 2024.

1.0 Introduction

Sirius Geotechnical Ltd (Sirius) was commissioned by Strata Homes to undertake site investigation work for a proposed retaining wall at the housing development off Westgate, Cleckheaton ('the site').

The proposed retaining wall that is subject of this site investigation is located along the south-eastern and eastern boundaries of the site, and is shown on Queensbury Design Drawing No. QD1776-03-01 Rev D, dated 22.11.23, a copy of which is included within Appendix A. At the time of writing, the exact type of retaining wall to be built has yet to be determined.

The objectives of the site investigation were to:

- Investigate shallow ground and groundwater conditions along the alignment of the proposed retaining wall;
- Procure laboratory analysis of soil samples to inform the detailed design and global stability analysis of the retaining wall.

2.0 Environmental Setting

The following information is largely taken from the Geoenvironmental Appraisal by Lithos Consulting (Report No. 3043/2D, dated July 2023). An overview of relevant information contained within the previous Geoenvironmental Appraisal is included below, although the Lithos report should be referred to for details of the historical development, environmental and

geological setting of the site, and previous site investigation works undertaken on the site by Lithos and others.

2.1 Site Description

The site can be considered as four distinct areas, based on former land uses which still dominate the current site features:

- Area A (1.1 ha) - former chemical works in the north-west.
- Area B (1.7 ha) - former rolling mill in the south and south-west.
- Area C (2.0 ha) - former scrap yard, malthouse, brickworks and quarry in the east.
- Area D (1.6 ha) - industrial area in the centre-north

The retaining wall will be mostly located in Area C, with the south-westernmost extent being located at the eastern end of Area B.

An earth bund separates Area C from the rest of the site. Levels across Area C vary by up to 6m, with steep embankments in the south-east where land is 3m to 6m lower than adjacent land to the north and west. Until recently, this area comprised mostly shrubs and trees, which have been cleared since the intrusive site investigation works took place. There are remnants of brick and stone walls to former buildings on the southern boundary of the site, as well as the concrete slab to a former building in the east of the site, adjacent to the site boundary with Quarry Road.

The southernmost extent of the proposed retaining wall coincides with the eastern end of the recently demolished Wharfe Mill building and external yard area, which both stand higher than the adjoining land to the east.

2.2 Historical Development

A quarry is shown in the east of the site on the earliest Ordnance Survey (OS) map, dated 1854.

The OS map dated 1894 shows that the eastern face of the quarry in the east of the site forms part of the site's south-eastern boundary, i.e., coincides with part of the alignment of the proposed retaining wall. The same map also shows Quarry Brickworks (clay pit) in the eastern part of the site, as well as unlabelled buildings on or near the southern site boundary in proximity to the proposed retaining wall alignment.

The OS maps dated 1938 and 1958 show that the quarry and clay pit were backfilled, with a slope present in proximity to the eastern face of the former quarry, as well as part of the adjacent Wharfe Works, indicating that fill was placed that both filled the quarry and raised the level above the top of the former quarry.

An aerial photograph dated 1999 shows that the layout of the south-eastern part of the site and adjacent land is similar to the current layout, i.e., that the land at the western end of the proposed retaining wall alignment lies within a yard and part of the former Wharfe Works building, and the central and eastern portions lie within vegetated / wooded areas, with industrial buildings to the south, and Quarry Road to the east.

2.3 Geology

Geological mapping shows that the site is underlain by the Clifton Rock, a named sandstone unit within the Pennine Lower Coal Measures Formation. No drift deposits are recorded on the site.

2.4 Coal Mining

The Lithos report concludes that it is highly unlikely that the site is at risk from shallow coal workings.

2.5 Hydrogeology

The underlying solid strata are classified as a Secondary A Aquifer.

2.6 Hydrology

Blacup Beck runs within c. 15m of the western end of the proposed retaining wall alignment.

2.7 Landfills

No landfills are recorded by the Environment Agency or local authority within the site.

3.0 Scope of Works

3.1 Fieldwork

The first phase of site investigation undertaken by Sirius was from 28th November to 1st December 2023 and comprised the following:

- Excavation of six trial pits (TP601 – TP606), to a maximum depth of 4.0m below ground level (bgl) with a wheeled backhoe excavator.
- Drilling of two cable percussion boreholes (BH601 and BH602), to a maximum depth of 9.9m bgl.
- Drilling of eight windowless sampler boreholes (WS601 – WS607 and WS602A), to a maximum depth of 5.0m bgl.

Groundwater level monitoring wells (50mm internal diameter standpipes) were installed within BH601, BH602, WS603, WS604, WS606 and WS607. The wells were provided with raised 'tophat' lockable steel covers.

The second phase of site investigation undertaken by Sirius was from 25th to 27th June 2024 and comprised the following:

- Excavation of twelve trial pits (TP701 – TP711 and TP709A), to a maximum depth of 5.0m bgl with a tracked 20 tonne excavator.
- Drilling of two cable percussion boreholes (BH701 and BH702), to a maximum depth of 7.04m bgl.
- Drilling of six windowless sampler boreholes (WS701 – WS706), to a maximum depth of 7.5m bgl.

The boreholes and trial pits were logged on site by a geoenvironmental engineer employed by Sirius in accordance with BS5930. In situ standard penetration tests (SPTs) were undertaken at 1m depth intervals (at 1.5m intervals below 5m bgl in BH601 and BH602).

The exploratory holes were excavated / drilled as close as practicable to the site boundary (i.e., alignment of the proposed retaining wall), although in places, particular during the first phase of investigation, this was constrained by the presence of trees, vegetation and remnant debris from partial site clearance undertaken prior to the site investigation.

The cable percussion boreholes were drilled to a depth at which intact rock was proven. The trial pits were excavated to depths at which the maximum reach of the excavator used, or further progress was not possible due to collapse of side walls or rapid ingress of groundwater. The windowless sampler boreholes were generally drilled to the maximum practical limits of the method within the ground conditions encountered (i.e., 4.0m to 7.5m bgl), with WS602, WS605 and WS607 being terminated at shallower depths, due to the presence of obstructions within made ground. WS701 was terminated at 7.5m bgl within natural strata, after recording an SPT N value >50, possibly indicative of intact rock at that depth.

Upon completion of drilling, the National Grid co-ordinates and elevation above Ordnance Datum (AOD) at the exploratory hole locations were recorded using survey-grade GPS equipment. However, it should be noted that the presence of buildings and trees in proximity to the exploratory holes resulted in reduced accuracy in some cases, particularly during the first phase of investigation.

The exploratory hole locations are shown on Drawing No. C9907/02 Rev B, in Appendix A.

The exploratory hole logs are included in Appendix B.

3.2 Geotechnical Laboratory Analysis

Selected disturbed soil samples collected during the site investigation were submitted to The Testing Lab, a UKAS accredited testing laboratory, for geotechnical analysis comprising the following:

- Atterberg limits and moisture content;
- Moisture content / dry density relationship (compaction testing);
- Particle density;
- Small shear box testing.

4.0 Ground Investigation Findings

4.1 Ground Conditions

Made ground was identified in each exploratory hole, to depths ranging between 0.9m and 9.5m bgl, with the majority of exploratory holes being terminated within made ground.

In the west of the site, (i.e., TP701, BH602, WS601, WS602 and WS602A, within the area of the historical sandstone quarry), the made ground typically comprised loose to very loose black slightly clayey sandy gravel of ash, clinker, brick, sandstone and slag. In BH602, at 5.0m bgl within this material, the SPT recorded an N value of zero, indicative of extremely loose material. Furthermore, following the SPT, the drilling tools penetrated down to c. 6m bgl in one drop without recovering any material, indicating the possible presence of a void.

At the base of made ground in BH602, from 6.9m to 9.5m bgl, soft to firm slightly gravelly sandy clay was recorded; given the location of the borehole, this is considered likely to be quarry backfill and hence has been logged as made ground.

Within the central and eastern parts of the site, the made ground was more variable, typically comprising interbedded layers of granular and cohesive materials. The granular material included loose black ashy material (including man-made materials such as glass, ceramic, fabric and wood, with low cobble / boulder content of sandstone, concrete and brick), as seen in the west of the site, but also very loose to medium dense sandy clayey gravel of sandstone. The cohesive made ground in this area comprised soft to firm sandy gravelly clay. Within BH601, the SPT at 3.0m bgl recorded an N value of zero, indicating the presence of extremely weak or voided material. Within WS604, made ground comprising soft to firm, very low to low strength, slightly sandy gravelly clay was recorded beneath made ground, from 2.5m to 4.0m bgl.

An intact brick cellar wall was identified within TP704, with the cellar itself being backfilled with loose whole bricks. During excavation of the trial pit, the brick wall collapsed, revealing a staircase behind, with a tyre at the base. The made ground in TP705 between 1.4m and 2.8m bgl also comprised loose demolition rubble (mostly whole bricks, with some wood and metal).

Natural residual soils were only identified in one location (TP602), comprising firm orangish brown sandy gravelly friable clay at 0.9m bgl underlying made ground and overlying sandstone bedrock.

Rockhead, where encountered, comprised very weak to medium strong yellow-brown sandstone and was recorded at depths of between 1.6m and 9.5m bgl.

No visual or olfactory evidence of gross contamination of soils (e.g., by hydrocarbons) was identified within any exploratory hole.

4.2 In Situ Geotechnical Test Results

The results of in situ geotechnical test results are summarised in Tables 1 and 2.

Table 1 - Summary of Hand Shear Vane Test Results

Stratum	No. of Tests	Minimum	Maximum	Mean	Median
		(kPa)			
Cohesive Made Ground	39	18	90	58	58

Table 2 – Summary of SPT Results

Stratum	No. of Tests	Minimum	Maximum	Mean	Median
		(Uncorrected N Values)			
Ashy Granular Made Ground	23	0	13	5	4
	Excludes two tests with N>50 (i.e., obstructions)				
Other Granular Made Ground	18	0	30	9	6
Cohesive Made Ground	38	0	17	8	8
	Excludes two tests with N>50 (i.e., obstructions)				
Sandstone	6	>50			

4.3 Groundwater

Groundwater strikes were noted within the majority of exploratory holes during excavation / drilling, as summarised in Table 3.

Table 3 – Summary of Groundwater Strikes during Site Investigation

Exploratory Hole	Depth (m bgl)	Stratum	Comments
BH601	3.0	Made Ground	Rose to 2.0m bgl after 20 minutes.
BH602	4.5	Made Ground	Water level remained static after 20 minutes.
BH701	3.0	Made Ground	Rose to 2.5m bgl after 20 minutes.
BH702	3.0	Made Ground	Water level remained static after 20 minutes.
TP603	2.8	Made Ground	
TP604	2.5	Made Ground	Rapid ingress of water, leading to collapse of trial pit sides.
TP605	2.4	Made Ground	Rapid ingress of water, leading to collapse of trial pit sides.
TP701	4.0	Made Ground	Moderate ingress.
TP703	3.0	Made Ground	Rapid ingress.
TP704	2.4	Made Ground	Rapid ingress.

Exploratory Hole	Depth (m bgl)	Stratum	Comments
TP705	2.9	Made Ground	Rapid ingress.
TP706	2.7	Made Ground	Rapid ingress.
TP707	2.1	Made Ground	Rapid ingress.
TP708	2.2	Made Ground	Rapid ingress.
TP709	5.0	Made Ground	Seepage.
TP710	5.0	Made Ground	Seepage.
TP711	3.0	Made Ground	Rapid ingress.
WS601	4.0	Made Ground	Liner noted to be wet from 4m bgl.
WS602A	3.0	Made Ground	Liner noted to be wet from 3m bgl.
WS603	4.0	Made Ground	Liner noted to be wet from 4m bgl.
WS604	2.0	Made Ground	Liner noted to be wet from 2m bgl.
WS606	2.0	Made Ground	Liner noted to be wet from 2m bgl.
WS607	3.0	Made Ground	Liner noted to be damp from 3m bgl.
WS702	6.0	Made Ground	Liner noted to be wet from 6m bgl.
WS703	2.0	Made Ground	Liner noted to be wet from 2m bgl.
WS704	2.0	Made Ground	Liner noted to be wet from 2m bgl.
WS705	2.0	Made Ground	Liner noted to be wet from 2m bgl.
WS706	2.0	Made Ground	Liner noted to be wet from 2m bgl.

5.0 Groundwater Level Monitoring

Three groundwater level monitoring visits were made after the first phase of site investigation, with additional monitoring undertaken on surviving monitoring wells during the second phase of investigation. On the first monitoring visit, the boreholes were purged of three times the well volume of water following initial level monitoring. The results of the groundwater monitoring visits are summarised in Table 4. The groundwater levels were noted to have remained unchanged, or changed little after purging, indicating fast groundwater recharge.

Table 4 – Summary of Groundwater Monitoring Results

Bore hole	08/12/23		04/01/24		16/01/24		27/06/24	
	GW Level (m bgl)	GW Level (m AOD)	GW Level (m bgl)	GW Level (m AOD)	GW Level (m bgl)	GW Level (m AOD)	GW Level (m bgl)	GW Level (m AOD)
BH601	1.73	90.60	1.32	91.01	Not recorded – well cover destroyed			
BH602	3.54	91.86	3.50	91.90	3.68	91.72	3.42	91.98
WS603	4.59	91.08	4.18	91.49	Not recorded – well cover destroyed			
WS604	1.81	90.19	1.77	90.23	2.01	89.99	1.94	90.06
WS606	1.90	90.17	1.90	90.17	2.06	90.01	Not recorded – well cover destroyed	
WS607	2.65	90.65	2.37	90.93	Not recorded – well cover destroyed			

6.0 Summary of Geotechnical Laboratory Analysis Results

6.1 Atterberg Limits

An Atterberg limits test undertaken on a sample of cohesive made ground (BH601 at 2.1 – 3.0m bgl) enables classification of this material as clay of intermediate plasticity.

6.2 Compaction Characteristics

Table 5 summarises the results of maximum dry density / optimum moisture content relationship analysis (using 2.5kg rammer compaction method), with a comment for each sample tested as to whether the natural moisture content value lies within the optimum range for compaction (i.e., to achieve ≥95% of the maximum dry density and <5% air voids), or is too wet or dry for effective compaction.

Table 5 – Summary of Compaction Testing

Sample Location, Depth (bgl)	Material Type	Optimum Moisture content (%)	Maximum Dry Density (Mg/m^3)	Optimum Moisture Content Range		Initial Moisture Content (%)	Comments on Natural Moisture Content
				Lower (%)	Upper (%)		
TP601, 1.0 - 1.5m	Granular Made Ground	17	1.79	16	20	16	Within optimum range
TP603, 0.4 - 0.9m	Ashy Granular Made Ground	20	1.27	22	23	20	Drier than optimum range
TP606, 0.2 - 0.7m	Granular Made Ground	16	1.78	15	19	16	Within optimum range

6.3 Small Shear Box Testing

Table 6 summarises the results of small shear box testing, undertaken on disturbed samples following light compaction.

Table 6 – Summary of Small Shear Box Testing

Sample Location, Depth (bgl)	Material Type	Moisture content (%)	Dry Density (Mg/m^3)	Peak Angle of Friction (Ø`) (degrees)	Peak Apparent Cohesion (c`) (kPa)
BH602, 0.2 - 1.0m	Granular Made Ground	13.8	1.49	25.5	13
TP604, 0.3 - 0.8m	Granular Made Ground	22.1	1.35	33	10
TP605, 1.8 – 2.3m	Cohesive Made Ground	22.8	1.51	26	12

We trust that the above and attached meet with your current requirements. Should you require any further information, please do not hesitate to contact the undersigned.

Yours sincerely,

REDACTED

Adrian Grant

Principal Engineer

For and on behalf of Sirius Geotechnical Ltd

Appendix A: Drawings

Appendix B: Borehole and Trial Pit Logs

Appendix C: Geotechnical Laboratory Analysis Results

APPENDIX A

DRAWINGS

YORKSHIRE WATER REF
H-3-264-963

Only PDF/ DWF Issues of this drawing are controlled. All other formats (eg. DWG AutoCAD FILES) are UN-controlled and are used at your own risk.

GENERAL NOTES

1. DO NOT USE THIS DRAWING IN ISOLATION. THIS DRAWING HAS BEEN PREPARED AS PART OF A SET, AND MUST THEREFORE BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER PRIOR TO COMMENCING WORKS.
2. THIRD PARTY INFORMATION IS USED TO PREPARE THE ENGINEERING DESIGN (TOPOGRAPHICAL SURVEY, UTILITIES RECORDS, GEOTECHNICAL REPORT, UTILITIES RECORDS, AND SPECIALIST DESIGN ITEMS). THE ENGINEERING DESIGN MUST THEREFORE BE READ IN CONJUNCTION WITH ALL THIRD PARTY INFORMATION PRIOR TO COMMENCING WORK. QUEENSBERRY DESIGN LTD ARE NOT RESPONSIBLE FOR ANY THIRD PARTY INFORMATION OR DETAILS
3. DRAWING STATUS WILL REMAIN PRELIMINARY UNTIL FULL TECHNICAL APPROVAL IS RECEIVED FROM LOCAL AUTHORITY AND SEWERAGE UNDERTAKER. WORKS SHOWN ON THIS DRAWING ARE NOT TECHNICAL APPROVAL AND SO AT RISK AND MAY BE SUBJECT TO CHANGE
4. THE CONTRACTOR IS EXPECTED TO PREPARE APPROPRIATE CONSTRUCTION METHOD STATEMENTS FOR ALL ASPECTS OF APPOINTED WORK. THIS SHOULD INCLUDE ANY TEMPORARY PROTECTION / WORKS
5. THE CONTRACTOR IS EXPECTED TO CHECK LEVELS TO DISCHARGE INTO THE PUBLIC SEWER NETWORK. ANY NEED FOR LAND DRAINAGE SHOULD BE ASSESSED BY THE GROUND WORKER AND LANDSCAPER DURING CONSTRUCTION AND PLACEMENT OF GARDENS ON AN INDIVIDUAL PLOT BASIS. IF LAND DRAINAGE DESIGNS ARE REQUIRED, THEY SHOULD BE APPOINTED PRIOR TO PLOT COMPLETION.
6. THE CONTRACTOR IS EXPECTED TO CAREFULLY CHECK ALL DRAINAGE INVERTS PRIOR TO COMMENCING WORK, THIS MAY INVOLVE EXCAVATION OF TRIAL HOLES IF INVERT LEVELS ARE NOT KNOWN. THE LEVELS, LOCATION, LINE AND DIAMETER OF ALL EXISTING DRAINAGE APPARATUS SHOULD BE CONFIRMED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER IMMEDIATELY.
7. THE CONTRACTOR MUST MONITOR THE "AS BUILT" PROGRESS OF EACH CONSTRUCTION STAGE (ROADS/SEWERS/PLOT WORKS ETC), TO ENABLE THE NEXT STAGES OF CONSTRUCTION TO BE CHECKED BEFORE INSTALLATION.

HIGHWAYS

1. ALL HIGHWAY WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT LOCAL AUTHORITY DESIGN GUIDE AND SPECIFICATION.
2. ALL EXCAVATIONS BELOW PROPOSED AND EXISTING HIGHWAYS TO BE BACK FILLED WITH GRANULAR MATERIAL AND WELL COMPACTED IN LAYERS NOT EXCEEDING 150MM, UNLESS OTHERWISE AGREED.
3. HIGHWAY AUTHORITY TO BE NOTIFIED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS.

ADOPTABLE DRAINAGE

1. ALL ADOPTABLE SEWER WORKS AND MATERIAL TO BE IN ACCORDANCE WITH "CODE FOR ADOPTION" THE RELEVANT BRITISH/EUROPEAN AND YORKSHIRE WATERS STANDARDS/DOCUMENTS/ADDENDUM TO THE MECHANICAL AND ELECTRICAL SPECIFICATION AND KITEMARKED
2. MANHOLE COVERS SHALL MUST HAVE A CLEAR OPENING OF 600MM AND SHALL BE CLASS D400 TO BS EN 124 WITH 150MM DEEP FRAMES IN HIGHWAYS
3. ALL ADOPTABLE SEWERS TO BE LAID AND CONSOLIDATED UNDER THE SUPERVISION AND TO THE SATISFACTION OF YORKSHIRE WATER BEFORE ANY SEWER WORKS ARE CARRIED OUT
4. YORKSHIRE WATER IS NOT OBLIGED TO ACCEPT FILTER DRAINLAND DRAINAGE RUN-OFF INTO THE PUBLIC SEWER NETWORK OR ADOPTABLE DRAINAGE SYSTEM DESIGNED TO ACCEPT LAND DRAINAGE RUN-OFF. ANY SYSTEM DESIGNED TO ACCEPT DRAINAGE RUN-OFF WILL THEREFORE BE REQUIRED AND YOU WILL HAVE TO LIAISE WITH THE LOCAL AUTHORITY, LAND DRAINAGE SECTION REGARDING THE DISPOSAL OF THE FILTER DRAINLAND DRAINAGE RUN-OFF
5. THE ADOPTABLE SEWERS SHOULD BE A MINIMUM OF 1M AND MANHOLES 0.5M FROM KERB FACES AND SERVICE MARGINS
6. SEWERS MUST HAVE 3 METRES CLEARANCE FROM TREES AND HEDGES OR THE WIDTH OF THE TREE AT MATURITY, WHICHEVER IS GREATER
7. SEWERS TO BE LAID IN CLASS "S" BEDDING (150MM GRANULAR BED AND SURROUND, WHERE DEPTH OF COVER TO TOP OF THE SEWER IS LESS THAN 1.2M IN HIGHWAYS AND VERGES (OR LESS THAN 900MM IN NON-VEHICULAR ACCESS AREAS) THEN A CONCRETE SLAB SHOULD BE PROVIDED ABOVE GRANULAR BED AND SURROUND
8. ALL PIPES SHALL BE CONSTRUCTED TO MEET THE REQUIREMENT OF WATER INDUSTRY SPECIFICATION WIS 82-3 (TABLE A2)
9. YORKSHIRE WATER POLICY IS THAT TYPE "C" BRICK MANHOLES AND 1500MM DIAMETER MANHOLE RINGS ARE NOT PREFERRED. INSTEAD IT IS PREFERRED THAT YOU USE A TYPE "B" MANHOLE WITH 1200MM DIAMETER OR 1500MM DIAMETER RINGS, WITH THE OPENING SITED OVER THE CHANNEL WHERE DEPTH OF COVER TO PIPE SOFFIT IS 1.2M OR LESS
10. ALL ADOPTABLE PLASTIC SEWER PIPES TO BE BSI KITEMARKED (CERTIFIED TO WIS 4-35-01 AND ESSENTIA'S). ADOPTABLE PLASTIC SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS. PLASTIC CHANNEL SECTIONS IN MANHOLES ARE NOT ACCEPTABLE AND YORKSHIRE WATER WOULD REQUIRE CLAY WARE CHANNEL IN MANHOLES.
11. ADOPTABLE CONCRETE SEWER PIPES SHALL MUST NOT BE LESS THAN BE AS FOLLOWS: 150MM DIA. 450MM, 150MM DIA. 450MM, 225MM DIA. 450MM AND 300MM DIA. 729MM. THE MINIMUM CRUSHING STRENGTH FOR CONCRETE PIPES SHOULD BE: - CLASS L2 TO EN 1916/BS1211 / 2003. PLASTIC PIPES SHOULD CONFORM TO WIS 4-35-01 AND EN 13476
12. WHERE A 900 COVER AND FRAME HAS BEEN APPROVED, THIS MUST NOT BE COATED IN PLASTIC AND MUST HAVE LIFTING EYES SUITABLE TO ACCOMMODATE STANDARD LIFTING KEYS. SCREW DOWN COVERS ARE NOT ACCEPTABLE.
13. WHERE A 600 COVER AND FRAME HAS BEEN APPROVED, THIS MUST HAVE BEDDING TO BOTH PIPES, APPROX. 500MM, IF CROSSSEWER IS NEAR THE KERB THEN THE CLEARANCE NEEDED MAY NEED TO BE INCREASED!.

EXISTING SERVICES

PRIOR TO THE COMMENCEMENT OF ANY WORKS UNDER GROUND MAPPING SURVEYS AND CONSTRAINTS PLAN IS TO BE REFERED TO ANY DISCREPANCIES ARE TO BE REPORTED TO ENGINEER.

ANY EXISTING SERVICES WHICH MAY BE AFFECTED BY THE PROPOSED WORKS SHOULD BE LOCATED BY MEANS OF A HAND DIG IN CLOSE LIAISON WITH THE STATUTORY SERVICE AUTHORITIES. THE CONTRACTOR SHALL ALLOW FOR THE DIVERSION OF ANY SERVICES THAT MAY AFFECT THE PROPOSED DESIGN. CONTRACTOR TO NOTIFY STATUTORY SERVICE AUTHORITIES PRIOR TO COMMENCEMENT OF WORK. AS CONSTRUCTED INFORMATION IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE THE FOLLOWING AS CONSTRUCTED DRAWINGS TO THE DEVELOPER UPON THE COMPLETION OF THE WORKS COVERED BY THE CONTRACT.

1. POSITION/CO-ORDINATES OF ALL ADOPTABLE MANHOLES.
2. INVERT AND COVER LEVELS OF ALL ADOPTABLE MANHOLES.
3. NEW GULLY POSITIONS AND CONNECTIONS.
4. POSITION AND DEPTH OF SERVICE DUCTS FOR WATER, GAS, ELECTRIC, BT, CABLE AND STREET LIGHTING, STATING SIZE AND NUMBER OF DUCTS.

LEGEND

ADOPTABLE DRAINAGE

PROPOSED ADOPTABLE FOUL MANHOLE F1

PROPOSED ADOPTABLE STORM MANHOLE S1

PROPOSED ADOPTABLE COMBINED MANHOLE C1

EXISTING ADOPTED COMBINED MANHOLE EX MH

ADOPTED COMBINED MANHOLE ABANDONED EX MH

ROAD GULLY

LATERAL DRAINAGE

450MM DIA. PRIVATE TYPE D CHAMBER. TO BE USED WHERE DEPTH TO INVERT IS 2000MM OR LESS. REDUCED ACCESS FITTING REQUIRED AT DEPTHS GREATER THAN 1200MM

OR

1200MM DIA. TYPE D MANHOLE WHERE DEPTH TO INVERT IS 2000 - 3000MM COVER TO HAVE A 600MM OPENING

COVER LEVELS PROVIDE ARE FOR GUIDANCE AND ARE SUBJECT TO FINISHED GROUND LEVELS

STREET LIGHTING

PROPOSED 6 METRE STEEL COLUMN WITH SPIGOT MOUNTED ORANGETEK IGNIS MINI 20 MPH 4-5, 70, 203, 218E, 2 (13W) 2 ITNLM LANTERN- 5 DEGREE TILT

PROPOSED 6 METRE STEEL COLUMN WITH SPIGOT MOUNTED ORANGETEK IGNIS MINI 20 MPH 4-5, 70, 203, 218E, 2 (13W) 2 ITNLM LANTERN- 0 DEGREE TILT

STREET TREES

POSITIONS AS LANDSCAPE DESIGN REFER TO LANDSCAPE ARCHITECT FOR TREE SPECIMEN, PLANTING MATERIAL AND TREE PIT OR BARRIER REQUIREMENTS

Rev.	Date	Revision Details	Drawn	Checked
D	22.11.23	STREET LIGHTING ADDED - FFL AMENDED 155-156 - STREET TREES ADDED	ND	MD
C	06.09.23	YORKSHIRE WATER COMMENTS ADDED - ATTENUATION CHANGED TO CELLULAR STORAGE	ND	MD
B	21.04.23	MINOR UPDATES TO PLANNING APPROVED LAYOUT	ND	MD
A	01.03.22	SITE RE-DESIGNED TO NEW PLANNING LAYOUT AND FLOOD RISK / SURFACE WATER DRAINAGE DESIGN REQUIREMENTS	ND	MD
-	18.02.22	FIRST ISSUE	ND	MD

QUEENSBERRY DESIGN
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Client: STRATA HOMES

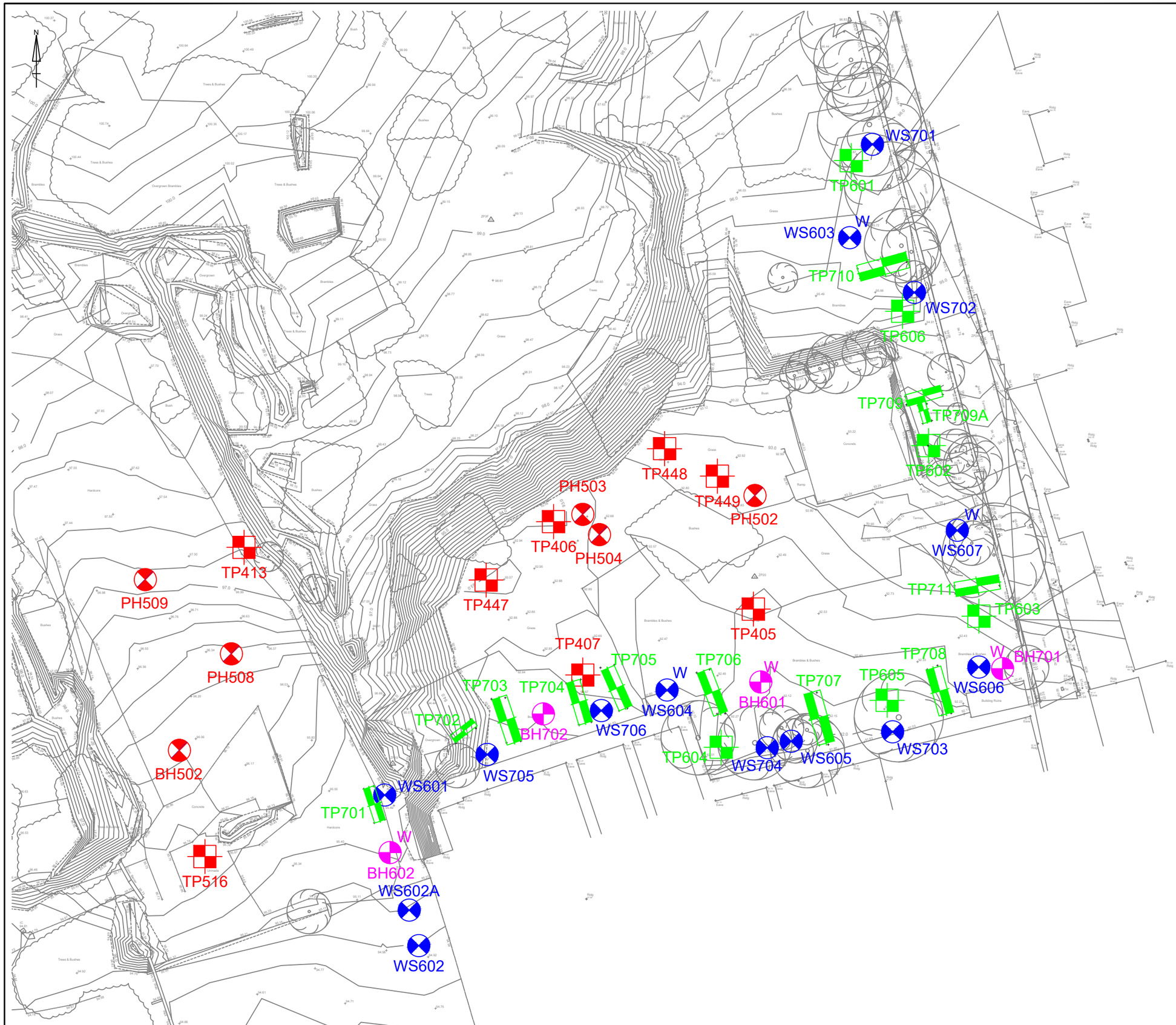
Project: WESTGATE CLECKHEATON

Title: ENGINEERING LAYOUT

Drawn	Checked	Date
ND	AL	26.10.2021

Drawing Number: QD1776-03-01

Drawing Status: TENDER | Scale: 1:500 - A0 | Rev: D



KEY

Sirius 2023/4 Retaining Wall Investigation

- Trial Pit
- Windowless Sampler Borehole
- W Windowless Sampler Borehole with Groundwater Monitoring Well
- W Cable Percussion Borehole with Groundwater Monitoring Well

Previous Lithos Investigations

- TP Trial Pit
- PH Rotary Probehole
- BH Cable Percussion Borehole with Rotary Core Follow-on

Notes

1. This drawing should not be viewed in isolation from the accompanying report.
2. Lithos exploratory hole locations are approximate; see exploratory hole logs for co-ordinates.
3. Base topographical survey plan is Professional Surveying Drawing No. 50067_PSL_001_1, dated May 2020. Some site clearance has been undertaken since date of survey.

REVISION		BY	DATE
0	For Information	MF	05/12/23
A	Selected Lithos Borehole and Trial Pits Added	AMG	08/12/23
B	June 2024 Boreholes and Trial Pits Added	AMG	01/07/24
C	>>	>>	>>
D	>>	>>	>>

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CLIENT

Strata Homes

SITE

Land off Westgate, Cleckheaton

DRAWING TITLE

Exploratory Hole Location Plan

DRAWING NO.	REVISION NO.
C9907/02	B
DRAWN BY: MF	APPROVED BY: AMG
DATE: December 2023	SCALE: 1:500
PAPER SIZE: A3	

APPENDIX B

BOREHOLE AND TRIAL PIT LOGS

BOREHOLE RECORD

BH No. **BH601**
Sheet 1 of 1

Site: Land off Westgate, Cleckheaton
Contract No: C9907A

Client: Strata Homes
Date(s): 29/11/2023

Method: Cable percussion drilling rig utilising 150mm casing and tools
Scale: 1:50

Logged By: J.C
Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	SPT (N), {ppm}, (Cu Peak), Vane Result (kN/m2)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Dark brown slightly clayey sandy gravelly TOPSOIL. Gravel is angular to subangular fine to coarse of brick, sandstone and clinker with occasional fragments of wood and rare rootlets.	0.10	92.23		
B	0.30 - 1.00			MADE GROUND: Very loose black sandy clayey angular to subangular fine to coarse GRAVEL of ash, brick, clinker and occasional slag.				
D	1.00 - 1.45	N=4 (1,1/1,1,1,1)	1					
D	2.00 - 2.45	N=4 (1,2/1,1,1,1)	2					
B	2.10 - 3.00			MADE GROUND: Soft to firm orangish brown locally dark brown slightly sandy gravelly CLAY. Intermediate plasticity (laboratory description). Gravel is angular to subangular fine to coarse of sandstone, mudstone and rare brick.	2.10	90.23		
		N=0 (0,0/0,0,0,0)	3					
D	4.00 - 4.45	N=5 (0,0/1,1,1,2)	4					
B	4.50 - 5.00			MADE GROUND: Loose yellowish brown clayey sandy angular to subangular fine to coarse GRAVEL of sandstone and mudstone.	4.50	87.83		
D	5.00 - 5.45	N=6 (2,2/1,1,1,3)	5					
D	6.00		6					
		50 (25 for 10mm/50 for 5mm)	7	Medium strong yellowish brown SANDSTONE. Recovered as sandy angular to subangular fine to coarse gravel.	6.50 6.65	85.83 85.68		
				End of Borehole at 6.65m				
			8					
			9					
			10					

Remarks and Groundwater Observations:

1. Cable percussive borehole utilising 150mm casing to 6.50m bgl. 2. Borehole complete at 6.65m bgl. 3. Chiselling of hard strata at 6.50m bgl, with no progress after 30 minutes. 4. Groundwater encountered at 3.00m and rose to 2.00m bgl, after 20 minutes of monitoring. 5. Installed with groundwater monitoring well, as detailed above.

GL (mAOD) 92.33
Easting: 418511.35
Northing: 425002.19

Fig No.
BH601

BOREHOLE RECORD

BH No. **BH602** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton | Contract No: C9907A

Client: Strata Homes | Date(s): 30/11/2023

Method: Cable percussion drilling rig utilising 150mm casing and tools | Scale: 1:50

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, (Cu Peak), Vane Result (kN/m2)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Black ASPHALT.	0.10	95.30		
B	0.20 - 1.00			MADE GROUND: Loose to very loose black slightly clayey sandy angular to subangular fine to coarse GRAVEL of brick, ash, clinker and rare slag.				
D	1.00 - 1.45	N=6 (1,1/2,2,1,1)	1					
D	2.00 - 2.45	N=4 (1,1/1,1,1,1)	2					
D	3.00 - 3.45	N=4 (1,1/1,1,1,1)	3	*From 3.00m bgl: Becoming clayey.*				
		N=3 (1,0/1,0,1,1)	4					
		N=0 (0,0/0,0,0,0)	5	*From 5.00 to 6.00m bgl: Tools penetrated in one drop, with no recovery: potential void.*				
D	6.00		6					
D	6.50 - 6.95	N=13 (6,5/4,3,3,3)						
			7	MADE GROUND: Soft to firm dark greyish brown slightly gravelly sandy CLAY. Low plasticity (field description). Gravel is subangular to subrounded fine to coarse of mudstone, sandstone, quartz and rare coal with faint humic odour and rare rootlets.	6.90	88.50		
B	7.00 - 8.00							
D	8.00 - 8.45	N=6 (1,2/3,1,1,1)	8					
D	9.00		9					
D	9.50 - 9.72	50 (1,2/50 for 85mm)		Very weak to medium strong yellowish brown SANDSTONE. Recovered as sandy angular to subangular fine to coarse gravel.	9.50	85.90		
D	9.90	50 (25 for 5mm/50 for 0mm)	10	End of Borehole at 9.90m	9.90	85.50		

Remarks and Groundwater Observations:

1. Cable percussive borehole utilising 150mm casing to 9.90m bgl. 2. Borehole complete at 9.90m bgl. 3. Chiselling of hard strata from 9.70 to 9.90m bgl (30 minutes). 4. Groundwater encountered at 4.50m with no rise after 20 minutes of monitoring. 5. Installed with groundwater monitoring well, as detailed above.

GL (mAOD) 95.40

Easting: 418461.40

Northing: 424979.22

Fig No. BH602

BOREHOLE RECORD

BH No. **BH701** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton | Contract No: C9907A

Client: Strata Homes | Date(s): 25/06/2024

Method: Cable percussion drilling rig utilising 150mm casing and tools | Scale: 1:50

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, (Cu Peak), Vane Result (kN/m2)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
B	0.00 - 0.30			MADE GROUND: Dark brown slightly clayey gravelly fine to coarse SAND with low cobble content. Gravel is angular to subangular fine to coarse of sandstone, mudstone and brick. With occasional rootlets and wood fragments.	0.30	92.03		
B	0.30 - 1.00							
D	1.00 - 1.45	N=9 (2,2/2,2,2,3)	1	MADE GROUND: Loose black locally dark brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of ash, clinker, brick and sandstone.	1.40	90.93		
B	1.50 - 2.00			MADE GROUND: Firm orangish brown mottled light grey slightly sandy gravelly CLAY. Low plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.				
D	2.00 - 2.45	N=4 (1,1/1,1,1,1)	2					
D	3.00	N=4 (1,1/1,1,1,1)	3	MADE GROUND: Very loose to loose yellowish brown locally greyish brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of sandstone.	2.50	89.83		
				From 3.50m bgl: With low cobble content. Cobbles are subangular of sandstone.				
D	4.00 - 4.45	N=4 (1,1/1,1,1,1)	4					
D	5.00 - 5.45	N=13 (1,1/1,1,1,10)	5	*Becoming medium dense from c. 5m bgl.*				
B	5.00 - 6.00							
D	6.00 - 6.45	N=13 (2,3/4,2,5,2)	6					
		50 (25 for 5mm/50 for 10mm)	7	Moderately weak greyish brown SANDSTONE. Recovered as angular to subangular fine to coarse gravel.	6.60 6.66	85.73 85.67		
				End of Borehole at 6.66m				
			8					
			9					
			10					

Remarks and Groundwater Observations:

1. Cable percussive borehole utilising 150mm casing to 6.60m bgl. 2. Borehole complete at 6.66m bgl. 3. Chiselling of hard strata at 6.66m bgl, with no progress after 30 minutes. 4. Groundwater encountered at 3.00m and rose to 2.50m bgl, after 20 minutes of monitoring. 5. Backfilled with arisings upon completion.

GL (mAOD) 92.33

Easting: 418543.89

Northing: 425003.96

Fig No. BH701

BOREHOLE RECORD

BH No. **BH702** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton | Contract No: C9907A

Client: Strata Homes | Date(s): 26/06/2024

Method: Cable percussion drilling rig utilising 150mm casing and tools | Scale: 1:50

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, (Cu Peak), Vane Result (kN/m2)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
B	0.00 - 1.00			MADE GROUND: Loose dark brown very gravelly fine to coarse SAND with medium cobble content. Gravel is angular to subangular fine to coarse of sandstone, brick, concrete and mudstone. Cobbles are angular of brick and sandstone. With rare wood fragments.				
D	1.00 - 1.45	N=5 (2,2/2,1,1,1)	1					
D	2.00	N=6 (1,2/1,2,1,2)	2					
D	3.00 - 3.45	N=7 (2,2/1,2,2,2)	3	MADE GROUND: Firm orangish brown mottled light grey slightly sandy gravelly CLAY with low cobble content. Low plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone and mudstone. Cobbles are angular to subrounded of sandstone.	3.00	89.48		
D	4.00 - 4.45	N=8 (2,2/2,2,2,2)	4					
B	4.00 - 5.00							
D	5.00 - 5.45	N=17 (2,2/3,5,5,4)	5					
D	6.00	N=19 (1,2/2,2,9,6)	6	MADE GROUND: Medium dense yellowish brown slightly clayey sandy GRAVEL with low cobble content. Gravel is angular to subangular fine to coarse of sandstone. Cobbles are subangular of sandstone.	6.00	86.48		
D	7.00	50 (25 for 40mm/50 for 0mm)	7	Medium strong yellowish brown SANDSTONE. Recovered as angular to subangular fine to coarse gravel.	7.00 7.04	85.48 85.44		
				End of Borehole at 7.04m				
			8					
			9					
			10					

Remarks and Groundwater Observations:

1. Cable percussive borehole utilising 150mm casing to 7.00m bgl. 2. Borehole complete at 7.04m bgl. 3. Chiselling of hard strata at 7.04m bgl, with no progress after 30 minutes. 4. Groundwater encountered at 3.00m with no rise, after 20 minutes of monitoring. 5. Backfilled with arisings upon completion.

GL (mAOD) 92.48

Easting: 418482.05

Northing: 424997.90

Fig No. BH702

TRIAL PIT RECORD

TP No. **TP601** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 28/11/2023

Method: JCB 3CX with 600mm toothed bucket

Scale: 1:25

Logged By: J.C | Checked By: AMG

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark brown slightly clayey sandy gravelly TOPSOIL. Gravel is angular to subangular fine to coarse of brick, concrete and sandstone with occasional rootlets.	0.10	95.81		
B	0.50 - 1.00			MADE GROUND: Black slightly clayey sandy GRAVEL with low cobble content. Gravel is angular to subangular fine to coarse of ash, clinker, brick and sandstone with rare fragments of glass, ceramic and metal. Cobbles are angular of brick and sandstone. *At 0.40m bgl: 3 No. Fibre glass sheets c. 20cm in length.*				
B	1.00 - 1.50		1					
				MADE GROUND: Firm light brown slightly sandy gravelly friable CLAY. Low plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone.	1.40	94.51		
			2					
			3					
			4	End of trial pit at 4.00m	4.00	91.91		
			5					

Remarks and Groundwater Observations

1. Trial pit complete at 4.00m bgl due to reach of machine. 2. Trial pit remained dry and stable. 3. Backfilled with arisings upon completion. 4. GPS accuracy may be compromised due to close proximity to trees.

GL (m AOD) 95.91

Easting: 418523.53

Northing: 425072.42

Fig No. TP601

TRIAL PIT RECORD

TP No. **TP602** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 28/11/2023

Method: JCB 3CX with 600mm toothed bucket

Scale: 1:25

Logged By: J.C | Checked By: AMG

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
B	0.20 - 0.50			MADE GROUND: Dark brown to black locally yellowish brown slightly clayey sandy GRAVEL with low cobble content. Gravel is angular to subangular fine to coarse of brick, ash, clinker, concrete and sandstone. Cobbles are angular of sandstone and brick.	0.90	93.22		
B	1.00 - 1.50		1	Firm orangish brown mottled bluish grey slightly sandy gravelly friable CLAY. Low plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	1.60	92.52		
			2	Weak yellowish brown SANDSTONE. Recovered as slightly clayey sandy angular to subangular fine to coarse gravel.	2.20	91.92		
				End of trial pit at 2.20m				
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Trial pit refusal at 2.20m bgl on sandstone. 2. Trial pit remained dry and stable throughout excavation. 3. Backfilled with arisings upon completion. 4. GPS accuracy may be compromised due to close proximity to trees.

GL (m AOD) 94.12

Easting: 418533.90

Northing: 425034.02

Fig No. TP602

TRIAL PIT RECORD

TP No. **TP603** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 28/11/2023

Method: JCB 3CX with 600mm toothed bucket

Scale: 1:25

Logged By: J.C | Checked By: AMG

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark brown to black slightly clayey sandy gravelly TOPSOIL. Gravel is angular to subangular fine to coarse of brick, concrete, sandstone and rare fragments of glass, wood and occasional rootlets.	0.10	92.46		
B	0.40 - 0.90			MADE GROUND: Black sandy GRAVEL with low cobble content. Gravel is angular to subangular fine to coarse of ash, clinker, brick and occasional slag. Cobbles are angular of brick.				
			1					
				MADE GROUND: Firm to stiff medium strength orangish brown with occasional bluish grey mottling slightly sandy slightly gravelly CLAY. Low plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	1.70	90.86		
B	2.00 - 2.50	44.0 48.0 54.0	2					
				MADE GROUND: Yellowish brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of sandstone.	2.90	89.66		
			3		3.00	89.56		
				End of trial pit at 3.00m				
			4					
			5					

Remarks and Groundwater Observations

1. Trial pit terminated at 3.00m bgl due to sidewall collapse. 2. Groundwater encountered at 2.80m bgl. 3. Sidewalls noted to be loose from 1.50m bgl. 4. Backfilled with arisings upon completion.

GL (m AOD) 92.56

Easting: 418540.74

Northing: 425011.07

Fig No. TP603

TRIAL PIT RECORD

TP No. **TP604** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 28/11/2023

Method: JCB 3CX with 600mm toothed bucket

Scale: 1:25

Logged By: J.C | Checked By: AMG

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
B	0.30 - 0.80			MADE GROUND: Dark brown slightly clayey sandy gravelly TOPSOIL. Gravel is angular to subangular fine to coarse of brick, clinker and sandstone with rare fragments of wood and many rootlets.	0.10	92.17		
				MADE GROUND: Black locally reddish brown slightly clayey sandy GRAVEL with low cobble content. Gravel is angular to subangular fine to coarse of sandstone, brick, ash, slag and clinker. Cobbles are angular of sandstone and brick.				
		70.0 76.0 82.0		MADE GROUND: Stiff medium to high strength orangish brown mottled bluish grey slightly sandy gravelly CLAY. Low plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	2.80 3.10	89.47 89.17		
				MADE GROUND: Yellowish brown sandy angular to subangular fine to coarse GRAVEL of sandstone.	3.20	89.07		
				End of trial pit at 3.20m				

1 2 3 4 5

Remarks and Groundwater Observations

1. Trial pit terminated at 3.20m bgl due to rapid ingress of water, leading to sidewall collapse. 2. Groundwater encountered at 2.50m bgl. 3. Sidewalls noted to be loose from 2.60m bgl. 4. Backfilled with arisings upon completion.

GL (m AOD) 92.27

Easting: 418506.02

Northing: 424993.42

Fig No. TP604

TRIAL PIT RECORD

TP No. **TP605** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 28/11/2023

Method: JCB 3CX with 600mm toothed bucket

Scale: 1:25

Logged By: J.C | Checked By: AMG

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark brown slightly clayey sandy gravelly TOPSOIL. Gravel is angular to subangular fine to coarse of brick, concrete, clinker and sandstone with occasional rootlets.	0.20	91.97		
B	0.50 - 1.00			MADE GROUND: Black locally reddish brown slightly clayey sandy GRAVEL with low cobble and boulder content. Gravel is angular to subangular fine to coarse of sandstone, brick, ash, slag, concrete and clinker. Cobbles are angular of sandstone, concrete and brick. Boulders are angular of sandstone and concrete up to 30cm in diameter with rare fragments of wood.				
			1					
				MADE GROUND: Firm to stiff orangish brown with occasional bluish grey mottling slightly sandy gravelly friable CLAY. Low plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	1.60	90.57		
B	1.80 - 2.30							
			2					
				MADE GROUND: Yellowish brown angular to subrounded fine to coarse GRAVEL of sandstone.	2.40	89.77		
				End of trial pit at 2.60m	2.60	89.57		
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Trial pit terminated at 2.60m bgl due to rapid ingress of water, leading to sidewall collapse. 2. Groundwater encountered at 2.40m bgl. 3. Sidewalls noted to be loose from 2.00m bgl. 4. Backfilled with arisings upon completion.

GL (m AOD) 92.17

Easting: 418528.38

Northing: 424999.75

Fig No. TP605

TRIAL PIT RECORD

TP No. **TP606** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 28/11/2023

Method: JCB 3CX with 600mm toothed bucket

Scale: 1:25

Logged By: J.C | Checked By: AMG

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
B	0.20 - 0.70			MADE GROUND: Dark brown slightly clayey sandy gravelly TOPSOIL. Gravel is angular to subangular fine to coarse of brick and sandstone with occasional rootlets.	0.10	95.26		
				MADE GROUND: Dark grey to black gravelly fine to coarse SAND with medium cobble and low boulder content with occasional fragments of wood and ceramic with rare fragments of glass and fabric. Gravel is angular to subangular fine to coarse of brick, concrete, sandstone and occasional ash. Cobbles are angular of brick and concrete. Boulders are angular of sandstone up to 35cm in diameter.				
			1					
				MADE GROUND: Dark grey sandy angular to subangular fine to coarse GRAVEL of mudstone and siltstone.	1.40	93.96		
B	1.80 - 2.10							
			2	*From 2.00m bgl: With low cobble content. Cobbles are angular of siltstone.*				
			3					
			4	End of trial pit at 4.00m	4.00	91.36		
			5					

Remarks and Groundwater Observations

1. Trial pit complete at 4.00m bgl due to reach of machine. 2. Trial pit remained dry and stable. 3. Backfilled with arisings upon completion. 4. GPS accuracy may be compromised due to close proximity to trees.

GL (m AOD) 95.36

Easting: 418530.47

Northing: 425052.12

Fig No. TP606

TRIAL PIT RECORD

TP No. **TP701** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton	Contract No: C9907A
Client: Strata Homes	Date: 25/06/2024
Method: 360 tracked excavator with a 600mm toothed bucket.	Scale: 1:25
	Logged By: J.C — Checked By: AMG

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Black ASPHALT.	0.10	95.32		
				MADE GROUND: Dark brown slightly clayey gravelly fine to coarse SAND with low cobble content. Gravel is angular to subangular fine to coarse of sandstone, brick and rare concrete. Cobbles are angular of brick and sandstone. With occasional fragments of wood, metal and ceramic.				
				MADE GROUND: Dark grey to black locally reddish brown slightly clayey very sandy GRAVEL with low cobble content. Gravel is angular to subangular fine to coarse of ash, sandstone, brick and occasional slag. Cobbles are angular of brick and sandstone.	1.50	93.92		
				From 1.80 to 1.90m bgl: Pocket of orangish brown angular to subangular fine to coarse GRAVEL of slag in eastern wall of trial pit.				
				At 3.00m bgl: 1 No. metal sheet.				
				End of trial pit at 4.60m	4.60	90.82		

1 2 3 4 5

Remarks and Groundwater Observations

1. Trial pit complete at 4.60m bgl due to instability of made ground. 2. Noted to be unstable from 3.50m bgl. 3. Moderate ingress of water at 4.00m bgl. 4. Backfilled with arisings upon completion.

GL (m AOD) 95.43
Easting: 418459.25
Northing: 424985.73

Fig No. TP701

TRIAL PIT RECORD

TP No. **TP702** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 25/06/2024

Method: 360 tracked excavator with a 600mm toothed bucket.

Scale: 1:25

Logged By: J.C

Checked By: AMG

SAMPLE DETAILS

STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Wood chippings.	0.10	93.66		
				MADE GROUND: Light brown silty gravelly fine to coarse SAND with low cobble content. Gravel is angular to subangular fine to coarse of sandstone, quartz and brick. Cobbles are angular of brick and sandstone. With occasional fragments of wood and plastic and rare fabric.				
				At 0.90m: 8 No. Plastic bags.				
			1					
				From 1.80m: With medium cobble content.				
			2					
			3	*From 3.00m: With rare pockets of Firm orangish brown gravelly CLAY.*				
				From 3.50m: With low boulder content. Boulders are angular of sandstone up to 40cm in diameter.				
			4					
			5	End of trial pit at 5.00m	5.00	88.76		

Remarks and Groundwater Observations

1. Trial pit complete at 5.00m due to reach of machine. 2. Noted to be loose from 3.00m bgl. 3. No groundwater encountered. 4. Backfilled with arisings upon completion.

GL (m AOD) 93.76

Easting: 418471.33

Northing: 424995.59

Fig No. TP702

TRIAL PIT RECORD

TP No. **TP703**
Sheet 1 of 1

Site: Land off Westgate, Cleckheaton	Contract No: C9907A
Client: Strata Homes	Date: 25/06/2024
Method: 360 tracked excavator with a 600mm toothed bucket.	Scale: 1:25
	Logged By: J.C — Checked By: AMG

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark brown to black slightly clayey gravelly fine to coarse SAND with medium cobble content. Gravel is angular to subangular fine to coarse of sandstone, brick and concrete. Cobbles are angular of brick and sandstone. With occasional fragments of wood, metal, fabric and plastic.				
				MADE GROUND: Firm orangish brown mottled light grey slightly sandy gravelly CLAY of medium plasticity (field assessment) with low cobble and low boulder content. Gravel is angular to subrounded fine to coarse of sandstone and mudstone. Cobbles are angular to subrounded of sandstone. Boulders are angular to subrounded of sandstone up to 40cm in diameter.	2.50	90.05		
				MADE GROUND: Yellowish brown sandy GRAVEL with medium cobble and low boulder content. Gravel is angular to subrounded fine to coarse of sandstone. Cobbles are angular of sandstone. Boulders are angular to subrounded of sandstone up to 30cm in diameter.	3.10	89.45		
				End of trial pit at 4.10m	4.10	88.45		

Ground-water: 3

Remarks and Groundwater Observations

1. Trial pit complete at 4.10m bgl due to instability of made ground. 2. Noted to be unstable from 3.00m bgl. 3. Rapid ingress of water at 3.00m bgl. 4. Backfilled with arisings upon completion.

GL (m AOD) 92.55
Easting: 418477.03
Northing: 424997.06

Fig No. TP703

TRIAL PIT RECORD

TP No. **TP704** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton	Contract No: C9907A
Client: Strata Homes	Date: 25/06/2024
Method: 360 tracked excavator with a 600mm toothed bucket.	Scale: 1:25
	Logged By: J.C — Checked By: AMG

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark brown to black slightly clayey very gravelly fine to coarse SAND with medium cobble content. Gravel is angular to subangular fine to coarse of sandstone, mudstone, brick and concrete. Cobbles are angular of brick and sandstone. With occasional fragments of wood, metal and plastic.				
				From 0.50 to 2.40m bgl: Intact brick wall in western wall of trial pit - later collapsed exposing staircase with a tyre at the base (relic cellar / basement).				
				MADE GROUND: Reddish brown sandy angular COBBLES of brick.	0.80	91.73		
		78.0 86.0 88.0		MADE GROUND: Stiff high strength orangish brown mottled bluish grey slightly sandy gravelly CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone.	2.40	90.13		
				End of trial pit at 4.00m	4.00	88.53		

1 2 3 4 5

Remarks and Groundwater Observations

1. Trial pit complete at 4.00m bgl due to instability of made ground. 2. Noted to be unstable from 2.70m bgl. 3. Rapid ingress of water at 2.40m bgl. 4. Backfilled with arisings upon completion.

GL (m AOD) 92.53

Easting: 418486.92

Northing: 424999.44

Fig No. TP704

TRIAL PIT RECORD

TP No. **TP705** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton	Contract No: C9907A
Client: Strata Homes	Date: 25/06/2024
Method: 360 tracked excavator with a 600mm toothed bucket.	Scale: 1:25
	Logged By: J.C — Checked By: AMG

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark greyish brown sandy GRAVEL with medium cobble content. Gravel is angular to subangular fine to coarse of sandstone, brick and concrete. Cobbles are angular of brick and concrete. With occasional fragments of wood, metal, plastic, rare polystyrene and fabric and 5 No. redundant cables, 6 No. paint tins and 7 No. plastic bags.				
				MADE GROUND: Reddish brown locally greyish brown sandy COBBLES. Cobbles are angular of brick and concrete.	1.40	91.22		
		66.0 72.0 80.0		MADE GROUND: Firm to stiff medium to high strength orangish brown mottled light grey slightly sandy gravelly CLAY of medium plasticity (field assessment) with low cobble content. Gravel is angular to subrounded fine to coarse of sandstone and mudstone. Cobbles are angular to subrounded of sandstone.	2.90	89.72		
				End of trial pit at 4.30m	4.30	88.32		

Remarks and Groundwater Observations

1. Trial pit complete at 4.30m bgl due to instability of made ground. 2. Noted to be unstable from 2.50m bgl. 3. Rapid ingress of water at 2.90m bgl. 4. Backfilled with arisings upon completion

GL (m AOD) 92.62

Easting: 418491.76

Northing: 425001.41

Fig No. TP705

TRIAL PIT RECORD

TP No. **TP706** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 25/06/2024

Method: 360 tracked excavator with a 600mm toothed bucket.

Scale: 1:25

Logged By: J.C

Checked By: AMG

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark brown to black clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, brick and rare clinker. Wth occasional rootlets and rare fragments of wood and metal.	0.20	92.13		
				MADE GROUND: Black locally reddish brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, ash, brick and occasional slag. With rare fragments of metal.				
				MADE GROUND: Firm to stiff orangish brown mottled light grey slightly sandy gravelly CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	2.00	90.33		
				MADE GROUND: Yellowish brown sandy GRAVEL with low cobble content. Gravel is angular to subrounded fine to coarse of sandstone. Cobbles are angular of sandstone.	4.00	88.33		
				End of trial pit at 4.70m	4.70	87.63		

Remarks and Groundwater Observations

1. Trial pit complete at 4.70m bgl due to instability of made ground. 2. Noted to be unstable from 2.50m bgl. 3. Rapid ingress of water at 2.70m bgl. 4. Backfilled with arisings upon completion.

GL (m AOD) 92.33

Easting: 418504.80

Northing: 425000.80

Fig No. TP706

TRIAL PIT RECORD

TP No. **TP707** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton	Contract No: C9907A
Client: Strata Homes	Date: 25/06/2024
Method: 360 tracked excavator with a 600mm toothed bucket.	Scale: 1:25
	Logged By: J.C — Checked By: AMG

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark reddish brown clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, brick and slag. Wth occasional rootlets and rare fragments of wood, plastic and metal.				
				MADE GROUND: Soft dark grey slightly sandy gravelly friable CLAY of low plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone, mudstone, quartz and occasional brick.	1.60	90.36		
				MADE GROUND: Firm to stiff high strength orangish brown mottled light grey slightly sandy gravelly CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	2.10	89.86		
		78.0 88.0 90.0		*From 2.80m bgl: With low cobble content. Cobbles are angular to subangular of sandstone.*				
				End of trial pit at 4.50m	4.50	87.46		

Remarks and Groundwater Observations

1. Trial pit complete at 4.50m bgl due to instability of made ground. 2. Noted to be unstable from 2.30m bgl. 3. Rapid ingress of water at 2.10m bgl. 4. Backfilled with arisings upon completion.

GL (m AOD) 91.96

Easting: 418519.03

Northing: 424997.17

Fig No. TP707

TRIAL PIT RECORD

TP No. **TP708**
Sheet 1 of 1

Site: Land off Westgate, Cleckheaton	Contract No: C9907A
Client: Strata Homes	Date: 26/06/2024
Method: 360 tracked excavator with a 600mm toothed bucket.	Scale: 1:25
	Logged By: J.C — Checked By: AMG

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark brown clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, brick and concrete. Wth occasional rootlets and rare fragments of wood, metal and cloth.				
				MADE GROUND: Black locally light brown slightly clayey very sandy angular to subangular fine to coarse GRAVEL of sandstone, ash, brick and occasional slag. With rare fragments of metal and wood.	0.70	91.39		
				MADE GROUND: Firm orangish brown mottled light grey slightly sandy gravelly CLAY of medium plasticity (field assessment) with low cobble content. Gravel is angular to subrounded fine to coarse of sandstone and mudstone. Cobbles are angular to subrounded of sandstone.	2.10	89.99		
				MADE GROUND: Yellowish brown slightly clayey sandy GRAVEL with medium cobble and low boulder content. Gravel is angular to subrounded fine to coarse of sandstone. Cobbles are angular of sandstone. Boulders are angular to subrounded of sandstone up to 30cm in diameter.	3.00	89.09		
				End of trial pit at 4.50m	4.50	87.59		

1 2 3 4 5

Remarks and Groundwater Observations

1. Trial pit complete at 4.50m bgl due to instability of made ground. 2. Noted to be unstable from 2.50m bgl. 3. Rapid ingress of water at 2.20m bgl; water noted to have a slight sheen. 4. Backfilled with arisings upon completion.

GL (m AOD) 92.09
Easting: 418535.42
Northing: 425001.01

Fig No. TP708

TRIAL PIT RECORD

TP No. **TP709** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 26/06/2024

Method: 360 tracked excavator with a 600mm toothed bucket.

Scale: 1:25

Logged By: J.C Checked By: AMG

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Black locally reddish brown brown slightly clayey sandy GRAVEL with low cobble content. Gravel is angular to subangular fine to coarse of sandstone, ash, brick and concrete. Cobbles are angular of brick and concrete. With rare fragments of wood.				
				MADE GROUND: Firm medium strength orangish brown locally dark brown mottled light grey slightly sandy gravelly CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	0.90	93.46		
		58.0 66.0 70.0		*From 2.00m bgl: With low cobble content. Cobbles are angular of sandstone.*				
				End of trial pit at 5.00m	5.00	89.36		

Remarks and Groundwater Observations

1. Trial pit complete at 5.00m due to reach of machine. 2. Remained stable throughout excavation. 3. Groundwater seepage at 5.00m bgl. 4. Backfilled with arisings upon completion.

GL (m AOD) 94.36

Easting: 418533.30

Northing: 425040.73

Fig No. TP709

TRIAL PIT RECORD

TP No. **TP709A** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton	Contract No: C9907A
Client: Strata Homes	Date: 26/06/2024
Method: 360 tracked excavator with a 600mm toothed bucket.	Scale: 1:25
	Logged By: / Checked By: AMG

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark brown to black clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, brick and concrete. With occasional rootlets and rare fragments of wood, plastic and metal.				
				End of trial pit at 0.60m	0.60	93.67		

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2
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Remarks and Groundwater Observations

1. Trial pit terminated at 0.60m bgl due to encountering disconnected small diameter yellow plastic gas pipe.
2. Remained dry and stable. 3. Backfilled with arisings upon completion.

GL (m AOD) 94.27
Easting: 418533.46
Northing: 425038.37

Fig No. TP709A

TRIAL PIT RECORD

TP No. **TP710** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton	Contract No: C9907A
Client: Strata Homes	Date: 26/06/2024
Method: 360 tracked excavator with a 600mm toothed bucket.	Scale: 1:25
	Logged By: J.C — Checked By: AMG

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark brown slightly clayey gravelly fine to coarse SAND with medium cobble content. Gravel is angular to subangular fine to coarse of sandstone, mudstone, brick and concrete. Cobbles are angular of brick and sandstone. With occasional fragments of wood, metal, fabric and plastic and many roots and rootlets.				
				MADE GROUND: Firm orangish brown mottled light grey slightly sandy gravelly friable CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	1.20	94.47		
				From 2.50m bgl: With low cobble content. Cobbles are angular to subangular of sandstone.				
				MADE GROUND: Dark grey sandy clayey angular to subrounded fine to coarse GRAVEL of mudstone, sandstone and rare brick.	3.30	92.37		
				End of trial pit at 5.00m	5.00	90.67		

Remarks and Groundwater Observations

1. Trial pit complete at 5.00m due to reach of machine. 2. Remained stable throughout excavation. 3. Groundwater seepage at 5.00m bgl. 4. Backfilled with arisings upon completion.

GL (m AOD) 95.67
Easting: 418527.74
Northing: 425058.25

Fig No. TP710

TRIAL PIT RECORD

TP No. **TP711** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 26/06/2024

Method: 360 tracked excavator with a 600mm toothed bucket.

Scale: 1:25

Logged By: J.C

Checked By: AMG

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) {}{ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark brown to black clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, brick and concrete. With occasional rootlets and rare fragments of wood and metal.	0.20	92.62		
				MADE GROUND: Black slightly clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, ash, brick and occasional slag. With rare fragments of plastic and metal and 1 No. rope.	0.70	92.12		
			1	MADE GROUND: Reddish brown sandy angular to subangular fine to coarse GRAVEL of brick, sandstone and rare slag.	1.10	91.72		
				MADE GROUND: Dark grey slightly clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, mudstone and brick.	1.40	91.42		
		64.0 72.0 78.0	2	MADE GROUND: Firm to stiff medium to high strength strength orangish brown mottled light grey slightly sandy gravelly CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.				
			3	MADE GROUND: Yellowish brown sandy clayey GRAVEL with low cobble content. Gravel is angular to subrounded fine to coarse of sandstone. Cobbles are angular to subangular of sandstone.	3.00	89.82		
			4	End of trial pit at 4.80m	4.80	88.02		
			5					

Remarks and Groundwater Observations

1. Trial pit complete at 4.80m bgl due to instability of made ground. 2. Noted to be unstable from 3.00m bgl. 3. Rapid ingress of water at 3.00m bgl. 4. Backfilled with arisings upon completion.

GL (m AOD) 92.82

Easting: 418540.49

Northing: 425015.17

Fig No. TP711

WINDOW SAMPLING RECORD

BH No. **WS601** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 01/12/2023

Method: Tracked window sampling rig.

Scale: 1:25

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Dark brown slightly clayey sandy gravelly TOPSOIL. Gravel is angular to subangular fine to coarse of sandstone and brick with occasional rootlets.	0.10	95.41		
				MADE GROUND: Firm dark brown locally orangish brown slightly sandy gravelly friable CLAY of medium plasticity (field assessment). Gravel is angular to subangular fine to coarse of sandstone, brick and coal with occasional rootlets.				
		N=18 (3,3/3,7,5,3)	1	MADE GROUND: Medium dense black slightly clayey sandy angular to subangular fine to coarse GRAVEL of ash, clinker, brick, sandstone and rare slag.	0.95	94.56		
		N=1 (1,1/0,0,1,0)	2	*From 2.00m bgl: Very loose.*				
				From 2.50 to 2.60m bgl: Pocket of orangish brown sandy angular to subangular fine to coarse gravel of slag and brick.				
		N=3 (1,0/1,0,1,1)	3					
				From 3.60m bgl: Becoming clayey.				
		N=3 (1,0/0,1,1,1)	4					
		N=3 (1,1/0,1,1,1)	5	End of Borehole at 5.00m	5.00	90.51		

Remarks and Groundwater Observations:

1. Borehole complete at 5.00m bgl. 2. Liner noted to be wet from 4.00m bgl. 3. Backfilled with arisings upon completion.

GL (m AOD) 95.51m AOD

Easting: 418460.68

Northing: 424986.98

Fig No. WS601

WINDOW SAMPLING RECORD

BH No. **WS602**
Sheet 1 of 1

Site: Land off Westgate, Cleckheaton
Contract No: C9907A
Client: Strata Homes
Date: 01/12/2023
Method: Tracked window sampling rig.
Scale: 1:25
Logged By: J.C
Checked By: AMG
Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
		50 (25 for 20mm/50 for 20mm)		MADE GROUND: Dark brown to black gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of brick and clinker.				
				End of Borehole at 0.50m	0.50	94.84		

1
2
3
4
5

Remarks and Groundwater Observations:

1. Borehole refusal on obstruction at 0.50m bgl. 2. Backfilled with arisings upon completion. 3. GPS accuracy may be compromised due to close proximity to structures.

GL (m AOD)
95.34m AOD
Easting:
418465.27
Northing:
424966.70

Fig No.
WS602

WINDOW SAMPLING RECORD

BH No. **WS602A** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 01/12/2023

Method: Tracked window sampling rig.

Scale: 1:25

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Loose to very loose dark brown to black gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, brick and clinker.				
				MADE GROUND: Very loose to loose black slightly clayey sandy angular to subangular fine to coarse GRAVEL of ash, clinker, brick, sandstone and occasional slag.	0.80	94.47		
		N=6 (2,1/1,2,2,1)	1					
				From 1.50 to 1.70m bgl: Pocket of firm orangish brown slightly sandy gravelly clay.				
		N=3 (1,1/0,0,1,2)	2					
		N=9 (5,3/2,2,2,3)	3	*From 3.00m bgl: Becoming clayey.*				
		N=12 (2,1/3,3,3,3)	4	End of Borehole at 4.00m	4.00	91.27		
			5					

Remarks and Groundwater Observations:

1. Borehole complete at 4.00m bgl due to collapse. 2. Liner noted to be wet from 3.00m bgl. 3. Backfilled with arisings upon completion.

GL (m AOD) 95.27m AOD

Easting: 418463.99

Northing: 424971.48

Fig No. WS602A

WINDOW SAMPLING RECORD

BH No. **WS603** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton | Contract No: C9907A

Client: Strata Homes | Date: 01/12/2023

Method: Tracked window sampling rig. | Scale: 1:25

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Dark brown slightly clayey sandy gravelly TOPSOIL. Gravel is angular to subangular fine to coarse of sandstone and brick with a occasional rootlets.	0.10	95.87		
				MADE GROUND: Dark grey to black sandy clayey angular to subangular fine to coarse GRAVEL of brick, ash, clinker, concrete and sandstone.				
		34 (25 for 40mm/34 for 225mm)	1					
				MADE GROUND: Firm dark brown locally orangish brown slightly sandy gravelly friable CLAY of low plasticity (field assessment). Gravel is angular to subangular fine to coarse of mudstone, sandstone, brick and rare coal.	1.20	94.77		
				At 1.80m bgl: 1 No. sandstone cobble.				
		N=8 (3,2/2,2,2,2)	2					
				MADE GROUND: Loose black sandy angular to subangular fine to coarse GRAVEL of ash, clinker, sandstone and rare slag.	2.50	93.47		
		N=9 (3,3/3,3,2,1)	3					
				MADE GROUND: Reddish brown sandy angular to subangular fine to coarse GRAVEL of brick and slag.	3.70	92.27		
		N=7 (2,1/2,2,1,2)	4	MADE GROUND: Firm orangish brown slightly sandy gravelly friable CLAY of low plasticity (field assessment). Gravel is angular to subangular fine to coarse of sandstone and mudstone.	4.00	91.97		
				MADE GROUND: Loose yellowish brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of sandstone.	4.90	91.07		
		N=6 (1,1/2,1,1,2)	5	End of Borehole at 5.00m	5.00	90.97		

Remarks and Groundwater Observations:

1. Borehole complete at 5.00m bgl. 2. Noted to be damp from 4.00m bgl. 3. Installed with groundwater monitoring well, as detailed above.

GL (m AOD) 95.97m AOD

Easting: 418523.32

Northing: 425062.02

Fig No. WS603

WINDOW SAMPLING RECORD

BH No. **WS604** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 01/12/2023

Method: Tracked window sampling rig.

Scale: 1:25

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Dark brown slightly clayey sandy gravelly TOPSOIL. Gravel is angular to subangular fine to coarse of brick, concrete and sandstone with rare rootlets.	0.10	91.90		
				MADE GROUND: Black slightly clayey sandy angular to subangular fine to coarse GRAVEL of ash, clinker, concrete, sandstone and siltstone.				
		N=8 (2,2/2,2,2,2)	1	MADE GROUND: Firm orangish brown slightly sandy gravelly friable CLAY of low plasticity (field assessment). Gravel is angular to subangular fine to coarse of sandstone.	1.00	91.00		
		N=30 (9,3/8,6,9,7)	2	MADE GROUND: Medium dense to dense yellowish brown sandy angular to subangular fine to coarse GRAVEL of sandstone. *At 2.00m bgl: Water noted to have sheen.*	1.90	90.10		
		18.0 24.0 30.0 N=12 (2,3/3,3,3,3)	3	MADE GROUND: Soft to firm very low to low strength slightly sandy gravelly CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone. *From 3.00 to 3.60m bgl: No recovery.*	2.50	89.50		
		N=11 (2,3/3,3,2,3)	4	End of Borehole at 4.00m	4.00	88.00		
			5					

Remarks and Groundwater Observations:

1. Borehole complete at 4.00m bgl due to collapse. 2. Liner noted to be wet from 2.00m bgl. 3. Installed with groundwater monitoring well, as detailed above.

GL (m AOD) 92.00m AOD

Easting: 418498.72

Northing: 425001.12

Fig No. WS604

WINDOW SAMPLING RECORD

BH No. **WS605** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 01/12/2023

Method: Tracked window sampling rig.

Scale: 1:25

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Dark brown slightly clayey sandy gravelly TOPSOIL. Gravel is angular to subangular fine to coarse of sandstone and brick with occasional fragments of wood.	0.10	91.73		
		N=6 (1,1/2,2,1,1)	1	MADE GROUND: Loose black sandy angular to subangular fine very angular coarse GRAVEL of ash, brick and sandstone with rare fragments of wood and glass.				
		50 (3,3/50 for 285mm)	2	MADE GROUND: Firm dark brown slightly sandy gravelly friable CLAY of low plasticity (field assessment). Gravel is angular to subangular fine to coarse of sandstone, mudstone and brick.	1.90	89.93		
				End of Borehole at 2.20m	2.20	89.63		
			3					
			4					
			5					

Remarks and Groundwater Observations:

1. Window sample refusal at 2.20m bgl. 2. No groundwater encountered. 3. Backfilled with arisings upon completion.

GL (m AOD) 91.83m AOD

Easting: 418515.45

Northing: 424994.21

Fig No. WS605

WINDOW SAMPLING RECORD

BH No. **WS606** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 01/12/2023

Method: Tracked window sampling rig.

Scale: 1:25

Logged By: J.C Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD			
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend / Well
				MADE GROUND: Dark brown slightly clayey sandy gravelly TOPSOIL. Gravel is angular to subangular fine to coarse of sandstone, brick and concrete with rare fragments of wood and rootlets.	0.10	91.97	
		N=13 (2,2/3,3,3,4)	1	MADE GROUND: Firm dark brown locally orangish brown slightly sandy gravelly friable CLAY of low plasticity (field assessment). Gravel is angular to subangular fine to coarse of sandstone, mudstone, brick and rare coal.			
				MADE GROUND: Firm orangish brown mottled bluish grey slightly sandy gravelly CLAY of low plasticity (field assessment). Gravel is angular to subangular fine to coarse of sandstone and mudstone.	1.50	90.57	
		N=8 (2,1/2,2,2,2)	2 ▼				
		N=6 (1,1/1,2,1,2)	3				
				MADE GROUND: Loose dark grey sandy clayey angular to subangular fine to coarse GRAVEL of mudstone and sandstone.	3.60	88.47	
		N=5 (2,1/1,1,2,1)	4				
		N=5 (2,2/1,2,1,1)	5	End of Borehole at 5.00m	5.00	87.07	

Remarks and Groundwater Observations:

1. Borehole complete at 5.00m bgl. 2. Liner noted to be wet from 2.00m bgl. 3. Installed with groundwater monitoring well, as detailed above.

GL (m AOD) 92.07m AOD

Easting: 418540.73

Northing: 425004.22

Fig No. WS606

WINDOW SAMPLING RECORD

BH No. **WS607** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 01/12/2023

Method: Tracked window sampling rig.

Scale: 1:25

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Dark brown. slightly clayey sandy gravelly TOPSOIL. Gravel is angular to subangular fine to coarse of brick, sandstone and clinker with occasional rootlets.	0.10	93.20		
				MADE GROUND: Black slightly clayey sandy angular to subangular fine to coarse GRAVEL of ash, sandstone and brick.				
				MADE GROUND: Firm light brown mottled bluish grey slightly sandy gravelly friable CLAY of low plasticity (field assessment). Gravel is subangular to subangular fine to coarse of sandstone, mudstone and rare coal.	0.80	92.50		
		N=17 (2,2/3,4,4,6)	1					
		N=11 (2,3/3,3,2,3)	2	MADE GROUND: Firm, medium strength, orangish brown mottled bluish grey slightly sandy gravelly CLAY of low plasticity (field assessment). Gravel is angular to subangular fine to coarse of sandstone and mudstone.	2.00	91.30		
		36.0 40.0 44.0						
		N=8 (2,2/2,2,2,2)	3					
		50 (3,2/50 for 245mm)	4	End of Borehole at 4.00m	4.00	89.30		
			5					

Remarks and Groundwater Observations:

1. Borehole refusal at 4.00m bgl. 2. Liner noted to be damp from 3.00m bgl. 3. Installed with groundwater monitoring well, as detailed above. 4. GPS accuracy may be compromised due to close proximity to trees.

GL (m AOD) 93.30m AOD

Easting: 418537.82

Northing: 425022.63

Fig No. WS607

WINDOW SAMPLING RECORD

BH No. **WS701** Sheet 1 of 2

Site: Land off Westgate, Cleckheaton | Contract No: C9907A

Client: Strata Homes | Date: 27/06/2024

Method: Tracked window sampling rig. | Scale: 1:25

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Dark brown slightly clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, mudstone and brick. With occasional rootlets.				
				MADE GROUND: Black slightly clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, ash, brick and rare slag. With rare fragments of glass and wood.	0.30	95.75		
				From 0.30 to 0.37m bgl: 1 No. angular sandstone cobble.				
		N=5 (2,2/1,1,2,1)	1					
				MADE GROUND: Firm medium strength orangish brown mottled light grey slightly sandy gravelly CLAY of low plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	1.20	94.85		
		48.0						
		N=9 (2,2/2,2,2,3)	2					
		52.0						
		N=11 (3,1/2,2,3,4)	3					
		58.0						
				MADE GROUND: Soft to firm dark grey slightly sandy gravelly friable CLAY of low plasticity (field assessment). Gravel is angular to subrounded fine to coarse of mudstone, sandstone and rare coal and brick.	3.70	92.35		
		N=8 (2,2/2,2,2,2)	4		4.00	92.05		
				MADE GROUND: Firm medium strength orangish brown mottled light grey locally dark grey slightly sandy gravelly CLAY of low plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone. With rare rootlets.				
		52.0						
			5	Continued next sheet				

Remarks and Groundwater Observations:

1. Borehole refusal at 7.50m bgl. 2. No groundwater encountered.3. Backfilled with arisings upon completion.

GL (m AOD) 96.05m AOD

Easting: 418526.39

Northing: 425074.62

Fig No. WS701

WINDOW SAMPLING RECORD

BH No. **WS701** Sheet 2 of 2

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 27/06/2024

Method: Tracked window sampling rig.

Scale: 1:25

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
		N=11 (2,2/2,3,3,3)		MADE GROUND: Firm medium strength orangish brown mottled light grey locally dark grey slightly sandy gravelly CLAY of low plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone. With rare rootlets.				
		44.0						
		N=11 (2,2/2,3,3,3)	6					
				MADE GROUND: Soft low strength light brown mottled light bluish grey slightly sandy slightly gravelly CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of mudstone, sandstone and rare brick.	6.50	89.55		
		28.0						
		N=12 (2,1/2,3,3,4)	7					
		50 (25 for 85mm/50 for 230mm)		Extremely weak greyish brown SANDSTONE. Recovered as angular to subangular fine to coarse gravel.	7.47	88.58		
				End of Borehole at 7.50m	7.50	88.55		
			8					
			9					
			10					

Remarks and Groundwater Observations:

1. Borehole refusal at 7.50m bgl. 2. No groundwater encountered.3. Backfilled with arisings upon completion.

GL (m AOD) 96.05m AOD

Easting: 418526.39

Northing: 425074.62

Fig No. WS701

WINDOW SAMPLING RECORD

BH No. **WS702**
Sheet 1 of 2

Site: Land off Westgate, Cleckheaton
Contract No: C9907A
Client: Strata Homes
Date: 27/06/2024
Method: Tracked window sampling rig.
Scale: 1:25
Logged By: J.C
Checked By: AMG
Driller: RP Drilling Ltd

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Dark brown clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, mudstone and brick. With occasional rootlets.				
				MADE GROUND: Black slightly clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, ash, brick and rare slag. With rare fragments of metal and wood.	0.40	95.14		
		N=9 (4,3/3,2,2,2)	1					
				MADE GROUND: Loose to medium dense lght grey sandy angular to subangular fine to coarse GRAVEL of mudstone and siltstone.	1.20	94.34		
		N=11 (2,2/2,3,3,3)	2					
		50.0		MADE GROUND: Firm medium strength orangish brown mottled light grey slightly sandy gravelly CLAY of low plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	2.50	93.04		
		N=4 (2,2/1,1,1,1)	3					
				MADE GROUND: Loose yellowish brown sandy clayey angular to subangular fine to coarse GRAVEL of sandstone.	3.30	92.24		
		N=8 (1,2/2,2,2,2)	4					
				MADE GROUND: Soft to firm dark greyish brown slightly sandy gravelly friable CLAY of low plasticity (field assessment). Gravel is angular to subrounded fine to coarse of mudstone, sandstone, brick and rare coal.	4.60	90.94		
			5					

Continued next sheet

Remarks and Groundwater Observations:

1. Borehole terminated at 7.00m bgl due to hole collapsing in. 2. Groundwater from 6.00m bgl. 3. Backfilled with arisings upon completion.

GL (m AOD) 95.54m AOD
Easting: 418532.05
Northing: 425054.64

Fig No. WS702

WINDOW SAMPLING RECORD

BH No. **WS702** Sheet 2 of 2

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 27/06/2024

Method: Tracked window sampling rig.

Scale: 1:25

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
		N=8 (2,2/2,2,2,2)		MADE GROUND: Soft to firm dark greyish brown slightly sandy gravelly friable CLAY of low plasticity (field assessment). Gravel is angular to subrounded fine to coarse of mudstone, sandstone, brick and rare coal.				
				MADE GROUND: Soft low strength light brown mottled light bluish grey slightly sandy slightly gravelly CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of mudstone, sandstone and rare brick.	5.40	90.14		
		24.0						
		N=9 (1,1/2,2,2,3)	6	*From 6.00 to 6.80m bgl: No recovery.*				
		N=6 (1,1/1,1,2,2)	7	End of Borehole at 7.00m	7.00	88.54		
			8					
			9					
			10					

Remarks and Groundwater Observations:

1. Borehole terminated at 7.00m bgl due to hole collapsing in. 2. Groundwater from 6.00m bgl. 3. Backfilled with arisings upon completion.

GL (m AOD) 95.54m AOD

Easting: 418532.05

Northing: 425054.64

Fig No. WS702

WINDOW SAMPLING RECORD

BH No. **WS703**
Sheet 1 of 1

Site: Land off Westgate, Cleckheaton
Contract No: C9907A
Client: Strata Homes
Date: 27/06/2024
Method: Tracked window sampling rig.
Scale: 1:25
Logged By: J.C
Checked By: AMG
Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Dark brown gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, brick and rare concrete. Wth occasional rootlets and rare fragments of wood.	0.20	91.66		
		N=6 (2,2/1,2,1,2)	1	MADE GROUND: Loose dark brown to black locally reddish brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of sandstone, ash, brick, concrete and rare slag. With rare fragments of metal and glass.				
				MADE GROUND: Firm to stiff medium strength orangish brown mottled light grey slightly sandy gravelly CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	1.50	90.36		
		62.0						
		N=3 (1,2/1,1,0,1)	2	*From 2.00m bgl: Locally dark brown.*				
		N=3 (1,1/1,0,1,1)	3	MADE GROUND: Soft low strength light brown with occasional bluish grey mottling slightly sandy gravelly CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of mudstone and sandstone.	3.00	88.86		
		26.0						
			4	End of Borehole at 4.00m	4.00	87.86		
			5					

Remarks and Groundwater Observations:

1. Borehole terminated at 4.00m bgl due to hole collapsing in. 2. Groundwater from 2.00m bgl. 3. Backfilled with arisings upon completion.

GL (m AOD)
91.86m AOD
Easting:
418529.10
Northing:
424995.52

Fig No.
WS703

WINDOW SAMPLING RECORD

BH No. **WS704** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 27/06/2024

Method: Tracked window sampling rig.

Scale: 1:25

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Very loose dark reddish brown clayey gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone, brick and slag. With occasional rootlets and rare fragments of wood, and metal.				
		N=1 (1,0/1,0,0,0)	1	*At 0.95m bgl: 7 No. Glass fragments.*				
				MADE GROUND: Black sandy clayey angular to subangular fine to coarse GRAVEL of sandstone, ash, brick and mudstone.	1.70	90.34		
		N=8 (1,1/2,2,2,2)	2	MADE GROUND: Firm medium strength orangish brown mottled light grey slightly sandy gravelly CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	2.00	90.04		
		54.0						
		N=4 (1,1/1,1,1,1)	3	*From 3.00 to 3.60m bgl: No recovery.*				
				MADE GROUND: Loose yellowish brown sandy clayey angular to subangular fine to coarse GRAVEL of sandstone.	3.60	88.44		
		N=6 (2,2/2,2,1,1)	4	End of Borehole at 4.00m	4.00	88.04		
			5					

Remarks and Groundwater Observations:

1. Borehole terminated at 4.00m bgl due to hole collapsing in. 2. Groundwater from 2.00m bgl. 3. Backfilled with arisings upon completion.

GL (m AOD) 92.04m AOD

Easting: 418513.27

Northing: 424992.25

Fig No. WS704

WINDOW SAMPLING RECORD

BH No. **WS705** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 27/06/2024

Method: Tracked window sampling rig.

Scale: 1:25

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Dark brown to black slightly clayey gravelly fine to coarse SAND with low cobble content. Gravel is angular to subangular fine to coarse of sandstone, brick and concrete. Cobbles are angular of brick and sandstone. With occasional fragments of wood and ceramic.				
		N=3 (1,0/0,1,1,1)	1	MADE GROUND: Very loose reddish brown sandy angular to subangular fine to coarse GRAVEL of brick.	1.00	91.56		
		N=5 (1,0/0,0,2,3)	2	MADE GROUND: Firm medium strength orangish brown with occasional light grey mottling slightly sandy gravelly CLAY of low plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	1.90	90.66		
				From 2.00 to 2.70m bgl: No recovery.				
		54.0						
		N=4 (2,1/0,0,1,3)	3					
		N=7 (1,1/2,1,2,2)	4	End of Borehole at 4.00m	4.00	88.56		
			5					

Remarks and Groundwater Observations:

1. Borehole terminated at 4.00m bgl due to hole collapsing in. 2. Groundwater from 2.00m bgl. 3. Backfilled with arisings upon completion.

GL (m AOD) 92.56m AOD

Easting: 418474.50

Northing: 424992.43

Fig No. WS705

WINDOW SAMPLING RECORD

BH No. **WS706** Sheet 1 of 1

Site: Land off Westgate, Cleckheaton

Contract No: C9907A

Client: Strata Homes

Date: 27/06/2024

Method: Tracked window sampling rig.

Scale: 1:25

Logged By: J.C | Checked By: AMG

Driller: RP Drilling Ltd

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), {ppm}, Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
				MADE GROUND: Dark greyish brown sandy GRAVEL with low cobble content. Gravel is angular to subangular fine to coarse of sandstone, brick and concrete. Cobbles are angular of brick and concrete.				
		N=0 (0,0/0,0,0,0)	1	No Recovery - Pushing cobble down. SPT result suggests very loose material.	1.00	91.53		
		N=6 (1,1/1,1,2,2)	2	MADE GROUND: Firm orangish brown mottled light grey slightly sandy gravelly CLAY of medium plasticity (field assessment). Gravel is angular to subrounded fine to coarse of sandstone and mudstone	2.00	90.53		
				From 2.30 to 3.00: No recovery.				
		N=5 (2,2/2,1,1,1)	3					
				From 3.20 to 4.00: No recovery.				
		N=7 (1,2/2,2,1,2)	4	End of Borehole at 4.00m	4.00	88.53		
			5					

Remarks and Groundwater Observations:

1. Borehole terminated at 4.00m bgl due to hole collapsing in. 2. Groundwater from 2.00m bgl. 3. Backfilled with arisings upon completion.

GL (m AOD) 92.53m AOD

Easting: 418489.87

Northing: 424998.35

Fig No. WS706

APPENDIX C

GEOTECHNICAL LABORATORY ANALYSIS RESULTS

GQF-008-48
Issue 01 - Oct 22

Summary of Classification Test Results

Project No.
J258814

Project Name
Westgate, Cleckheaton

Hole No.	Sample				Soil Description	Density bulk	Density dry	w	Passing 425µm	LL	PL	PI	Particle density	Remarks
	Ref	Top	Base	Type		Mg/m^3		%	%	%	%	%	Mg/m^3	
BH601		2.10	3.00	B	Brown slightly sandy slightly gravelly CLAY			23	70	39	22	17		
BH602		0.20	1.00	B	Dark grey brownslightly sandy slightly gravelly CLAY. Contains fragments of brick and slag.			9.4					2.73-gj	
TP601		1.00	1.50	B	Brown slightly sandy slightly gravelly CLAY			16					2.71-gj	
TP603		0.40	0.90	B	Dark grey slightly clayey sandy GRAVEL. Contains ash.			20					1.84-gj	
TP604		0.30	0.80	B	Dark brown slightly sandy gravelly CLAY			18					2.64-gj	
TP605		1.80	2.30	B	Brown slightly sandy slightly gravelly CLAY			22					2.6-gj	
TP606		0.20	0.70	B	Dark grey clayey gravelly SAND. Contains roots, glass and pottery fragments			16					2.59-gj	
TP606		1.80	2.10	B	Brown slightly clayey slightly sandy GRAVEL			7.3			NP			

All tests performed in accordance with BS1377:1990 unless specified otherwise

Date Printed	18/01/2024

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

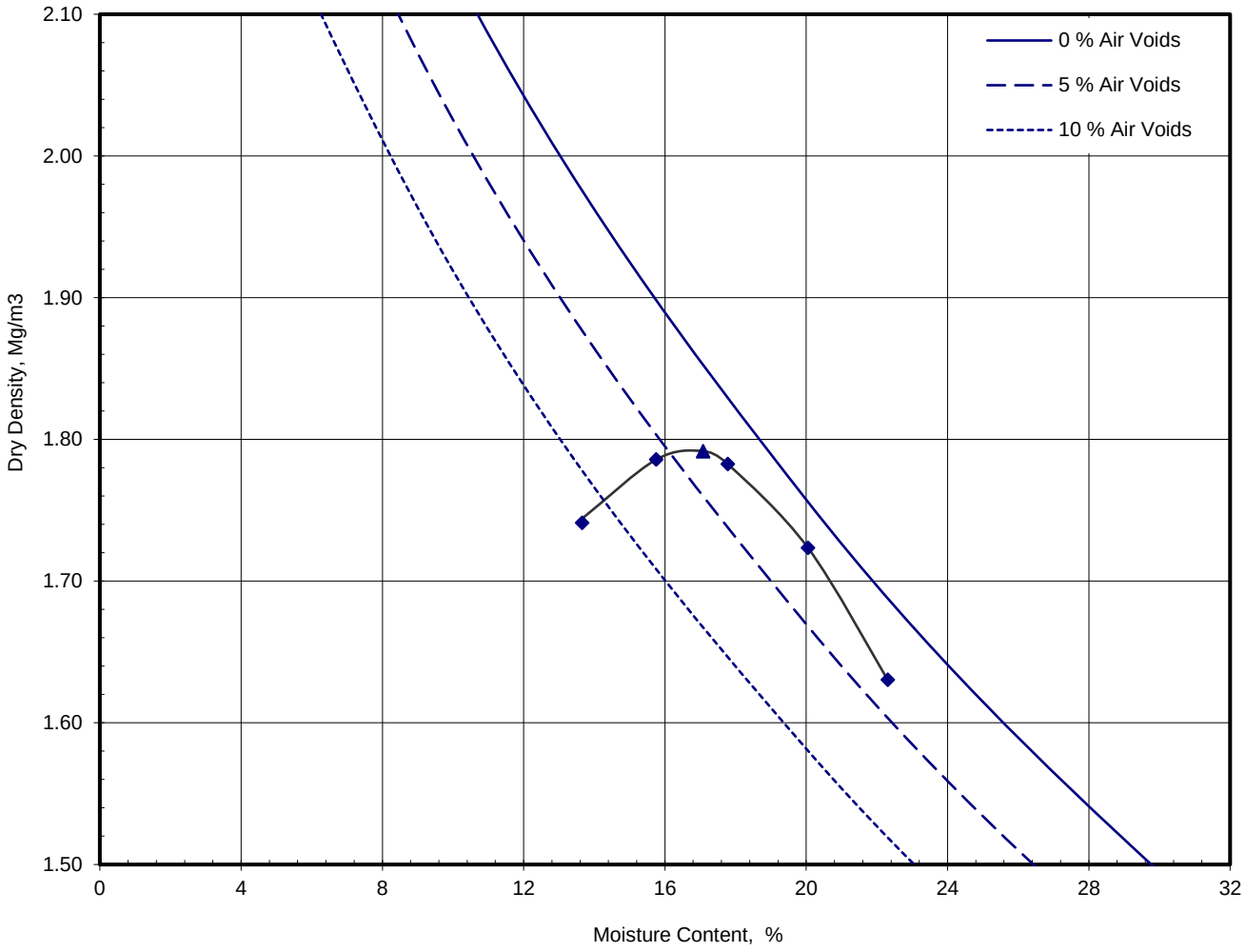
Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

Particle density
sp - small pyknometer
gj - gas jar

UKAS TESTING
7758

INDEX

	Dry Density / Moisture Content Relationship Light Compaction			Job Ref	J258814
				Borehole / Pit No	TP601
Project Name	Westgate, Cleckheaton			Sample No	
Soil Description				Depth	1.00 m
Specimen Ref.		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.3, 2.5kg rammer			Keylab ID	TTLP2024010350

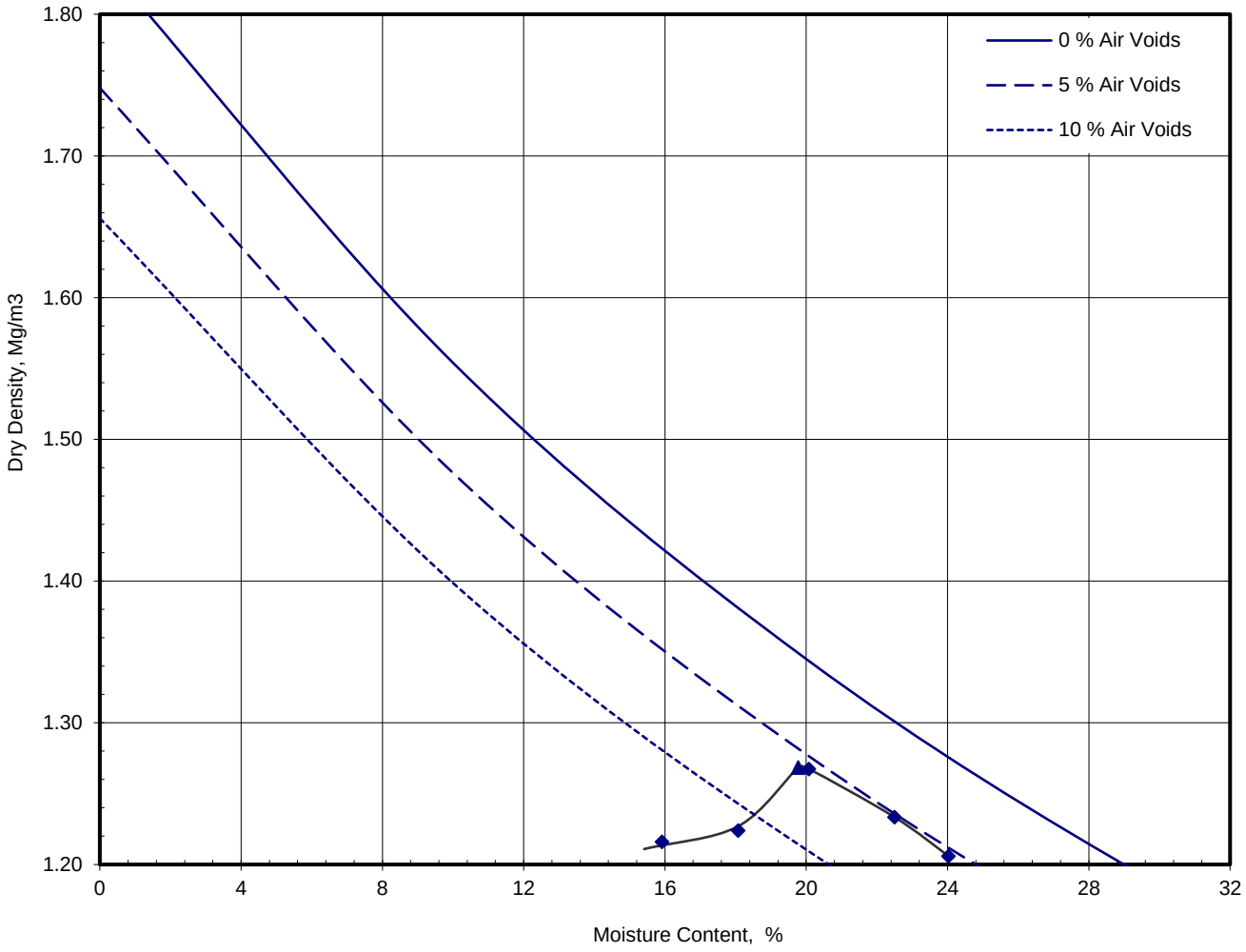


Preparation		
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	4
Particle Density - Measured	Mg/m³	2.71

Maximum Dry Density	Mg/m³	**1.79**
Optimum Moisture Content	%	**17**

TTL	UKAS TESTING 7758	Remarks	**COMPL**
		Date Printed	18/01/2024

	Dry Density / Moisture Content Relationship **Light Compaction**			Job Ref	**J258814**
				Borehole / Pit No	TP603
Project Name	**Westgate, Cleckheaton**			Sample No	
Soil Description				Depth	0.40 m
Specimen Ref.		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg rammer			Keylab ID	TTLP2024010349



Preparation		
Mould Type		CBR
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	15
Material Retained on 20.0 mm Sieve	%	8
Particle Density - Measured	Mg/m³	1.84

Maximum Dry Density	Mg/m³	**1.27**
Optimum Moisture Content	%	**20**

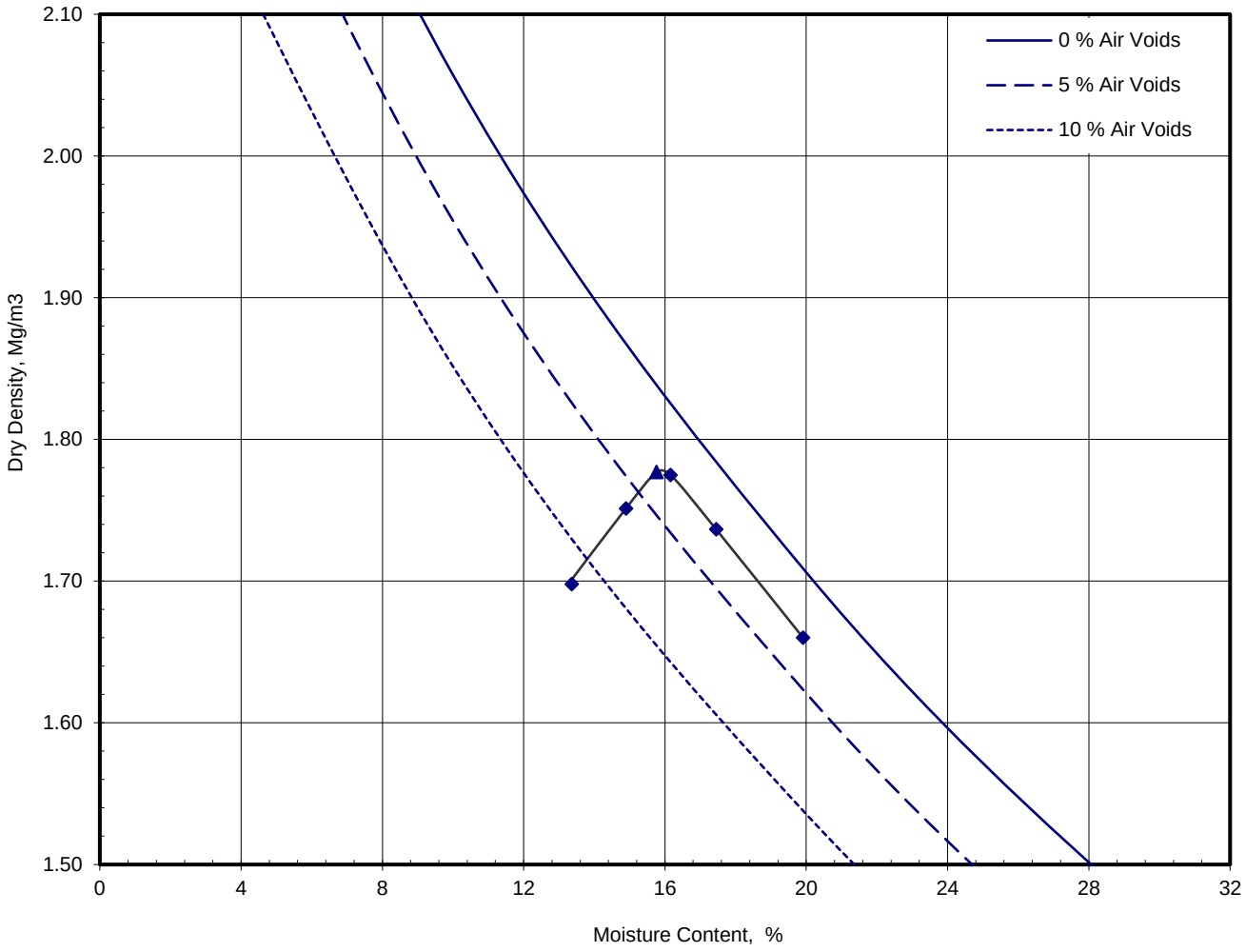
7758

Remarks

Date Printed 18/01/2024

COMPL

	Dry Density / Moisture Content Relationship **Light Compaction**			Job Ref	**J258814**
				Borehole / Pit No	TP606
Project Name	**Westgate, Cleckheaton**			Sample No	
Soil Description				Depth	0.20 m
Specimen Ref.		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg rammer			Keylab ID	TTLP2024010351



Preparation		
Mould Type		CBR
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	25
Material Retained on 20.0 mm Sieve	%	13
Particle Density - Measured	Mg/m³	2.59

Maximum Dry Density	Mg/m³	**1.78**
Optimum Moisture Content	%	**16**

TTL	UKAS TESTING 7758	Remarks	**COMPL**
		Date Printed 18/01/2024	

GQF-008-64 Issue 01 - Oct 22	**Determination of shear strength using the Small Direct Shearbox Apparatus**			Job Ref	J258814
				Borehole/Pit No.	BH602
Project Name	Westgate, Cleckheaton			Sample No.	
Soil Description	Dark grey brownslightly sandy slightly gravelly CLAY. Contains fragments of brick and slag.			Depth m	0.2
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description				KeyLAB ID	TTLP2024010346
Test Method	BS1377 : Part 7 : 1990, clause 4			Date of test	04.01.24

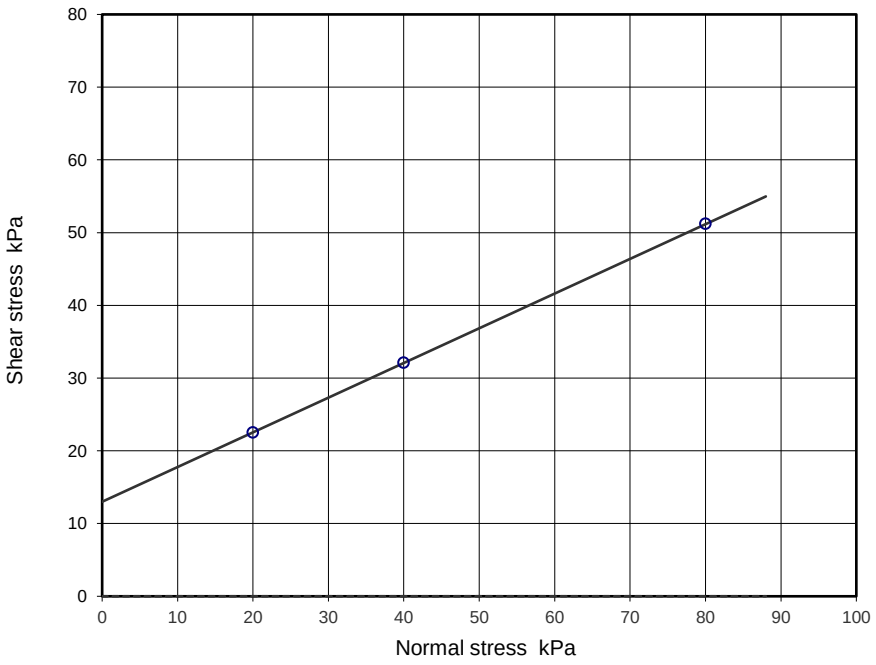
Preparation Details -2mm material. Recompacted using equivalent 2.5kg effort at as received moisture content

Specimen Details

		Test No.	**1**	**2**	**3**				
Initial	Height		23.7	23.6	23.5				mm
	Bulk Density		1.70	1.70	1.70				Mg/m³
	Moisture Content		13.8	13.8	13.8				%
	Dry density		1.49	1.49	1.49				Mg/m³
	Voids ratio		0.779	0.779	0.779				
	Degree of Saturation		47	47	47				%
Consolidation	Consolidation / Normal Stress applied		**20**	**40**	**80**				kPa
	Change in height during consolidation*		-0.272	-0.420	-0.540				mm
	Voids ratio after consolidation		0.759	0.747	0.738				
After test	Final Moisture content		23.5	22.7	22.4				

Shearing stage(s)

Rate of displacement	Peak	0.60000	0.60000	0.60000				mm/min
	Residual							mm/min
Peak values, (o)	Relative horizontal displacement	10.00	10.00	2.00				mm
	Shear stress	22.5	32.1	51.2				kPa
	Vertical Movement at peak shear stress*	-0.62	-0.83	-0.67				mm
Residual values, (x)	No. of traverses (including peak run)	1	1	1				
	Relative horizontal displacement							mm
	Shear stress							kPa
	Vertical movement at residual shear stress*							mm



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	13	-
Ø '	degrees	25.5	-

Residual strength, (x)

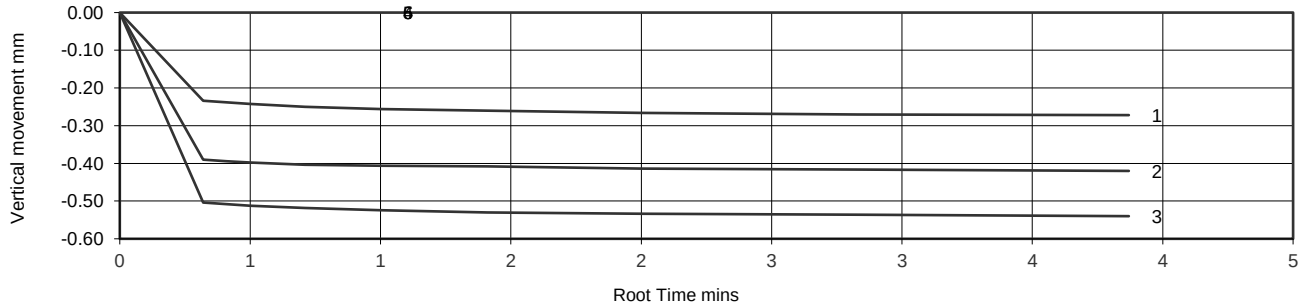
c'_R	kPa	not assessed	-
$Ø'_R$	degrees	not assessed	-

Remarks

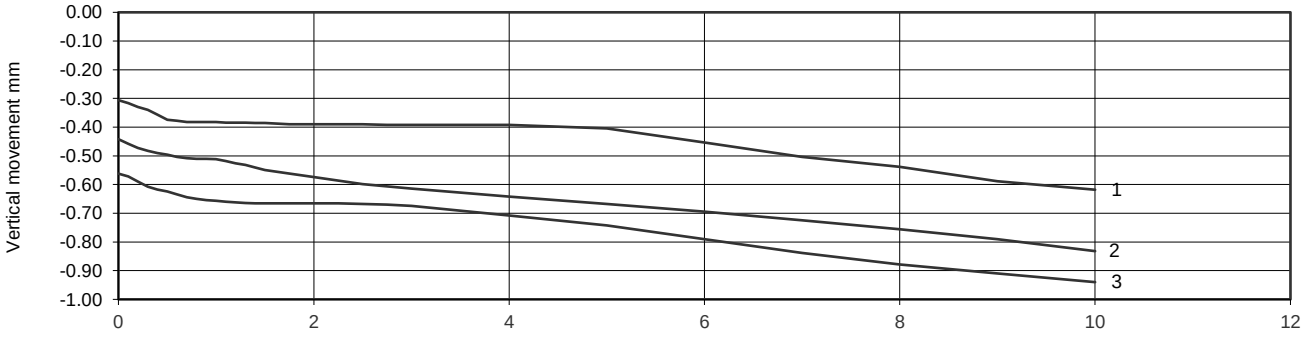
	Date Printed			
	18/01/2024	UKAS TESTING 7758	TTL	**SSB**

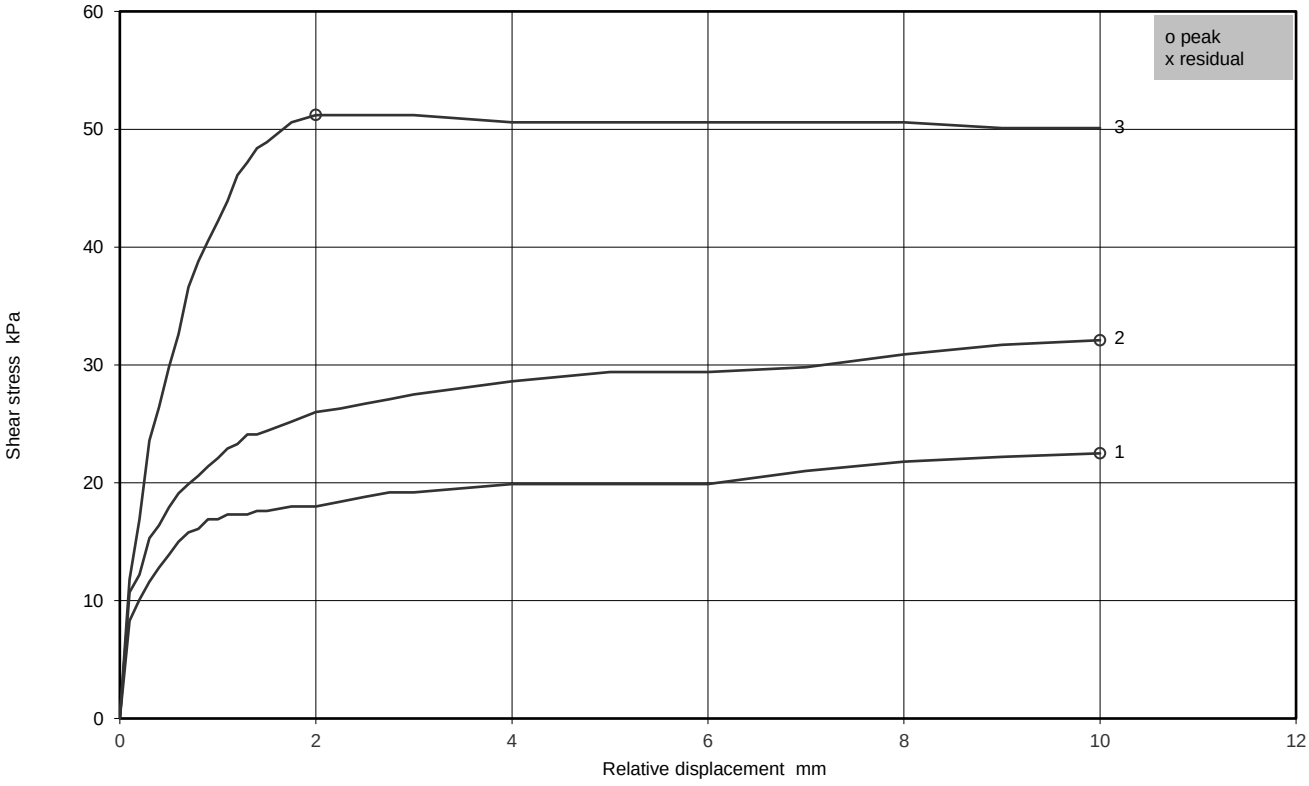
	Determination of shear strength using the Small Direct Shearbox Apparatus				Job Ref	J258814
					Borehole/Pit No.	BH602
Project Name	Westgate, Cleckheaton				Sample No.	
Soil Description	Dark grey brownslightly sandy slightly gravelly CLAY. Contains fragments of brick and slag.				Depth m	0.2
Specimen Reference		Specimen Depth		m	Sample Type	B
Specimen Description					KeyLAB ID	TTLP2024010346

Consolidation stage(s)



Shearing stage(s)





*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).	Date Printed			SSB
	18/01/2024			

GQF-008-64 Issue 01 - Oct 22	**Determination of shear strength using the Small Direct Shearbox Apparatus**			Job Ref	J258814
				Borehole/Pit No.	TP604
Project Name	Westgate, Cleckheaton			Sample No.	
Soil Description	Dark brown slightly sandy gravelly CLAY			Depth m	0.3
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description				KeyLAB ID	TTLP2024010344
Test Method	BS1377 : Part 7 : 1990, clause 4			Date of test	01/05/2024

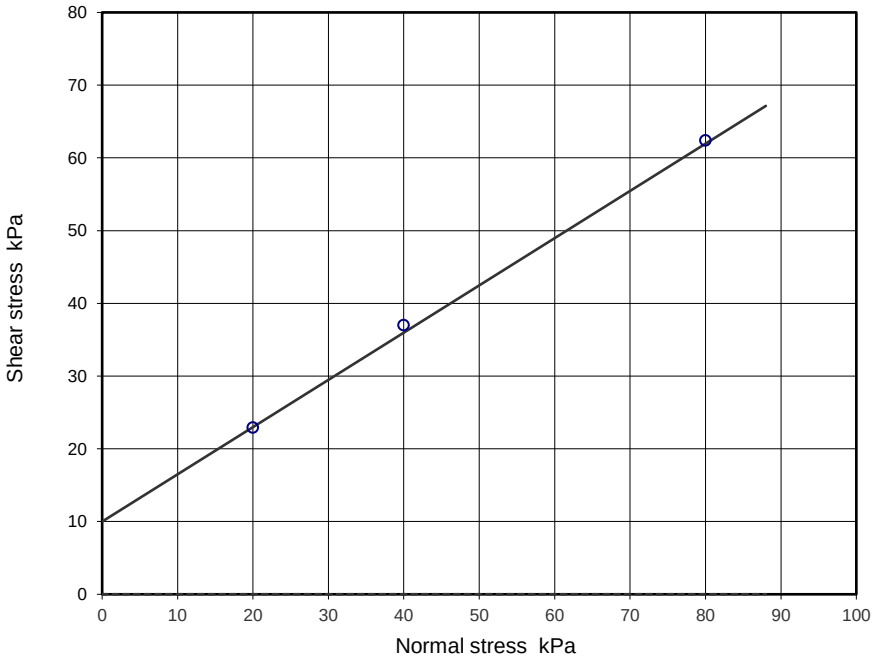
Preparation Details -2mm material. Recompacted using equivalent 2.5kg effort at as received moisture content

Specimen Details

		Test No.	**1**	**2**	**3**				
Initial	Height		23.8	23.6	23.6				mm
	Bulk Density		1.65	1.65	1.65				Mg/m³
	Moisture Content		22.1	22.1	22.1				%
	Dry density		1.35	1.35	1.35				Mg/m³
	Voids ratio		0.963	0.963	0.963				
	Degree of Saturation		61	61	61				%
Consolidation	Consolidation / Normal Stress applied		**20**	**40**	**80**				kPa
	Change in height during consolidation*		-0.230	-0.392	-0.812				mm
	Voids ratio after consolidation		0.944	0.930	0.895				
After test	Final Moisture content		34.4	32.8	31.5				

Shearing stage(s)

Rate of displacement	Peak	0.60000	0.60000	0.60000				mm/min
	Residual							mm/min
Peak values, (o)	Relative horizontal displacement	10.00	10.00	10.00				mm
	Shear stress	22.9	37.0	62.4				kPa
	Vertical Movement at peak shear stress*	-0.97	-1.00	-1.58				mm
Residual values, (x)	No. of traverses (including peak run)	1	1	1				
	Relative horizontal displacement							mm
	Shear stress							kPa
	Vertical movement at residual shear stress*							mm



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	10	-
Ø '	degrees	33	-

Residual strength, (x)

c'_R	kPa	not assessed	-
$Ø'_R$	degrees	not assessed	-

Remarks

	Date Printed			
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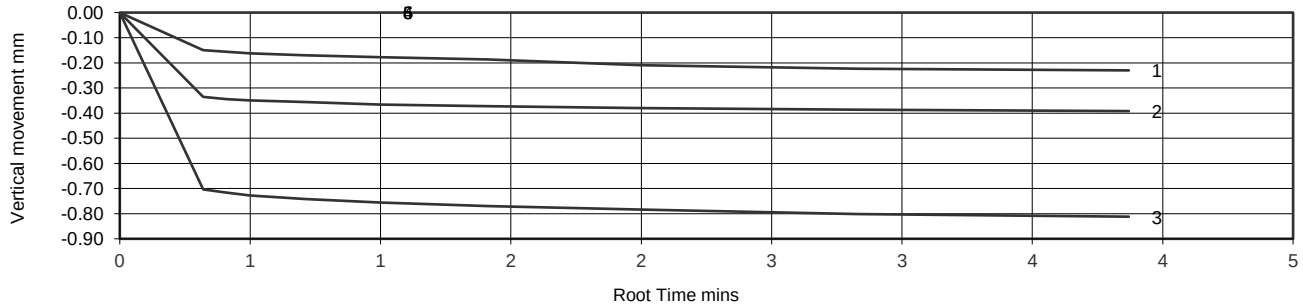
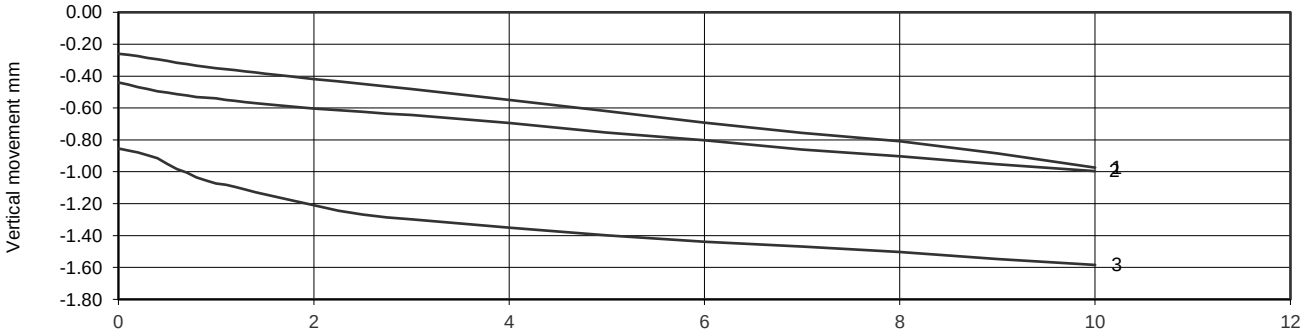
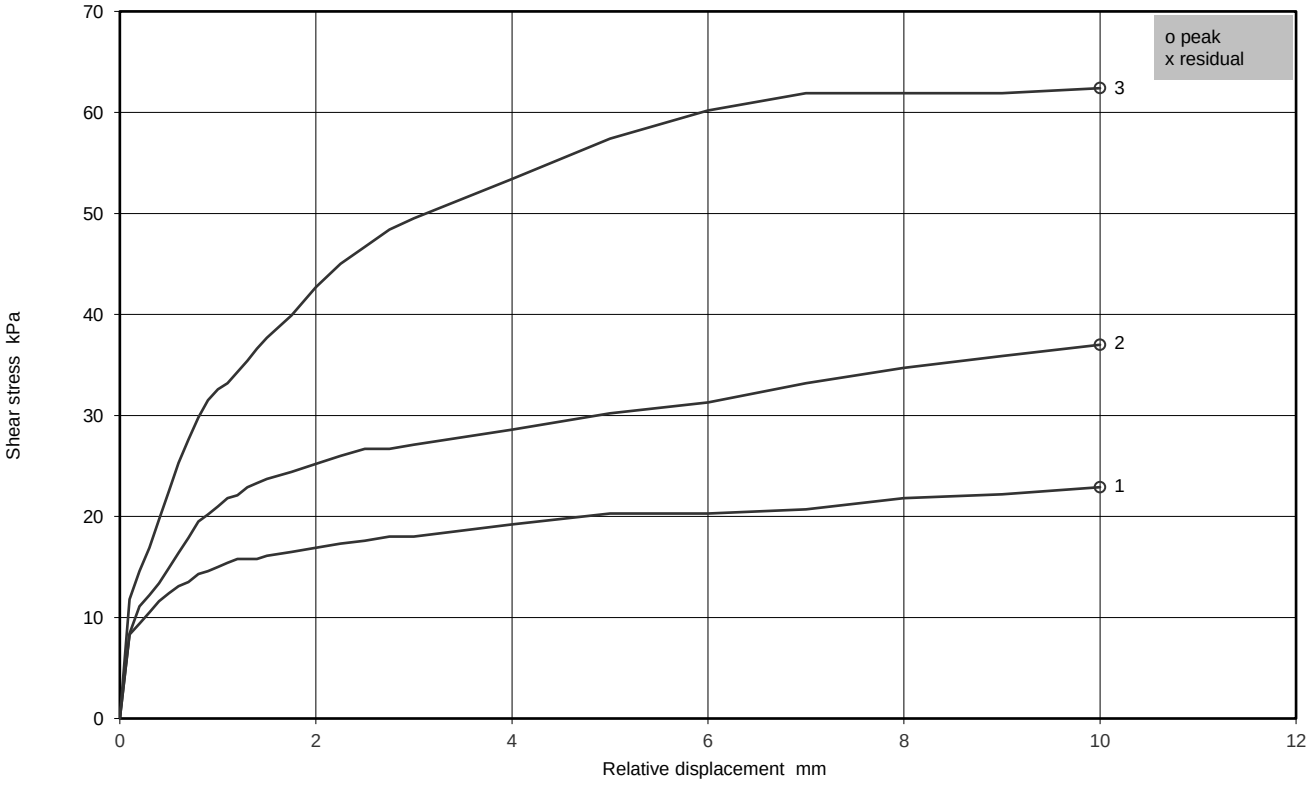
	Determination of shear strength using the Small Direct Shearbox Apparatus				Job Ref	J258814
					Borehole/Pit No.	TP604
Project Name	Westgate, Cleckheaton				Sample No.	
Soil Description	Dark brown slightly sandy gravelly CLAY				Depth m	0.3
Specimen Reference		Specimen Depth		m	Sample Type	B
Specimen Description					KeyLAB ID	TTLP2024010344

Consolidation stage(s)



Shearing stage(s)





*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).	Date Printed			SSB
	18/01/2024			

GQF-008-64 Issue 01 - Oct 22	**Determination of shear strength using the Small Direct Shearbox Apparatus**			Job Ref	J258814
				Borehole/Pit No.	TP605
Project Name	Westgate, Cleckheaton			Sample No.	
Soil Description	Brown slightly sandy slightly gravelly CLAY			Depth m	1.8
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description				KeyLAB ID	TTLP2024010345
Test Method	BS1377 : Part 7 : 1990, clause 4			Date of test	01/08/2024

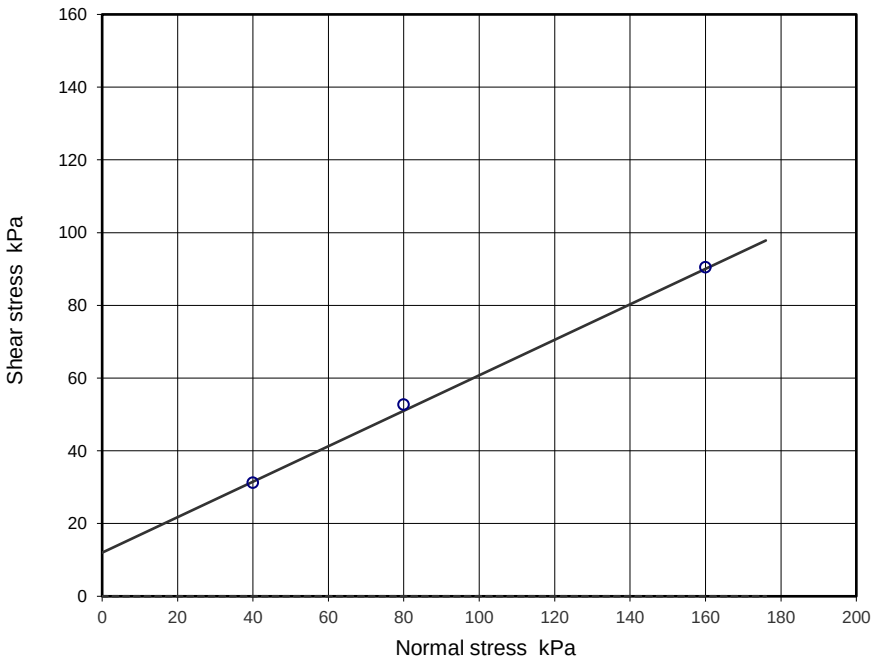
Preparation Details -2mm material. Recompacted using equivalent 2.5kg effort at as received moisture content

Specimen Details

		Test No.	**1**	**2**	**3**				
Initial	Height		23.9	23.9	24.3				mm
	Bulk Density		1.85	1.84	1.81				Mg/m³
	Moisture Content		22.8	22.8	22.8				%
	Dry density		1.51	1.50	1.47				Mg/m³
	Voids ratio		0.755	0.767	0.803				
	Degree of Saturation		80	79	75				%
Consolidation	Consolidation / Normal Stress applied		**40**	**80**	**160**				kPa
	Change in height during consolidation*		-0.846	-1.246	-2.530				mm
	Voids ratio after consolidation		0.693	0.675	0.615				
After test	Final Moisture content		25.8	24.8	23.1				

Shearing stage(s)

Rate of displacement	Peak	0.02625	0.02625	0.02625				mm/min
	Residual							mm/min
Peak values, (o)	Relative horizontal displacement	10.00	10.00	8.01				mm
	Shear stress	31.2	52.7	90.5				kPa
	Vertical Movement at peak shear stress*	-1.57	-1.92	-3.19				mm
Residual values, (x)	No. of traverses (including peak run)	1	1	1				
	Relative horizontal displacement							mm
	Shear stress							kPa
	Vertical movement at residual shear stress*							mm



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	12	-
Ø '	degrees	26	-

Residual strength, (x)

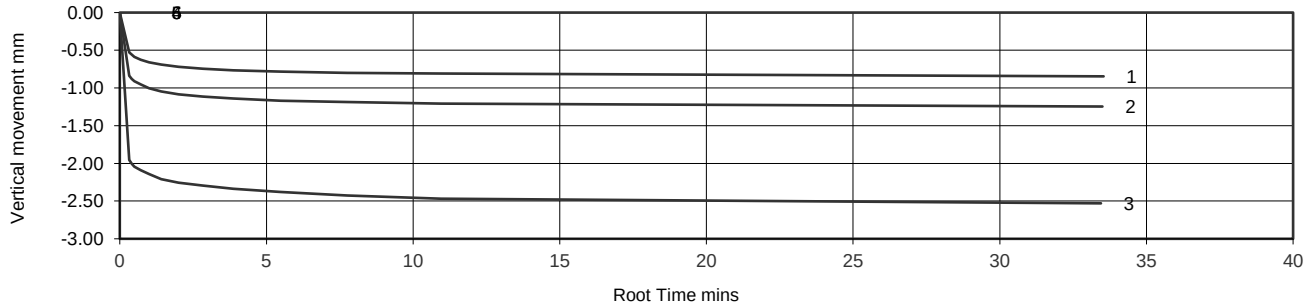
c'_R	kPa	not assessed	-
$Ø'_R$	degrees	not assessed	-

Remarks

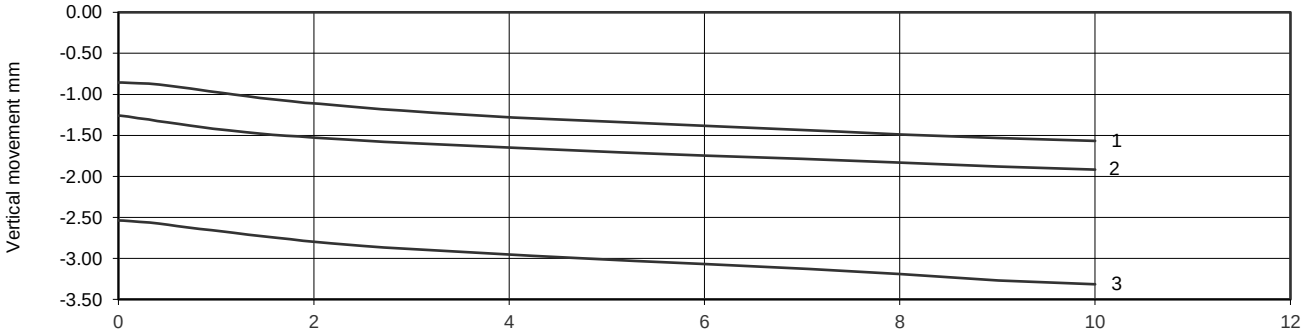
	Date Printed			**SSB**
	18/01/2024	UKAS TESTING 7758	TTL	

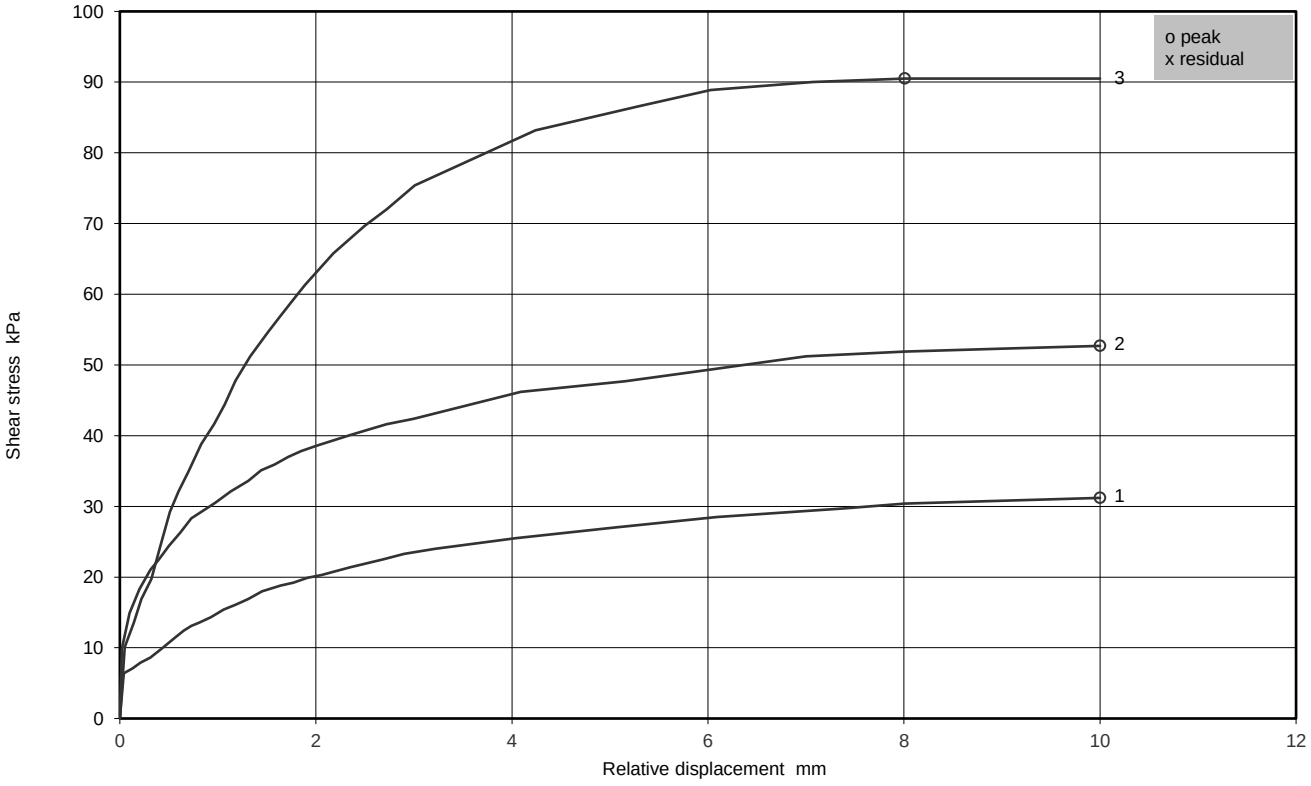
	Determination of shear strength using the Small Direct Shearbox Apparatus				Job Ref	J258814
					Borehole/Pit No.	TP605
Project Name	Westgate, Cleckheaton				Sample No.	
Soil Description	Brown slightly sandy slightly gravelly CLAY				Depth m	1.8
Specimen Reference		Specimen Depth		m	Sample Type	B
Specimen Description					KeyLAB ID	TTLP2024010345

Consolidation stage(s)



Shearing stage(s)





*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).	Date Printed			SSB
	18/01/2024			