

APPENDIX G

GEOTECHNICAL INVESTIGATION REPORT



**GEOTECHNICAL SITE INVESTIGATION
AND INTERPRETATIVE REPORT
OF LAND AT
ASHTON CANAL,
NEW ISLINGTON**

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1.0 INTRODUCTION

1.1 Instruction

- 1.1.1 GeoCon Site Investigations Ltd (GeoCon) have been commissioned by Wilde Consultants Ltd on behalf of Manchester City Council to undertake a geotechnical ground investigation on land at New Islington, Manchester.
- 1.1.2 It is understood that a ground investigation is required to provide an environmental and geotechnical information relating to the proposed NE Gateway Bridge Refurbishment.
- 1.1.3 This report is provided to identify the ground conditions and provide details of their engineering properties in order to facilitate foundation design for the proposed development.
- 1.1.4 GeoCon have not been commissioned to undertake a Phase I Preliminary Risk Assessment or Phase II Geoenvironmental Site Investigation and have not been provide with any third-party reports at this stage.
- 1.1.5 This ground investigation has been designed by the Wilde Consultants Ltd, in accordance with their ground investigation specification Referenced: 651-197-SI Specification Rev A.

1.2 Scope of Works

- 1.2.1 Prior to commencing the site works the proposed scope of investigation was as follows, however the proposed scope will be subject to change dependent upon site conditions, access, restrictions and obstructions. The actual works undertaken following the completion of the site works and any on site amendments are detailed in section 3.0.
 - Four boreholes to a target depth of 20m or 2m into the bedrock, whichever comes first.
 - Insitu environmental and geotechnical sampling, and insitu geotechnical testing.
 - Full supervision of all works by engineering geologist including sampling and detailed geotechnical descriptions to BS5930, EN ISO 14688-1 EN ISO 14688-2 and EN ISO 14689 of all strata types encountered within the exploratory holes.
 - A suite of chemical laboratory analysis.
 - A suite of geotechnical laboratory analysis.
 - Production of an interpretative factual report.

1.3 Reliance and Limitations

- 1.3.1 This report has been prepared using published information and information provided by the Client and their professional advisers which has been made available to GeoCon at the time of writing only. GeoCon accepts no liability for any changes resulting from new information which has become available since this time.
- 1.3.2 This report is provided for the sole use of the client and their professional advisors and is confidential to them unless agreed otherwise in writing. This report may only be used and relied on once the work has been paid for in full.
- 1.3.3 GeoCon owes no duty of care and has no liability to any third party who is not authorised by GeoCon to use this report. Any unauthorised third parties using information contained in this report do so at their own risk.
- 1.3.4 This assessment has been carried out to determine the potential risks posed to future end users, along with other key receptors, resulting from potential contamination at the site, based on the proposed development. Should any revisions in the development proposals result in a change any assessment parameters detailed in this report, a re-assessment of the risk should be carried out.

- 1.3.5 Whilst this report may reference observations made regarding the presence of features/ issues such as invasive species, ACM, site drainage and evidence of structural abnormalities, this report does not constitute specialist surveys on these matters. Should further specialist surveys be carried out in this regard, the findings of these should be reported to GeoCon so that we may determine if this has any impact on the findings of this report.
- 1.3.6 The assessment and interpretation of the factual data obtained as part of this Ground Investigation has been undertaken in accordance with standard consulting practise and with current national and international guidance.
- 1.3.7 This report presents the observations made during the Ground Investigation and the factual data obtained. The conclusions and recommendations in this report are limited to those which can be made based on the findings of the survey and information provided by third parties. GeoCon assumes all third-party data to be true and correct. No responsibility can be accepted by GeoCon for inaccuracies in the information provided by any other party.
- 1.3.8 This report is written in the context of an agreed scope of works and should not be used in a different context. Furthermore, new information, improved practises, and changes in legislation may require the reinterpretation of the report in whole or in part after its original issue. GeoCon reserve the right to alter their conclusions and recommendations in the light of further information that may become available. This report is provided for the sole use of the client and their professional advisers and is confidential to them unless agreed otherwise in writing.
- 1.3.9 Ground conditions can be variable and change rapidly, especially in areas of Made Ground, however it is assumed that the ground conditions encountered and observed are typical and representative of the site as a whole. Most specifically with regard to this limited investigation, the ground conditions have been determined from a limited number of exploratory holes formed across the site, therefore only a small percentage of the total area of the site has been investigated. Interpolation between exploratory holes has enabled a general picture of the subsurface conditions to be produced. Conclusions drawn from the ground investigation should be read in this context. GeoCon cannot accept responsibility for any situations resulting from locally unforeseen ground conditions occurring between exploratory holes.
- 1.3.10 In addition, subsurface conditions including contaminant concentrations and groundwater levels may vary spatially with time. This factor should be given due consideration in the event that the information contained within this report is used after any significant period of time has elapsed.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

- 2.1.1 The site is located at land off Ashton Canal, New Islington at approximate National Grid Reference NGR: 385463:398318 (centre of the site).
- 2.1.2 A site location plan is presented as Drawing No. GSI 1595/01 in Appendix A.

2.2 Site Reconnaissance

- 2.2.1 A site reconnaissance was carried out in August 2021. All details from the site walkover are included in the site description below.

2.3 Site Description

- 2.3.1 The site is an irregular shaped piece of land with an approximate area of 0.056Ha.
- 2.3.2 The topography of the site is generally flat with a slight downwards slope to the northwest of the site, as the gradient slopes towards the canal from the existing lock/bridge.
- 2.3.3 The site is currently occupied by a canal towpath, lock and public grassed area.
- 2.3.4 An approximate distribution of the surface covering is given below in Table 2.1: Site Surface Covering.

Table 2.1: Site Surface Covering

Type of Surface Cover	Distribution (%)
Soft Ground (grassed and landscaped areas)	45
Hardstanding	55
Roadways	0
Buildings	0
Water (ponds, streams)	0

- 2.3.5 The site is bounded by flats to the north, the Ashton Canal and New Islington Green to the west, New Islington Green and New Islington tram stop to the south and the Ashton Canal and New Islington Green to the east.
- 2.3.6 Access to the site is via a short walk across New Islington Green, from a car park adjacent to New Islington tram stop.

2.4 Surrounding Area

- 2.4.1 The current surrounding land use to the site is generally residential properties and public space in all directions, with the Ashton Canal running through the site, orientated northeast to southwest.
- 2.4.2 The topography of the surrounding area is generally flat.

2.5 Future Site Usage

- 2.5.1 It is currently proposed to construct a new cyclist and pedestrian bridge spanning the Ashton Canal. At this stage GeoCon have not been provided with any proposed development plans.

3.0 GROUND INVESTIGATION

3.1 General

- 3.1.1 The intrusive investigation was carried out between 29th November and 3rd December 2021.
- 3.1.2 The specification and scope of works for the ground investigation has been provided by the client's agent, Wilde Consultants Ltd.
- 3.1.3 This ground investigation has been designed by the Wilde Consultants Ltd, in accordance with their ground investigation specification Referenced: 651-197-SI Specification Rev A.
- 3.1.4 The ground investigation has been carried out in accordance with BS5930 and the UK Specification for Ground Investigation Second Edition 2012.
- 3.1.5 All strata descriptions were undertaken in accordance with BS5930 Amendment 2; EN ISO 14688 -1; EN ISO 14688 -2; and EN ISO 14689.
- 3.1.6 The actual ground investigation comprised the formation of:
 - Three cable percussion boreholes. BH01 was terminated at the target depth of 20.00m, BH02 terminated at 17.62m, and BH03 terminated at 3.45m after confirming depth of natural strata.
 - Insitu geotechnical and geoenvironmental testing and sampling.
 - Full supervision of all works by engineering geologist including sampling and detailed geotechnical descriptions to BS5930, EN ISO 14688-1 EN ISO 14688-2 and EN ISO 14689 of all strata types encountered within the exploratory holes.
 - A suite of geotechnical laboratory analysis.
 - A suite of chemical laboratory analysis.
 - Production of an interpretative report.
- 3.1.7 The ground investigation was carried out to determine the geotechnical properties of the soils and rock beneath the site for a proposed residential development at the site.
- 3.1.8 The locations of the exploratory holes were specified by GeoCon and were positioned to gain key information beneath the site in relation to the proposed development.
- 3.1.9 All locations were checked against buried service location plans and then scanned with a Cable Avoidance Tool (CAT) and Genny prior to excavation, and a permit to dig was then issued. Each location was then continued by hand down to a minimum of 1.20mbgl to clear any buried services or other subsurface obstructions. All locations were then checked again with a CAT at the base of the hand excavated inspection pit by GeoCon prior to commencement of drilling.
- 3.1.10 All access permissions were arranged by Wilde Consultants prior to the ground investigation commencing.
- 3.1.11 An exploratory hole location plan is presented in Appendix A as drawing number GSI 1595/02.

3.2 Cable Percussion Boreholes

- 3.2.1 Three cable percussion boreholes referenced BH01, BH02 and BH03 were drilled at the site to depths of between 3.45 and 20.10mbgl.
- 3.2.2 The cable percussion boreholes were drilled in order to facilitate geoenvironmental sampling and to gain an understanding of the environmental and geotechnical properties of the soils and rock beneath the site.
- 3.2.3 The cable percussion boreholes were commenced in 200mm diameter drilling string and reduced to 150mm diameter drill string where necessary to achieve the target depths.

3.2.4 The cable percussion follow on borehole logs are presented in Appendix B.

3.3 Sampling and Insitu Testing

3.3.1 The environmental and geotechnical sampling regime and insitu testing regime included the following:

- Environmental samples for subsequent chemical analysis were taken in the made ground, with a minimum of two samples taken from the upper 1.00 m.
- Small disturbed samples taken from each strata type and then at 2.00 m intervals thereafter.
- Bulk disturbed samples taken at 2.00 m intervals to the base of the boreholes.
- Insitu Standard Penetration Tests (SPTs) were carried out at 2.00 m intervals down to the base of the boreholes to collate insitu strength information (relative density) for the soils beneath the site.
- Undisturbed samples (U100's) were taken alternating with SPTs at 2.00 m intervals down to the base of the boreholes in cohesive soils for subsequent laboratory analysis.

3.3.2 Soil samples were collected for environmental and geotechnical analysis by the engineering geologist on site based on physical and visual inspection in addition to standard sampling.

3.3.3 All samples were stored in pre-chilled cool-boxes prior to immediate dispatch to laboratory. Where there has been a delay in transporting the samples to the laboratory, samples have been kept in a cool dark storage unit inside cool boxes packed with ice, which is regularly replaced to maintain sample quality.

3.3.4 The environmental samples were subsequently transported to a chemical laboratory in plastic tubs, glass jars and soils vials. The geotechnical samples were subsequently transported to a geotechnical laboratory in prepared bulk bags and plastic tubs.

3.4 Backfill

3.4.1 All exploratory holes were backfilled with a mixture of arisings and bentonite and made level at the surface to a similar condition as prior to the work.

3.5 Groundwater

3.5.1 Where groundwater was encountered a waiting period of 20 minutes was allowed to monitor any change (rise or fall) in the levels of each groundwater strike.

3.6 Groundwater Monitoring

3.6.1 GeoCon have not been commissioned to undertake any groundwater monitoring at this stage.

3.7 Laboratory Testing

3.7.1 Geotechnical laboratory testing was subsequently carried out on selected samples of soil. Further details of the geotechnical laboratory testing are given within Section 5.0 – Geotechnical Testing and Results.

3.7.2 All geotechnical laboratory testing was scheduled by GeoCon.

3.7.3 Chemical laboratory testing was subsequently carried out on selected samples of soil. Further details of the chemical laboratory testing are given within Section 7.0 – Chemical Testing and Results.

3.7.4 All chemical laboratory testing was scheduled by GeoCon.

3.8 Restrictions

3.8.1 No restrictions were encountered during this site investigation that would have prevented parts of the site being accessed and consequently resulting in any of the exploratory locations being abandoned.

4.0 GROUND CONDITIONS

4.1 Geology

- 4.1.1 The British Geological Survey shows the site to be underlain by the geological succession outlined below Table 4.1: Published Geology.

Table 4.1: Published Geology

Geology	Description /strata	BGS General Description
Artificial	None Recorded	-
Superficial	Devensian Till	<i>No BGS description is available; however, these deposits are generally gravelly clay with cobbles and varying silt sand and gravel content</i>
Bedrock	Manchester Marls Formation	<i>Red marl (calcareous mudstone and siltstone) with thin beds of fossiliferous marine limestone and dolomite; locally green; sandy in places especially in top part; local breccias and pebbly beds.</i>

4.2 General

- 4.2.1 A generalised summary of the ground conditions encountered, depths to base, and thickness recorded from the exploratory hole records is presented below in **Error! Reference source not found.**Table 4.2: Summary of Ground Conditions.

Table 4.2: Summary of Ground Conditions

Geology / Strata	Depth (mbgl)				Thickness (m)		Locations encountered
	Top		Base		Min	Max	
	Min	Max	Min	Max			
Made Ground	0.00	-	1.00	3.00	1.00	3.00	BH01, BH02, BH03
Devensian Till	1.00	3.00	-	-	16.62	17.10	BH01, BH02, BH03
Groundwater	Strike depth (mbgl)		Rest Level (mbgl)		Locations encountered		
	Min	Max	Min	Max			
Strike	0.70	16.00	0.70	16.00	BH01, BH03		

- 4.2.2 The general ground conditions encountered have been summarised below.
- 4.2.3 Detailed strata descriptions are presented on the cable percussion borehole logs presented in Appendix B.
- 4.2.4 The actual ground conditions encountered across the site were generally uniform and comprised made ground overlying Devensian Till.

4.3 Made Ground

- 4.3.1 Made ground was encountered in all exploratory hole locations from ground level to depths of between, 1.00 and 3.00mbgl. The made ground generally comprised grass (with the exception of BH03 where hardstanding was encountered) overlying layers of granular and cohesive made ground materials.

Hardstanding:

- 4.3.3 Hardstanding was encountered in BH03 from ground level to depths of 0.05mbgl, and generally comprised a cemented gravel.

Granular Made Ground:

- 4.3.4 Granular made ground materials were encountered in all locations from both ground level and beneath the hardstanding in BH03 to depths of between 0.30 and 2.30mbgl, and generally comprised clayey gravelly sand with fragments of brick, limestone and concrete.

Cohesive Made Ground:

- 4.3.5 Cohesive made ground materials were encountered in all locations from beneath the granular made ground to depths of between 1.00 and 3.00mbgl, and generally comprised sandy gravelly clay with fragments of limestone, concrete and brick.

4.4 Superficial Deposits

- 4.4.1 Soils considered to represent Devensian Till were encountered in all locations directly beneath the made ground and were proven to depths of between 3.45 and 20.10mbgl.
- 4.4.2 The Devensian Till deposits generally comprised a firm to very stiff sandy gravelly clay.

4.5 Bedrock

- 4.5.1 Sandstone Bedrock was encountered at two locations and were recovered as a gravelly sand from 16.50 and 17.00mbgl in BH02 and BH01 respectively.

4.6 Groundwater

- 4.6.1 Groundwater was encountered in two of the three exploratory holes formed across the site. Further details are as follows: -
- BH01 – strike at 16.00mbgl remaining stable after 20 minutes.
 - BH03 – strike at 0.70mbgl – perched water table

4.7 Groundwater Monitoring

- 4.7.1 GeoCon have not been commissioned to carry out any groundwater monitoring at the site.

4.8 Obstructions

- 4.8.1 No obstructions were encountered during this ground investigation.

4.9 Contamination

- 4.9.1 No visual or olfactory evidence of contamination was encountered or observed during this ground investigation, in particular no obvious visual or olfactory evidence of mobile contamination was observed during the ground investigation.

5.0 GEOTECHNICAL TESTING AND RESULTS

5.1 In-situ Testing

- 5.1.1 In-situ Standard Penetration Tests (SPTs) were undertaken in accordance with BS1377 (1990) within the window sample boreholes. A summary of the insitu testing is given below in Table 5.1: Insitu Geotechnical Testing.

Table 5.1: Insitu Geotechnical Testing

Strata	SPT N Value vs Depth Range	Locations Encountered
Made Ground	1.20 – 2.00m: 0 – 31	All Locations
Till (Cohesive)	2.00 – 16.00m: 14 - 47	All Location
Sandstone	16.00 – 20.00m: 50 - 50	BH01, BH02

NR = Not Recorded In This Strata

5.2 Laboratory Testing

- 5.2.1 A programme of geotechnical laboratory testing was undertaken in accordance with BS1377 (1990) 'Methods of tests for soils for civil engineering purposes. The geotechnical testing regime has been summarised below in Table 5.2: Geotechnical Laboratory Analysis.

Table 5.2: Geotechnical Laboratory Analysis

BS 1377 Test Number	Test Description	Quantity Analysed
BS 1377:1990 - Part 2 : 7.2	Density by Linear Measurement	12
BS1377 : Part7 : Clause 8	Quick Undrained Triaxial	12

- 5.2.2 The results of the geotechnical testing are presented in Appendix C.

Bulk Density Testing

- 5.2.3 The bulk density was obtained using the measurements from bulk density tests. The Dry density value ranged between 1.55 and 1.88mg/m³. The bulk density values range between 1.71 mg/m³ and 2.15 mg/m³. Moisture contents ranged between 10 and 25%.

Triaxial Testing

- 5.2.4 Twelve samples were analysed for Unconsolidated Undrained Triaxial Tests. The results are summarised below in Table 5.3: Triaxial Testing ResultsError! Reference source not found..

Table 5.3: Triaxial Testing Results

Test	Range
Moisture content %	11 -18
Bulk Density (mg/m ³)	1.86 – 2.08
Dry Density (mg/m ³)	1.60 – 1.85
Shear Strength (kPa)	9 - 208

6.0 GEOTECHNICAL ASSESSMENT

6.1 General

- 6.1.1 It is understood that the proposed development will comprise the construction of a new cyclist and pedestrian footbridge spanning the Ashton Canal.
- 6.1.2 At this stage GeoCon have not been provided with any loadings for the proposed development.
- 6.1.3 The recommendations given below assume that ground levels intended for the redevelopment will be similar to those existing at present. If ground levels are subject to significant change as part of the proposed development, then the recommendations in this report may require reinterpretation.

6.2 Geotechnical Model

- 6.2.1 Three Cable Percussion boreholes were formed over the area to be taken up by the proposed footbridge approach on each side of the Ashton Canal.
- 6.2.2 The ground conditions encountered within the exploratory holes are summarised below in Table 6.1: Summary of Ground Conditions.

Table 6.1: Summary of Ground Conditions

Stratum	Depth Range to Base of Stratum (mbgl) (Thickness Range)	Strength/Consistency	Notes
Made Ground and Topsoil			
Made Ground	1.50 to 3.00m (1.50 to 3.00m)	SPT 'N' values: 1.20 – 1.65: N = 0 - 14 2.00 – 2.45: N = 31	Made Ground was recorded at all locations and comprised of grass (with the exception of BH03 where hardstanding was encountered) overlying layers of granular and cohesive made ground materials
Natural Strata			
Till (Cohesive)	16.50 to 17.50m (14.00 to 15.00m)	Firm to very stiff consistency. SPT 'N' values: 2.00 – 2.45: N = 18 3.00 – 3.45: N = 14 - 20 4.00 – 4.45: N = 19 - 23 6.00 – 6.45: N = 17 - 20 8.00 – 8.45: N = 21 - 22 10.00 – 10.45: N = 23 - 24 12.00 – 12.45: N = 28 - 36 14.00 – 14.45: N = 30 - 42 16.00 – 16.45: N = 47 Undrained Shear Strength FROM TRIAXIAL RESULTS 9 kPa @ 2.00 – 2.45m 208 kPa @ 3.00-3.45m 194 kPa @ 5.00-5.45m 94 - 134 kPa @ 7.00-7.45m 80 kPa @ 9.00-9.45m 55 – 72 kPa @ 11.00-11.45m 162 kPa @ 13.00-13.45m 57 - 148 kPa @ 15.00-15.45m	Described in the field as an orangish brown very sandy clay. Encountered directly beneath the Made Ground at all locations
Sandstone Bedrock	20.10m+ (3.10m+)	SPT 'N' values: 16.00 – 16.45m: N = 50 17.0 – 17.45: N = 50/160mm	Recorded below the clay layer and generally described as a very weak weathered sandstone

Stratum	Depth Range to Base of Stratum (mbgl) (Thickness Range)	Strength/Consistency	Notes
		17.50 – 17.95: N = 50/75mm 18.50 – 18.95: N = 50/65mm 20.00 – 20.45: N = 50/75mm	
* - Corrected for fines content in accordance with NHBC Chapter 4.2.			

6.2.3 The bulk density was obtained using the measurements from bulk density tests. The Dry density value ranged between 1.55 and 1.88mg/m³. The bulk density values range between 1.71mg/m³ and 2.15mg/m³. Moisture contents ranged between 10 and 25%.

6.2.4 Groundwater was encountered in BH01, with a strike at 16.00mbgl remaining stable after 20 minutes. A perched water table was observed within made ground materials at 0.70mbgl.

6.3 Foundations

6.3.1 The made ground in its current setting would not be suitable for the construction of shallow foundations due to the risk of unacceptable total and differential settlement occurring. These soils are present in a weak and variable condition such that excessive total and or differential settlement could occur under moderately light surface loading.

6.3.2 Due to the thickness of made ground beneath the surface it is recommended that a piled foundation solution should be adopted for the construction of the new development at this site to transfer the foundation loads through the made ground and shallow natural soils to more competent strata at depth. In order to formulate a suitable design, it is recommended that the advice of specialist piling contractors be sought. In addition, the pile design should include provision for negative skin friction within the made ground soils as these deposits may be subject to collapse compression if not treated.

6.3.3 In view of the relatively weak near surface soils, it will be necessary to construct a working platform for the piling rig and any other plant required during the works. Such a design should be undertaken in accordance with the procedures given in the BRE publication: Working platforms for tracked plant.

6.3.4 As an alternative to the use of piled foundations, consideration may be directed towards ground improvement techniques such as vibro-stone columns, dynamic compaction or modification with lime or cement. In order to formulate a suitable design, it is recommended that the advice of a competent structural engineer is sought.

6.3.5 Interactions between new and existing foundations and retaining walls would need to be considered, as would the potential for differential settlement between new and existing structures. A construction joint should be incorporated at the interface between any new and existing structures. Particular care will be required to ensure that the new basement does not adversely impact the existing foundations.

6.4 Groundwater and Excavations

6.4.1 Groundwater or perched water is likely to represent a particular problem to the construction of the proposed development at this site, given the canal intersecting the site. However, it should be recognized that slight seepages and minor water entries may combine in any long trench excavations to create a significant volume of water which may cause local problems during the construction phase. Any minor groundwater seepages or significant standing water within excavations made upon this site may be removed by using a simple form of de-watering. Such a system could include the excavation of sumps from which the water could be pumped. Advice on Groundwater Control is given in CIRIA Report No 515 – Groundwater Control Design and Practice.

6.4.2 Foundation excavations should be feasible using conventional plant.

- 6.4.3 The stability of the excavation faces cannot be guaranteed, thus temporary support to the excavation faces may become necessary. Alternatively, subject to space constraints, excavations could be battered back to a suitable angle of repose. However, if there is a requirement to protect nearby structures or services, appropriate supports may still be required. Advice on excavation support is given in CIRIA Report No 97 – Trenching Practice.

6.5 Road Pavement

- 6.5.1 Any new pavements will require assessment of the existing sub grade in terms of its California Bearing Ratio (CBR) to facilitate the actual pavement design.
- 6.5.2 It is recommended that CBR testing is carried out at the site along any proposed access roads and / or parking areas prior to construction to confirm the CBR design value.

6.6 Existing structures

- 6.6.1 Any existing structures and foundations if found should be grubbed up and replaced with a suitable engineered granular backfill and should be compacted in layers.

6.7 Material Re-Use

- 6.7.1 Any site won soils / materials may be available for reuse across the site subject to the appropriate classification, analysis and engineered solution.

6.8 Further Work

- 6.8.1 Due to the geotechnical recommendations, consultation with a suitable piling contractor is recommended and the results of the report provided to assist in piling design for the footbridge.

7.0 CHEMICAL TESTING AND RESULTS

7.1 General

- 7.1.1 All samples were sent to a UKAS accredited chemical testing laboratory, and MCERTS were used where available. The analytical strategy focussed on a general suite of potential contaminants and the analytical suites are summarised in Table 7.1: Summary of Chemical Testing Suite.

Table 7.1: Summary of Chemical Testing Suite

Testing	Comment	No. of soil samples analysed
WAC E	Waste Acceptance Criteria testing to inform on disposal of waste from the site development	4

- 7.1.2 All chemical testing results are presented in Appendix D.

8.0 OTHER POTENTIAL DEVELOPMENT CONSIDERATIONS

8.1 Waste Soils Characterisation

- 8.1.1 Any excavation works may potentially produce waste soils for which appropriate waste management will be required. Any soils requiring removal and disposal from site would require appropriate classification testing prior to disposal and the results would need to be confirmed with the landfill operator. Isolated hotspots if encountered may need to be taken off as Non-Hazardous or Hazardous waste. Any off-site disposal of soil requires careful management and due consideration of appropriate legislation, guidance and Duty of Care responsibilities.
- 8.1.2 A Hazardous Waste Assessment should be carried out on any materials requiring removal and disposal from site.
- 8.1.3 Waste Acceptance Criteria (WAC) testing has been carried out four samples of potential materials requiring disposal from site. The results of the WAC testing should be presented to the landfill operator for their confirmation of waste category.

8.2 Imported Fill

- 8.2.1 Any imported fill will be subject to specific quality requirements, particularly in any proposed areas of landscaping. Allowance should be made for the testing of imported fill materials prior to emplacement to ensure suitability should the materials be delivered with no testing certification.

8.3 Construction Activities

- 8.3.1 Due consideration should be given to the suppression of noise, dust and vibration emissions from the site during construction.

8.4 Previously Unidentified Contamination

- 8.4.1 If, during the course of the groundworks phase of the construction, previously unidentified contamination is encountered or suspected to have been encountered, samples of the potentially contaminated material should be tested and if appropriate a Remediation Strategy provided to advise on how to remediate this material.
- 8.4.2 The LPA should be informed that potentially contaminated material has been encountered and should be kept informed at all times with respect to work relating to previously unidentified contamination.

9.0 REFERENCES

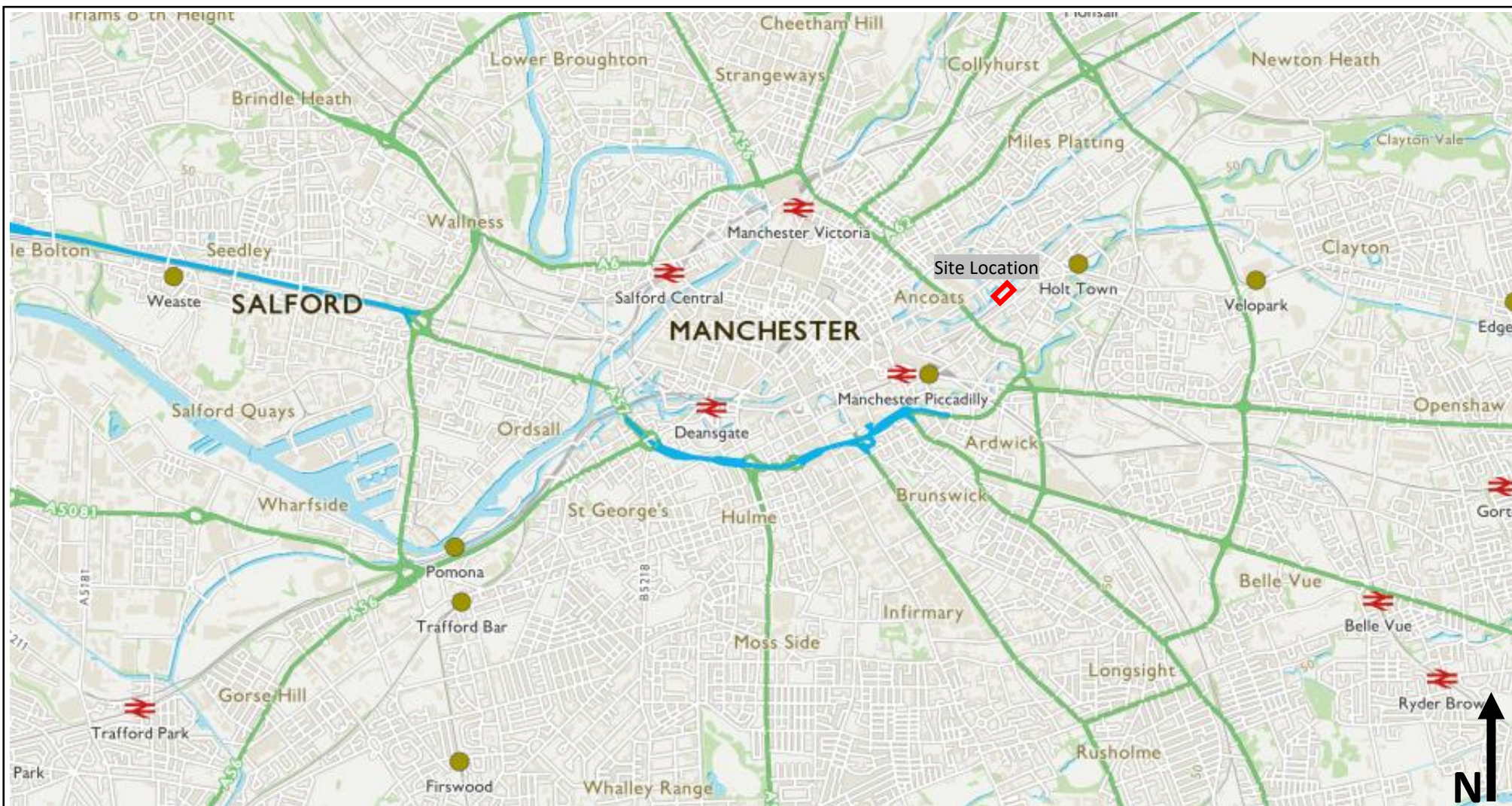
- AGS: *A clients guides and tool kit*
- Atkins: *AtRisk Soil Screening Values and Water Screening Values*
- British Geological Survey (BGS): *1:50'000 geological maps of the area*
- British Geological Survey (BGS): *Open geoscience online mapping tool*
- BS 5930: *code of Practise for Site Investigation Amendment 2*
- BS 10175: *Code of Practise for the Investigation of Potentially Contaminated Sites*
- BRE 211 Radon: *Guidance on protective measures for new buildings*
- CIRIA 552: *Contaminated Land Risk Assessment; A Guide to Good Practise 2001*
- CIRIA 665: *Assessing the Risks Posed by Hazardous Ground Gases for Buildings 2007*
- Coal Authority: *Coal authority mining report and Cheshire brine subsidence report*
- *Contaminated Land: Applications in Real Environments (CL:AIRE): 'The Soil Generic Assessment Criteria for Human Health Risk Assessment' GAC's.*
- David Norbury: *Soil and Rock Descriptions in Engineering Practise*
- Department of the Environment: *DOE industry profiles*
- EN ISO 14688-1: *Geotechnical investigation and testing -- Identification and classification of soil -- Part 1: Identification and description*
- EN ISO 14688-2: *Geotechnical investigation and testing -- Identification and classification of soil -- Part 2: Principles for a classification*
- EN ISO 14689: *Geotechnical investigation and testing -- Identification and classification of rock -- Part 1: Identification and description*
- Environment Agency (EA): *EA Online & What's in my back yard*
- Environment Agency (EA): *Soil Guideline Values (SGVs)*
- Land Quality Management (LQM): *Generic Screening Criteria (GACs)*
- Landmark: *Envirocheck report and Envirocheck analysis online historical mapping tool.*
- Ordnance survey: *OS Landranger map for the area; OS open data online mapping tool*
- Planning Policy 23: *Planning and Pollution Control, Office of The Deputy Prime Minister 2004*
- R&D Publication CLR 8: *Assessment of risks to human health from land contamination.*
- R&D Publication CLR 10: *The Contaminated Land Exposure Model (CLEA)*
- R&D Publication CLR 11: *Model Procedure for the Management of Contaminated Land DEFRA 2004*
- UK Specification for Ground Investigation Second Edition 2012

LIST OF ACRONYMS

Acronym	Meaning
BGS	British Geological Survey
BH	Borehole
CDM	Construction Design and Management
CL:AIRE	Contaminated Land: Applications In Real Environments
CLR	Contaminated Land Report
COSHH	Control Of Substances Hazardous to Health
CSM	Conceptual Site Model
DCP	Dynamic Cone Penetrometer
DEFRA	Department for Environment Foods and Rural Affairs
DP	Dynamic Probe
DoE	Department of Environment
DWS	Drinking Water Standard
EA	Environment Agency
EQS	Environmental Quality Standard
GAC	Generic Acceptance Criteria
HP	Hand Pit
HA	Hand Auger
LPA	Local Planning Authority
LQM	Land Quality Management
mbgl	Metres Below Ground Level
MP	Mackintosh Probe
NPPF	National Planning Policy Framework
NGR	National Grid Reference
OS	Ordnance Survey
SGV	Soil Guideline Value
SSV	Soil Screening Value
WSV	Water Screening Value
SPOSH	Significant Possibility of Significant Harm
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
TP	Trial Pit
TT	Trial Trench
WS	Windowless Sample / Window Sample

APPENDIX A

DRAWINGS



Land Adjacent to: New Islington tram station, M4 6BU



GeoCon Site Investigations Ltd
Suite 2 Marple House,
39 Stockport Road,
Marple,
Stockport,
SK6 6BD.
Tel: 0844 504 3901, Fax: 0844 504 3902,
Email: info@geoconsiteinvestigations.com
Web: www.geoconsiteinvestigations.com

SITE NAME

GSI 1595, New Islington

JOB NUMBER

GSI 1595/01

SCALE

N.T.S

TITLE

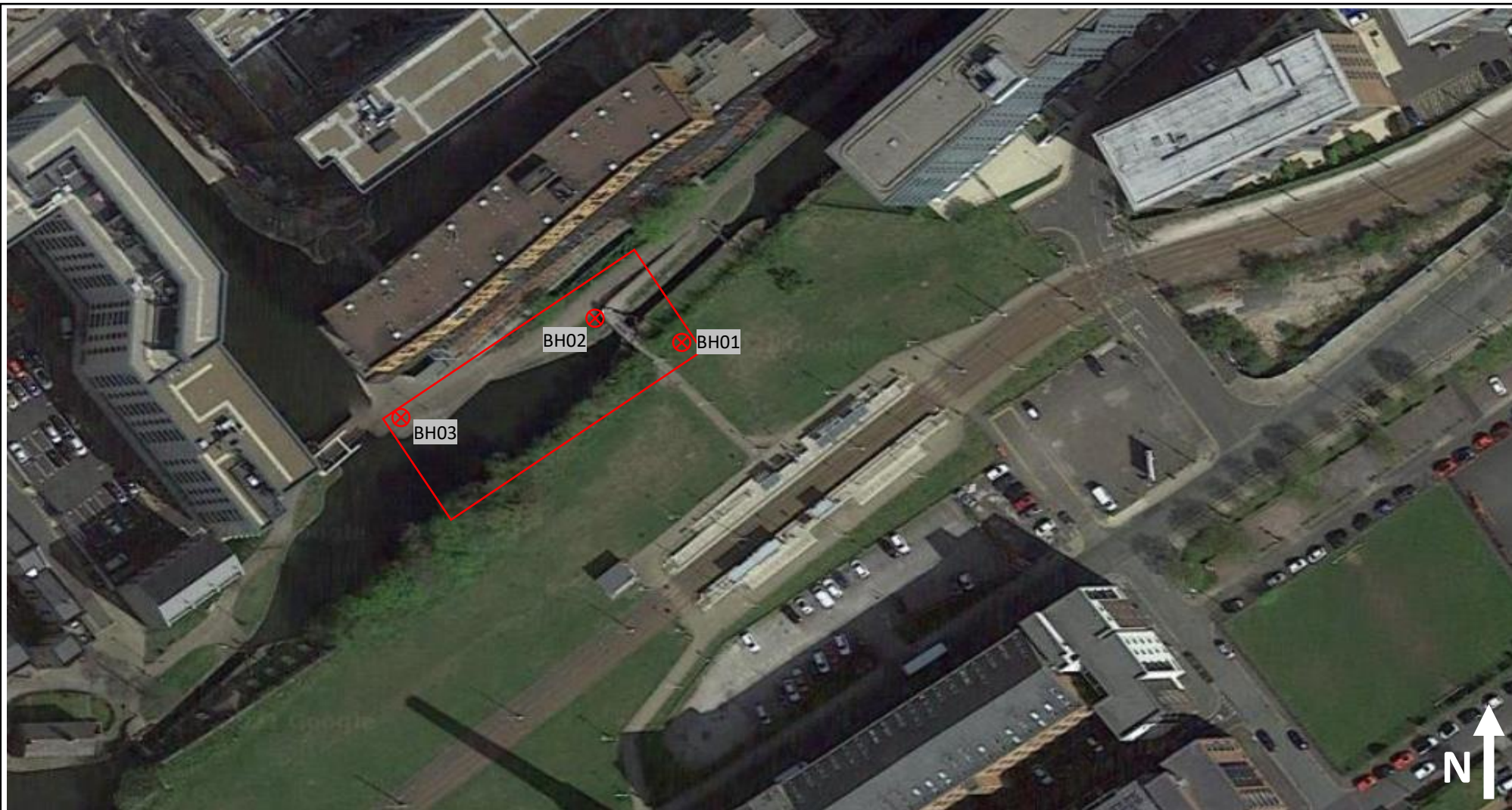
Site Location

DATE

08/12/21

DRAWN BY

HH



Land Adjacent to: New Islington tram station, M4 6BU



GeoCon Site Investigations Ltd
Suite 2 Marple House,
39 Stockport Road,
Marple,
Stockport,
SK6 6BD.
Tel: 0844 504 3901, Fax: 0844 504 3902,
Email: info@geoconsiteinvestigations.com
Web: www.geoconsiteinvestigations.com

SITE NAME

GSI 1595 New Islington

JOB NUMBER

GSI 1595

SCALE

N.T.S

TITLE

Exploratory Hole Locations

DATE

09/12/21

DRAWN BY

HH

APPENDIX B
BOREHOLE LOGS



CABLE PERCUSSION BOREHOLE LOG

Project New Islington				BOREHOLE No BH01	
Project ID GSI1595	Date 29-11-12 01-12-21	Ground Level (m)	Co-Ordinates		
Contractor				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument & Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.25	ES					0.40	MADE GROUND: Brown clayey gravel fine to coarse SAND. Grvel is angular to subangular fine to coarse of brick.	MG	
0.60	ES								
1.20	B					(1.90)	MADE GROUND: Greyclayey gravelly fine to coarse SAND with a cobble content. Gravel is angular to subangular fine to coarse of limestone, brick and concrete. Cobbles are angular to subangular of brick and concrete.	MG	
1.20	SPT	N14							
2.00	SPT	N31				2.30			
2.50	B					3.00	MADE GROUND: Soft to firm dark grey sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of brick and concrete.	MG	
2.80	ES								
3.00	B								
3.00	SPT	N20							
3.70	D								
4.00	SPT	N19							
5.00	U100								
6.00	B								
6.00	SPT	N20							
7.00	U100								
8.00	B								
8.00	SPT	N21							
9.00	U100								
10.00	B					(14.00)			
10.00	SPT	N23							
11.00	U100								
12.00	B								
12.00	SPT	N28							
13.00	U100								
14.00	B								
14.00	SPT	N30							
15.00	U100								
16.00	B								
16.00	SPT	N47				17.00			
17.00	B								
17.00	SPT	N50/ 160 mm							
18.50	SPT	N50/ 65 mm				(3.10)	Brown gravelly fine to coarse SAND with a cobble content. Gravel is angular to rounded fine to coarse of sandstone. Cobbles are subangular to subrounded of sandstone. (DEVENSIAN TILL)	TILLD	
20.00	SPT	N50/ 75 mm				20.10			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											Inspection pit hand excavated to 1.2mbgl prior to drilling. Groundwater was not observed. Upon completion the hole was backfilled with bentonite.
All dimensions in metres Scale 1:131.25			Client Wilde Consultants Ltd			Method / Plant Used Dando 2000			Logged By HH		

CABLE PERCUSSION BOREHOLE LOG

Project New Islington				BOREHOLE No BH02	
Project ID GSI1595	Date 02-12-21 03-12-21	Ground Level (m)	Co-Ordinates		
Contractor				Sheet 1 of 1	

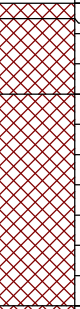
SAMPLES & TESTS			STRATA					Geology	Instrument & Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.30	ES					0.40	MADE GROUND: Dark grey clayey gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular of brick and concrete.	MG	
0.90	ES					1.00	MADE GROUND: Soft greyish brown sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of brick and concrete.	MG	
1.20	B	N0							
1.20	SPT								
2.00	B	N18							
2.00	SPT								
3.00	U100								
4.00	B	N23							
4.00	SPT								
5.00	U100								
6.00	B	N17							
6.00	SPT								
7.00	U100								
8.00	B	N22							
8.00	SPT								
9.00	U100								
10.00	B	N24							
10.00	SPT								
11.00	U100								
12.00	B	N36							
12.00	SPT								
13.00	U100								
14.00	B	N42							
14.00	SPT								
15.00	U100								
16.00	B	N50				16.50			
16.00	SPT								
16.50	B								
17.50	SPT	N50/75 mm				17.62	Brown gravelly fine to coarse SAND with a cobble content. Gravel is angular to rounded fine to coarse of sandstone. Cobbles are subangular to subrounded of sandstone. (DEVENSIAN TILL)	TILLD	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											Inspection pit hand excavated to 1.2mbgl prior to drilling. Perched water was encountered at 1.00mbgl. Upon completion the hole was backfilled with bentonite.

All dimensions in metres Scale 1:125	Client Wilde Consultants Ltd	Method / Plant Used Dando 2000	Logged By HH
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CABLE PERCUSSION BOREHOLE LOG

Project New Islington				BOREHOLE No BH03	
Project ID GSI1595	Date 03-12-21 03-12-21	Ground Level (m)	Co-Ordinates		
Contractor				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument & Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.40 0.50	ES D	N11				0.05	MADE GROUND: Cemented GRAVEL of various lithologies.	MG	
						(0.25) 0.30	MADE GROUND: Grey GRAVEL. Angular to subangular fine to coarse of limestone.	MG	
						(0.70)	MADE GROUND: Grey sandy gravelly CLAY. Gravel is angular to subangular fine to medium of limestone.	MG	
0.90 1.20 1.20	ES B SPT	N11				1.00	MADE GROUND: Soft grey sandy CLAY.	MG	
						(2.00) 3.00			
3.00 3.00	B SPT	N14				(0.45) 3.45	Firm brown sandy gravelly CLAY. Gravel is angular to rounded fine to coarse of sandstone. (DEVENSIAN TILL)	TILLD	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Depth	From	To	Hours	From	To	
											Inspection pit hand excavated to 1.2mbgl prior to drilling. Perched water was encountered at 1.00mbgl. Upon completion the hole was backfilled with bentonite. Postcrete was used to reinstate footpath.
All dimensions in metres Scale 1:25			Client Wilde Consultants Ltd			Method / Plant Used Dando 2000			Logged By HH		

APPENDIX C
GEOTECHNICAL LABORATORY
RESULTS



Laboratory Report



Contract Number: 57255

Client Ref: **GSI 1595**

Report Date: **24-01-2022**

Client PO:

Client **GeoCon Site Investigation Limited**
Suite 2, Marple House
39 Stockport Road, Marple
Stockport
SK6 6BD

Contract Title: **New Islington**
For the attention of: **Ian Walker**

Date Received: **16-12-2021**

Date Completed: **24-01-2022**

Test Description	Qty
Density by Linear Measurement BS 1377:1990 - Part 2 : 7.2 - * UKAS	12
Quick Undrained Triaxial Compression test - single specimen at one confining pressure (100mm or 38mm diameter) BS 1377:1990 - Part 7 : 8 - * UKAS	11
Samples Received - @ Non Accredited Test	24
Disposal of samples for job	1

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

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Emma Sharp (Business Support Manager) - Paul Evans (Director) - Richard John (Quality/Technical Manager)

Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager) - Wayne Honey (Quality Assistant / Administrator / Health and Safety Coordinator)

GEO Site & Testing Services Ltd

Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN

Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

SUMMARY OF SOIL DENSITY TESTS (BS 1377 : PART 2 : 7.2 : 1990)

Contract Number	57255	
Site Name	New Islington	
Date Tested	12/01/2022	

[illegible]

<u>Key</u>	<u>Reported As</u>
Moisture Content	%
Bulk Density	Mg/m ³
Dry Density	Mg/m ³
Particle Density	Mg/m ³
Air Voids	%

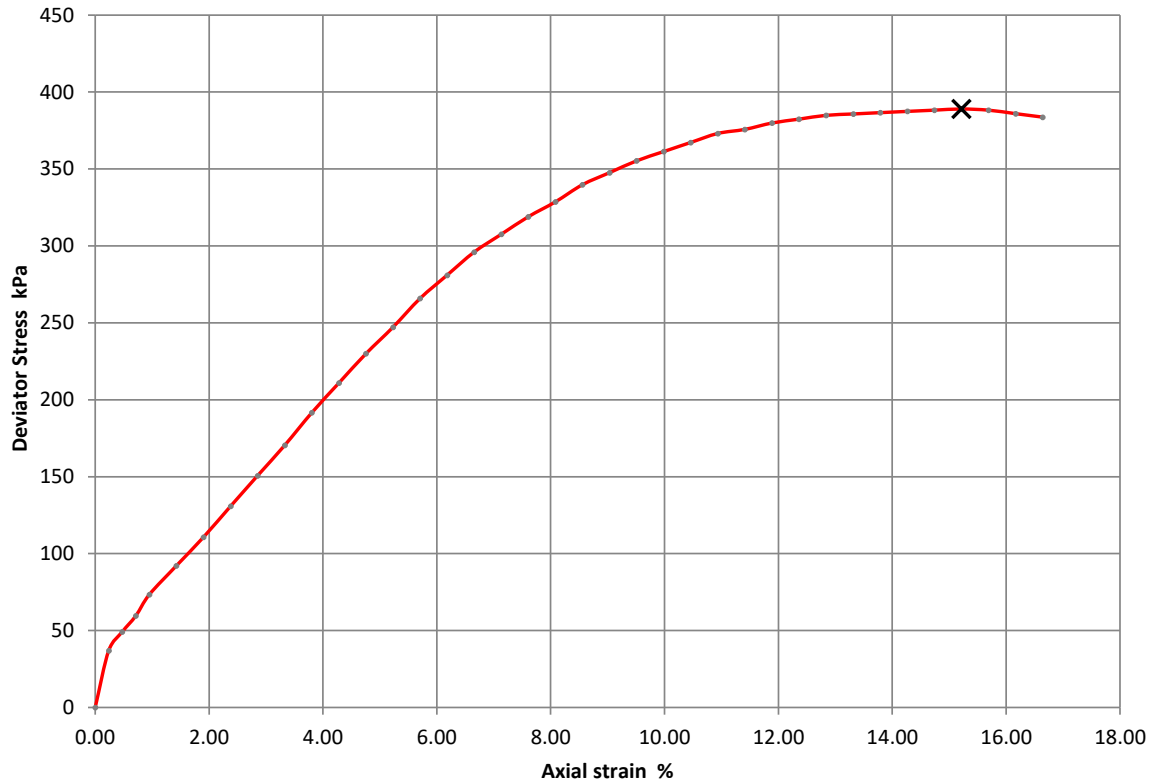
Operators	Checked	23/01/2022	Richard John	
Conor	Approved	24/01/2022	Paul Evans	



**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number	57255
Borehole/Pit No.	BH01
Sample No.	
Depth Top (m)	5.00
Depth Base (m)	
Sample Type	U
Technician	Jordan Williams

Site Name	New Islington
Soil Description	Brown silty CLAY
Date Tested	21/01/2022



Moisture Content (%)	18
Bulk Density (Mg/m ³)	1.92
Dry Density (Mg/m ³)	1.63
Specimen Length (mm)	210.32
Specimen Diameter (mm)	108.1
Cell Pressure (kPa)	100
Deviator Stress (kPa)	389
Undrained Shear Strength (kPa)	194
Failure Strain (%)	15
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.43

Checked	23/01/2022	Richard John	
Approved	24/01/2022	Paul Evans	

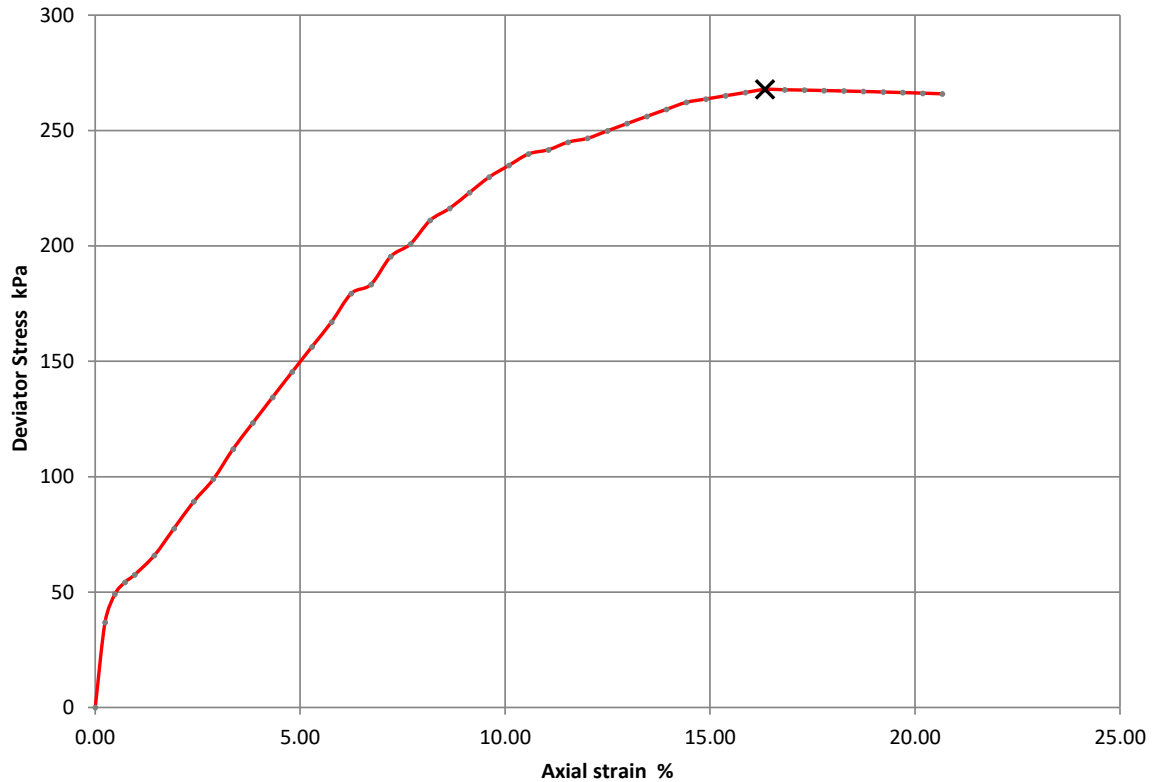




**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number	57255
Borehole/Pit No.	BH01
Sample No.	
Depth Top (m)	7.00
Depth Base (m)	
Sample Type	U
Technician	Jordan Williams

Site Name	New Islington
Soil Description	Brown fine to coarse gravelly silty CLAY
Date Tested	21/01/2022



Moisture Content (%)	17
Bulk Density (Mg/m ³)	1.91
Dry Density (Mg/m ³)	1.64
Specimen Length (mm)	208.1
Specimen Diameter (mm)	108.2
Cell Pressure (kPa)	140
Deviator Stress (kPa)	268
Undrained Shear Strength (kPa)	134
Failure Strain (%)	16
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.44

Checked	23/01/2022	Richard John	
Approved	24/01/2022	Paul Evans	

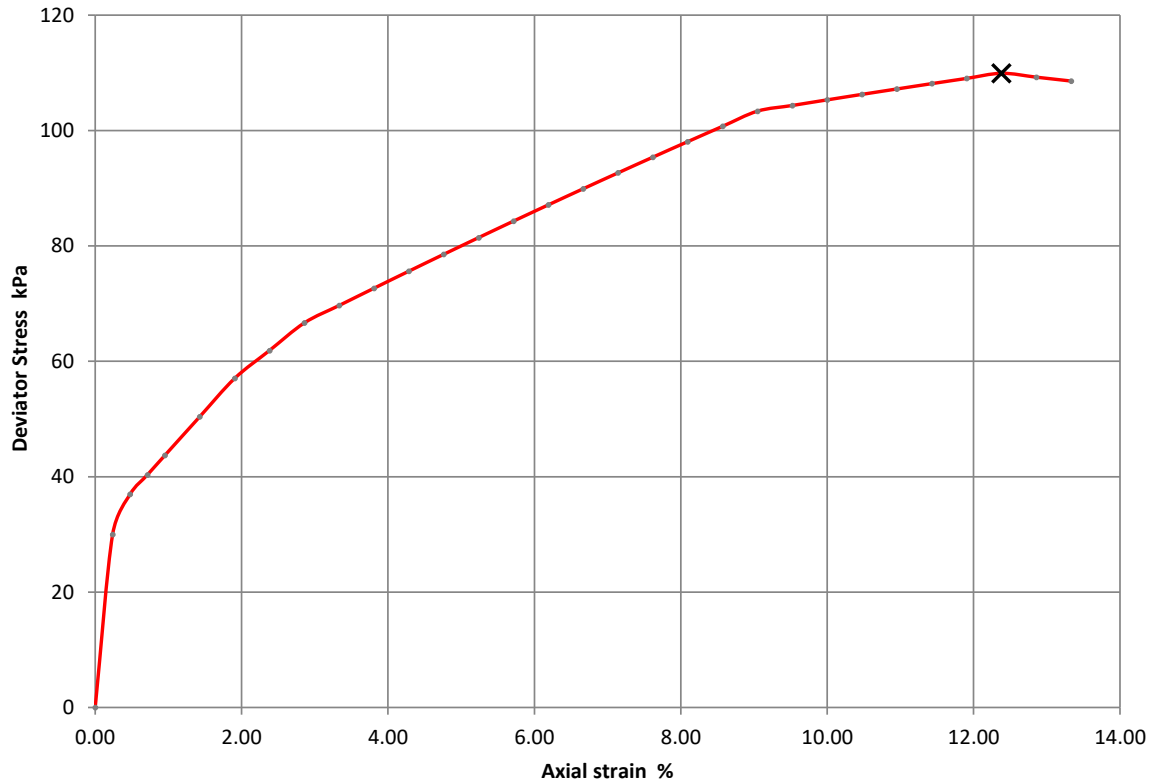




**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number	57255
Borehole/Pit No.	BH01
Sample No.	
Depth Top (m)	11.00
Depth Base (m)	
Sample Type	U
Technician	Jordan Williams

Site Name	New Islington
Soil Description	Brown fine to coarse gravelly silty CLAY
Date Tested	21/01/2022



Moisture Content (%)	17
Bulk Density (Mg/m ³)	1.94
Dry Density (Mg/m ³)	1.66
Specimen Length (mm)	210
Specimen Diameter (mm)	108
Cell Pressure (kPa)	220
Deviator Stress (kPa)	110
Undrained Shear Strength (kPa)	55
Failure Strain (%)	12
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.43

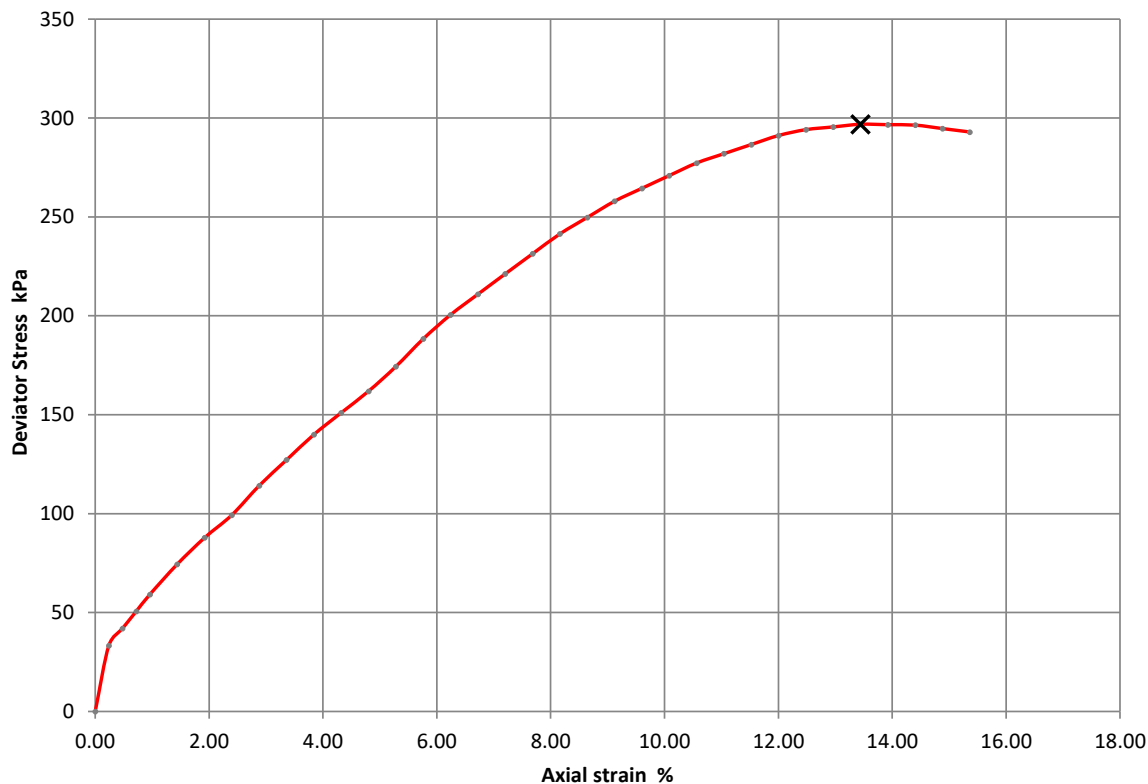
Checked	23/01/2022	Richard John	
Approved	24/01/2022	Paul Evans	





**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number	57255
Borehole/Pit No.	BH01
Site Name	New Islington
Sample No.	
Soil Description	Brown fine to coarse gravelly sandy silty CLAY
Depth Top (m)	15.00
Depth Base (m)	
Date Tested	21/01/2022
Sample Type	U
Technician	Jordan Williams



Moisture Content (%)	11
Bulk Density (Mg/m ³)	2.05
Dry Density (Mg/m ³)	1.85
Specimen Length (mm)	208.3
Specimen Diameter (mm)	108.3
Cell Pressure (kPa)	300
Deviator Stress (kPa)	297
Undrained Shear Strength (kPa)	148
Failure Strain (%)	13
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.44

Checked	23/01/2022	Richard John	
Approved	24/01/2022	Paul Evans	

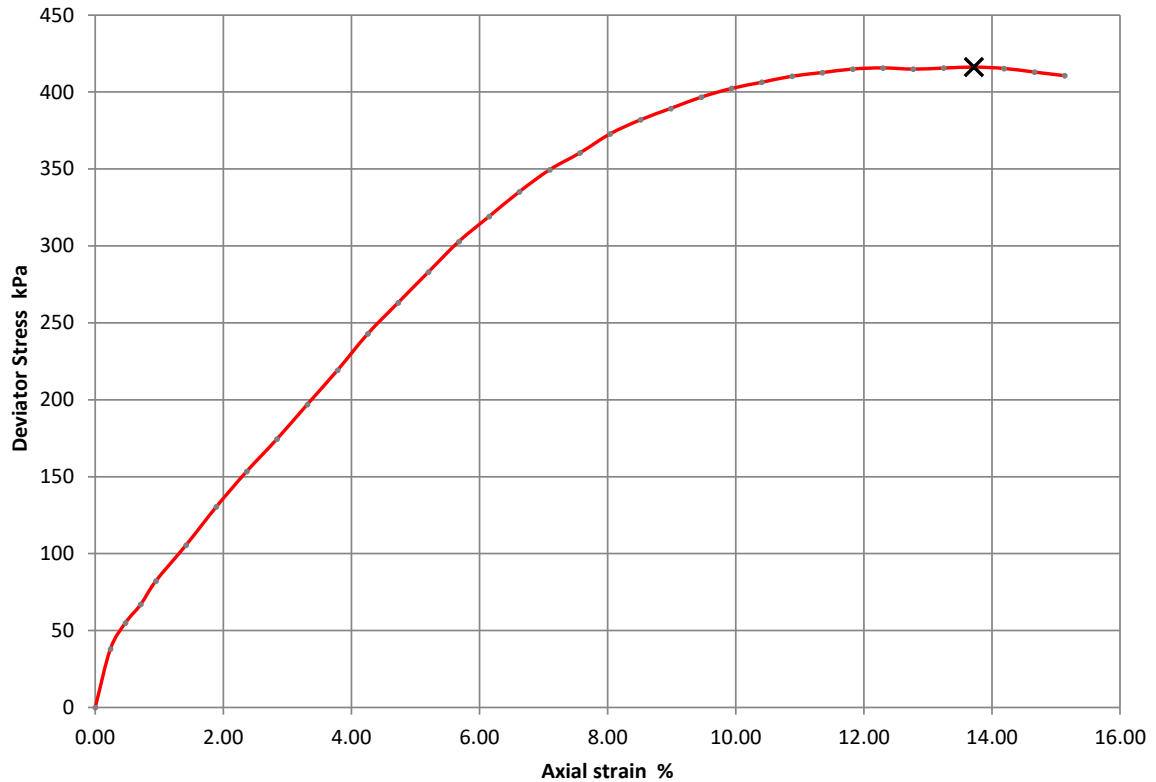




**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number	57255
Borehole/Pit No.	BH02
Sample No.	
Depth Top (m)	3.00
Depth Base (m)	
Sample Type	U
Technician	Jordan Williams

Site Name	New Islington
Soil Description	Brown silty CLAY
Date Tested	21/01/2022



Moisture Content (%)	17
Bulk Density (Mg/m ³)	1.86
Dry Density (Mg/m ³)	1.60
Specimen Length (mm)	211.41
Specimen Diameter (mm)	109.24
Cell Pressure (kPa)	60
Deviator Stress (kPa)	416
Undrained Shear Strength (kPa)	208
Failure Strain (%)	14
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.42

Checked	23/01/2022	Richard John	
Approved	24/01/2022	Paul Evans	

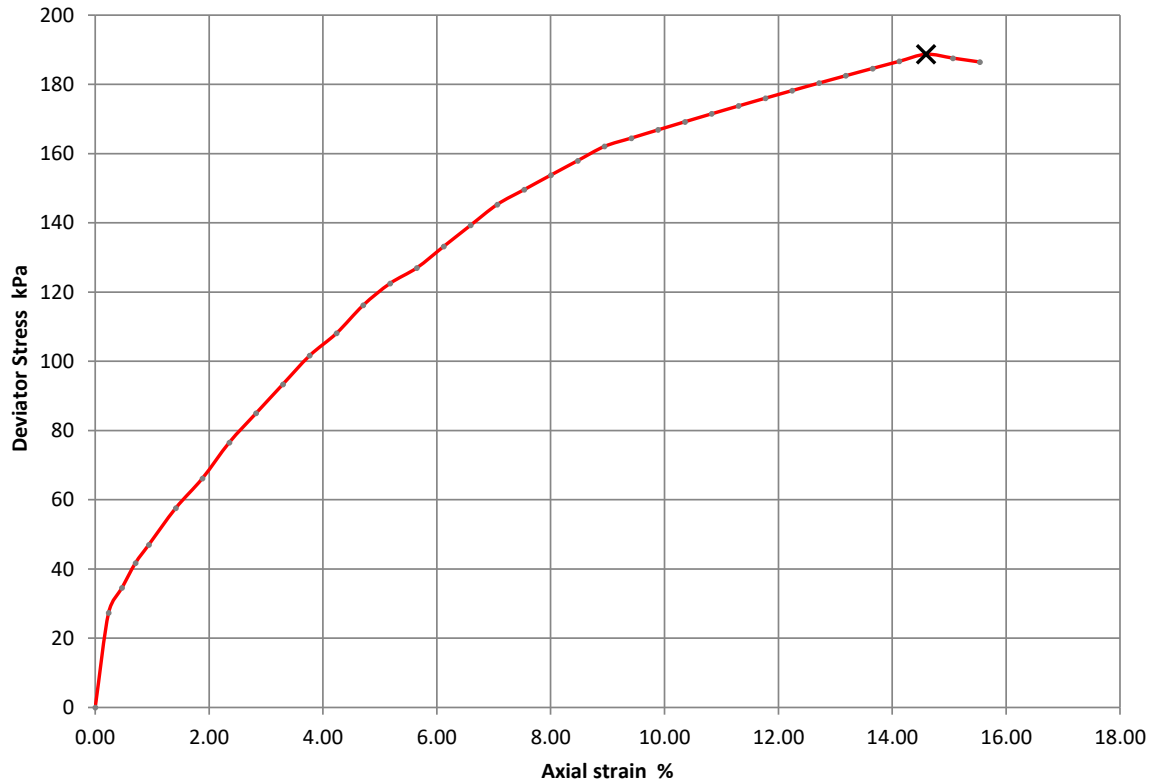




**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number	57255
Borehole/Pit No.	BH02
Sample No.	
Depth Top (m)	7.00
Depth Base (m)	
Sample Type	U
Technician	Jordan Williams

Site Name	New Islington
Soil Description	Brown fine to coarse gravelly silty CLAY
Date Tested	21/01/2022



Moisture Content (%)	16
Bulk Density (Mg/m ³)	2.02
Dry Density (Mg/m ³)	1.74
Specimen Length (mm)	212.4
Specimen Diameter (mm)	106.2
Cell Pressure (kPa)	140
Deviator Stress (kPa)	189
Undrained Shear Strength (kPa)	94
Failure Strain (%)	15
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.41

Checked	23/01/2022	Richard John	
Approved	24/01/2022	Paul Evans	

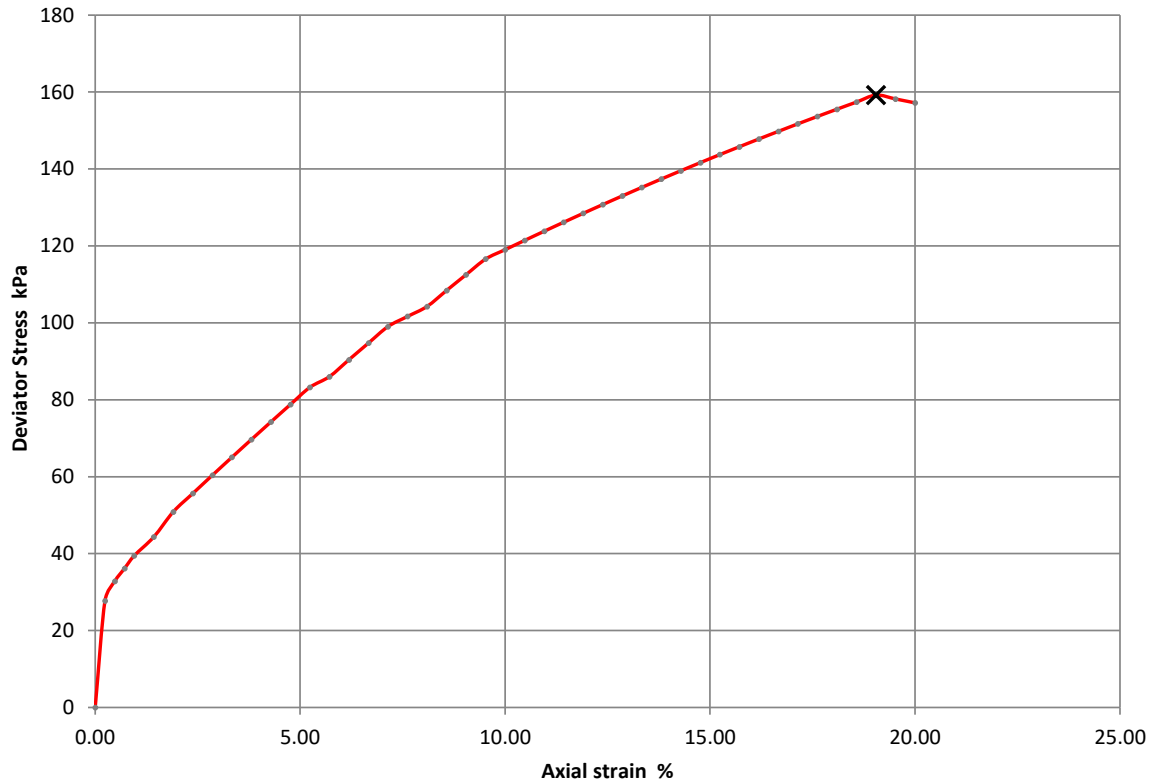




**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number	57255
Borehole/Pit No.	BH02
Sample No.	
Depth Top (m)	9.00
Depth Base (m)	
Sample Type	U
Technician	Jordan Williams

Site Name	New Islington
Soil Description	Brown fine to coarse gravelly silty CLAY
Date Tested	21/01/2022



Moisture Content (%)	17
Bulk Density (Mg/m ³)	2.02
Dry Density (Mg/m ³)	1.73
Specimen Length (mm)	210
Specimen Diameter (mm)	109
Cell Pressure (kPa)	180
Deviator Stress (kPa)	159
Undrained Shear Strength (kPa)	80
Failure Strain (%)	19
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.43

Checked	23/01/2022	Richard John	
Approved	24/01/2022	Paul Evans	

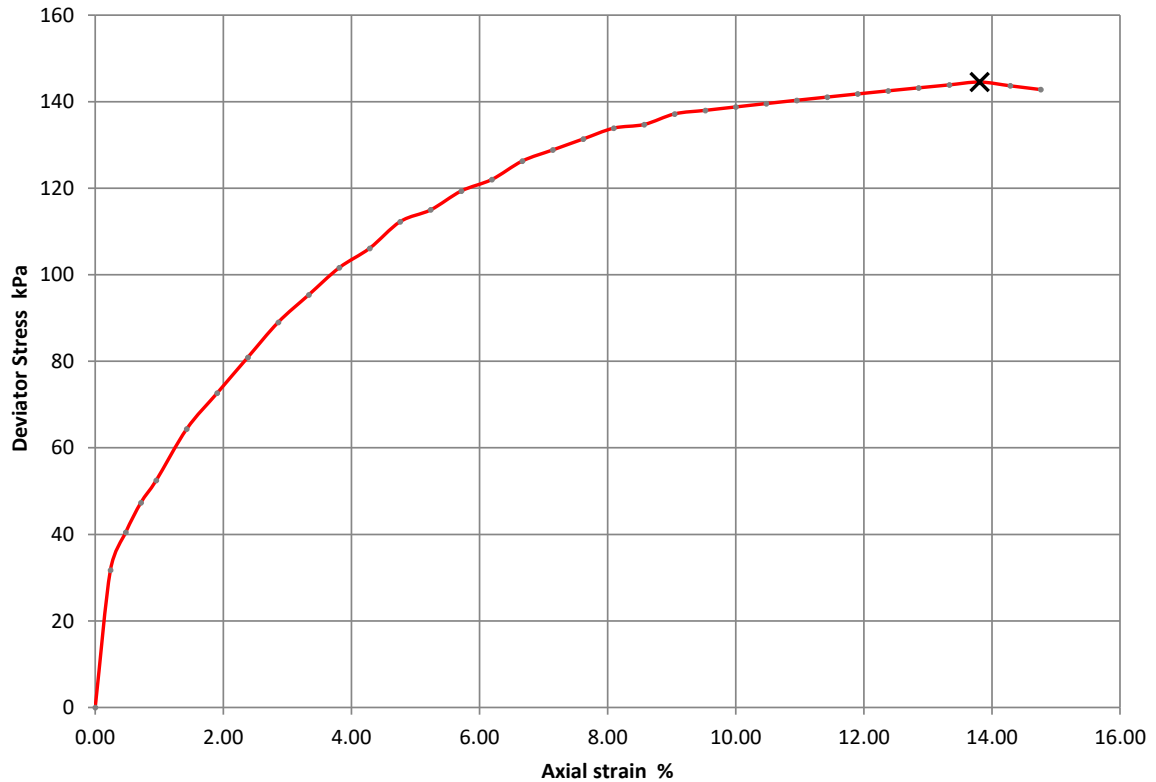




**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number	57255
Borehole/Pit No.	BH02
Sample No.	
Depth Top (m)	11.00
Depth Base (m)	
Sample Type	U
Technician	Jordan Williams

Site Name	New Islington
Soil Description	Brown silty CLAY
Date Tested	21/01/2022



Moisture Content (%)	16
Bulk Density (Mg/m ³)	1.98
Dry Density (Mg/m ³)	1.71
Specimen Length (mm)	210
Specimen Diameter (mm)	108
Cell Pressure (kPa)	220
Deviator Stress (kPa)	145
Undrained Shear Strength (kPa)	72
Failure Strain (%)	14
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.43

Checked	23/01/2022	Richard John	
Approved	24/01/2022	Paul Evans	

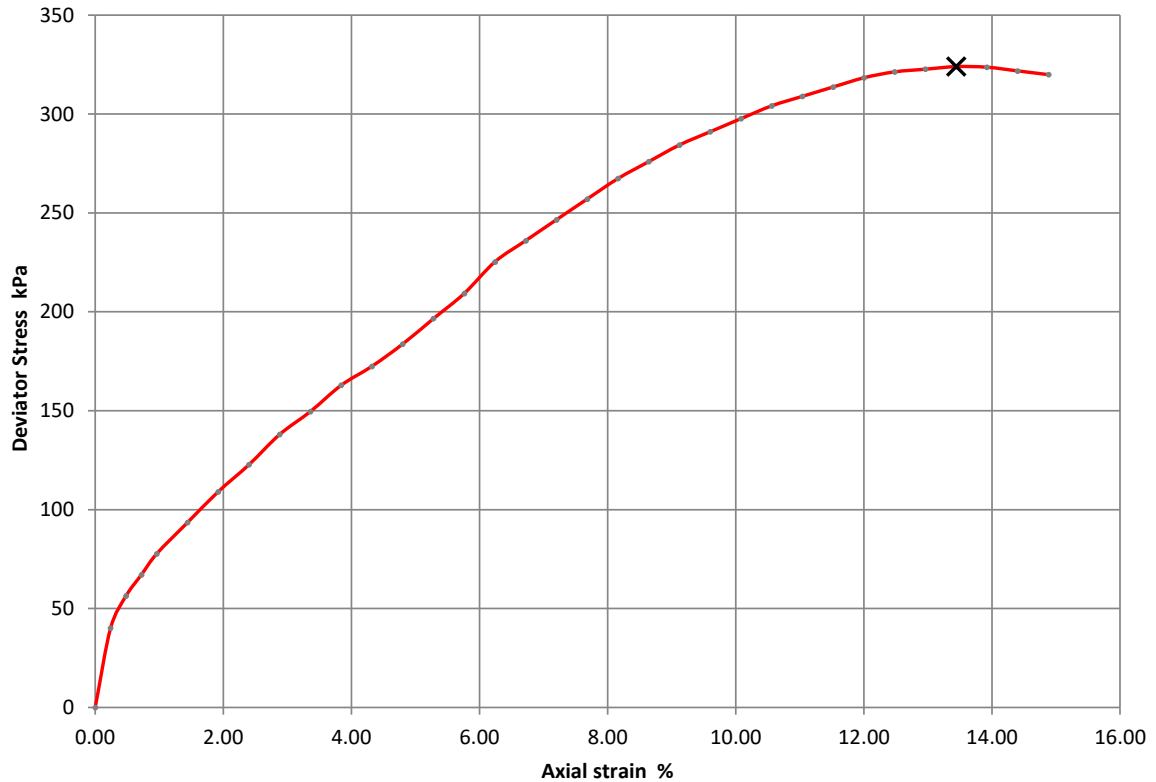




**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number	57255
Borehole/Pit No.	BH02
Sample No.	
Depth Top (m)	13.00
Depth Base (m)	
Sample Type	U
Technician	Jordan Williams

Site Name	New Islington
Soil Description	Brown silty CLAY
Date Tested	21/01/2022



Moisture Content (%)	16
Bulk Density (Mg/m ³)	2.02
Dry Density (Mg/m ³)	1.74
Specimen Length (mm)	208.29
Specimen Diameter (mm)	106.3
Cell Pressure (kPa)	260
Deviator Stress (kPa)	324
Undrained Shear Strength (kPa)	162
Failure Strain (%)	13
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.44

Checked	23/01/2022	Richard John	
Approved	24/01/2022	Paul Evans	

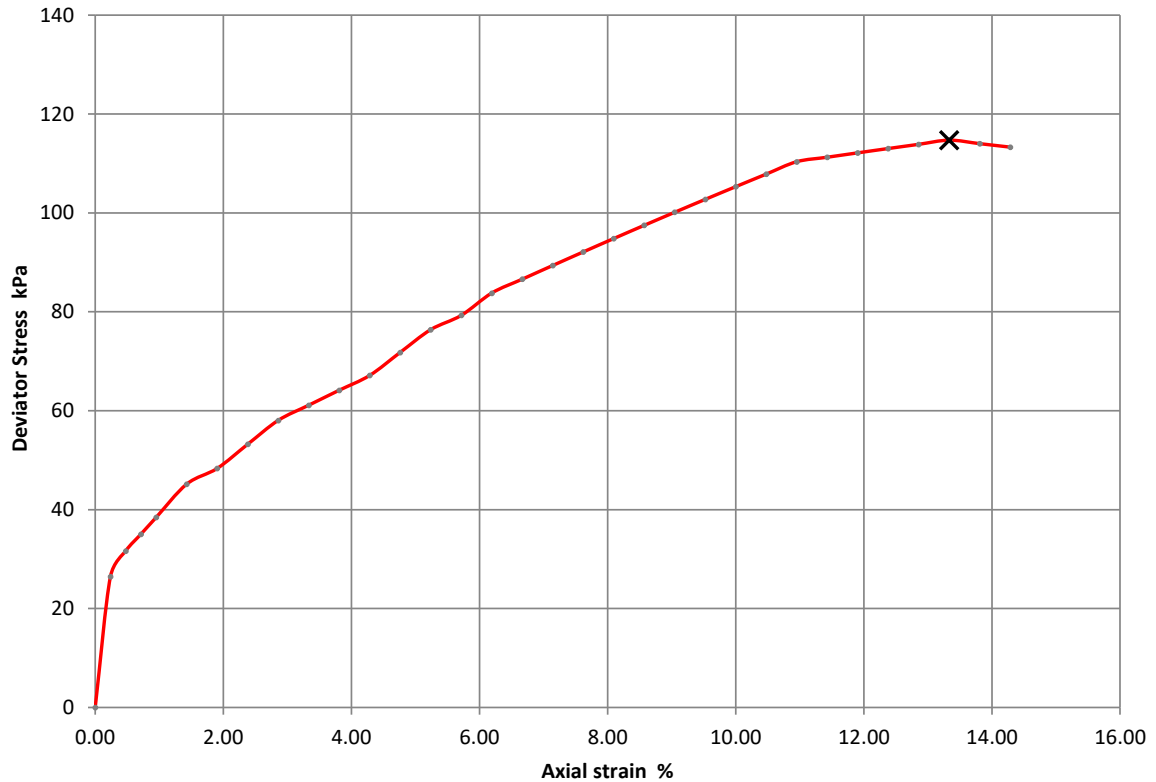




**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number	57255
Borehole/Pit No.	BH02
Sample No.	
Depth Top (m)	15.00
Depth Base (m)	
Sample Type	U
Technician	Jordan Williams

Site Name	New Islington
Soil Description	Brown fine to coarse gravelly silty CLAY
Date Tested	21/01/2022



Moisture Content (%)	14
Bulk Density (Mg/m ³)	2.01
Dry Density (Mg/m ³)	1.76
Specimen Length (mm)	210
Specimen Diameter (mm)	108
Cell Pressure (kPa)	300
Deviator Stress (kPa)	115
Undrained Shear Strength (kPa)	57
Failure Strain (%)	13
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.43

Checked	23/01/2022	Richard John	
Approved	24/01/2022	Paul Evans	

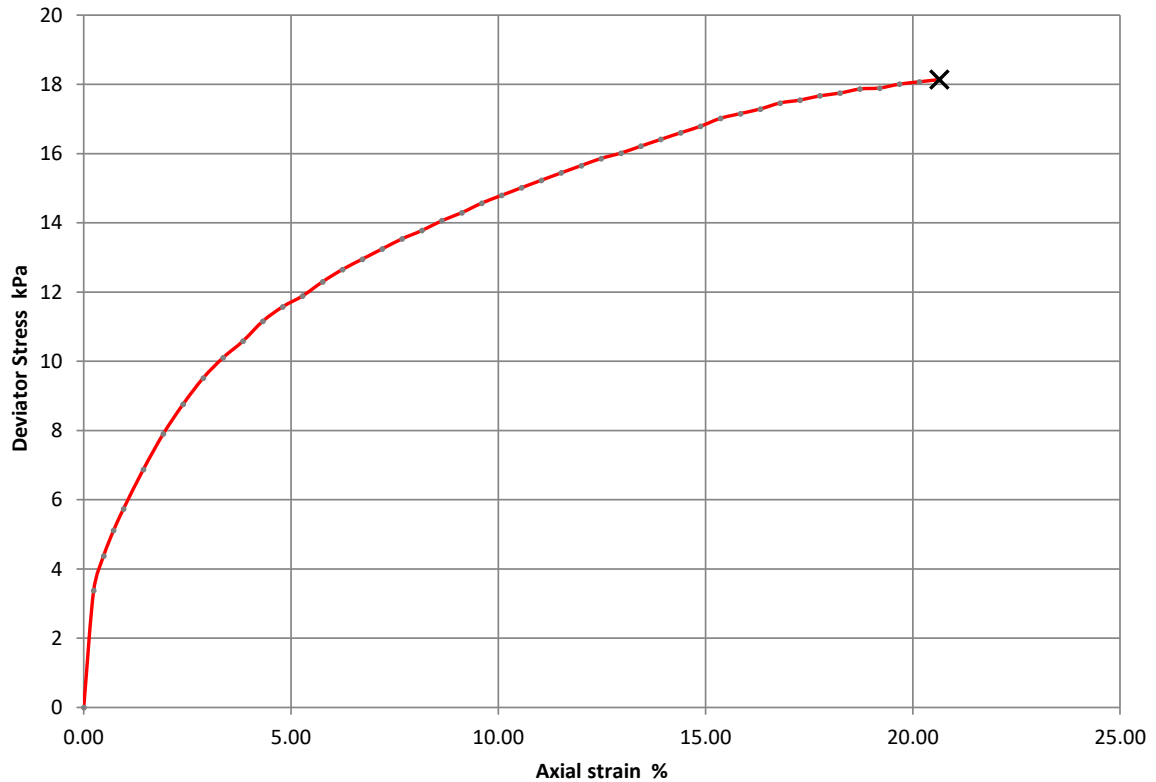




**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number	57255
Borehole/Pit No.	BH03
Sample No.	
Depth Top (m)	2.00
Depth Base (m)	
Sample Type	U
Technician	Jordan Williams

Site Name	New Islington
Soil Description	Brown fine to medium gravelly silty CLAY
Date Tested	21/01/2022



Moisture Content (%)	16
Bulk Density (Mg/m ³)	2.08
Dry Density (Mg/m ³)	1.79
Specimen Length (mm)	208.32
Specimen Diameter (mm)	104.32
Cell Pressure (kPa)	40
Deviator Stress (kPa)	18
Undrained Shear Strength (kPa)	9
Failure Strain (%)	21
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.44

Checked	23/01/2022	Richard John	
Approved	24/01/2022	Paul Evans	



APPENDIX D
CHEMICAL LABORATORY RESULTS

Final Test Report

Envirolab Job Number: 21/13864
Issue Number: 1

Date: 10-Jan-22

Client: Geocon Site Investigations Ltd
Suite 2 Marple House,
39 Stockport Road,
Marple
Stockport
UK, SK6 6BD

Project Manager: Use - Mailing list/Use - Mailing list 2
Project Name: New Islington
Project Ref: GSI 1595
Order No: PO 21/0751

Date Samples Received: 7-Dec-21
Date Instructions Received: 22-Dec-21
Date Analysis Completed: 10-Jan-22

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

HWOL TPH Code: EH_CU_1D_AL: Extractable hydrocarbons - i.e. everything extracted by the solvent(s), Clean-up - e.g. by florisil, silica gel, GC - Single coil gas chromatography, Aliphatics only

Approved by:



Sophie France
Client Service Manager

Sample Details								Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	21/13864/1						
Client Sample Number								Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH01						
Depth to Top				0.25						
Depth to Bottom										
Date Sampled				29/11/2021						
Sample Type				Solid						
Sample Matrix Code				7						
Solid Waste Analysis										
pH (pH Units) _D	A-T-031	N	N	8.49				-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.52				-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.13				-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	4.3				-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	1.82				3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	21.9				100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	44				500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007				1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01				6	-	-
Eluate Analysis				2:1	8:1	2:1	Cumulative 10:1	Limit values for compliance leaching test using		
				mg/l		mg/kg		BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.006	0.002	0.015	0.030	0.5	2	25
Barium	A-T-025	N	N	0.045	0.060	0.110	0.610	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.001	<0.002	<0.01	0.04	1	5
Chromium	A-T-025	N	N	0.049	0.022	0.120	0.260	0.5	10	70
Copper	A-T-025	N	N	0.028	0.008	0.069	0.110	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.0005	<0.001	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.017	0.005	0.042	0.070	0.5	10	30
Nickel	A-T-025	N	N	0.005	0.001	0.012	0.020	0.4	10	40
Lead	A-T-025	N	N	0.004	0.008	0.010	0.080	0.5	10	50
Antimony	A-T-025	N	N	0.011	0.008	0.027	0.090	0.06	0.7	5
Selenium	A-T-025	N	N	0.001	<0.001	0.002	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	<0.001	0.002	<0.002	<0.01	4	50	200
Chloride	A-T-026	N	N	13	2	31	37	800	15000	25000
Fluoride	A-T-026	N	N	0.3	0.3	0.8	3.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	84	30	206	380	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	181	139	444	1501	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.01	<0.02	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	25.1	<20.0	62	<200	500	800	1000
Leach Test Information										
pH (pH Units)	A-T-031	N	N	9.8	10.6					
Conductivity (µS/cm)	A-T-037	N	N	362	277					
Mass Sample (kg)				0.254						
Dry Matter (%)	A-T-044	N	N	68.9						
Stage 1										
Volume Leachant, L ₂ (l)	A-T-046			0.350						
Filtered Eluate Volume, VE ₁ (l)	A-T-046			0.200						
Stage 2										
Volume Leachant, L ₈ (l)	A-T-046			1.400						
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation										

*Landfill WAC analysis must not be used for hazardous waste classification purposes.
This analysis is only applicable for landfill acceptance and does not give any indication
as to whether a waste may be hazardous or non-hazardous.*

Sample Details								Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	21/13864/2						
Client Sample Number								Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH01						
Depth to Top				0.6						
Depth to Bottom										
Date Sampled				29/11/2021						
Sample Type				Soil - ES						
Sample Matrix Code				4A						
Solid Waste Analysis										
pH (pH Units) _D	A-T-031	N	N	9.04				-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	1.2				-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.13				-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	3.1				-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	3.17				3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	0.85				100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	32				500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007				1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01				6	-	-
Eluate Analysis				2:1	8:1	2:1	Cumulative 10:1	Limit values for compliance leaching test using		
				mg/l		mg/kg		BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.004	0.002	0.008	0.020	0.5	2	25
Barium	A-T-025	N	N	0.042	0.065	0.089	0.630	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.001	<0.002	<0.01	0.04	1	5
Chromium	A-T-025	N	N	0.043	0.016	0.091	0.190	0.5	10	70
Copper	A-T-025	N	N	0.025	0.007	0.053	0.090	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.0005	<0.001	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.014	0.004	0.030	0.050	0.5	10	30
Nickel	A-T-025	N	N	0.004	0.001	0.008	0.010	0.4	10	40
Lead	A-T-025	N	N	0.001	0.005	0.002	0.050	0.5	10	50
Antimony	A-T-025	N	N	0.010	0.006	0.021	0.070	0.06	0.7	5
Selenium	A-T-025	N	N	0.001	<0.001	0.002	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	<0.001	0.001	<0.002	<0.01	4	50	200
Chloride	A-T-026	N	N	11	5	22	61	800	15000	25000
Fluoride	A-T-026	N	N	0.4	0.3	0.9	4.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	75	16	159	229	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	158	138	335	1419	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.01	<0.02	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	24.7	<20.0	52	<200	500	800	1000
Leach Test Information										
pH (pH Units)	A-T-031	N	N	9.9	10.7					
Conductivity (µS/cm)	A-T-037	N	N	316	276					
Mass Sample (kg)				0.196						
Dry Matter (%)	A-T-044	N	N	89.4						
Stage 1										
Volume Leachant, L ₂ (l)	A-T-046			0.350						
Filtered Eluate Volume, VE ₁ (l)	A-T-046			0.200						
Stage 2										
Volume Leachant, L ₈ (l)	A-T-046			1.400						
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation										

Sample Details								Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	21/13864/4						
Client Sample Number								Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH02						
Depth to Top				0.3						
Depth to Bottom										
Date Sampled				02/12/2021						
Sample Type				Soil - ES						
Sample Matrix Code				6AE						
Solid Waste Analysis										
pH (pH Units) _D	A-T-031	N	N	8.18				-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.28				-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.12				-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	6.8				-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	4				3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	0.89				100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	54				500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007				1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.05				6	-	-
Eluate Analysis				2:1	8:1	2:1	Cumulative 10:1	Limit values for compliance leaching test using		
				mg/l		mg/kg		BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.005	0.002	0.012	0.020	0.5	2	25
Barium	A-T-025	N	N	0.035	0.060	0.082	0.590	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.001	<0.002	<0.01	0.04	1	5
Chromium	A-T-025	N	N	0.023	0.010	0.054	0.120	0.5	10	70
Copper	A-T-025	N	N	0.013	0.004	0.030	0.050	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.0005	<0.001	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.013	0.003	0.030	0.040	0.5	10	30
Nickel	A-T-025	N	N	0.002	<0.001	0.005	<0.01	0.4	10	40
Lead	A-T-025	N	N	0.002	0.012	0.005	0.110	0.5	10	50
Antimony	A-T-025	N	N	0.009	0.005	0.021	0.060	0.06	0.7	5
Selenium	A-T-025	N	N	0.001	<0.001	0.002	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.004	0.003	0.009	0.030	4	50	200
Chloride	A-T-026	N	N	12	2	29	31	800	15000	25000
Fluoride	A-T-026	N	N	0.4	0.6	1.0	6.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	72	20	168	261	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	142	82	333	916	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.01	<0.02	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	21.1	<20.0	49	<200	500	800	1000
Leach Test Information										
pH (pH Units)	A-T-031	N	N	9.7	10.4					
Conductivity (µS/cm)	A-T-037	N	N	284	164					
Mass Sample (kg)				0.235						
Dry Matter (%)	A-T-044	N	N	74.4						
Stage 1										
Volume Leachant, L ₂ (l)	A-T-046			0.350						
Filtered Eluate Volume, VE ₁ (l)	A-T-046			0.200						
Stage 2										
Volume Leachant, L ₈ (l)	A-T-046			1.400						
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation										

Sample Details								Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	21/13864/6						
Client Sample Number								Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH03						
Depth to Top				0.4						
Depth to Bottom										
Date Sampled				03/12/2021						
Sample Type				Soil - ES						
Sample Matrix Code				6A						
Solid Waste Analysis										
pH (pH Units) _D	A-T-031	N	N	8.43				-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	1.43				-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.28				-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	6.6				-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	3.7				3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	20.5				100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	282				500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007				1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01				6	-	-
Eluate Analysis				2:1	8:1	2:1	Cumulative 10:1	Limit values for compliance leaching test using		
				mg/l		mg/kg		BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.013	0.012	0.031	0.130	0.5	2	25
Barium	A-T-025	N	N	0.112	0.051	0.264	0.600	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.001	<0.002	<0.01	0.04	1	5
Chromium	A-T-025	N	N	<0.001	<0.001	<0.002	<0.01	0.5	10	70
Copper	A-T-025	N	N	0.017	0.010	0.040	0.110	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.0005	<0.001	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.129	0.028	0.304	0.410	0.5	10	30
Nickel	A-T-025	N	N	0.008	0.003	0.019	0.040	0.4	10	40
Lead	A-T-025	N	N	0.021	0.004	0.049	0.060	0.5	10	50
Antimony	A-T-025	N	N	0.023	0.021	0.054	0.220	0.06	0.7	5
Selenium	A-T-025	N	N	0.002	0.001	0.005	0.010	0.1	0.5	7
Zinc	A-T-025	N	N	0.020	0.005	0.047	0.070	4	50	200
Chloride	A-T-026	N	N	12	5	29	59	800	15000	25000
Fluoride	A-T-026	N	N	0.6	0.4	1.4	4.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	243	66	573	882	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	323	145	760	1705	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.01	<0.02	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	66.9	24.90	157	306	500	800	1000
Leach Test Information										
pH (pH Units)	A-T-031	N	N	8.1	8.8					
Conductivity (µS/cm)	A-T-037	N	N	647	290					
Mass Sample (kg)				0.237						
Dry Matter (%)	A-T-044	N	N	73.9						
Stage 1										
Volume Leachant, L ₂ (l)	A-T-046			0.350						
Filtered Eluate Volume, VE ₁ (l)	A-T-046			0.200						
Stage 2										
Volume Leachant, L ₈ (l)	A-T-046			1.400						
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation										

APPENDIX H

TRIAL PIT AND GROUND PENETRATING RADAR SURVEYS



Figure 1 - Trial pit looking towards exiting stairs



Figure 2 - Trial Pit - note foundation construction does not step out and therefore will not clash with proposed foundations



Figure 3 - Trial Pit



Figure 4 - Trial pit view looking at existing stairs

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 42440from Wilde Consultants. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	client supplied	
OUTDATED		
OS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out for verification, especially within critical areas.

- Vegetation cleared to obtain more GPR data
- CCTV survey to obtain more bywash details

Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
QL-D	Service positions taken from records.	Unfalsified	QL-B2	Horizontal & vertical location using only one geospatial technique.
QL-C	Visual evidence of service existence but <i>undetectable by geospatial technology.</i>	Unfalsified	QL-B1	Horizontal & vertical location using multiple geospatial techniques.
QL-B4	Undetectable service present shown as an assumed <i>route (AR).</i>	H at 100m V at 10m	QL-A	Horizontal & vertical position verification by open excavation, maples and/or inspection chambers.
QL-B3	Horizontal location by one geospatial technique but with <i>none or poor depth information.</i>			

DRAINAGE SURVEY

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DP's, Gullies, Drains, VP's, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

GM/SS and/or VM/WS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.

When the Gas/Water pipe line is constructed using conductible materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductible material is used, GPR methodology will be employed to locate and plot the final service layout.

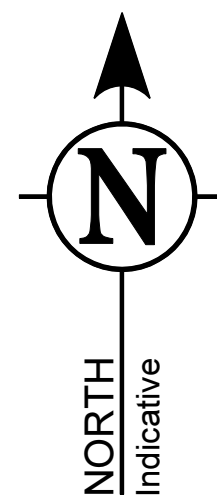
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

All UITs will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

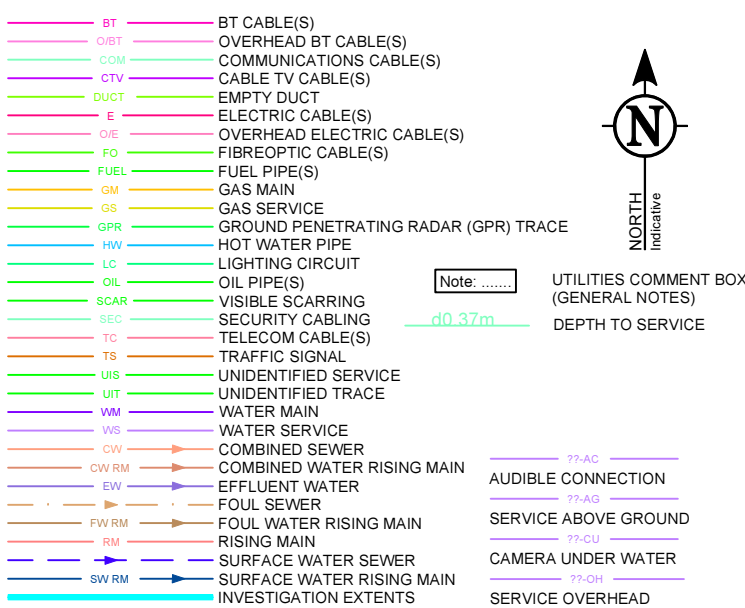
Scarring has been identified on site with a potential of an undetectable service present.

Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/cables/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.



ABBREVIATIONS & SYMBOLS					
10 SC	1 Out of 5 Cables	DCr	Depth To Crown	RBC	Rectangular Brick Chamber
Ø	Diameter	DS	Depth To Inlet	RCC	Rectangular Concave Chamber
AC	Audio Connection	DI	Depth To Silt	RE	Receding Eye
AB	Above Ground	DTB	Depth To Base	SA	Surface Abandoned
AB	Above Ground	DTW	Depth To Water	SL	Surface Level
BL	Base Level	DTW	Depth To Water	SL	Surface Level
BC	Concrete Banching	EDB	External Banching	TRF	Taken From Records
CBC	Circular Brick Chamber	EOT	End Of Trace	UTC	Unable To CCTV
CCC	Circular Concrete Chamber	IBO	Internal Banching	UTD	Unable To Determine Offset
CL	Cover Level	IL	Inlet Level	UTI	Unable To Lift
CP	Concrete Plastic Chamber	OK	OK	UTS	Unable To Survey
CL	Crown Level	PPR	Peak Depth Response	UTL	Unable To Trace
CU	Camera Under Water	RD	Rest Depth	WL	Water Level



All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out to confirm any identifications, positions and depths.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

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Do not scale from this drawing

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)		
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B		
COMMISSIONED: NO		
UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	PUBLIC	CAGBERT GAS
TELECOM	PUBLIC	BRITISH TELECOMS
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATA
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PROJECT TITLE ASHTON CANAL BYWASH, LAMPWICK LANE, MANCHESTER, M4 6BU				
DRAWING DETAIL UTILITIES SURVEY. SHEET 1 OF 1				
CLIENT WILDE CONSULTANTS.				SCALE 1:200
SURVEYOR DCB	SURVEY DATE 27/06/2022	CHECKED BY JTM	APPROVED BY JTM	DWG STATUS FINAL
DRAWING NUMBER 42497NGUG-01			REVISION	ISSUE DATE 28/06/2022

