



Phase II Geo-environmental Site Assessment

Grimshaw Lane Plots 1 & 2
Manchester
M40 2BA
April 2021

423207.0000.0001

Prepared For:

Canmoor (Manchester) Limited
34 Dover Street
London
W1S 4NG

Prepared By:

TRC Companies Limited
Work Life
Brown Street
Manchester
M2 1DH

Quality Control

Client Name:	Canmoor (Manchester) Limited
Project Name:	Grimshaw Lane Plots 1 & 2
Project No.:	423207.0000.0001
Document Title:	Phase II Geo-environmental Site Assessment
Date:	April 2021

Version:	Draft			
Prepared by:				
	Colin Morton			
Reviewed by:				
	J Sander			
Approved by:				
	S Nichols			

Table of Contents

Executive Summary	1
1.0 Introduction.....	6
1.1 Purpose.....	6
1.2 Proposed Development	6
1.3 Scope of Services	6
1.4 Significant Assumptions	7
1.5 User Reliance	7
2.0 Site Description	8
2.1 Site Location and Site Description	8
2.2 Subject and Surrounding Area.....	8
2.3 Previous Environmental Assessment, Investigations or Remediation	8
3.0 Ground Investigation Scope of Works	11
3.1 Scope	11
3.2 Investigation Rationale	11
3.3 Methodology	12
3.4 Environmental Laboratory Analysis.....	13
3.5 Geotechnical Laboratory Analysis	13
4.0 Factual Summary of Investigation Findings.....	14
4.1 Historical and Archive Information	14
4.2 Ground Conditions	15
4.3 Groundwater	19
4.4 Visual and Olfactory Evidence of Contamination	19
5.0 Soil and Groundwater Assessment	22
5.1 Soil Assessment	22
5.2 Groundwater Assessment	23
6.0 Ground Gas Assessment.....	26
7.0 Geotechnical Assessment.....	28
7.1 Summary of TRC Investigation	28
7.2 Geotechnical Assessment	29
8.0 Environmental Risk Assessment	34
8.1 Conceptual Site Model	34
9.0 Conclusions	37
9.1 Findings.....	37
9.2 Summary of Environmental Risk	37
9.3 Summary of Geotechnical Assessment.....	39

Table of Contents: Annexes

Annex A: Figures

Annex B: Site Photographs

Annex C: Exploratory Hole Logs

Annex D: Field Data

Annex E: Laboratory Chemical Data

Annex F: Screened Data

Annex G: Laboratory Geotechnical Data

Executive Summary

TRC Companies Limited (TRC) was commissioned by Canmoor Projects Limited to undertake a Phase II Geo-environmental and Geotechnical Site Assessment at Grimshaw Lane, Manchester, M40 2BA (hereafter referred to as the 'Site').

This Executive Summary is part of the complete report; and findings, opinions or conclusions in this Executive Summary are made in context with the complete report. TRC recommends that the user reads the entire report for all supporting information related to findings opinions and conclusions.

Executive Summary	
Site Details	
Client	Canmoor Projects Limited
Site Address & Grid Reference	Grimshaw Lane, Manchester, M40 2BA Nothing (399919) & Easting (387047)
Site Area	4.75 ha
Current Site Use	At the time of this reporting the Site was divided into two plots of land, which were named Plot 1 and Plot 2, and both were undeveloped and vacant. Plot 1 was accessed via an unnamed service road, which bounded the plot of land to the south. This unnamed road connected to Grimshaw Lane which bounded the plot of land to the south-west. The plot was also accessed directly via Grimshaw Lane. Plot 2, which is situated 150m to the east of Plot 1 was accessed via Ten Acres Lane on its eastern boundary. The surrounding land uses include light industrial / commercial units, undeveloped land and residential dwelling. The Rochdale Canal is located immediately north of Plot 1.
Proposed Development	TRC understand that the Client is proposing to redevelop the Site for light industrial/commercial end use. The proposed development will include two separate plots: - Plot 1 will comprise six units of variable size between 5,100 ft² to 12,250 ft² with associated parking and infrastructure. No soft landscaping is proposed at the Site; and - Plot 2 will comprise one unit which will be 122,000 ft² with associated parking infrastructure and loading yards. No soft landscaping is proposed at the Site. A Proposed Development Plan is presented as Figure 2 in Annex A. It should be noted that this redevelopment plan includes Mathers Foundry (previously investigated by TRC) as well as Plots 1 and 2. This report should be read in conjunction with the Maters Foundry Phase II Report (TRC Report: 385367.0000.0000).
Phase I Summary	
Site History	Historical mapping indicated that there is likely to be a variable thickness of Made Ground on both plots resulting from infilling of the former ponds and reworking of the near surface sites to create level building/sports pitch platforms. In addition, former foundations associated with the previous development of Plot 2 were likely to be present. The Coal Mining Risk Assessment (CMRA) previously prepared by TRC (January 2021) identified that there is a potential risk associated with the potential for shallow coal beneath Plot 1 and the potential presence of a fault line. Plot 2 was not considered to be at risk from shallow coal workings.

Executive Summary	
Investigation Findings	
Ground Conditions	The investigation identified that both Plots were underlain by Made Ground varying from 2.2m to 4.0m on Plot 1 and from 3.0m to 4.95m on Plot 2. The Made Ground on both plots were underlain by Glacial Till. The exploratory holes on Plot 2 only extended to a maximum depth of 10mbgl. However, the deeper boreholes on Plot 1 identified that superficial deposits extended to depths of between 36.0m and 39.5mbgl, beneath which the Pennine Middle Coal Measures Formation was encountered. The superficial deposits generally comprised Glacial Till. With increasing depth more granular materials were encountered. These deposits have been interpreted as Ice Contact Deposits. The Pennine Middle Coal Measures were found to comprise a weak weathered mudstone.
Groundwater Conditions	During the Site investigation groundwater was encountered in Plot 1 between 2.0mbgl and 3.0mbgl. During subsequent gas and groundwater monitoring, groundwater resting levels were recorded between 1.11mbgl and 2.90mbgl in Plot 1. During the Site investigation groundwater was encountered in Plot 2 between 2.0mbgl and 3.4mbgl. During subsequent gas and groundwater monitoring, groundwater resting levels were recorded between 0.25mbgl and 3.62mbgl in Plot 2.
Contaminated Land Risk Assessment	
Human Health	Plot 1 No soil exceedances were identified when screened against the relevant screening criteria for the proposed development. It is therefore considered that no soil remediation is necessary for the proposed light industrial / commercial end use. The contaminants detected are considered unlikely to present a significant risk within a future development scenario if placed beneath engineered hardstanding as this will provide a physical barrier against contact with any contaminants, thereby removing human health risk pathways. Based on the proposed development plan it is assumed that no soft landscaping will be constructed at the Site. However, should soft landscaping (communal areas) be constructed, the potential risks from soil contamination can be managed via construction of an appropriate capping layer (i.e. 150mm topsoil and 150mm subsoil) with a geotextile membrane installed as a marker layer. Plot 2 Although no soil exceedances have been identified when screened against the relevant screening criteria for the proposed development, asbestos in soil (<0.001%) was identified in several sample locations across Plot 2. All of the sample locations to detect asbestos in soil were below ground and therefore are not considered to present a risk to the current Site users unless disturbed. As above, this contamination is considered unlikely to present a significant risk to proposed development if placed beneath hardstanding, which will provide a physical barrier against contact with any contaminants. Based on the proposed development plan it is assumed that no soft landscaping will be constructed at the Site. However, if required clean capping can be used to create an engineered break layer as described above. If soils are to be excavated and removed from the Site as surplus to the development, TRC consider that the asbestos contamination would be classified

Executive Summary	
	as non-hazardous waste as the quantification is less than the 0.1% hazardous waste threshold. It is recommended that further waste assessment testing is undertaken to further classify the waste materials and to ensure compliance with current duty of care regulations. In addition, a robust health, safety and environmental management plan will be required to ensure future protection of groundworkers during development works that could potentially disturb asbestos in soil. The developer should consider the contamination within the context of waste disposal of surplus soils that may be generated at the Site during construction works. TRC recommends that soils are retained at the Site, where possible, to minimise the construction costs associated with excavation, transport and disposal charges.
Controlled Waters	No evidence of significant contaminant sources were identified during the soil screening assessment. In addition, the Site (both Plot 1 and Plot 2) is underlain by an Unproductive Strata which is likely to preclude contaminant transfer to the deeper sensitive aquifer. On this basis, TRC considers that the water quality encountered during this assessment are more indicative of the broader groundwater quality rather than contamination arising from Site sources and unlikely to pose a risk to controlled waters.
Ground Gas Risk Assessment	Ground gas monitoring is ongoing at the time of writing. This report will be updated following completion of those works. The preliminary findings are as follows: <u>Plot 1</u> Ground gas monitoring indicates that Plot 1 would be classified as Characteristic Situation 1 (very low risk). However, an anomaly was identified in RC02 during drilling. RC02 is located in the north-western section of Plot 1. RC02 was terminated at 22.0mbgl due to a carbon monoxide reading of 106ppm during drilling. This elevated carbon monoxide concentration may be as a result of gas originating from a deep coal mine. TRC consider that the fault line at the Site could be acting as preferential pathway in the transfer of hazardous gases. It is anticipated that the gas concentrations are likely to be accumulating within the Ice Contact Deposits underlying the Site as these granular deposits are more permeable than the overlying Glacial Till. As a precautionary approach, it is recommended that gas protection measures are installed across Plot 1. This will likely comprise the installation of a gas protection membrane to mitigate the risks from ground gases. These measures should be integrated into the ground floor design for the proposed buildings. TRC note any design and installation should be subject to independent verification to satisfy the requirements of BS8485:2019 and subsequent planning review. It would be prudent to undertake additional monitoring in the area of RC02 at Plot 1 to further assess the risk. <u>Plot 2</u> Ground gas monitoring indicates that Plot 2 would be classified as Characteristic Situation 2 (low risk). The data indicates that basic gas protection measures would be required for the proposed development at Plot 2, which will likely comprise the installation of a gas protection membrane to mitigate the risks from ground gases. These measures should be integrated into the ground floor design for the proposed buildings. TRC note any design and installation should be subject to independent verification to satisfy the requirements of BS8485:2019 and subsequent planning review.

Executive Summary	
	Two further rounds of gas monitoring are still to be undertaken; once completed this report will be updated accordingly.
Geotechnical Assessment	
Foundation Design	Historical mapping indicated that there is likely to be a variable thickness of Made Ground on both plots (Plot 1 and 2) resulting from infilling of the former ponds and reworking of the near surface sites to create level building/sports pitch platforms. In addition, former foundations associated with the previous development of Plot 2 are likely to be present. The Coal Mining Risk Assessment (CMRA) prepared by TRC in January 2021 (385367.0000.0000) identified that there is a potential risk associated with the potential of shallow coal beneath Plot 1. Due to the presence of a fault line, Plot 2 was not considered to be at risk from shallow coal workings. The geotechnical assessment within this report found that either a ground improvement option or piled foundation solution will be suitable for the proposed development. The following sections present a summary of these options. <u>Ground Improvement Appraisal</u> Ground improvement techniques such as vibro-replacement stone or concrete columns could be considered for the Site. Both ground improvement techniques involve inserting a vibrating poker into the ground, which displaces the soil. The resultant void is then infilled with either stone or concrete. It should be noted that stone columns could provide a potential pathway for the migration of ground gas, which could be produced from the underlying Made Ground or from deeper coal mining sources. Vibro-replacement concrete columns do not have the same disadvantages. In order for concrete columns to work effectively they will need to penetrate the full thickness of the Made Ground. Therefore, a column depth in the order of 5 to 6mbgl should be anticipated. The stiff Glacial Till should provide a suitable bearing layer for the concrete columns. It is recommended that specialist advice is sought from a ground improvement contractor with regard to the suitability of this technique in these ground conditions and the anticipated achievable bearing capacities. If either of these techniques is selected, it is recommended that appropriate in-situ testing is specified in order to assess the performance of these foundations. <u>Pile Foundation Solution</u> TRC considers that either driven or continuous flight auger (CFA) piles could be utilised at the Site. Driven piles have the advantage of improving the density of the ground whereas CFA piles could potentially loosen the granular deposits and thus result in a reduced safe working load. The main disadvantage of driven piles is that they can cause unacceptable amounts of vibration that could potentially damage nearby above and underground structures. If driven piles are used then assurances will need to be sought from the piling contractor that damage will not be caused to nearby structures, including buried infrastructure on the site. Driven piles could also result in the dragging down of contaminants within the Made Ground. It is considered that piles end bearing within the Glacial Till could be suitable for the proposed development, depending upon proposed structural loads. At the

Executive Summary

time of writing this report, there was no information available on the anticipated structural loads that the piled foundations would be required to carry. The preliminary calculations below have been undertaken for driven and CFA piles with toe depths of 8 and 10m, respectively. Geotechnical information was only collected in the upper 10m and therefore information on the deeper materials is not available.

For the preliminary pile calculations refer to Section 7.2.3 of this report

Conclusions / Recommendations

No significant contamination was encountered at the Site that would trigger a requirement for soil remediation. TRC consider that potential risks from minor contamination within the soils can be mitigated via the placement of engineered hardstanding across the Site or clean capping in areas of landscaping (if constructed).

Asbestos in soil was detected in Plot 2. As above, it is considered that risks from asbestos fibres can be mitigated through placement of capping during development. It is recommended that further waste assessment testing is undertaken to further classify the waste materials and to ensure compliance with current duty of care regulations. In addition, a robust health, safety and environmental management plan will be required to ensure future protection of groundworkers during development works that could potentially disturb asbestos in soil. The risk to future Site users will be managed via design led mitigation measures, as detailed in the above sections.

It is considered that the most appropriate foundation solution for the Site is using ground improvement techniques such as vibro-replacement stone or concrete columns. Specialist contractors should be consulted to advise on the applicability of piling and ground improvement to achieve the desired performance and safe application.

Two additional ground gas monitoring visits remain outstanding. The report will be updated and issued as final following receipt of these monitoring visits.

1.0 Introduction

1.1 Purpose

TRC Companies Limited (TRC) was commissioned by Canmoor Projects Limited (the 'Client') to undertake a Phase II Geo-environmental and Geotechnical Site Investigation at the Grimshaw Lane, Plots 1 & 2, Manchester, M40 2BA (hereafter referred to as the 'Site').

A Site location plan is presented as Figure 1 in Annex A.

TRC has already prepared an intrusive report for the main part of the Site (TRC Report 385367.0000.0000), which was named Mathers Foundry. Plot 1 is located to the northwest of Mathers Foundry, and fronts onto Grimshaw Lane. Plot 2 is located to the southeast of Mathers Foundry and fronts onto Ten Acres Lane.

The purpose of this Phase II Geo-environmental Site Assessment was to undertake an environmental and geotechnical investigation to support the proposed light industrial/commercial development of the Site. This Phase II Geo-environmental Assessment used intrusive investigation methodologies to aid Site characterisation and to inform the Client of potential environmental liabilities and geotechnical parameters. It is expected that this report will either support the Client with future planning application for development of the Site for a proposed light industrial/commercial end use.

1.2 Proposed Development

TRC understand that the Client is proposing to redevelop the Site for light industrial/commercial end use. The proposed development will include two separate plots:

- Plot 1 will comprise six units of variable size between 5,100 ft² to 12,250 ft² with associated parking and infrastructure. No soft landscaping is proposed at the Site; and
- Plot 2 will comprise one unit which will be 122,000 ft² with associated parking infrastructure and loading yards. No soft landscaping is proposed at the Site.

A Proposed Development Plan is presented as Figure 2 in Annex A. It should be noted that this redevelopment plan includes Mathers Foundry (previously investigated by TRC) as well as Plots 1 and 2. This report should be read in conjunction with the following reports:

- TRC Companies Limited, Phase II Geo-environmental Site Assessment for Mathers Foundry, report ref. 385367.0000.0000, dated September 2020;
- TRC Companies Limited, Coal Mining Risk Assessment for Mathers Foundry and Grimshaw Lane Plots 1 & 2, report ref. 423207.0000.0000, dated January 2021;
- TRC Companies Limited, Phase I Environmental Site Assessment for Plots 1 & 2 Grimshaw Lane, report ref. 423207.0000.0000, dated April 2021.

Mathers Foundry Phase II Report (TRC Report: 385367.0000.0000).

1.3 Scope of Services

This report presents the findings of a Phase II Geo-environmental Site Assessment (ESA), based on the following information:

- Current use and condition of the Site;
- Environmental setting in terms of geology, hydrogeology, hydrology and surrounding land uses;
- Coal Mining Risk Assessment prepared by TRC, ref. 423207.0000.0000. (January 2021); and,
- Intrusive investigation including environmental and geotechnical sampling and testing.

The Phase II ESA was conducted with due regard to the following guidance:

- The National Planning Policy Framework;
- BS10175 (2017) Investigation of Potentially Contaminated Sites – Code of Practice;
- BS5930 (2020) Code of Practice for Ground Investigations;
- Land Contamination: Risk Management (LCRM)
- BS8485 (2019) Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings; and
- BS8676:2013 'Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds (VOCs).

1.4 Significant Assumptions

This report presents TRC's observations, findings, and conclusions as they existed on the date that this report was issued. This report is subject to modification if TRC becomes aware of additional information after the date of this report that is material to its findings and conclusions.

The reliability of information provided by others to TRC cannot be guaranteed to be accurate or complete. Performance of this Phase II Geo-environmental Site Assessment is intended to reduce, but not eliminate, uncertainty of environmental conditions associated with the subject site; therefore, the findings and conclusions made in this report should not be construed to warrant or guarantee the subject site, or express or imply, including without limitation, warranties as to its marketability for a particular use. TRC found no reason to question the validity of information received unless explicitly noted elsewhere in this report.

1.5 User Reliance

This report was prepared for Canmoor Projects Limited. Reliance on the Report by any other third party is subject to requesting and fully executing a reliance letter between TRC and the third party that acknowledges the TRC Standard Terms and Conditions with the Client, to the same extent as if they were the Client thereunder.

TRC has been provided with information from third parties for information purposes only and without representation or warranty, express or implied as to its accuracy or completeness and without any liability on such third parties part to revise or update the information. Where reliance has been provided by third parties to potential purchasers this is noted in our report.

2.0 Site Description

2.1 Site Location and Site Description

The Site comprises two separate plots of land to the south east and west of the old Mathers Foundry Site, approximately 3.5km to the northeast of Manchester City Centre. A Site location plan is presented as Figure 1 in Annex A.

Plot 1 is a rectangular 1.2ha parcel of land centred on National Grid Reference 386870, 399930; approximately 175m northwest of the Fine Lady Bakeries. Topographically Plot 1 is generally flat and has an average elevation of approximately 69.8m above Ordnance Datum (aOD).

Plot 2 is a triangular 3.6ha parcel of land centred on National Grid Reference 387258, 399903; approximately 10m north of the Fine Lady Bakeries. The Site drops in elevation by around 5m from a high point of 78.11m AOD on the north eastern boundary to around 73.23m AOD on the south western boundary.

At the time of this report, both Plot 1 and Plot 2 were undeveloped and vacant. Plot 1 was accessed via an unnamed service road, which bounded the plot of land to the south. This unnamed road connected to Grimshaw Lane which bounded the plot of land to the southwest. The plot was also accessed directly via Grimshaw Lane. Plot 2, which is situated 150m to the southeast of Plot 1 was accessed via Ten Acres Lane on its eastern boundary.

2.2 Subject and Surrounding Area

The Site is located within an area of predominantly commercial and residential land use. Land uses in the immediate vicinity include the following principal features:

Table 1: Summary of Surrounding Land Use

Direction	Plot 1 Land Use	Plot 2 Land Use
North	Plot 1 is bound to the north by Rochdale canal, after which are several warehouses/light industrial units.	Plot 2 is bound to the north by Mathers Foundry which will be developed into light industrial land use as part of the larger development.
East	Plot 1 is bound to the east by undeveloped land which will be developed into light industrial land use as part of the larger development.	Plot 2 is bound to the east by Ten Acres Lane, with residential properties beyond.
South	Plot 1 is bound to the south by an unnamed service road, after which is undeveloped land.	Plot 2 is bound to the south by Briscoe Lane, with a commercial property beyond.
West	Plot 1 is bound to the west by Grimshaw Lane, after which is Princes Health Food.	Plot 2 is bound to the west by Fine Lady Bakeries.

2.3 Previous Environmental Assessment, Investigations or Remediation

Two desk study and ground investigation reports were carried out at Plot 1 & 2 in January and May 2014 by WYG Environment. A Coal Mining Risk Assessment was completed by TRC in January 2021. Details of each report are listed below and summarised in Table 2.

- WYG Environment Plot 2 (Plot 2), Geo-environmental Desk Study and Ground Investigation Report for Homes and Communities Agency, report ref. A083215, dated May 2014;

- WYG Environment Plot 3 (Plot 1), Newton Heath, Manchester, Geo-environmental Desk Study and Ground Investigation Report for Homes and Communities Agency, report ref. A083215, dated January 2014 and,
- Coal Mining Risk Assessment (CMRA) TRC report ref. 423207.0000.0000, Dated 19th January 2021

Table 2: Summary of Previous Site Assessments

Report Title	Summary of Findings
Plot 2, Geo-environmental Desk Study and Ground Investigation Report (Plot 2) May 2014	The desk study revealed that the Site was formerly occupied by ponds / clay pits followed by development as an engineering works including tanks and a substation. The Site was known to have remained derelict since 2007, but excavated soils and imported capping materials were deposited on the Site in conjunction with the development of the bakery immediately south of the Site between 2009 and 2011. The geology was classified as the Glacial Till with the Sherwood Sandstone at depth. The bedrock was classified as a Principal Aquifer overlain by an Unproductive Strata (Glacial Till). The Site was not located in a Groundwater Source Protection Zone. The nearest surface water feature was the Rochdale Canal located 200m northwest of the Site. Elevated concentrations of petroleum hydrocarbons were identified in soil and further site investigation was recommended to delineate and determine the risk to future Site users. No testing of groundwater appears to have been undertaken as part of the Phase II. Asbestos fibres were identified in all of the Made Ground samples. However, the concentration was <0.001% (less than the laboratories limit of detection). Ground gas monitoring was undertaken to determine the risk from hazardous gases arising from Made Ground and natural soils and migrating into buildings and subsequent inhalation risk. The Site currently corresponds with a CS1 classification (Very Low Risk). Therefore, gas protection measures are unlikely to be required. There is a low to moderate risk from land contamination to future Site users. Review of freely available unexploded ordnance (UXO) mapping suggests the Site presents a moderate risk of intrusive works encountering UXO. TRC consider that further UXO assessment would be required to satisfy future intrusive investigation and construction phase works.
Plot 3, Newton Heath, Manchester, Geo-environmental Desk Study and Ground Investigation Report (Plot 1) January 2014	The desk study revealed that the Site was formerly occupied by clay pits followed by development as a sports pitch with possible land filling. The geology was mapped as Glacial Till with Coal Measures / Newton Heath Sandstone at depth. The bedrock geology was classified as a Secondary (A) Aquifer overlain by an Unproductive Strata (Glacial Till). The Site was not in a Source Protection Zone. The nearest surface water feature was the Rochdale Canal which was immediately north of the Site. No elevated concentrations of contaminants in soil exceeded the assessment criteria for a commercial use. Asbestos fibres were identified in one soil sample. No testing of groundwater appears to have been undertaken as part of the Phase II. Ground gas monitoring was undertaken to determine the risk from hazardous gases arising from Made Ground and natural soils and migrating into buildings and subsequent inhalation risk. The Site currently corresponds with a CS1 classification (Very Low Risk). Therefore, gas protection measures are unlikely to be required. There is a low risk from land contamination to future Site users.

Report Title	Summary of Findings
	The Made Ground is too thick to allow shallow spread foundations to be adopted for the proposed development. Ground improvement utilising vibro-stone columns or concrete columns are likely to be a suitable foundation solution. The Coal Authority website suggests the Site is within an area at risk from coal mining. A development high risk area is present at the southwest of the Site. A historical landfill site is located 285m northeast of the Site. The landfill was operational between 1973 and 1984. Review of freely available unexploded ordnance (UXO) mapping suggests the Site presents a moderate risk of intrusive works encountering UXO. TRC consider that further UXO assessment would be required to satisfy future intrusive investigation and construction phase works.
TRC Companies Coal Mining Risk Assessment for Mathers Foundry and Grimshaw Lan Plots 1 & 2 January 2021	One coal seam was worked beneath the Site. The worked coal seam was located to the southwest of a northwest to southeast orientated fault and is only likely to be present beneath Plot 1. The coal mining assessment has indicated that there should be sufficient thickness of intact rock above this coal seam to minimize the risk of voids migrating to surface. The Coal Authority website indicates that the western edge of Plot 1 is located within a development high risk area and a coal seam is indicated to subcrop beneath the superficial deposits. The Coal Authority Consultants Report identifies this as the Doctor Coal. The Consultant's report indicates that the Doctor Coal was not workable and given the considerable thickness of overlying superficial deposits it is considered that this coal seam is unlikely to have been worked. The proposed redevelopment includes the construction of new buildings in the main part of the site, located predominantly to the northeast of the fault line and to the northeast of the Doctor Coal Seam subcrop. The Doctor Coal subcrops at the western end of Plot 1 with the coal seam dipping away from the main part of the Site. As such while there remains a potential risk that the coal seam had been worked, the fact that this area of the Site unlikely to support new buildings it is considered that the risk to the proposed redevelopment will be low. If redevelopment includes the construction of new buildings in the southwestern part of the Site, it is recommended that the risk is reviewed. There is a potential risk to the proposed development from the fault line. Based upon the information collected by Curtins it is likely that this will be masked by the presence of significant thickness Glacial Till. However, should the Glacial Till be granular in nature this could act as a preferential pathway for mine gas. It is recommended that should granular deposits be encountered within the Glacial Till that monitoring wells are installed with the screened sections installed to coincide with the granular layers. Subsequent permanent ground gas monitoring should be undertaken to ensure that the granular layers do not provide a pathway through the Glacial Till for gas migration.

3.0 Ground Investigation Scope of Works

3.1 Scope

The TRC Phase II Geo-environmental and Geotechnical investigation was conducted at the Site between the 3rd and 19th February 2021. The purpose of the investigation was to characterise underlying ground conditions and investigate the potential presence of contamination that may present a risk to the proposed development at the Site. Additionally, a geotechnical investigation was undertaken to aid future foundation design.

The scope of works comprised:

Plot 1

- Supervision of drilling contractors during the advancement of two cable percussive boreholes (CP101 and CP102) to a maximum depth of 10.0mbgl with in-situ geotechnical testing (standard and cone penetration testing (SPT/CPT));
- Supervision of drilling contractors during the advancement of four rotary boreholes (RC01, RC02, RC01A, and RC02A) to a maximum depth of 45.0mbgl;
- Supervision of drilling contractors during the advancement of four window sample boreholes (WS101 to WS104) to a maximum depth of 5.0mbgl with in-situ geotechnical testing (SPT/CPT);
- Supervision of four trial pits (TP101 to TP104) to a maximum depth of 3.0mbgl;
- Inspection of soils within boreholes and trial pits to facilitate geological logging;
- Collection of soil samples for third party environmental and geotechnical laboratory testing;
- Field monitoring for permanent ground gases and groundwater levels; and,
- Collection of groundwater samples on one occasion.

Plot 2

- Supervision of drilling contractors during the advancement of two cable percussive boreholes (CP301 and CP302) to a maximum depth of 10.0mbgl;
- Supervision of drilling contractors during the advancement of four window sample boreholes (WS301 to WS304) to a maximum depth of 5.0mbgl with in-situ geotechnical testing (SPT/CPT);
- Supervision of five trial pits (TP301 to TP305) to a maximum depth of 3.0mbgl;
- Inspection of soils within boreholes and trial pits to facilitate geological logging;
- Collection of soil samples for third party environmental and geotechnical laboratory testing;
- Field monitoring for permanent ground gases and groundwater levels; and,
- Collection of groundwater samples on one occasion.

3.2 Investigation Rationale

The ground investigation was designed by TRC on behalf of the Client to gather information on the environmental and geotechnical ground conditions, groundwater and ground-borne gas conditions at the Site. The TRC investigation aimed to gain good general coverage of the Site. All areas were accessible as part of the Site investigation.

The Exploratory Hole Location Plan for Plot 1 is presented as Figure 3 in Annex A. The Exploratory Hole Location Plan for Plot 2 is presented as Figure 4 in Annex A. The exploratory hole locations are summarised in the table below.

Table 3: Summary of Exploratory Hole Locations

Exploratory Hole	Site Location
CP101	Located in the north eastern section of Plot 1
CP102	Located in the south western section of Plot 1

Exploratory Hole	Site Location
WS101	Located in the north eastern section of Plot 1
WS102	Located in the southern section of Plot 1
WS103	Located in the north eastern section of Plot 1
WS104	Located in the north western section of Plot 1
TP101	Located in the eastern section of Plot 1
TP102	Located centrally in Plot 1
TP103	Located in the south western section of Plot 1
TP104	Located in the southern section of Plot 1
RC01	Located in the south western section of Plot 1
RC02	Located in the north western section of Plot 1
RC01A	Located in the south western section of Plot 1
RC02A	Located in the north western section of Plot 1
CP301	Located in the northern section of Plot 2
CP302	Located in the south eastern section of Plot 2
WS301	Located in the northern section of Plot 2
WS302	Located in the north eastern section of Plot 2
WS303	Located in the north western section of Plot 2
WS304	Located in the south western section of Plot 2
TP301	Located centrally in Plot 2
TP302	Located centrally in Plot 2
TP303	Located in the south eastern section of Plot 2
TP304	Located in the western section of Plot 2
TP305	Located in the south western section of Plot 2

3.3 Methodology

3.3.1 Ground Investigation

TRC commissioned DMW Drilling (drilling contractor) to undertake the drilling works at the Site. Boreholes CP101, CP102, CP301 and CP302 were advanced using a cable percussive rig with a target depth of 10.0mbgl. Boreholes RC01, RC01A, RC02, and RC02A were advanced using Rotary drilling techniques to a target depth of 45mbgl. All Window samples were advanced using a tracked windowless sampling rig with a target depth of 5.0mbgl. The Trial pits were advanced using a 360° excavator. The drilling works were overseen by a TRC engineer who performed field assessment and logging of soil arisings.

The works included the following key actions:

- Each of the proposed exploratory hole locations was cleared using a Cable Avoidance Tool (CAT) and ground penetrating radar (GPR);
- Cable percussive drilling, rotary drilling and windowless sampling was performed at each location by the drilling contractor, including in-situ geotechnical testing (Standard / Cone Penetration Testing);
- On-Site field assessment and recording of soil type and potential indicators of contamination. Field screening using a PID;
- Collection of soil samples for environmental and geotechnical laboratory analysis;
- Construction of gas and groundwater monitoring wells in 12 borehole locations - WS101, WS102, WS103, WS104, WS301, WS302, WS303, WS304, CP101, CP102, CP301, CP302; and,
- Boreholes, RC01, RC01A, RC02, and RC02A were backfilled with arisings.

3.3.2 Groundwater and Ground Gas Monitoring

Groundwater and ground gas monitoring was conducted by a TRC technician on two occasions. The dates of the monitoring visits were 2nd March 2021 and 10th March 2021. At the time of preparing the report an

additional two rounds of monitoring were scheduled. This report will be revised following completion of the monitoring.

During each visit, groundwater elevation and potential presence of any free phase oils was measured using an oil/water interface probe. Gas monitoring was undertaken using a portable gas analyser at each monitoring well head. The field assessment gathered data relating to the concentrations of permanent ground gases (e.g. methane, carbon dioxide, carbon monoxide and oxygen).

Groundwater sampling was also undertaken in all the monitoring wells.

3.4 Environmental Laboratory Analysis

A total of 42 soil samples was collected for environmental analysis during the investigation works. All soil samples were packed in laboratory provided containers and delivered to I2 Analytical (I2) for chemical analysis.

All soil samples were collected in order to provide environmental data on the quality of near surface and shallow soils beneath the Site. Representative samples of Made Ground / Fill and natural deposits were collected where feasible. The analytical suite of soils included the following parameters:

- Asbestos (Made Ground/Fill Materials only);
- Heavy metals suite;
- Polycyclic aromatic hydrocarbons (PAH); and,
- Total petroleum hydrocarbons – Criteria Working Group (TPH-CWG).

Groundwater samples were collected from all 12 of the boreholes. The samples were sent to I2 Analytical (I2) and analysed for the following:

- Heavy metals suite;
- Polycyclic aromatic hydrocarbons (PAH); and,
- Total petroleum hydrocarbons – Criteria Working Group (TPH-CWG).

The full set of chemical results are presented in Annex E.

3.5 Geotechnical Laboratory Analysis

Soil sampling for geotechnical testing was undertaken via disturbed and bulk sampling. The geotechnical testing was performed by I2 Analytical (I2) and comprised the following:

- 10 Moisture Content;
- 6 Atterberg Limits;
- 6 PSD by wet sieve;
- 6 Sedimentation Tests
- 4 Optimum Moisture Content and Maximum Dry Density
- 3 Quick Undrained Triaxial Tests; and
- 7 BRE Full Suites

The full set of geotechnical results is presented in Annex G.

4.0 Factual Summary of Investigation Findings

4.1 Historical and Archive Information

The following publications of the British Geological (BGS) and Coal Authority have been examined in respect of the strata underlying the Site:

- BGS Geoindex;
- BGS historical borehole records;
- BGS 1:50,000 Series Map Sheet 85, Manchester (Bedrock and Superficial Edition), 2011 and (Bedrock Edition) 2010 and;
- Coal Authority Website; and
- Coal Authority Consultants Coal Mining Report (ref: 51002290625001, dated 22nd July 2020).

While the BGS Geoindex indicates that Made Ground was present within the local area, neither Plot 1 nor Plot 2 is indicated to be underlain by Made Ground. However, the previous investigation of Plot 1 by WYG Environment indicated that Made Ground extended to depths of between 0.4 and 3.3m bgl. The thickest Made Ground was in the western section of the Site (nearby to the historical excavation). Other areas that encountered Made Ground of significant thickness was the northern section of the Site (3.05m to 4.3m) and the eastern section of the Site (maximum of 2.7m). In addition, historical mapping indicated that an excavation and ponds were present on the Site which were later infilled. Backfilled ponds were also present in Plot 2. It is therefore considered that a variable thickness of made ground is likely to be present on both plots of land overlying the natural geology.

According to the BGS Geoindex service, both plots are indicated to be underlain by superficial deposits comprising Glacial Till. The BGS describes the Glacial Till as “unsorted and unstratified drift, generally over consolidated, deposited directly by and underneath a glacier without subsequent reworking by water from the glacier”. Also, according to cross sections included on the 1:50,000 Series Map (Bedrock and Superficial Edition), Ice Contact Deposits (mainly sand with some gravel) are present in the surrounding area and could also be encountered beneath the Site. The BGS maps and historical borehole logs indicate that the superficial deposits are likely to be in excess of 20m thick.

According to the BGS Geoindex, The Bradford Fault runs in a northwest to southeast direction in this area and is indicated to pass between Plots 1 and 2. A fault is a discontinuity or fracture of a rock which can cause displacement due to the movement of the rock. It is anticipated that there is likely to be in excess of 20m of superficial deposits overlying the bedrock. The superficial deposits would have been deposited after the fault movement and as such the fault is unlikely to extend to surface.

Southwest of the Bradford Fault, in Plot 1, the bedrock geology is indicated to comprise Pennine Middle Coal Measures Formation and Newton Heath Sandstone (a named sandstone unit within the Pennine Middle Coal Measures). The 1:50,000 Series BGS map indicates that the Newton Heath Sandstone Formation is between 15 and 20m thick and underlain by mudstones and siltstones of the Pennine Middle Coal Measures. The BGS describes Pennine Coal Measures Formation as “Interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams, with a bed of mudstone containing marine fossils at the base, and several such marine fossil-bearing mudstones in the upper half of the unit”.

Northeast of the Bradford Fault, in Plot 2, the bedrock geology is indicated to comprise the Chester Formation. The BGS describes the Chester Formation as “a coarse-grained, typically well-cemented proximal facies to a fine-grained, less well-cemented distal facies. Red-brown, yellow, or yellow-mottled, very fine to coarse grained sandstones that are commonly cross-bedded, locally micaceous, silty or argillaceous, pebbly or conglomeratic, and generally friable”.

A review of the available coal mining information has been undertaken for the site and the results provided in TRC Coal Mining Risk Assessment (TRC report reference 423207.0000.0000, dated January 2021). The following information was obtained:

- The findings of the desktop review indicate that one coal seam was worked beneath the Site. The worked coal seam was located to the southwest of the fault and therefore is only likely to be present beneath Plot 1. The coal mining assessment has indicated that there should be sufficient thickness of intact rock above this coal seam to minimize the risk of voids migrating to surface.
- The Coal Authority website indicates that the western edge of Plot 1 is located within a development high risk area due to the presence of a coal seam which is indicate to subcrop beneath the superficial deposits. The Coal Authority Consultants Report identifies this as the Doctor Coal. It is noted that the Consultants' report indicates that the seam was not workable.
- It is also noted that the 1:50,000 Series BGS map does not record the presence of the Doctor Coal suggesting that this is not a significant seam. In addition, there is likely to be superficial deposits overlying the Doctor Coal seam which could be in excess of 20m thick. If present, the Doctor Coal is likely to dip to the southwest (i.e. off-site) and therefore is only likely to be present beneath the southwestern part of Plot 1 and the existing Site access road.

Several BGS historical borehole records are located on the Site, however, all but one of the logs are restricted / confidential, as such these could not be assessed.

Borehole SJ89NE52 was located on the western edge of Plot 1 and included details of several boreholes that were drilled on Plot 1 to a maximum depth of 9.75mbgl. All the locations encountered Made Ground underlain by Boulder Clay to the base of each borehole.

The following historical boreholes were located in the vicinity on Plot 2:

- Borehole SJ89NE2504 located approximately 20m south of Plot 2 (Grid Ref: 387086,399870) and recorded Made Ground down to approximately 1.7m with stiff brown clay (Glacial Till) to 8.0m.
- Borehole SJ89NE2509 located approximately 20m south of Plot 2 (Grid Ref: 387313,399795), and recorded Made Ground to 0.1m, and firm, to very stiff brown Clay (Glacial Till) to 8.15m.

The historical boreholes in the vicinity of the Site confirm the general sequence of superficial deposits indicated on the BGS maps. The superficial deposits generally comprised Glacial Till but there were layers of granular Glacial Deposits also present.

4.2 Ground Conditions

Given that each of the plots are located on either side of a fault line and therefore anticipated to encounter different ground conditions, the findings of investigation for each plot have been discussed separately.

Table 4: Summary of Ground Conditions for Plot 1

Strata	Description	Observed Thickness (m)	Range of Depth to top of Strata (m)	Maximum recorded depth (m)
Made Ground	The Made Ground encountered was variable in composition with both cohesive and granular materials encountered which contained a variety of anthropogenic fragments including concrete, brick, ash and clinker.	2.2 - 4.0	0	4.0 (RC01, RC01A and RC02)
Glacial Till and Ice Contact Deposits	Generally described as firm becoming stiff clay with varying silt sand and gravel content and occasional silt and sand layers.	33.0 to 35.5	2.2 to 4.0	39.5 (RC01A)

Strata	Description	Observed Thickness (m)	Range of Depth to top of Strata (m)	Maximum recorded depth (m)
	Gravel comprised mudstone, sandstone, quartzite and coal. With increasing depth more granular layers generally described as light brown sand with variable gravel content was encountered interpreted as Ice Contact Deposits.			
Pennine Middle Coal Measures Formation	Weak greyish brown weathered MUDSTONE. Only encountered in RC01A and RC02A.	>5.5	36.0 to 39.5	45.0 (RC01A)

It should be noted that RC01 was terminated at a depth of 27mbgl due to the casing jamming within the Ice Contact Deposits. RC02 was terminated at a depth of 22mbgl due to the presence of elevated carbon monoxide reading during drilling.

Table 5: Summary of Ground Conditions for Plot 2

Strata	Description	Observed Thickness (m)	Range of Depth to top of Strata (m)	Maximum recorded depth (m)
Made Ground	The Made Ground encountered generally comprised a slightly sandy slightly gravelly clay occasionally with cobbles and boulders. Anthropogenic materials included brick, concrete and metal.	3.0 - 4.95	0	4.95 (WS303)
Glacial Till	Generally described as firm becoming stiff clay with varying silt sand and gravel content and occasional silt and sand layers. Gravel generally comprised mudstone.	>6.2	3.0-4.95	>10.0m (CP301 and CP302)

The borehole logs are presented in full within Annex C.

The ground conditions encountered correspond with the publicly available records of ground conditions published by the British Geological Survey (BGS). However, the depth to bedrock was greater than anticipated. In addition, the Pennine Middle Coal Measures were found to comprise a weak weathered mudstone and not the anticipated sandstone. In addition, coal was not encountered. It is considered that the anticipated Newton Heath Sandstone and Doctor Coal Seam beneath the site was eroded to greater depths than anticipated and replaced with glacial deposits comprising Glacial Till and Ice Contact Deposits.

4.2.1 Made Ground

Plot 1

The Made Ground on Plot 1 was found to be highly variable in composition and included both granular and cohesive materials which contained a variety of anthropogenic fragments including concrete, brick, ash and clinker. The Made Ground extended to depths of between 2.2 and 4.0mbgl.

SPT N values varied from 2 and 17 for the cohesive made ground materials which equates to estimated undrained shear strengths of between 10kPa and 75kPa indicated very soft to firm conditions. With respect to the granular made ground materials SPT N values varied between 6 and 24 which equates to relative densities of loose and medium dense.

Particle Size Distribution (PSD) analysis was undertaken on four samples of Made Ground between ground level and 1.2m. The following table provides a summary of PSDs which indicates that the Made Ground included both cohesive and granular materials ranging from a clayey very gravelly sand to a slightly gravelly slightly sandy clay/silt.

Table 6: Summary of PSD Results for the Made Ground (Plot 1)

Borehole Reference	Depth (m)	Strata	Clay (%)	Silt (%)	Fines (%)	Sand (%)	Gravel (%)
CP101	1.2	Made Ground	34	42	76	21	3
CP102	1.2	Made Ground	-	-	21	59	20
WS103	0	Made Ground	18	39	57	34	9
WS104	0	Made Ground	30	44	74	23	3

Four samples were tested for aqueous extract Sulphate (SO₄) and pH, at depths ranging from 0m to 2mbgl. Water soluble sulphate contents ranged between 30mg/l and 160mg/l. On this basis the Design Sulphate Class would be DS-1. The pH values in the soil samples varied between 7.3 and 8.4. Mobile groundwater conditions have been assumed and, on this basis, the Aggressive Chemical Environment for Concrete (ACEC) class for the Made Ground on Plot 1 is AC-1.

Three Optimum Moisture Content / Dry Density Test was undertaken on samples of cohesive Made Ground materials for cut/fill purposes. Maximum dry densities varied from 1.57 to 1.69 Mg/m³ and the optimum moisture content varied from 18 to 21%. Natural moisture contents ranged from 22 to 28% indicating that the natural state of the material was wet of optimum.

Plot 2

The Made Ground encountered on Plot 2 generally comprised a slightly sandy slightly gravelly clay occasionally with cobbles and boulders, although more cohesive materials were encountered in CP301. Anthropogenic materials included brick, concrete and metal. The Made Ground extended to depths of between 3.0 and 4.95mbgl.

SPT N values varied from 6 and 29 for the cohesive made ground materials which equates to estimated undrained shear strengths of between 29kPa and 139kPa indicated soft to stiff conditions. With respect to the granular made ground materials SPT N values varied between 8 and 13 which equates to relative densities of loose and medium dense.

Particle Size Distribution (PSD) analysis was undertaken on four samples of Made Ground between ground level and 3mbgl. The following table provides a summary of PSDs which indicates that the Made Ground was generally cohesive and granular materials with variable sand, gravel and occasional cobble content.

Table 7: Summary of PSD Results for the Made Ground (Plot 2)

Borehole Reference	Depth (m)	Strata	Clay (%)	Silt (%)	Fines (%)	Sand (%)	Gravel (%)	Cobble (%)
CP301	2	Made Ground	14	18	32	30	38	0
CP302	1.2	Made Ground	20	19	39	23	31	7

Borehole Reference	Depth (m)	Strata	Clay (%)	Silt (%)	Fines (%)	Sand (%)	Gravel (%)	Cobble (%)
WS302	0	Made Ground	21	20	41	27	32	0
WS303	2	Made Ground	16	29	45	37	18	0
WS304	3	Made Ground	37	39	76	21	3	0
WS304	0	Made Ground	32	40	72	20	8	0

Four samples were tested for aqueous extract Sulphate (SO_4) and pH, at depths ranging from 0m to 2mbgl. Water soluble sulphate contents ranged between 210mg/l and 560mg/l. On this basis the Design Sulphate Class would be DS-2. The pH values in the soil samples varied between 7.3 and 7.8. Mobile groundwater conditions have been assumed and, on this basis, the Aggressive Chemical Environment for Concrete (ACEC) class for the Made Ground on Plot 2 is AC-2.

Three Optimum Moisture Content / Dry Density Test was undertaken on samples of Made Ground materials for cut/fill purposes. Maximum dry densities varied from 1.73 to 1.81 Mg/m^3 and the optimum moisture content varied from 15 to 16%. Natural moisture contents ranged from 15 to 19% indicating that the natural state of the material was relatively close to optimum.

4.2.2. Glacial Till and Ice Contact Deposits

Beneath the Made Ground on both Plots 1 and 2, the Glacial Till was encountered. The Glacial Till was generally described as firm becoming stiff clay with varying silt sand and gravel content and occasional silt and sand layers. The gravel component comprised mudstone, sandstone, quartzite and coal. With increasing depth more granular layers generally described as light brown sand with variable gravel content was encountered interpreted as Ice Contact Deposits. Due to the depth of investigation on Plot 2, the Ice Contact Deposits were not encountered. The Glacial Till and Ice Contact Deposits were found to extend to depths of between 36.0m and 39.5m bgl.

Granular units interpreted as either the Ice Contact Deposits or sand layers within the Glacial Till were encountered in the following exploratory holes:

- CP102 from 22 to at least 36mbgl;
- RC01 between 7 and 11mbgl;
- RC01 from 23 to at least 27mbgl;
- RC01A between 28 and 32mbgl;
- RC01A between 36 and 39mbgl;
- RC02 from 21.5 to at least 22mbgl;
- RC02A between 21.5 and 30.5mbgl.

The Ice Contact Deposits were noted to contain occasional coal and sandstone gravel.

It should be noted that borehole RC02 was terminated at 22mbgl due to gas emission from the boreholes which was found to comprise carbon monoxide. It is noted that this occurred at the point where the granular Ice Contact Deposits materials were encountered suggesting that the granular materials could be acting as preferential pathways.

SPT N values varied from 6 to >50 for the Glacial Till on both plots. The recorded N value >50 is likely to be associated with the presence of a cobble/boulder within the Glacial Till and is unlikely to be associated with the consistency/strength of the clay. Excluding this result the next highest SPT N value recorded was 40. The results equate to estimated undrained shear strengths of between 29 and 190kPa indicated soft to very stiff conditions.

Three single stage and two multi stage unconsolidated undrained triaxial tests were conducted on samples of Glacial Till from Plot 1 and Plot 2. Undrained shear strengths were found to vary from 29 to 187kPa

which is generally consistent with the SPT N values. In general the strength of the Glacial Till was found to increase with depth.

Atterberg limit tests was carried out on ten samples within the Glacial at depths of 1.9m (CP102) and 10m (CP301). The results indicate that the Glacial can be generally classified as moderately plastic, with a maximum Plasticity Index of 24%. The modified plasticity index was calculated to be between 11% and 23%, and in accordance with NHBC guidelines the clay is therefore of low to medium volume change potential (VCP).

Seven samples were tested for aqueous extract Sulphate (SO₄) and pH, at depths ranging from 3m to 10mbgl from Plots 1 and 2. Water soluble sulphate contents ranged between 64mg/l and 150mg/l. On this basis the Design Sulphate Class would be DS-1. The pH values in the soil samples varied between 7.2 and 8.7. Static groundwater conditions have been assumed and, on this basis, the Aggressive Chemical Environment for Concrete (ACEC) class for the Glacial Till is AC-1.

4.2.3. Pennine Middle Coal Measures

The Pennine Middle Coal Measures were only encountered in two of the rotary boreholes. These were RC01A and RC02A, both located on Plot 1, at depths of 39.5 and 36mbgl, respectively. The Pennine Middle Coal Measures were generally described as weak greyish brown weathered MUDSTONE. The boreholes proved the presence of mudstone to a depth of 45mbgl. There was no obvious signs of coal or sandstone.

4.2.4. Summary of SPTs/CPTs

Table 8 (overleaf) presents a summary of the SPT/CPT testing undertaken at the Site.

4.3 Groundwater

During the Site investigation groundwater was encountered in Plot 1 between 2.0mbgl and 3.0mbgl. During subsequent gas and groundwater monitoring, groundwater resting levels were recorded between 1.11mbgl and 2.90mbgl.

During the Site investigation groundwater was encountered in Plot 2 between 2.0mbgl and 3.4mbgl. During subsequent gas and groundwater monitoring, groundwater resting levels were recorded between 0.25mbgl and 3.62mbgl.

Field monitoring data for groundwater monitoring is presented in Annex D.

4.4 Visual and Olfactory Evidence of Contamination

Occasional visual and olfactory evidence of contamination was encountered during the Site investigation, as detailed in the below table.

Table 9 – Evidence of Contamination

Exploratory Location	Comment
RC02	At 22.0mbgl a carbon monoxide gas reading was detected, which recorded 106ppm. The borehole was subsequently terminated.
TP101	Occasional black staining was recorded between 0.45m and 2.1mbgl.
TP301	Slight hydrocarbon odour between 0.0m and 3.3mbgl.
TP302	Slight hydrocarbon odour between 0.0m and 3.5mbgl.
WS101	Occasional black staining was recorded between 1.0m and 1.7mbgl.

Table 8: SPT/CPT Data Summary

SPT N Values																			
Borehole Reference	Depth (m)	Strata	Cohesive/ Granular	1 st Seating Blows	1 st Seating Penetration (mm)	2 nd Seating Blows	2 nd Seating Penetration (mm)	1 st Increment Blows	1 st Increment Penetration (mm)	2 nd Increment Blows	2 nd Increment Penetration (mm)	3 rd Increment Blows	3 rd Increment Penetration (mm)	4 th Increment Blows	4 th Increment Penetration (mm)	N Value	Total Test Penetration (mm)	N Value for full 300mm Penetration	Corrected N Value (N60)
CP101	1.2	Made Ground	Cohesive	1	75	0	75	1	75	1	75	1	75	2	75	5	300	5	5
CP101	2	Made Ground	Cohesive	3	75	4	75	4	75	4	75	4	75	5	75	17	300	17	18
CP101	4	Glacial Till	Cohesive	4	75	5	75	5	75	5	75	6	75	6	75	22	300	22	23
CP101	5	Glacial Till	Cohesive	3	75	4	75	4	75	5	75	6	75	7	75	22	300	22	23
CP101	6	Glacial Till	Cohesive	3	75	3	75	4	75	5	75	5	75	6	75	20	300	20	21
CP101	7.5	Glacial Till	Cohesive	2	75	3	75	3	75	5	75	5	75	7	75	20	300	20	21
CP101	9.5	Glacial Till	Cohesive	3	75	4	75	4	75	5	75	6	75	7	75	22	300	22	23
CP102	1.2	Made Ground	Granular	2	75	4	75	4	75	5	75	6	75	9	75	24	300	24	26
CP102	3	Glacial Till	Cohesive	2	75	3	75	3	75	3	75	3	75	4	75	13	300	13	14
CP102	5	Glacial Till	Cohesive	3	75	4	75	5	75	6	75	7	75	7	75	25	300	25	27
CP102	6	Glacial Till	Cohesive	2	75	3	75	4	75	5	75	5	75	7	75	21	300	21	22
CP102	7.5	Glacial Till	Cohesive	2	75	3	75	4	75	4	75	6	75	7	75	21	300	21	22
CP102	9	Glacial Till	Cohesive	3	75	3	75	4	75	5	75	6	75	7	75	22	300	22	23
WS101	1.2	Made Ground	Cohesive	1	75	1	75	1	75	1	75	1	75	1	75	4	300	4	5
WS101	2	Made Ground	Cohesive	1	75	1	75	2	75	2	75	2	75	2	75	8	300	8	9
WS101	3	Glacial Till	Cohesive	3	75	3	75	5	75	5	75	6	75	6	75	22	300	22	26
WS101	4	Glacial Till	Cohesive	4	75	6	75	7	75	8	75	9	75	11	75	35	300	35	41
WS101	6	Glacial Till	Cohesive	4	75	6	75	8	75	11	75	11	75	10	75	40	300	40	47
WS102	1.2	Made Ground	Granular	2	75	3	75	2	75	2	75	1	75	1	75	6	300	6	7
WS102	2	Made Ground	Granular	13	75	7	75	7	75	4	75	6	75	5	75	22	300	22	26
WS102	3	Glacial Till	Cohesive	3	75	3	75	1	75	1	75	2	75	2	75	6	300	6	7
WS103	1.2	Made Ground	Cohesive	1	75	1	75	1	75	0	75	1	75	0	75	2	300	2	2
WS103	2	Glacial Till	Cohesive	1	75	2	75	3	75	3	75	2	75	3	75	11	300	11	13
WS103	3	Glacial Till	Cohesive	2	75	3	75	4	75	5	75	6	75	5	75	20	300	20	23
WS103	4	Glacial Till	Cohesive	6	75	5	75	6	75	6	75	12	75	12	75	36	300	36	42
WS103	5	Glacial Till	Cohesive	8	75	8	75	10	75	16	75	16	75	8	20	50	245	61	71
WS104	1.2	Made Ground	Cohesive	2	75	1	75	2	75	1	75	1	75	1	75	5	300	5	6
WS104	2	Made Ground	Cohesive	1	75	0	75	1	75	2	75	3	75	1	75	7	300	7	8
WS104	3	Glacial Till	Cohesive	3	75	3	75	4	75	4	75	5	75	5	75	18	300	18	21
WS301	1.2	Made Ground	Cohesive	2	75	3	75	3	75	3	75	4	75	5	75	15	300	15	18
WS301	2	Made Ground	Cohesive	2	75	2	75	2	75	2	75	8	75	12	75	24	300	24	28
WS302	1	Made Ground	Cohesive	1	75	1	75	1	75	2	75	2	75	2	75	7	300	7	8
WS302	2	Made Ground	Cohesive	3	75	3	75	2	75	3	75	3	75	3	75	11	300	11	13
WS302	3	Made Ground	Cohesive	8	75	5	75	6	75	3	75	6	75	10	75	25	300	25	29
WS303	1.2	Made Ground	Cohesive	3	75	2	75	3	75	7	75	10	75	9	75	29	300	29	34
WS303	2	Made Ground	Cohesive	2	75	2	75	2	75	2	75	2	75	2	75	8	300	8	9
WS303	3	Made Ground	Cohesive	3	75	2	75	1	75	2	75	1	75	2	75	6	300	6	7

WS303	4	Made Ground	Cohesive	1	75	2	75	2	75	2	75	5	75	2	75	11	300	11	13
WS303	5	Glacial Till	Cohesive	4	75	4	75	4	75	4	75	5	75	6	75	19	300	19	22
WS304	1.2	Made Ground	Cohesive	1	75	2	75	1	75	2	75	2	75	2	75	7	300	7	8
WS304	2	Made Ground	Cohesive	1	75	1	75	4	75	4	75	2	75	2	75	12	300	12	14
WS304	3	Made Ground	Cohesive	4	75	3	75	3	75	3	75	3	75	4	75	13	300	13	15
WS304	4	Made Ground	Cohesive	4	75	5	75	3	75	4	75	6	75	8	75	21	300	21	25
BH301	1.2	Made Ground	Granular	2	75	3	75	3	75	3	75	4	75	3	75	13	300	13	14
BH301	2	Made Ground	Granular	2	75	2	75	2	75	2	75	2	75	2	75	8	300	8	9
BH301	4	Glacial Till	Cohesive	3	75	3	75	4	75	8	75	9	75	10	75	31	300	31	33
BH301	5	Glacial Till	Cohesive	3	75	4	75	6	75	10	75	10	75	10	75	36	300	36	38
BH301	9	Glacial Till	Cohesive	3	75	4	75	5	75	5	75	7	75	8	75	25	300	25	27
BH302	1.2	Made Ground	Cohesive	2	75	1	75	2	75	3	75	3	75	2	75	10	300	10	11
BH302	2	Made Ground	Cohesive	2	75	3	75	3	75	2	75	1	75	2	75	8	300	8	9
BH302	3	Made Ground	Cohesive	3	75	3	75	3	75	5	75	6	75	5	75	19	300	19	21
BH302	4	Glacial Till	Cohesive	3	75	5	75	7	75	8	75	8	75	9	75	32	300	32	35
BH302	5	Glacial Till	Cohesive	4	75	3	75	3	75	3	75	5	75	5	75	16	300	16	18
BH302	8	Glacial Till	Cohesive	5	75	5	75	5	75	6	75	7	75	8	75	26	300	26	29

NB:

- I. The Corrected N Value (N_{60}) value displayed in Table 8 has been rounded to the nearest whole value for design assessment.
- II. The determined value is referred to as N as N, the Standard Penetration Test resistance, is defined as the number of blows for 300mm penetration.
- III. The Corrected N Value (N_{60}) is the equivalent Standard Penetration Test resistance corrected to energy losses, which is defined by the following equation: $N_{60} = (E_r/60) \times N$. Where E_r is the Energy Ratio for the drilling rigs SPT hammer equipment and N is the SPT N Value. See the drillers certificate in Annex C for the E_r adopted.
- IV. The N_{60} value should be used with caution when the strata recorded is granular.
- V. For design purposes the engineer should adopt the uncorrected N-Value.

5.0 Soil and Groundwater Assessment

5.1 Soil Assessment

In order to appraise the significance of the concentrations reported by laboratory testing, TRC has assessed each contaminant species that is elevated above the laboratory LOD against published screening criteria referred to as Generic Assessment Criteria (GAC). GAC are derived from the following reference material:

- Land Quality Management Limited and Chartered Institute of Environmental Health (November 2014), the LQM/CIEH S4ULs for Human Health Risk Assessment. Document reference: S4UL3435;
- Development of Category 4 Screening Levels for assessment of land affected by contamination – SP1010 (September 2014);
- LQM S4ULs: evaluation of 2017 USEPA Toxicological Review of Benzo(a)pyrene; and,
- LQM/CIEH S4ULs for Nickel according to land use (Revised August 2015).

TRC has selected GAC for a light industrial / commercial end use, based on the proposed development comprising seven units with associated infrastructure and loading yards. The following assessment assumes that there will be no soft landscaping installed at the Site. A summary of the laboratory data and the screening tables with relevant GAC is presented in Annex F.

5.1.1 Asbestos

Plot 1

No Asbestos Containing Materials (ACMs) or asbestos in soil was identified in the samples tested.

Plot 2

Asbestos fibres in soil were encountered within six samples analysed in the Made Ground (TP301 at 1.0m, TP304 at 1.0m, WS301 at 1.0m, WS302 at 1.0m, WS303 at 0.8m, and CP301 at 2.3m). The samples containing asbestos were found to contain amosite and chrysotile fibres of asbestos. Asbestos quantification was undertaken on these samples.

All of the samples had concentrations of asbestos of <0.001% asbestos fibres in soil.

5.1.2 Heavy Metals

Plot 1

Minor concentrations of heavy metals were detected in soil samples (both Made Ground and natural soils). None of the concentrations exceeded the GAC.

Plot 2

Minor concentrations of heavy metals were detected in soil samples (both Made Ground and natural soils). None of the concentrations exceeded the GAC.

5.1.3 Hydrocarbons

Plot 1

Minor concentrations of hydrocarbons were detected in the Made Ground soil samples and the samples from the natural soils recorded hydrocarbon concentrations below the laboratory limit of detection. None of the concentrations exceed the GAC.

Plot 2

Minor concentrations of hydrocarbons were detected in the soil samples (both Made Ground and natural soils). None of the concentrations exceed the GAC.

5.1.4 Soil Quality Discussion

Plot 1

No soil exceedances have been identified when screened against the GAC; it is therefore considered that no soil remediation is necessary for the proposed light industrial / commercial end use. The contaminants detected are unlikely to present a significant risk within a future development if placed beneath hardstanding, which will provide a physical barrier against contact with any contaminants.

Based on the proposed development plan it is assumed that no soft landscaping will be constructed at the Site; however, should soft landscaping (communal areas) be constructed the risk can be managed via an appropriate capping layer (150mm topsoil and 150mm subsoil) with a geotextile membrane installed as a marker layer.

Plot 2

Although no soil exceedances have been identified when screened against the GAC, asbestos in soil (<0.001%) has been identified in several sample locations across Plot 2. All of the sample locations to detect asbestos in soil are below ground and therefore are not considered to present a risk to the current Site users unless disturbed. The contamination is unlikely to present a significant risk with a future development if placed beneath hardstanding, which will provide a physical barrier against contact with any contaminants.

Based on the proposed development plan it is assumed that no soft landscaping will be constructed at the Site; however, should soft landscaping (communal areas) be constructed, the risk can be managed via an appropriate capping layer (150mm topsoil and 150mm subsoil) with a geotextile membrane installed as a marker layer.

If these soils are to be removed from the Site as surplus to the development, TRC consider that the asbestos contamination would be classified as non-hazardous waste as the quantification is less than the 0.1% hazardous waste threshold. It is recommended that further waste assessment testing is undertaken to further classify the waste materials and to ensure compliance with current duty of care regulations. In addition, a robust health, safety and environmental management plan will be required to ensure future protection of groundworkers during development works that could potentially disturb asbestos in soil.

The developer should consider the contamination within the context of waste disposal of surplus soils that may be generated at the Site during construction works. TRC recommends that soils are retained at the Site, where possible, to minimise the construction costs associated with excavation, transport and disposal charges.

5.2 Groundwater Assessment

In order to appraise the significance of the groundwater concentrations recorded, TRC has assessed each contaminant species that is elevated above the laboratory LOD against the following published guidance values:

- Environmental Quality Standards (EQS) for freshwater; and,
- SoBRA, Development of a Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater, Version 1 (2017).

Plot 1 is underlain by a Unproductive Strata within the Superficial Deposits and a Secondary (A) Aquifer within the bedrock geology. Plot 2 is underlain by Unproductive Strata within the Superficial Deposits and a Principal Aquifer within the bedrock geology. Neither Plot 1 nor Plot 2 are located within a groundwater Source Protection Zone. The Rochdale Canal is located 200m northwest of the Plot 2 and immediately north of Plot 1. Therefore, TRC has opted for the EQS to assess the risk posed to surface water features. The Drinking Water Standards have not been selected as the water is unlikely to be abstracted for consumption. The data has also been screened against the SoBRA screening criteria to assess for vapour intrusion associated with human health.

Groundwater monitoring recorded groundwater in all monitoring wells ranging from 0.25mbgl to 3.62mbgl across both Plots 1 and 2. No free phase oils or hydrocarbons odours were identified. Groundwater samples were taken from each borehole was sent to I2 Analytical for laboratory analysis.

5.2.1 Heavy Metals

Plot 1

The laboratory analysis reported elevated concentrations of heavy metals exceeding the EQS in the samples collected for analysis. The exceedances are summarised in the below table.

Table 10: Summary of Groundwater Exceedances (EQS) for Heavy Metals

Contaminant	EQS (ug/l)	Maximum Concentration (ug/l)	Location of Maximum Concentration	Number of Exceedances
Chromium (hexavalent)	4.7	5.1	WS101	1
Copper	1.0	4.1	WS101	5
Nickel	4.0	20	WS104	5
Zinc	10.9	34	WS101	2

Plot 2

The laboratory analysis reported elevated concentrations of heavy metals exceeding the EQS in the samples collected for analysis. The exceedances are summarised in the below table.

Table 11: Summary of Groundwater Exceedances (EQS) for Heavy Metals

Contaminant	EQS (ug/l)	Maximum Concentration (ug/l)	Location of Maximum Concentration	Number of Exceedances
Cadmium	0.08	0.12	WS302	2
Chromium (hexavalent)	4.7	5.7	CP302	1
Copper	1.0	8.5	CP301	6
Lead	1.2	2.2	WS304	1
Mercury	0.07	0.14	WS302	1
Nickel	4.0	12	WS302	3
Zinc	10.9	26	CP301	2

5.2.2 Hydrocarbons

Plot 1

The laboratory analysis reported that all samples analysed were below the laboratory limit of detection, therefore no exceedances were identified.

Plot 2

The laboratory report elevated concentrations of speciated PAHs exceeding the EQS in several of the samples collected. The exceedances are summarised in the below table.

Table 12: Summary of Groundwater Exceedances (EQS) for Hydrocarbons

Contaminant	EQS (ug/l)	Maximum Concentration (ug/l)	Location of Maximum Concentration	Number of Exceedances
Fluoranthene	0.0063	0.68	WS302	3
Anthracene	0.1	0.95	WS302	5
Benzo(b)fluoranthene	0.00017	0.45	WS302	2
Benzo(k)fluoranthene	0.00017	0.17	WS301	2
Benzo(a)pyrene	0.00017	0.31	WS301	2

5.2.3 SoBRA

Plot 1

No exceedances were identified when the groundwater results were screened against the SoBRA criteria that present a human health risk.

Plot 2

No exceedances were identified when the groundwater results were screened against the SoBRA criteria that present a human health risk.

5.2.4 Groundwater Quality Discussion

Plot 1 & 2

No evidence of a significant contaminant sources was identified during the soil screening. In addition, the Site is underlain by an Unproductive Strata which is likely to preclude contaminant transfer to the deeper sensitive aquifer. On this basis, TRC considers that the elevated concentrations are more indicative of the broader groundwater quality rather than contamination arising from Site sources and unlikely to pose a risk to controlled waters.

6.0 Ground Gas Assessment

Field monitoring for permanent ground gases was performed at six monitoring well locations on two occasions on the 2nd March and 10th March 2021. The maximum concentrations are summarised in the table below and the complete monitoring data are provided within Annex D.

An additional two monitoring visit remains outstanding. Therefore, the following assessment should be used for indicative purposes only. The report will be updated following completion of the two additional monitoring visits.

Table 13: Summary of Gas Monitoring Results

Location	Methane (%v/v)		CO ₂ (%v/v)		CO (ppmv)		Oxygen		Flow Rate (l/hr)		PID (ppm)
	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady	Peak	Steady	Peak
CP101	0	0	2.4	0.5	ND	ND	13.6	14.9	0.2	0	1.0
CP102	0	0	3.9	3.9	ND	ND	7.3	12.3	0	0	1.0
WS101	0	0	1.0	0.8	ND	ND	16.6	18.5	0.9	0	1.0
WS102	0	0	4.3	4.3	ND	ND	3.1	11.5	0	0	1.0
WS103	0	0	2.4	2.4	ND	ND	13.5	14.9	0.2	0	1.0
WS104	0	0	3.7	1.7	ND	ND	14.3	17.2	0	0	1.0
CP301	2.8	2.7	0.6	0.4	ND	ND	16.5	17.0	0.1	0	3.2
CP302	2.6	2.6	2.3	2.3	ND	ND	0.4	18.1	0.9	0	2.9
WS301	9.6	0.1	0.2	0.2	ND	ND	10.3	17.0	0.1	0	1.0
WS302	16.5	13.9	3.0	3.0	ND	ND	0.5	0.5	0.7	0	9.4
WS303	1.8	0.1	0.1	0.1	ND	ND	9.6	18.6	0.1	0	1.2
WS304	0	0	0.1	0.1	ND	ND	19.7	20.1	0	0	1.0

Notes:

- I. ND – Not Detected
- II. The maximum steady values for methane and carbon dioxide are displayed based on the two monitoring rounds
- III. The minimum steady value for oxygen is displayed based on the two monitoring rounds
- IV. Plot 1 – CP101, CP102, WS101, WS102, WS103 and WS104
- V. Plot 2 – CP301, CP302, WS301, WS302, WS303 and WS304

Plot 1

Methane was not detected in any of the monitoring wells. Carbon dioxide concentrations were detected in all the monitoring wells with peak concentrations ranging from 1.0% to 4.3% v/v. Flow was detected in three of the monitoring wells (CP101, WS101 and WS103). Peak flow ranged from 0.2 l/hr to 0.9 l/hr, the worst case (0.9 l/hr) has been adopted for this assessment. Field monitoring detected minor PID readings of 1.0ppm in all of the monitoring wells.

TRC has assessed the permanent ground gas concentrations in accordance with current guidance (CIRIA C665 and BS8485:2019). Based on the results, a gas screening value (GSV) of 0.0387 l/hr was calculated for carbon dioxide, which would classify the Site as Characteristic Situation 1 (very low risk).

Based on the results, it is not considered that gas protection would be required for the proposed development at Plot 1. However, an anomaly was identified in RC02 during drilling. RC02 is located in the north-western section of Plot 1. RC02 was terminated at 22.0mbgl due to a carbon monoxide reading of 106ppm during drilling. This elevated carbon monoxide concentration may be as a result of gas originating from a deep coal mine. The fault line at the Site could be acting as preferential pathway in the transfer of

hazardous gases. It is anticipated that the gas concentrations are likely to be accumulating within the Ice Contact Deposits underlying the Site.

Therefore, it is recommended that gas protection measures are installed across Plot 1. This will likely comprise the installation of a gas protection membrane to mitigate the risks from ground gases. These measures should be integrated into the ground floor design for the proposed buildings. TRC note any design and installation should be subject to independent verification to satisfy the requirements of BS8485:2019 and subsequent planning review. It would be prudent to undertake additional monitoring in the area of RC02 at Plot 1 to further assess the risk.

As detailed above, a further two gas monitoring visits remain outstanding, as such this should be adopted for indicative purposes only at this stage.

Plot 2

Methane concentrations were detected in five of the monitoring wells with peak concentrations ranging from 1.8% to 16.5% v/v. Carbon dioxide concentrations were detected in all the monitoring wells with peak concentrations ranging from 0.1% to 3.0% v/v. Flow was detected in five of the monitoring wells. Peak flow ranged from 0.1 l/hr to 0.9 l/hr. Field monitoring detected minor PID readings of 1.0ppm in all of the monitoring wells.

TRC has assessed the permanent ground gas concentrations in accordance with current guidance (CIRIA C665 and BS8485:2019). Based on the results, a gas screening value (GSV) of 0.027 l/hr was calculated for carbon dioxide and a GSV of 0.1485 l/hr for methane, which would classify the Site as Characteristic Situation 2 (low risk).

The data indicates that basic gas protection measures would be required for the proposed development at Plot 2, which will likely comprise the installation of a gas protection membrane to mitigate the risks from ground gases. These measures should be integrated into the ground floor design for the proposed buildings. TRC note any design and installation should be subject to independent verification to satisfy the requirements of BS8485:2019 and subsequent planning review.

As detailed above, a further two gas monitoring visits remain outstanding, as such this should be adopted for indicative purposes only at this stage.

7.0 Geotechnical Assessment

7.1 Summary of TRC Investigation

The following section provides a summary of the intrusive investigation geotechnical parameters. During the intrusive investigation, TRC gathered both in-situ and laboratory geotechnical data for each of the exploratory hole locations at the Site.

The proposed development comprises a number of light industrial/commercial units. No proposed loadings were made available to TRC at the time of writing this report. The following is proposed to be constructed on each unit:

- Plot 1 will comprise six units of variable size as well as associated parking infrastructure and soft landscaping; and,
- Plot 2 will comprise one unit as well as associated parking infrastructure and soft landscaping.

A Proposed Development Plan is presented as Figure 2 in Annex A. It should be noted that this redevelopment plan includes the main part of the site (previously investigated by TRC) as well as Plots 1 and 2.

A review of the historical maps has identified a number of potential features that could have an impact on the geotechnical solution for each plot of land. These are detailed for each plot below.

Plot 1:

- Former pond located in the southwestern part of the Plot 1 (on 1:2,500 scale OS map from 1908) that was subsequently infilled;
- Large excavation located to the northeast of Plot 1 (on 1908, 1:2,500 scale OS map). This excavation did not appear to extend onto Plot 1, but given the size there is a potential that this may have occurred; and,
- Slope located along the southwestern, north-eastern and south-eastern boundaries of the site indicating that the site had probably been raised to create a level 'sports ground' (1:2,500 scale OS map dated 1951). Several trees were also indicated that have the potential to cause desiccation of near surface soils.

Plot 2:

- Two ponds were historically located adjacent to Ten Acres Lane that have subsequently been infilled. The smaller pond was depicted on the 1:2,500 scale OS Maps from 1893 and 1908 and the second pond was that was larger and irregular shaped was only depicted on the OS map from 1908; and,
- Park Engineering works was present from circa 1908 initially in the north-western part and subsequently extended to the southeast. A slope was indicated to be present along the north-eastern side of the building in 1932, however, the building was further extended across this slope.

The historical maps indicate that there is likely to be a variable thickness of made ground on both plots resulting from infilling of the former ponds and reworking of the near surface sites to create level building/sports pitch platforms. In addition, former foundations associated with the previous development of Plot 2 are likely to be present.

The CMRA has identified that there is a potential risk associated with the potential of shallow coal beneath Plot 1. Due to the presence of a fault line, Plot 2 was not considered to be at risk from shallow coal workings.

The investigation identified that both Plots were underlain by a considerable thickness of made ground varying from 2.2m to 4.0m on Plot 1 and from 3.0m to 4.95m on Plot 2. The Made Ground on both plots were underlain by Glacial Till. The exploratory holes on Plot 2 only extended to a maximum depth of

10mbgl. However, the deeper boreholes on Plot 1 identified that superficial deposits extended to depths of between 36.0m and 39.5mbgl beneath which the Pennine Middle Coal Measures Formation was encountered.

While the superficial deposits generally comprised Glacial Till, with increasing depth more granular materials were encountered that have been interpreted as Ice Contact Deposits. The Pennine Middle Coal Measures were found to comprise a weak weathered mudstone.

It should be noted that borehole RC02 was terminated at 22mbgl due to gas emission from the boreholes which was found to comprise carbon monoxide. It is noted that this occurred at the point where the granular Ice Contact Deposits materials were encountered suggesting that the granular materials could be acting as preferential pathways.

The borehole logs are presented in Annex C.

7.2 Geotechnical Assessment

7.2.1 General

This geotechnical assessment is based on the parameters determined from the field work and laboratory analysis described within this report. This geotechnical assessment provides an overview of possible foundation solutions and infrastructure design and does not constitute a detailed design report for the proposed development.

For the purposes of this assessment, TRC has assumed that finished ground levels will be at, or close to, existing ground levels. In the event that these levels are changed, then TRC would recommend that this assessment is revisited to examine potential changes in recommendations.

7.2.2 Coal Mining Assessment

Information from the Coal Authority suggested that a coal seam (Doctor Coal) sub-cropped beneath the superficial deposits at the western end of Plot 1. In order to determine if the coal seam was present and to determine if it had been worked deep rotary boreholes were drilled at the Site. The deeper boreholes were sunk using rotary drilling techniques, using a water flush. A license was obtained from the coal authority for the permitted activities (Permit Application Number: 21423). The results of the investigation identified that the superficial deposits were deeper than anticipated and with increasing depth became more granular. This resulted in difficulties in driving the casing needed to support the boreholes and limited the number of locations where the Pennine Middle Coal Measures were encountered.

The Pennine Middle Coal Measures were encountered in two of the rotary holes located at the western end of Plot 1 and was generally found to comprise a weak weathered mudstone. There was no evidence of coal or the anticipated sandstone. There was no loss of flush noted and no indication that a coal seam had been worked.

It is considered that the anticipated Newton Heath Sandstone and Doctor Coal Seam beneath the site was eroded to greater depths than anticipated and replaced with glacial deposits comprising Glacial Till and Ice Contact Deposits. Given that the CMRA suggested that the Doctor Coal Seam was not workable and that there was no evidence for the presence of coal seam in the exploratory holes drilled it is considered that the risk presented by coal mining at the site is considered to be low.

During the drilling of borehole RC02 gas emission was noted from the borehole at a depth of 22mbgl. The gas was identified as carbon monoxide and for health and safety reasons the borehole was terminated at this depth. It is feasible that the gas has originated from deep coal mines that are known to be present beneath the site. Mine gas can migrate along fault lines and could therefore migrate upwards accumulating within the granular Ice Contact Deposits materials. While the presence of cohesive Glacial Till will limit the upwards migration of gas, the Glacial Till at the site was found to contain bands and layers of silt and sand, which could act as preferential pathways, particularly if these bands and layers are

interconnected. There is also the potential for preferential pathways to be created during the construction of foundations.

7.2.3 Foundations

Given the variability of the Made Ground, these soils are not considered suitable for traditional foundations in their current composition. This is due to the inherent variability in the composition of Made Ground soils and their associated properties. Deep Made Ground was encountered on both plots of land and as such it is considered that either a pile foundation solution or ground improvement solution would be the most suitable options for the Site.

Ground improvement techniques such as vibro-replacement stone or concrete columns could be considered for the site. Both ground improvement techniques involve inserting a vibrating poker into the ground, which displaces the soil. The resultant void is then infilled with either stone or concrete. It should be noted that stone columns could provide a potential pathway for the migration of ground gas, which could be produced from the underlying made ground or from deeper coal mining sources. Vibro-replacement concrete columns do not have the same disadvantages.

In order for concrete columns to work effectively they will need to penetrate the full thickness of the made ground. Therefore, a column depth in the order of 5 to 6mbgl should be anticipated. The stiff Glacial Till should provide a suitable bearing layer for the concrete columns. It is recommended that specialist advice is sought from a ground improvement contractor with regard to the suitability of this technique in these ground conditions and the anticipated achievable bearing capacities. If either of these techniques is selected, it is recommended that appropriate in-situ testing is specified in order to assess the performance of these foundations.

If a piled foundation solution is adopted, then either driven or continuous flight auger (CFA) piles could be utilised. Driven piles have the advantage of improving the density of the ground whereas CFA piles could potentially loosen the granular deposits and thus result in a reduced safe working load. The main disadvantage of driven piles is that they can cause unacceptable amounts of vibration that could potentially damage nearby above and underground structures. If driven piles are used then assurances will need to be sought from the piling contractor that damage will not be caused to nearby structures, including buried infrastructure on the site. Driven piles could also result in the dragging down of contaminants within the made ground.

It is considered that piles end bearing within the Glacial Till could be suitable for the proposed development, depending upon proposed structural loads. At the time of writing this report, there was no information available on the anticipated structural loads that the piled foundations would be required to carry.

The preliminary calculations below have been undertaken for driven and CFA piles with toe depths of 8 and 10m, respectively. Geotechnical information was only collected in the upper 10m and therefore information on the deeper materials is not available.

The preliminary pile calculations have been based upon the following idealised soil profile based on the intrusive works and the following assumptions:

Table 14 – Soil Profile

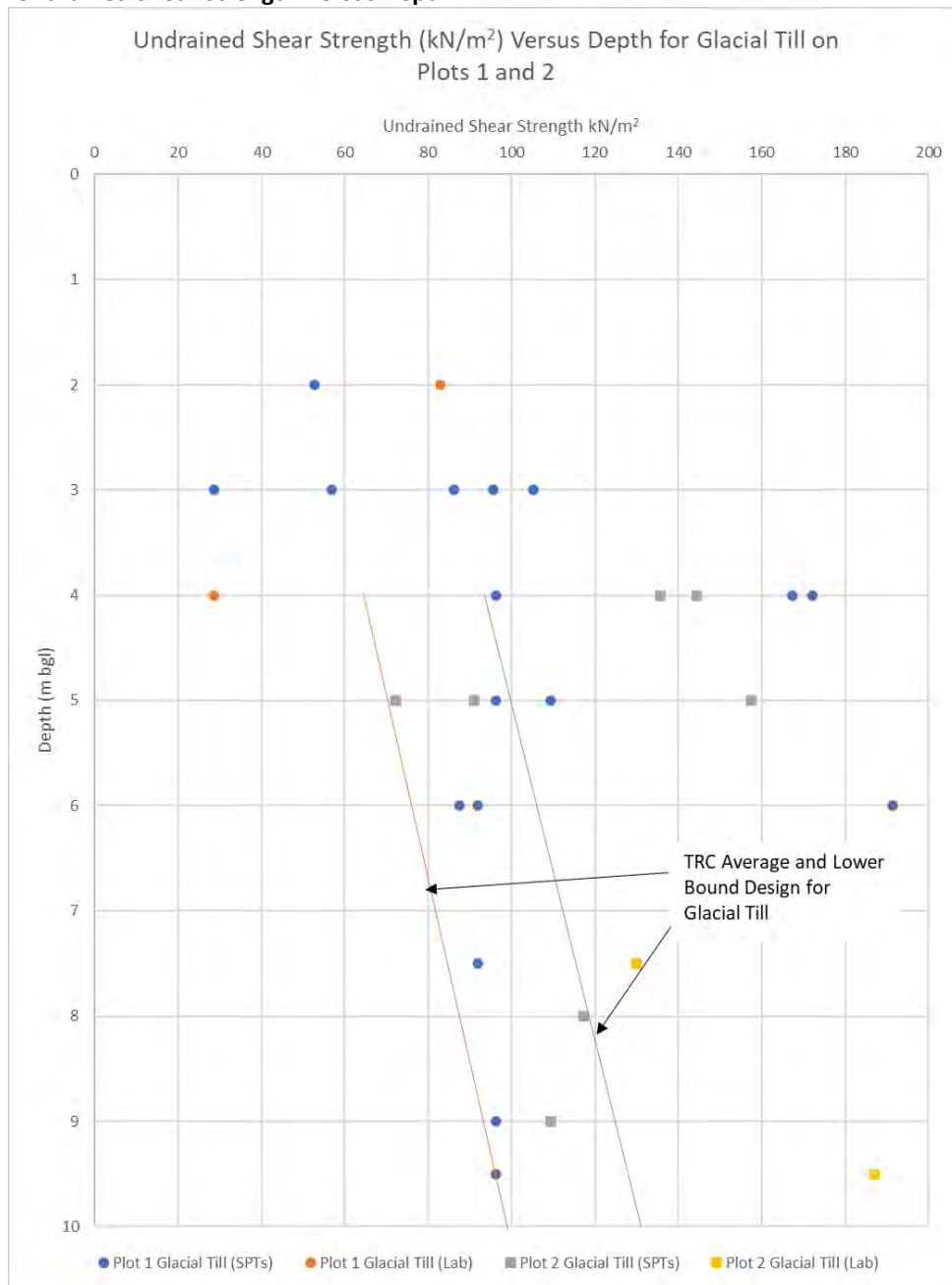
Depth (m)	Ground Conditions	Assumptions
GL to 4.95	Made Ground	Excluded from calculations
4.95 to 10.0	Glacial Till	Assumed to be cohesive. Undrained shear strength values taken from TRC design lines provided on Figure 5 below.

Depth (m)	Ground Conditions	Assumptions
		Lower bound values used to estimate base resistance and average values used to estimate skin friction.

Groundwater has been assumed to be at 1.0mbgl.

The design lines used by TRC to estimate safe working loads are indicated on the following graph, based on uncorrected SPT N Values and laboratory analysis.

Figure 5: Undrained Shear Strength Versus Depth



The safe working load has been calculated by two different methods. In the first method a factor of safety of 2.5 is applied to both the end bearing and skin friction components. In the second method a factor of safety of 3.0 is applied to the end bearing component and 1.5 to the skin friction component. The safe working load is calculated by both methods and the lower of the two is adopted. The following tables provide a summary of the estimated safe working loads based upon the assumptions detailed above.

Table 15: Preliminary Pile Calculations for CFA Piles

Pile Total Length (m)	Pile Diameter (mm)	Safe Working Capacity (kN)
8	300	120
	450	200
	600	290
10	300	200
	450	320
	600	450

The estimated safe working load is indicative only and specialist piling contractors should be consulted with regard to the design and performance of their piled foundations. It is recommended that pile testing is undertaken. The safe working load has been calculated for single isolated pile. The effect of group action has not been taken into consideration. In addition, negative skin friction in the Made Ground has not been taken into consideration.

It should be noted that the Glacial Till could contain cobbles and boulders that could represent hard spots. In addition, CFA piles could potentially suffer from 'necking' or 'waisting' of their pile shafts through made ground and in zones of groundwater seepage. The risk of this occurring will be significantly reduced by careful supervision and good workmanship.

7.2.4 Excavations

Excavations for foundations above vibro columns, pile caps and groundbeams, floor slabs, and laying services should be readily achievable using standard excavation plant. The developer should consider the potential for random and sudden falls from the faces of near vertically sided excavations at the Site. This may be prevalent in the Made Ground soils, sandy layers, and in low strength natural strata. Potential for excavation collapse may be exacerbated by water inflows.

A risk assessment on the stability of any open excavation should be undertaken by a competent person and appropriate measures employed to ensure safe working practice in and around open excavations. Temporary trench support or battering of excavation sides should be considered for all excavations, particularly where personnel are required to enter the excavations.

Shallow groundwater strikes were recorded during drilling and in subsequent groundwater monitoring the levels recorded were shallow. Due to the variable cohesive and granular nature of the deposits beneath the Site, groundwater accumulating in shallow excavations during the development is likely to be managed via sump pumping. The developer should also consider the impact of weather and potential for rainwater and surface run-off to accumulate with excavations.

Water pumped from excavations may require pre-treatment prior to discharge. This could include settlement tanks to reduce silt and suspended solids. No significant contamination has been identified at the Site, therefore further filtration or other such treatment stage is considered unlikely. Although, occasional hydrocarbon odours were observed in Plot 2 and hotspots of contamination could therefore be encountered during future work. The developer should consult with the local water authority and/or Environment Agency to obtain necessary discharge consents and agree the scope of pre-treatment prior to discharge.

7.2.5 Ground Floor Slabs

Ground bearing floor slabs are likely to be feasible if ground improvement is undertaken beneath the entire building footprint. If this is not undertaken, then a suspended floor slab will need to be utilised.

The investigation has identified that there were elevated concentrations of permanent ground gas (methane and carbon dioxide). Further details are provided in Section 6.0. Precautionary measures will need to be included within the floor slab to prevent the ingress of gas into the buildings.

7.2.6 Below Ground Concrete

Water soluble sulphate analysis was carried out on samples of made ground and Glacial Till from both Plots 1 and 2 as detailed in Section 4. The results indicate that for Plot 1 a Design Sulphate Class of DS-1 is appropriate as defined in BRE Special Digest 1 (2005). However, for Plot 2 the made ground was found to contain elevated concentrations of water-soluble sulphate that are consistent with Design Sulphate Class of DS-2.

Mobile groundwater conditions have been assumed and, on this basis, the Aggressive Chemical Environment for Concrete (ACEC) class for the Site is AC-1 for Plot 1 and AC-2 for Plot 2.

7.2.7 Pavement Construction

Access roads and areas of hardstanding are likely to be constructed on a subgrade of Made Ground. Given the variability of the Made Ground it is recommended that a California Bearing Ratio (CBR) value of 2% is adopted for preliminary design purposes.

8.0 Environmental Risk Assessment

8.1 Conceptual Site Model

The ground investigation performed at the Site by TRC identified minor concentrations of heavy metals and hydrocarbons. However, none of the soil concentrations exceeded the GAC for a light industrial / commercial end use. Asbestos in soil was encountered in Plot 2, which revealed a maximum asbestos quantification concentration of 0.001% asbestos fibres in soil. Plot 1 did not encounter any asbestos in soil. Minor heavy metal contamination in groundwater was identified at both Plot 1 and Plot 2 when screened against the EQS. Hydrocarbon contamination in groundwater was identified in Plot 2 only when screened against the EQS. The ground gas risk assessment classified Plot 1 as Characteristic Situation 1 (very low risk), however a carbon monoxide anomaly was identified during drilling and as such gas protection was recommended. The ground gas risk assessment classified Plot 2 as Characteristic Situation 2 (low risk).

The methodology of this risk assessment uses the source-pathway-receptor pollutant linkage to provide a qualitative appraisal of environmental risks and potential liabilities associated with soil and groundwater contamination at the Site. The conceptual Site model (CSM) has been prepared considering the proposed light industrial / commercial end use.

The following CSM has been prepared to take into consideration the findings from the intrusive investigation.

Table 16: Revised Conceptual Site Model

Source	Pathway	Receptor	Risk
On-Site Sources			
Asbestos in soil (<0.001%) recorded in Plot 2. Minor heavy metal contamination in groundwater when screened against the EQS (both Plot 1 and Plot 2). Minor hydrocarbon contamination in groundwater when screened against the EQS (Plot 2 only). Ground gas concentrations indicative of CS1 for Plot 1, although presence of high concentrations of carbon monoxide and CS2 for Plot 2.	Dermal contact, ingestion and inhalation pathways	Future Site users	Low For a light industrial / commercial end use the Site will be covered in hardstanding within the building footprint and across the associated infrastructure, which will provide a physical barrier against contact with contaminants. Based on the proposed development plan it is assumed that no soft landscaping will be constructed at the Site; however, should soft landscaping (communal areas) be constructed the risk can be managed via an appropriate capping layer (150mm topsoil and 150mm subsoil) with a geotextile membrane installed as a marker layer. The presence of asbestos in soil could pose a potential risk to future Site users at Plot 2 should the ground be disturbed. However, as detailed above it is assumed that engineered capping will be installed across the entirety of the Site which will act to contain and segregate asbestos from future Site users.
		Neighbouring residents	Low No significant contamination was detected in the soils analysed at the Site. The Made Ground was generally underlain by a cohesive

Source	Pathway	Receptor	Risk
			based Glacial Till which may limit the vertical and lateral migration of contaminants. Extensive organic contamination was not encountered in the soil samples analysed at the Site. It is considered unlikely that contaminants have significantly migrated to the underlying strata.
		Construction workers	Moderate A robust health, safety and environmental management plan will be required to ensure future protection of groundworkers during development works that could potentially disturb asbestos in soil within Plot 2.
	Leaching of contaminants and vertical migration into groundwater	Controlled waters	Low The samples identified heavy metal contamination across the Site exceeding the EQS. In addition, the samples identified hydrocarbon contamination at Plot 2 exceeding the EQS. However, no significant source was identified during the soil screening. On this basis, TRC considers that the concentrations are more indicative of the broader groundwater quality associated with the wider industrial / commercial estate rather than contamination arising from onsite sources.
	Contact with buried services	Buried services	Low Proposed development to consider risk of residual contamination and incorporate protective measures as appropriate. This may include clean service corridors and/or the use of chemically resistant pipework.
	Migration of ground gases onto Site and ingress into buildings	Future Site users	Moderate Gas monitoring indicates that Plot 1 would be classified as Characteristic Situation 1 (very low risk) and Plot 2 would be classified as Characteristic Situation 2 (low risk). However, it has been deemed necessary to increase the risk rating of Plot 1 to Characteristic Situation 2. This is because of a high carbon monoxide reading recorded during drilling. Minor PID readings were recorded. The SoBRA screening did not identify any contaminants exceeding the screening criteria. Therefore, a VOC risk is not considered to be present at the Site.

Source	Pathway	Receptor	Risk
			On this basis, gas protection measures are required for the Site, which will likely comprise the installation of a gas protection membrane to mitigate the risk of ground gases. Further monitoring is recommended at Plot 1 in the area of RC02 to further assess the carbon monoxide and ground gas risk. Two further rounds of gas monitoring are still to be undertaken; once completed the report will be updated accordingly.
		Construction workers	Low Pathway to be managed through good construction practices and mitigation of risks when working in confined spaces.

9.0 Conclusions

9.1 Findings

At the time of this reporting the Site was divided into two plots of land, which were named Plot 1 and Plot 2, and both were undeveloped and vacant. Plot 1 was accessed via an unnamed service road, which bounded the plot of land to the east. This unnamed road connected to Grimshaw Lane which bounded the plot of land to the south. Plot 2, which is situated 150m to the east of Plot 1 was accessed via Ten Acres Lane on its eastern boundary. The surrounding land uses include light industrial / commercial units, undeveloped land and residential dwellings. The Rochdale Canal is located immediately north of Plot 1.

Historical mapping indicated that there is likely to be a variable thickness of Made Ground on both plots resulting from infilling of the former ponds and reworking of the near surface sites to create level building/sports pitch platforms. In addition, former foundations associated with the previous development of Plot 2 were likely to be present. The CMRA previously written by TRC identified that there is a potential risk associated with the potential of shallow coal beneath Plot 1 and the presence of a fault line. Plot 2 was not considered to be at risk from shallow coal workings.

The investigation identified that both plots were underlain by a considerable thickness of Made Ground varying from 2.2m to 4.0m on Plot 1 and from 3.0m to 4.95m on Plot 2. The Made Ground on both plots were underlain by Glacial Till. The exploratory holes on Plot 2 only extended to a maximum depth of 10mbgl. However, the deeper boreholes on Plot 1 identified that superficial deposits extended to depths of between 36.0m and 39.5mbgl beneath which the Pennine Middle Coal Measures Formation was encountered. While the superficial deposits generally comprised Glacial Till, with increasing depth more granular materials were encountered that have been interpreted as Ice Contact Deposits. The Pennine Middle Coal Measures were found to comprise a weak weathered mudstone.

During the Site investigation groundwater was encountered in Plot 1 between 2.0mbgl and 3.0mbgl. During subsequent gas and groundwater monitoring, groundwater resting levels were recorded between 1.11mbgl and 2.90mbgl in Plot 1. During the Site investigation groundwater was encountered in Plot 2 between 2.0mbgl and 3.4mbgl. During subsequent gas and groundwater monitoring, groundwater resting levels were recorded between 0.25mbgl and 3.62mbgl in Plot 2.

9.2 Summary of Environmental Risk

Soil Discussion

Plot 1

No soil exceedances were identified when screened against the relevant screening criteria for the proposed development; it is therefore considered that no soil remediation is necessary for the proposed light industrial / commercial end use. The contaminants detected are unlikely to present a significant risk within a future development if placed beneath hardstanding, which will provide a physical barrier against contact with any contaminants.

Based on the proposed development plan it is assumed that no soft landscaping will be constructed at the Site; however, should soft landscaping (communal areas) be constructed the risk can be managed via an appropriate capping layer (150mm topsoil and 150mm subsoil) with a geotextile membrane installed as a marker layer.

Plot 2

Although no soil exceedances have been identified when screened against the relevant screening criteria for the proposed development, asbestos in soil (<0.001%) was identified in several sample locations across Plot 2. All of the sample locations where asbestos was detected were below ground and therefore are not considered to present a risk to the current Site users unless disturbed. The contamination is unlikely to present a significant risk with a future development if placed beneath hardstanding, which will provide a physical barrier against contact with any contaminants.

Based on the proposed development plan it is assumed that no soft landscaping will be constructed at the Site; however, should soft landscaping (communal areas) be constructed the risk can be managed via an appropriate capping layer (150mm topsoil and 150mm subsoil) with a geotextile membrane installed as a marker layer.

If these soils are to be removed from the Site as surplus to the development, TRC consider that the asbestos contamination would be classified as non-hazardous waste as the quantification is less than the 0.1% hazardous waste threshold. It is recommended that further waste assessment testing is undertaken to further classify the waste materials and to ensure compliance with current duty of care regulations. In addition, a robust health, safety and environmental management plan will be required to ensure future protection of groundworkers during development works that could potentially disturb asbestos in soil.

The developer should consider the contamination within the context of waste disposal of surplus soils that may be generated at the Site during construction works. TRC recommends that soils are retained at the Site, where possible, to minimise the construction costs associated with excavation, transport and disposal charges.

Groundwater Discussion

No evidence of a significant contaminant sources was identified during the soil screening. In addition, the Site (both Plot 1 and Plot 2) is underlain by an Unproductive Strata which is likely to preclude contaminant transfer to the deeper sensitive aquifer. On this basis, TRC considers that the concentrations are more indicative of the broader groundwater quality rather than contamination arising from Site sources and unlikely to pose a risk to controlled waters.

Ground Gas Discussion

A further two gas monitoring visits remain outstanding, as such the following assessments should be adopted for indicative purposes only at this stage.

Plot 1

Ground gas monitoring indicates that Plot 1 would be classified as Characteristic Situation 1 (very low risk). However, an anomaly was identified in RC02 during drilling. RC02 is located in the north-western section of Plot 1. RC02 was terminated at 22.0mbgl due to a carbon monoxide reading of 106ppm during drilling. This elevated carbon monoxide concentration may be as a result of gas originating from a deep coal mine. The fault line at the Site could be acting as preferential pathway in the transfer of hazardous gases. It is anticipated that the gas concentrations are likely to be accumulating within the Ice Contact Deposits underlying the Site.

Therefore, it is recommended that gas protection measures are installed across Plot 1. This will likely comprise the installation of a gas protection membrane to mitigate the risks from ground gases. These measures should be integrated into the ground floor design for the proposed buildings. TRC note any design and installation should be subject to independent verification to satisfy the requirements of BS8485:2019 and subsequent planning review. It would be prudent to undertake additional monitoring in the area of RC02 at Plot 1 to further assess the risk.

Plot 2

Ground gas monitoring indicates that Plot 2 would be classified as Characteristic Situation 2 (low risk). The data indicates that basic gas protection measures would be required for the proposed development at Plot 2, which will likely comprise the installation of a gas protection membrane to mitigate the risks from ground gases. These measures should be integrated into the ground floor design for the proposed buildings. TRC note any design and installation should be subject to independent verification to satisfy the requirements of BS8485:2019 and subsequent planning review.

Two further rounds of gas monitoring are still to be undertaken; once completed this report will be updated accordingly.

9.3 Summary of Geotechnical Assessment

Historical mapping indicated that there is likely to be a variable thickness of made ground on both plots (Plot 1 and 2) resulting from infilling of the former ponds and reworking of the near surface sites to create level building/sports pitch platforms. In addition, former foundations associated with the previous development of Plot 2 are likely to be present. The Coal Mining Risk Assessment (CMRA) identified that there is a potential risk associated with the potential of shallow coal beneath Plot 1. Due to the presence of a fault line, Plot 2 was not considered to be at risk from shallow coal workings.

The investigation identified that Plot 1 and Plot 2 were underlain by a considerable thickness of made ground varying from 2.2m to 4.0m on Plot 1 and from 3.0m to 4.95m on Plot 2. The Made Ground on both plots were underlain by Glacial Till. The exploratory holes on Plot 2 only extended to a maximum depth of 10mbgl. However, the deeper boreholes on Plot 1 identified that superficial deposits extended to depths of between 36.0m and 39.5mbgl beneath which the Pennine Middle Coal Measures Formation was encountered. While the superficial deposits generally comprised Glacial Till, with increasing depth more granular materials were encountered that have been interpreted as Ice Contact Deposits. The Pennine Middle Coal Measures were found to comprise a weak weathered mudstone.

The geotechnical section of this report details that either a ground improvement option or piled foundation solution will be suitable for the proposed development. The following sections present a summary of these options.

Ground Improvement Appraisal

Ground improvement techniques such as vibro-replacement stone or concrete columns could be considered for the site. Both ground improvement techniques involve inserting a vibrating poker into the ground, which displaces the soil. The resultant void is then infilled with either stone or concrete. It should be noted that stone columns could provide a potential pathway for the migration of ground gas, which could be produced from the underlying made ground or from deeper coal mining sources. Vibro-replacement concrete columns do not have the same disadvantages.

In order for concrete columns to work effectively they will need to penetrate the full thickness of the made ground. Therefore, a column depth in the order of 5 to 6mbgl should be anticipated. The stiff Glacial Till should provide a suitable bearing layer for the concrete columns. It is recommended that specialist advice is sought from a ground improvement contractor with regard to the suitability of this technique in these ground conditions and the anticipated achievable bearing capacities. If either of these techniques is selected, it is recommended that appropriate in-situ testing is specified in order to assess the performance of these foundations.

Pile Foundation Solution

TRC considers that either driven or continuous flight auger (CFA) piles could be utilised at the Site. Driven piles have the advantage of improving the density of the ground whereas CFA piles could potentially loosen the granular deposits and thus result in a reduced safe working load. The main disadvantage of driven piles is that they can cause unacceptable amounts of vibration that could potentially damage nearby above and underground structures. If driven piles are used then assurances will need to be sought from the piling contractor that damage will not be caused to nearby structures, including buried infrastructure on the site. Driven piles could also result in the dragging down of contaminants within the made ground.

It is considered that piles end bearing within the Glacial Till could be suitable for the proposed development, depending upon proposed structural loads. At the time of writing this report, there was no information available on the anticipated structural loads that the piled foundations would be required to carry. The preliminary calculations below have been undertaken for driven and CFA piles with toe depths of 8 and 10m, respectively. Geotechnical information was only collected in the upper 10m and therefore information on the deeper materials is not available.

For the preliminary pile calculations refer to Section 7.2.3 of this report.

Annex A: Figures

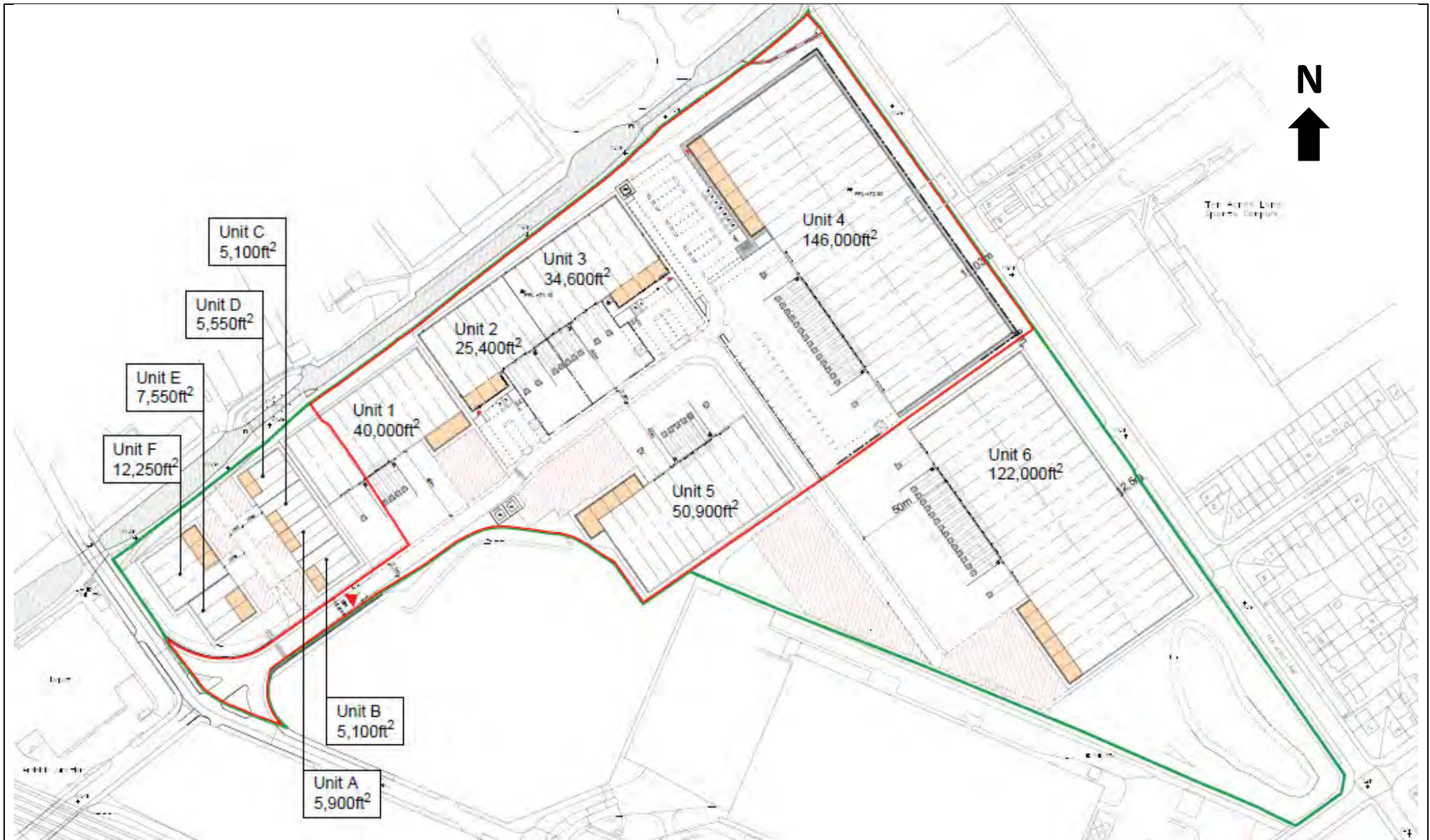


Legend

Plot 1

Plot 2

NOTES	COPYRIGHT NOTES Data Copyright © 2012, TRC Environmental, Inc. This map does not represent a legal document. It is intended to serve as an aid in graphical representation only. Information shown on this map is not warranted for accuracy or fitness for any particular purpose.				REVISIONS				TRC Work.Life Brown Street, Manchester, M2 1DH		TITLE	
											SITE LOCATION PLAN	
					TRC PROJECT NO.		SCALE @ A3					
					423207		1:6000					
P01	FIRST ISSUE				CANMOOR		PURPOSE OF ISSUE		STATUS			
	Initials	CMD	CMD	18/01/21			SUITABLE FOR INFORMATION		S2			
REV.	REVISION NOTES/COMMENTS				PROJECT GRIMSHAW LANE, PLOTS 1&2		DRAWING NO.		REVISION			
	Initials						FIGURE 01		P01			



CLIENT:
CANMOOR PROJECTS LIMITED

DRAWN BY:
CM

PROJECT NO.:
423207.0000.0000

DATE:
MARCH 2021

GRIMSHAW LANE

TRC 20 Red Lion Street
London, WC1R 4PQ

<http://www.trccompanies.com/>

Data Copyright © 2012, TRC Environmental, Inc. This map does not represent a legal document. It is intended to serve as an aid in graphical representation only. Information shown on this map is not warranted for accuracy or fitness for any particular purpose.

FIGURE:

2



CLIENT:
CANMOOR PROJECTS LIMITED

DRAWN BY:
CM

PROJECT NO.:
423207.0000.0000

DATE:
MARCH 2021

GRIMSHAW LANE PLOT 1



20 Red Lion Street
London, WC1R 4PQ

<http://www.trccompanies.com/>

Data Copyright © 2012, TRC Environmental, Inc. This map does not represent a legal document. It is intended to serve as an aid in graphical representation only. Information shown on this map is not warranted for accuracy or fitness for any particular purpose.

FIGURE:

3



CLIENT:
CANMOOR PROJECTS LIMITED

DRAWN BY:
CM

PROJECT NO.:
423207.0000.0000

DATE:
MARCH 2021

GRIMSHAW LANE PLOT 2

TRC 20 Red Lion Street
London, WC1R 4PQ

<http://www.trccompanies.com/>

Data Copyright © 2012, TRC Environmental, Inc. This map does not represent a legal document. It is intended to serve as an aid in graphical representation only. Information shown on this map is not warranted for accuracy or fitness for any particular purpose.

FIGURE:

4

Annex B: Site Photographs

Photographic Log

Client Name: Canmoor Projects Limited		Site Location: Grimshaw Lane, Plots 1/2	Project No.: 423207.0000.0000
Photo No. 1	Date 03/02/2021		
Description: Overview of Grimshaw lane Plot 1, looking west			
Photo No. 2	Date 04/02/2021		
Description: Overview of Grimshaw lane Plot 2, looking east			

Photographic Log

Client Name: Canmoor Projects Limited		Site Location: Grimshaw Lane, Plots 1/2	Project No.: 423207.0000.0000
Photo No. 3	Date 03/02/2021		
Description: Drilling Borehole CP101			
Photo No. 4	Date 04/02/2020		
Description: Excavating Trial Pit TP302			

Photographic Log

Client Name:		Site Location:		Project No.:
Canmoor Projects Limited		Grimshaw Lane, Plots 1/2		423207.0000.0000
Photo No.	Date			
5	04/02/2021			
Description: Excavating TP101				
Photo No.	Date			
6	05/02/2021			
Description: Excavating TP304. Extensive made ground including loose metal and rebar is visible in the arisings.				

Photographic Log

Client Name: Canmoor Projects Limited		Site Location: Grimshaw Lane, Plots 1/2	Project No.: 423207.0000.0000
Photo No. 7	Date 05/02/2020		
Description: Excavating TP305.			
Photo No. 8	Date 08/02/2020		
Description: Excavating RC01.			

Annex C: Exploratory Hole Logs



WINDOW SAMPLE LOG

WINDOW SAMPLE NO. WS101

Page 1 of 2

Facility/Project Name: Grimshaw lane, Plot 1		Date Drilling Started: 3/2/21		Date Drilling Completed: 3/2/21		Project Number: 423207	
Drilling Firm: DMW Drilling		Drilling Method: Window Sampling		Surface Elev. (m) ---		TOC Elevation (m) ---	
Window Sample Location: N: 53.4961 E: -2.1988		Personnel Logged By - Colin Morton Driller - David Williamson		Total Depth (m bgs) 5.0		Borehole Dia. (cm)	
Civil Town/City/or Village: Manchester		County:		Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Drilling Equipment: Window Sampling	
				Depth (m bgs)		Depth (m bgs)	

SAMPLE	NUMBER AND TYPE	RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
ENV1					MADE GROUND: Dark grey clayey gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of quartzite.				
					MADE GROUND: Black very sandy GRAVEL. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of ash and clinker.				
					MADE GROUND: Brownish grey CLAY.				
				1	MADE GROUND: Dark brown clayey very gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of brick fragments.				
					MADE GROUND: Brownish grey CLAY. Occasional black staining.				
SPT			4						
				2					
SPT			8						
ENV2				3	Stiff, becoming very stiff mottled dark brownish grey CLAY. (GLACIAL TILL)				
SPT			22						
				4					
SPT			35						

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

WINDOW SAMPLE LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS GPJ 423207 8/4/21



WINDOW SAMPLE LOG

WINDOW SAMPLE NO. WS101

Page 2 of 2

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
SPT		40	6 7 8 9 10 11					



WINDOW SAMPLE LOG

WINDOW SAMPLE NO. WS102

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Drilling Started: 3/2/21		Date Drilling Completed: 3/2/21		Project Number: 423207	
Drilling Firm: DMW Drilling		Drilling Method: Window Sampling		Surface Elev. (m) ---		TOC Elevation (m) ---	
Window Sample Location: N: 53.4955 E: -2.1994		Personnel Logged By - Colin Morton Driller - David Williamson		Total Depth (m bgs) 5.0		Borehole Dia. (cm)	
Civil Town/City/or Village: Manchester		County:		Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Drilling Equipment: Window Sampling	
				Depth (m bgs)		Depth (m bgs)	

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
				MADE GROUND: Dark grey clayey gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick ash and clinker.				
			1	MADE GROUND: Greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of brick, concrete and quartzite.				
SPT		6		MADE GROUND: Black slightly clayey very gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of ash and clinker.				
ENV			2					
SPT		22						
			3	MADE GROUND: Greyish brown clayey very sandy GRAVEL. Sand is fine to medium, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick and concrete.				
SPT		6		Soft mottled brownish grey slightly sandy, slightly gravelly CLAY. Sand is fine to medium, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of quartzite. (GLACIAL TILL)				
ENV			4					
								...Hole collapsed before spt at 4.0m could be taken.

WINDOW SAMPLE LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS GPJ 423207 8/4/21

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----



WINDOW SAMPLE LOG

WINDOW SAMPLE NO. WS103

Page 1 of 2

Facility/Project Name: Grimshaw lane, Plot 1		Date Drilling Started: 3/2/21	Date Drilling Completed: 3/2/21	Project Number: 423207	
Drilling Firm: DMW Drilling	Drilling Method: Window Sampling	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 5.0	Borehole Dia. (cm)
Window Sample Location: N: 53.4961 E: -2.1993		Personnel Logged By - Colin Morton Driller - David Williamson		Drilling Equipment: Window Sampling	
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)	

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
ENV				MADE GROUND: Dark brownish grey very silty clayey gravelly SAND. Sand is fine to medium, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of quartzite. Thin band of ash and clinker at 0.35m				
Bulk			1	MADE GROUND: Dark brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of quartzite.				
SPT		2		MADE GROUND: Reworked mottled brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to medium, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of quartzite.				
SPT		11	2					
ENV2			3	Firm, becoming very stiff brownish grey CLAY. Very dense band of sand at 5.0m. (GLACIAL TILL)				
SPT		20						
SPT		36	4					

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

WINDOW SAMPLE LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS GPJ 423207 8/4/21



WINDOW SAMPLE LOG

WINDOW SAMPLE NO. WS103

Page 2 of 2

SAMPLE		RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE									
SPT			>50						8/20mm
				6					
				7					
				8					
				9					
				10					
				11					



WINDOW SAMPLE LOG

WINDOW SAMPLE NO. WS104

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Drilling Started: 3/2/21		Date Drilling Completed: 3/2/21		Project Number: 423207	
Drilling Firm: DMW Drilling		Drilling Method: Window Sampling		Surface Elev. (m) ---		TOC Elevation (m) ---	
Window Sample Location: N: 53.4959 E: -2.1998		Personnel Logged By - Colin Morton Driller - David Williamson		Total Depth (m bgs) 5.0		Borehole Dia. (cm)	
Civil Town/City/or Village: Manchester		County:		Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Drilling Equipment: Window Sampling	
				Depth (m bgs)		Depth (m bgs)	

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
Bulk			1	MADE GROUND: Dark brownish grey very silty clayey gravelly SAND. Sand is fine to medium, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of brick, clinker, coal and quartzite.				
SPT		5		MADE GROUND: Dark brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to medium, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of clinker and quartzite.				
ENV1			2	MADE GROUND: Black gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of ash and clinker.				
SPT		7		MADE GROUND: Dark grey slightly sandy slightly gravelly CLAY. Sand is fine to medium, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of ash and clinker.				
			3	Stiff dark brownish grey CLAY. (GLACIAL TILL)				
SPT		18						
ENV2			4					

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

WINDOW SAMPLE LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS GPJ 423207 8/4/21



WINDOW SAMPLE LOG

WINDOW SAMPLE NO. WS301

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Drilling Started: 4/2/21		Date Drilling Completed: 4/2/21		Project Number: 423207					
Drilling Firm: DMW Drilling		Drilling Method: Window Sampling		Surface Elev. (m) ---		TOC Elevation (m) ---		Total Depth (m bgs) 5.0		Borehole Dia. (cm)	
Window Sample Location: N: 53.4960 E: -2.1929				Personnel Logged By - Colin Morton Driller - David Williamson				Drilling Equipment: Window Sampling			
Civil Town/City/or Village: Manchester		County:		Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time				Depth (m bgs) Depth (m bgs)			

SAMPLE		RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE									
					MADE GROUND: Dark brownish grey slightly sandy gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick.				
ENV1				1	MADE GROUND: Dark grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of brick and mudstone.				
SPT			15						
ENV2				2					
SPT			24						
				3					...Obstruction at 3.0m
				4					

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

WINDOW SAMPLE LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21



WINDOW SAMPLE LOG

WINDOW SAMPLE NO. WS302

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Drilling Started: 4/2/21		Date Drilling Completed: 4/2/21		Project Number: 423207					
Drilling Firm: DMW Drilling		Drilling Method: Window Sampling		Surface Elev. (m) ---		TOC Elevation (m) ---		Total Depth (m bgs) 5.0		Borehole Dia. (cm)	
Window Sample Location: N: 53.4955 E: -2.1926				Personnel Logged By - Colin Morton Driller - David Williamson				Drilling Equipment: Window Sampling			
Civil Town/City/or Village: Manchester		County:		Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time				Depth (m bgs) Depth (m bgs)			

SAMPLE		RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE									
					MADE GROUND: Dark grey slightly sandy gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick and concrete.				
ENV Bulk				1	MADE GROUND: Dark grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick, concrete and mudstone.				
SPT			7						
				2					
SPT			11						
				3					
ENV									
SPT			25						
				4					...Obstruction at 3.5m

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

WINDOW SAMPLE LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS GPJ 423207 8/4/21



WINDOW SAMPLE LOG

WINDOW SAMPLE NO. WS303

Page 1 of 2

Facility/Project Name: Grimshaw lane, Plot 1		Date Drilling Started: 4/2/21		Date Drilling Completed: 4/2/21		Project Number: 423207					
Drilling Firm: DMW Drilling		Drilling Method: Window Sampling		Surface Elev. (m) ---		TOC Elevation (m) ---		Total Depth (m bgs) 5.0		Borehole Dia. (cm)	
Window Sample Location: N: 53.4961 E: -2.1941				Personnel Logged By - Colin Morton Driller - David Williamson				Drilling Equipment: Window Sampling			
Civil Town/City/or Village: Manchester		County:		Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time				Depth (m bgs) Depth (m bgs)			

SAMPLE		RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE									
ENV				1	MADE GROUND: Dark grey slightly gravelly sandy clayey SILT. Sand is fine to medium, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick, concrete and mudstone.				...Water seepage at 2.0m
SPT			29						
SPT			8	2					
SPT			6	3					
SPT			11	4					

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

WINDOW SAMPLE LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS GPJ 423207 8/4/21



WINDOW SAMPLE LOG

WINDOW SAMPLE NO. WS303

Page 2 of 2

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
ENV2		19		Stiff brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to medium, Gravel is sub-angular to rounded, fine to coarse grained. Gravel consists of mudstone. (GLACIAL TILL)				
SPT								
			6					
			7					
			8					
			9					
			10					
			11					



WINDOW SAMPLE LOG

WINDOW SAMPLE NO. WS304

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Drilling Started: 4/2/21		Date Drilling Completed: 4/2/21		Project Number: 423207	
Drilling Firm: DMW Drilling		Drilling Method: Window Sampling		Surface Elev. (m) ---		TOC Elevation (m) ---	
Window Sample Location: N: 53.4955 E: -2.1943		Personnel Logged By - Colin Morton Driller - David Williamson		Total Depth (m bgs) 5.0		Borehole Dia. (cm)	
Civil Town/City/or Village: Manchester		County:		Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Drilling Equipment: Window Sampling	
				Depth (m bgs)		Depth (m bgs)	

SAMPLE		RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE									
ENV Bulk				1	MADE GROUND: Dark greyish brown slightly gravelly sandy very clayey SILT. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick and mudstone.				...Wood fragments recovered at 0.9m
SPT			7						
SPT			12	2					...Water seepage at 2.0m
SPT			13	3					
ENV				4	Firm to stiff brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to medium, Gravel is sub-angular to rounded, fine to coarse grained. Gravel consists of mudstone. (GLACIAL TILL)				
SPT			21						

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

WINDOW SAMPLE LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS GPJ 423207 8/4/21



BOREHOLE LOG

BH NO. CP101

Page 1 of 2

Facility/Project Name: Grimshaw lane, Plot 1		Date Borehole Started: 3/2/21	Date Borehole Completed: 3/2/21	Project Number: 423207
Drilling Firm: DMW Drilling	Drilling Method: Cable Percussive	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 10.0
Boring Location: N: 53.49623 E: -2.19898		Personnel Logged By - Colin Morton Driller - David Williamson		Drilling Equipment: Cable Percussive
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) <u>3</u> Depth (m bgs) <u>2</u>

SAMPLE		RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE									
D					MADE GROUND: Dark brownish grey clayey gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick and quartzite.				
Bulk									
ENV					MADE GROUND: Dark brownish grey slightly sandy slightly gravelly very silty CLAY. Sand is fine to medium, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of brick and quartzite. Thin band of ash and clinker at 0.7m.				
D				1					
Bulk SPT			5						
				2					
Bulk SPT			17						...Groundwater level after 30mins = 2m
ENV					Firm dark brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to medium grained. Gravel is subangular to subrounded, fine to coarse grained. (GLACIAL TILL)				
J100				3					...Groundwater Encountered at 3m
D									
Bulk SPT			22	4	Stiff dark grey slightly sandy slightly gravelly CLAY. Sand is fine to medium grained. Gravel is subangular to subrounded, fine to coarse grained. Occasional bands of silt. (GLACIAL TILL)				

METRIC BOREHOLE LOG (NON-J.S.) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----



BOREHOLE LOG

BH NO. CP101

Page 2 of 2

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
Bulk SPT		22						
			6					
Bulk SPT		20						
			7					
Bulk SPT		20						
			8					
			9					
SPT		22						
			10					
			11					



BOREHOLE LOG

BH NO. CP102

Page 1 of 6

Facility/Project Name: Grimshaw lane, Plot 1		Date Borehole Started: 4/2/21	Date Borehole Completed: 4/2/21	Project Number: 423207	
Drilling Firm: DMW Drilling	Drilling Method: Cable Perc, Rotary from 10.0m	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 36.0	Borehole Dia. (cm)
Boring Location: N: 53.49553 E: -2.20006		Personnel Logged By - Colin Morton Driller - David Williamson		Drilling Equipment: Cable Percussive	
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		▽ Depth (m bgs) <u>2.8</u> ▼ Depth (m bgs) <u>1.3</u>	

SAMPLE		RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE									
D					MADE GROUND: Dark brownish grey clayey gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick and quartzite.				
D					MADE GROUND: Black clayey SAND. Sand is fine to coarse.				
Bulk									
ENV Bulk SPT			24	1					...Groundwater level after 30mins = 1.3m
D				2	Firm brownish grey silty slightly sandy slightly gravelly CLAY. Sand is fine grained. Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of mudstone. (GLACIAL TILL)				
U100									
D									
Bulk SPT			13	3					...Groundwater Encountered at 2.8m
U100				4					
D									
D					Stiff dark brownish grey sandy slightly gravelly CLAY. Sand is				

Signature:	Firm: TRC Companies	Fax
------------	----------------------------	-----

METRIC BOREHOLE LOG (NON-U.S.) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21



BOREHOLE LOG

BH NO. CP102

Page 2 of 6

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
Bulk SPT ENV2		25		fine to medium grained. Gravel is sub-angular to sub-rounded, fine to coarse grained. Occasional silt bands. (GLACIAL TILL)				
			6					
Bulk SPT		21						
			7					
Bulk SPT		21						
			8					
			9					
Bulk SPT		22						
			10					
D			11					

...Rotary Drilling from 10.0m to TD.



BOREHOLE LOG

BH NO. CP102

Page 3 of 6

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
			12					
			13					
			14					
			15					
			16					
			17					
			18					



BOREHOLE LOG

BH NO. CP102

Page 4 of 6

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
			19					
			20					
			21					
			22	Light brown SAND. Sand is fine to medium grained. (ICE CONTACT DEPOSITS)				
			23					
			24					



BOREHOLE LOG

BH NO. CP102

Page 5 of 6

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
			25					
			26					
			27					
			28					
			29					
			30					
			31					



BOREHOLE LOG

BH NO. CP102

Page 6 of 6

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
			32					
			33					
			34					
			35					
			36					Terminated hole at 36m due to casing jam.
			37					



BOREHOLE LOG

BH NO. CP301

Page 1 of 2

Facility/Project Name: Grimshaw lane, Plot 1		Date Borehole Started: 5/2/21	Date Borehole Completed: 5/2/21	Project Number: 423207	
Drilling Firm: DMW Drilling	Drilling Method: Cable Percussive	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 10.0	Borehole Dia. (cm)
Boring Location: N: 53.49538 E: -2.19319		Personnel Logged By - Colin Morton Driller - David Williamson		Drilling Equipment: Cable Percussive	
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)	

SAMPLE		RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE									
D					MADE GROUND: Dark grey clayey silty very sandy GRAVEL. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick, concrete and mudstone.				
Bulk				1					
Bulk SPT			13						
D				2					
Bulk SPT			8		Stiff / very stiff dark grey slightly sandy slightly gravelly CLAY. Sand is fine to medium grained. Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of mudstone. (GLACIAL TILL)				
ENV									
J100				3					
D									
D				4					
ENV									
Bulk SPT			31						

METRIC BOREHOLE LOG (NON-U.S.) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----



BOREHOLE LOG

BH NO. CP301

Page 2 of 2

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
Bulk SPT		36						
D			6					
Bulk								
			7					
J100								
D			8					
			9					
Bulk SPT		25						
			10					
D								
			11					

METRIC BOREHOLE LOG (NON-U.S.) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21

**BOREHOLE LOG****BH NO. CP302**

Page 1 of 2

Facility/Project Name: Grimshaw lane, Plot 1		Date Borehole Started: 5/2/21	Date Borehole Completed: 5/2/21	Project Number: 423207	
Drilling Firm: DMW Drilling	Drilling Method: Cable Percussive	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 10.0	Borehole Dia. (cm)
Boring Location: N: 53.49626 E: -2.19341		Personnel Logged By - Colin Morton Driller - David Williamson		Drilling Equipment: Cable Percussive	
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		▽ Depth (m bgs) <u>3.4</u> Depth (m bgs)	

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
Bulk			1	MADE GROUND: Dark grey silty slightly sandy very gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick, concrete and mudstone. Occasional cobbles of brick and concrete.				...Groundwater Encountered at 3.4m
Bulk SPT		10						
ENV			2					
Bulk SPT		8						
			3	Firm/Stiff dark grey slightly sandy slightly gravelly CLAY. Sand is fine to medium grained. Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of mudstone. (GLACIAL TILL)				
Bulk SPT		19						
			4					
Bulk SPT		32						

METRIC BOREHOLE LOG (NON-U.S.) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21

Signature:	Firm: TRC Companies	Fax
------------	----------------------------	-----



BOREHOLE LOG

BH NO. CP302

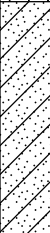
Page 2 of 2

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
Bulk SPT		16						
ENV2			6					
J100								
J100								
D			7					
Bulk SPT		26	8					
			9					
J100			10					
			11					

**BOREHOLE LOG****BH NO. RC01**

Page 1 of 5

Facility/Project Name: Grimshaw lane, Plot 1		Date Borehole Started: 9/2/21	Date Borehole Completed: 10/2/21	Project Number: 423207	
Drilling Firm: DMW Drilling	Drilling Method: Rotary Drilling	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 27.0	Borehole Dia. (cm)
Boring Location: N: 53.49534 E: -2.19975		Personnel Logged By - Ashley Standen-Howard Driller - David Williamson		Drilling Equipment: Rotary Drilling	
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)	

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
				MADE GROUND: Light brown topsoil. Gravel consists of ash and brick.			
			1	MADE GROUND: Soft dark brown sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is angular to sub-rounded, fine to coarse grained. Gravel consists of brick and concrete.			
			2				
			3				
			4	Firm light brown slightly sandy CLAY. Sand is fine to coarse grained. (GLACIAL TILL)			

METRIC BOREHOLE LOG (NON-U.S.) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21

Signature:	Firm: TRC Companies	Fax
------------	----------------------------	-----



BOREHOLE LOG

BH NO. RC01

Page 2 of 5

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			6				
			7	light brown sandy CLAY. Sand is fine to coarse grained. (GLACIAL TILL)			
			8				
			9				
			10	light brown clayey SAND. Sand is fine to coarse grained. (GLACIAL TILL)			
			11	Firm light brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is angular to sub-rounded, fine to coarse grained. Gravel consists of coal, mudstone and sandstone. (GLACIAL TILL)			



BOREHOLE LOG

BH NO. RC01

Page 3 of 5

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			12				
			13				
			14				
			15				
			16				
			17				
			18				



BOREHOLE LOG

BH NO. RC01

Page 4 of 5

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			19				
			20				
			21				
			22				
			23	light brown slightly clayey SAND. Sand is fine to coarse grained. Traces of Coal at 27.0m. (ICE CONTACT DEPOSITS)			
			24				



BOREHOLE LOG

BH NO. RC01

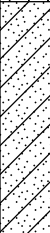
Page 5 of 5

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			25				
			26				
			27				
			28				...Terminated hole at 27m due to casing jam.
			29				
			30				
			31				

**BOREHOLE LOG****BH NO. RC01A**

Page 1 of 8

Facility/Project Name: Grimshaw lane, Plot 1		Date Borehole Started: 13/2/21	Date Borehole Completed: 17/2/21	Project Number: 423207	
Drilling Firm: DMW Drilling	Drilling Method: Cable Perc, Rotary from 40.0m	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 45.0	Borehole Dia. (cm)
Boring Location: N: 53.49536 E: -2.19981		Personnel Logged By - Ashley Standen-Howard Driller - David Williamson		Drilling Equipment: Rotary Drilling	
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)	

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
				MADE GROUND: Light brown topsoil.			
			1	MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is angular to sub-rounded, fine to coarse grained. Gravel consists of ash, brick and concrete.			
			2				
			3				
			4	Firm light brown slightly sandy CLAY. Sand is fine to coarse grained. (GLACIAL TILL)			

METRIC BOREHOLE LOG (NON-U.S.) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21

Signature:	Firm: TRC Companies	Fax
------------	----------------------------	-----



BOREHOLE LOG

BH NO. RC01A

Page 2 of 8

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			6				
			7				
			8				
			9				
			10	Very stiff light brown sandy CLAY. Sand is fine to coarse grained. Rare boulders of sandstone. (GLACIAL TILL)			
			11				



BOREHOLE LOG

BH NO. RC01A

Page 3 of 8

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			12				
			13				
			14				
			15				 200mm casing from 15.0mbgl
			16				
			17				
			18				 150mm casing from 18.0mbgl- TD



BOREHOLE LOG

BH NO. RC01A

Page 4 of 8

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			19				
			20				
			21				
			22				
			23				
			24				



BOREHOLE LOG

BH NO. RC01A

Page 5 of 8

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			25				
			26				
			27				
			28	light brown slightly gravelly SAND. Sand is fine to coarse, Gravel is angular to sub-rounded, fine to coarse grained. Gravel consists of coal, mudstone and sandstone. (ICE CONTACT DEPOSITS)			
			29				
			30				
			31				



BOREHOLE LOG

BH NO. RC01A

Page 6 of 8

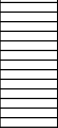
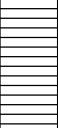
SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			32	Very stiff light brown sandy CLAY. Sand is fine to coarse grained. (GLACIAL TILL)			
			33				
			34				
			35	Firm light brown sandy SILT. Sand is fine to coarse grained. (GLACIAL TILL)			
			36	light brown very gravelly SAND. Sand is fine to coarse, Gravel is very angular to sub-rounded, fine to coarse grained. Gravel consists of mudstone and sandstone. (ICE CONTACT DEPOSITS)			
			37				



BOREHOLE LOG

BH NO. RC01A

Page 7 of 8

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			39	Very stiff dark brown slightly gravelly CLAY. Gravel is very angular to sub-angular, fine to coarse grained. Gravel consists of mudstone. (GLACIAL TILL)			
			40	Weak greyish brown weathered MUDSTONE. (Pennine Middle Coal Measures Formation)			
			41				
			42				
			43				
			44				
							
							
							
							
							
							

... Rotary Drilling from 40.0m to TD.



BOREHOLE LOG

BH NO. RC01A

Page 8 of 8

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			45				...Terminated borehole - hard rock at 45.0m.
			46				...Terminated borehole - hard rock at 45.0m.
			47				...Terminated borehole - hard rock at 45.0m.
			48				...Terminated borehole - hard rock at 45.0m.
			49				...Terminated borehole - hard rock at 45.0m.
			50				...Terminated borehole - hard rock at 45.0m.
			51				...Terminated borehole - hard rock at 45.0m.



BOREHOLE LOG

BH NO. RC02

Page 1 of 4

Facility/Project Name: Grimshaw lane, Plot 1		Date Borehole Started: 11/2/21	Date Borehole Completed: 12/2/21	Project Number: 423207	
Drilling Firm: DMW Drilling	Drilling Method: Rotary Drilling	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 23.0	Borehole Dia. (cm)
Boring Location: N: 53.49568 E: -2.20023		Personnel Logged By - Ashley Standen-Howard Driller - David Williamson		Drilling Equipment: Rotary Drilling	
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)	

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
				MADE GROUND: Light brown topsoil.			
			1	MADE GROUND: dark brown clayey very gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of ash, brick and concrete.			
			2				
			3				
			4	Firm light brown slightly sandy CLAY. Sand is fine to coarse grained. Occasional silt bands from 5.0m. (GLACIAL TILL)			

METRIC BOREHOLE LOG (NON-U.S.) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----



BOREHOLE LOG

BH NO. RC02

Page 2 of 4

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			6				
			7				
			8				
			9				
			10				
			11				



BOREHOLE LOG

BH NO. RC02

Page 3 of 4

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			12				
			13				
			14				
			15				
			16				
			17				
			18				



BOREHOLE LOG

BH NO. RC02

Page 4 of 4

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			19				
			20				
			21				
			22	Medium dense light brown SAND. Sand is fine to coarse grained. (ICE CONTACT DEPOSITS)			
			23				...Borehole terminated due to suspected carbon monoxide gas emission. Gas readings recorded 106ppm CO.
			24				

**BOREHOLE LOG****BH NO. RC02A**

Page 1 of 7

Facility/Project Name: Grimshaw lane, Plot 1		Date Borehole Started: 17/2/21	Date Borehole Completed: 20/2/21	Project Number: 423207	
Drilling Firm: DMW Drilling	Drilling Method: Cable Perc, Rotary from 32.0m	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 40.0	Borehole Dia. (cm)
Boring Location: N: 53.49563 E: -2.20032		Personnel Logged By - Ashley Standen-Howard Driller - David Williamson		Drilling Equipment: Rotary Drilling	
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)	

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
				MADE GROUND: Light brown topsoil.			
			1	MADE GROUND: Firm dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is angular to sub-rounded, fine to coarse grained. Gravel consists of ash, brick and concrete.			
			2				
			3	Firm light brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is angular to sub-rounded, fine to coarse grained. Gravel consists of coal, mudstone, and sandstone. (GLACIAL TILL)			
			4				

Signature:	Firm: TRC Companies	Fax
------------	----------------------------	-----

METRIC BOREHOLE LOG (NON-U.S.) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21



BOREHOLE LOG

BH NO. RC02A

Page 2 of 7

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			6				
			7				
			8				
			9				
			10				
			11				



BOREHOLE LOG

BH NO. RC02A

Page 3 of 7

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			12				
			13				
			14				
			15				
			16				
			17				
			18				



BOREHOLE LOG

BH NO. RC02A

Page 4 of 7

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			19				
			20				
			21				
				light brown SAND. Sand is fine to coarse grained. (GLACIAL TILL)			
			22				
			23				
			24				



BOREHOLE LOG

BH NO. RC02A

Page 5 of 7

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			25				
				Brown very stiff sandy gravelly boulder CLAY (GLACIAL TILL)			
			26				
			27				
			28				
			29				
			30				
				Grey weathered MUDSTONE. Becoming hard at 32.0m.			
			31				

... Slow drilling - hard rock.
Chiselling for 2 hrs from
31.0m to 32.0m.



BOREHOLE LOG

BH NO. RC02A

Page 7 of 7

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
			39				
			40				
			41				
			42				
			43				
			44				



TRIAL PITTING LOG

TRIAL PIT NO. TP101

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Trial Pit Started: 4/2/21	Date Trial Pit Completed: 4/2/21	Project Number: 423207
Contractor: DMW Drilling	Excavation Method: Excavator	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 3.3
Trial Pit Location: N: 53.49589 E: -2.19851		Personnel Logged By - Colin Morton Trial Pitter - David Williamson		Excavation Equipment: Excavator
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
ENV1			1	MADE GROUND: Black clayey gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of brick, concrete and quartzite.			
				MADE GROUND: Mottled brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick. Occasional black staining.			
			2				
ENV2			3	MADE GROUND: Greyish redish brown clayey very sandy GRAVEL. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick.			...Perched water encountered at 2.2m

TRIAL PITTING LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----



TRIAL PITTING LOG

TRIAL PIT NO. TP102

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Trial Pit Started: 4/2/21	Date Trial Pit Completed: 4/2/21	Project Number: 423207
Contractor: DMW Drilling	Excavation Method: Excavator	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 4.0
Trial Pit Location: N: 53.49588 E: -2.19909		Personnel Logged By - Martin Dorfling Trial Pitter - David Williamson		Excavation Equipment: Excavator
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
ENV1			1	MADE GROUND: Dark greyish brown clayey very gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine grained. Gravel consists of brick.			
				MADE GROUND: Black gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of ash and clinker.			
				MADE GROUND: Dark brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of brick.			
				MADE GROUND: Redish brown sandy GRAVEL. Sand is fine to coarse. Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick.			
				MADE GROUND: Dark brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of brick.			
ENV2			3				

...Perched water encountered at 2m

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

TRIAL PITTING LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21



TRIAL PITTING LOG

TRIAL PIT NO. TP103

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Trial Pit Started: 4/2/21	Date Trial Pit Completed: 4/2/21	Project Number: 423207
Contractor: DMW Drilling	Excavation Method: Excavator	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 4.0
Trial Pit Location: N: 53.49542 E: -2.19992		Personnel Logged By - Martin Dorfling Trial Pitter - David Williamson		Excavation Equipment: Excavator
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
ENV1			1	MADE GROUND: Black clayey SAND. Sand is fine to coarse grained.			
				MADE GROUND: Black very gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of ash and clinker.			
				MADE GROUND: Mottled brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of brick and concrete.			
				MADE GROUND: Dark grey very clayey very gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of ash and clinker .			
			2	MADE GROUND: Mottled brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to medium, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of brick.			
				MADE GROUND: Greyish redish brown very sandy GRAVEL. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick.			
ENV2			3	MADE GROUND: Brownish grey slightly sandy CLAY. Sand is fine to medium grained.			...Perched water encountered at 2.7m

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

TRIAL PITTING LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21



TRIAL PITTING LOG

TRIAL PIT NO. TP104

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Trial Pit Started: 4/2/21	Date Trial Pit Completed: 4/2/21	Project Number: 423207
Contractor: DMW Drilling	Excavation Method: Excavator	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 4.0
Trial Pit Location: N: 53.49573 E: -2.19886		Personnel Logged By - Martin Dorfling Trial Pitter - David Williamson		Excavation Equipment: Excavator
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
ENV			1	MADE GROUND: Black clayey very gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of brick and concrete.			
				MADE GROUND: Mottled brown and grey slightly sandy slightly gravelly CLAY. Sand is fine to medium, Gravel is sub-angular to sub-rounded, fine to medium grained. Gravel consists of brick.			
				MADE GROUND: Black very gravelly SAND. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of ash and clinker.			
				MADE GROUND: Brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick and concrete. 2.4 - 2.6 layer of ash and clinker.			
				MADE GROUND: Greyish redish brown very sandy GRAVEL. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick.			
ENV			3	MADE GROUND: Black very sandy GRAVEL. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of ash and clinker.			
				MADE GROUND: Brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick and concrete.			

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

TRIAL PITTING LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21



TRIAL PITTING LOG

TRIAL PIT NO. TP301

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Trial Pit Started: 4/2/21	Date Trial Pit Completed: 4/2/21	Project Number: 423207
Contractor: DMW Drilling	Excavation Method: Excavator	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 3.5
Trial Pit Location: N: 53.49577 E: -2.19308		Personnel Logged By - Colin Morton Trial Pitter - David Williamson		Excavation Equipment: Excavator
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
ENV1			1	MADE GROUND: Dark grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is angular to sub-rounded, fine to coarse grained. Gravel consists of brick, concrete and mudstone. Cobbles and boulders of concrete. Slight hydrocarbon odour. 3m Long metal rebar in excavation.			
			2				
			3				
ENV2							

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

TRIAL PITTING LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21



TRIAL PITTING LOG

TRIAL PIT NO. TP302

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Trial Pit Started: 4/2/21	Date Trial Pit Completed: 4/2/21	Project Number: 423207
Contractor: DMW Drilling	Excavation Method: Excavator	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 3.0
Trial Pit Location: N: 53.49594 E: -2.19336		Personnel Logged By - Colin Morton Trial Pitter - David Williamson		Excavation Equipment: Excavator
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
ENV1			1	MADE GROUND: Dark grey slightly sandy gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of yellow and red brick and mudstone. Slight hydrocarbon odour. Cobbles and boulders of cement.			
			2				
ENV2			3				

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

TRIAL PITTING LOG (METRIC) GRIMSHAW LANE MANCHESTER LOGS.GPJ 423207 8/4/21



TRIAL PITTING LOG

TRIAL PIT NO. TP303

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Trial Pit Started: 5/2/21	Date Trial Pit Completed: 5/2/21	Project Number: 423207
Contractor: DMW Drilling	Excavation Method: Excavator	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 4.0
Trial Pit Location: N: 53.49515 E: -2.19343		Personnel Logged By - Colin Morton Trial Pitter - David Williamson		Excavation Equipment: Excavator
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
ENV1			1	MADE GROUND: Dark grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick, concrete and mudstone. Cobbles and boulders of concrete. 0.4m layer of bricks and concrete starting at 1.35m.			
Bulk			3	Firm brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to medium, Gravel is sub-rounded to rounded, fine to coarse grained. Gravel consists of quartzite.			
ENV2							

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

TRIAL PITTING LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21



TRIAL PITTING LOG

TRIAL PIT NO. TP304

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Trial Pit Started: 5/2/21	Date Trial Pit Completed: 5/2/21	Project Number: 423207
Contractor: DMW Drilling	Excavation Method: Excavator	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 4.0
Trial Pit Location: N: 53.49593 E: -2.19438		Personnel Logged By - Colin Morton Trial Pitter - David Williamson		Excavation Equipment: Excavator
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
ENV1			1	MADE GROUND: Dark grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick, concrete and mudstone. Cobbles and boulders of concrete. Large amounts of loose metal rebar encountered.			
ENV2			3				

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

TRIAL PITTING LOG (METRIC) GRIMSHAW LANE, MANCHESTER LOGS.GPJ 423207 8/4/21



TRIAL PITTING LOG

TRIAL PIT NO. TP305

Page 1 of 1

Facility/Project Name: Grimshaw lane, Plot 1		Date Trial Pit Started: 5/2/21	Date Trial Pit Completed: 5/2/21	Project Number: 423207
Contractor: DMW Drilling	Excavation Method: Excavator	Surface Elev. (m) ---	TOC Elevation (m) ---	Total Depth (m bgs) 4.0
Trial Pit Location: N: 53.49569 E: -2.19548		Personnel Logged By - Colin Morton Trial Pitter - David Williamson		Excavation Equipment: Excavator
Civil Town/City/or Village: Manchester	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
ENV1			1	MADE GROUND: Dark grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick, concrete and mudstone.			
			2				
ENV2			3				
							...Concrete obstruction at 3.2m

Signature:	Firm: TRC Companies	Fax
------------	---------------------	-----

TRIAL PITTING LOG (METRIC) GRIMSHAW LANE MANCHESTER LOGS.GPJ 423207 8/4/21

Annex D: Field Data

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: TRC Solutions
Site: Grimshaw Lane, Manchester
Date: 02/03/2021 - 04/03/2021

Quote No:
Visit No: 1 of
Operator:

Project Manager: Jonathon Sander



Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA		Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady	Peak	Steady							
CP101	0.0	0.0	ND	ND	0.5	0.5	ND	ND	ND	ND	14.4	14.9	1.0	NR	0.0	0.0	0	60	1.11	8.60	
CP102	0.0	0.0	ND	ND	3.9	3.9	ND	ND	ND	ND	12.2	12.3	1.0	NR	0.0	0.0	2	60	2.34	8.86	
WS101	0.0	0.0	ND	ND	0.8	0.8	ND	ND	ND	ND	16.6	18.5	1.0	NR	0.0	0.0	0	60	1.24	3.90	
WS102	0.0	0.0	ND	ND	2.5	2.5	ND	ND	ND	ND	11.5	11.5	1.0	NR	0.0	0.0	0	60	2.90	3.10	
WS103	0.0	0.0	ND	ND	2.3	2.3	ND	ND	ND	ND	14.4	14.9	1.0	NR	0.0	0.0	0	60	1.65	2.85	
WS104	0.0	0.0	ND	ND	1.7	1.7	ND	ND	ND	ND	16.2	17.2	1.0	NR	0.0	0.0	0	60	2.40	3.10	
CP301	2.7	2.7	54.0	54.0	0.4	0.4	ND	ND	ND	ND	17.0	17.0	3.2	NR	0.1	0.0	0	60	1.65	9.85	
CP302	2.6	2.6	52.0	52.0	1.6	1.6	ND	ND	ND	ND	0.0	0.0	2.9	NR	0.1	0.0	0	60	3.53	8.82	
WS301	0.1	0.1	2.0	2.0	0.2	0.2	ND	ND	ND	ND	10.3	17.0	1.0	NR	0.1	0.0	0	60	0.50	2.52	
WS302	13.9	13.9	>>>>	>>>>	3.0	3.0	ND	ND	ND	ND	0.5	0.5	0.0	NR	0.1	0.0	0	60	2.72	3.16	
WS303	0.1	0.1	2.0	2.0	0.1	0.1	ND	ND	ND	ND	9.6	18.6	1.0	NR	0.1	0.0	0	60	1.96	4.80	
WS304	0.0	0.0	ND	ND	0.1	0.1	ND	ND	ND	ND	20.1	20.3	1.0	NR	0.0	0.0	0	60	0.55	3.82	
Max	13.9	13.9	54.0	54.0	3.9	3.9	ND	ND	ND	ND	20.1	20.3	3.2	ND	0.1	0.0	1.8	60	3.53	9.85	
Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60	0.50	2.52	

ND - Not detected
 NR - Not recorded
 NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: ☒ Dry ☐ Moist ☐ Wet ☐ Snow ☐ Frozen
 Wind: ☐ Calm ☒ Light ☐ Moderate ☐ Strong
 Cloud cover: ☒ None ☐ Slight ☐ Cloudy ☐ Overcast
 Precipitation: ☒ None ☐ Slight ☐ Moderate ☐ Heavy
 Time monitoring performed: 07:00 Start 11:30 End
 Barometric pressure (mbar): 1016 Start 1017 End
 Pressure trend (Daily): ☐ Falling ☐ Steady ☒ Rising
 Source: Online
 Air Temperature (Deg. C): 12 Before 16 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA 5000 - G500672
Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 23/01/2021
Date of next calibration: 23/12/2021

Ambient air check: CH₄ ND CO₂ 0.1 O₂ 20.9

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: TRC Solutions
Site: Grimshaw Lane, Manchester
Date: 10/03/2021

Quote No:
Visit No: 1 of
Operator:

Project Manager: Jonathon Sander



Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA		Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
CP101	0.0	0.0	ND	ND	2.4	0.3	ND	ND	ND	ND	13.6	19.8	1.0	NR	0.2	0.0	1	60	1.21	8.56	
CP102	0.0	0.0	ND	ND	3.8	3.8	ND	ND	ND	ND	7.3	14.1	1.0	NR	0.0	0.0	0	60	2.46	8.95	
WS101	0.0	0.0	ND	ND	1.0	0.7	ND	ND	ND	ND	17.7	19.4	1.0	NR	0.9	0.0	5	60	1.41	3.63	
WS102	0.0	0.0	ND	ND	4.3	4.3	ND	ND	ND	ND	3.1	20.4	1.0	NR	0.0	0.0	0	60	2.85	3.04	
WS103	0.0	0.0	ND	ND	2.4	2.4	ND	ND	ND	ND	13.5	18.0	1.0	NR	0.2	0.0	1	60	1.81	2.87	
WS104	0.0	0.0	ND	ND	3.7	0.9	ND	ND	ND	ND	14.3	18.2	1.0	NR	0.0	0.0	0	60	2.47	3.04	
CP301	2.8	2.7	56.0	54.0	0.6	0.4	ND	ND	ND	ND	16.5	19.2	3.2	NR	-6.6	0.0	-1	60	1.45	9.87	
CP302	1.9	1.9	38.0	38.0	2.3	2.3	ND	ND	ND	ND	0.4	18.1	1.9	NR	0.9	0.0	5	60	3.62	8.73	
WS301	9.6	0.0	>>>>	ND	0.2	0.1	ND	ND	ND	ND	16.1	19.5	1.0	NR	0.0	0.0	0	60	0.25	2.12	
WS302	16.5	10.3	>>>>	>>>>	0.4	0.2	ND	ND	ND	ND	8.3	17.9	9.4	NR	0.7	0.0	4	60	2.90	3.10	
WS303	1.8	0.0	36.0	ND	0.0	0.0	ND	ND	ND	ND	14.2	19.3	1.2	NR	0.0	0.0	0	60	2.10	4.70	
WS304	0.0	0.0	ND	ND	0.0	0.0	ND	ND	ND	ND	19.7	20.1	1.0	NR	-4.5	0.0	-50	60	1.56	3.30	
Max	16.5	10.3	56.0	54.0	4.3	4.3	ND	ND	ND	ND	19.7	20.4	9.4	ND	0.9	0.0	5.0	60	3.62	9.87	
Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60	0.25	2.12	

ND - Not detected
 NR - Not recorded
 NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: ☒ Dry ☐ Moist ☐ Wet ☐ Snow ☐ Frozen
 Wind: ☐ Calm ☒ Light ☐ Moderate ☐ Strong
 Cloud cover: ☒ None ☐ Slight ☐ Cloudy ☐ Overcast
 Precipitation: ☒ None ☐ Slight ☐ Moderate ☐ Heavy
 Time monitoring performed: 07:00 Start 11:30 End
 Barometric pressure (mbar): 990 Start 990 End
 Pressure trend (Daily): ☐ Falling ☐ Steady ☒ Rising
 Source: Online
 Air Temperature (Deg. C): 12 Before 16 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA 5000 - G500672
Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 23/01/2021
Date of next calibration: 23/12/2021

Ambient air check: CH₄ ND CO₂ 0.1 O₂ 20.9

Annex E: Laboratory Chemical Data



Jonathon Sander

TRC Companies Ltd
Work.Life
Brown Street
Manchester
M2 1DH

e: JSander@trccompanies.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 21-55693

Replaces Analytical Report Number: 21-55693, issue no. 1
Additional analysis undertaken.

Project / Site name:	Grimshaw Lane Plot 2	Samples received on:	08/02/2021
Your job number:	423207	Samples instructed on/ Analysis started on:	08/02/2021
Your order number:		Analysis completed by:	23/02/2021
Report Issue Number:	2	Report issued on:	23/02/2021
Samples Analysed:	22 soil samples		

Signed: *Karolina Marek*

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 21-55693
Project / Site name: Grimshaw Lane Plot 2

Lab Sample Number				1764134	1764135	1764136	1764137	1764138
Sample Reference				TP301	TP301	TP302	TP302	WS301
Sample Number				1	2	1	2	1
Depth (m)				1.00	3.30	0.50	3.00	1.00
Date Sampled				04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	13	9.8	14	10
Total mass of sample received	kg	0.001	NONE	1.0	1.0	1.0	1.0	1.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-	-	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Detected	-	Not-detected	-	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-	-	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-	-	< 0.001

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	8.1	7.8	8.5	8.5
----------------	----------	-----	--------	-----	-----	-----	-----	-----

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.75	3.2	< 0.05	0.76	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.92	< 0.05	0.25	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	1.1	7.5	< 0.05	2.2	0.76
Fluorene	mg/kg	0.05	MCERTS	0.95	6.4	< 0.05	2.3	0.72
Phenanthrene	mg/kg	0.05	MCERTS	11	41	0.73	13	4.1
Anthracene	mg/kg	0.05	MCERTS	2.2	10	< 0.05	3.2	1.1
Fluoranthene	mg/kg	0.05	MCERTS	14	58	1.4	18	8
Pyrene	mg/kg	0.05	MCERTS	14	50	1.3	17	7.5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	7.8	25	0.94	9	4.5
Chrysene	mg/kg	0.05	MCERTS	5.7	23	0.66	6.6	3.5
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	8.1	26	0.69	8.1	3.7
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.4	7.7	0.5	2.4	2.5
Benzo(a)pyrene	mg/kg	0.05	MCERTS	7.5	21	0.66	6.9	2.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.9	9.4	0.35	3.2	2.0
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	2.4	< 0.05	0.84	0.62
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	4.1	10	0.39	4.0	2.3

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	83.7	302	7.62	97.2	44.2
-----------------------------	-------	-----	--------	------	-----	------	------	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	15	11	16	15
Boron (water soluble)	mg/kg	0.2	MCERTS	2.4	1.6	0.5	1.3	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.8	0.8	< 0.2	1.1	1.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	24	26	36	35	100
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	26	36	35	100
Copper (aqua regia extractable)	mg/kg	1	MCERTS	230	130	72	350	550
Lead (aqua regia extractable)	mg/kg	1	MCERTS	170	250	57	440	320
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.7	< 0.3	0.9	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	29	30	48	43	97
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	180	210	110	250	300

Analytical Report Number: 21-55693
Project / Site name: Grimshaw Lane Plot 2

Lab Sample Number	1764134	1764135	1764136	1764137	1764138
Sample Reference	TP301	TP301	TP302	TP302	WS301
Sample Number	1	2	1	2	1
Depth (m)	1.00	3.30	0.50	3.00	1.00
Date Sampled	04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	7.6	3	< 1.0	12	5.6
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	23	37	< 2.0	70	22
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	48	50	< 8.0	120	30
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	220	130	< 8.0	240	170
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	300	220	< 10	440	220

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	5.8	26	< 1.0	5.2	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	17	63	< 2.0	29	16
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	57	280	13	150	72
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	170	400	30	250	200
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	250	770	43	430	290

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-55693
Project / Site name: Grimshaw Lane Plot 2

Lab Sample Number				1764139	1764140	1764141	1764142	1764143
Sample Reference				WS301	WS302	WS302	WS303	WS303
Sample Number				2	1	2	1	2
Depth (m)				2.00	1.00	3.00	0.80	5.00
Date Sampled				04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	13	13	13	15
Total mass of sample received	kg	0.001	NONE	1.0	1.0	1.0	1.0	1.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Detected	-	Detected	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	< 0.001	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.7	8.6	9.7	8.9	8.7
----------------	----------	-----	--------	-----	-----	-----	-----	-----

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.42	0.97	0.48	1.5	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.24	0.53	0.26	0.35	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	1.4	1.8	1.9	3.7	0.24
Fluorene	mg/kg	0.05	MCERTS	1.2	2.0	2.4	3.1	0.31
Phenanthrene	mg/kg	0.05	MCERTS	6.8	12	13	20	2.1
Anthracene	mg/kg	0.05	MCERTS	1.8	2.7	3.8	5.4	0.51
Fluoranthene	mg/kg	0.05	MCERTS	13	17	16	22	3.3
Pyrene	mg/kg	0.05	MCERTS	12	17	15	20	3.1
Benzo(a)anthracene	mg/kg	0.05	MCERTS	7.4	9.0	8.8	13	1.5
Chrysene	mg/kg	0.05	MCERTS	4.9	7.8	5.0	7.5	1.3
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	5.7	8.1	6.7	11	1.7
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.1	3.9	3.5	3.3	0.59
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.4	7.9	5.6	7.9	1.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.5	3.6	2.5	3.9	0.59
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.79	1.1	0.78	1.2	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.8	4.1	2.7	4.4	0.7

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	68.9	99.7	88.4	128	17.1
-----------------------------	-------	-----	--------	------	------	------	-----	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	26	16	16	18	8
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	1.9	2.3	1.2	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.6	0.9	1.1	1.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	97	35	36	54	28
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	97	35	36	55	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	250	160	260	340	32
Lead (aqua regia extractable)	mg/kg	1	MCERTS	360	180	290	300	29
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	3	< 0.3	2.3	2.2	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	77	38	39	54	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	440	200	440	320	65

Analytical Report Number: 21-55693
Project / Site name: Grimshaw Lane Plot 2

Lab Sample Number				1764139	1764140	1764141	1764142	1764143
Sample Reference				WS301	WS302	WS302	WS303	WS303
Sample Number				2	1	2	1	2
Depth (m)				2.00	1.00	3.00	0.80	5.00
Date Sampled				04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	7.6	3.5	9.9	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	120	26	140	29	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	420	68	320	140	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	1200	250	1000	510	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	1700	350	1500	690	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	44	15	60	26	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	250	96	340	150	18
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	530	250	760	440	44
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	820	370	1200	620	62

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-55693
Project / Site name: Grimshaw Lane Plot 2

Lab Sample Number	1764144	1764145	1764146	1764147	1764148
Sample Reference	WS304	WS304	TP303	TP303	TP304
Sample Number	1	2	1	2	1
Depth (m)	1.00	4.00	1.00	3.30	1.00
Date Sampled	04/02/2021	04/02/2021	05/02/2021	05/02/2021	05/02/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	13
Total mass of sample received	kg	0.001	NONE	1.2	1.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	Chrysotile & Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	< 0.001

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.8	8.7	9	8.7	8.5
----------------	----------	-----	--------	-----	-----	---	-----	-----

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	4.6	< 0.05	5.7	< 0.05	1.3
Acenaphthylene	mg/kg	0.05	MCERTS	0.4	< 0.05	2.3	< 0.05	0.34
Acenaphthene	mg/kg	0.05	MCERTS	5.1	< 0.05	3.6	< 0.05	1.3
Fluorene	mg/kg	0.05	MCERTS	4.1	< 0.05	5.8	< 0.05	1.2
Phenanthrene	mg/kg	0.05	MCERTS	32	0.78	27	< 0.05	9.6
Anthracene	mg/kg	0.05	MCERTS	9.5	< 0.05	6.9	< 0.05	2.4
Fluoranthene	mg/kg	0.05	MCERTS	41	0.69	25	< 0.05	13
Pyrene	mg/kg	0.05	MCERTS	37	0.63	24	< 0.05	13
Benzo(a)anthracene	mg/kg	0.05	MCERTS	21	0.36	13	< 0.05	8.2
Chrysene	mg/kg	0.05	MCERTS	14	0.27	8.5	< 0.05	5.2
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	18	< 0.05	11	< 0.05	7.4
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	8.1	< 0.05	3.4	< 0.05	2.9
Benzo(a)pyrene	mg/kg	0.05	MCERTS	15	< 0.05	8.8	< 0.05	5.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	6.5	< 0.05	3.5	< 0.05	2.8
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.9	< 0.05	1.2	< 0.05	0.85
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	7.7	< 0.05	4.4	< 0.05	3.2

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	224	2.73	153	< 0.80	78.8
-----------------------------	-------	-----	--------	-----	------	-----	--------	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	9.5	13	7.8	20
Boron (water soluble)	mg/kg	0.2	MCERTS	1	< 0.2	2.1	0.3	2.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7	0.4	0.7	< 0.2	1.3
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	28	31	39	26	53
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	31	39	26	53
Copper (aqua regia extractable)	mg/kg	1	MCERTS	160	39	110	36	440
Lead (aqua regia extractable)	mg/kg	1	MCERTS	230	27	150	16	350
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.5	< 0.3	< 0.3	< 0.3	2
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	44	38	38	34	52
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	240	79	160	70	340

Analytical Report Number: 21-55693
Project / Site name: Grimshaw Lane Plot 2

Lab Sample Number				1764144	1764145	1764146	1764147	1764148
Sample Reference				WS304	WS304	TP303	TP303	TP304
Sample Number				1	2	1	2	1
Depth (m)				1.00	4.00	1.00	3.30	1.00
Date Sampled				04/02/2021	04/02/2021	05/02/2021	05/02/2021	05/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	2	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	30	< 2.0	10	< 2.0	46
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	62	< 8.0	23	< 8.0	120
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	180	< 8.0	140	< 8.0	410
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	270	< 10	170	< 10	570

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.8	< 1.0	8.7	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	32	< 2.0	19	< 2.0	14
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	150	< 10	52	< 10	92
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	290	< 10	76	< 10	180
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	470	< 10	160	< 10	290

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-55693
Project / Site name: Grimshaw Lane Plot 2

Lab Sample Number				1764149	1764150	1764151	1764152	1764153
Sample Reference				TP304	TP305	TP305	CP301	CP301
Sample Number				2	1	2	1	2
Depth (m)				2.90	0.90	3.00	2.30	4.10
Date Sampled				05/02/2021	05/02/2021	05/02/2021	05/02/2021	05/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	13	16	15	14
Total mass of sample received	kg	0.001	NONE	1.0	1.0	1.0	1.0	1.2

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	-	Detected	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	< 0.001	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6	8.6	8.8	8.3	8.6
----------------	----------	-----	--------	-----	-----	-----	-----	-----

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1.1	0.76	6.2	0.69	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.79	0.2	0.26	0.44	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	2.3	1.2	3.4	2.2	< 0.05
Fluorene	mg/kg	0.05	MCERTS	2	1.1	3.2	2.3	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	19	7.2	19	13	< 0.05
Anthracene	mg/kg	0.05	MCERTS	4.9	1.6	5	3.4	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	37	9.7	19	17	< 0.05
Pyrene	mg/kg	0.05	MCERTS	34	9	18	15	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	23	4.6	10	9.9	< 0.05
Chrysene	mg/kg	0.05	MCERTS	14	3.6	6.8	6.3	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	24	5.1	8.8	10	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	7.5	2.4	4.1	2.7	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	18	4.3	7.8	7.1	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	8.6	2	3.7	3.4	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.6	0.63	1	1.1	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	10	2.3	4.3	4.1	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	209	55.6	121	98.4	< 0.80
-----------------------------	-------	-----	--------	-----	------	-----	------	--------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	22	14	14	18	7.6
Boron (water soluble)	mg/kg	0.2	MCERTS	1.8	0.9	0.8	1.5	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.2	< 0.2	< 0.2	2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	35	38	34	48	27
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	35	38	34	48	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	190	77	110	220	36
Lead (aqua regia extractable)	mg/kg	1	MCERTS	680	140	250	350	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.9	< 0.3	< 0.3	3.6	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	39	39	30	47	35
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	490	120	160	410	72

Analytical Report Number: 21-55693
Project / Site name: Grimshaw Lane Plot 2

Lab Sample Number				1764149	1764150	1764151	1764152	1764153
Sample Reference				TP304	TP305	TP305	CP301	CP301
Sample Number				2	1	2	1	2
Depth (m)				2.90	0.90	3.00	2.30	4.10
Date Sampled				05/02/2021	05/02/2021	05/02/2021	05/02/2021	05/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Monoaromatics & Oxygenates								
Benzene				µg/kg	1	MCERTS	< 1.0	< 1.0
Toluene				µg/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene				µg/kg	1	MCERTS	< 1.0	< 1.0
p & m-xylene				µg/kg	1	MCERTS	< 1.0	< 1.0
o-xylene				µg/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)				µg/kg	1	MCERTS	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	19	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	9	8.5	6.5	57	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	24	20	32	140	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	110	81	220	450	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	140	110	260	670	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	12	14	17	30	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	78	33	55	120	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	160	71	130	260	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	250	120	200	410	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-55693
Project / Site name: Grimshaw Lane Plot 2

Lab Sample Number				1764154	1764155
Sample Reference				CP302	CP302
Sample Number				1	2
Depth (m)				2.20	6.00
Date Sampled				05/02/2021	05/02/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	19
Total mass of sample received	kg	0.001	NONE	1.0	1.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.4
----------------	----------	-----	--------	-----	-----

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.36	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.38	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	2.3	1.0
Anthracene	mg/kg	0.05	MCERTS	0.53	0.2
Fluoranthene	mg/kg	0.05	MCERTS	3.3	1.1
Pyrene	mg/kg	0.05	MCERTS	3.2	0.87
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.9	0.37
Chrysene	mg/kg	0.05	MCERTS	1.6	0.36
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.2	0.3
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.67	0.18
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.6	0.26
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.78	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.27	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.93	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	19.9	4.62
-----------------------------	-------	-----	--------	------	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	8.3
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	30	30
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	65	36
Lead (aqua regia extractable)	mg/kg	1	MCERTS	78	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	33	38
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	69

Analytical Report Number: 21-55693
Project / Site name: Grimshaw Lane Plot 2

Lab Sample Number				1764154	1764155
Sample Reference				CP302	CP302
Sample Number				1	2
Depth (m)				2.20	6.00
Date Sampled				05/02/2021	05/02/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Monoaromatics & Oxygenates					
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	14	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	26	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	64	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	100	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	20	14
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	37	26
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	57	40

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-55693
Project / Site name: Grimshaw Lane Plot 2
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1764134	TP301	1.00	158	Loose Fibres	Chrysotile	< 0.001	< 0.001
1764138	WS301	1.00	157	Loose Fibres	Chrysotile	< 0.001	< 0.001
1764140	WS302	1.00	124	Loose Fibres	Chrysotile	< 0.001	< 0.001
1764142	WS303	0.80	155	Loose Fibres	Chrysotile	< 0.001	< 0.001
1764148	TP304	1.00	149	Loose Fibres	Chrysotile & Amosite	< 0.001	< 0.001
1764152	CP301	2.30	146	Loose Fibres	Chrysotile	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 21-55693

Project / Site name: Grimshaw Lane Plot 2

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1764134	TP301	1	1	Brown clay and loam with gravel.
1764135	TP301	2	3.3	Brown clay and loam with gravel.
1764136	TP302	1	0.5	Brown clay and loam with gravel and vegetation.
1764137	TP302	2	3	Brown clay with vegetation.
1764138	WS301	1	1	Brown clay with gravel.
1764139	WS301	2	2	Brown clay with vegetation.
1764140	WS302	1	1	Brown clay with gravel.
1764141	WS302	2	3	Brown clay with gravel.
1764142	WS303	1	0.8	Brown clay with vegetation.
1764143	WS303	2	5	Brown clay with vegetation.
1764144	WS304	1	1	Brown clay with vegetation.
1764145	WS304	2	4	Brown clay with vegetation.
1764146	TP303	1	1	Brown clay with gravel.
1764147	TP303	2	3.3	Brown clay.
1764148	TP304	1	1	Brown clay with vegetation and gravel
1764149	TP304	2	2.9	Brown clay with vegetation and gravel
1764150	TP305	1	0.9	Brown clay with vegetation and gravel
1764151	TP305	2	3	Brown clay with vegetation and gravel
1764152	CP301	1	2.3	Brown clay with vegetation.
1764153	CP301	2	4.1	Brown clay.
1764154	CP302	1	2.2	Brown clay.
1764155	CP302	2	6	Brown clay.

Analytical Report Number : 21-55693

Project / Site name: Grimshaw Lane Plot 2

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L0738-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Jonathon Sander
TRC Companies Ltd
Work.Life
Brown Street
Manchester
M2 1DH

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

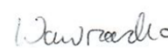
e: JSander@trccompanies.com

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 21-55689

Project / Site name:	Grimshaw Lane Plot 1	Samples received on:	08/02/2021
Your job number:	423207	Samples instructed on/ Analysis started on:	08/02/2021
Your order number:		Analysis completed by:	16/02/2021
Report Issue Number:	1	Report issued on:	16/02/2021
Samples Analysed:	19 soil samples		

Signed:



Joanna Wawrzeczko
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 21-55689
Project / Site name: Grimshaw Lane Plot 1

Lab Sample Number				1764090	1764091	1764092	1764093	1764094
Sample Reference				WS103	WS103	CP101	CP101	WS104
Sample Number				1	2	1	2	1
Depth (m)				0.50	2.80	0.70	2.50	1.90
Date Sampled				03/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	11	19	10	13
Total mass of sample received	kg	0.001	NONE	1	1	1	0.9	1

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-	Not-detected
------------------	------	-----	-----------	--------------	---	--------------	---	--------------

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	7.7	7.1	8.6	7.6
----------------	----------	-----	--------	-----	-----	-----	-----	-----

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.31	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.43	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.32	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	3	< 0.05	0.94	< 0.05	0.62
Anthracene	mg/kg	0.05	MCERTS	0.52	< 0.05	0.21	< 0.05	0.14
Fluoranthene	mg/kg	0.05	MCERTS	5.3	< 0.05	2	< 0.05	0.9
Pyrene	mg/kg	0.05	MCERTS	5.4	< 0.05	2	< 0.05	1.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3	< 0.05	1.6	< 0.05	0.8
Chrysene	mg/kg	0.05	MCERTS	2.5	< 0.05	1.5	< 0.05	0.86
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	3.1	< 0.05	1.5	< 0.05	0.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.2	< 0.05	0.82	< 0.05	0.49
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.5	< 0.05	1.4	< 0.05	0.79
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	< 0.05	0.64	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.7	< 0.05	0.92	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	30.4	< 0.80	13.5	< 0.80	6.62
-----------------------------	-------	-----	--------	------	--------	------	--------	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	8.6	25	9	16
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	0.8	0.9	0.2	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	27	26	29	27	18
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	26	29	27	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	190	24	110	35	240
Lead (aqua regia extractable)	mg/kg	1	MCERTS	210	20	100	17	280
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.4	< 0.3	1.6
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	50	23	44	34	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	42	100	67	79

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 21-55689
Project / Site name: Grimshaw Lane Plot 1

Lab Sample Number				1764090	1764091	1764092	1764093	1764094
Sample Reference				WS103	WS103	CP101	CP101	WS104
Sample Number				1	2	1	2	1
Depth (m)				0.50	2.80	0.70	2.50	1.90
Date Sampled				03/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	37
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	45

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	3.6	< 2.0	4.4	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	16	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	41	< 10	25	< 10	13
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	62	< 10	37	< 10	17

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-55689
Project / Site name: Grimshaw Lane Plot 1

Lab Sample Number				1764095	1764096	1764097	1764098	1764099
Sample Reference				WS104	WS102	WS102	WS101	WS101
Sample Number				2	1	2	1	2
Depth (m)				3.50	1.30	3.70	0.20	2.80
Date Sampled				03/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	8.2	14	18	12
Total mass of sample received	kg	0.001	NONE	1	1	1	0.9	1

Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	-	Not-detected	-
------------------	------	-----	-----------	---	--------------	---	--------------	---

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.7	7.5	7.6	7.2	7.9
----------------	----------	-----	--------	-----	-----	-----	-----	-----

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.44	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	1.3	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	1.2	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.9	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.3	< 0.05	11	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.29	< 0.05	2.7	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.39	< 0.05	24	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.35	< 0.05	28	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.22	< 0.05	17	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.22	< 0.05	8.3	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	11	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	5	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	9.4	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	3.9	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	1.3	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	5	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	1.77	< 0.80	131	< 0.80
-----------------------------	-------	-----	--------	--------	------	--------	-----	--------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	17	12	30	9.8
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.9	0.4	0.3	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	29	26	29	23	30
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	27	29	23	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	41	58	47	220	40
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	31	19	280	22
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.4	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	38	27	39	43	48
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	60	46	68	180	65

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 21-55689
Project / Site name: Grimshaw Lane Plot 1

Lab Sample Number				1764095	1764096	1764097	1764098	1764099
Sample Reference				WS104	WS102	WS102	WS101	WS101
Sample Number				2	1	2	1	2
Depth (m)				3.50	1.30	3.70	0.20	2.80
Date Sampled				03/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	4.6	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	14	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	93	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	170	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	280	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-55689
Project / Site name: Grimshaw Lane Plot 1

Lab Sample Number				1764100	1764101	1764102	1764103	1764104
Sample Reference				TP101	TP101	TP104	TP104	CP102
Sample Number				1	2	1	None Supplied	1
Depth (m)				0.80	2.80	1.00	3.10	1.40
Date Sampled				04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	18	13	12	15	14
Total mass of sample received	kg	0.001	NONE	1	1	1	1	1

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-	Not-detected
------------------	------	-----	-----------	--------------	---	--------------	---	--------------

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.7	8	7.3	7	7.1
----------------	----------	-----	--------	-----	---	-----	---	-----

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1.4	< 0.05	< 0.05	< 0.05	0.72
Acenaphthylene	mg/kg	0.05	MCERTS	0.26	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.37	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.29	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	4	< 0.05	0.43	< 0.05	0.87
Anthracene	mg/kg	0.05	MCERTS	1.1	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	7.2	< 0.05	0.35	< 0.05	0.97
Pyrene	mg/kg	0.05	MCERTS	7	< 0.05	0.28	< 0.05	0.91
Benzo(a)anthracene	mg/kg	0.05	MCERTS	5.1	< 0.05	< 0.05	< 0.05	0.51
Chrysene	mg/kg	0.05	MCERTS	3.8	< 0.05	< 0.05	< 0.05	0.52
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	5.1	< 0.05	< 0.05	< 0.05	0.41
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	2.3	< 0.05	< 0.05	< 0.05	0.19
Benzo(a)pyrene	mg/kg	0.05	MCERTS	4.2	< 0.05	< 0.05	< 0.05	0.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.44	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.4	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	46.8	< 0.80	1.06	< 0.80	5.4
-----------------------------	-------	-----	--------	------	--------	------	--------	-----

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	37	18	15	9.7	41
Boron (water soluble)	mg/kg	0.2	MCERTS	1	1	1.5	1.4	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	29	28	23	21	73
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	29	23	21	73
Copper (aqua regia extractable)	mg/kg	1	MCERTS	340	35	110	31	130
Lead (aqua regia extractable)	mg/kg	1	MCERTS	140	15	130	16	78
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	71	41	20	18	91
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	230	63	150	47	110

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 21-55689
Project / Site name: Grimshaw Lane Plot 1

Lab Sample Number				1764100	1764101	1764102	1764103	1764104
Sample Reference				TP101	TP101	TP104	TP104	CP102
Sample Number				1	2	1	None Supplied	1
Depth (m)				0.80	2.80	1.00	3.10	1.40
Date Sampled				04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	4.4	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	7.8	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	13	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	42	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	66	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	4.9	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	5.3	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	21	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	35	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	66	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-55689
Project / Site name: Grimshaw Lane Plot 1

Lab Sample Number				1764106	1764107	1764108	1764109
Sample Reference				TP102	TP102	TP103	TP103
Sample Number				1	2	None Supplied	2
Depth (m)				0.60	2.70	1.00	2.80
Date Sampled				04/02/2021	04/02/2021	04/02/2021	04/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	24	19	13	18
Total mass of sample received	kg	0.001	NONE	1	1	1	1

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-
------------------	------	-----	-----------	--------------	---	--------------	---

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.5	7.5	6.8	7.7
----------------	----------	-----	--------	-----	-----	-----	-----

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.37	< 0.05	< 0.05	1.8
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.76	< 0.05	< 0.05	1.9
Fluorene	mg/kg	0.05	MCERTS	0.74	< 0.05	< 0.05	1
Phenanthrene	mg/kg	0.05	MCERTS	6.3	< 0.05	0.34	6.1
Anthracene	mg/kg	0.05	MCERTS	1.5	< 0.05	< 0.05	1.5
Fluoranthene	mg/kg	0.05	MCERTS	11	< 0.05	0.36	8.1
Pyrene	mg/kg	0.05	MCERTS	8.8	< 0.05	0.4	8
Benzo(a)anthracene	mg/kg	0.05	MCERTS	5.7	< 0.05	0.22	4.3
Chrysene	mg/kg	0.05	MCERTS	4.3	< 0.05	0.3	3.4
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	5.3	< 0.05	< 0.05	4.1
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	2.2	< 0.05	< 0.05	1.9
Benzo(a)pyrene	mg/kg	0.05	MCERTS	4.2	< 0.05	< 0.05	3.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.9	< 0.05	< 0.05	1.5
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.6	< 0.05	< 0.05	0.44
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.7	< 0.05	< 0.05	2.1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	55.9	< 0.80	1.62	49.9
-----------------------------	-------	-----	--------	------	--------	------	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	41	27	10	26
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	0.9	0.8	2.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	23	25	18	35
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	25	18	36
Copper (aqua regia extractable)	mg/kg	1	MCERTS	330	45	53	79
Lead (aqua regia extractable)	mg/kg	1	MCERTS	150	61	64	190
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	41	27	19	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	210	64	65	110

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 21-55689
Project / Site name: Grimshaw Lane Plot 1

Lab Sample Number				1764106	1764107	1764108	1764109
Sample Reference				TP102	TP102	TP103	TP103
Sample Number				1	2	None Supplied	2
Depth (m)				0.60	2.70	1.00	2.80
Date Sampled				04/02/2021	04/02/2021	04/02/2021	04/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Petroleum Hydrocarbons							
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	4	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	14	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	31	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	100	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	150	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	6
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	7.3	< 2.0	< 2.0	9.2
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	48	< 10	< 10	24
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	64	< 10	< 10	30
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	120	< 10	< 10	69

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-55689

Project / Site name: Grimshaw Lane Plot 1

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1764090	WS103	1	0.5	Brown loam and clay with gravel and vegetation.
1764091	WS103	2	2.8	Brown clay with vegetation.
1764092	CP101	1	0.7	Brown loam and clay with gravel and vegetation.
1764093	CP101	2	2.5	Brown clay with gravel.
1764094	WS104	1	1.9	Brown loam and clay with gravel and vegetation.
1764095	WS104	2	3.5	Brown clay with gravel and vegetation.
1764096	WS102	1	1.3	Brown loam with gravel.
1764097	WS102	2	3.7	Brown clay.
1764098	WS101	1	0.2	Brown loam and clay with gravel and vegetation.
1764099	WS101	2	2.8	Brown clay with gravel and vegetation.
1764100	TP101	1	0.8	Brown gravelly loam.
1764101	TP101	2	2.8	Brown clay and sand with gravel.
1764102	TP104	1	1	Brown loam with gravel.
1764103	TP104	None Supplied	3.1	Brown clay and loam with gravel.
1764104	CP102	1	1.4	Brown loam and clay with gravel and brick.
1764106	TP102	1	0.6	Brown loam and clay with gravel.
1764107	TP102	2	2.7	Brown loam and clay with gravel.
1764108	TP103	None Supplied	1	Brown loam with vegetation.
1764109	TP103	2	2.8	Brown clay and loam with gravel.

Analytical Report Number : 21-55689
Project / Site name: Grimshaw Lane Plot 1

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Annex F: Screened Data

TRC Companies Limited - Soil Assessment Record (Commercial / Light Industrial End Use)																				
Contract Engineer		Colin Morton																		
Project/Site Name		Grimshaw Lane Plot 1																		
Project Number		423207.0000.0000																		

Sample Reference	CP101	CP101	CP102	WS101	WS101	WS102	WS102	WS103	WS103	WS104	WS104	TP101	TP101	TP102	TP102	TP103	TP103	TP104	TP104
Depth	0.70	2.50	1.40	0.20	2.80	1.30	3.70	0.50	2.80	1.90	3.50	0.80	2.80	0.60	2.70	1.00	2.80	1.00	3.10
Date Sampled	03/02/2021	03/02/2021	04/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021	03/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021	04/02/2021
Time Taken	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Analytical Parameter (Soil Analysis)	Units	Screening Criteria																			
Stone Content	%		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%		19	10	14	18	12	8.2	14	12	11	13	14	18	13	24	19	13	18	12	15

Asbestos																				
Asbestos in Soil Screen Name	Type	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos in Soil	Type	N/A	Not-detected	-	Not-detected	Not-detected	-	Not-detected	-	Not-detected	-	Not-detected	-	Not-detected	-	Not-detected	-	Not-detected	-	Not-detected

Speciated PAHs																					
Naphthalene	mg/kg	190	< 0.05	< 0.05	0.72	0.44	< 0.05	< 0.05	< 0.05	0.31	< 0.05	< 0.05	< 0.05	1.4	< 0.05	0.37	< 0.05	< 0.05	1.8	< 0.05	< 0.05
Acenaphthylene	mg/kg	83000	< 0.05	< 0.05	< 0.05	1.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.26	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	84000	< 0.05	< 0.05	< 0.05	1.2	< 0.05	< 0.05	< 0.05	0.43	< 0.05	< 0.05	< 0.05	0.37	< 0.05	0.76	< 0.05	< 0.05	1.9	< 0.05	< 0.05
Fluorene	mg/kg	63000	< 0.05	< 0.05	< 0.05	0.9	< 0.05	< 0.05	< 0.05	0.32	< 0.05	< 0.05	< 0.05	0.29	< 0.05	0.74	< 0.05	< 0.05	1	< 0.05	< 0.05
Phenanthrene	mg/kg	22000	0.94	< 0.05	0.87	11	< 0.05	0.3	< 0.05	3	< 0.05	0.62	< 0.05	4	< 0.05	6.3	< 0.05	0.34	6.1	0.43	< 0.05
Anthracene	mg/kg	520000	0.21	< 0.05	< 0.05	2.7	< 0.05	0.29	< 0.05	0.52	< 0.05	0.14	< 0.05	1.1	< 0.05	1.5	< 0.05	< 0.05	1.5	< 0.05	< 0.05
Fluoranthene	mg/kg	23000	2	< 0.05	0.97	24	< 0.05	0.39	< 0.05	5.3	< 0.05	0.9	< 0.05	7.2	< 0.05	11	< 0.05	0.36	8.1	0.35	< 0.05
Pyrene	mg/kg	54000	2	< 0.05	0.91	28	< 0.05	0.35	< 0.05	5.4	< 0.05	1.4	< 0.05	7	< 0.05	8.8	< 0.05	0.4	8	0.28	< 0.05
Benzo(a)anthracene	mg/kg	170	1.6	< 0.05	0.51	17	< 0.05	0.22	< 0.05	3	< 0.05	0.8	< 0.05	5.1	< 0.05	5.7	< 0.05	0.22	4.3	< 0.05	< 0.05
Chrysene	mg/kg	350	1.5	< 0.05	0.52	8.3	< 0.05	0.22	< 0.05	2.5	< 0.05	0.86	< 0.05	3.8	< 0.05	4.3	< 0.05	0.3	3.4	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	44	1.5	< 0.05	0.41	11	< 0.05	< 0.05	< 0.05	3.1	< 0.05	0.6	< 0.05	5.1	< 0.05	5.3	< 0.05	< 0.05	4.1	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	1200	0.82	< 0.05	0.19	5	< 0.05	< 0.05	< 0.05	1.2	< 0.05	0.49	< 0.05	2.3	< 0.05	2.2	< 0.05	< 0.05	1.9	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	36	1.4	< 0.05	0.3	9.4	< 0.05	< 0.05	< 0.05	2.5	< 0.05	0.79	< 0.05	4.2	< 0.05	4.2	< 0.05	< 0.05	3.8	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	500	0.64	< 0.05	< 0.05	3.9	< 0.05	< 0.05	< 0.05	1.1	< 0.05	< 0.05	< 0.05	2	< 0.05	1.9	< 0.05	< 0.05	1.5	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	3.5	< 0.05	< 0.05	< 0.05	1.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.44	< 0.05	0.6	< 0.05	< 0.05	0.44	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	3900	0.92	< 0.05	< 0.05	5	< 0.05	< 0.05	< 0.05	1.7	< 0.05	< 0.05	< 0.05	2.4	< 0.05	2.7	< 0.05	< 0.05	2.1	< 0.05	< 0.05
Total PAH																					
Speciated Total EPA-16 PAHs	mg/kg		13.5	< 0.80	5.4	131	< 0.80	1.77	< 0.80	30.4	< 0.80	6.62	< 0.80	46.8	< 0.80	55.9	< 0.80	1.62	49.9	1.06	< 0.80

Heavy Metals / Metalloids																					
Arsenic	mg/kg	640	25	9	41	30	9.8	17	12	21	8.6	16	11	37	18	41	27	10	26	15	9.7
Boron	mg/kg	240000	0.9	0.2	1.3	0.3	0.4	0.9	0.4	0.3	0.8	0.3	0.4	1	1	0.9	0.9	0.8	2.2	1.5	1.4
Cadmium	mg/kg	190	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	33	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	8600	29	27	73	23	30	26	29	27	26	18	29	29	28	23	25	18	35	23	21
Copper	mg/kg	68000	110	35	130	220	40	58	47	190	24	240	41	340	35	330	45	53	79	110	31
Lead	mg/kg	2300	100	17	78	280	22	31	19	210	20	280	18	140	15	150	61	64	190	130	16
Elemental Mercury	mg/kg	58	0.4	< 0.3	< 0.3	< 0.3	< 0.3	0.4	< 0.3	< 0.3	< 0.3	1.6	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	0.4	< 0.3	< 0.3
Inorganic Mercury	mg/kg	1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Methyl Mercury	mg/kg	320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nickel	mg/kg	980	44	34	91	43	48	27	39	50	23	21	38	71	41	41	27	19	30	20	18
Selenium	mg/kg	12000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	mg/kg	730000	100	67	110	180	65	46	68	110	42	79	60	230	63	210	64	65	110	150	47

Monoaromatics																				
Benzene	µg/kg	27000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	56000000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	5700000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	12100000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	6600000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	3340000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons																					
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	3200	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	7800	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	2000	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	9700	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4	< 1.0	< 1.0	< 1.0	4.4	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	59000	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	14	< 2.0	< 2.0	< 2.0	7.8	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	1600000	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	31	< 8.0	< 8.0	< 8.0	13	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	1600000	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	100	< 8.0	< 8.0	< 8.0	42	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	150	< 10	< 10	< 10	66	< 10

TRC Companies Ltd - Groundwater Assessment Record (EQS)											
Contract Engineer						Troy Randall					
Project/Site Name						Grimshaw Lane, Plot 1					
Project Number						423307.0000.0000					

Sample Reference	CP101	CP102	WS101	WS102	WS103	WS104
Depth	-	-	-	-	-	-
Date Sampled	02/03/2021	02/03/2021	02/03/2021	02/03/2021	02/03/2021	02/03/2021
Time Taken	16:15	14:30	16:44	14:00	15:00	13:30

Determinand	Unit	Source	Screening Criteria	Min	Max	
-------------	------	--------	--------------------	-----	-----	--

General Inorganics											
pH	Units	N/A	N/A	6.80	7.10	7.1	7	7	6.8	6.8	6.8
Electrical Conductivity at 20 °C	µS/cm	N/A	N/A	-	-	-	-	-	-	-	-
Total Cyanide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Complex Cyanide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Free Cyanide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Thiocyanate as SCN	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Sulphate as SO ₄	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Sulphate as SO ₄	mg/l	N/A	N/A	15.20	166.00	79.1	166	79.6	45	15.2	16.5
Total Sulphur	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Sulphide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Chloride	mg/l	N/A	N/A	-	-	-	-	-	-	-	-
Ammonium as NH ₄	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (DOC)	mg/l	N/A	N/A	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/l	N/A	N/A	-	-	-	-	-	-	-	-

Phenols by HPLC											
Catechol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Resorcinol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Ethylphenol & Dimethylphenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Cresols	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Naphthols	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Isopropylphenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Phenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Trimethylphenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-

Total Phenols											
Total Phenols (HPLC)	µg/l	N/A	N/A	-	-	-	-	-	-	-	-

Speciated PAHs											
Naphthalene (aq)	ug/l	GUK 18	2	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene (aq)	ug/l	N/A	N/A	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene (aq)	ug/l	N/A	N/A	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene (aq)	ug/l	GUK 18	0.0063	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene (aq)	ug/l	GUK 18	0.1	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene (aq)	ug/l	N/A	N/A	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene (aq)	ug/l	N/A	N/A	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene (aq)	ug/l	N/A	N/A	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene (aq)	ug/l	N/A	N/A	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene (aq)	ug/l	N/A	N/A	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene (aq)	ug/l	GUK 18	0.00017	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene (aq)	ug/l	GUK 18	0.00017	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene (aq)	ug/l	GUK 18	0.00017	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene (aq)	ug/l	N/A	N/A	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene (aq)	ug/l	GUK 18	0.00017	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene (aq)	ug/l	GUK 18	0.00017	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total EPA-16 PAHs	ug/l	N/A	N/A	<0.16	<0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16

Heavy Metals / Metalloids											
Arsenic (dissolved)	ug/l	WFD 14	50	1.01	19.00	1.01	1.57	1.11	5.9	3.64	19
Boron (dissolved)	ug/l	EQS Annex VIII	2,000	68.00	240.00	120	240	69	110	68	120
Cadmium (dissolved)	ug/l	DEP 08	0.08	0.02	0.06	0.06	0.04	0.02	0.04	0.03	0.06
Chromium (hexavalent)	ug/l	WFD 14	3.4	<5.0	<5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	ug/l	WFD 14	4.7	2.60	5.10	3.5	4.5	5.1	3.3	2.6	4.4
Copper (dissolved)	ug/l	WFD 14	1	1.40	4.10	3.5	1.4	4.1	1.4	< 0.5	1.5
Lead (dissolved)	ug/l	GUK 18	1.2	<0.2	0.50	< 0.2	< 0.2	< 0.2	0.5	0.2	< 0.2
Mercury (dissolved)	ug/l	DEP 08 MAC	0.07	<0.05	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	ug/l	GUK 18	4	2.90	20.00	6	7.5	5.2	6.7	2.9	20
Selenium (dissolved)	ug/l	N/A	N/A	<0.6	1.80	< 0.6	< 0.6	1.8	< 0.6	< 0.6	0.7
Zinc (dissolved)	ug/l	WFD 14	10.9	<0.5	34.00	27	3	34	1.9	< 0.5	10

Monoaromatics											
Benzene	ug/l	GUK 18	10	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/l	WFD 14	74	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/l	EQS R&D	20	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	ug/l	RBD	30	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	ug/l	RBD	30	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons											
Aliphatic >C5 - C6	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C6 - C8	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C8 - C10	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C10 - C12	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C12 - C16	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C16 - C21	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C21 - C35	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C35)	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10

Petroleum Hydrocarbons											
Aromatic >C5 - C7	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic >C7 - C8	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic >C8 - C10	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic >C10 - C12	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C12 - C16	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C16 - C21	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C21 - C35	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Total >C5 - C35	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10

Key	
Document	Source Reference
Water Framework Directive implementation in England and Wales (PB 14163, 2014) - fresh water only, for saltwater guidelines refer to the document	WFD 14
Directive 2008/105/EC of the European Parliament and of the Council (L 348/84, 2008), value adopted is the AA (annual average)	DEP 08
Environmental Quality Standards for Annex VIII Substances, UK TAG	EQS for Annex VIII
Directive 2008/105/EC of the European Parliament and of the Council (L 348/84, 2008), value adopted is the MAC (Maximum Allowable Concentration)	DEP 08 MAC
Proposed Environmental Quality Standards for Ethylbenzene in Water R&D Technical Report P2-115/TR4 (Annual Average) 2002	EQS R&D
The River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Directions 2010, Annual Average EQS (surface waters).	RBD
Gov.UK April 2018. Surface water pollution risk assessment for your environmental permit. (www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit).	GUK 18

TRC Companies Ltd - Groundwater Assessment Record (EQS)						
Contract Engineer			Troy Randall			
Project/Site Name			Grimshaw Lane, Plot 2			
Project Number			423207.0000.0000			

Sample Reference	CP301	CP302	WS301	WS302	WS303	WS304
Depth	-	-	-	-	-	-
Date Sampled	04/03/2021	04/03/2021	04/03/2021	04/03/2021	04/03/2021	04/03/2021
Time Taken	-	-	-	-	-	-

Determinand	Unit	Source	Screening Criteria	Min	Max	
-------------	------	--------	--------------------	-----	-----	--

General Inorganics											
pH	Units	N/A	N/A	7.30	8.90	7.5	7.3	7.8	8.5	8.9	7.6
Electrical Conductivity at 20 °C	µS/cm	N/A	N/A	-	-	-	-	-	-	-	-
Total Cyanide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Complex Cyanide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Free Cyanide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Thiocyanate as SCN	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Sulphate as SO ₄	µg/l	N/A	N/A	45000.00	612000.00	170000	45000	213000	612000	125000	84900
Sulphate as SO ₄	mg/l	N/A	N/A	45.00	612.00	170	45	213	612	125	84.9
Total Sulphur	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Sulphide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Chloride	mg/l	N/A	N/A	-	-	-	-	-	-	-	-
Ammonium as NH ₄	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (DOC)	mg/l	N/A	N/A	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/l	N/A	N/A	-	-	-	-	-	-	-	-

Phenols by HPLC											
Catechol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Resorcinol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Ethylphenol & Dimethylphenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Cresols	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Naphthols	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Isopropylphenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Phenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Trimethylphenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-

Total Phenols											
Total Phenols (HPLC)	µg/l	N/A	N/A	-	-	-	-	-	-	-	-

Speciated PAHs											
Naphthalene (aq)	ug/l	GUK 18	2	0.25	1.38	< 0.01	0.26	< 0.01	0.25	1.38	< 0.01
Acenaphthene (aq)	ug/l	N/A	N/A	<0.01	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene (aq)	ug/l	N/A	N/A	<0.01	1.71	< 0.01	1.22	0.23	1.71	0.58	0.12
Fluoranthene (aq)	ug/l	GUK 18	0.0063	<0.01	0.68	< 0.01	0.34	< 0.01	0.68	0.19	< 0.01
Anthracene (aq)	ug/l	GUK 18	0.1	<0.01	0.95	< 0.01	0.2	0.54	0.95	0.44	0.14
Phenanthrene (aq)	ug/l	N/A	N/A	<0.01	0.36	< 0.01	0.21	< 0.01	0.36	< 0.01	< 0.01
Fluorene (aq)	ug/l	N/A	N/A	<0.01	1.53	< 0.01	1.3	1.07	1.53	0.42	0.3
Chrysene (aq)	ug/l	N/A	N/A	<0.01	1.28	< 0.01	0.78	0.97	1.28	0.38	0.26
Pyrene (aq)	ug/l	N/A	N/A	<0.01	0.44	< 0.01	< 0.01	0.39	0.44	< 0.01	< 0.01
Benzo(a)anthracene (aq)	ug/l	N/A	N/A	<0.01	0.41	< 0.01	< 0.01	0.41	0.38	< 0.01	< 0.01
Benzo(b)fluoranthene (aq)	ug/l	GUK 18	0.00017	<0.01	0.45	< 0.01	< 0.01	0.44	0.45	< 0.01	< 0.01
Benzo(k)fluoranthene (aq)	ug/l	GUK 18	0.00017	<0.01	0.17	< 0.01	< 0.01	0.17	0.16	< 0.01	< 0.01
Benzo(a)pyrene (aq)	ug/l	GUK 18	0.00017	<0.01	0.31	< 0.01	< 0.01	0.31	0.3	< 0.01	< 0.01
Dibenzo(a,h)anthracene (aq)	ug/l	N/A	N/A	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene (aq)	ug/l	GUK 18	0.00017	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene (aq)	ug/l	GUK 18	0.00017	<0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total EPA-16 PAHs	ug/l	N/A	N/A	<0.16	8.49	< 0.16	4.31	4.53	8.49	3.39	0.82

Heavy Metals / Metalloids											
Arsenic (dissolved)	ug/l	WFD 14	50	0.63	10.60	0.63	1.15	2.12	10.6	6.98	6.11
Boron (dissolved)	ug/l	EQS Annex VIII	2,000	80.00	490.00	110	490	110	80	120	88
Cadmium (dissolved)	ug/l	DEP 08	0.08	0.02	0.12	0.02	0.02	0.09	0.12	0.02	0.05
Chromium (hexavalent)	ug/l	WFD 14	3.4	<5.0	<5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	ug/l	WFD 14	4.7	<0.2	5.70	3.3	5.7	1.6	< 0.2	< 0.2	1.2
Copper (dissolved)	ug/l	WFD 14	1	2.40	8.50	8.5	2.7	7.8	6.3	2.4	3.6
Lead (dissolved)	ug/l	GUK 18	1.2	<0.2	2.20	< 0.2	< 0.2	0.7	1.1	0.3	2.2
Mercury (dissolved)	ug/l	DEP 08 MAC	0.07	<0.05	0.14	< 0.05	< 0.05	< 0.05	0.14	< 0.05	< 0.05
Nickel (dissolved)	ug/l	GUK 18	4	2.90	12.00	5.3	3.4	9.3	12	2.9	4
Selenium (dissolved)	ug/l	N/A	N/A	1.10	4.50	1.1	1.5	1.5	4.5	2.2	1.2
Zinc (dissolved)	ug/l	WFD 14	10.9	<0.5	26.00	26	19	8.3	2.5	< 0.5	7

Monoaromatics											
Benzene	ug/l	GUK 18	10	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/l	WFD 14	74	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/l	EQS R&D	20	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	ug/l	RBD	30	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	ug/l	RBD	30	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons											
Aliphatic >C5 - C6	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C6 - C8	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C8 - C10	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C10 - C12	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C12 - C16	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C16 - C21	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C21 - C35	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C35)	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10

Petroleum Hydrocarbons											
Aromatic >C5 - C7	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic >C7 - C8	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic >C8 - C10	ug/l	N/A	N/A	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic >C10 - C12	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C12 - C16	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C16 - C21	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C21 - C35	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Total >C5 - C35	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10

Key	
Document	Source Reference
Water Framework Directive implementation in England and Wales (PB 14163, 2014) - fresh water only, for saltwater guidelines refer to the document	WFD 14
Directive 2008/105/EC of the European Parliament and of the Council (L 348/84, 2008), value adopted is the AA (annual average)	DEP 08
Environmental Quality Standards for Annex VIII Substances, UK TAG	EQS for Annex VIII
Directive 2008/105/EC of the European Parliament and of the Council (L 348/84, 2008), value adopted is the MAC (Maximum Allowable Concentration)	DEP 08 MAC
Proposed Environmental Quality Standards for Ethylbenzene in Water R&D Technical Report P2-115/TR4 (Annual Average) 2002	EQS R&D
The River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Directions 2010, Annual Average EQS (surface waters).	RBD
Gov.UK April 2018. Surface water pollution risk assessment for your environmental permit. (www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit).	GUK 18

TRC Companies Ltd - Groundwater Assessment Record (SoBRA - Commercial)											
Contract Engineer						Troy Randall					
Project/Site Name						Grimshaw Lane, Plot 1					
Project Number						423307.0000.0000					

Sample Reference	CP101	CP102	WS101	WS102	WS103	WS104
Depth	-	-	-	-	-	-
Date Sampled	02/03/2021	02/03/2021	02/03/2021	02/03/2021	02/03/2021	02/03/2021
Time Taken	16:15	14:30	16:44	14:00	15:00	13:30

Determinand	Unit	Source	Screening Criteria	Min	Max
-------------	------	--------	--------------------	-----	-----

General Inorganics											
pH	Units	N/A	N/A	6.80	7.10	7.1	7	7	6.8	6.8	6.8
Electrical Conductivity at 20 °C	µS/cm	N/A	N/A	-	-	-	-	-	-	-	-
Total Cyanide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Complex Cyanide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Free Cyanide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Thiocyanate as SCN	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Sulphate as SO ₄	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Sulphate as SO ₄	mg/l	N/A	N/A	15.20	166.00	79.1	166	79.6	45	15.2	16.5
Total Sulphur	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Sulphide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Chloride	mg/l	N/A	N/A	-	-	-	-	-	-	-	-
Ammonium as NH ₄	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (DOC)	mg/l	N/A	N/A	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/l	N/A	N/A	-	-	-	-	-	-	-	-

Phenols by HPLC											
Catechol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Resorcinol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Ethylphenol & Dimethylphenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Cresols	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Naphthols	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Isopropylphenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Phenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Trimethylphenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-

Total Phenols											
Total Phenols (HPLC)	µg/l	N/A	N/A	-	-	-	-	-	-	-	-

Speciated PAHs											
Naphthalene (aq)	ug/l	SOBRA 17	23000	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene (aq)	ug/l	SOBRA 17	15000000	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene (aq)	ug/l	SOBRA 17	20000000	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene (aq)	ug/l	SOBRA 17	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene (aq)	ug/l	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene (aq)	ug/l	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene (aq)	ug/l	SOBRA 17	18000000	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene (aq)	ug/l	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pyrene (aq)	ug/l	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)anthracene (aq)	ug/l	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene (aq)	ug/l	SOBRA 17	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene (aq)	ug/l	SOBRA 17	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene (aq)	ug/l	SOBRA 17	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene (aq)	ug/l	N/A	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene (aq)	ug/l	SOBRA 17	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene (aq)	ug/l	SOBRA 17	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total EPA-16 PAHs	ug/l	N/A	N/A	<0.01	<0.01	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16

Heavy Metals / Metalloids											
Arsenic (dissolved)	ug/l	N/A	N/A	1.01	19.00	1.01	1.57	1.11	5.9	3.64	19
Boron (dissolved)	ug/l	N/A	N/A	68.00	240.00	120	240	69	110	68	120
Cadmium (dissolved)	ug/l	N/A	N/A	0.02	0.06	0.06	0.04	0.02	0.04	0.03	0.06
Chromium (hexavalent)	ug/l	N/A	N/A	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chromium (dissolved)	ug/l	N/A	N/A	2.60	5.10	3.5	4.5	5.1	3.3	2.6	4.4
Copper (dissolved)	ug/l	N/A	N/A	1.40	4.10	3.5	1.4	4.1	1.4	<0.5	1.5
Lead (dissolved)	ug/l	N/A	N/A	<0.2	0.50	<0.2	<0.2	<0.2	0.5	0.2	<0.2
Mercury (dissolved)	ug/l	N/A	N/A	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel (dissolved)	ug/l	N/A	N/A	2.90	20.00	6	7.5	5.2	6.7	2.9	20
Selenium (dissolved)	ug/l	N/A	N/A	<0.6	1.80	<0.6	<0.6	1.8	<0.6	<0.6	0.7
Zinc (dissolved)	ug/l	N/A	N/A	<0.5	34.00	27	3	34	1.9	<0.5	10

Monoaromatics											
Benzene	ug/l	SOBRA 17	20000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	ug/l	SOBRA 17	230000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	ug/l	SOBRA 17	960000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
p & m-xylene	ug/l	SOBRA 17	94000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-xylene	ug/l	SOBRA 17	1100000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MTBE	ug/l	SOBRA 17	7800000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Petroleum Hydrocarbons											
Aliphatic >C5 - C6	ug/l	SOBRA 17	193000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Aliphatic >C6 - C8	ug/l	SOBRA 17	148000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Aliphatic >C8 - C10	ug/l	SOBRA 17	5650	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Aliphatic >C10 - C12	ug/l	SOBRA 17	3640	<10	<10	<10	<10	<10	<10	<10	<10
Aliphatic >C12 - C16	ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10
Aliphatic >C16 - C21	ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10
Aliphatic >C21 - C35	ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10
Aliphatic (C5 - C35)	ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10

Petroleum Hydrocarbons											
Aromatic >C5 - C7	ug/l	SOBRA 17	20200000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Aromatic >C7 - C8	ug/l	SOBRA 17	21100000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Aromatic >C8 - C10	ug/l	SOBRA 17	191000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Aromatic >C10 - C12	ug/l	SOBRA 17	664000	<10	<10	<10	<10	<10	<10	<10	<10
Aromatic >C12 - C16	ug/l	SOBRA 17	3680000	<10	<10	<10	<10	<10	<10	<10	<10
Aromatic >C16 - C21	ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10
Aromatic >C21 - C35	ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10
Total >C5 - C35	ug/l	N/A	N/A	<10	<10	<10	<10	<10	<10	<10	<10

Key	
Document	Source Reference
Society of Brownfield Risk Assessment, Development of Generic Assessment Criteria for Assessing Vapour Risk to Human Health from Volatile Contaminants in Groundwater, 2017	SOBRA 17

TRC Companies Ltd - Groundwater Assessment Record (SoBRA - Commercial)											
Contract Engineer						Troy Randall					
Project/Site Name						Grimshaw Lane, Plot 2					
Project Number						423207.0000.0000					

Sample Reference	CP301	CP302	WS301	WS302	WS303	WS304
Depth	-	-	-	-	-	-
Date Sampled	04/03/2021	04/03/2021	04/03/2021	04/03/2021	04/03/2021	04/03/2021
Time Taken	-	-	-	-	-	-

Determinand	Unit	Source	Screening Criteria	Min	Max	
-------------	------	--------	--------------------	-----	-----	--

General Inorganics											
pH	Units	N/A	N/A	7.30	8.90	7.5	7.3	7.8	8.5	8.9	7.6
Electrical Conductivity at 20 °C	µS/cm	N/A	N/A	-	-	-	-	-	-	-	-
Total Cyanide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Complex Cyanide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Free Cyanide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Thiocyanate as SCN	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Sulphate as SO ₄	µg/l	N/A	N/A	45000	612000	170000	45000	213000	612000	125000	84900
Sulphate as SO ₄	mg/l	N/A	N/A	45.00	612.00	170	45	213	612	125	84.9
Total Sulphur	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Sulphide	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Chloride	mg/l	N/A	N/A	-	-	-	-	-	-	-	-
Ammonium as NH ₄	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Dissolved Organic Carbon (DOC)	mg/l	N/A	N/A	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/l	N/A	N/A	-	-	-	-	-	-	-	-

Phenols by HPLC											
Catechol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Resorcinol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Ethylphenol & Dimethylphenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Cresols	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Naphthols	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Isopropylphenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Phenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-
Trimethylphenol	µg/l	N/A	N/A	-	-	-	-	-	-	-	-

Total Phenols											
Total Phenols (HPLC)	µg/l	N/A	N/A	-	-	-	-	-	-	-	-

Speciated PAHs											
Naphthalene (aq)	ug/l	SOBRA 17	23000	<0.01	1.38	< 0.01	0.26	< 0.01	0.25	1.38	< 0.01
Acenaphthene (aq)	ug/l	SOBRA 17	15000000	<0.01	0.00	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene (aq)	ug/l	SOBRA 17	20000000	<0.01	1.71	< 0.01	1.22	0.23	1.71	0.58	0.12
Fluoranthene (aq)	ug/l	SOBRA 17	N/A	<0.01	0.68	< 0.01	0.34	< 0.01	0.68	0.19	< 0.01
Anthracene (aq)	ug/l	N/A	N/A	<0.01	0.95	< 0.01	0.2	0.54	0.95	0.44	0.14
Phenanthrene (aq)	ug/l	N/A	N/A	<0.01	0.36	< 0.01	0.21	< 0.01	0.36	< 0.01	< 0.01
Fluorene (aq)	ug/l	SOBRA 17	18000000	<0.01	1.53	< 0.01	1.3	1.07	1.53	0.42	0.3
Chrysene (aq)	ug/l	N/A	N/A	<0.01	1.28	< 0.01	0.78	0.97	1.28	0.38	0.26
Pyrene (aq)	ug/l	N/A	N/A	<0.01	0.44	< 0.01	< 0.01	0.39	0.44	< 0.01	< 0.01
Benzo(a)anthracene (aq)	ug/l	N/A	N/A	<0.01	0.41	< 0.01	< 0.01	0.41	0.38	< 0.01	< 0.01
Benzo(b)fluoranthene (aq)	ug/l	SOBRA 17	N/A	<0.01	0.45	< 0.01	< 0.01	0.44	0.45	< 0.01	< 0.01
Benzo(k)fluoranthene (aq)	ug/l	SOBRA 17	N/A	<0.01	0.17	< 0.01	< 0.01	0.17	0.16	< 0.01	< 0.01
Benzo(a)pyrene (aq)	ug/l	SOBRA 17	N/A	<0.01	0.31	< 0.01	< 0.01	0.31	0.3	< 0.01	< 0.01
Dibenzo(a,h)anthracene (aq)	ug/l	N/A	N/A	<0.01	0.00	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene (aq)	ug/l	SOBRA 17	N/A	<0.01	0.00	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene (aq)	ug/l	SOBRA 17	N/A	<0.01	0.00	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total EPA-16 PAHs	ug/l	N/A	N/A	<0.16	8.49	< 0.16	4.31	4.53	8.49	3.39	0.82

Heavy Metals / Metalloids											
Arsenic (dissolved)	ug/l	N/A	N/A	0.63	10.60	0.63	1.15	2.12	10.6	6.98	6.11
Boron (dissolved)	ug/l	N/A	N/A	80.00	490.00	110	490	110	80	120	88
Cadmium (dissolved)	ug/l	N/A	N/A	0.02	0.12	0.02	0.02	0.09	0.12	0.02	0.05
Chromium (hexavalent)	ug/l	N/A	N/A	<5.0	<5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	ug/l	N/A	N/A	<0.2	5.70	3.3	5.7	1.6	< 0.2	< 0.2	1.2
Copper (dissolved)	ug/l	N/A	N/A	2.40	8.50	8.5	2.7	7.8	6.3	2.4	3.6
Lead (dissolved)	ug/l	N/A	N/A	<0.2	2.20	< 0.2	< 0.2	0.7	1.1	0.3	2.2
Mercury (dissolved)	ug/l	N/A	N/A	<0.05	0.14	< 0.05	< 0.05	< 0.05	0.14	< 0.05	< 0.05
Nickel (dissolved)	ug/l	N/A	N/A	2.90	12.00	5.3	3.4	9.3	12	2.9	4
Selenium (dissolved)	ug/l	N/A	N/A	1.10	4.50	1.1	1.5	1.5	4.5	2.2	1.2
Zinc (dissolved)	ug/l	N/A	N/A	<0.5	26.00	26	19	8.3	2.5	< 0.5	7

Monoaromatics											
Benzene	ug/l	SOBRA 17	20000	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/l	SOBRA 17	230000	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/l	SOBRA 17	960000	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	ug/l	SOBRA 17	94000	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	ug/l	SOBRA 17	1100000	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE	ug/l	SOBRA 17	7800000	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons											
Aliphatic >C5 - C6	ug/l	SOBRA 17	193000	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C6 - C8	ug/l	SOBRA 17	148000	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C8 - C10	ug/l	SOBRA 17	5650	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic >C10 - C12	ug/l	SOBRA 17	3640	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C12 - C16	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C16 - C21	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic >C21 - C35	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C35)	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10

Petroleum Hydrocarbons											
Aromatic >C5 - C7	ug/l	SOBRA 17	20200000	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic >C7 - C8	ug/l	SOBRA 17	21100000	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic >C8 - C10	ug/l	SOBRA 17	191000	<1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic >C10 - C12	ug/l	SOBRA 17	664000	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C12 - C16	ug/l	SOBRA 17	3680000	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C16 - C21	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic >C21 - C35	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10
Total >C5 - C35	ug/l	N/A	N/A	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10

Key	
Document	Source Reference
Society of Brownfield Risk Assessment, Development of Generic Assessment Criteria for Assessing Vapour Risk to Human Health from Volatile Contaminants in Groundwater, 2017	SOBRA 17

Annex G: Laboratory Geotechnical Data



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 03/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

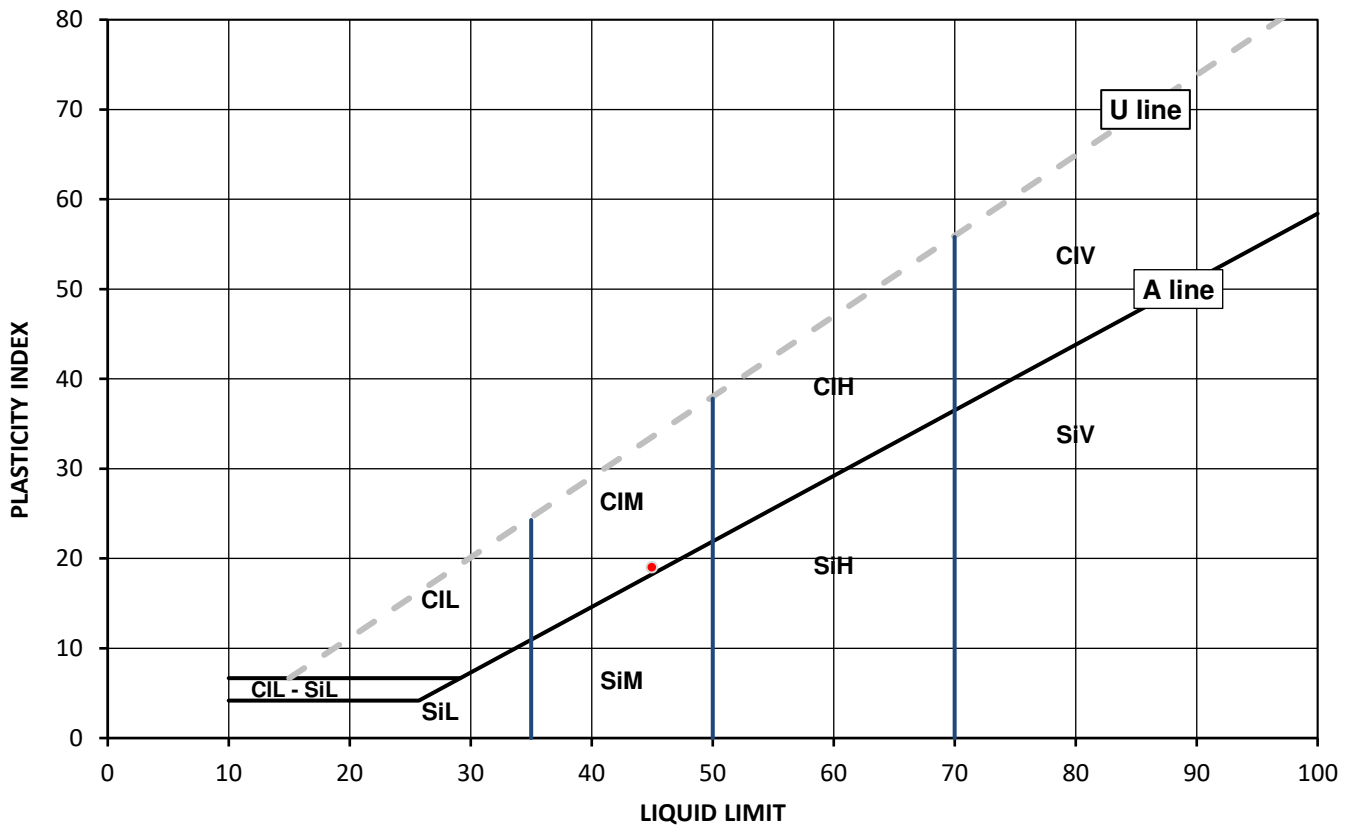
Test Results:

Laboratory Reference: 1770736
Hole No.: CP101
Sample Reference: Not Given
Soil Description: Dark brown gravelly slightly sandy CLAY

Depth Top [m]: 3.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425um BS Test Sieve
24	45	26	19	63



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity	Liquid Limit
Cl	Clay	L Low	below 35
Si	Silt	M Medium	35 to 50
		H High	50 to 70
		V Very high	exceeding 70
		O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 04/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

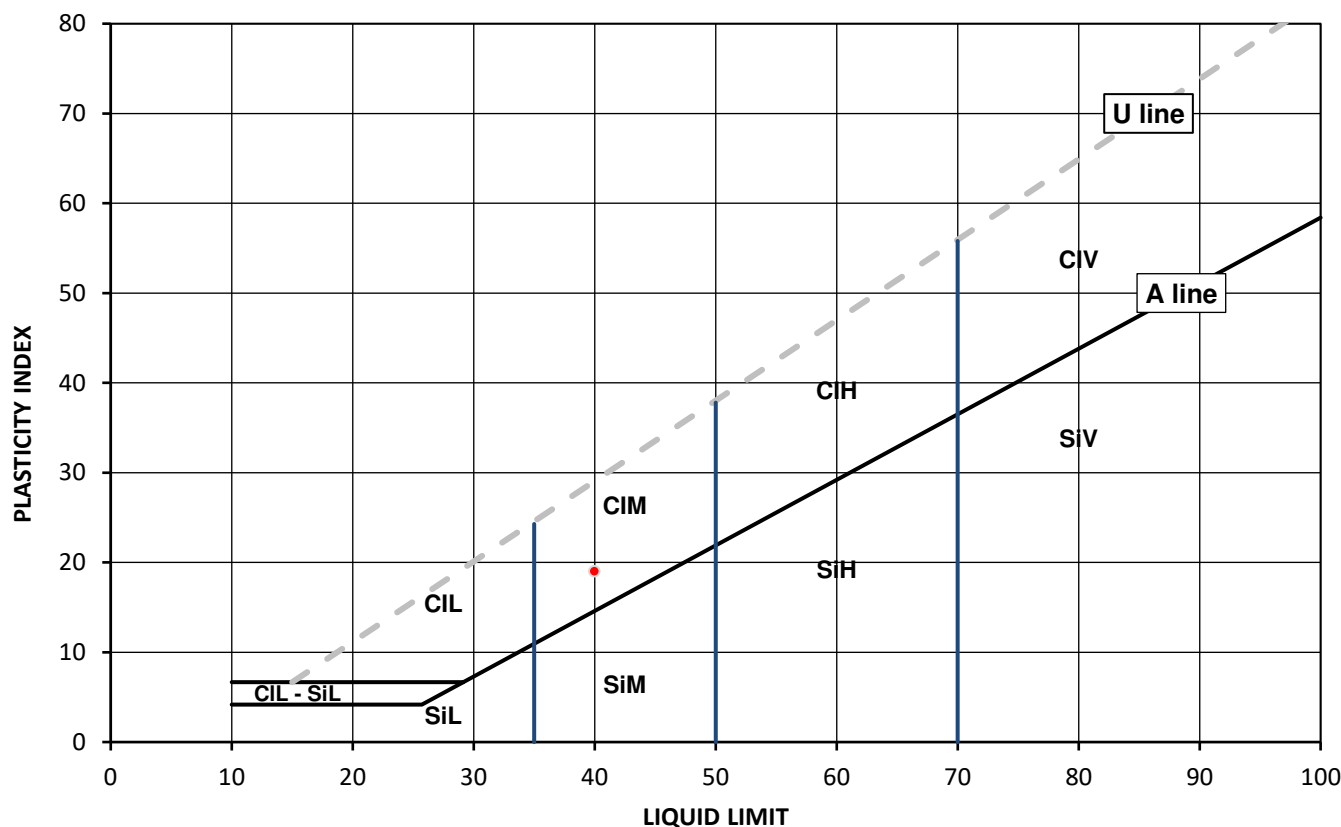
Test Results:

Laboratory Reference: 1770738
Hole No.: CP102
Sample Reference: Not Given
Soil Description: Dark brown sandy CLAY

Depth Top [m]: 1.90
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
20	40	21	19	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 04/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

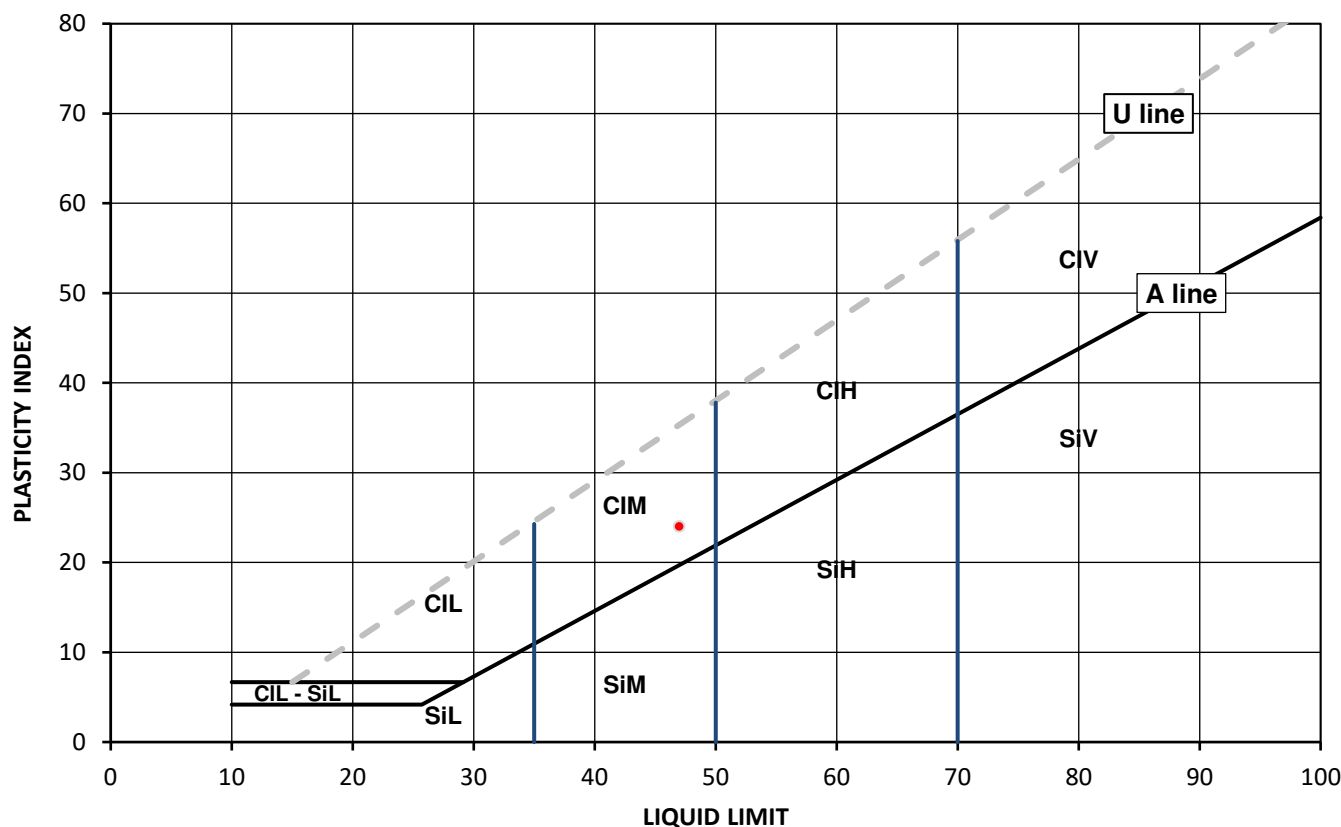
Test Results:

Laboratory Reference: 1770741
Hole No.: CP102
Sample Reference: Not Given
Soil Description: Dark brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 4.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425um BS Test Sieve
27	47	23	24	97



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 04/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

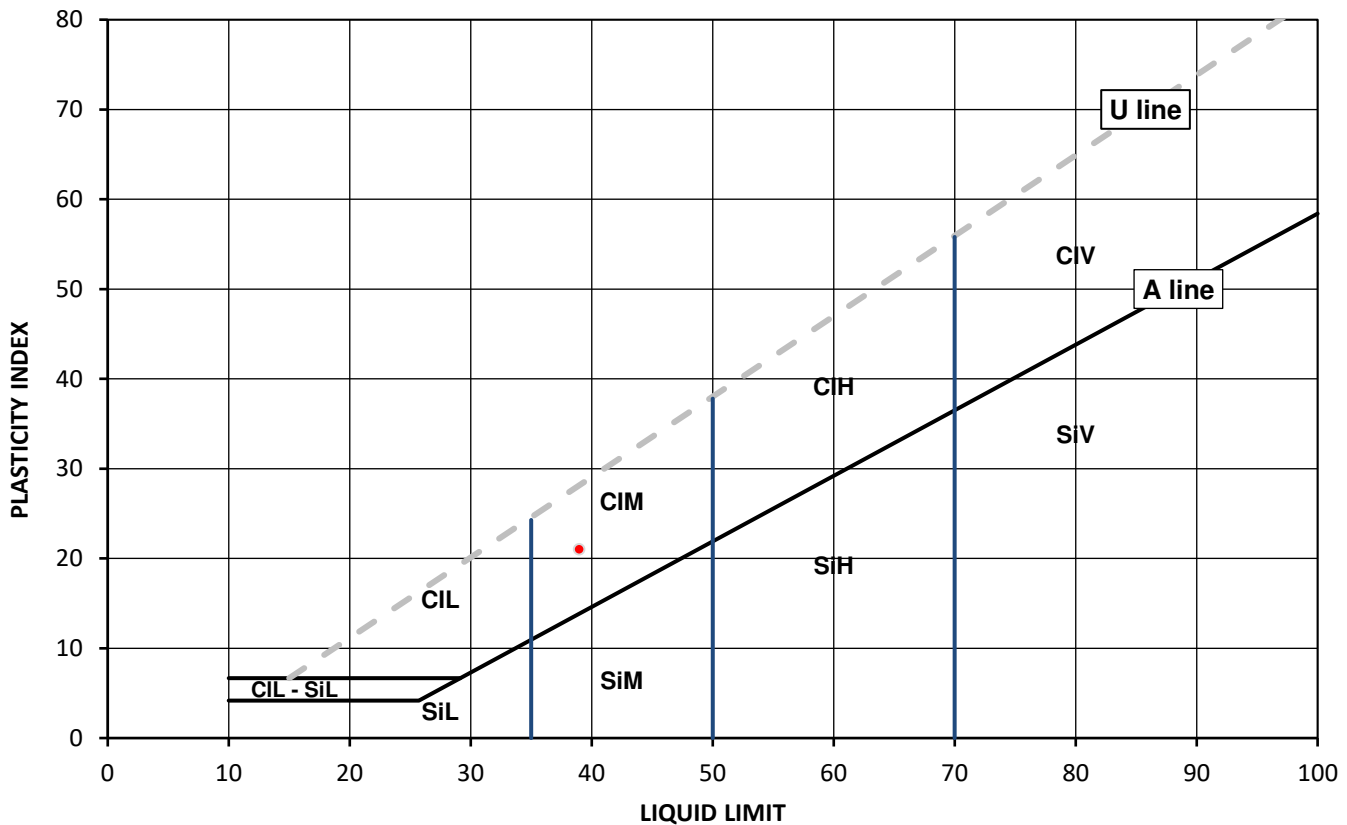
Test Results:

Laboratory Reference: 1770742
Hole No.: CP102
Sample Reference: Not Given
Soil Description: Dark brown slightly gravelly sandy CLAY

Depth Top [m]: 10.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
18	39	18	21	94



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 03/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

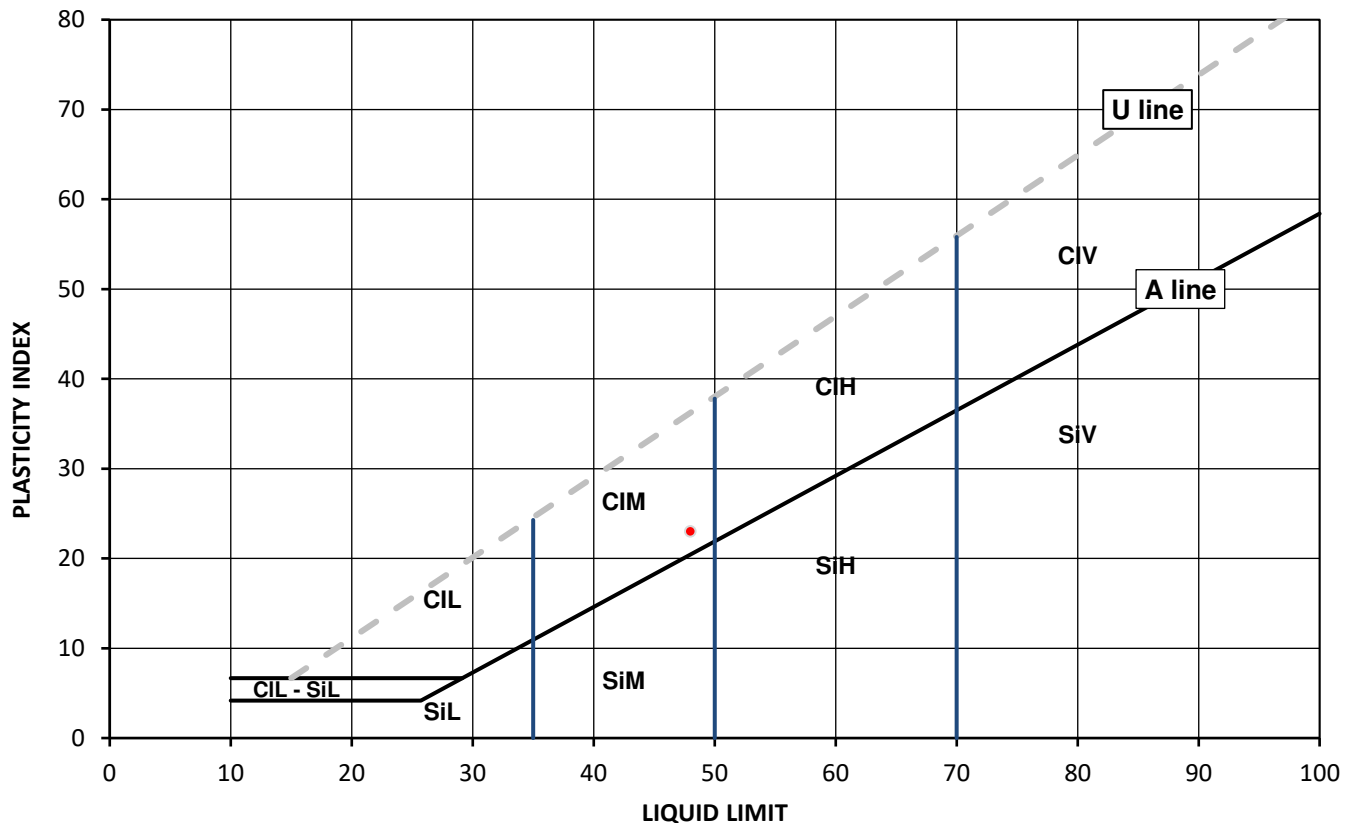
Test Results:

Laboratory Reference: 1770743
Hole No.: WS102
Sample Reference: Not Given
Soil Description: Dark brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 3.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
26	48	25	23	91



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Clay	Silt	Plasticity	Liquid Limit
Cl	Clay		L Low	below 35
Si		Silt	M Medium	35 to 50
			H High	50 to 70
			V Very high	exceeding 70
			O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

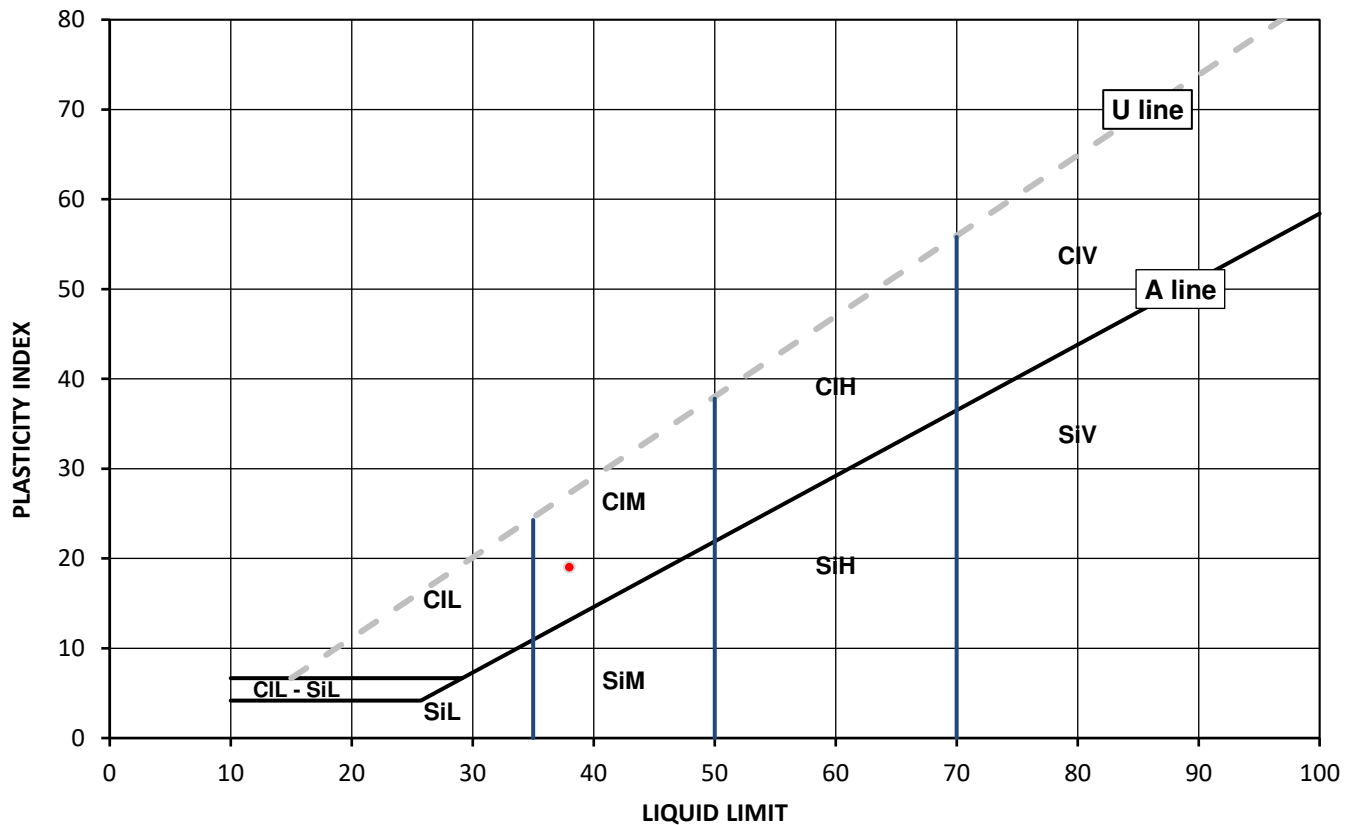
Test Results:

Laboratory Reference: 1770748
Hole No.: CP301
Sample Reference: Not Given
Soil Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 3.80
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425um BS Test Sieve
18	38	19	19	96



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Page 1 of 1

Date Reported: 08/03/2021

GF 232.10



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

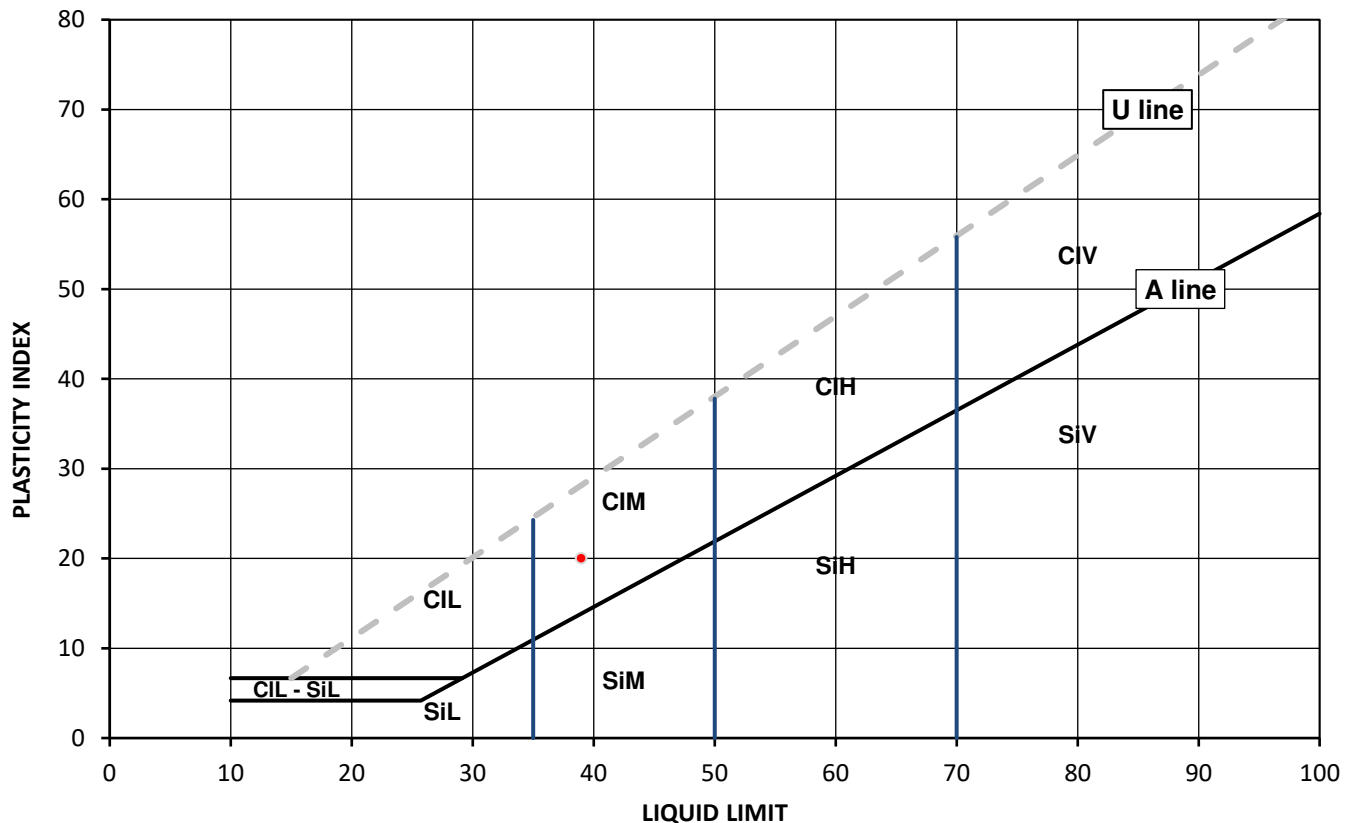
Test Results:

Laboratory Reference: 1770750
Hole No.: CP301
Sample Reference: Not Given
Soil Description: Dark brown slightly gravelly sandy CLAY

Depth Top [m]: 10.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
21	39	19	20	98



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity	Liquid Limit
Cl	Clay	L Low	below 35
Si	Silt	M Medium	35 to 50
		H High	50 to 70
		V Very high	exceeding 70
		O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Page 1 of 1

Date Reported: 08/03/2021

GF 232.10



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

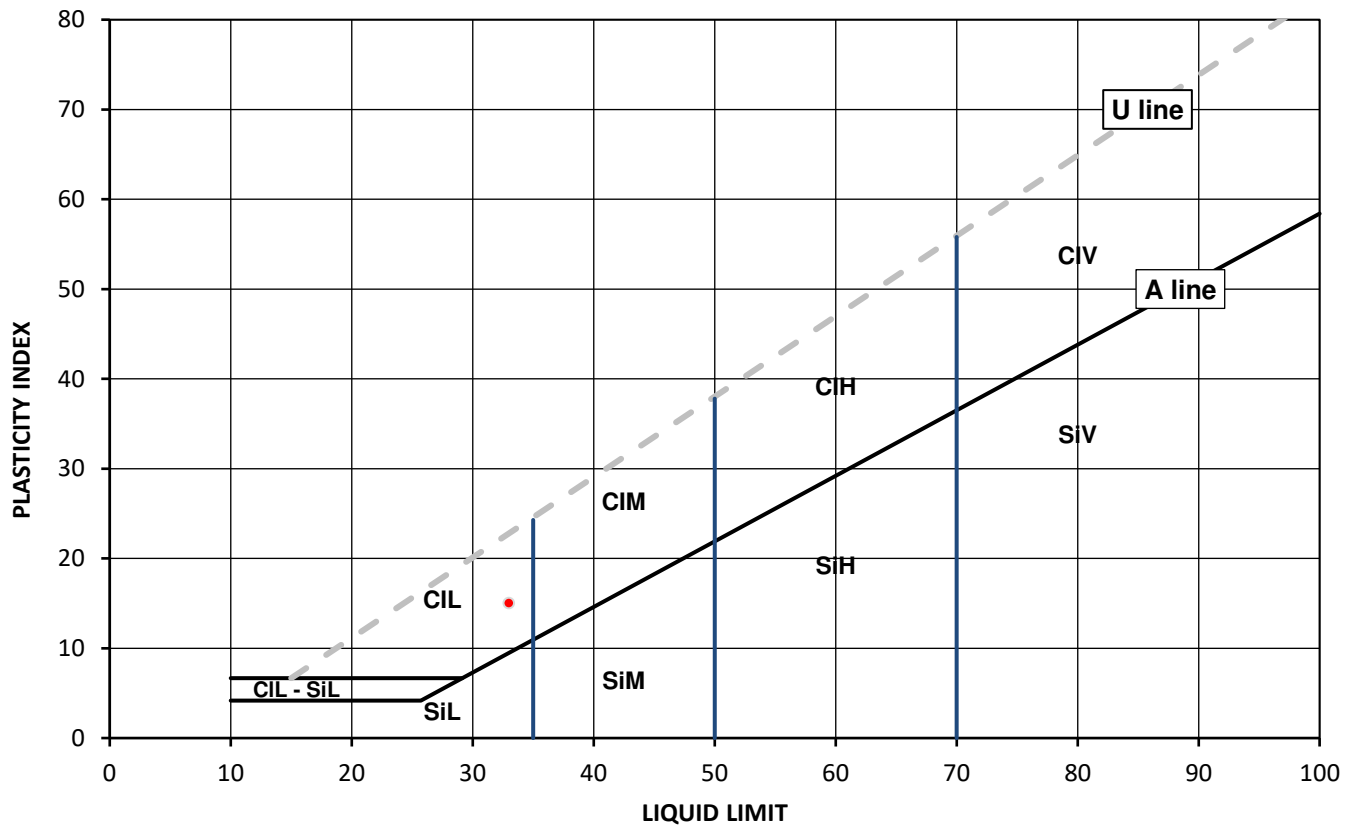
Test Results:

Laboratory Reference: 1770753
Hole No.: CP302
Sample Reference: Not Given
Soil Description: Dark brown slightly gravelly very sandy CLAY

Depth Top [m]: 7.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
16	33	18	15	89



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L Low	50 to 70
	M Medium	exceeding 70
	H High	append to classification for organic material (eg CIHO)
	V Very high	
	O Organic	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

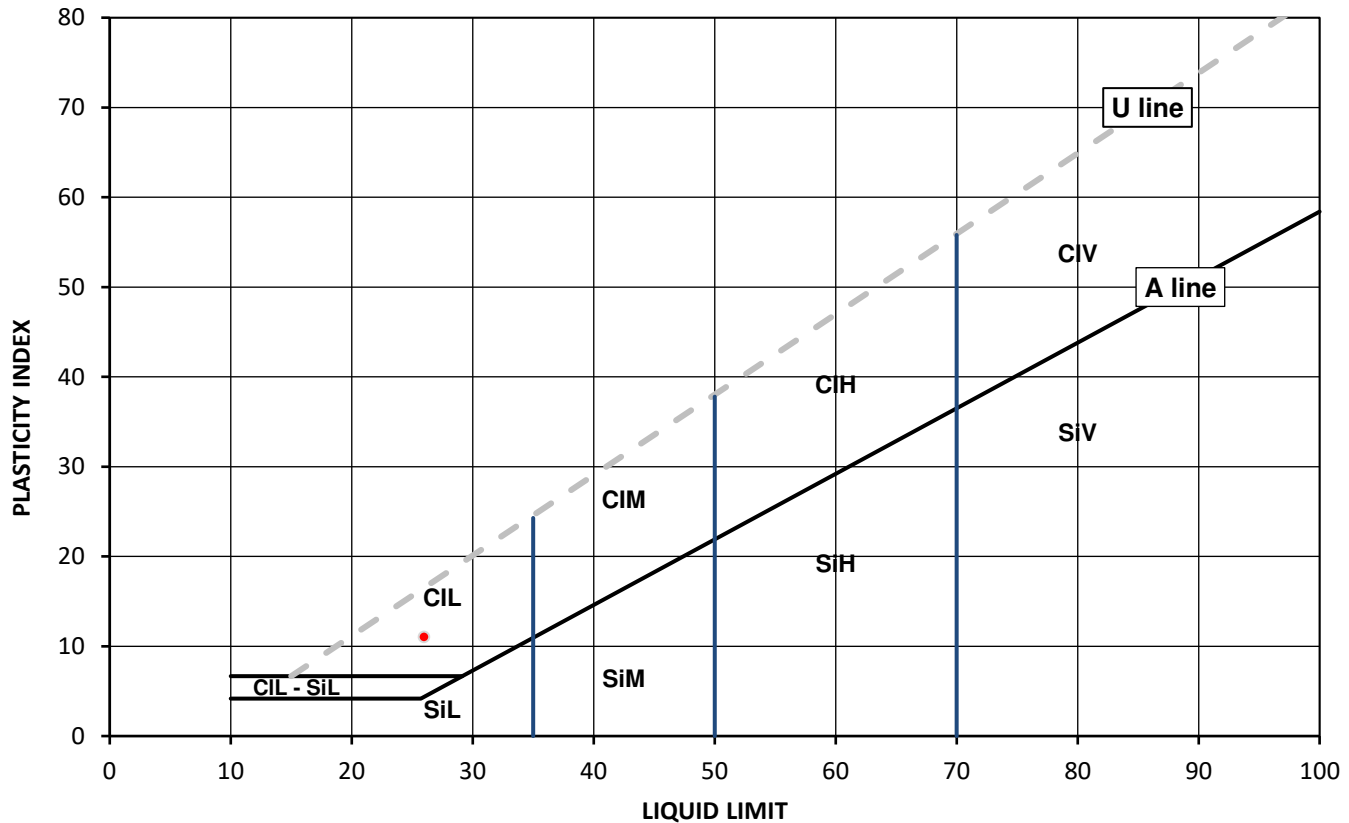
Test Results:

Laboratory Reference: 1770758
Hole No.: WS303
Sample Reference: Not Given
Soil Description: Brown very sandy CLAY

Depth Top [m]: 5.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
18	26	15	11	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

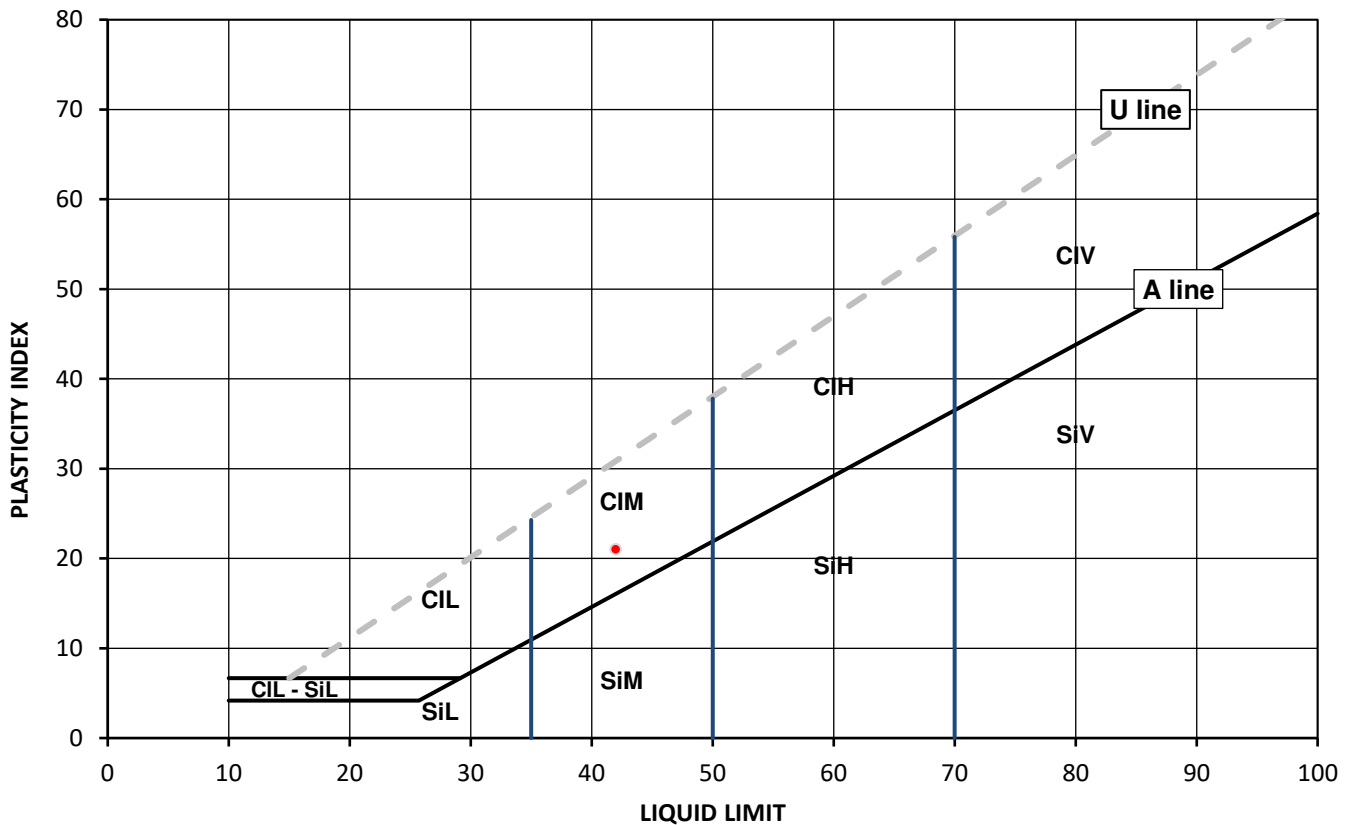
Test Results:

Laboratory Reference: 1770761
Hole No.: TP303
Sample Reference: Not Given
Soil Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 3.30
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425µm

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
16	42	21	21	85



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



SUMMARY REPORT

Summary of Classification Test Results

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with:

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Client Reference: 423207

Job Number: 21-56886

Date Sampled: 03/02 - 05/02/2021

Date Received: 15/02/2021

Date Tested: 22/02/2021

Sampled By: Client

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Moisture Content [W]	Water Content [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
1770734	CP101	Not Given	1.20	Not Given	B	Brown slightly gravelly sandy very clayey SILT		28											
1770736	CP101	Not Given	3.50	Not Given	D	Dark brown gravelly slightly sandy CLAY	Atterberg 1 Point	24		63	45	26	19						
1770737	CP102	Not Given	1.20	Not Given	B	Dark brown gravelly clayey SAND		19											
1770738	CP102	Not Given	1.90	Not Given	D	Dark brown sandy CLAY	Atterberg 1 Point	20		100	40	21	19						
1770741	CP102	Not Given	4.50	Not Given	D	Dark brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	27		97	47	23	24						
1770742	CP102	Not Given	10.00	Not Given	D	Dark brown slightly gravelly sandy CLAY	Atterberg 1 Point	18		94	39	18	21						
1770747	CP301	Not Given	2.00	Not Given	B	Greyish brown silty clayey very sandy GRAVEL with fragments of brick		22											
1770748	CP301	Not Given	3.80	Not Given	D	Brown slightly gravelly sandy CLAY	Atterberg 1 Point	18		96	38	19	19						
1770750	CP301	Not Given	10.00	Not Given	D	Dark brown slightly gravelly sandy CLAY	Atterberg 1 Point	21		98	39	19	20						
1770755	CP302	Not Given	1.20	Not Given	B	Brown very gravelly sandy silty CLAY with fragments of brick, concrete		21											

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



SUMMARY REPORT

Summary of Classification Test Results

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with:

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Client Reference: 423207

Job Number: 21-56886

Date Sampled: 03/02 - 11/02/2021

Date Received: 15/02/2021

Date Tested: 22/02/2021

Sampled By: Client

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Moisture Content [W]	Water Content [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
1770751	CP302	Not Given	4.00	Not Given	D	Brown slightly clayey GRAVEL		16											
1770753	CP302	Not Given	7.00	Not Given	D	Dark brown slightly gravelly very sandy CLAY	Atterberg 1 Point	16		89	33	18	15						
1770761	TP303	Not Given	3.30	Not Given	D	Brown slightly gravelly sandy CLAY	Atterberg 1 Point	16		85	42	21	21						
1770743	WS102	Not Given	3.00	Not Given	D	Dark brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	26		91	48	25	23						
1770744	WS103	Not Given	0.00	2.00	B	Dark brown slightly gravelly very sandy clayey SILT		27											
1770746	WS104	Not Given	0.00	2.00	B	Brown mottled grey slightly gravelly sandy very clayey SILT		22											
1770745	WS104	Not Given	3.00	Not Given	D	Dark brown CLAY		29											
1770756	WS302	Not Given	0.00	2.00	B	Greyish brown very gravelly very sandy very silty CLAY with fragments of brick, concrete		24											
1770758	WS303	Not Given	5.00	Not Given	D	Brown very sandy CLAY	Atterberg 1 Point	18		100	26	15	11						
1770760	WS304	Not Given	0.00	2.00	B	Dark brown slightly gravelly sandy very clayey SILT		16											

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 03/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

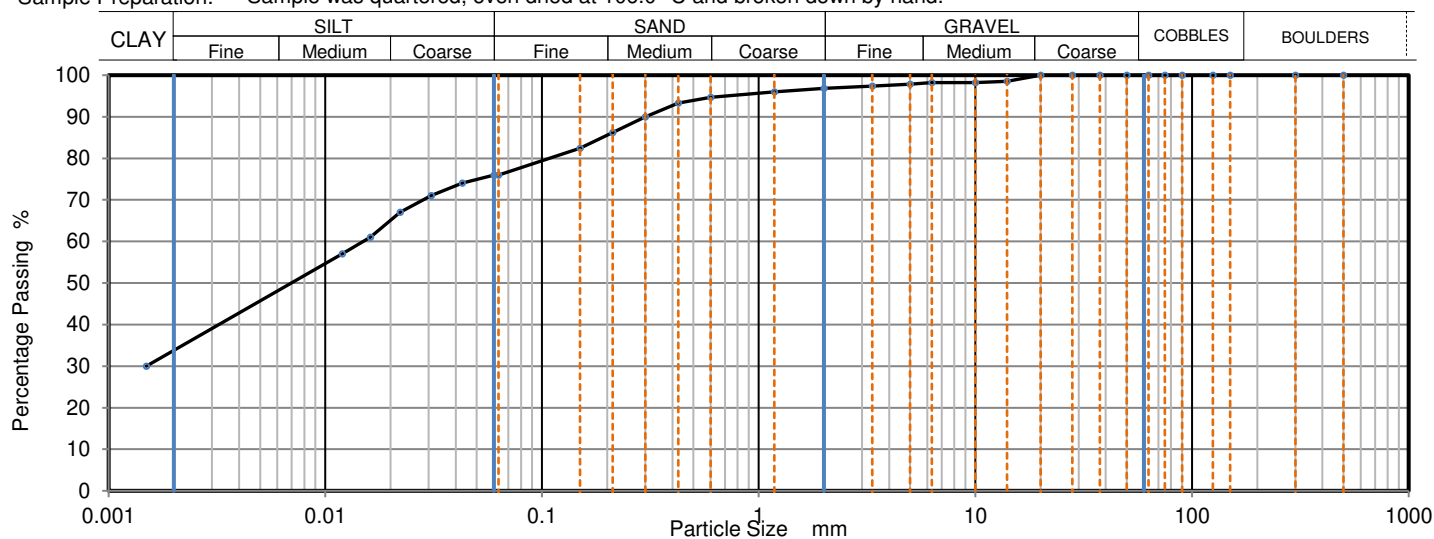
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770734
Hole No.: CP101
Sample Reference: Not Given
Sample Description: Brown slightly gravelly sandy very clayey SILT
Sample Preparation: Sample was quartered, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 1.20
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0600	76
300	100	0.0428	74
150	100	0.0308	71
125	100	0.0221	67
90	100	0.0162	61
75	100	0.0120	57
63	100	0.0015	30
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	98		
5	98		
3.35	97	Particle density (assumed) 2.65 Mg/m ³	
2	97		
1.18	96		
0.6	95		
0.425	93		
0.3	90		
0.212	86		
0.15	82		
0.063	76		

Sample Proportions	% dry mass
Very coarse	0
Gravel	3
Sand	21
Silt	42
Clay	34

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 10
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:

Szczepan Bielatowicz

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 04/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

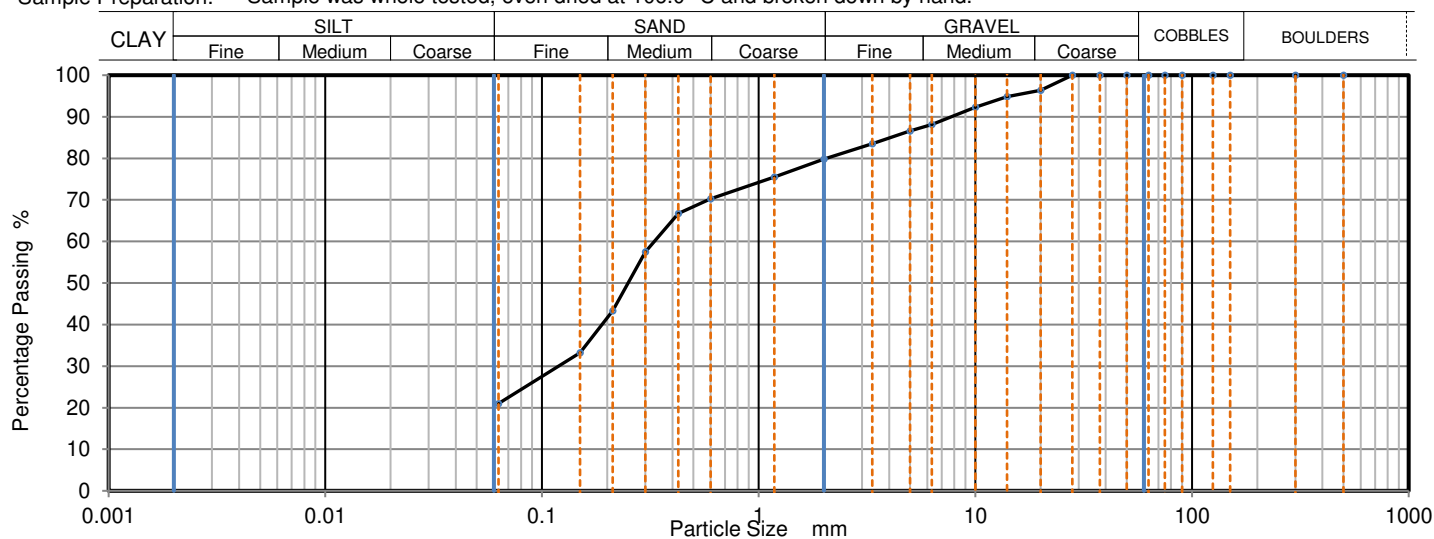
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770737
Hole No.: CP102
Sample Reference: Not Given
Sample Description: Dark brown gravelly clayey SAND
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 1.20
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	96		
14	95		
10	92		
6.3	88		
5	87		
3.35	84		
2	80		
1.18	76		
0.6	70		
0.425	67		
0.3	58		
0.212	43		
0.15	33		
0.063	21		

Sample Proportions	% dry mass
Very coarse	0
Gravel	20
Sand	59
Fines <0.063mm	21

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 5.2
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 11/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

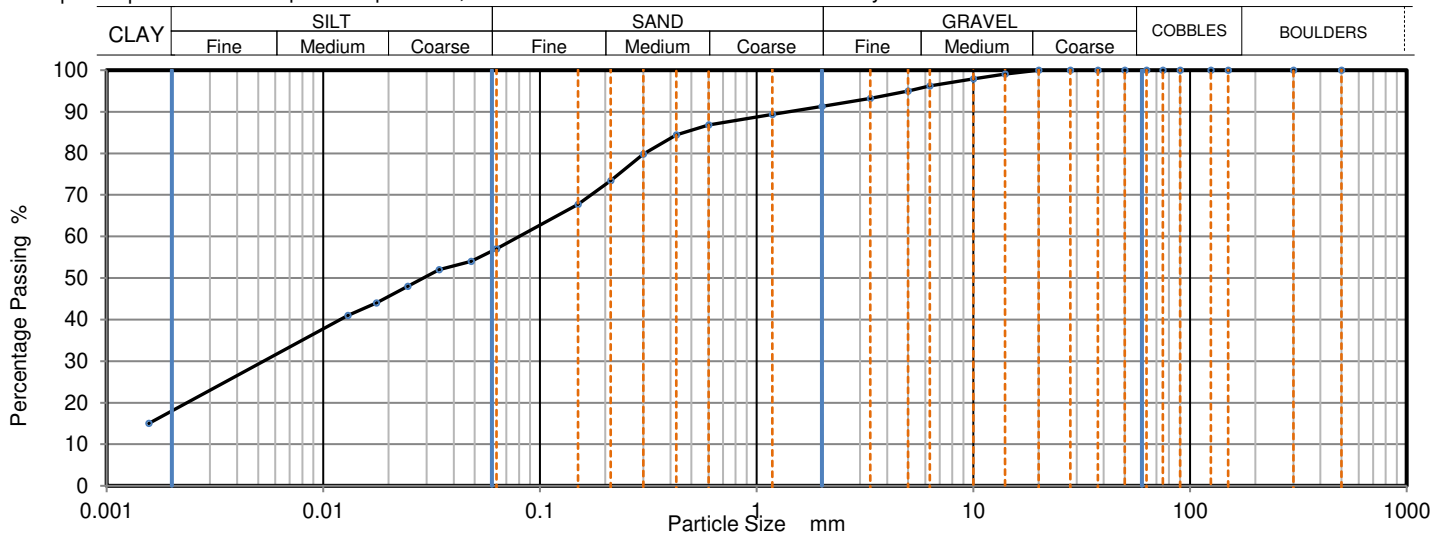
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770744
Hole No.: WS103
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly very sandy clayey SILT
Sample Preparation: Sample was quartered, oven dried at 106.3 °C and broken down by hand.

Depth Top [m]: 0.00
Depth Base [m]: 2.00
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	57
300	100	0.0481	54
150	100	0.0342	52
125	100	0.0245	48
90	100	0.0176	44
75	100	0.0130	41
63	100	0.0016	15
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	96		
5	95		
3.35	93	Particle density (assumed) 2.65 Mg/m3	
2	91		
1.18	89		
0.6	87		
0.425	84		
0.3	80		
0.212	73		
0.15	68		
0.063	57		

Sample Proportions	% dry mass
Very coarse	0
Gravel	9
Sand	34
Silt	39
Clay	18

Grading Analysis	
D100	mm 20
D60	mm 0.0782
D30	mm 0.00541
D10	mm
Uniformity Coefficient	> 50
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:

Szczepan Bielatowicz

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 11/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

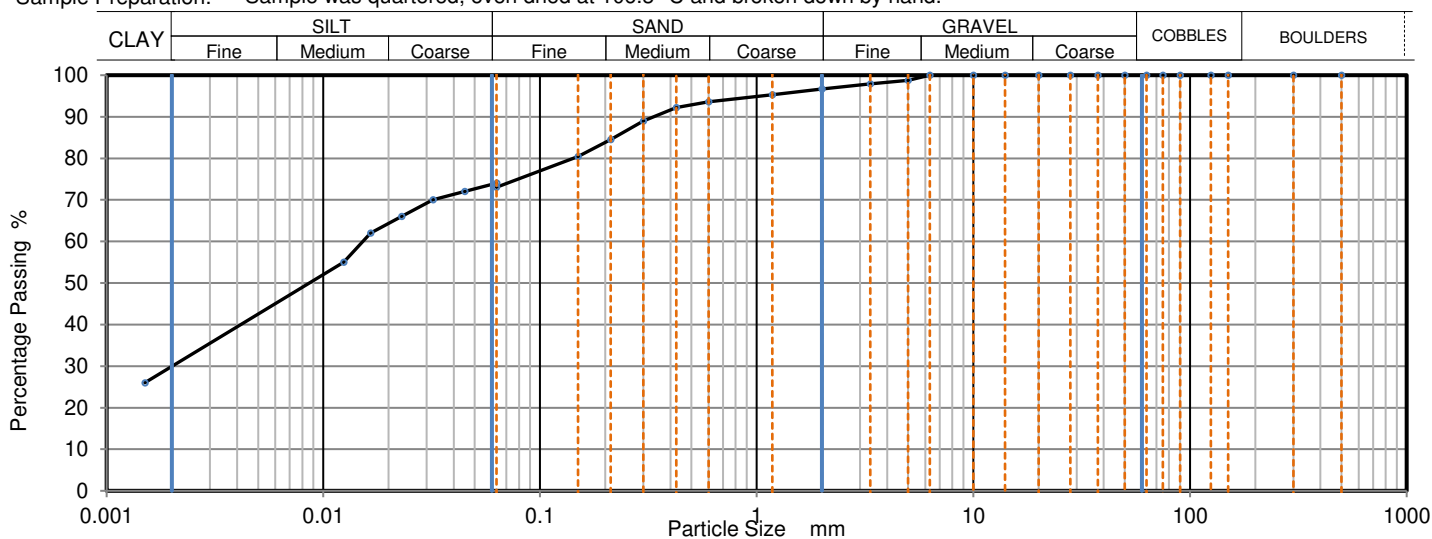
Test Results:

Laboratory Reference: 1770746
Hole No.: WS104
Sample Reference: Not Given
Sample Description: Brown mottled grey slightly gravelly sandy very clayey SILT
Sample Preparation: Sample was quartered, oven dried at 106.3 °C and broken down by hand.

Depth Top [m]: 0.00

Depth Base [m]: 2.00

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0631	74
300	100	0.0450	72
150	100	0.0321	70
125	100	0.0230	66
90	100	0.0165	62
75	100	0.0124	55
63	100	0.0015	26
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	98	Particle density (assumed) 2.65 Mg/m ³	
2	97		
1.18	95		
0.6	94		
0.425	92		
0.3	89		
0.212	85		
0.15	80		
0.063	74		

Sample Proportions	% dry mass
Very coarse	0
Gravel	3
Sand	23
Silt	44
Clay	30

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 10
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:

Sergiusz Bialowicz

Szczepan Bialowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

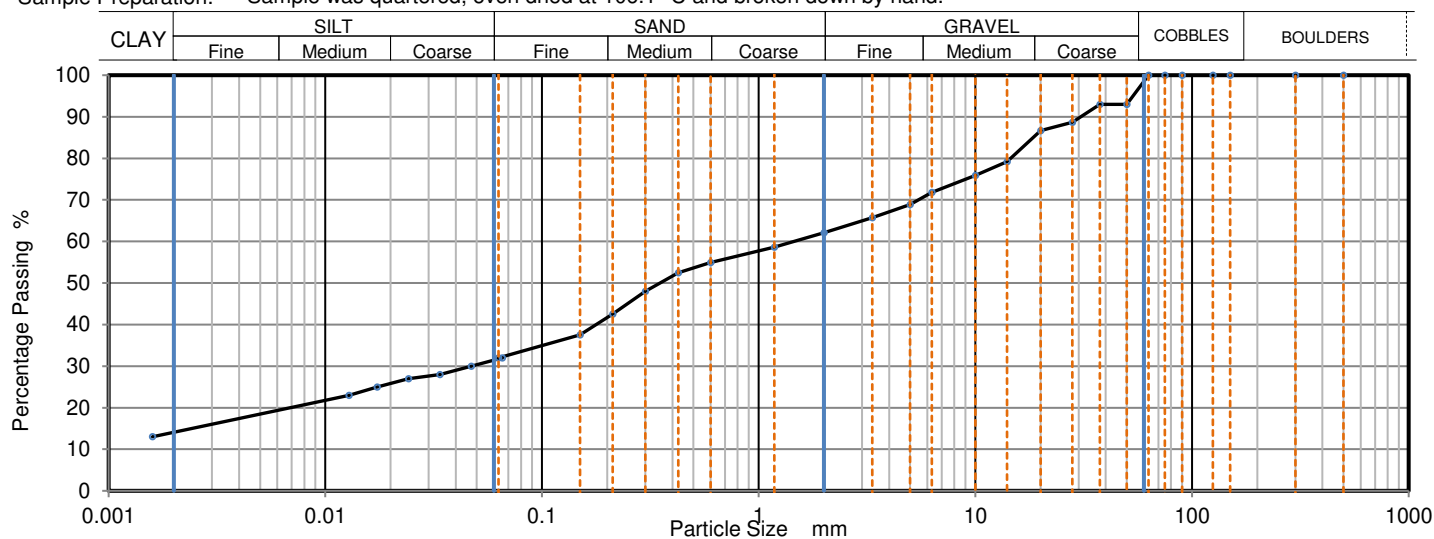
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770747
Hole No.: CP301
Sample Reference: Not Given
Sample Description: Greyish brown silty clayey very sandy GRAVEL with fragments of brick
Sample Preparation: Sample was quartered, oven dried at 106.1 °C and broken down by hand.

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0656	32
300	100	0.0471	30
150	100	0.0338	28
125	100	0.0242	27
90	100	0.0173	25
75	100	0.0128	23
63	100	0.0016	13
50	93		
37.5	93		
28	89		
20	87		
14	79		
10	76		
6.3	72		
5	69		
3.35	66	Particle density (assumed) 2.65 Mg/m ³	
2	62		
1.18	59		
0.6	55		
0.425	53		
0.3	48		
0.212	43		
0.15	38		
0.063	32		

Sample Proportions	% dry mass
Very coarse	0
Gravel	38
Sand	30
Silt	18
Clay	14

Grading Analysis	
D100	mm 63
D60	mm 1.46
D30	mm 0.0446
D10	mm
Uniformity Coefficient	> 920
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

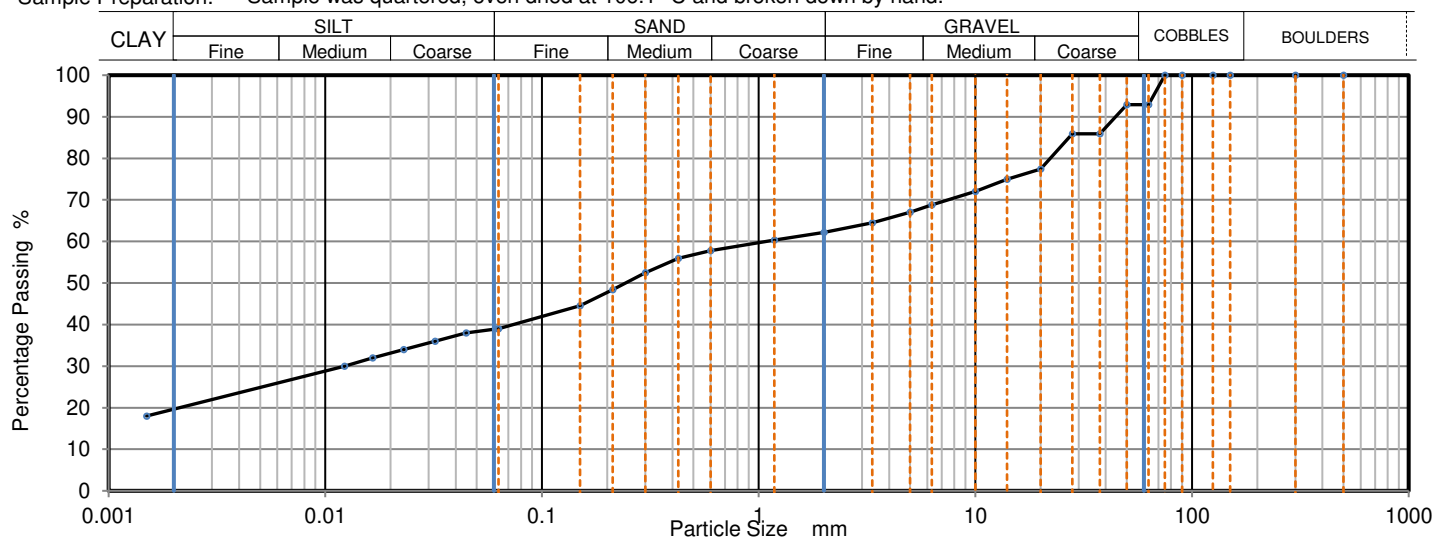
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770755
Hole No.: CP302
Sample Reference: Not Given
Sample Description: Brown very gravelly sandy silty CLAY with fragments of brick, concrete
Sample Preparation: Sample was quartered, oven dried at 106.1 °C and broken down by hand.

Depth Top [m]: 1.20
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0626	39
300	100	0.0446	38
150	100	0.0321	36
125	100	0.0230	34
90	100	0.0165	32
75	100	0.0123	30
63	93	0.0015	18
50	93		
37.5	86		
28	86		
20	77		
14	75		
10	72		
6.3	69		
5	67		
3.35	65	Particle density (assumed) 2.65 Mg/m ³	
2	62		
1.18	60		
0.6	58		
0.425	56		
0.3	53		
0.212	48		
0.15	45		
0.063	39		

Sample Proportions	% dry mass
Very coarse	7
Gravel	31
Sand	23
Silt	19
Clay	20

Grading Analysis	
D100	mm 75
D60	mm 1.08
D30	mm 0.0121
D10	mm
Uniformity Coefficient	> 720
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 11/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770756

Hole No.: WS302

Sample Reference: Not Given

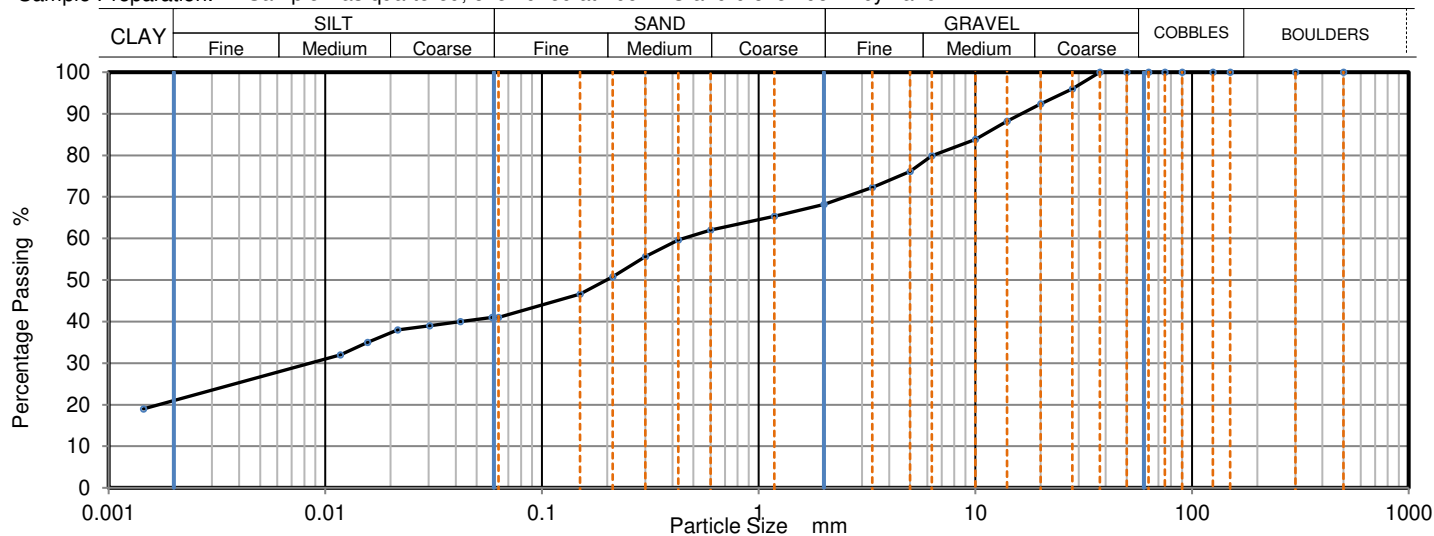
Sample Description: Greyish brown very gravelly very sandy very silty CLAY with fragments of brick, concrete

Sample Preparation: Sample was quartered, oven dried at 106.1 °C and broken down by hand.

Depth Top [m]: 0.00

Depth Base [m]: 2.00

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0588	41
300	100	0.0420	40
150	100	0.0302	39
125	100	0.0216	38
90	100	0.0157	35
75	100	0.0117	32
63	100	0.0014	19
50	100		
37.5	100		
28	96		
20	92		
14	88		
10	84		
6.3	80		
5	76		
3.35	72	Particle density (assumed) 2.65 Mg/m ³	
2	68		
1.18	65		
0.6	62		
0.425	60		
0.3	56		
0.212	51		
0.15	47		
0.063	41		

Sample Proportions	% dry mass
Very coarse	0
Gravel	32
Sand	27
Silt	20
Clay	21

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 310
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

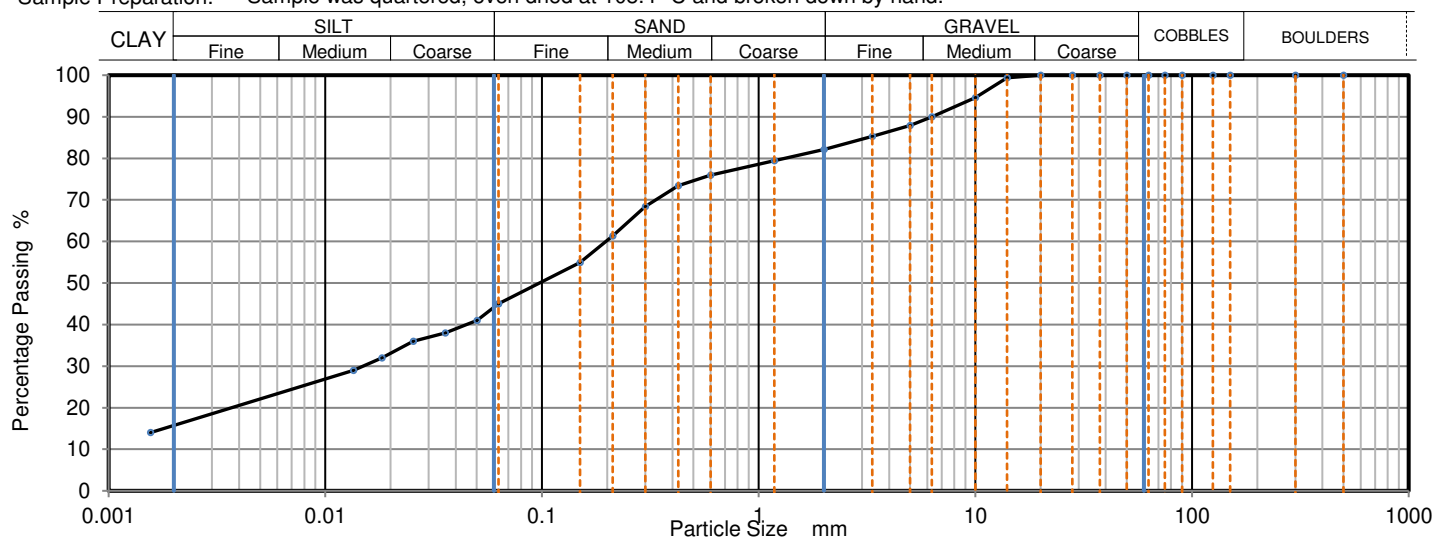
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770757
Hole No.: WS303
Sample Reference: Not Given
Sample Description: Dark brown very sandy gravelly clayey SILT
Sample Preparation: Sample was quartered, oven dried at 108.4 °C and broken down by hand.

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	45
300	100	0.0500	41
150	100	0.0358	38
125	100	0.0255	36
90	100	0.0182	32
75	100	0.0135	29
63	100	0.0016	14
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	95		
6.3	90		
5	88		
3.35	85	Particle density (assumed) 2.65 Mg/m ³	
2	82		
1.18	79		
0.6	76		
0.425	73		
0.3	68		
0.212	61		
0.15	55		
0.063	45		

Sample Proportions	% dry mass
Very coarse	0
Gravel	18
Sand	37
Silt	29
Clay	16

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 130
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:

Szczepan Bielatowicz

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

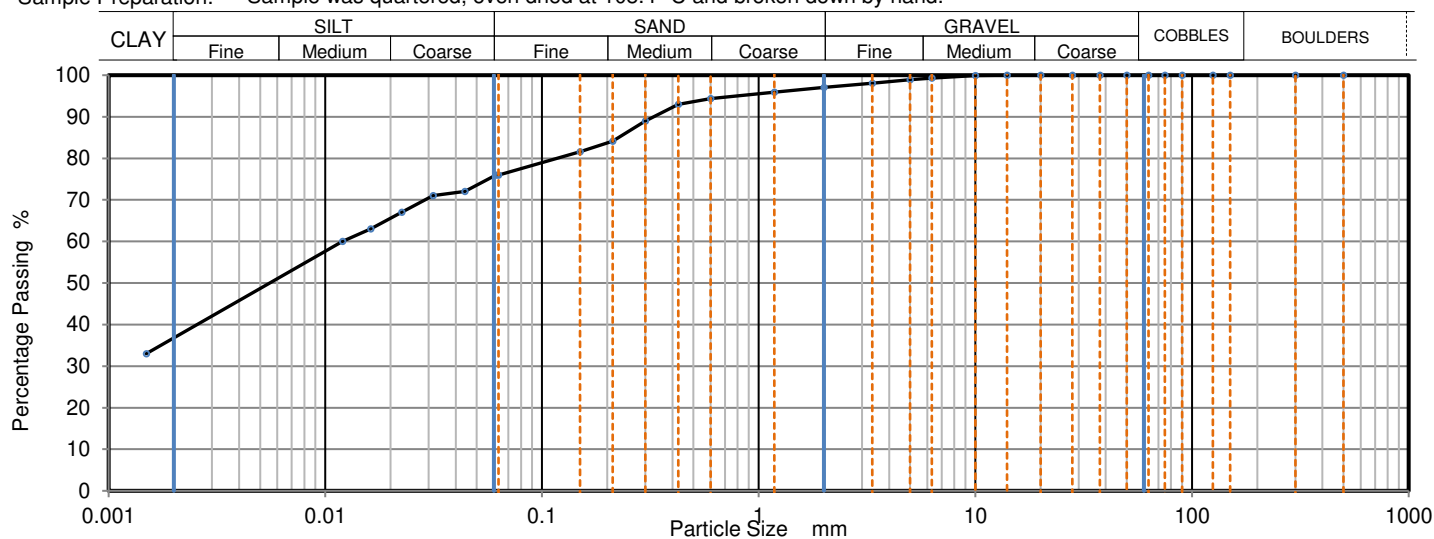
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770759
Hole No.: WS304
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly sandy very clayey SILT
Sample Preparation: Sample was quartered, oven dried at 108.4 °C and broken down by hand.

Depth Top [m]: 3.00
Depth Base [m]: Not Given
Sample Type: D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0613	76
300	100	0.0440	72
150	100	0.0314	71
125	100	0.0226	67
90	100	0.0162	63
75	100	0.0120	60
63	100	0.0015	33
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	98	Particle density (assumed) 2.65 Mg/m ³	
2	97		
1.18	96		
0.6	94		
0.425	93		
0.3	89		
0.212	84		
0.15	82		
0.063	76		

Sample Proportions	% dry mass
Very coarse	0
Gravel	3
Sand	21
Silt	39
Clay	37

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 8.1
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:

Szczepan Bielatowicz

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 11/02/2021
Date Received: 15/02/2021
Date Tested: 22/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

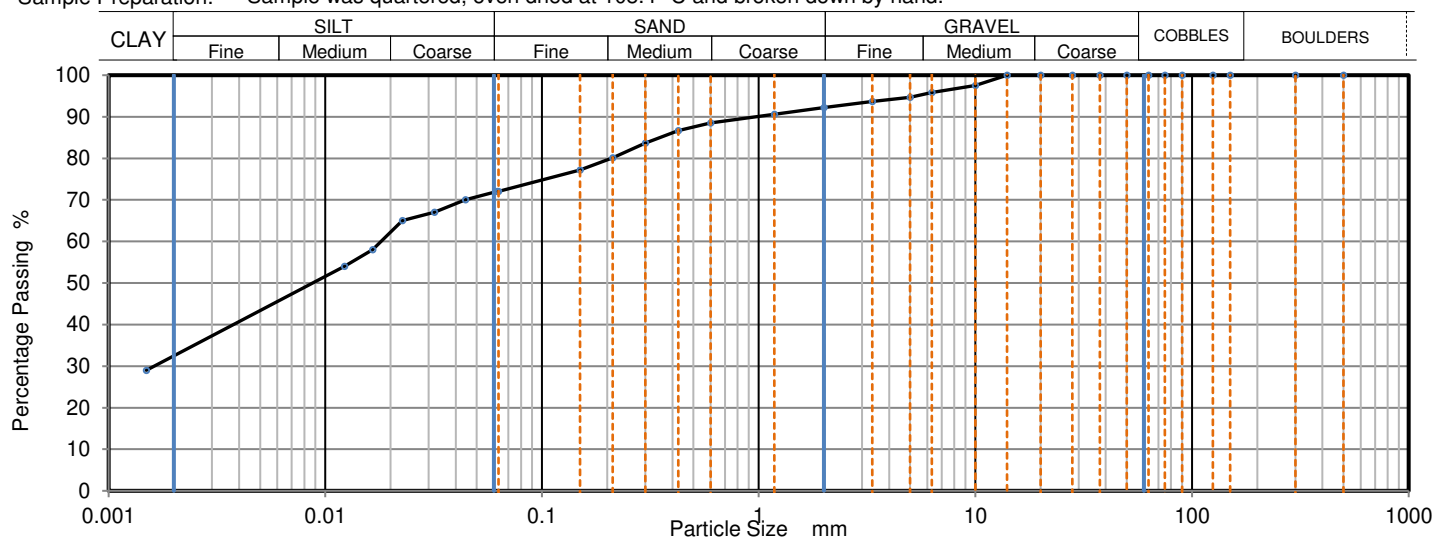
Test Results:

Laboratory Reference: 1770760
Hole No.: WS304
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly sandy very clayey SILT
Sample Preparation: Sample was quartered, oven dried at 108.4 °C and broken down by hand.

Depth Top [m]: 0.00

Depth Base [m]: 2.00

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0621	72
300	100	0.0443	70
150	100	0.0318	67
125	100	0.0227	65
90	100	0.0165	58
75	100	0.0123	54
63	100	0.0015	29
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	98		
6.3	96		
5	95		
3.35	94	Particle density (assumed) 2.65 Mg/m3	
2	92		
1.18	91		
0.6	89		
0.425	87		
0.3	84		
0.212	80		
0.15	77		
0.063	72		

Sample Proportions	% dry mass
Very coarse	0
Gravel	8
Sand	20
Silt	40
Clay	32

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 12
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:

Szczepan Bielatowicz

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 03/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

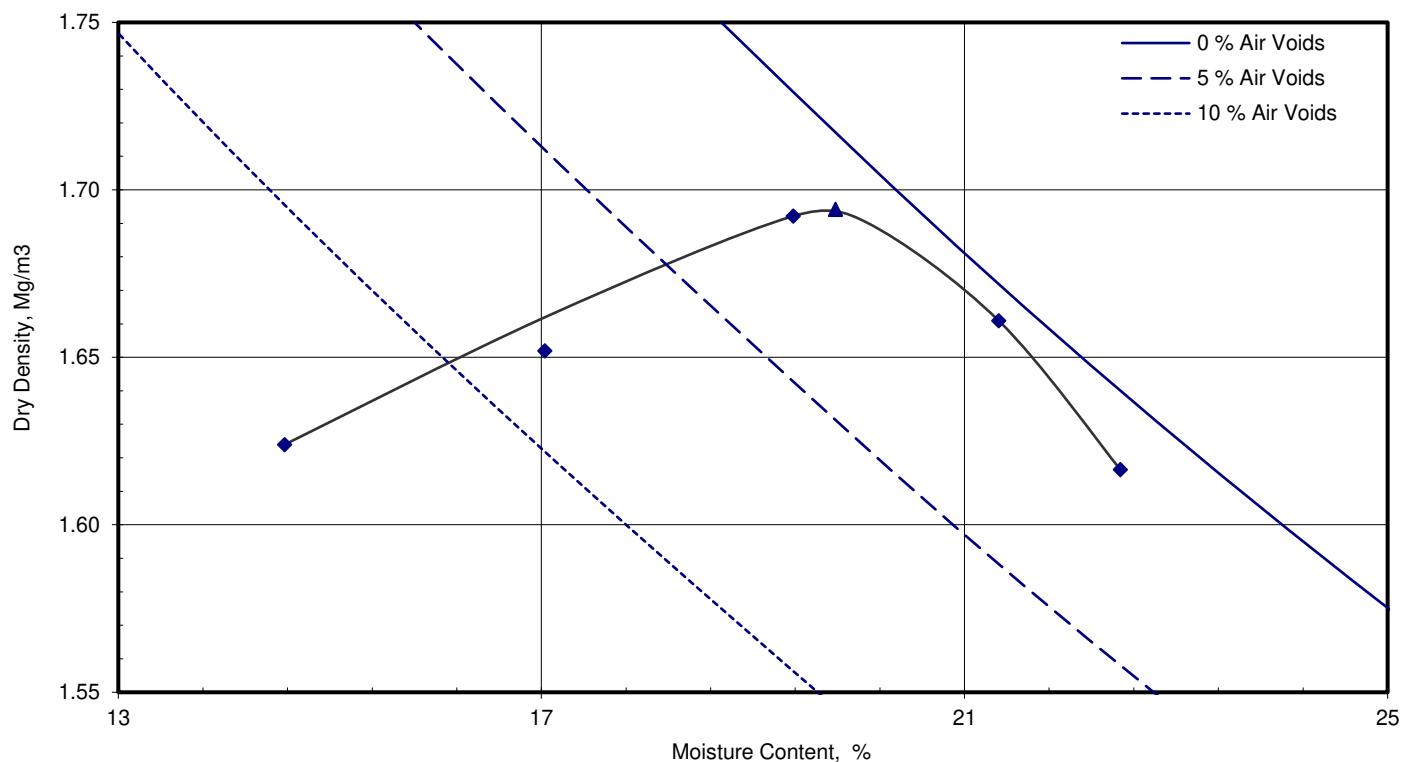
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770734
Hole No.: CP101
Sample Reference: Not Given
Sample Description: Brown slightly gravelly sandy very clayey SILT
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 1.20
Depth Base [m]: Not Given
Sample Type: B



Compaction Point No.	1	2	3	4	5	
Moisture Content	%	15	17	19	21	22
Dry Density	Mg/m³	1.62	1.65	1.69	1.66	1.62

Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.60
As received Moisture Content	%	28
Maximum Dry Density	Mg/m³	1.69

Optimum Moisture Content	%	20
--------------------------	---	----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 11/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

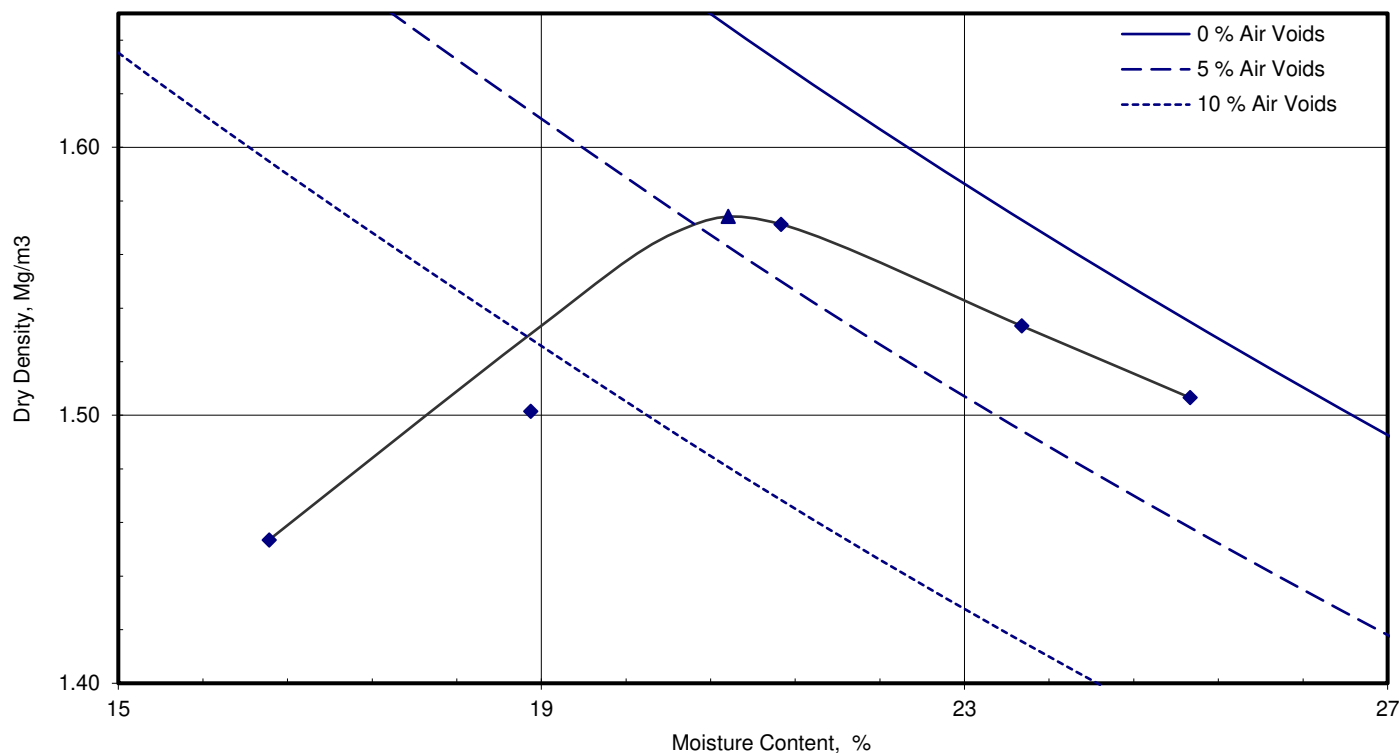
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770744
Hole No.: WS103
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly very sandy clayey SILT
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 0.00
Depth Base [m]: 2.00
Sample Type: B



Compaction Point No.		1	2	3	4	5
Moisture Content	%	16	19	21	24	25
Dry Density	Mg/m³	1.45	1.50	1.57	1.53	1.51

Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.50
As received Moisture Content	%	27
Maximum Dry Density	Mg/m³	1.57

Optimum Moisture Content	%	21
--------------------------	---	----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 11/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

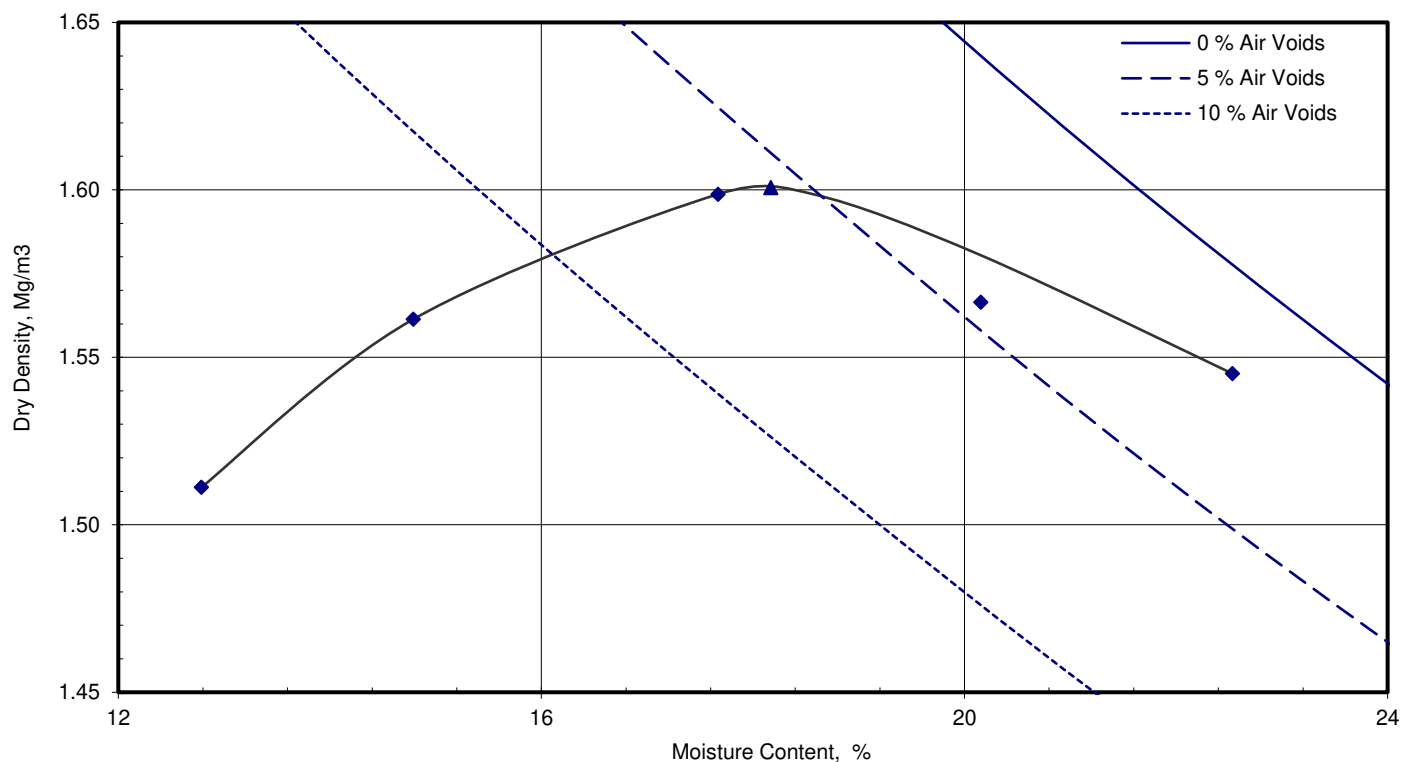
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770746
Hole No.: WS104
Sample Reference: Not Given
Sample Description: Brown mottled grey slightly gravelly sandy very clayey SILT
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 0.00
Depth Base [m]: 2.00
Sample Type: B



Compaction Point No.		1	2	3	4	5
Moisture Content	%	13	15	18	20	23
Dry Density	Mg/m³	1.51	1.56	1.60	1.57	1.55

Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.45
As received Moisture Content	%	22
Maximum Dry Density	Mg/m³	1.60

Optimum Moisture Content	%	18
--------------------------	---	----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

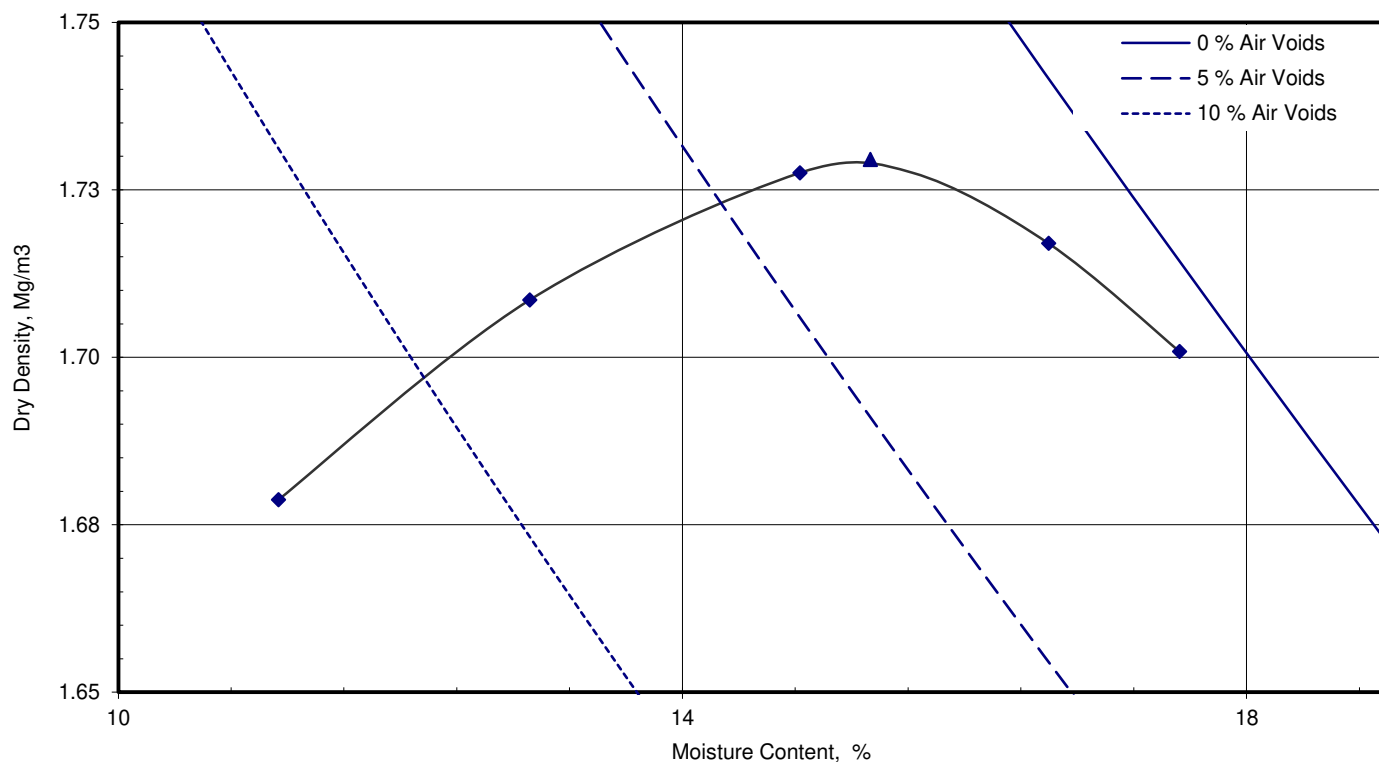
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770747
Hole No.: CP301
Sample Reference: Not Given
Sample Description: Greyish brown silty clayey very sandy GRAVEL with fragments of brick
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: B



Compaction Point No.		1	2	3	4	5
Moisture Content	%	11	13	15	17	18
Dry Density	Mg/m³	1.68	1.71	1.73	1.72	1.70

Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	7
Material Retained on 20.0 mm Sieve	%	13
Particle Density - Assumed	Mg/m³	2.45
As received Moisture Content	%	16
Maximum Dry Density	Mg/m³	1.73

Optimum Moisture Content	%	15
--------------------------	---	----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.4 using 2.5kg [light] Rammer

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE
Dry Density / Moisture Content
Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

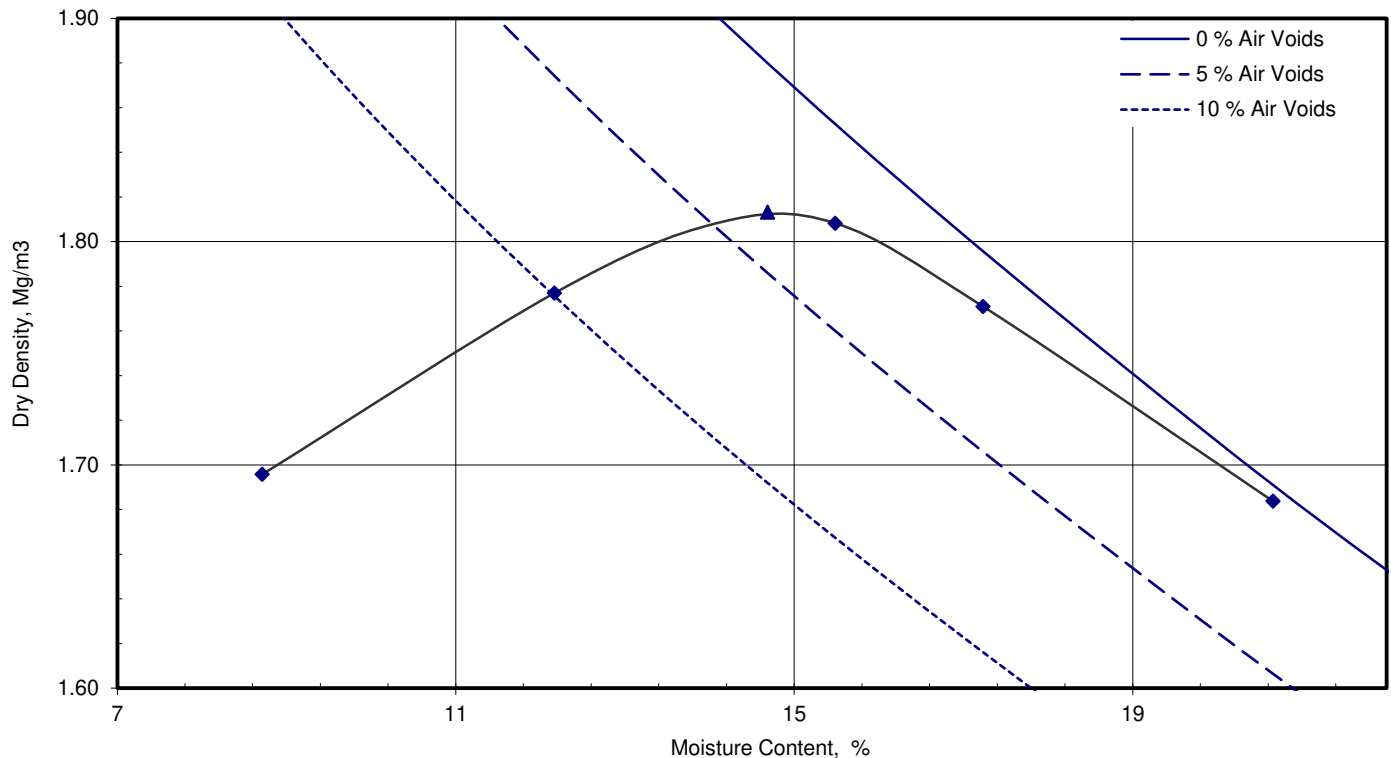
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770755
Hole No.: CP302
Sample Reference: Not Given
Sample Description: Brown very gravelly sandy silty CLAY with fragments of brick, concrete
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 1.20
Depth Base [m]: Not Given
Sample Type: B



Compaction Point No.	1	2	3	4	5	
Moisture Content	%	8.7	12	15	17	21
Dry Density	Mg/m³	1.70	1.78	1.81	1.77	1.68

Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	14
Material Retained on 20.0 mm Sieve	%	23
Particle Density - Assumed	Mg/m³	2.60
As received Moisture Content	%	15
Maximum Dry Density	Mg/m³	1.81

Optimum Moisture Content	%	15
--------------------------	---	----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.4 using 2.5kg [light] Rammer

Remarks: Zone X - test carried out as per client request

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 11/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

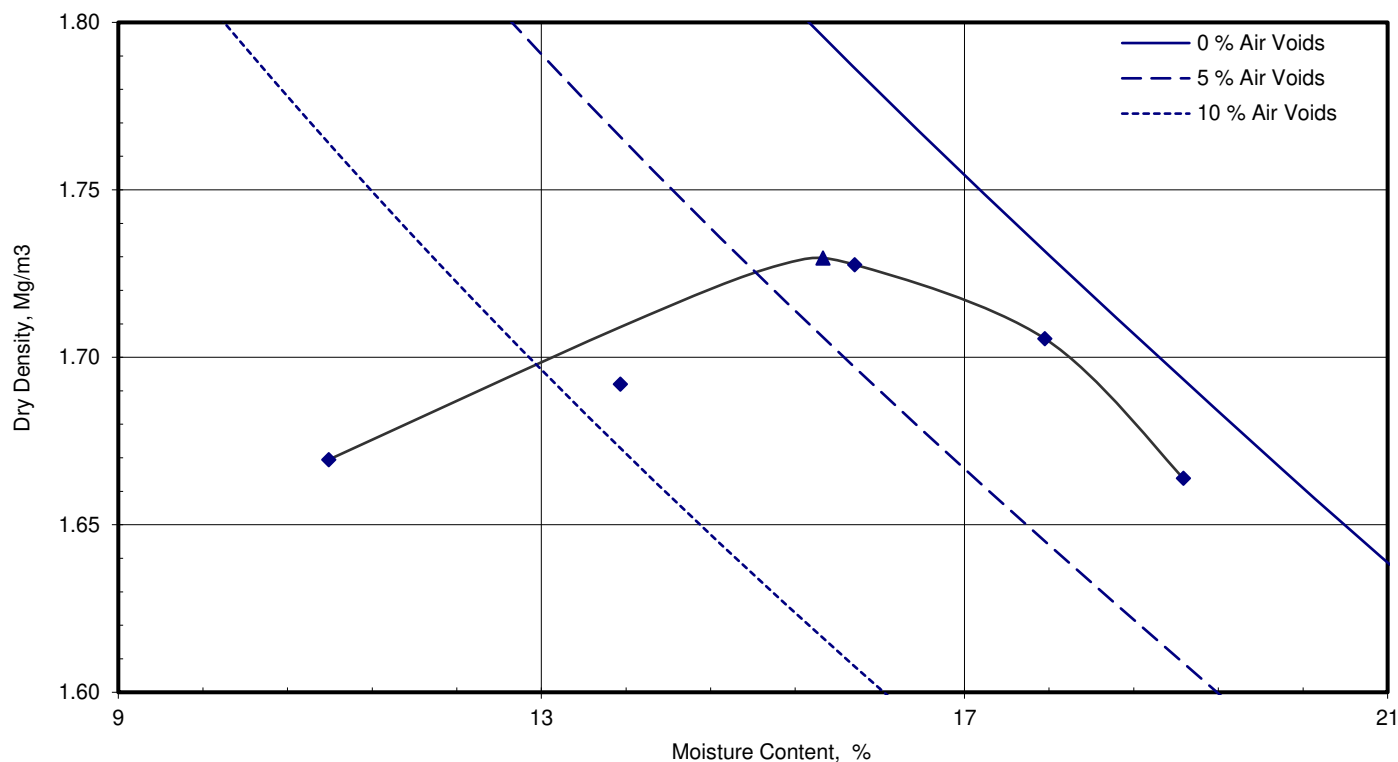
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770756
Hole No.: WS302
Sample Reference: Not Given
Sample Description: Greyish brown very gravelly very sandy very silty CLAY with fragments of brick, concrete
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 0.00
Depth Base [m]: 2.00
Sample Type: B



Compaction Point No.		1	2	3	4	5
Moisture Content	%	11	14	16	18	19
Dry Density	Mg/m³	1.67	1.69	1.73	1.71	1.66

Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	8
Particle Density - Assumed	Mg/m³	2.50
As received Moisture Content	%	19
Maximum Dry Density	Mg/m³	1.73
Optimum Moisture Content	%	16

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.4 using 2.5kg [light] Rammer

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Dry Density / Moisture Content

Relationship Light Compaction

Tested in Accordance with:
BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 11/02/2021
Date Received: 15/02/2021
Date Tested: 02/03/2021
Sampled By: Client

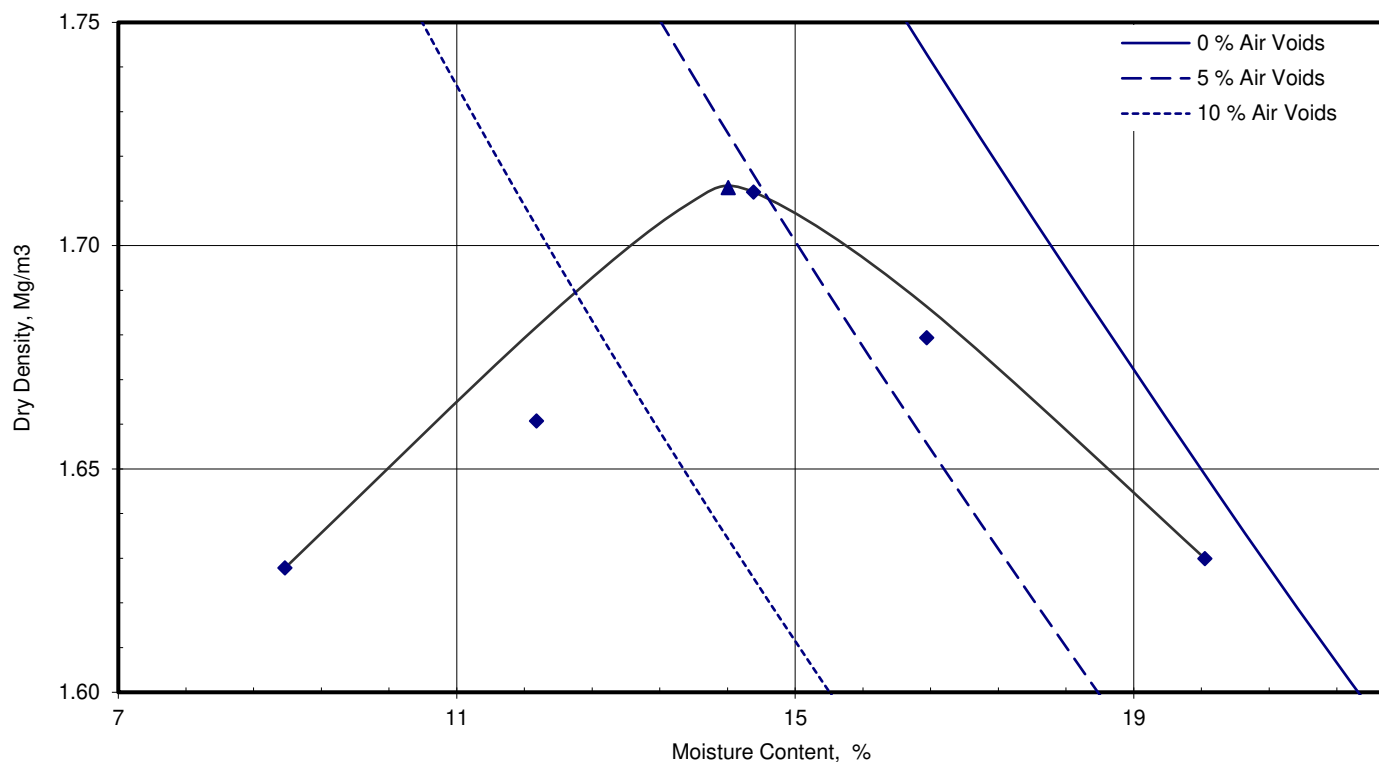
Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770760
Hole No.: WS304
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly sandy very clayey SILT
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 0.00
Depth Base [m]: 2.00
Sample Type: B



Compaction Point No.		1	2	3	4	5
Moisture Content	%	9.0	12	15	17	20
Dry Density	Mg/m³	1.63	1.66	1.71	1.68	1.63

Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.45
As received Moisture Content	%	16
Maximum Dry Density	Mg/m³	1.71

Optimum Moisture Content	%	14
--------------------------	---	----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 20/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770749
Hole No.: CP301
Sample Reference: Not Given
Sample Description: Reddish brown slightly gravelly CLAY

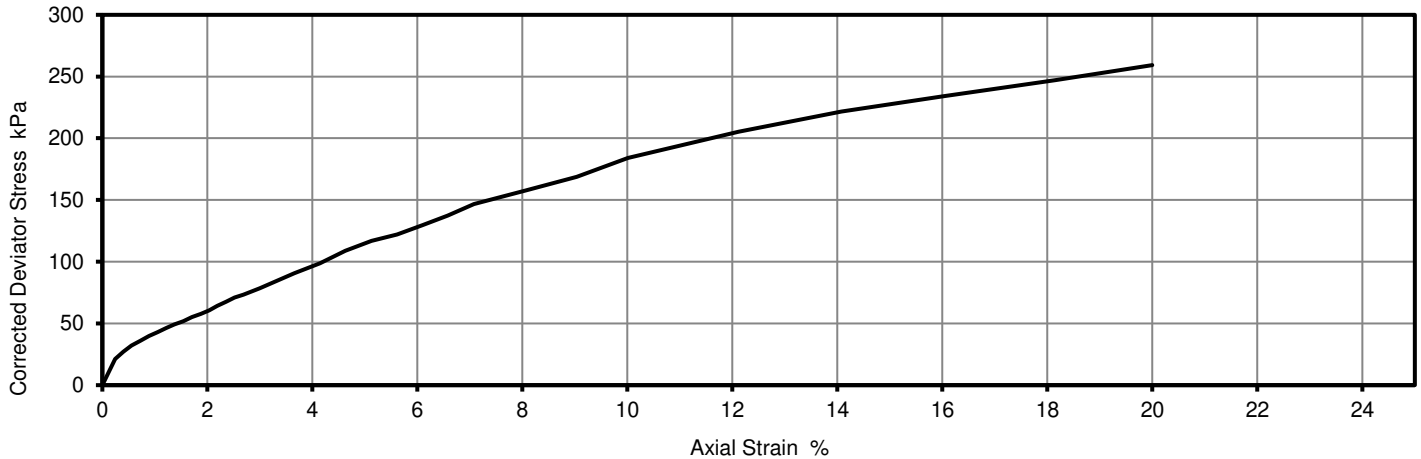
Depth Top [m]: 7.50
Depth Base [m]: Not Given
Sample Type: U

Test Number	1
Length	202.57 mm
Diameter	101.00 mm
Bulk Density	2.14 Mg/m ³
Moisture Content	20 %
Dry Density	1.78 Mg/m ³
Membrane Correction	0.88 kPa

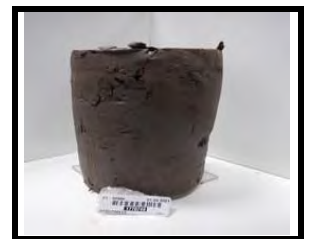
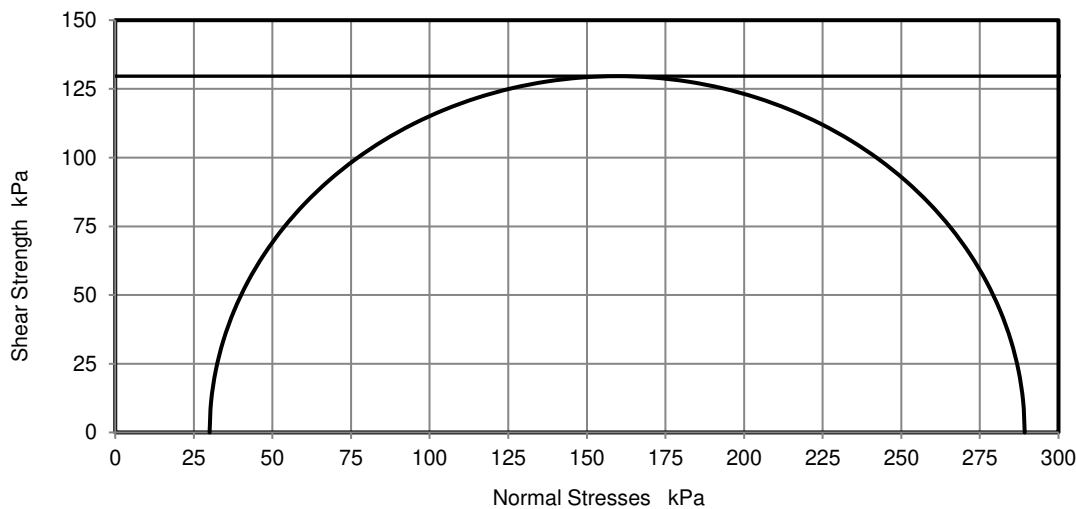
Rate of Strain
Cell Pressure
Axial Strain at failure
Deviator Stress, ($\sigma_1 - \sigma_3$)_f
Undrained Shear Strength, c_u
Mode of Failure
Membrane thickness

1.97	%/min
30	kPa
20.0	%
259	kPa
130	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Compound	
0.23	mm

Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks: No failure occurred until 20 % Axial Strain – reported as a single stage test.

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 20/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770752
Hole No.: CP302
Sample Reference: Not Given
Sample Description: Reddish brown slightly gravelly CLAY

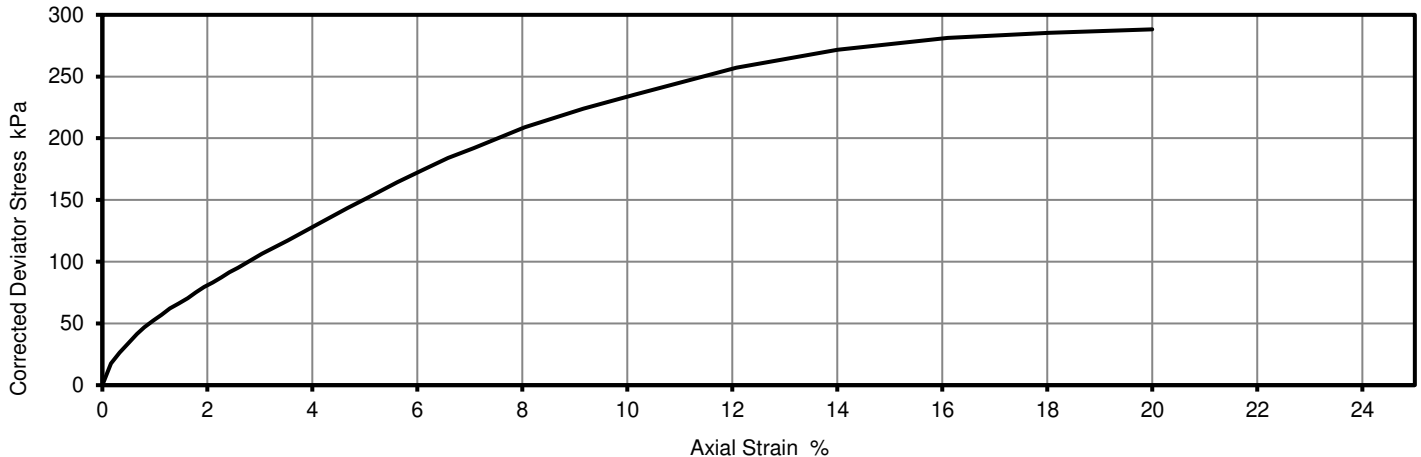
Depth Top [m]: 6.50
Depth Base [m]: Not Given
Sample Type: U

Test Number	1
Length	203.62 mm
Diameter	101.87 mm
Bulk Density	2.20 Mg/m ³
Moisture Content	19 %
Dry Density	1.85 Mg/m ³
Membrane Correction	0.87 kPa

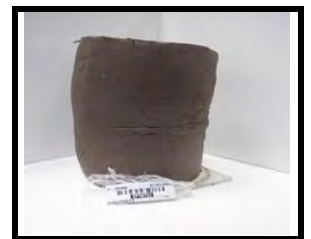
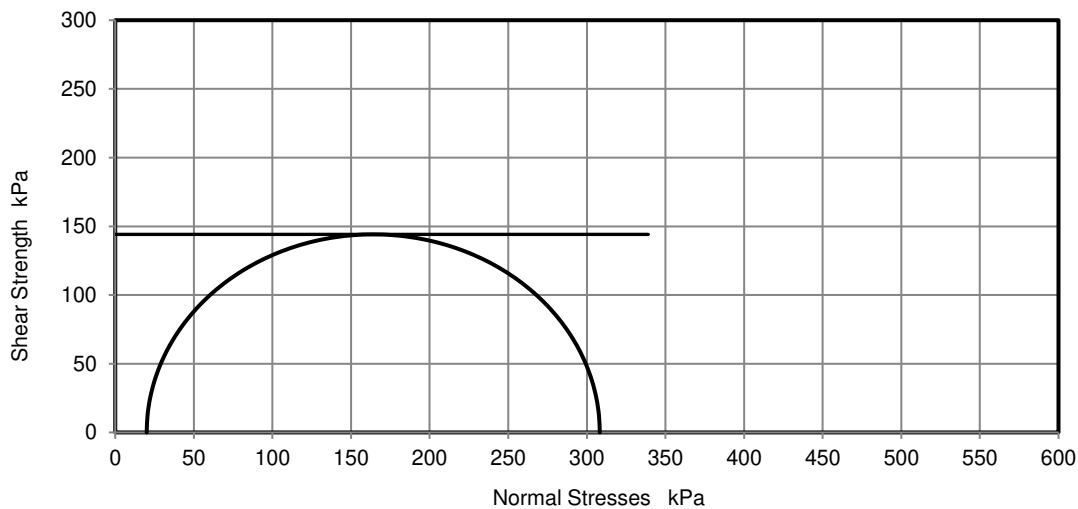
Rate of Strain
Cell Pressure
Axial Strain at failure
Deviator Stress, ($\sigma_1 - \sigma_3$)_f
Undrained Shear Strength, c_u
Mode of Failure
Membrane thickness

1.96	%/min
20	kPa
20.0	%
288	kPa
144	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Compound	
0.23	mm

Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

Remarks: No failure occurred until 20 % Axial Strain – reported as a single stage test.

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 05/02/2021
Date Received: 15/02/2021
Date Tested: 20/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

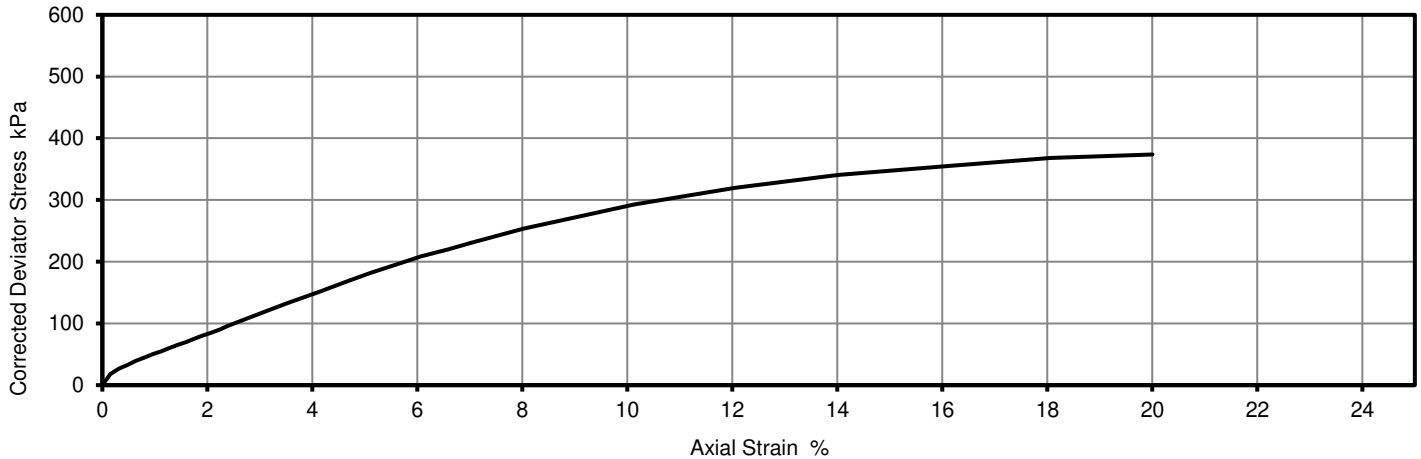
Laboratory Reference: 1770754
Hole No.: CP302
Sample Reference: Not Given
Sample Description: Reddish brown slightly gravelly CLAY

Depth Top [m]: 9.50
Depth Base [m]: Not Given
Sample Type: U

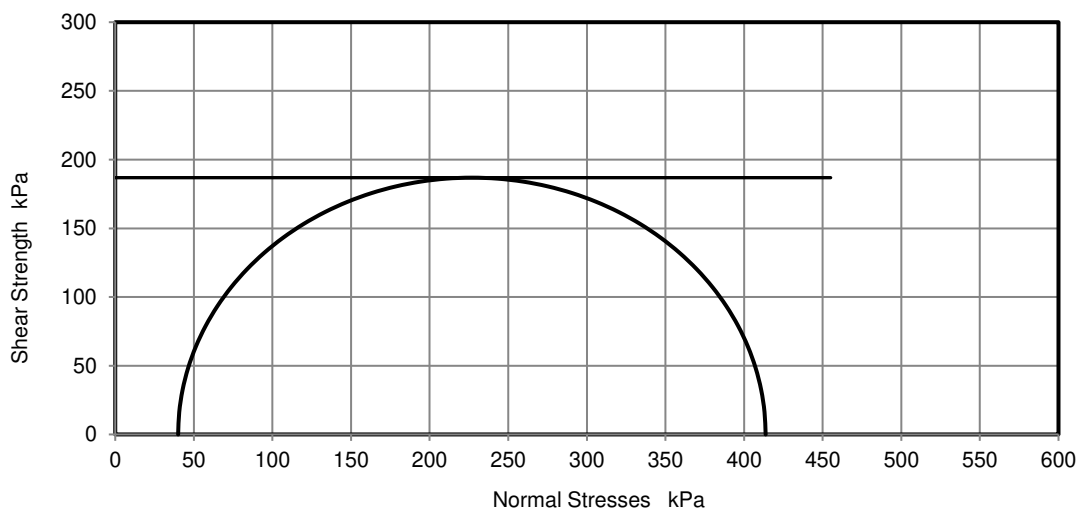
Test Number	1
Length	203.63 mm
Diameter	102.13 mm
Bulk Density	2.18 Mg/m ³
Moisture Content	17 %
Dry Density	1.86 Mg/m ³
Membrane Correction	0.79 kPa

Rate of Strain	1.96 %/min
Cell Pressure	40 kPa
Axial Strain at failure	20.0 %
Deviator Stress, $(\sigma_1 - \sigma_3)_f$	374 kPa
Undrained Shear Strength, c_u	187 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Plastic
Membrane thickness	0.21 mm

Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

Remarks: No failure occurred until 20 % Axial Strain – reported as a single stage test.

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Tested in Accordance with: BS 1377-7: 1990: Clause 9

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 04/02/2021
Date Received: 15/02/2021
Date Tested: 20/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770739
Hole No.: CP102
Sample Reference: Not Given
Sample Description: Brown mottled grey CLAY

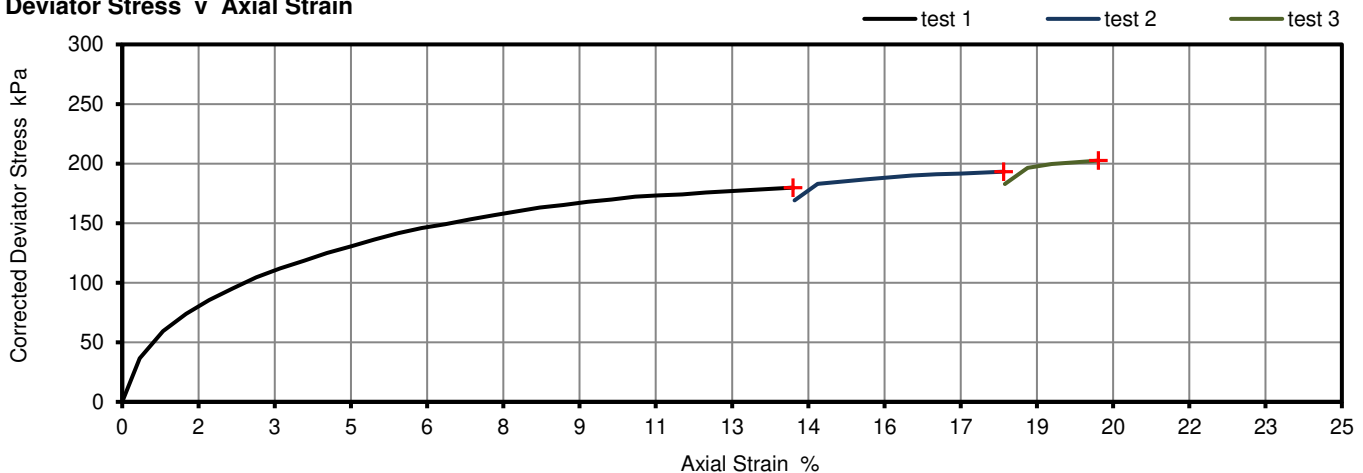
Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: U

Length	203.46	mm
Diameter	102.57	mm
Bulk Density	2.05	Mg/m ³
Moisture Content	24	%
Dry Density	1.66	Mg/m ³
Membrane thickness	0.27	mm

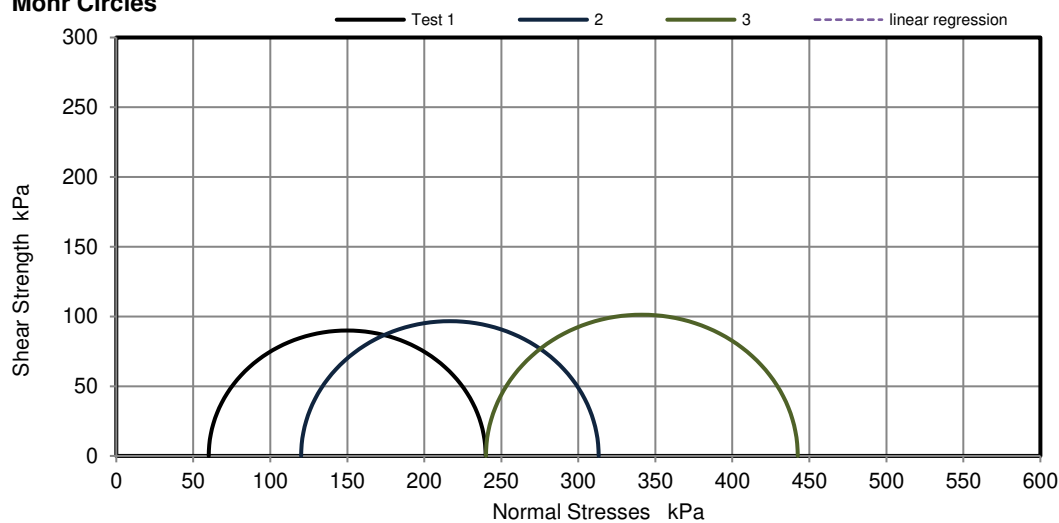
Rate of Strain
Stage Number
Cell Pressure
Axial Strain at failure
Deviator Stress, ($\sigma_1 - \sigma_3$) f
Shear strength, cu
Mode of failure
Membrane Correction

1.97				%/min
1	2	3		
60	120	240		kPa
13.8	18.1	20.0		%
180	193	202		kPa
90	97	101		kPa
Compound				
0.75	0.93	1.01		kPa

Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Linear Regression
 ϕ_u
cu kPa

Note: Mohr circles and their interpretation is not covered by BS1377. These are provided for information only.

Remarks: Correction values: 60kPa=25N, 120kPa=73N, 240kPa=127N.

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Tested in Accordance with: BS 1377-7: 1990: Clause 9

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 423207
Job Number: 21-56886
Date Sampled: 04/02/2021
Date Received: 15/02/2021
Date Tested: 20/02/2021
Sampled By: Client

Contact: Troy Randall
Site Address: Grimshaw Lane, Manchester (Plot 1)

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1770740
Hole No.: CP102
Sample Reference: Not Given
Sample Description: Brown mottled grey CLAY

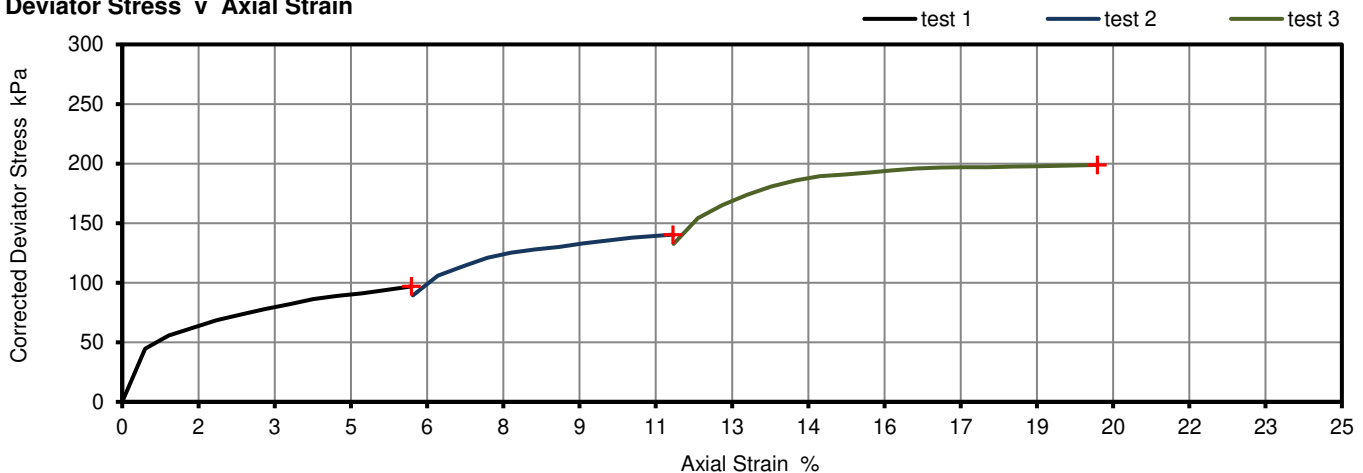
Depth Top [m]: 4.00
Depth Base [m]: Not Given
Sample Type: U

Length	140.15	mm
Diameter	69.13	mm
Bulk Density	1.98	Mg/m ³
Moisture Content	23	%
Dry Density	1.61	Mg/m ³
Membrane thickness	0.27	mm

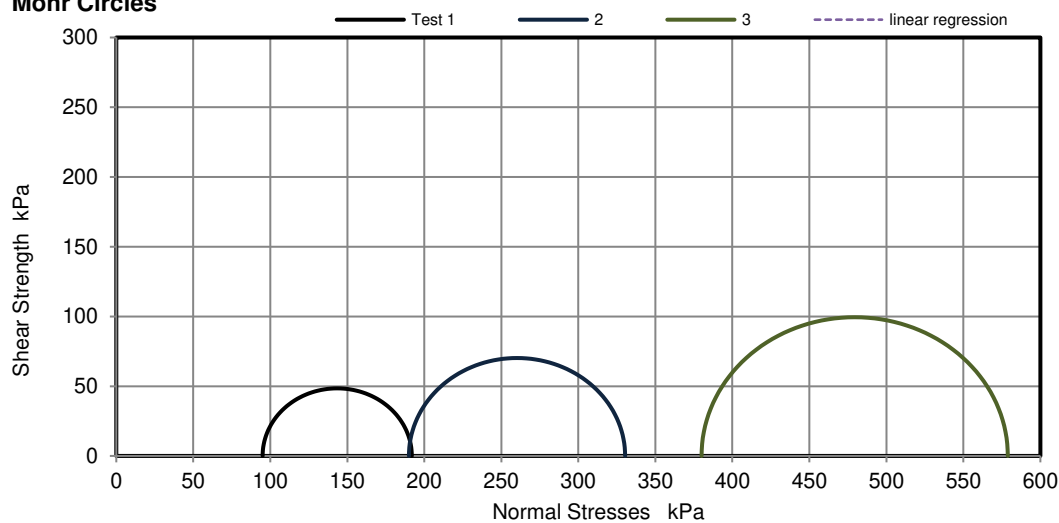
Rate of Strain
Stage Number
Cell Pressure
Axial Strain at failure
Deviator Stress, ($\sigma_1 - \sigma_3$) f
Shear strength, cu
Mode of failure
Membrane Correction

2.00			%/min
1	2	3	
95	190	380	kPa
5.9	11.3	20.0	%
97	140	199	kPa
48	70	99	kPa
Compound			
0.61	0.95	1.50	kPa

Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Linear Regression
 ϕ_u °
cu kPa

Note: Mohr circles and their interpretation is not covered by BS1377. These are provided for information only.

Remarks: Correction values: 95kPa=41N, 190kPa=103N, 380kPa=207N.

Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.