



Phase 2 Site Investigation Report Land at Bamford Mews, Bamford, Rochdale

Prepared for McCarthy Stone

November 2024

10/2529/002 Rev. 00

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Document Origin

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Executive Summary

Client	McCarthy Stone
Location	Bamford Mews, Bamford, Rochdale OL11 5NX.
Description	The site is located approximately 3.75km to the west of Rochdale train station at Ordnance Survey (OS) Coordinates 386170, 413190. The site is currently occupied by undeveloped roughly vegetated open land to the north and west of an existing residential development. The site is bordered to the north and west by grassed sports pitches with Bamford Mews present to the south and east. A further sports pitch is also present beyond Bamford Mews to the south. Residential properties, schools and shops are present from approximately 100m to the east of the site.
Development	A three-storey apartment building, with an associated parking area and soft landscaping is proposed in the western section of the site. Up to 12 detached bungalows are proposed in the northern section of the site.
Site History	Mapping from 1851 until 1968 indicated that the site was occupied by open undeveloped fields. From 1975 until the present day the site comprised green open space associated with developments to the south and east. Mapping from 1851 until 1938 indicate that Pitfield Mills (cotton) was present beyond the eastern boundary of the site. Two reservoirs and a circular tank structure were associated with the mill. Mapping from 1851 indicated that a gasometer was also present. A 'pit hole' was present immediately to the east of the mill beyond Nordon Road. Land use to the north, south and west was predominantly rural in nature. A feature labelled 'issues, sinks' was present immediately to the south and east of the site on mapping from 1959 until 1968. Pitfield Mills and the pit hole to the east were no longer indicated to be present at this time.
Geology	Based on British Geological Survey mapping, the geology beneath the site is indicated to comprise Devensian Till overlying the Pennine Lower Coal Measures. A fault line in the Pennine Lower Coal Measures is indicated to cross the northeast corner of the site.
Radon	Radon gas protection measures are not required in the construction of new dwellings or extensions.
Mining & Ground Stability	The site is located within a Coal Authority Coal Mining Reporting Area. A Development High Risk Area is present immediately to the east of the site but does not appear to encroach onto the proposed development. A Consultants Coal Mining Report obtained for the site indicates that no mine entries are indicated to be present within 20m of the site and no recorded worked coal seams are present beneath the site. The report does however state unrecorded coal mine workings may be present beneath the site at shallow depth. On the basis that the site lies outside a High Risk Development Area, a desk based Coal Mining Risk Assessment is not considered to be required for planning purposes. However, given the highlighted risk of potential unrecorded shallow workings beneath the site, an intrusive mining investigation is recommended to ensure that no voids are present beneath the development area at depths which could cause ground instability.

Flood Risk

According to the Flood Map for Planning, available on the gov.uk website, the site is located within Flood Zone 1, whereby there is less than a 0.1% (1 in 1,000) chance of flooding from rivers or the sea occurring each year. However, given that the proposed development area exceeds 1 ha, a Flood Risk Assessment will be required for planning purposes.

Environmental Setting

The site is underlain by an Undifferentiated Secondary Aquifer relating to the Devensian Till. The underlying Pennine Lower Coal Measures is classified as a Secondary A Aquifer. The site is not located within a groundwater source protection zone (SPZ) and the nearest recorded groundwater abstraction is located approximately 470m to the west of the site, used for agricultural purposes.

The Naden Brook is present from approximately 650m to the west of the site at its closest point.

UXO

Zetica Bomb Risk Mapping indicates the site to be in an area of low UXO risk. Therefore, no further assessment of the risk posed by UXO is considered to be required.

Site Investigations

The site investigation comprised four window sample boreholes (WS01 to WS04) to depths of approximately 5.45m below ground level (bgl), four cable percussion boreholes with rotary follow on (BH01 to BH04) to depths of approximately 35.00m bgl and eight trial pits (TP01 to TP06, SA01 and SA02) to depths ranging from approximately 2.00m and 3.00m bgl. Soakaway testing in accordance with BRE Special Digest 365 was undertaken in two trial pits (SA01 and SA02).

No worked coal, broken ground, loss of flush or voids were recorded to a maximum depth of 35.00m bgl. It is therefore considered that the area of the proposed development is not affected by shallow coal workings and no remedial works are required. Should voids be present at depths of those investigated, it is considered likely that any migration caused by a future collapse will be dissipated before affecting the foundations of the proposed development.

Ground Conditions

A limited thickness of Made Ground was present beneath topsoil at each borehole. Made Ground was underlain by Devensian Till and the Pennine Middle Coal Measures.

Groundwater strikes were recorded at depths ranging from approximately 2.00m and 7.00m bgl within the Devensian Till and Pennine Middle Coal Measures. This is considered to be representative of perched groundwater within granular bands of the Devensian Till and fissures within the Pennine Middle Coal Measures.

Contamination

PAH compounds were recorded in a sample of Made Ground collected from borehole WS04 at concentrations in excess of adopted AC. Following redevelopment, the pathways of direct contact, ingestion and inhalation of contaminated dust will not be active in areas covered by building footprint or hard surfacing. However, these pathways may remain active in areas of soft landscaping. It is recommended that a 300mm thickness of clean capping layer, comprising at least 150mm thickness of topsoil, is placed in areas of soft landscaping to form a barrier between recorded contaminants of concern beneath the site and future site users. This should be increased to 600mm in private garden areas.

The site is underlain by an Undifferentiated Secondary Aquifer relating to the Devensian Till. The underlying Pennine Lower Coal Measures is classified as a Secondary A Aquifer. However, the site is not located within a groundwater SPZ and the nearest recorded groundwater abstraction is located approximately 470m to the west of the site, used for agricultural purposes. Therefore, these aquifers are not considered to represent sensitive groundwater resource receptors.

Furthermore, significant concentrations of mobile contaminants considered to represent a significant risk to groundwater receptors were not recorded in soils analysed from beneath the site.

Ground Gas

The Naden Brook is present from approximately 650m to the west of the site at its closest point. Given its distance, this watercourse is not considered to be at significant risk from contaminants of concern recorded beneath the site.

Significant sources of ground gas were not identified as part of the previous Phase 1 Preliminary Risk Assessment or during subsequent intrusive works as part of the Phase 2 Site Investigation. On this basis, the risk posed to future site users by ground gas in enclosed areas is not considered to be significant and no further assessment of the risk posed by ground gases is considered to be required.

Geotechnical

Based upon SPT results, the Devensian Till is likely to provide a suitable bearing stratum for traditional foundations supporting light to moderately loaded structures, where it is at least firm cohesive material at foundation bearing depth (assessed to be from approximately 1.20m bgl in most areas). Foundations may need to be taken deeper in some areas where soft deposits are present in the upper layers of the Devensian Till, such as in the locations of boreholes WS01 and BH02.

Given the variable strength characteristics of the upper layers of the Devensian Till, it is considered that traditional pad or strip foundations would need to be taken down excessive depths in order to support heavier loads. This may be the case for the proposed three storey apartment building. On this basis, it would be prudent to consider ground improvement methods to enable the adoption of traditional foundations at shallower depths. Vibro stone columns may be suitable across the proposed development footprint. Allowable bearing capacities of up to 150kN/m² are generally achievable in soils treated with vibro stone columns from depths of approximately 1.00m bgl. However, the suitability of vibro stone columns in these soils and the improvement achievable should be confirmed by the ground improvement contractor.

Should traditional foundations and/or ground improvement be considered unsuitable to support the proposed apartment building, piled foundations would be required. Continuous flight auger (CFA) or bored piles, terminating in the deeper layers of the London Clay Formation are likely to be most suitable on the subject site from a geotechnical viewpoint.

Infiltration Testing

Soakaway testing in accordance with BRE Special Digest 365 was undertaken in two trial pits. The response zone of each test was positioned across the Devensian Till. The water level within the trial pits did not drop significantly over the 24-hour period the soakaway tests were carried out. On this basis, infiltration drainage does not appear suitable to discharge surface water runoff from the proposed development. However, this would need to be confirmed by the drainage engineer. It is considered that the poor infiltration characteristics observed was likely due to the cohesive content of the Devensian Till.

Further Works / Considerations

The following should be considered for the proposed development:

- Clean topsoil cover should be provided in soft landscaped areas to provide a barrier between recorded concentrations of contamination and future site users.
- Details regarding the provision of a clean capping layer should be formalized in a Remediation Method Statement for submission to the Local Planning Authority.
- Verification of the clean cover installation will also be required by an environmental consultant to ensure planning discharge.

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Site Location Plan
Proposed Development Plan
Exploratory Hole Location Plan

Appendices

Appendix I	Drawings
Appendix II	Exploratory Hole Logs
Appendix III	Chemical Laboratory Test Results
Appendix IV	Geotechnical Laboratory Test Results
Appendix V	Coal Authority Permit

1.0 Introduction

1.1 Background

Clancy Consulting Limited has been instructed by McCarthy Stone to carry out a Phase 2 Site Investigation at Bamford Mews, Bamford, Rochdale OL11 5NX.

The site is proposed to be developed with a three-storey apartment building, associated parking area and soft landscaping in the west of the site. A series of 12 detached bungalows are proposed in the northern section of the site.

A proposed development plan is included in Appendix I.

1.2 Objectives

The objectives of this investigation are summarised below:

- Undertake intrusive site investigation works to establish the ground conditions across the proposed development area.
- Carry out a geotechnical assessment of the ground conditions and provide preliminary recommendations for foundation design.
- Identify potential voids in the Pennine Middle Coal Measures beneath the site, related to historical coal mining.
- Carry out chemical testing of soil and groundwater samples to determine the contamination status of the site and potential risk posed to human health and environmental receptors.
- Refine the preliminary risk assessment and conceptual site model undertaken as part of the Phase 1 Preliminary Risk Assessment.
- Provide recommendations regarding the requirement for further investigations or remedial works, if required, to satisfy the Local Planning Authority and to inform detailed civil and structural design.

1.3 Limitations of the Study

Clancy Consulting Limited cannot be held responsible for any omissions, misrepresentation, errors or inaccuracies with the supplied third-party report information. The report is written in the context of an agreed scope of work and budget and should not be used in a different context. New information or improved practices and changes in legislation may require a reinterpretation of the report in whole or in part.

Clancy Consulting Limited reserves the right to amend either conclusions or recommendations in light of any further information that may become available. The report is provided for the sole use of McCarthy Stone for the objectives discussed previously only and is confidential to them.

The report may not be relied upon by any other party without prior written consent of Clancy Consulting Limited. Those using this information in subsequent assessments or evaluations do so at their own risk.

It must be noted that whilst this investigation aims to characterise the general ground conditions beneath the proposed development site, Clancy Consulting Ltd cannot be held accountable for variations in ground and groundwater conditions, unidentified contamination or the presence of below ground structures present.

2.0 Summary of Desk Study

A desk study was carried out by Clancy Consulting Limited (10/2529/001); a summary of the findings is presented below.

The proposed development includes a three-storey later living apartment block and 12 detached bungalows with associated parking and soft landscaping.

The site is effectively Greenfield having never been developed other than by soft landscaping as part of the adjacent Bamford Mews residential development. Surrounding areas land. Much of the surrounding has also been largely rural with some residential and commercial development. The only significant off-site historical land use was a cotton mill with two reservoirs and a gasometer which were present to the east during the late 1800s and early 1900s.

Based on British Geological Survey mapping, the geology beneath the site is indicated to comprise predominantly cohesive Devensian Till deposits overlying interbedded mudstone, siltstone and sandstone of the Pennine Lower Coal Measures. A fault line in the Pennine Lower Coal Measures is indicated to cross the northeast corner of the site.

The radon guidance on protective measures for new dwellings indicates that the site is in a 'low' probability radon area where less than 1% of homes are estimated to be at or above the Action Level. Radon gas protection measures are therefore not required in the construction of new dwellings or extensions.

The Lower Pennine Coal Measures are known to be coal bearing and have been mined extensively. A Consultants Coal Mining Report obtained for the site indicates that no mine entries are present within 200m of the site and no recorded worked coal seams are present beneath the site. The report does also states however that the possibility of unrecorded coal mine workings being present beneath the site cannot be discounted. It is also noteworthy that the site lies immediately adjacent to a Coal Authority designated Development High Risk Area. On this basis it is recommended that intrusive mining investigations be undertaken to assess whether any voids are present at shallow depth (less than 30m) which could lead to ground subsidence.

The environmental database report indicates that the site represents a low risk regarding ground stability issues relating to collapsible ground, landslides, shrinking/swelling clay, running sand, dissolution features and compressible ground.

The site is located within Flood Zone 1, however, as the proposed development area exceeds one hectare, a Flood Risk Assessment will be required for planning purposes.

The site is underlain by an Undifferentiated Secondary Aquifer relating to the Devensian Till. The underlying Pennine Lower Coal Measures is classified as a Secondary A Aquifer. The site is not located within a groundwater Source Protection Zone (SPZ) and the nearest recorded groundwater abstraction is located approximately 470m to the west of the site, used for agricultural purposes. Naden Brook is present from approximately 650m to the west of the site at its closest point. Based on the above it can be concluded that no sensitive controlled waters receptors have been identified within close proximity to the site.

Zetica Bomb Risk Mapping indicates the site to be in an area of low UXO risk. Therefore, no further assessment of the risk posed by UXO is required.

The site does not appear to have had a significant development history. However, given the proximity of the adjacent historical Pitfield Mills, there is potential for contamination to be present from this nearby off-site source, though the risk of any significant contamination impacting the site is low. It is recommended that any future intrusive investigation incorporates some chemical testing to assess the contamination status of the soils.

Based on the findings of this Phase 1 study, we would recommend the following Phase 2 works be undertaken at the site:

- Prepare a Flood Risk Assessment report suitable for planning purposes.
- Undertake soil infiltration testing to assist with the development of a suitable drainage strategy.
- Carry out boreholes and / or trial pits to assess the shallow soil and groundwater conditions to allow both a contamination and geotechnical appraisal including a qualitative contamination risk assessment and recommendations for foundations.
- Drilling of rotary open hole boreholes to depths of at least 30m (final depth dependent on thickness and nature of drift strata) to investigate the presence of any voids associated with historic coal mining activities.
- Depending on the ground conditions encountered, there may also be a requirement for installing some boreholes with gas monitoring wells to undertake a gas risk assessment.

3.0 Site Investigation

3.1 Investigation Design & Objectives

Pollutant linkages identified within the Preliminary Conceptual Site Model are currently active or will be made active upon redevelopment of the site. The investigation design approach was based on guidance provided in BS 10175 Code of Practice for Investigation of Potentially Contaminated Land (2011+A2:2017). The investigation also provided information on ground conditions and data for the assessment geotechnical properties of the strata underlying the site.

It must be noted that whilst this investigation aims to characterise the general ground conditions beneath the proposed development site, Clancy Consulting Ltd cannot be held accountable for variations in ground and groundwater conditions, unidentified contamination or the presence of below ground structures in areas of the site which fall outside our borehole locations.

3.2 Fieldwork

Site investigations were undertaken in accordance the requirements as set out in the Coal Authority Permit No. 28966 dated 23rd September 2024, a copy of which is presented in Appendix V.

Site investigation works were carried out on 10th to 11th September 2024 and 30th September to 7th October 2024 and comprised:

- Eight trial pits (TP01 to TP06, SA01 and SA02) to depths ranging from approximately 2.00m and 3.00m bgl.
- Soakaway testing was undertaken in two trial pits (SA01 and SA02) in accordance with BRE Special Digest 365.
- Four window sample boreholes (WS01 to WS04) to depths of approximately 5.45m bgl.
- Four cable percussion boreholes with rotary follow on (BH01 to BH04) using water flush to depths of approximately 35.00m bgl.
- In situ geotechnical testing throughout the depth of each borehole.
- Soil samples were collected at regular intervals from each exploratory hole for chemical and geotechnical laboratory analysis.

A plan indicating the positions of the exploratory hole boreholes is provided in Appendix I. Exploratory hole logs are provided as Appendix II.

During the drilling phase of the investigations, monitoring for mine gases were undertaken both of the rig and borehole as per the permit requirements. No discernible concentrations of mine gases were recorded.

3.3 Laboratory Testing

3.3.1 Environmental Laboratory Testing – Soil

Five samples of the Made Ground and three samples of the Devensian Till were submitted to a UKAS/MCERTS accredited laboratory and analysed for a number of determinands including:

Inorganic Determinands:

pH, arsenic, beryllium, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, sulphate, selenium, vanadium, zinc and asbestos.

Organic Determinands:

Polycyclic aromatic hydrocarbons (PAH) and total petroleum hydrocarbons (TPH).

Two samples collected from the Made Ground were also submitted for Waste Acceptance Criteria (WAC) analysis.

Chemical Laboratory Certificates are presented as Appendix III.

3.3.2 Geotechnical Laboratory Testing

Samples collected from the Made Ground and Devensian Till were analysed by a UKAS accredited laboratory for Atterberg Limits, particle size distribution (PSD), pH and water-soluble sulphate content.

Geotechnical Laboratory Certificates are presented as Appendix IV.

4.0 Site Investigation Findings

4.1 Ground Conditions & Geotechnical Testing Parameters

The strata encountered during the intrusive investigation are summarised in the table below and described in the following section.

Table 1 – Encountered Strata

Strata	Depth to Top of Strata (m bgl)	Thickness (m)
Made Ground/Poor Quality Topsoil	Ground level	0.10 to 0.60
Made Ground	0.10 to 0.60	0.15 to 1.60
Devensian Till	0.20 to 1.70	2.45 to 14.60 (where proven)
Pennine Lower Coal Measures Formation	3.20 to 15.00	Not proven beyond a maximum depth of approximately 35.00m bgl

General descriptions of the strata encountered during the intrusive investigation are summarised below. Reference should be made to the borehole logs within Appendix VII of this report for full descriptions of ground conditions underlying the site and to the geotechnical laboratory results included in Appendix IX.

4.1.1 Made Ground

Made Ground was recorded beneath a limited thickness of poor-quality topsoil and ranged in thickness from approximately 0.15m to 1.60m bgl. The Made Ground was variable in nature, but typically comprised brownish grey to dark brown sandy, gravelly clay. Gravel comprised fine to coarse brick, concrete, mudstone, limestone, quartzite, sandstone, wood, metal, polystyrene, fragments of pottery and plastic.

One SPT undertaken within the Made Ground at a depth of approximately 1.20m bgl in borehole BH02 gave a result of $N = 11$.

Approximate undrained shear strengths were calculated from the SPT results using the correlation by Stroud:

$$C = f_1 \times N$$

Where, a conservative value for $f_1 = 4.5$.

The SPT result corresponds approximately to undrained shear strength value of 50kN/m², which is indicative of a firm cohesive material.

4.1.2 Devensian Till

The Devensian Till was encountered beneath the Made Ground at depths ranging from approximately 0.20 m to 1.70m bgl and ranged from approximately 2.45m to 14.60m in thickness. The stratum was of significantly greater thickness in the southeast corner of the site, within borehole BH04.

The Devensian Till was variable in nature, but generally comprised grey-brown, silty, sandy, gravelly clay with bands of sand. Gravel comprised fine to medium rounded of mudstone, limestone and sandstone.

Atterberg Limit testing was undertaken on four soil samples collected from the Devensian Till at depths ranging from approximately 0.35m to 1.20m bgl. This testing was undertaken to determine values for Liquid Limit (LL), Plastic Limit (PL) and Plasticity Index (PI). The results for LL ranged from 26% to 41%. The results for PL ranged from 16% to 22%. The results for PI ranged from 9% to 19%. This is indicative of a low to intermediate plasticity clay. Modified plasticity index values indicate that these samples have a low-volume change potential. The natural moisture content of these samples ranged from 17.0% to 25.6%.

23 SPTs undertaken within the Devensian Till at depths ranging from approximately 1.20m to 10.50m bgl gave results ranging from $N = 6$ to in excess of $N = 50$. SPT results generally increased within depth. The SPT results correspond approximately to undrained shear strength values ranging from 27kN/m^2 to in excess of 225kN/m^2 , which is indicative of a soft, ranging to a very stiff cohesive material.

PSD testing was undertaken on two samples of the Devensian Till collected from trial pits SA01 and SA02 at depths of 1.20m and 1.90m bgl, respectively. The constituents of the samples are summarised below:

- Gravel: 6% and 30%
- Sand: 39% and 27%
- Clay/Silt: 55% and 43%

4.1.3 Pennine Lower Coal Measures Formation

The Pennine Lower Coal Measures Formation was recorded beneath the Devensian Till at depths ranging from approximately 3.20m to 15.00m bgl. The stratum was recorded to the base of each borehole. The Pennine Middle Coal Measures were variable in nature, comprising bands of grey and light grey sandstone and siltstone. Evidence of potential voids associated with historical coal mining was not identified.

16 SPTs undertaken within the Pennine Middle Coal Measures at depths ranging from approximately 4.00m to 21.00m bgl gave results ranging from $N = 20$ to in excess of $N = 50$. Lower SPT results were recorded in the upper layers of the stratum.

No worked coal, broken ground, loss of flush or voids were recorded to a maximum depth of 35.00m bgl. It is therefore considered that the area of the proposed development is not affected by shallow coal workings and no remedial works are required. Should voids be present at depths of those investigated, it is considered likely that any migration caused by a future collapse will be dissipated before affecting the foundations of the proposed development.

4.2 Groundwater

Groundwater strikes were recorded at depths ranging from approximately 2.00m and 7.00m bgl within the Devensian Till and Pennine Middle Coal Measures. This is considered to be representative of perched groundwater within granular bands of the Devensian Till and fissures within the Pennine Middle Coal Measures.

5.0 Ground Gas Risk Assessment

Significant sources of ground gas were not identified as part of the previous Phase 1 Preliminary Risk Assessment or during subsequent intrusive works as part of the Phase 2 Site Investigation. On this basis, the risk posed to future site users by ground gas in enclosed areas is not considered to be significant and no further assessment of the risk posed by ground gases is considered to be required.

6.0 Tier 1 Contamination Analysis

The field investigation findings indicate that pathways are present by which contaminants of concern can impact identified receptors. Chemical analysis has been carried out on soils sampled from beneath the site. The concentrations of contaminants of concern within soil can be compared to assessment criteria (AC) to determine whether these represent an unacceptable risk to identified receptors. The derivation of AC to be used and the comparison of these criteria to the results of the chemical analyses are presented below.

6.1 Human Health Assessment Criteria

In order to assess risks to future site users, concentrations of contaminants of concern have been compared to Suitable 4 Use Levels (S4UL) generic AC published by Land Quality Management: Chartered Institute of Environmental Health (LQM:CIEH) in 2015.

The assessment has been based upon the use of the site for residential purposes with plant uptake, given the proposed development of the site as later living apartments and bungalows with soft landscaped areas.

As a conservative measure, concentrations of contaminants of concern have been compared to the S4UL (1.00% Soil Organic Matter) values.

A notable exclusion from the S4ULs is lead. In the absence of a S4UL for lead, the Category 4 Screening Level (C4SL) has been selected, published by DEFRA in 2014. It is noted that the C4SL are based on the acceptance of a low level of toxicological concern, rather than the more conservative standard adopted in the derivation of S4ULs, which are based on a tolerable or minimal level of risk.

The potential risk posed to controlled waters from contaminants of concern within soils beneath the site is not addressed by these screening criteria.

6.2 Comparison of Soil Analyses to Human Health Assessment Criteria

Chemical analysis was undertaken on five samples of the Made Ground and three samples of the Devensian Till. A comparison of soil analyses to the relevant AC presented below.

6.2.1 Inorganic Determinands

Inorganic contaminants of concern were not recorded within soil samples analysed from beneath the site at concentrations in excess of adopted AC.

6.2.2 Organic Determinands

Benzo(b)fluoranthene (3.9mg/kg), benzo(a)pyrene (3.8mg/kg) and dibenz(a,h)anthracene (0.39mg/kg) were recorded at concentrations in excess of their respective AC within a sample of Made Ground collected from borehole WS04 at a depth of approximately 0.30m bgl.

PAH contaminants of concern were not recorded within other soil samples analysed from beneath the site at concentrations in excess of adopted AC.

TPH contaminants of concern were not recorded within soil samples analysed from beneath the site at concentrations in excess of adopted AC.

6.2.3 Asbestos

Asbestos containing materials (ACMs) were not identified in any of the soil samples submitted for screening.

7.0 Contamination Assessment

7.1 Introduction

Based on the information obtained during the ground investigation and laboratory testing, the 'Preliminary Conceptual Site Model' has been amended accordingly. The Conceptual Site Model is used as a basis to identify contamination sources, pathways and receptors and is subject to constant refinement as more information becomes available.

7.2 On Site Human Health Receptors

PAH compounds were recorded in a sample of Made Ground collected from borehole WS04 at concentrations in excess of adopted AC. Following redevelopment, the pathways of direct contact, ingestion and inhalation of contaminated dust will not be active in areas covered by building footprint or hard surfacing. However, these pathways may remain active in areas of soft landscaping. It is recommended that a 300mm thickness of clean capping layer, comprising at least 150mm thickness of topsoil, is placed in areas of soft landscaping to form a barrier between recorded contaminants of concern beneath the site and future site users. This should be increased to 600mm in private garden areas.

Significant concentrations of volatile contaminants of concern were not recorded within soil sampled from beneath the site. Therefore, future site users are not considered to be at significant risk from contaminants in soil via the vapour inhalation pathway in indoor areas.

Based on the available information and recommended mitigation measures being implemented, concentrations of contaminants of concern detected within soil sampled from beneath the site are not considered to represent a potentially significant risk to future site users.

7.3 Off-site Human Health Receptors

Following redevelopment, the site will be covered by building footprint, hardstanding or clean soil capping and there is limited potential for the air-borne migration of soil or dust to impact neighbouring receptors.

Given the perched and discontinuous nature of the groundwater table beneath the site, the potential for contaminants of concern to migrate off site towards nearby residential developments is considered to be limited.

Based on the available information, concentrations of contaminants of concern detected within soil sampled from beneath the site are not considered to represent a potentially significant risk to off-site human health receptors.

7.4 Construction / Maintenance Workers

S4UL screening criteria cannot be used to assess the acute (short term exposure) risk that personnel in close contact with exposed soils may experience during construction/site maintenance duties.

Potential risks to construction/maintenance workers can be controlled by the use of appropriate personal protection equipment (e.g. disposable coveralls, gloves and particulate/vapour masks) and by adopting high levels of personal hygiene.

7.5 Groundwater

The site is underlain by an Undifferentiated Secondary Aquifer relating to the Devensian Till. The underlying Pennine Lower Coal Measures is classified as a Secondary A Aquifer. However, the site is not located within a groundwater SPZ and the nearest recorded groundwater abstraction is located approximately 470m to the west of the site, used for agricultural purposes. Therefore, these aquifers are not considered to represent sensitive groundwater resource receptors. Furthermore, significant concentrations of mobile contaminants

considered to represent a significant risk to groundwater receptors were not recorded in soils analysed from beneath the site.

7.6 Surface Water

The Naden Brook is present from approximately 650m to the west of the site at its closest point. Given its distance, this watercourse is not considered to be at significant risk from contaminants of concern recorded beneath the site.

7.7 Polymeric Utility Pipes

Elevated concentrations of hydrocarbon contaminants were recorded within a soil sample collected from the Made Ground in the location of borehole WS04. Standard polymeric utility pipes may therefore be suitable for the proposed development. Barrier pipe may be required, or utility pipes laid in dedicated trenches and backfilled with clean, inert material.

Requirements for buried utility pipes should be discussed with service providers before the development stage.

7.8 Revised Conceptual Site Model

The potential source-pathway-receptor linkages and associated risks upon completion of the proposed development at the site, as identified following completion of the assessment, are summarised in the table below.

Table 2 – Revised Conceptual Site Model

Potential Source	Via	Potential Pathways	Linkage Potentially Active? (Yes/No)	Receptors
On site: Made Ground PAH contaminants recorded in a sample of Made Ground in borehole WS04.	Soil	Direct contact/ingestion	No	Site users
		Inhalation of volatiles	No	
		Airborne migration of soil or dust	No	Off-site users
		Leaching of mobile contaminants	No	Devensian Till Undifferentiated Secondary Aquifer and Pennine Middle Coal Measures Secondary A Aquifer
	Groundwater	Direct contact/ingestion	No	Site users
			No	Off-site users
		Inhalation of volatiles	No	Site users
			No	Off-site users
		Vertical and lateral migration in permeable strata	No	Devensian Till Undifferentiated Secondary Aquifer and Pennine Middle Coal Measures Secondary A Aquifer
			No	Naden Brook
Off site: Historical cotton mill (including tank and gasometer) and 'pit hole'	Groundwater	Direct contact/ingestion	No	Site users
		Inhalation of volatiles	No	Site users
	Service conduits	Direct contact/ingestion	No	Site users
		Inhalation of volatiles	No	Site users
On and off-site: Potential hazardous ground gas and vapours from Made Ground	Ground Gas	Inhalation of ground gas	No	Site users
			No	Off-site users
		Explosive risks	No	Site users
			No	Off-site users

The risk assessment is based upon the available information relating to the site and all recommended mitigation measures being implemented. Should ground conditions inconsistent with those outlined in this report be encountered CCL should be contacted to enable further assessment. The findings of the CSM should be confirmed upon finalisation of the proposed redevelopment plans.

8.0 Geotechnical Assessment

8.1 Introduction

The proposed development includes a three-storey later living apartment block and 12 detached bungalows with associated parking and soft landscaping.

No preliminary structural loads have been received for the proposed development. Therefore, the preliminary recommendations below will need to be reviewed at the detailed design stage once these are known.

8.2 Preliminary Geotechnical Risk Register

The table below summarises the potential geotechnical hazards associated with the development. The table provides an assessment of whether the site is likely to be affected by the hazard and the possible consequences and engineering considerations.

Table 1 – Geotechnical Risk Register

Hazard Description	Is hazard likely to be present / affect the site?	Comments/possible engineering requirements where hazard present
Sudden lateral/vertical changes in ground conditions	L	A generally limited thickness of Made Ground was recorded beneath the site, overlying Devensian Till and the Pennine Middle Coal Measures. The main variation in ground conditions is likely to be associated with the composition and strength characteristics of the Devensian Till.
Highly compressible/low bearing capacity soils, (including peat and soft clay)	M	The Devensian Till was generally firm in nature. However, localised soft spots were recorded at shallow depth. It is considered that traditional foundations bearing within this stratum would likely be suitable to support low to moderate loads. Ground improvement or piled foundations would need to be considered to heavier loads.
Ground dissolution features/natural cavities	L	Ground conditions beneath the site are not consistent with these features.
Shrinking and swelling clays	L/M	Samples tested from the Devensian Till had a low volume change potential. Where traditional foundations are adopted, these should be designed in accordance with Appendix 4.2H of the NHBC guidance (Building Near Trees).
Slope stability/Retaining wall issues	L	No slopes or retaining walls are understood to be proposed as part of the development. However, any temporary or permanent slopes or retaining walls created as part of the development should be subject to appropriate geotechnical design based on site-specific site investigation information.
High groundwater table (including waterlogged ground)	L/M	Groundwater strikes were recorded at depths ranging from approximately 2.00m and 7.00m bgl within the Devensian Till and Pennine Middle Coal Measures. It is considered likely that perched groundwater encountered within excavations may be controlled via pumping from a localised sump.
Filled and Made Ground (including embankments)	L/M	A generally limited thickness of Made Ground was recorded beneath the site.
Obstructions (including foundations, services, basements, tunnels and adjacent sub-structures)	L	The site has mostly remained undeveloped except for a small area of soft landscaping. It is considered v unlikely that relic foundations and/or buried services would be present. However, if encountered they could be removed using standard construction plant.
Underground mining	L/M	The site is located in an area affected by mining. However, evidence of worked coal seams were not identified in boreholes drilled beneath the site to depths of up to 35.00m bgl.

Hazard Description	Is hazard likely to be present / affect the site?	Comments/possible engineering requirements where hazard present
Concrete classification	L/M	Testing indicates that that a Design Sulphate Class of DS2 and an Aggressive Chemical Environment for Concrete (ACEC) Classification of AC2 would be required for buried concrete structures in contact with the Made Ground. A Design Sulphate Class of DS1 and an ACEC Classification of AC2z would be required for buried concrete structures in contact with natural soils.
Seismic Activity	L	The Eurocode 8 seismic hazard zoning maps for the UK (Musson and Sargeant, 2007) indicate that horizontal Peak Ground Acceleration (PGA) values with 10% probability of being exceeded in 50 years (475 year return period) are between 0.00g and 0.02g, which is considered very low.
NOTES: H – High Risk M – Medium Risk L – Low risk		

8.3 Foundation Solutions

8.3.1 Traditional Foundations

Based upon SPT results, the Devensian Till is likely to provide a suitable bearing stratum for traditional foundations supporting light to moderately loaded structures, where it is at least firm cohesive material at foundation bearing depth (assessed to be from approximately 1.20m bgl in most areas).

In accordance with the guidance set out in Eurocode 7, a 2.00m wide concrete pad foundation placed at a depth of 1.20m bgl should be capable of supporting building loads of up to 100kN/m². Foundations may need to be taken deeper in some areas where soft deposits are present in the upper layers of the Devensian Till, such as in the locations of boreholes WS01 and BH02.

Subsequent to foundation excavation, in accordance with the guidance set out in Eurocode 7 to satisfy Ultimate Limit State (ULS) and Serviceability Limit State (SLS) design, settlement underlying a 2.00m wide concrete pad foundation, constructed in the manner discussed above, is estimated to be within acceptable limits (<25mm). Settlements in excess of 25mm should be anticipated for larger pad foundations supporting heavier column loads.

The formation should be inspected by the site engineer before placing foundations. If Made Ground, low strength cohesive or loose granular material is encountered at the target bearing depth, foundations should be taken deeper to an appropriate formation level or unsuitable material should be excavated and replaced with compacted granular fill.

8.3.2 Ground Improvement

Given the variable strength characteristics of the upper layers of the Devensian Till, it is considered that traditional pad or strip foundations would need to be taken down excessive depths in order to support heavier loads. This may be the case for the proposed three storey apartment building.

On this basis, it would be prudent to consider ground improvement methods to enable the adoption of traditional foundations at shallower depths. Vibro stone columns may be suitable across the proposed development footprint. Allowable bearing capacities of up to 150kN/m² are generally achievable in soils treated with vibro stone columns from depths of approximately 1.00m bgl. However, the suitability of vibro stone columns in these soils and the improvement achievable should be confirmed by the ground improvement contractor.

8.3.3 Piled Foundations

Should traditional foundations and/or ground improvement be considered unsuitable to support the proposed apartment building, piled foundations would be required. Continuous flight auger (CFA) or bored piles, terminating in the deeper layers of the London Clay Formation are likely to be most suitable on the subject site from a geotechnical viewpoint.

Preliminary anticipated CFA or bored pile bearing capacities are detailed in the table, below:

Table 4 – Anticipated Preliminary Pile Capacities

Pile Length (m bgl)	Pile Diameter		
	300mm	450mm	600mm
10.00	225kN	365kN	520kN
15.00	650kN	1245kN	2010kN
20.00	910kN	1630kN	2525kN

A piling contractor should be consulted with regard to detailed pile design, since the type of pile and method of installation adopted will affect capacity.

Partial safety factors have been applied to the calculated pile capacities above in accordance with Design Approach 1: Combination 2, as detailed within Tables A.6, A.7 and A.8 of Annex A in BS EN 1997-1. This was found to be the most conservative design approach.

It should be noted that no design loads have been received at this stage. It is recommended that when the final structural loads have known further detailed assessment of pile capacity will need to be undertaken in accordance with the recommendations provided in Eurocode 7.

Loads are based on single piles only and do not take into account the action of groups of piles. This should be considered at the detailed design stage.

The pile capacity estimates presented above are preliminary and based on a conservative soil profile derived from exploratory holes undertaken on site. The adopted pile profile is summarised as follows:

Table 2 – Adopted Soil Profile

Stratum	Depth (m bgl)	Bulk Density (kN/m ³)	Shear Strength (kN/m ²)	N _c	SPT
Made Ground	GL to 1.50	18	Not taken into account		
Devensian Till	1.50 to 15.00	20	50 at 1.50m bgl, increasing linearly to 150 at 15.00m bgl	9	-
Pennine Middle Coal Measures	15.00 to 35.00	20	-	-	N = 50

An appropriate piling platform should be designed and constructed in accordance with BRE Digest 470 (Working platforms for Tracked Plant).

8.4 Floor Slabs

Made Ground is anticipated to be present at floor slab formation level beneath the proposed development at an assumed depth of approximately 0.60m bgl. If the remaining thickness of Made Ground beneath proposed floor slab formation level is limited, this may be excavated and replaced in an engineered fashion to form a suitable bearing stratum for ground bearing floor slabs.

If this is not feasible, suspended floor slabs would be required to prevent excessive total and differential settlement, whereby settlement beneath the slab would be controlled by the foundations of the building. Additional loads from suspended floor slabs should be taken into account when designing foundations for the proposed development.

8.5 Temporary Works and Excavations

The site has mostly remained undeveloped except for a small area of soft landscaping. It is considered v unlikely that relic foundations and/or buried services would be present. However, if encountered they could be removed using standard construction plant.

Groundwater strikes were recorded at depths ranging from approximately 2.00m and 7.00m bgl within the Devensian Till and Pennine Middle Coal Measures. This is considered to be representative of perched groundwater within granular bands of the Devensian Till and fissures within the Pennine Middle Coal Measures. It is considered likely that perched groundwater encountered within excavations may be controlled via pumping from a localised sump.

If groundwater is encountered during excavation, degradation of the formation may occur. The formation should therefore be adequately protected from seepages and protected from adverse weather conditions. If the formation layer becomes wet resulting in loosening or softening of the surface materials, then excavation may have to be taken deeper in order to find a suitable bearing layer. Instability of excavations in granular material should be expected, especially during periods of adverse weather. Suitable shoring measures or battering back of slopes may be required for any excavations greater than 1.20m bgl. All temporary excavations should be undertaken in accordance with CIRIA Report 97 'Trenching Practice'.

8.6 Chemical Attack on Buried Concrete

Samples of the Made Ground, Devensian Till and Pennine Middle Coal Measures were tested for pH and for sulphate content. The results are presented below:

Table 6 – Results of pH and sulphate testing

Stratum	No. Samples	Range of pH	Characteristic pH	Range of Sulphate (mg/kg)	Characteristic Sulphate (mg/kg)	Design Sulphate Class	ACEC Class
Made Ground	2	7.7 to 8.0	7.7	731 to 838	838	DS2	AC2
Devensian Till	9	5.3 to 8.3	5.7	3 to 68	61	DS1	AC2z
Pennine Middle Coal Measures	1	8.3	8.3	71	71	DS1	AC1

The data was used to assess appropriate concrete classification for buried concrete in accordance with BRE Special Digest 1, based on the following assumptions:

- Brownfield ground conditions.
- Mobile groundwater conditions.
- For a dataset of less than five samples, the characteristic value for soluble sulphate has been taken as the highest result, while the characteristic value for pH is taken as the lowest pH result; and
- For a dataset of between five and nine samples, the characteristic value for soluble sulphate has been taken as the average of the two highest results, while the characteristic value for pH is taken as the average of the two lowest pH results.

Based on the above, it is considered that a Design Sulphate Class of DS2 and an Aggressive Chemical Environment for Concrete (ACEC) Classification of AC2 would be required for buried concrete structures in contact with the Made Ground. A Design Sulphate Class of DS1 and an ACEC Classification of AC2z would be required for buried concrete structures in contact with natural soils.

8.7 Infiltration Testing

Soakaway testing in accordance with BRE Special Digest 365 was undertaken in two trial pits (SA01 and SA02), excavated to depths of approximately 2.00m and 2.40m bgl, respectively. The response zone of each test was positioned across the Devensian Till.

The water level within the trial pits did not drop significantly over the 24-hour period the soakaway tests were carried out.

On the basis of the above, infiltration drainage does not appear suitable to discharge surface water runoff from the proposed development. However, this would need to be confirmed by the drainage engineer. It is considered that the poor infiltration characteristics observed was likely due to the cohesive content of the Devensian Till.

9.0 Conclusions and Recommendations

Clancy Consulting Limited was instructed by McCarthy Stone to carry out a Phase 2 Site Investigation at Bamford Mews, Bamford, Rochdale OL11 5NX. The site is proposed to be developed with a three-storey apartment building, associated parking area and soft landscaping in the west of the site. A series of 12 detached bungalows are proposed in the northern section of the site.

The site investigation comprised four window sample boreholes (WS01 to WS04) to depths of approximately 5.45m bgl, four cable percussion boreholes with rotary follow on (BH01 to BH04) to depths of approximately 35.00m bgl and eight trial pits (TP01 to TP06, SA01 and SA02) to depths ranging from approximately 2.00m and 3.00m bgl. Soakaway testing in accordance with BRE Special Digest 365 was undertaken in two trial pits (SA01 and SA02).

A limited thickness of Made Ground was present beneath topsoil at each borehole. Made Ground was underlain by Devensian Till and the Pennine Middle Coal Measures. Groundwater strikes were recorded at depths ranging from approximately 2.00m and 7.00m bgl within the Devensian Till and Pennine Middle Coal Measures. This is considered to be representative of perched groundwater within granular bands of the Devensian Till and fissures within the Pennine Middle Coal Measures.

The boreholes did not record worked coal, broken ground, loss of flush or voids to a maximum depth of 35.00m bgl. It is therefore considered that the area of the proposed development is not affected by shallow coal workings and no remedial works are required. Should voids be present at depths of those investigated, it is considered likely that any migration caused by a future collapse will be dissipated before affecting the foundations of the proposed development.

PAH compounds were recorded in a sample of Made Ground collected from borehole WS04 at concentrations in excess of adopted AC. Following redevelopment, the pathways of direct contact, ingestion and inhalation of contaminated dust will be not be active in areas covered by building footprint or hard surfacing. However, these pathways may remain active in areas of soft landscaping. It is recommended that a 300mm thickness of clean capping layer, comprising at least 150mm thickness of topsoil, is placed in areas of soft landscaping to form a barrier between recorded contaminants of concern beneath the site and future site users. This should be increased to 600mm in private garden areas.

The site is underlain by an Undifferentiated Secondary Aquifer relating to the Devensian Till. The underlying Pennine Lower Coal Measures is classified as a Secondary A Aquifer. However, the site is not located within a groundwater SPZ and the nearest recorded groundwater abstraction is located approximately 470m to the west of the site, used for agricultural purposes. Therefore, these aquifers are not considered to represent sensitive groundwater resource receptors. Furthermore, significant concentrations of mobile contaminants considered to represent a significant risk to groundwater receptors were not recorded in soils analysed from beneath the site.

The Naden Brook is present from approximately 650m to the west of the site at its closest point. Given its distance, this watercourse is not considered to be at significant risk from contaminants of concern recorded beneath the site.

Significant sources of ground gas were not identified as part of the previous Phase 1 Preliminary Risk Assessment or during subsequent intrusive works as part of the Phase 2 Site Investigation. On this basis, the risk posed to future site users by ground gas in enclosed areas is not considered to be significant and no further assessment of the risk posed by ground gases is considered to be required.

Based upon SPT results, the Devensian Till is likely to provide a suitable bearing stratum for traditional foundations supporting light to moderately loaded structures, where it is at least firm cohesive material at foundation bearing depth (assessed to be from approximately 1.20m bgl in most areas). Foundations may need to be taken deeper in some areas where soft deposits are present in the upper layers of the Devensian Till, such as in the locations of boreholes WS01 and BH02.

Given the variable strength characteristics of the upper layers of the Devensian Till, it is considered that traditional pad or strip foundations would need to be taken down excessive depths in order to support heavier

loads. This may be the case for the proposed three storey apartment building. On this basis, it would be prudent to consider ground improvement methods to enable the adoption of traditional foundations at shallower depths. Vibro stone columns may be suitable across the proposed development footprint. Allowable bearing capacities of up to 150kN/m² are generally achievable in soils treated with vibro stone columns from depths of approximately 1.00m bgl. However, the suitability of vibro stone columns in these soils and the improvement achievable should be confirmed by the ground improvement contractor.

Should traditional foundations and/or ground improvement be considered unsuitable to support the proposed apartment building, piled foundations would be required. Continuous flight auger (CFA) or bored piles, terminating in the deeper layers of the London Clay Formation are likely to be most suitable on the subject site from a geotechnical viewpoint.

Soakaway testing in accordance with BRE Special Digest 365 was undertaken in two trial pits. The response zone of each test was positioned across the Devensian Till. The water level within the trial pits did not drop significantly over the 24-hour period the soakaway tests were carried out. On this basis, infiltration drainage does not appear suitable to discharge surface water runoff from the proposed development. However, this would need to be confirmed by the drainage engineer. It is considered that the poor infiltration characteristics observed was likely due to the cohesive content of the Devensian Till.

The following should be considered for the proposed development:

- Clean topsoil cover should be provided in soft landscaped areas to provide a barrier between recorded concentrations of contamination and future site users.
- Details regarding the provision of a clean capping layer should be formalized in a Remediation Method Statement for submission to the Local Planning Authority.
- Verification of the clean cover installation will also be required by an environmental consultant to ensure planning discharge.

APPENDIX I
DRAWINGS

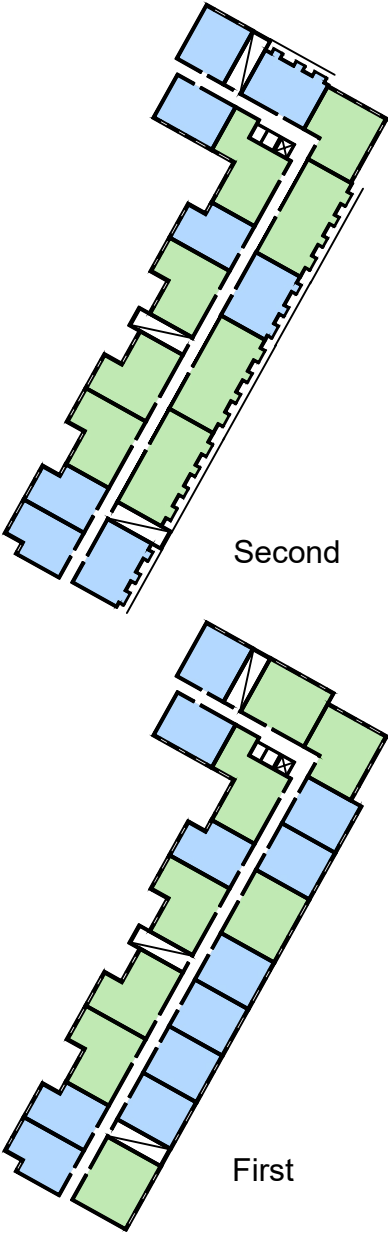


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						Approved	RP	Status	Live				
											10/2529	001	-



McCARTHY STONE
Life, well lived



Bamford Rev B

ACCOMMODATION SCHEDULE

	1 BED	2BED		
01.L GROUND				
02.GROUND	10	5		
03.FIRST	11	8		
04.SECOND	8	8		
05.THIRD				
06.FOURTH				
APARTMENTS	29	21	50	TOTAL
BUNGALOWS			12	TOTAL
PARKING (apts)			37	TOTAL

Playing Fields

Bamford Mews

Lounge

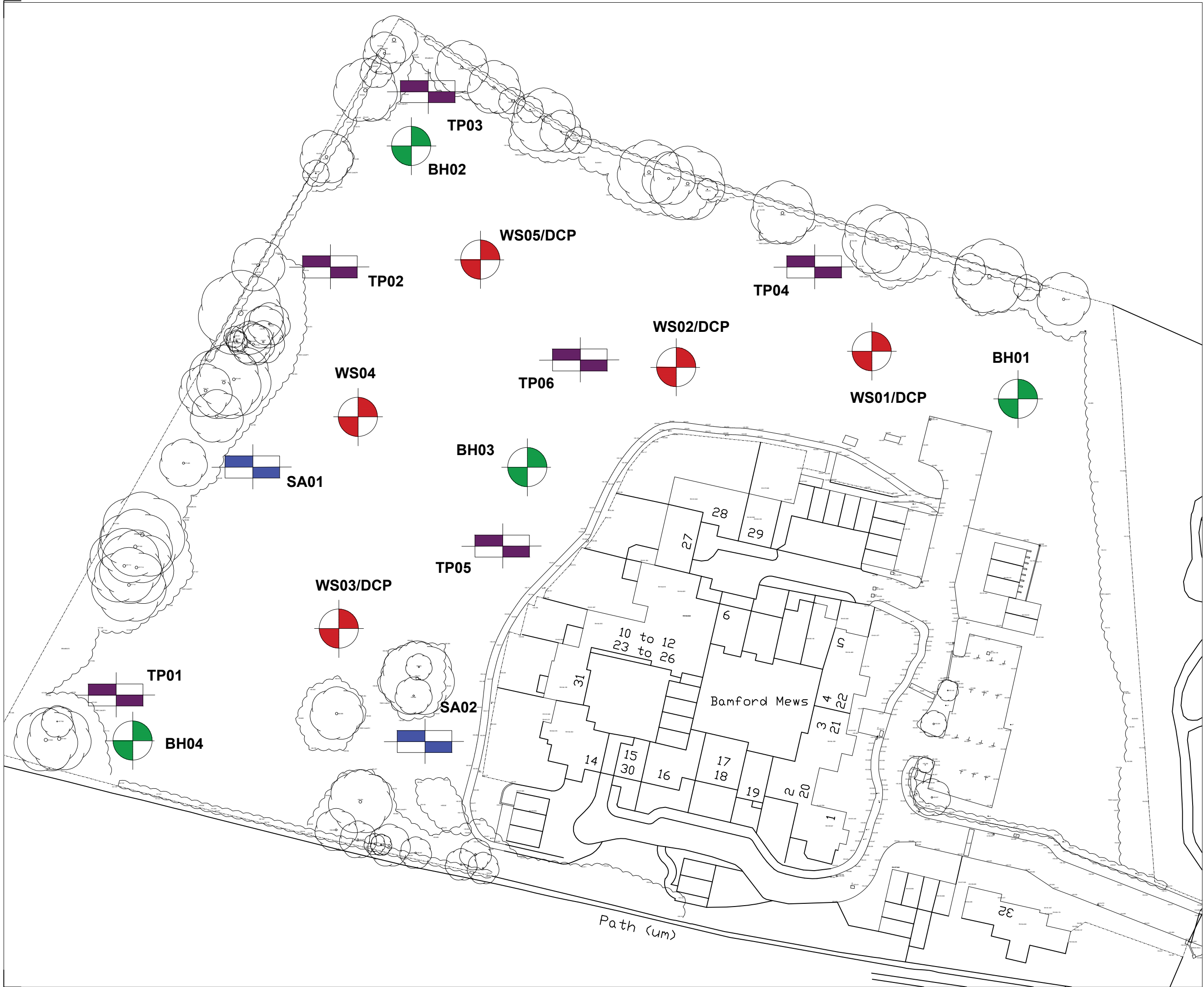
Path (um)

Shelter

Top o' th' Lane Bungalow

Cherrywood House





Key

Cable Percussive Borehole

Window Sample Borehole

Soakaway Trial Pit

Trial Pit

REV	DATE	DESCRIPTION	BY	CHK.	APP.
Rev	Date	Description	By	Check	App.

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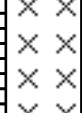
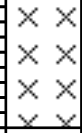
Client	McCarthy Stone
Project	Bamford Mews Rochdale
Office	Manchester
Discipline	Geo-Environmental
Title	Exploratory Hole Location Plan
Scale @ A3	NTS
Status	Live

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Originator	Job Number	Discipline	Building/Zone
SHP	102595	GEO	-
Type	Level	Drawing No.	Revision
GA	-	002	02

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APPENDIX II
EXPLORATORY HOLE LOGS

			Project Title: Bamford Mews, Rochdale				BH01																																														
			Project Number: 10/2529		Client: McCarthy & Stone					Sheet 1 Of 5																																											
			GL (mAOD):		N Coord: 0		E Coord: 0																																														
Date: 30/09/2024-03/10/2024			Method: Cable Percussion		Driller: VC Drilling		Logged By: SHP																																														
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe																																													
1.20 - 1.65	SPT	N=17			0.60	Grass over dark brown sandy gravelly clay with abundant rootlets. Gravel is fine to coarse angular of brick and pottery.																																															
					0.75																																																
	U				1.00	Greyish brown sandy slightly gravelly clay. Gravel is fine to coarse, angular to subangular of concrete, brick and sandstone with fragments of metal and plastic.																																															
					1.10																																																
2.00 - 2.45	U				2.00	Light brown mottled grey clayey SAND. Sand is medium to coarse. (DEVENSIAN TILL)																																															
2.50	D					Dark grey very clayey SAND with fragments of coal. Sand is fine to medium. (DEVENSIAN TILL)																																															
3.00 - 3.45	SPT	N=38			3.00																																																
					3.50		▼																																														
4.00 - 4.31	SPT	pp 50/235mm			4.00	Firm becoming stiff mottled grey and brown sandy slightly gravelly CLAY. Gravel is fine to coarse subrounded of sandstone, siltstone and mudstone (DEVENSIAN TILL)	▼																																														
					4.25																																																
					4.50	Very dense mottled brownish grey clayey sandy gravel. Gravel is fine to coarse, angular to sub angular of sandstone and mudstone (DEVENSIAN TILL)	▼																																														
					5.00																																																
5.00 - 5.10	SPT	sb 75/100mm				Dark grey gravelly slightly sandy CLAY. Gravel is fine to coarse sub angular of mudstone. (DEVENSIAN TILL)	▼																																														
					6.00	Interbedded dark grey carbonaceous mudstone and light brown micaceous sandstone. (PENNINE LOWER COAL MEASURES FORMATION)																																															
					7.00	Dark grey Siltstone. (PENNINE LOWER COAL MEASURES FORMATION)																																															
					8.00																																																
						Borehole Continues																																															
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▼ - Groundwater Strike ▼ - Groundwater Level 			REMARKS Borehole continued by rotary open hole from 5.00m to 35.00m. No voids, broken ground or loss of water flush encountered. No elevated concentrations of hazardous ground gas encountered. Borehole backfilled with bentonite. Scale: 1:50			Water Strikes <table><tr><th>Date</th><th>Strike</th><th>Level</th><th>Minutes</th><th>Casing</th><th>Sealed</th></tr><tr><td>16/10/2024</td><td>3.5</td><td></td><td>10</td><td></td><td></td></tr><tr><td>16/10/2024</td><td>3.7</td><td></td><td>5</td><td></td><td></td></tr><tr><td>16/10/2024</td><td>3.8</td><td></td><td></td><td>3.0</td><td></td></tr></table> Daily Log Of Depths <table><tr><th>Date</th><th>Casing</th><th>Water</th><th>From</th><th>To</th><th>Hours</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>						Date	Strike	Level	Minutes	Casing	Sealed	16/10/2024	3.5		10			16/10/2024	3.7		5			16/10/2024	3.8			3.0		Date	Casing	Water	From	To	Hours												
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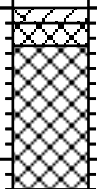
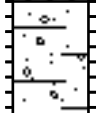
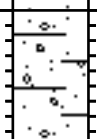
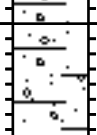
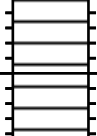
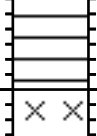
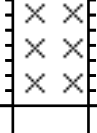
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			Project Number: 10/2529		Client: McCarthy & Stone				
			GL (mAOD):		N Coord: 0		E Coord: 0		
Date: 30/09/2024-03/10/2024			Method: Cable Percussion		Driller: VC Drilling		Logged By: SHP		
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe	
				* *	33.00	Light Grey Sandstone. (PENNINE LOWER COAL MEASURES FORMATION)			
				* *	34.00				
				* *	35.00	End Of Borehole At 35.00 m			
					36.00				
					37.00				
					38.00				
					39.00				
					40.00				
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level			REMARKS Borehole continued by rotary open hole from 5.00m to 35.00m. No voids, broken ground or loss of water flush encountered. No elevated concentrations of hazardous ground gas encountered. Borehole backfilled with bentonite. Scale: 1:50			Water Strikes			
						Date	Strike	Level	Minutes
						16/10/2024 3.5 10			
						16/10/2024 3.7 5			
						16/10/2024 3.8 3.0			
						Daily Log Of Depths Chiselling			
						Date	Casing	Water	From

			Project Title: Bamford Mews, Rochdale				BH02				
			Project Number: 10/2529		Client: McCarthy & Stone				Sheet 1 Of 5		
			GL (mAOD):		N Coord: 0		E Coord: 0				
Date: 01/10/2024-07/10/2024			Method: Cable Percussion		Driller: VC Drilling		Logged By: SHP				
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe			
1.20 1.20 - 1.65	D SPT	N=11			0.10 1.00	Soft dark brown slightly sandy loamy topsoil. Soft mottled brown / grey sandy gravelly clay. Gravel is fine to coarse angular of brick and sandstone.					
2.00 - 2.45	SPT	N=6			1.70 2.00 2.70	Soft grey silty CLAY with thin grey sand lenses. (DEVENSIAN TILL) Soft mottled grey / brown very sandy CLAY (DEVENSIAN TILL)	▼				
3.00 - 4.00 3.00 - 3.45	D SPT	N=6			3.00 3.70	Soft grey silty sandy CLAY (DEVENSIAN TILL) Loose brown silty SAND (DEVENSIAN TILL)					
4.00 - 4.45	U				4.00 4.10 4.50	Stiff grey silty gravelly CLAY. Gravel is fine to coarse, angular to sub angular of sandstone and mudstone. (DEVENSIAN TILL) GRAVEL. Gravel is fine to coarse sub angular to sub rounded of sandstone and mudstone (PENNINE LOWER COAL MEASURES FORMATION) very stiff grey weathered MUDSTONE. (PENNINE LOWER COAL MEASURES FORMATION)	▼				
5.00 - 5.45	SPT	pp 50/280mm			5.00		▼				
6.00 - 6.45	SPT	pp 0/300mm			6.00 7.00	Dark grey MUDSTONE. (PENNINE LOWER COAL MEASURES FORMATION)	▼				
7.50	SPT	N=41			8.00	Borehole Continues	▼				
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level			REMARKS Borehole continued by rotary open hole from 5.00m to 36.00m. No voids, broken ground or loss of water flush encountered. No elevated concentrations of hazardous ground gas encountered. Borehole backfilled with bentonite. Scale: 1:50			Water Strikes					
						Date	Strike	Level	Minutes	Casing	Sealed
						01/10/2024	2		5		
						01/10/2024	4.1		0	4.0	
						16/10/2024	5.1				
			Daily Log Of Depths			Chiselling					
						Date	Casing	Water	From	To	Hours

			Project Title: Bamford Mews, Rochdale				BH02				
			Project Number: 10/2529		Client: McCarthy & Stone					Sheet 3 Of 5	
			GL (mAOD):		N Coord: 0		E Coord: 0				
Date: 01/10/2024-07/10/2024			Method: Cable Percussion		Driller: VC Drilling		Logged By: SHP				
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe			
						Light grey MUDSTONE with occasional SANDSTONE bands. (PENNINE LOWER COAL MEASURES FORMATION)					
					17.00						
					18.00						
					19.00						
					20.00						
					21.00						
					22.00						
					23.00						
					24.00						
						Borehole Continues					
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level 			REMARKS Borehole continued by rotary open hole from 5.00m to 36.00m. No voids, broken ground or loss of water flush encountered. No elevated concentrations of hazardous ground gas encountered. Borehole backfilled with bentonite. Scale: 1:50			Water Strikes					
						Date	Strike	Level	Minutes	Casing	Sealed
						01/10/2024	2		5		
						01/10/2024	4.1		0	4.0	
						16/10/2024	5.1				
						Daily Log Of Depths			Chiselling		
						Date	Casing	Water	From	To	Hours

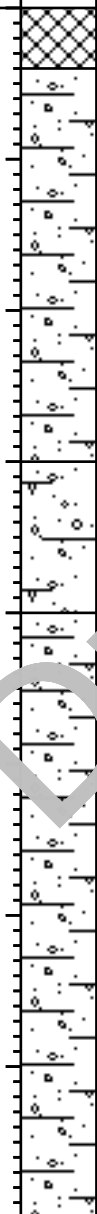
			Project Title: Bamford Mews, Rochdale				BH02				
			Project Number: 10/2529		Client: McCarthy & Stone					Sheet 4 Of 5	
			GL (mAOD):		N Coord: 0		E Coord: 0				
Date: 01/10/2024-07/10/2024			Method: Cable Percussion		Driller: VC Drilling		Logged By: SHP				
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe			
						Light grey MUDSTONE with occasional SANDSTONE bands. (PENNINE LOWER COAL MEASURES FORMATION)					
					25.00						
					26.00						
					27.00						
					28.00						
					29.00						
					30.00						
					31.00						
					32.00						
						Borehole Continues					
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level 			REMARKS Borehole continued by rotary open hole from 5.00m to 36.00m. No voids, broken ground or loss of water flush encountered. No elevated concentrations of hazardous ground gas encountered. Borehole backfilled with bentonite. Scale: 1:50			Water Strikes					
						Date	Strike	Level	Minutes	Casing	Sealed
						01/10/2024	2		5		
						01/10/2024	4.1		0	4.0	
						16/10/2024	5.1				
						Daily Log Of Depths			Chiselling		
						Date	Casing	Water	From	To	Hours

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			Project Title: Bamford Mews, Rochdale				BH03																																														
			Project Number: 10/2529		Client: McCarthy & Stone					Sheet 1 Of 5																																											
			GL (mAOD):		N Coord: 0		E Coord: 0																																														
Date: 01/10/2024-07/10/2024			Method: Cable Percussion		Driller: VC Drilling		Logged By: SHP																																														
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe																																													
1.20 - 1.65	SPT	N=7			0.10	Grass onto soft dark brown silty loam topsoil.																																															
					0.25	Concrete (possible slab).																																															
2.00 - 2.45	SPT	N=17			1.00	Firm dark brown gravelly clay. Gravel is fine to coarse of brick and concrete.																																															
					1.20																																																
3.00 - 3.45	D U				2.00	Soft mottled brown / grey silty gravelly CLAY. Gravel is fine to medium, rounded to sub rounded of sandstone, mudstone and siltstone.																																															
					2.00																																																
4.00 - 4.45	SPT	N=11			3.00	Firm mottled brown, grey and black silty gravelly CLAY. Gravel is fine to medium, rounded to sub rounded of sandstone, mudstone and siltstone.																																															
					3.00																																																
5.00 - 5.45	SPT	N=31			4.00	Soft to firm brown sandy gravelly CLAY. Gravel is fine to medium, rounded to sub rounded of sandstone, mudstone and siltstone.																																															
					4.00																																																
6.00 - 6.45	SPT	pp 50/125mm			5.00	Stiff weathered grey MUDSTONE																																															
					5.00																																																
6.50 - 6.95	SPT	sb 75/90mm			6.00	Very stiff mudstone with brown sandstone cobbles.																																															
					6.00																																																
					7.00	Dark Grey MUDSTONE																																															
					7.00																																																
					8.00	Light grey SILTSTONE																																															
					8.00																																																
						Borehole Continues																																															
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level 			REMARKS No Groundwater Encountered Borehole continued by rotary open hole from 6.00m to 36.00m. No voids, broken ground or loss of water flush encountered. No elevated concentrations of hazardous ground gas encountered. Borehole backfilled with bentonite. Scale: 1:50			Water Strikes <table><tr><th>Date</th><th>Strike</th><th>Level</th><th>Minutes</th><th>Casing</th><th>Sealed</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> Daily Log Of Depths <table><tr><th>Date</th><th>Casing</th><th>Water</th><th>From</th><th>To</th><th>Hours</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>						Date	Strike	Level	Minutes	Casing	Sealed																			Date	Casing	Water	From	To	Hours												
						Date	Strike	Level	Minutes	Casing	Sealed																																										
						Date	Casing	Water	From	To	Hours																																										

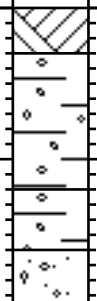
			Project Title: Bamford Mews, Rochdale				BH03				
			Project Number: 10/2529		Client: McCarthy & Stone					Sheet 4 Of 5	
			GL (mAOD):		N Coord: 0		E Coord: 0				
Date: 01/10/2024-07/10/2024			Method: Cable Percussion		Driller: VC Drilling		Logged By: SHP				
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe			
						Light grey MUDSTONE with occasional SANDSTONE bands.					
					25.00						
					26.00						
					27.00						
					28.00						
					29.00						
					30.00						
					31.00						
					32.00						
						Borehole Continues					
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level 			REMARKS No Groundwater Encountered Borehole continued by rotary open hole from 6.00m to 36.00m. No voids, broken ground or loss of water flush encountered. No elevated concentrations of hazardous ground gas encountered. Borehole backfilled with bentonite. Scale: 1:50			Water Strikes					
						Date	Strike	Level	Minutes	Casing	Sealed
						Daily Log Of Depths			Chiselling		
						Date	Casing	Water	From	To	Hours

			Project Title: Bamford Mews, Rochdale				BH03				
			Project Number: 10/2529		Client: McCarthy & Stone					Sheet 5 Of 5	
			GL (mAOD):		N Coord: 0		E Coord: 0				
Date: 01/10/2024-07/10/2024			Method: Cable Percussion		Driller: VC Drilling		Logged By: SHP				
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe			
						Light grey MUDSTONE with occasional SANDSTONE bands.					
					33.00						
					34.00						
					35.00	End of Borehole At 35.00 m					
					36.00						
					37.00						
					38.00						
					39.00						
					40.00						
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level 			REMARKS No Groundwater Encountered Borehole continued by rotary open hole from 6.00m to 36.00m. No voids, broken ground or loss of water flush encountered. No elevated concentrations of hazardous ground gas encountered. Borehole backfilled with bentonite. Scale: 1:50			Water Strikes					
						Date	Strike	Level	Minutes	Casing	Sealed
						Daily Log Of Depths			Chiselling		
						Date	Casing	Water	From	To	Hours

			Project Title: Bamford Mews, Rochdale				BH04																																														
			Project Number: 10/2529		Client: McCarthy & Stone					Sheet 1 Of 5																																											
			GL (mAOD):		N Coord: 0		E Coord: 0																																														
Date: 02/10/2024-07/10/2024			Method: Cable Percussion		Driller: VC Drilling Ltd		Logged By: MS / SHP																																														
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe																																													
1.20 - 1.65	SPT	N=13			0.40	MADE GROUND: Dark brown gravelly slightly clayey silty sand. Sand is fine to medium. Gravel is subrounded to subangular fine to coarse of sandstone. With frequent rootlets. (TOPSOIL) Soft becoming firm to stiff brown mottled grey sandy gravelly CLAY. Gravels are fine to coarse, rounded to sub rounded of sandstone, mudstone, siltstone and coal. (DEVENSIAN TILL)																																															
2.00 - 2.45	U				1.00																																																
2.50	D				2.00																																																
3.00 - 3.45	D	N=25			3.00	Medium dense brown sandy slightly clayey GRAVEL and is fine to coarse. Gravel is sub rounded to angular fine to coarse of sandstone and mudstone. (DEVENSIAN TILL)																																															
4.00 - 4.45	SPT	N=25			4.00																																																
5.00 - 5.45	SPT	pp 50/295mm			5.00	Stiff to very stiff brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded fine to medium of sandstone. (DEVENSIAN TILL)																																															
6.00 - 6.45	SPT	N=30			6.00																																																
7.50 - 7.95	SPT	N=35			7.00																																																
					8.00	Borehole Continues																																															
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level 			REMARKS No Groundwater Encountered Borehole continued by rotary open hole from 15.00m to 36.00m. No voids, broken ground or loss of water flush encountered. No elevated concentrations of hazardous ground gas encountered. Borehole backfilled with bentonite. Scale: 1:50			Water Strikes <table><tr><th>Date</th><th>Strike</th><th>Level</th><th>Minutes</th><th>Casing</th><th>Sealed</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> Daily Log Of Depths <table><tr><th>Date</th><th>Casing</th><th>Water</th><th>From</th><th>To</th><th>Hours</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>						Date	Strike	Level	Minutes	Casing	Sealed																			Date	Casing	Water	From	To	Hours												
						Date	Strike	Level	Minutes	Casing	Sealed																																										
Date	Casing	Water	From	To	Hours																																																
						Chiselling <table><tr><th>Date</th><th>Casing</th><th>Water</th><th>From</th><th>To</th><th>Hours</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>						Date	Casing	Water	From	To	Hours																																				
Date	Casing	Water	From	To	Hours																																																

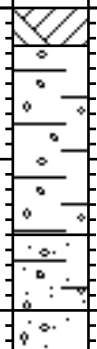
			Project Title: Bamford Mews, Rochdale				BH04						
			Project Number: 10/2529		Client: McCarthy & Stone					Sheet 2 Of 5			
			GL (mAOD):		N Coord: 0		E Coord: 0						
Date: 02/10/2024-07/10/2024			Method: Cable Percussion		Driller: VC Drilling Ltd		Logged By: MS / SHP						
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe					
9.00 - 9.45	U	N=25			9.00	Stiff to very stiff brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded fine to medium of sandstone. (DEVENSIAN TILL)							
9.50	D				10.00								
10.50 - 10.95	SPT				10.50								
					11.00	Stiff brown silty CLAY. (DEVENSIAN TILL)							
					12.00								
					13.00								
					14.00								
					15.00	Light grey SILTSTONE with frequent SANDSTONE bands (PENNINE LOWER COAL MEASURES FORMATION)							
					16.00								
						Borehole Continues							
KEY			REMARKS			Water Strikes							
D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level 			No Groundwater Encountered Borehole continued by rotary open hole from 15.00m to 36.00m. No voids, broken ground or loss of water flush encountered. No elevated concentrations of hazardous ground gas encountered. Borehole backfilled with bentonite. Scale: 1:50			Date			Strike	Level	Minutes	Casing	Sealed
						Daily Log Of Depths			Chiselling				
						Date			Casing	Water	From	To	Hours

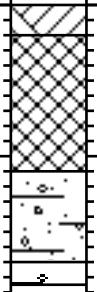
			Project Title: Bamford Mews, Rochdale				BH04						
			Project Number: 10/2529		Client: McCarthy & Stone					Sheet 3 Of 5			
			GL (mAOD):		N Coord: 0		E Coord: 0						
Date: 02/10/2024-07/10/2024			Method: Cable Percussion		Driller: VC Drilling Ltd		Logged By: MS / SHP						
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe					
18.00 - 18.45	SPT	sb 75/140mm		X X		Light grey SILTSTONE with frequent SANDSTONE bands (PENNINE LOWER COAL MEASURES FORMATION)							
				X X									
				X X									
				X X									
				X X									
				X X									
				X X									
				X X									
				X X									
				X X									
21.00 - 21.45	SPT	sb 75/105mm		X X		Borehole Continues							
				X X									
				X X									
				X X									
				X X									
				X X									
				X X									
				X X									
				X X									
				X X									
KEY			REMARKS			Water Strikes							
D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level 			No Groundwater Encountered Borehole continued by rotary open hole from 15.00m to 36.00m. No voids, broken ground or loss of water flush encountered. No elevated concentrations of hazardous ground gas encountered. Borehole backfilled with bentonite. Scale: 1:50			Date			Strike	Level	Minutes	Casing	Sealed
						Daily Log Of Depths			Chiselling				
						Date			Casing	Water	From	To	Hours

			Project Title: Bamford Mews, Rochdale				SA01	
			Project Number: 10/2529		Client: McCarthy & Stone			
			GL (mAOD):		N Coord: 0		E Coord: 0	
Date: 10/09/2024-11/09/2024			Method:		Logged By: PJH		Scale: 1:50	
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	
0.50	D				0.30	Grass onto soft dark brown sandy slightly gravelly loam TOPSOIL. Gravel is fine to coarse of brick, occasional coal and ash.		
1.20 - 1.50	D				1.00	Stiff dark grey mottled brown gravelly slightly cobbled CLAY. Gravel is fine to coarse angular to rounded of sandstone, mudstone, limestone and quartzite. Cobbles of sandstone and limestone, large limestone cobble at 0.8 to 1.0m.		
1.60 - 1.80	B				1.20	(Devensian Till)		
					1.60	Stiff dark grey very gravelly CLAY. Gravel is medium to coarse, rounded of sandstone, limestone and quatrzite. (Devensian Till)		
					2.00	Brown sandy GRAVEL. Gravel is fine to coarse, angular to rounded of sandstone, mudstone, limestone and quartzite. (Devensian Till)		
					3.00	End Of Trial Pit At 2.00 m		
					4.00			
					5.00			
					6.00			
					7.00			
					8.00			
					9.00			
					10.00			
KEY					REMARKS			
D - Disturbed Sample B - Bulk Sample W - Water Sample V - Hand Shear Vane kPa					 - Groundwater Strike  - Groundwater Level 			



			Project Title: Bamford Mews, Rochdale			SA02		
			Project Number: 10/2529		Client: McCarthy & Stone			Sheet 1 Of 1
			GL (mAOD):		N Coord: 0		E Coord: 0	
Date: 10/09/2024-11/09/2024			Method:		Logged By: PJH		Scale: 1:50	
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	
0.40	D				0.20	Soft dark brown sandy gravelly loam, TOPSOIL. Gravel is fine to coarse, subrounded to rounded of sandstone, limestone and quartzite.		
1.20 - 1.40	D				1.00	Still flight brown sandy gravelly slightly cobbled CLAY. Gravel is fine to coarse, rounded to subrounded of sandstone, mudstone, limestone and quartzite. Cobbles are of limestone.		
					1.25	(Devensian Till)		
1.90 - 2.20	D				2.00	Firm to stiff dark grey very gravelly CLAY. Gravel is fine to coarse, rounded to subrounded of sandstone, mudstone, limestone and quartzite.		
					2.40	(Devensian Till)		
						End Of Trial Pit At 2.40 m		
					3.00			
					4.00			
					5.00			
					6.00			
					7.00			
					8.00			
					9.00			
					10.00			
KEY						REMARKS		
D - Disturbed Sample						No Groundwater Encountered		
B - Bulk Sample								
W - Water Sample								
V - Hand Shear Vane kPa								
 - Groundwater Strike								
 - Groundwater Level								
								

			Project Title: Bamford Mews, Rochdale			TP01		
			Project Number: 10/2529		Client: McCarthy & Stone			Sheet 1 Of 1
			GL (mAOD):		N Coord: 0		E Coord: 0	
Date: 10/09/2024			Method:		Logged By: PJH		Scale: 1:50	
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	
0.35	D				0.25	Soft dark brown sandy gravelly loam TOPSOIL. Gravel is fine to coarse subrounded to rounded of sandstone, limestone, mudstone and quartzite.		
					1.00	Firm light brown very gravelly slightly cobbled CLAY. Gravel is fine to coarse rounded of sandstone, mudstone, limestone and quartzite. Cobbles ore of limestone.		
					1.50	1.20 Water seep		
					2.00	Stiff dark grey very sandy gravelly CLAY. Gravel is fine to coarse rounded of sandstone, mudstone, limestone and quartzite		
2.30	D				2.30	Loose brown SAND AND GRAVEL. Gravel is fine to coarse, angular to rounded of limestone, mudstone, sandstone and shale.	▼	
					3.00	End Of Trial Pit At 2.30 m		
					4.00			
					5.00			
					6.00			
					7.00			
					8.00			
					9.00			
					10.00			
KEY					REMARKS			
D - Disturbed Sample B - Bulk Sample W - Water Sample V - Hand Shear Vane kPa					AGS			
					Δ - Groundwater Strike ▼ - Groundwater Level			

			Project Title: Bamford Mews, Rochdale			TP02	
			Project Number: 10/2529		Client: McCarthy & Stone		
			GL (mAOD):		N Coord: 0	E Coord: 0	
Date: 10/09/2024			Method:		Logged By: PJH	Scale: 1:50	
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water
1.25	D				0.20	Grass onto soft dark brown sandy gravelly loam TOPSOIL.	
					1.00	Soft dark brown cobbly, bouldery gravelly clay. Gravel, cobbles and boulders are of brick, concrete, paving slabs, kerb stones. MADE GROUND.	
					1.10		
					1.70	Stiff dark brown mottled grey very sandy gravelly CLAY. Gravel is fine to coarse rounded to sub-angular of limestone, mudstone, sandstone and quartzite.	
					1.85		
					2.00	Light brown very clayey gravel with rare boulders. Gravel is fine to medium rounded to sub-angular of limestone, mudstone, sandstone and quartzite. Strong water ingress at base of a large sandstone boulder at 1.8m bgl.	
						End Of Trial Pit At 1.85 m	
					3.00		
					4.00		
					5.00		
					6.00		
					7.00		
					8.00		
					9.00		
					10.00		
KEY D - Disturbed Sample B - Bulk Sample W - Water Sample V - Hand Shear Vane kPa						REMARKS	

 - Groundwater Strike
 - Groundwater Level

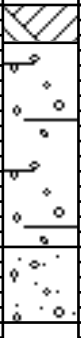


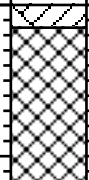
			Project Title: Bamford Mews, Rochdale			TP03	
			Project Number: 10/2529		Client: McCarthy & Stone		
			GL (mAOD):		N Coord: 0	E Coord: 0	
Date: 10/09/2024			Method:		Logged By: PJH	Scale: 1:50	
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water
1.20	D				0.25	Soft dark brown sandy gravelly loam TOPSOIL with fragments of brick and concrete.	
					1.00	Soft to firm dark grey gravelly cobbly clay. Gravel and cobbles are of brick and concrete with rare wood. MADE GROUND	
1.80 - 2.20	D				1.70	Soft to firm dark grey very gravelly CLAY. Gravel is fine to coarse subangular to rounded of sandstone, mudstone, limestone and quartzite.	
					2.00	Soft to firm brown very sandy gravelly CLAY. Gravel is fine to medium rounded of sandstone, mudstone, limestone and quartzite.	
					2.60	End Of Trial Pit At 2.60 m	
					3.00		
					4.00		
					5.00		
					6.00		
					7.00		
					8.00		
					9.00		
					10.00		
KEY D - Disturbed Sample B - Bulk Sample W - Water Sample V - Hand Shear Vane kPa						REMARKS	

 - Groundwater Strike
  - Groundwater Level

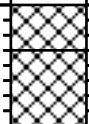
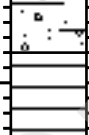


			Project Title: Bamford Mews, Rochdale			TP04	
			Project Number: 10/2529		Client: McCarthy & Stone		Sheet 1 Of 1
			GL (mAOD):		N Coord: 0		E Coord: 0
Date: 10/09/2024			Method:		Logged By: PJH		Scale: 1:50
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water
1.20	D				0.20	Grass over soft dark brown gravelly TOPSOIL with fragments of brick and concrete.	
					0.80	Soft dark grey very gravelly, cobbly CLAY. Gravel and Cobbles are of brick and concrete with fragments of wood (timber). MADE GROUND	
					1.00		
					1.80	Firm to stiff grey mottled brown sandy slightly gravelly slightly cobbled CLAY. Gravel is fine to medium rounded of limestone, sandstone and quartzite. Cobbles are rounded of limestone.	
					1.80		
1.80 - 2.20	D				2.00	Firm to stiff grey mottled brown sandy slightly gravelly slightly cobbled CLAY. Gravel is fine to medium rounded of limestone, sandstone and quartzite. Cobbles are rounded of limestone.	
						End Of Trial Pit At 1.80 m	
					3.00		
					4.00		
					5.00		
					6.00		
					7.00		
					8.00		
					9.00		
					10.00		
KEY D - Disturbed Sample B - Bulk Sample W - Water Sample V - Hand Shear Vane kPa  - Groundwater Strike  - Groundwater Level 						REMARKS No Groundwater Encountered	

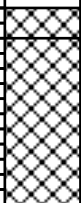
			Project Title: Bamford Mews, Rochdale			TP05	
			Project Number: 10/2529		Client: McCarthy & Stone	Sheet 1 Of 1	
			GL (mAOD):		N Coord: 0	E Coord: 0	
Date: 11/09/2024			Method:		Logged By: PJH	Scale: 1:50	
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water
0.40	D				0.25	Grass onto soft dark brown sandy gravelly loam., Gravel is of brick and concrete. TOPSOIL	
1.30	D				1.00	Stiff light brown very gravelly cobbly CLAY. Gravel is fine to coarse, rounded of sandstone, mudstone, limestone and quartzite. Cobbles are angular to rounded of sandstone and limestone.	
2.10	B				1.60		
					2.00	Slightly clayey cobbly SAND and GRAVEL. Gravel is fine to coarse, rounded of sandstone, mudstone, limestone and quartzite. Cobbles are rounded of sandstone and limestone.	
					2.10		
					2.30	Hard black 'cemented' gravel. Gravel is fine to coarse angular of coal / shale.	
					2.50	Dark grey sandy GRAVEL. Gravel is fine to coarse angular to rounded of sandstone, mudstone, limestone, quartzite and coal shale	
					3.00	End Of Trial Pit At 2.50 m	
					4.00		
					5.00		
					6.00		
					7.00		
					8.00		
					9.00		
					10.00		
KEY D - Disturbed Sample B - Bulk Sample W - Water Sample V - Hand Shear Vane kPa						REMARKS No Groundwater Encountered	
 - Groundwater Strike  - Groundwater Level							

			Project Title: Bamford Mews, Rochdale			TP06	
			Project Number: 10/2529	Client: McCarthy & Stone	Sheet 1 Of 1		
			GL (mAOD):		N Coord: 0		E Coord: 0
Date: 11/09/2024			Method:		Logged By: PJH		Scale: 1:50
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water
1.30	D				0.15	Soft dark brown gravelly loamy topsoil. Gravel is fine to coarse of sandstone, limestone, brick and concrete. TOPSOIL	
2.00 - 2.30	D				1.00 1.20	Soft very cobbly bouldery CLAY. Cobbles and boulders are of brick and concrete with paving and kerb stones, thermalite block fragments. Wire, cables and metal. MADE GROUND	
					2.00	Stiff light brown slightly gravelly sandy CLAY. Gravel is fine to medium rounded of mudstone, limestone, sandstone. Increasing gravel content form 2.1m	
					3.00	End of Trial Pit At 3.00 m	▼
					4.00		
					5.00		
					6.00		
					7.00		
					8.00		
					9.00		
					10.00		
KEY D - Disturbed Sample B - Bulk Sample W - Water Sample V - Hand Shear Vane kPa						REMARKS	
 - Groundwater Strike  - Groundwater Level							

		Project Title: Bamford Mews, Rochdale				WS01	
		Project Number: 10/2529		Client: McCarthy & Stone			
		GL (mAOD):		N Coord: 0		E Coord: 0	
Date: 01/10/2024		Method: Window Sampler		Driller: Boreworx		Logged By: SHP	

Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe
0.50	ES	N=12			0.30	MADE GROUND: Grass over dark brown sandy clay with abundant rootlets. Occasional fragments of brick (topsoil).		
1.10 1.20 - 1.65	ES SPT				0.80 1.00	MADE GROUND: Greyish brown sandy slightly gravelly clay with a low cobble content of brick and concrete. Gravel is angular to sub-angular fine to coarse of brick and concrete. Fragments of polystyrene.		
2.00 - 2.45	SPT	N=17			1.90 2.00	Firm becoming soft light brown mottled grey very sandy slightly gravelly CLAY. Gravel is sub-angular to sub-rounded fine to coarse of sandstone and mudstone. (DEVENSIAN TILL)		
3.00 - 3.45	SPT	N=29			3.00	Stiff dark grey mottled brown sandy slightly gravelly CLAY. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, siltstone and mudstone. (DEVENSIAN TILL)		
4.00 - 4.45	SPT	N=20			3.80 4.00	2.50 - 3.10 Bands of slightly gravelly medium SAND.		
5.00 - 5.45	SPT	N=20			5.00	Dark grey MUDSTONE recovered as angular fine to medium gravel of mudstone. (PENNINE LOWER COAL MEASURES FORMATION)		
					5.45	End Of Borehole At 5.45 m		
					6.00			
					7.00			
					8.00			

KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa  - Groundwater Strike  - Groundwater Level		REMARKS Groundwater encountered at 2.50m falling to 2.70m. Borehole backfilled with arisings. 	Water Strikes <table border="1"> <thead> <tr> <th>Date</th> <th>Strike</th> <th>Level</th> <th>Minutes</th> <th>Casing</th> <th>Sealed</th> </tr> </thead> <tbody> <tr> <td>01/10/2024</td> <td>2.5</td> <td>2.7</td> <td>20</td> <td></td> <td></td> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Date	Strike	Level	Minutes	Casing	Sealed	01/10/2024	2.5	2.7	20																										
Date	Strike	Level	Minutes	Casing	Sealed																																		
01/10/2024	2.5	2.7	20																																				
		Daily Log Of Depths <table border="1"> <thead> <tr> <th>Date</th> <th>Casing</th> <th>Water</th> <th>From</th> <th>To</th> <th>Hours</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Date	Casing	Water	From	To	Hours													Chiselling <table border="1"> <thead> <tr> <th>Date</th> <th>Casing</th> <th>Water</th> <th>From</th> <th>To</th> <th>Hours</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Date	Casing	Water	From	To	Hours												
Date	Casing	Water	From	To	Hours																																		
Date	Casing	Water	From	To	Hours																																		

			Project Title: Bamford Mews, Rochdale				WS02																																														
			Project Number: 10/2529		Client: McCarthy & Stone					Sheet 1 Of 1																																											
			GL (mAOD):		N Coord: 0		E Coord: 0																																														
Date: 01/10/2024			Method: Window Sampler		Driller: Boreworx		Logged By: SHP																																														
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe																																													
0.10	ES	N=16			0.20	MADE GROUND: Grass over dark brown sandy clay with abundant rootlets (topsoil).																																															
0.80	ES				1.00	MADE GROUND: Grey very sandy slightly clayey angular to sub-angular fine to coarse gravel of brick, concrete and sandstone. Fragments of pottery, plastic and metal. Low to medium cobble content of concrete and brick.																																															
1.20 - 1.65	SPT				1.30	Firm to stiff dark grey mottled grey sandy slightly gravelly CLAY. (DEVENSIAN TILL)																																															
1.90	ES	N=7			2.00	Firm grey very sandy CLAY with sand lenses. (DEVENSIAN TILL)																																															
2.00 - 2.45	SPT				3.00	Grey clayey fine to medium SAND. (DEVENSIAN TILL)																																															
3.00 - 3.45	SPT	N=20			3.75	Firm grey gravelly CLAY. Gravel is angular fine to medium of mudstone. (PENNINE LOWER COAL MEASURES FORMATION)																																															
4.00 - 4.45	SPT	N=26			4.00																																																
5.00 - 5.45	SPT	N=34			5.00																																																
					5.45	End Of Borehole At 5.45 m																																															
					6.00																																																
					7.00																																																
					8.00																																																
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa  - Groundwater Strike  - Groundwater Level 			REMARKS Groundwater encountered at 3.00m. Borehole backfilled with arisings. Scale: 1:50			Water Strikes <table><tr><th>Date</th><th>Strike</th><th>Level</th><th>Minutes</th><th>Casing</th><th>Sealed</th></tr><tr><td>01/10/2024</td><td>3</td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> Daily Log Of Depths Chiselling <table><tr><th>Date</th><th>Casing</th><th>Water</th><th>From</th><th>To</th><th>Hours</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>						Date	Strike	Level	Minutes	Casing	Sealed	01/10/2024	3																	Date	Casing	Water	From	To	Hours												
						Date	Strike	Level	Minutes	Casing	Sealed																																										
						01/10/2024	3																																														
						Date	Casing	Water	From	To	Hours																																										

			Project Title: Bamford Mews, Rochdale				WS04				
			Project Number: 10/2529		Client: McCarthy & Stone					Sheet 1 Of 1	
			GL (mAOD):		N Coord: 0		E Coord: 0				
Date: 01/10/2024			Method: Window Sampler		Driller: Boreworx		Logged By: SHP				
Depth (m)	Type	Test Result	Level	Legend	Depth (m)	Description	Water	Standpipe			
0.30	ES				0.20	MADE GROUND:					
					0.40	MADE GROUND: Dark greyish brown sandy clay with fragments of brick.					
1.20 - 1.65	SPT	N=14			1.00	MADE GROUND: Soft to firm dark grey mottled brown sandy slightly gravelly clay. Gravel is sub-angular to sub-rounded fine to coarse of sandstone and mudstone. (Reworked natural)					
1.50	ES				1.40						
2.00 - 2.45	SPT	N=14			2.00	Stiff becoming very stiff orangish brown becoming dark grey mottled brown sandy slightly gravelly CLAY. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, siltstone and mudstone. (DEVENSIAN TILL)					
3.00 - 3.45	SPT	N=14			3.00						
3.10	D				3.75	Greyish brown fine to medium SAND. Slightly gravelly towards the base of the unit. Gravel is sub-rounded to rounded fine to medium of sandstone. (DEVENSIAN TILL)					
4.00 - 4.45	SPT	N=11			4.00	Dark grey sandy slightly gravelly CLAY. Gravel is fine to coarse angular to sub-rounded of sandstone and mudstone. (DEVENSIAN TILL)					
5.00 - 5.45	SPT	N=43			5.00	No Recovery.					
					5.45	End Of Borehole At 5.45 m					
					6.00						
					7.00						
					8.00						
KEY D - Disturbed Sample B - Bulk Sample U - Undisturbed W - Water Sample S - Standard Penetration Test C - Cone Penetration Test N - Penetration Test 'N' Value V - Hand Shear Vane kPa ▽ - Groundwater Strike ▼ - Groundwater Level 			REMARKS Groundwater encountered at 2.80m. Borehole collapsing in from 3.00m. Borehole backfilled with arisings. Scale: 1:50			Water Strikes					
						Date	Strike	Level	Minutes	Casing	Sealed
						01/10/2024	2.8				
						Daily Log Of Depths				Chiselling	
						Date	Casing	Water	From	To	Hours

APPENDIX III
CHEMICAL LABORATORY RESULTS

Clancy Consulting
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Croxley Green
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Watford,
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WD18 8YS

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e: reception@i2analytical.com

Analytical Report Number : 24-046558

Project / Site name:	Bamford Mews	Samples received on:	03/10/2024
Your job number:	10 2529	Samples instructed on/ Analysis started on:	09/10/2024
Your order number:	34604	Analysis completed by:	18/10/2024
Report Issue Number:	1	Report issued on:	18/10/2024
Samples Analysed:	10 soil samples		


Signed:

Trevor Hill
Customer Service Advisor
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: 24-046558

Project / Site name: Bamford Mews

Your Order No: 34604

Lab Sample Number	341742	341743	341744	341745	341746
Sample Reference	WS01	WS01	WS02	WS02	WS02
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.50	1.10	0.10	0.80	1.90
Date Sampled	01/10/2024	01/10/2024	01/10/2024	01/10/2024	01/10/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	37.3	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	16	37	16	12
Total mass of sample received	kg	0.1	NONE	0.5	0.7	0.6	0.7	0.6

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	DSA	-	DSA	DSA	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7.7	6.2	6.8	8	7.3
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1500	54	-	1700	73
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	731	26.9	-	838	36.5
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.6	-	4.8	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.13	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.16	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	0.07	< 0.05	0.12	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	0.42	< 0.05	0.88	0.34	-
Anthracene	mg/kg	0.05	MCERTS	0.11	< 0.05	0.21	0.11	-
Fluoranthene	mg/kg	0.05	MCERTS	0.84	< 0.05	1.5	0.86	-
Pyrene	mg/kg	0.05	MCERTS	0.82	< 0.05	1.3	0.8	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.43	< 0.05	0.64	0.45	-
Chrysene	mg/kg	0.05	MCERTS	0.48	< 0.05	0.78	0.5	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.78	< 0.05	0.96	0.75	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.34	< 0.05	0.43	0.25	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.71	< 0.05	0.83	0.59	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.39	< 0.05	0.34	0.25	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.08	< 0.05	0.09	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.44	< 0.05	0.37	0.3	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	5.91	< 0.80	8.67	5.21	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.5	13	24	12	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	140	74	220	130	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.81	0.65	1.3	1.2	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	0.6	1.2	2.6	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	< 0.2	0.8	0.4	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	28	30	26	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	34	19	43	32	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	46	18	96	40	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	16	24	26	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.5	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	30	37	44	32	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	82	40	120	98	-

Analytical Report Number: 24-046558

Project / Site name: Bamford Mews

Your Order No: 34604

Lab Sample Number				341742	341743	341744	341745	341746
Sample Reference				WS01	WS01	WS02	WS02	WS02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.10	0.10	0.80	1.90
Date Sampled				01/10/2024	01/10/2024	01/10/2024	01/10/2024	01/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	-	-	-	-
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	-	-	-	-
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	-	-	-	-
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	5.4	-	-	-	-
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	20	-	-	-	-
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	77	-	-	-	-
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	100	-	-	-	-

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010	-	-	-	-
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010	-	-	-	-
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	< 0.020	-	-	-	-
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	2.6	-	-	-	-
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	-	-	-	-
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	73	-	-	-	-
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	76	-	-	-	-

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0 [#]	-	-	-	-
Benzene	µg/kg	5	MCERTS	< 5.0	-	-	-	-
Toluene	µg/kg	5	MCERTS	< 5.0	-	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	-	-	-	-
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	-	-	-	-
o-Xylene	µg/kg	5	MCERTS	< 5.0	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-046558

Project / Site name: Bamford Mews

Your Order No: 34604

Lab Sample Number	341747	341748	341749	341750	341751
Sample Reference	WS03	WS04	WS04	BH04	BH04
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.60	0.30	1.40	0.30	0.90
Date Sampled	01/10/2024	01/10/2024	01/10/2024	02/10/2024	02/10/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	17	15	16	36	19
Total mass of sample received	kg	0.1	NONE	0.7	0.6	0.7	0.6	0.7

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	Not-detected	-	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	-	DSA	-	DSA	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	6.4	6.7	6.1	6.5	6.1
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	-	140	-	74
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	-	-	68.4	-	37.1
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	1.7	-	5	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.89	-	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.05	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	1.2	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.71	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.05	6	-	0.2	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	1.3	-	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.09	7	-	0.44	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.09	7.3	-	0.41	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	3.2	-	0.21	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	3.6	-	0.26	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	3.9	-	0.47	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	1.6	-	0.13	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	3.8	-	0.34	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.5	-	0.15	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.39	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	1.9	-	0.19	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	44.2	-	2.79	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.8	15	-	15	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	65	120	-	100	57
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.67	0.97	-	0.73	1
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.6	-	0.9	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.4	-	0.6	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	-	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	22	-	22	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	65	-	59	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	100	-	87	22
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	23	-	16	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	27	29	-	34	31
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	47	130	-	110	51

Analytical Report Number: 24-046558

Project / Site name: Bamford Mews

Your Order No: 34604

Lab Sample Number				341747	341748	341749	341750	341751
Sample Reference				WS03	WS04	WS04	BH04	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.30	1.40	0.30	0.90
Date Sampled				01/10/2024	01/10/2024	01/10/2024	02/10/2024	02/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	-	< 0.010	-
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	-	< 0.010	-
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	-	< 0.010	-
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	-	-	-	< 10	-

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	-	-	< 0.010	-
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	-	-	< 0.010	-
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	-	-	-	< 0.020	-
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-	-	< 10	-
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-	-	12	-
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	-	-	-	12	-

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	-	-	-	< 5.0 [#]	-
Benzene	µg/kg	5	MCERTS	-	-	-	< 5.0	-
Toluene	µg/kg	5	MCERTS	-	-	-	< 5.0	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	< 5.0	-
p & m-Xylene	µg/kg	8	MCERTS	-	-	-	< 8.0	-
o-Xylene	µg/kg	5	MCERTS	-	-	-	< 5.0	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-046558

Project / Site name: Bamford Mews

* 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 *
341742	WS01	None Supplied	0.5	Brown clay and sand with gravel and stones
341743	WS01	None Supplied	1.1	Brown clay and sand with gravel
341744	WS02	None Supplied	0.1	Brown loam and clay with vegetation
341745	WS02	None Supplied	0.8	Brown loam and clay with gravel and vegetation
341746	WS02	None Supplied	1.9	Brown clay and sand with gravel
341747	WS03	None Supplied	0.6	Brown clay and sand with gravel
341748	WS04	None Supplied	0.3	Brown clay and loam with gravel and vegetation
341749	WS04	None Supplied	1.4	Brown clay and sand with gravel
341750	BH04	None Supplied	0.3	Brown loam and clay with vegetation
341751	BH04	None Supplied	0.9	Brown loam and sand with vegetation

Analytical Report Number : 24-046558

Project / Site name: Bamford Mews

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
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	L038B	D	MCERTS
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	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	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

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' 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 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Analytical Report Number : 24-046558

Project / Site name: Bamford Mews

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

- Quality control parameter failure associated with this result; other checks applied prior to reporting the data have been accepted. The result should be considered as deviating and should be interpreted with caution. The result is not accredited.

APPENDIX IV
GEOTECHNICAL LABORATORY TEST RESULTS

Client: Clancy Consulting
Client Address: Dunham Court, 2 Dunham Road,
Altrincham
Contact: Phil Hill
Site Address: Bamford Mews

Client Reference: 10 2529
Job Number: 24-042079-1
Date Sampled: Not Given
Date Received: 13/09/2024
Date Tested: 24/09/2024
Sampled By: Not Given

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

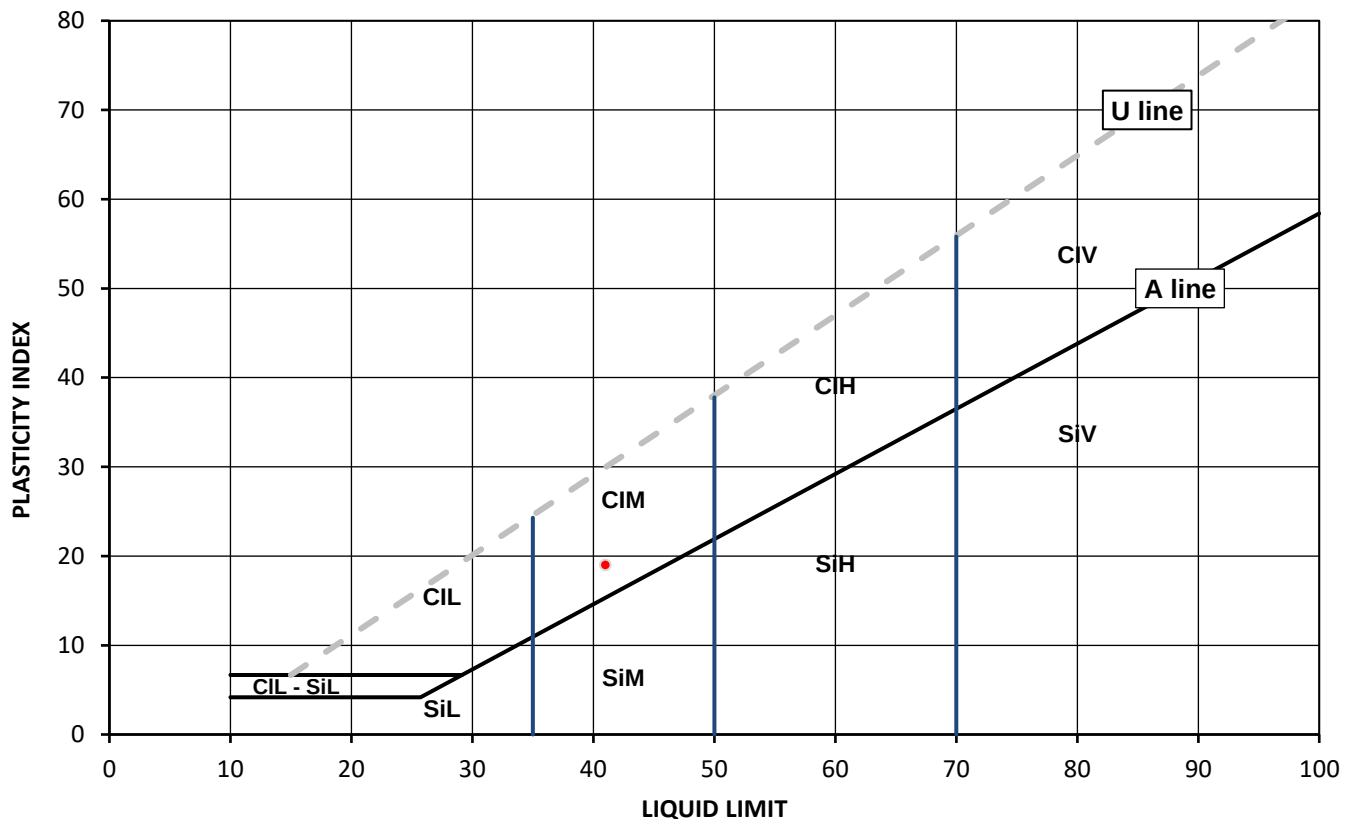
Test Results:

Laboratory Reference: 316491
Hole No.: SAO2
Sample Reference: Not Given
Sample Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 0.40
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
25.1	41	22	19	0.16	0.84	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 ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

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.

Signed:
Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Client: Clancy Consulting
Client Address: Dunham Court, 2 Dunham Road,
Altrincham
Contact: Phil Hill
Site Address: Bamford Mews

Client Reference: 10 2529
Job Number: 24-042079-1
Date Sampled: Not Given
Date Received: 13/09/2024
Date Tested: 24/09/2024
Sampled By: Not Given

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

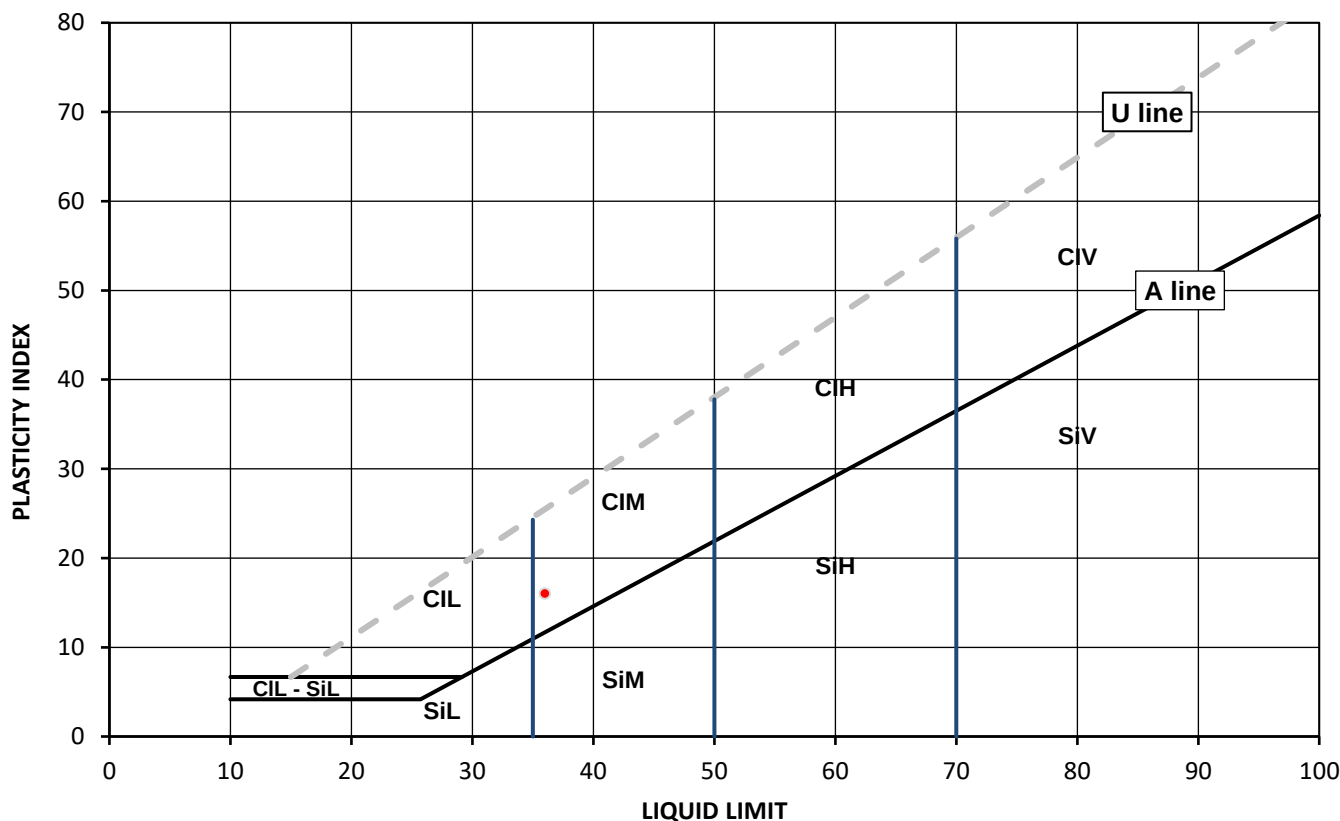
Test Results:

Laboratory Reference: 316493
Hole No.: TP01
Sample Reference: Not Given
Sample Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 0.35
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
25.6	36	20	16	0.38	0.63	94



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

	Clay	Plasticity	Liquid Limit
CI	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: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

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Signed:
Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
 Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
 cl 5.2 and 6

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

Client: Clancy Consulting
 Client Address: Dunham Court, 2 Dunham Road,
 Altrincham
 Contact: Phil Hill
 Site Address: Bamford Mews

Client Reference: 10 2529
 Job Number: 24-042079-1
 Date Sampled: Not Given
 Date Received: 13/09/2024
 Date Tested: 24/09/2024
 Sampled By: Not Given

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

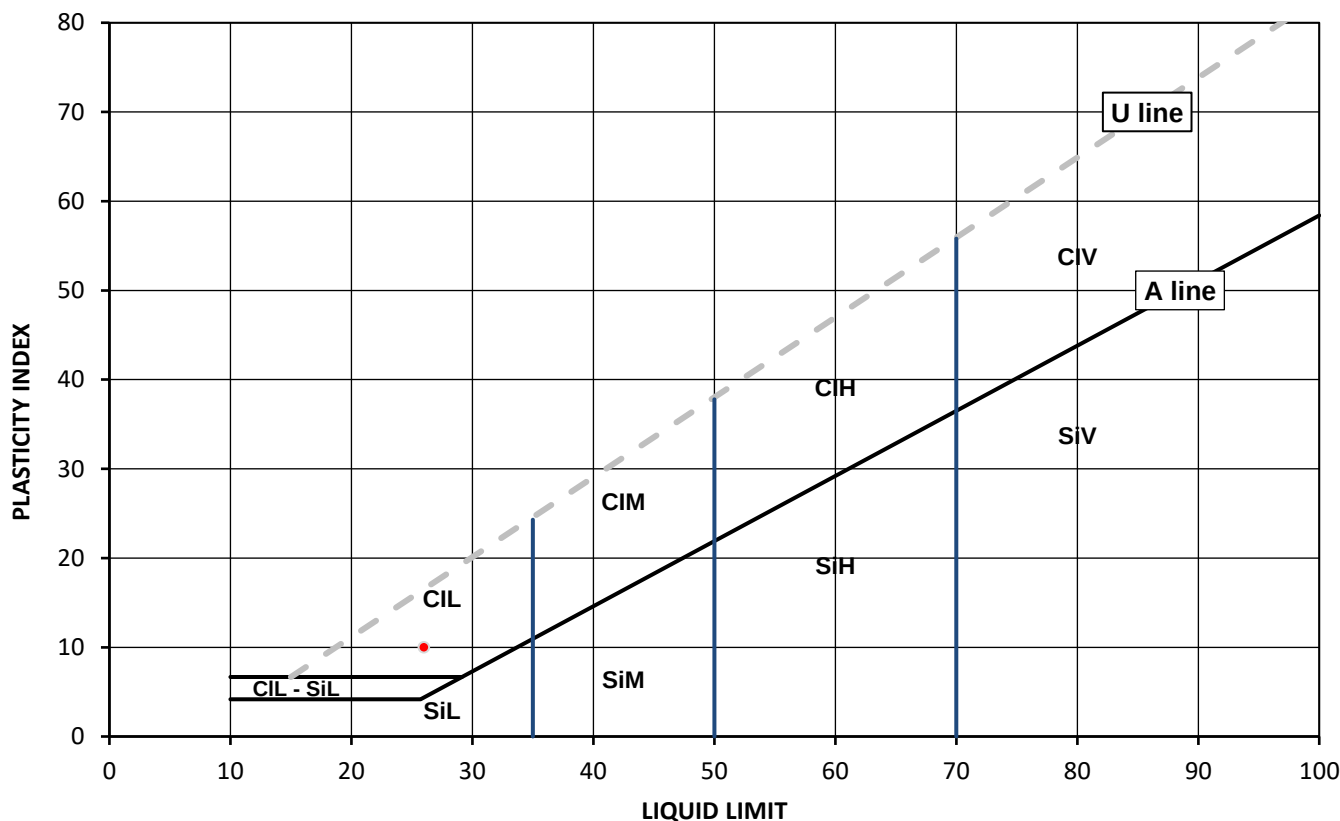
Test Results:

Laboratory Reference: 316494
 Hole No.: TP04
 Sample Reference: Not Given
 Sample Description: Greyish brown slightly gravelly very sandy CLAY

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

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
 Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
17.0	26	16	10	0.10	0.90	99



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

	Clay	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 ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

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.

Signed:


Katarzyna Koziel
 Geotechnical Reporting Team Leader

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
 Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
 cl 5.2 and 6

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

Client: Clancy Consulting
 Client Address: Dunham Court, 2 Dunham Road,
 Altrincham
 Contact: Phil Hill
 Site Address: Bamford Mews

Client Reference: 10 2529
 Job Number: 24-042079-1
 Date Sampled: Not Given
 Date Received: 13/09/2024
 Date Tested: 24/09/2024
 Sampled By: Not Given

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

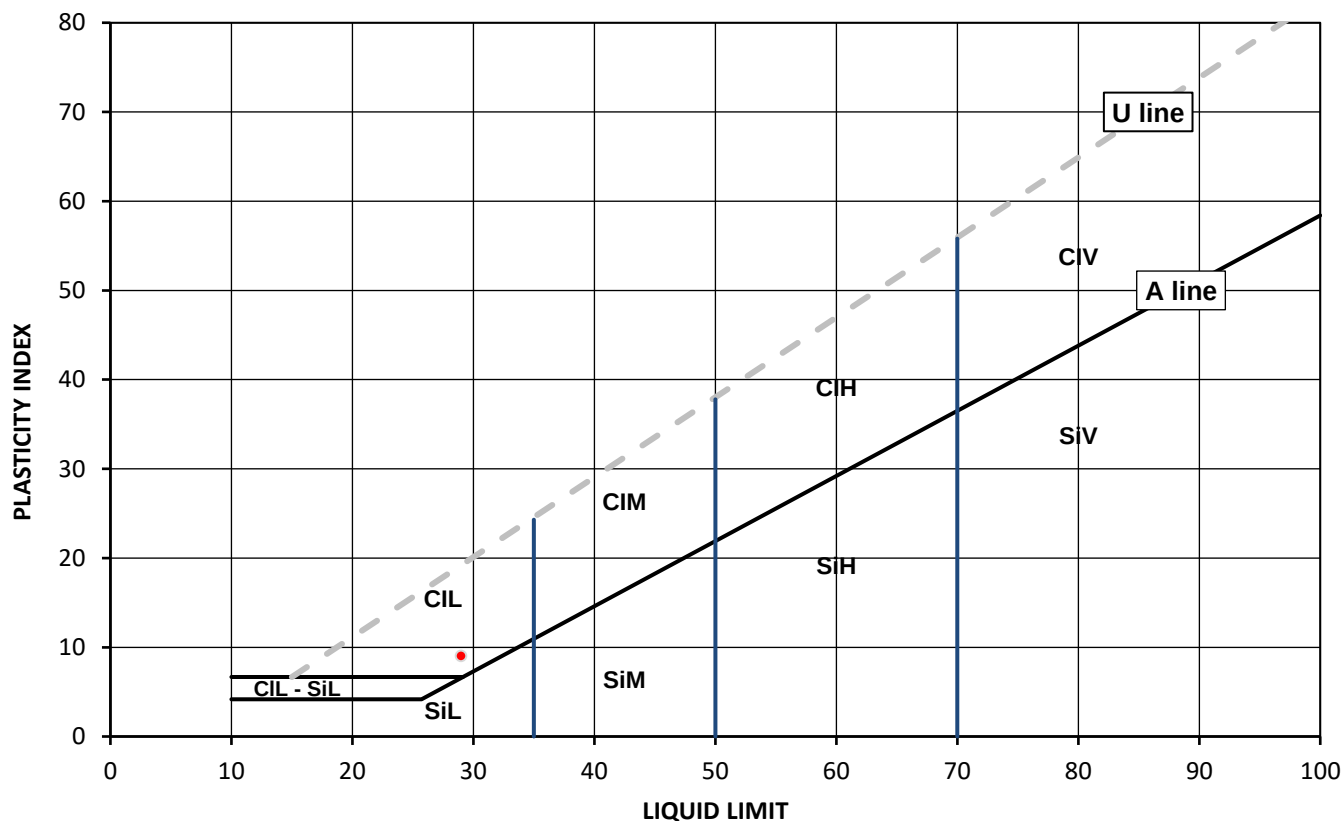
Test Results:

Laboratory Reference: 316495
 Hole No.: TP05
 Sample Reference: Not Given
 Sample Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 0.40
 Depth Base [m]: Not Given
 Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
 Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
21.1	29	20	9	0.11	0.89	97



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

	Clay	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 ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

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Signed:


Katarzyna Koziel
 Geotechnical Reporting Team Leader

for and on behalf of i2 Analytical Ltd



4041



SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

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



Client: Clancy Consulting
Client Address: Dunham Court, 2 Dunham Road,
Altrincham

BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt
Test, BS 1377-2:2022, cl 5.2 and 6. W by BS EN ISO 17892-1:2014+A1:2022.

Client Reference: 10 2529
Job Number: 24-042079-1
Date Sampled: Not Given
Date Received: 13/09/2024
Date Tested: 24/09/2024
Sampled By: Not Given

Contact: Phil Hill
Site Address: Bamford Mews

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit								Density		
		Reference	Depth Top	Depth Base	Type				% Passing 425um	WL*	Correlation Factor	Wp	Ip	Cone type	Sample Preparation	bulk	dry	PD	
			m	m					%	%		%	%			Mg/m3	Mg/m3	Mg/m3	
316491	SAO2	Not Given	0.40	Not Given	D	Brown slightly gravelly sandy CLAY	Atterberg 4 Point	25.1	97	41	-	22	19	80g/30 deg	R / I				
316493	TP01	Not Given	0.35	Not Given	D	Brown slightly gravelly sandy CLAY	Atterberg 4 Point	25.6	94	36	-	20	16	80g/30 deg	R / I				
316494	TP04	Not Given	1.20	Not Given	D	Greyish brown slightly gravelly very sandy CLAY	Atterberg 4 Point	17.0	99	26	-	16	10	80g/30 deg	R / I				
316495	TP05	Not Given	0.40	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 4 Point	21.1	97	29	-	20	9	80g/30 deg	R / I				

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, W - Tested after washing to remove >425mm; I - The water content in the sample was increased ,
D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

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Signed:
Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader

for and on behalf of i2 Analytical Ltd



SUMMARY REPORT
DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS EN ISO 17892-1:2014+A1:2022, BS 1377-2: 2022, clause 4.1

Client: Clancy Consulting
Client Address: Dunham Court, 2 Dunham Road,
Altrincham
Contact: Phil Hill
Site Address: Bamford Mews
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: 10 2529
Job Number: 24-042079-1
Date Sampled: Not Given
Date Received: 13/09/2024
Date Tested: 24/09/2024
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC %											
		Reference	Depth Top m	Depth Base m	Type														
316491	SAO2	Not Given	0.40	Not Given	D	Brown slightly gravelly sandy CLAY		25.1											
316493	TP01	Not Given	0.35	Not Given	D	Brown slightly gravelly sandy CLAY		25.6											
316494	TP04	Not Given	1.20	Not Given	D	Greyish brown slightly gravelly very sandy CLAY		17.0											
316495	TP05	Not Given	0.40	Not Given	D	Brown slightly gravelly very sandy CLAY		21.1											

Comments:

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Signed:
Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Client:

Clancy Consulting

Client Address:

Dunham Court, 2 Dunham Road,
Altrincham

Contact:

Phil Hill

Site Address:

Bamford Mews

Client Reference:

10 2529

Job Number:

24-042079-1

Date Sampled:

Not Given

Date Received:

13/09/2024

Date Tested:

24/09/2024

Sampled By:

Not Given

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

Test Results:

Laboratory Reference:

316490

Hole No.:

SA01

Sample Reference:

Not Given

Sample Description:

Greyish brown very sandy CLAY

Sample Preparation:

Sample was quartered, oven dried at 107.9 °C and broken down by hand.

Depth Top [m]:

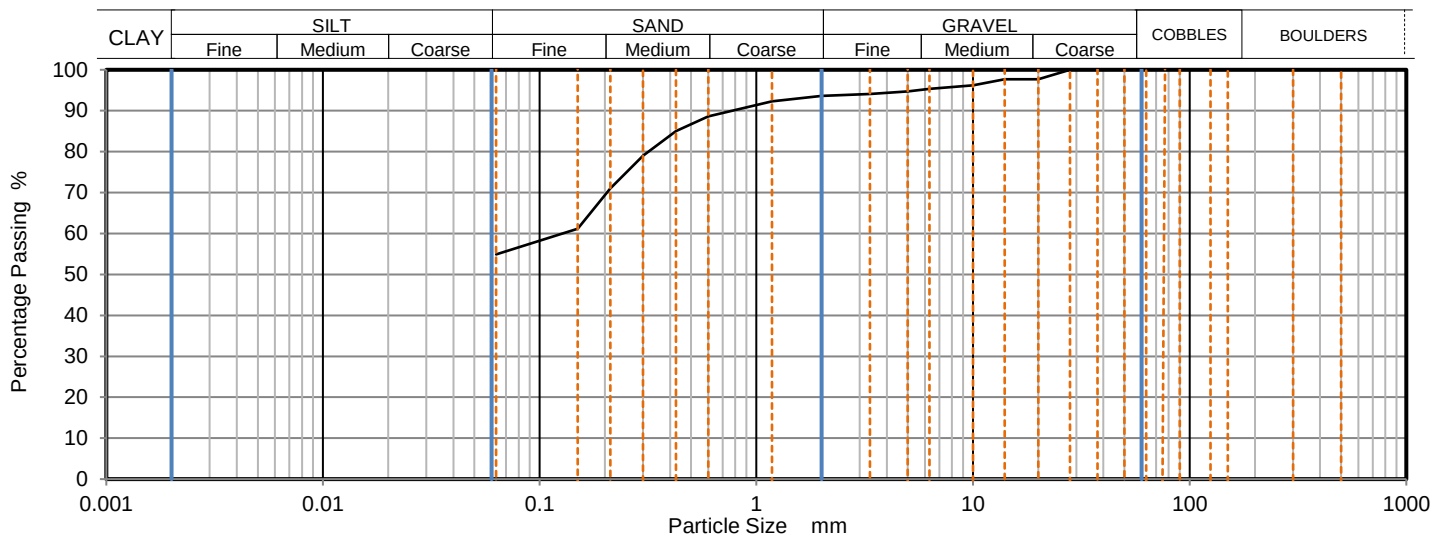
1.20

Depth Base [m]:

Not Given

Sample Type:

D



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	98		
14	98		
10	96		
6.3	95		
5	95		
3.35	94		
2	94		
1.18	92		
0.6	89		
0.425	85		
0.3	79		
0.212	71		
0.15	61		
0.063	55		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	6.00
Sand	39.00
Fines <0.063 mm	55.00

Grading Analysis		
D100	mm	28
D60	mm	0.127
D30	mm	
D10	mm	
Uniformity Coefficient		2
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

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Signed:

Katarzyna Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader

for and on behalf of i2 Analytical Ltd

Client: Clancy Consulting
Client Address: Dunham Court, 2 Dunham Road,
Altrincham
Contact: Phil Hill
Site Address: Bamford Mews

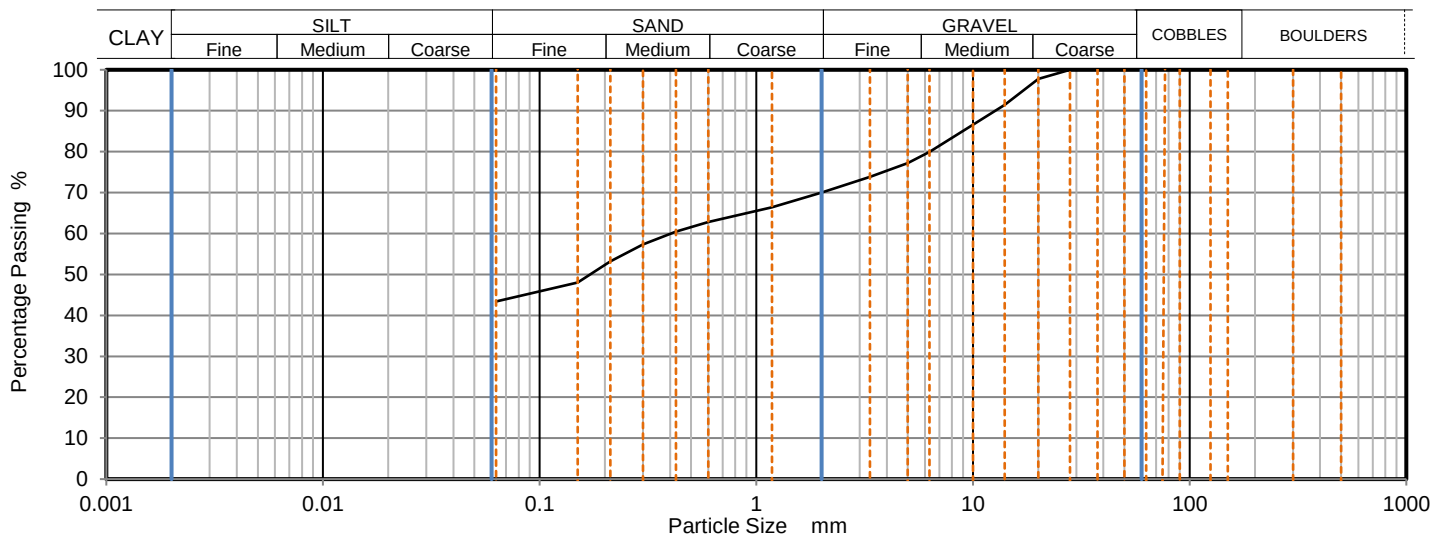
Client Reference: 10 2529
Job Number: 24-042079-1
Date Sampled: Not Given
Date Received: 13/09/2024
Date Tested: 24/09/2024
Sampled By: Not Given

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

Test Results:

Laboratory Reference: 316492
Hole No.: SAO2
Sample Reference: Not Given
Sample Description: Dark brown sandy very gravelly CLAY
Sample Preparation: Sample was quartered, oven dried at 107.9 °C and broken down by hand.

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



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	98		
14	91		
10	87		
6.3	80		
5	77		
3.35	74		
2	70		
1.18	66		
0.6	63		
0.425	61		
0.3	57		
0.212	53		
0.15	48		
0.063	43		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	30.00
Sand	27.00
Fines <0.063 mm	43.00

Grading Analysis		
D100	mm	28
D60	mm	0.402
D30	mm	
D10	mm	
Uniformity Coefficient		6.4
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS EN ISO 17892-4:2016 Table 1.



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,
cl 5.3, 6

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



Environmental Science

4041

Client: Clancy Consulting
Client Address: 4th Floor, Windmill Green,
24 Mount Street, M2 3NX

Contact: Desy Korai
Site Address: Bamford Mews

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

Client Reference: 10 2529
Job Number: 24-046675-1
Date Sampled: 30/09/2024
Date Received: 03/10/2024
Date Tested: 28/10/2024
Sampled By: Not Given

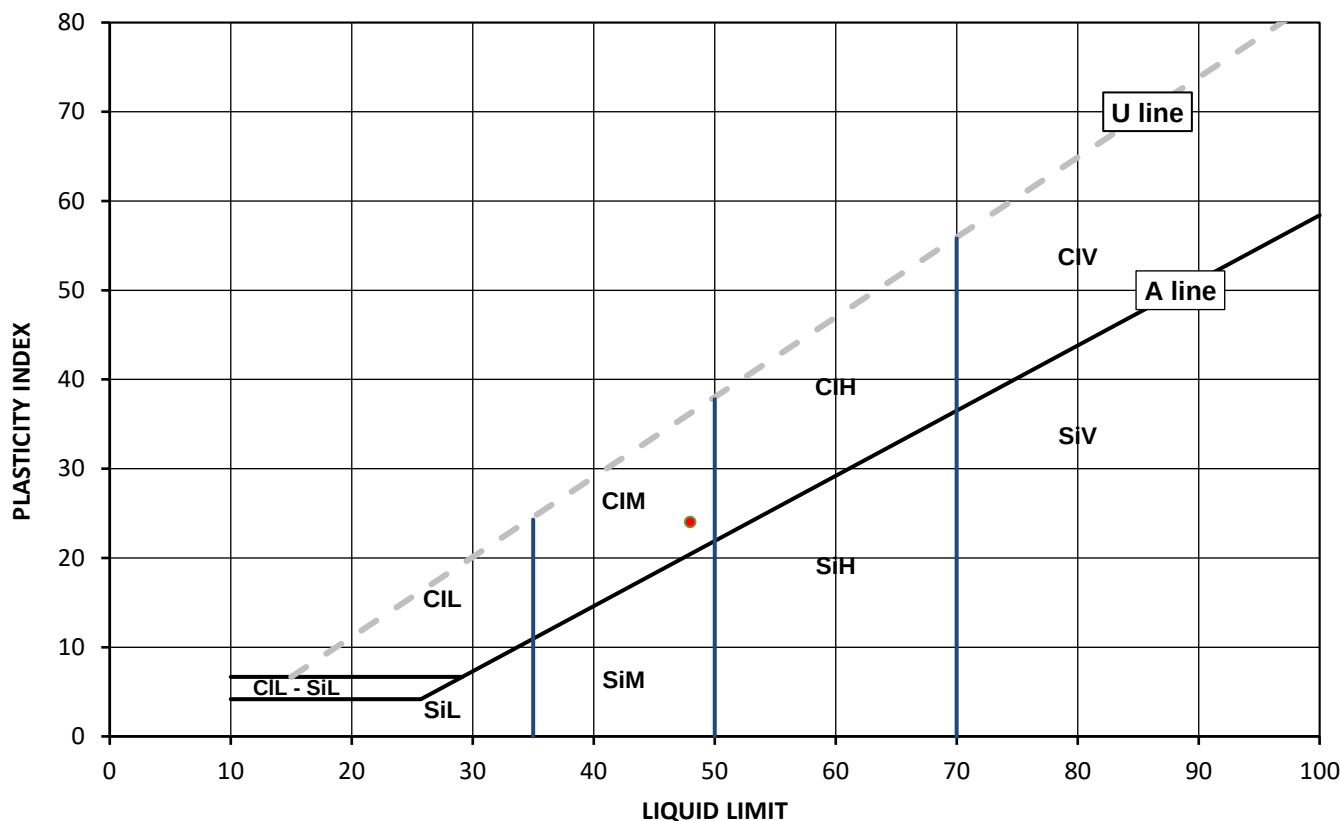
Test Results:

Laboratory Reference: 342583
Hole No.: BH01
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 2.00
Depth Base [m]: 2.45
Sample Type: U

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
17.2	48	1.020	24	24	-0.29	1.29	65



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 ClHO)

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks:

Signed:

Katarzyna Korai

Katarzyna Korai
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,
cl 5.3, 6

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



Environmental Science

4041

Client: Clancy Consulting
Client Address: 4th Floor, Windmill Green,
24 Mount Street, M2 3NX

Contact: Desy Korai
Site Address: Bamford Mews

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

Client Reference: 10 2529
Job Number: 24-046675-1
Date Sampled: 01/10/2024
Date Received: 03/10/2024
Date Tested: 28/10/2024
Sampled By: Not Given

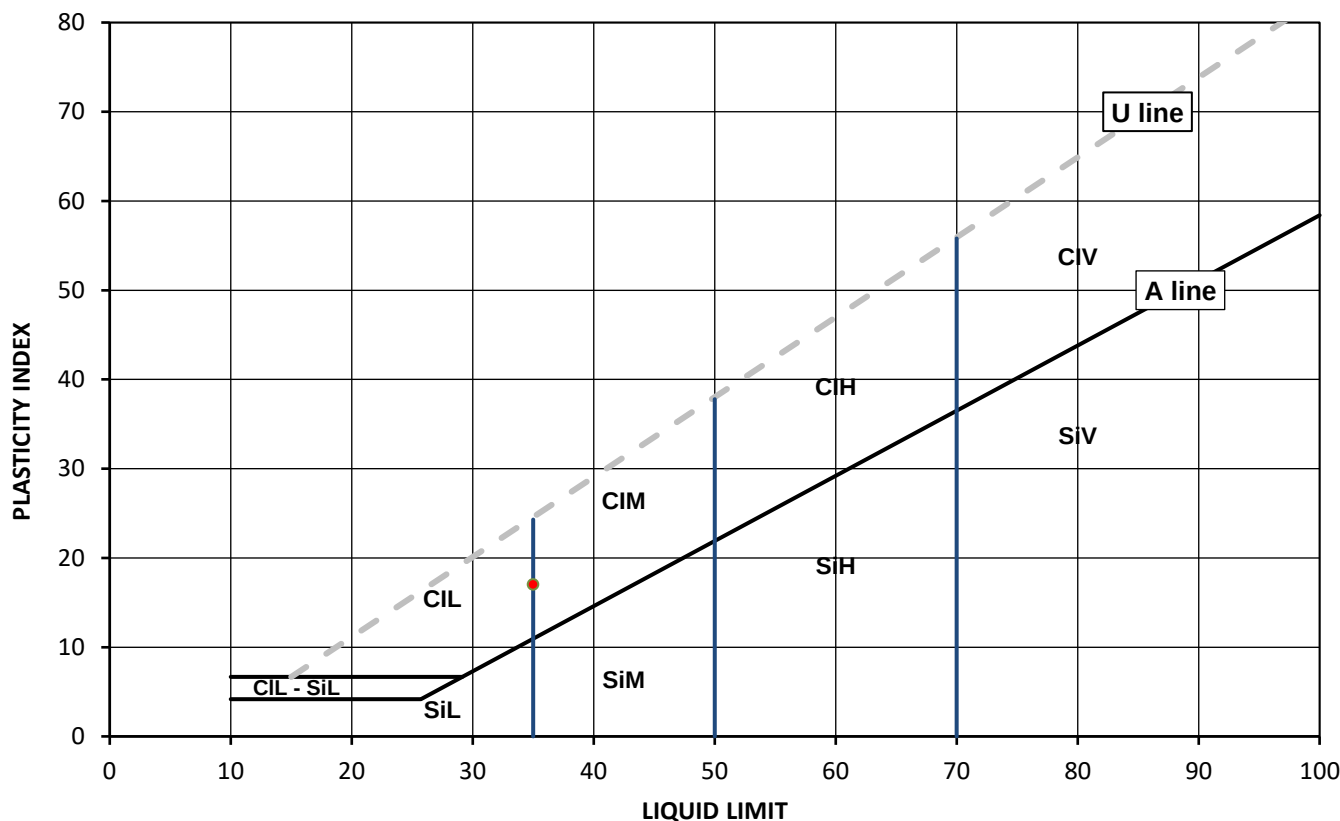
Test Results:

Laboratory Reference: 342584
Hole No.: BH03
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly sandy CLAY

Depth Top [m]: 4.00
Depth Base [m]: 4.45
Sample Type: U

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
20.5	35	1.000	18	17	0.18	0.82	76



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
		50 to 70
		exceeding 70
O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks:

Signed:

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Katarzyna Korai

Katarzyna Korai
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,
cl 5.3, 6

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



Environmental Science

4041

Client: Clancy Consulting
Client Address: 4th Floor, Windmill Green,
24 Mount Street, M2 3NX

Contact: Desy Korai
Site Address: Bamford Mews

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

Client Reference: 10 2529
Job Number: 24-046675-1
Date Sampled: 02/10/2024
Date Received: 03/10/2024
Date Tested: 28/10/2024
Sampled By: Not Given

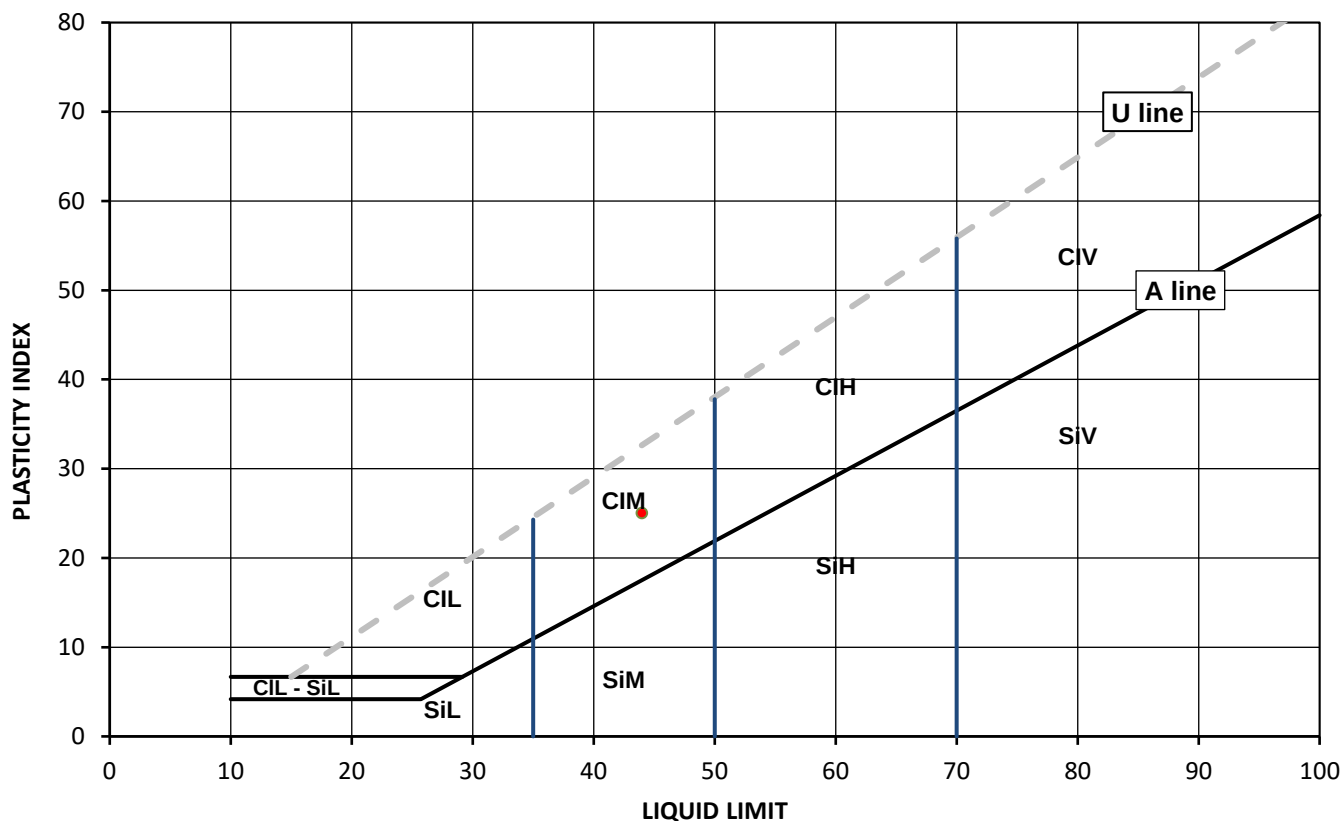
Test Results:

Laboratory Reference: 342585
Hole No.: BH04
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly sandy CLAY

Depth Top [m]: 2.00
Depth Base [m]: 2.45
Sample Type: U

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
18.7	44	0.981	19	25	0.00	1.00	95



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 ClHO)

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks:

Signed:

Katarzyna Korai

Katarzyna Korai
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

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



Environmental Science

Tested in Accordance with:

BS EN ISO 17892-12:2018+A2:2022, cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022, cl 5.3, 6. Correlation Factor by Clayton C.R.I and Jukes A.W (1978). W by BS EN ISO 17892-1:2014+A1:2022.

Client Reference: 10 2529
Job Number: 24-046675-1
Date Sampled: 30/09 - 02/10/2024
Date Received: 03/10/2024
Date Tested: 28/10/2024
Sampled By: Not Given

4041

Client: Clancy Consulting
Client Address: 4th Floor, Windmill Green,
24 Mount Street, M2 3NX

Contact: Desy Korai
Site Address: Bamford Mews

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top	Depth Base	Type				% Passing 425um	WL*	Correlation Factor	Wp	Ip	Cone type	Sample Preparation	bulk	dry	PD
			m	m												Mg/m3	Mg/m3	Mg/m3
342583	BH01	Not Given	2.00	2.45	U	Dark brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	17.2	65	48	1.020	24	24	80g/30 deg	WR			
342584	BH03	Not Given	4.00	4.45	U	Dark brown slightly gravelly sandy CLAY	Atterberg 1 Point	20.5	76	35	1.000	18	17	80g/30 deg	WR			
342585	BH04	Not Given	2.00	2.45	U	Dark brown slightly gravelly sandy CLAY	Atterberg 1 Point	18.7	95	44	0.981	19	25	80g/30 deg	WR			

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0.425mm removed by hand, WR - Tested after washing to remove >425mm; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

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Signed:

Katarzyna Korai

Katarzyna Korai
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



SUMMARY REPORT
DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS EN ISO 17892-1:2014+A1:2022, BS 1377-2: 2022, clause 4.1

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



Environmental Science

4041
Client: Clancy Consulting
Client Address: 4th Floor, Windmill Green,
24 Mount Street, M2 3NX

Contact: Desy Korai
Site Address: Bamford Mews

Client Reference: 10 2529
Job Number: 24-046675-1
Date Sampled: 30/09 - 02/10/2024
Date Received: 03/10/2024
Date Tested: 28/10/2024
Sampled By: Not Given

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC											
		Reference	Depth Top m	Depth Base m	Type														
342583	BH01	Not Given	2.00	2.45	U	Dark brown slightly gravelly slightly sandy CLAY		17.2											
342584	BH03	Not Given	4.00	4.45	U	Dark brown slightly gravelly sandy CLAY		20.5											
342585	BH04	Not Given	2.00	2.45	U	Dark brown slightly gravelly sandy CLAY		18.7											

Comments:

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Signed:

Katarzyna Korai

Katarzyna Korai
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



TEST CERTIFICATE

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

Tested in Accordance with: BS EN ISO 17982-8:2018,
BS 1377-2 Cl. 28:2022

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



Environmental Science

4041

Client: Clancy Consulting
Client Address: 4th Floor, Windmill Green,
24 Mount Street, M2 3NX

Contact: Desy Korai
Site Address: Bamford Mews

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

Client Reference: 10 2529
Job Number: 24-046675-1
Date Sampled: 30/09/2024
Date Received: 03/10/2024
Date Tested: 30/10/2024
Sampled By: Not Given

Test Results:

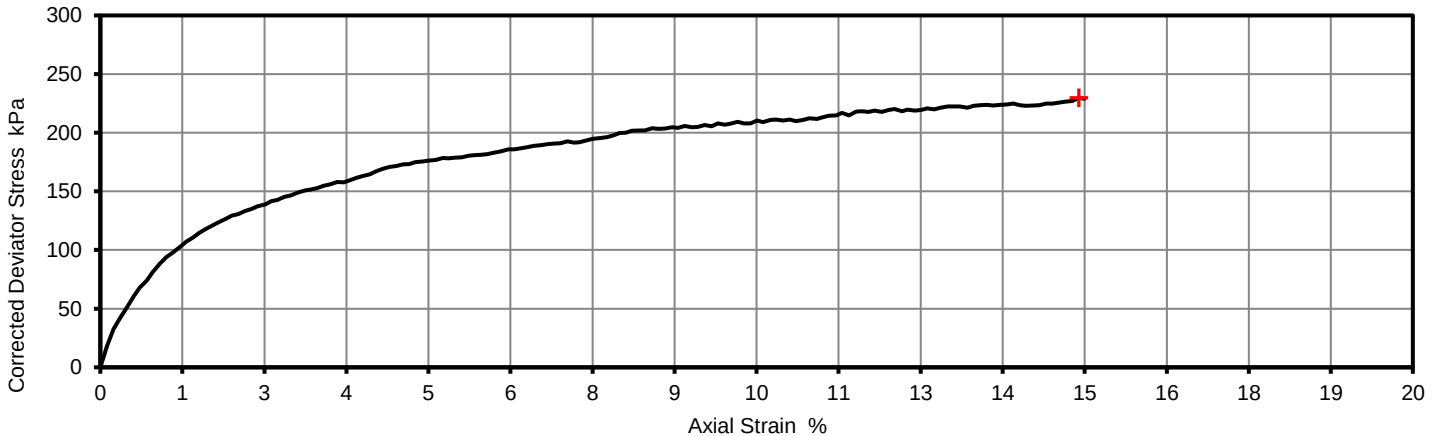
Laboratory Reference: 342583
Hole No.: BH01
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly slightly sandy CLAY
Sample Preparation: Sample prepared in accordance with BS EN ISO 17892-8: 2018 Clause 6.2.

Depth Top [m]: 2.00
Depth Base [m]: 2.45
Sample Type: U

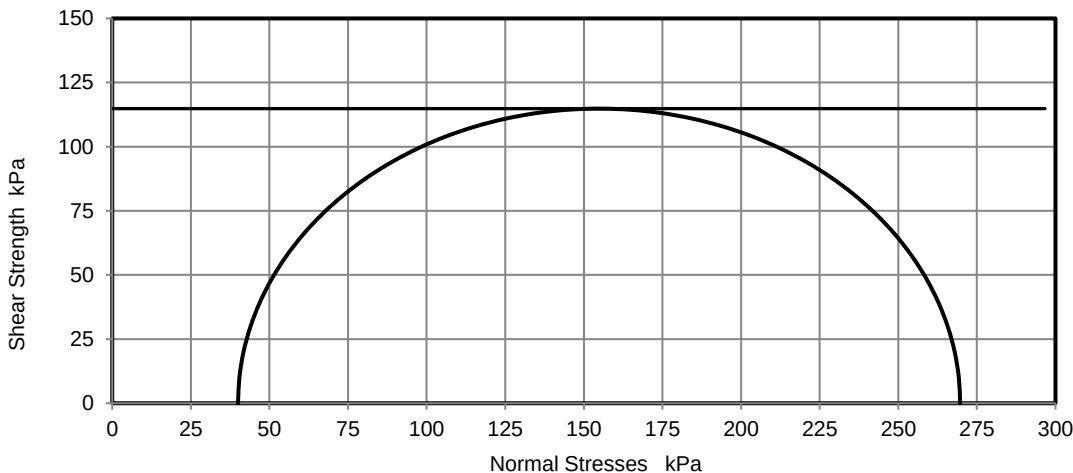
Test Number	1
Depth within Sample	- m
Length	138.57 mm
Diameter	69.91 mm
Length Prior to Shearing	138.57 mm
Bulk Density	2.13 Mg/m ³
Initial Water Content	17.2 %
Final Water Content	17.1 %
Dry Density	1.82 Mg/m ³

Rate of Strain	2.00 %/min
Cell Pressure	40 kPa
Axial Strain at Failure	14.9 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	230 kPa
Undrained Shear Strength, c_u	115 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound
Membrane Thickness	0.24 mm
Membrane Correction	2.96 kPa

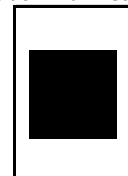
Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects.

Remarks:

Signed:

Katarzyna
Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

Tested in Accordance with: BS EN ISO 17982-8:2018,
BS 1377-2 Cl. 28:2022

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



Environmental Science

4041

Client: Clancy Consulting
Client Address: 4th Floor, Windmill Green,
24 Mount Street, M2 3NX

Contact: Desy Korai
Site Address: Bamford Mews

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

Client Reference: 10 2529
Job Number: 24-046675-1
Date Sampled: 01/10/2024
Date Received: 03/10/2024
Date Tested: 30/10/2024
Sampled By: Not Given

Test Results:

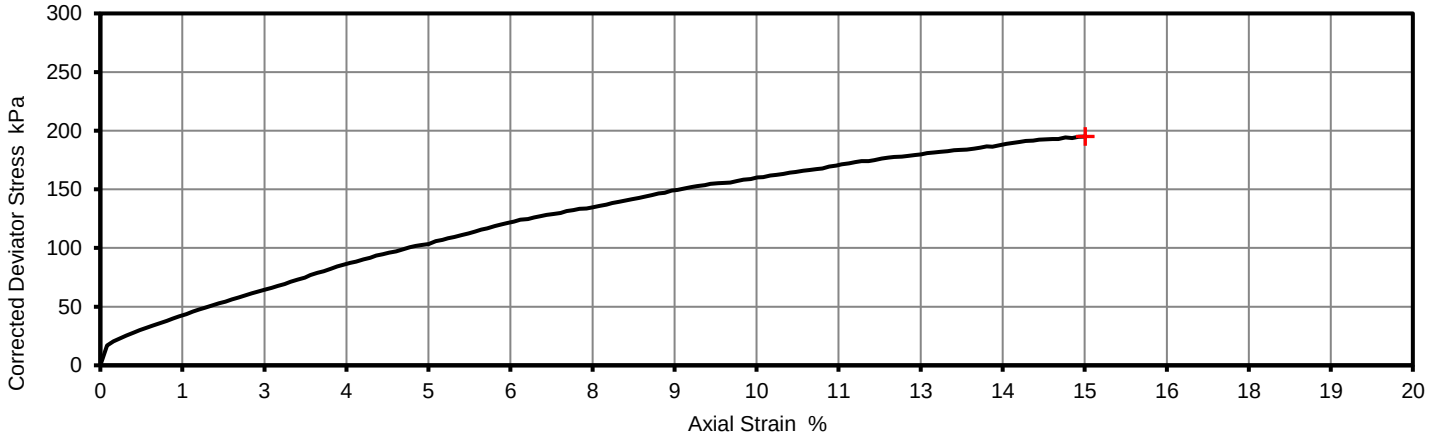
Laboratory Reference: 342584
Hole No.: BH03
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly sandy CLAY
Sample Preparation: Sample prepared in accordance with BS EN ISO 17892-8: 2018 Clause 6.2.

Depth Top [m]: 4.00
Depth Base [m]: 4.45
Sample Type: U

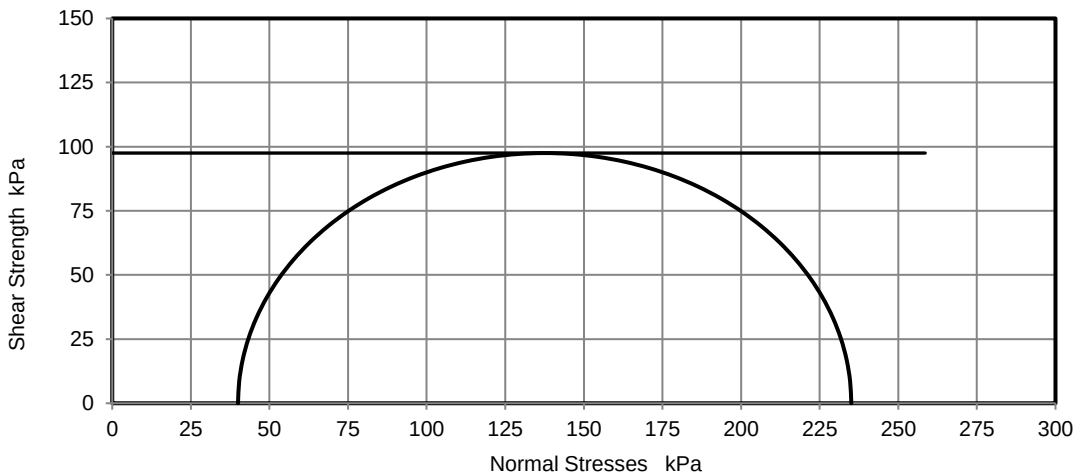
Test Number	1
Depth within Sample	- m
Length	192.35 mm
Diameter	102.56 mm
Length Prior to Shearing	192.35 mm
Bulk Density	2.19 Mg/m ³
Initial Water Content	20.5 %
Final Water Content	19.0 %
Dry Density	1.82 Mg/m ³

Rate of Strain	2.00 %/min
Cell Pressure	40 kPa
Axial Strain at Failure	15.0 %
Deviator Stress, $(\sigma_1 - \sigma_3)_f$	195 kPa
Undrained Shear Strength, c_u	98 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound
Membrane Thickness	0.30 mm
Membrane Correction	2.53 kPa

Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects.

Remarks:

Signed:

Katarzyna
Koziel

Katarzyna Koziel
Geotechnical Reporting Team Leader
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 TEST
Tested in Accordance with: BS EN ISO 17982-8:2018,
BS 1377-2 Cl. 28:2022

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



Environmental Science

4041

Client: Clancy Consulting
Client Address: 4th Floor, Windmill Green,
24 Mount Street, M2 3NX

Contact: Desy Korai
Site Address: Bamford Mews

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

Client Reference: 10 2529
Job Number: 24-046675-1
Date Sampled: 02/10/2024
Date Received: 03/10/2024
Date Tested: 30/10/2024
Sampled By: Not Given

Test Results:

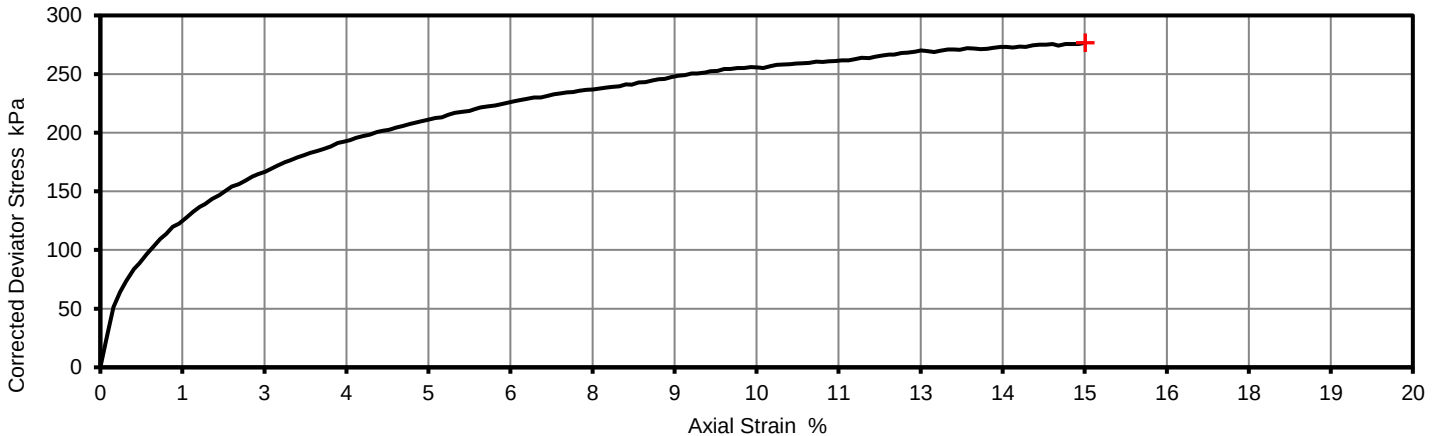
Laboratory Reference: 342585
Hole No.: BH04
Sample Reference: Not Given
Sample Description: Dark brown slightly gravelly sandy CLAY
Sample Preparation: Sample prepared in accordance with BS EN ISO 17892-8: 2018 Clause 6.2.

Depth Top [m]: 2.00
Depth Base [m]: 2.45
Sample Type: U

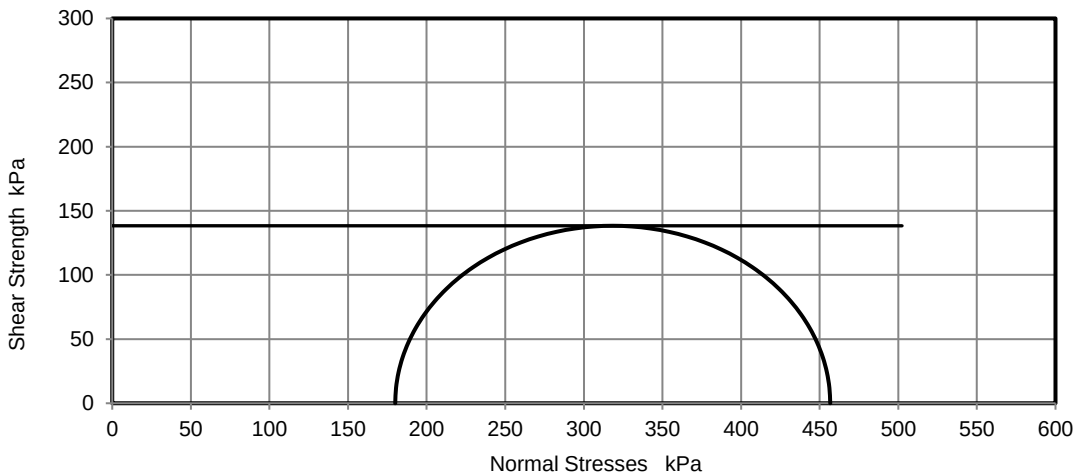
Test Number	1
Depth within Sample	- m
Length	139.06 mm
Diameter	70.14 mm
Length Prior to Shearing	139.06 mm
Bulk Density	2.11 Mg/m3
Initial Water Content	18.6 %
Final Water Content	17.5 %
Dry Density	1.78 Mg/m3

Rate of Strain	2.00 %/min
Cell Pressure	180 kPa
Axial Strain at Failure	15.0 %
Deviator Stress, $(\sigma_1 - \sigma_3)_{\text{f}}$	277 kPa
Undrained Shear Strength, c_u	138 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_{\text{f}}$
Mode of Failure	Compound
Membrane Thickness	0.26 mm
Membrane Correction	3.17 kPa

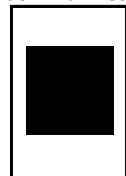
Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects.

Remarks:

Signed:

Katarzyna Korai

Katarzyna Korai
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

Tested in Accordance with: BS EN ISO 17982-8:2018,
BS 1377-2 Cl. 28:2022

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



Environmental Science

4041

Client: Clancy Consulting
Client Address: 4th Floor, Windmill Green,
24 Mount Street, M2 3NX

Contact: Desy Korai
Site Address: Bamford Mews

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

Client Reference: 10 2529
Job Number: 24-046675-1
Date Sampled: 02/10/2024
Date Received: 03/10/2024
Date Tested: 30/10/2024
Sampled By: Not Given

Test Results:

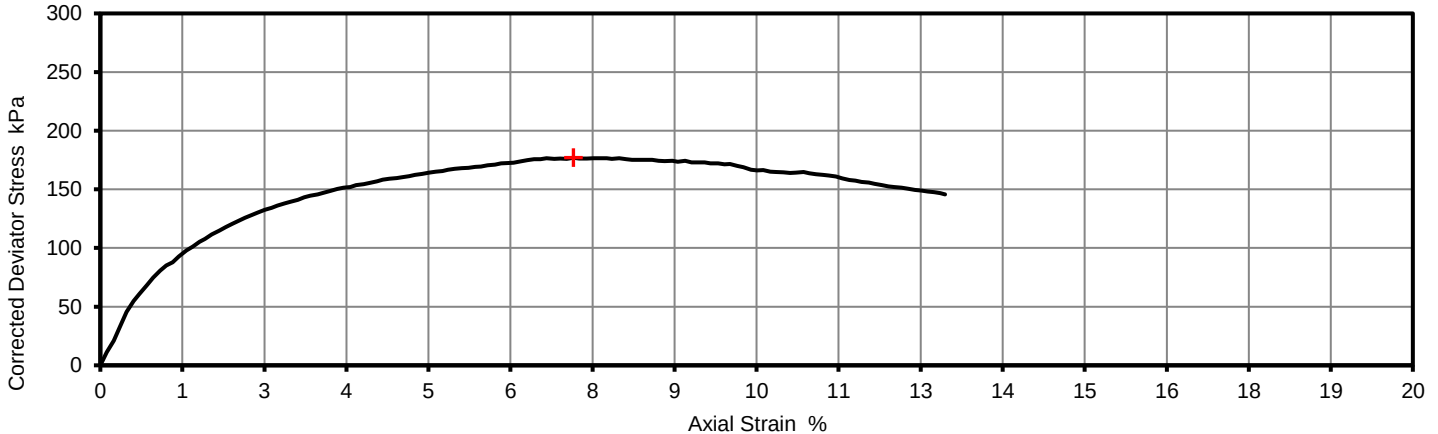
Laboratory Reference: 342586
Hole No.: BH04
Sample Reference: Not Given
Sample Description: Brown slightly gravelly CLAY
Sample Preparation: Sample prepared in accordance with BS EN ISO 17892-8: 2018 Clause 6.2.

Depth Top [m]: 9.00
Depth Base [m]: 9.45
Sample Type: U

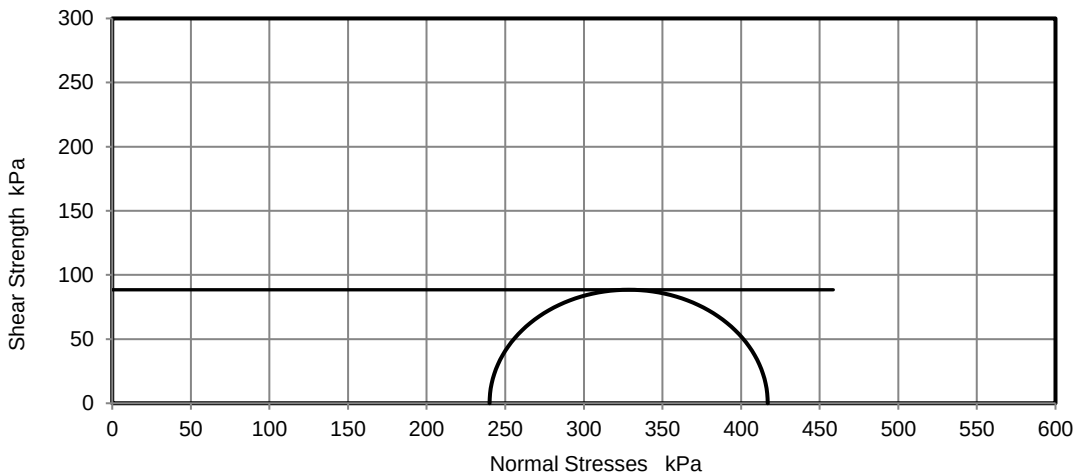
Test Number	1
Depth within Sample	- m
Length	206.66 mm
Diameter	102.49 mm
Length Prior to Shearing	206.65 mm
Bulk Density	2.05 Mg/m ³
Initial Water Content	19.7 %
Final Water Content	17.5 %
Dry Density	1.71 Mg/m ³

Rate of Strain	2.00 %/min
Cell Pressure	240 kPa
Axial Strain at Failure	7.2 %
Deviator Stress, $(\sigma_1 - \sigma_3)_f$	177 kPa
Undrained Shear Strength, c_u	88 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound
Membrane Thickness	0.29 mm
Membrane Correction	1.18 kPa

Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects.

Remarks:

Signed:

Katarzyna Korai

Katarzyna Korai
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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

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

Analytical Report Number : 24-046676

Project / Site name:	Bamford Mews	Samples received on:	03/10/2024
Your job number:	10 2529	Samples instructed on/ Analysis started on:	09/10/2024
Your order number:	34604	Analysis completed by:	30/10/2024
Report Issue Number:	1	Report issued on:	30/10/2024
Samples Analysed:	4 soil samples		


Signed:

Dominika Liana
Junior Reporting Specialist
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: 24-046676
Project / Site name: Bamford Mews
Your Order No: 34604

Lab Sample Number				342587	342588	342589	342590
Sample Reference				BH01	BH03	BH04	BH04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00-2.45	4.00-4.45	2.00-2.45	9.00-9.45
Date Sampled				30/09/2024	01/10/2024	02/10/2024	02/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	14	14	20
Total mass of sample received	kg	0.1	NONE	0.5	0.5	0.5	0.5

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	6.6	7.6	8.3	8.3
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	83	43	89	140
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	41.3	21.4	44.6	71

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number : 24-046676
Project / Site name: Bamford Mews

* 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 *
342587	BH01	None Supplied	2.00-2.45	Brown clay and loam with gravel and vegetation
342588	BH03	None Supplied	4.00-4.45	Brown clay with gravel
342589	BH04	None Supplied	2.00-2.45	Brown clay with gravel
342590	BH04	None Supplied	9.00-9.45	Brown clay



Analytical Report Number : 24-046676
Project / Site name: Bamford Mews

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	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

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' 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.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

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e: desy.korai@clancy.co.uk

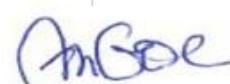
t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 24-046826

Project / Site name:	Bamford Mews	Samples received on:	10/10/2024
Your job number:	10 2529	Samples instructed on/ Analysis started on:	10/10/2024
Your order number:	34604	Analysis completed by:	16/10/2024
Report Issue Number:	1	Report issued on:	16/10/2024
Samples Analysed:	2 soil samples		



Signed: _____

Anna Goc
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: 24-046826

Project / Site name: Bamford Mews

Your Order No: 34604

Lab Sample Number				343930	343931
Sample Reference				WS03	WS04
Sample Number				None Supplied	None Supplied
Depth (m)				2.50	3.10
Date Sampled				01/10/2024	01/10/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection
				Test Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	16
Total mass of sample received	kg	0.1	NONE	0.5	0.5

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	5.3	7.6
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	6.3	53
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	3.17	26.5

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-046826

Project / Site name: Bamford Mews

* 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 *
343930	WS03	None Supplied	2.5	Brown clay and sand with gravel
343931	WS04	None Supplied	3.1	Brown sand with gravel

Analytical Report Number : 24-046826

Project / Site name: Bamford Mews

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	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

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

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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 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

APPENDIX V
COAL AUTHORITY PERMIT



The Coal
Authority

Permit to Enter or Disturb Coal Authority Interests

Permit 28966

Name and Address of Permit Holder:

McCarthy Stone
Unit 1 Edward Court
Altrincham Business Park
Altrincham
WA14 5GL

Site Location:

Land off
Bamford Mews
Rochdale
OL11 5NX

This certificate hereby grants the above named Permit Holder a Permit to carry out:-

Ground investigation by four boreholes to 35m to determine presence of shallow mine workings

within the Authority's interests at the identified site location above as shown on the Grant Permit Boundary (overleaf) for the period of **12 months** from the granted date shown below. *The granting of this Permit does not constitute advice given by the Authority in relation to the proposed operations. It is the Permit Holder's responsibility to obtain appropriate health, safety, environmental, technical and legal advice.*

Conditions:

- *Manned entry (i.e.) into mine entries/workings) is strictly prohibited.*
- *Water flush*
- *Gas Monitoring CO, CH₄, CO₂, O₂, H₂S at borehole and rig*
- *Operators undertaking the work must be in possession of this certificate and the Permit boundary plan at the time of works*
- *Appropriate borehole sealing without delay and to withstand site level changes*

Signed: Ruth Griffiths Granted Date: 23rd September 2024

For and on behalf of The Coal Authority

Nominated Representative: Ruth Griffiths, Permitting Manager;

The Coal Authority, Permitting Office, 200 Lichfield Lane, Mansfield, Notts, NG18 4RG

Tel: 01623 637450; E-Mail: permissions@coal.gov.uk



The Coal
Authority

Granted Permit Boundary

Permit Ref: 28966

Permit Boundary:



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