

PHASE 2 SITE INVESTIGATION

Proposed Temporary Classroom Replacement Building

for

Manchester Enterprise Academy





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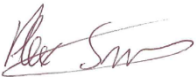
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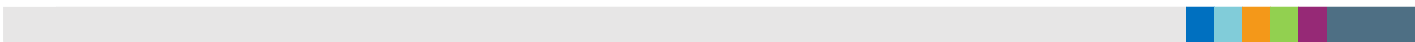
At

Proposed Temporary Classroom Replacement Building

On behalf of

Manchester Enterprise Academy

DESCRIPTION		DATE	AUTHOR	REVIEWED BY	APPROVED BY
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1.0 Introduction

1.1 Background

- 1.1.1 RoC Consulting has been appointed by Ben Broster of Saffer Cooper to conduct a Phase 2 Site Investigation across Manchester Enterprise Academy (the site). It is understood that the site is to be redeveloped as a classroom with the construction of a new HUB learning centre and associated landscaping.
- 1.1.2 The following assessment has been completed to support design and planning requirements for the site's redevelopment and follows on from a number of site investigations relating to the development site, specifically:
 - 1) Phase 1 Desktop Study completed by TerraConsult
 - 2) Phase 2 Site Investigation completed by TerraConsult
- 1.1.3 It is recommended reference be made to the abovementioned report (s) when reviewing the current assessment.
- 1.1.4 The scope of the report and its assessment has been based around the site's redevelopment proposals as outlined in the Pozzoni proposed site plan (Ref: 5606-PAL-XX-XX-DR-A-8000) included in Appendix A. It should be noted that any subsequent revision of the proposed redevelopment or site boundary away from the above-mentioned drawing may result in the full or partial re-interpretation of this report and assessment.

1.2 Terms of Reference

- 1.2.1 The Phase 2 Site Investigation was carried out following receipt of an instruction from Ben Broster of Saffer Cooper.

1.3 Objectives

- 1.3.1 The scope of works has been tailored to meet both planning and design requirements to assist with the site's redevelopment. These considerations include:
 - 1) Design a programme of site investigation works to establish ground conditions beneath the site and target known or suspected sources of contamination.
 - 2) Completion of site investigation field works including the formation of six hand dug inspection pits to establish the site's geology.
 - 3) Completion of geo-environmental and geotechnical laboratory analysis of soil / rock samples to determine physical and chemical characteristics.



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- 4) Completion of a detailed geotechnical assessment of site conditions to inform new building foundation design. The scope of this assessment will also include reference to the findings and result of previous site investigation works.
- 5) Completion of a geo-environmental assessment utilising information provided by both the current and previous phases of site investigation works sufficient in its scope to assist with the discharge of contaminated land related planning conditions.

2.0 Limitations of Study Assessment

- 2.0.1 The report has been produced by RoC Consulting for the client solely for the purposes of a review of information for the above-mentioned site. It may not be used by any person for any other purpose other than that specified without the express written permission of RoC Consulting. Any liability arising out of its use by a third party for purposes not wholly connected with the above shall be the responsibility of that party who shall indemnify RoC Consulting against all claims, costs, damages and losses arising out of such use.
- 2.0.2 This report is written in the context of an agreed scope of work and should not be used in a different context. The report should be read in its entirety. Furthermore, new information, improved practices and changes in legislation may require re-interpretation of this report in whole or in part after its original issue. RoC Consulting reserve the right to alter their conclusions and recommendations in the light of further information that may become available.
- 2.0.3 Ground conditions can change rapidly, especially in areas of made ground, however, it is assumed that the ground conditions observed are typical and representative of the site as a whole. The ground conditions have been determined from a limited number of exploratory holes formed across the property, therefore, only a small percentage of the total area of the property has been investigated. Interpolation between exploratory holes has enabled a general picture of the subsurface conditions to be produced.
- 2.0.4 Conclusions drawn from the ground investigation should be read in this context. RoC Consulting cannot accept responsibility for any situations resulting from locally unforeseen ground conditions occurring between exploratory holes.

3.0 Background Information

- 3.0.1 The overview below outlines the most salient points / considerations and it is recommended reference be made to the source documentation for additional information / clarification.

3.1 Site Description

- 3.1.1 The Manchester Enterprise Way campus site is located off Simonsway, Wythenshawe approximately 10km south of Manchester city centre. The area of investigation is located to the north of the main school building and is bordered by car parking to the south, a field to the west sports hall to the east and artificial grass pitches / fields to the north. The area of investigation comprises 60% soft landscaped ground predominantly grassland with several small trees and a large oak tree. The south eastern corner comprises of a gravel surfacing which has been laid down in the location of a recently demolished building.
- 3.1.2 The topography of the site is relatively flat with levels varying between 57.83 mAOD to 57.20 mAOD.

3.2 Geological Characteristics

- 3.2.1 Review of publicly available BGS geological map records indicate the site is underlain by the following:

Drift Geology: Till, Devensian - Diamicton

Solid Geology: Bollin Mudstone Member – Mudstone

- 3.2.2 The Coal Authority Interactive Map Viewer indicates that the site is not located in an area which may be affected by historic Coal Mining or Brine extraction and a Coal Authority report is not required.

3.3 Site History and Environmental Characteristics

- 3.3.1 Earliest historical records dated 1897-1899 indicate the site to have been used as an agricultural field. In 1960 the Poundwick Grammar School is indicated immediately to the south of the site. The current academy is thought to have been constructed in 2008/2009 and the previous school buildings demolished during this period.
- 3.3.2 The MAGIC Map database indicates the drift geology is classified secondary undifferentiated with the underlying mudstone bedrock classed as a Secondary B Aquifer. The site is not said to be located within any Environment Agency Source Protection Zones. According to the TerraConsult Phase 1 Report there are no surface or groundwater abstraction points within 1000m of the site.
- 3.3.3 The nearest surface water feature is indicated 210m to the southwest in the form of Bagueley Brook. There is no water quality or flow rate data available for the watercourse. There are no surface or groundwater abstraction points within 500m of the site; one discharge consent is located 480m from the site into the River Medlock.

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- 3.3.4 There are no registered Integrated Pollution Control (IPC) Sites, Registered Radioactive Substances sites, Control of Major Accident sites (COMAH), Explosives Sites or Notification of Installations Handling Hazardous Substances (NIHHS) within 250m of the site.
- 3.3.5 The site is not said to be located in an area deemed to be at risk from flooding or extreme flooding events from either land or sea.

4.0 Site Investigation Design

General

- 4.0.1 The RoC intrusive investigation was designed and completed to further investigate geo-environmental issues identified during previous site investigations as well as provide geotechnical information to facilitate new building design.
- 4.0.2 The site investigation works comprised the formation of 6 hand dug pits to a maximum depth of 0.60mbgl.
- 4.0.3 Exploratory hole were positioned to achieve a suitable spread across the study site and assess whether areas of the site are affected by contamination. In addition, hand pits were located within the footprint of the proposed new development to establish ground conditions and support foundation design.
- 4.0.4 Samples of soil collected during the investigation works were analysed for a variety of determinants.
- 4.0.5 Table 4.0 provided below provides location justification for each exploratory hole formed during the site investigation fieldworks. The purposes of this table are to illustrate the targeting of potential sources of contamination during the Phase 2 site investigation works.

Table 4.0: Exploratory Hole Locations & Justification

BH/WS ID.	Reason for selection
HDP01	Provide information on ground conditions within site footprint and assess potential heave impacts that may arise from adjacent tree
HDP02	
HDP03	
HDP04	
HDP05	
HDP06	

- 4.0.6 Exploratory hole locations are shown on RoC Consulting drawing ES101 (Current Site) provided within Appendix B.

5.0 Site Investigation Fieldworks

- 5.0.1 Site investigation fieldworks were completed on the 16/06/20 by ROC Consulting. Hand dug inspection pits were formed using a shovel and hand auger.
- 5.0.2 Information with respect to buried services was obtained from relevant providers prior to commencement of the investigation works. However, as a precautionary measure all exploratory hole locations were scanned with a Cable Avoidance Tool prior to the commencement of works.
- 5.0.3 Soil samples were collected for subsequent chemical and geotechnical laboratory analysis. Soil samples used for geotechnical analysis were collected in 500g plastic sample tubs. Samples collected for chemical testing were collected in 300g glass jars and 500g plastic sample tubs. Samples were obtained from both made ground and natural strata to assess the overall quality of underlying soils. In situ soil strength was investigated using a hand shear vane test.
- 5.0.4 The shallow soils encountered during construction of the boreholes were described and logged by a suitably qualified engineer in accordance with BS 5930: Code of Practice for Site Investigations (the log sheets for which have been provided within Appendix C).

6.0 Encountered Ground Conditions

- 6.0.1 The following ground conditions are summarised from the exploratory holes formed during the ROC Consulting site investigation. The following represents an overview of encountered ground conditions and it is recommended reference be made to the log sheets provided within Appendix C for a detailed strata description; all depths shown are given in metres below ground level (mbgl) unless otherwise stated).

6.1 Ground Conditions Overview

Made Ground

- 6.1.1 Made ground was reported at all exploratory hole locations underlying topsoil comprising a brown sandy slightly gravelly clay. Gravel comprised mudstone, limestone and brick.

Topsoil

- 6.1.2 Topsoil was reported at all exploratory hole locations from ground level to a depth between 0.1 and 0.2 comprising grass over a dark brown slightly sandy, slightly gravelly clay with roots and rootlets. Gravel comprised brick, limestone and mudstone.

Weathered Mudstone

- 6.1.3 Weathered Mudstone was reported at 4 exploratory hole locations from depths between 0.4 and 0.6 mbgl in the form of an orangish brown slightly sandy clay.

6.2 Groundwater & Contamination Observations

- 6.2.1 No visual or olfactory evidence of contamination was noted during the site investigation
- 6.2.2 No ground water strikes were encountered during the site investigation.

6.3 Below ground obstructions

- 6.3.1 A single obstruction was encountered during the site investigation works at HDP01 and was believed to be a large cobble/boulder which prevented progress of the hand auger.

6.4 Shear Vane Test

- 6.4.1 A total of 7 shear vane tests were completed during the SI works. 5 of these were undertaken in the made ground and 2 were undertaken in the weathered mudstone. The results of these tests are provided within the logs in Appendix C.
- 6.4.2 The tests undertaken within the made ground varied between 24 and 106kPa. The value of 106 appears to be an anomaly and a more accurate representation of ground conditions would be values ranging from 24 to 64kPa
- 6.4.3 The tests undertaken in the weathered mudstone varied from 54 to 62kPa.

7.0 Laboratory Testing

- 7.0.1 To establish the physical and chemical properties of underlying soils, a programme of laboratory analysis was completed utilising samples obtained during site investigation works. This analysis comprised the testing of soil samples to assist with the estimation of risks posed by contaminated land related concerns.

Chemical Testing

- 7.0.2 RoC Consulting submitted a total of 6 soil samples to a UKAS accredited testing facility for analysis against a range of determinands synonymous with the site's former industrial activity.

Determinands	No. of Tests
Toxic and phytotoxic metals and metalloids	6
Total & Speciated Polycyclic Aromatic Hydrocarbons (PAH),	6
Other inorganic substances (e.g. Sulphate, Cyanide etc)	6
Asbestos ID	6
Leachate Analysis (Heavy Metals etc)	6
Water Soluble Sulfate & pH	6

- 7.0.3 Copies of chemical testing results have been provided within Appendix D.

Geotechnical Testing

- 7.0.4 A programme of geotechnical laboratory analysis was also completed on tub samples obtained during site investigation works.

Plasticity Index

- 7.0.5 A total of 6 soil samples were tested for the determination of the clays plasticity index. The depth range of samples tested varied from 0.3 to 0.5m with a mean depth of 0.375mbgl. The plasticity index range varied between 17 and 34% with a mean value of 21%. These results indicate clays to be of a medium to high plastic nature.
- 7.0.6 Results from geotechnical laboratory testing have been provided within Appendix E.

8.0 Geo-Environmental Assessment

- 8.0.1 The information obtained during the desk-based study has been reviewed to establish the Preliminary Conceptual Model for the site. This model is based around the Source / Pathway / Receptor methodology as outlined in Figure 8.0.

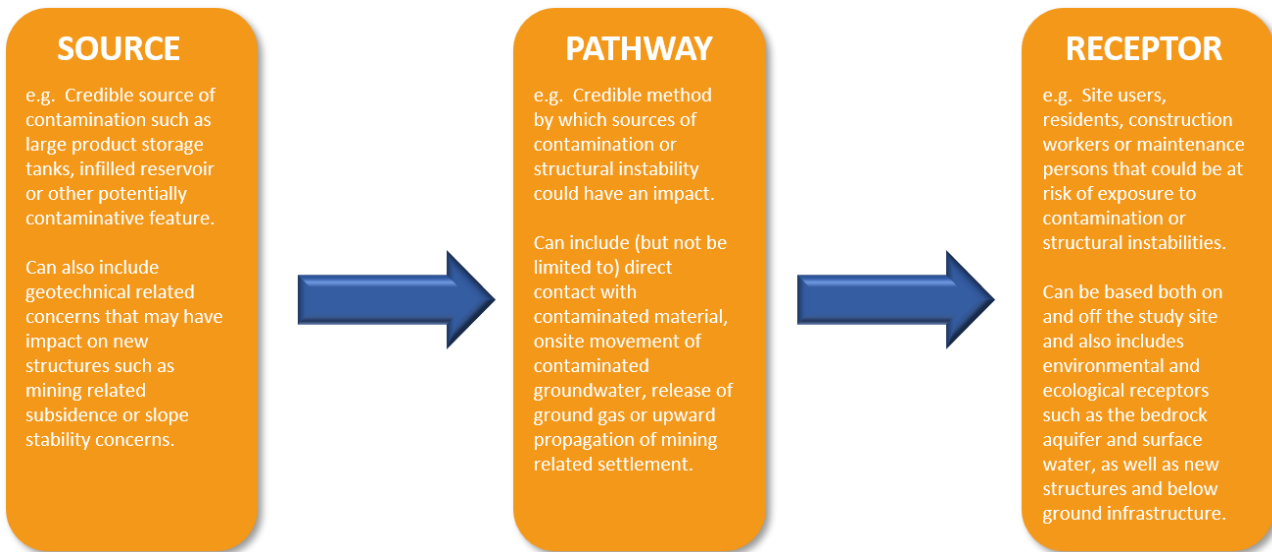


Figure 8.0 Source Pathway Receptor Diagram

- 8.0.2 Risk assessment is the process of collating known information on a hazard or set hazards in order to establish actual or potential risks to receptors. The receptor may be human health, controlled waters, a sensitive local ecosystem or even construction materials. Receptors can be connected with the hazard under consideration via one or several exposure pathways (e.g. the pathway of direct skin contact and oral exposure).
- 8.0.3 Risks are generally managed by isolating or removing the hazard, isolating the receptor, or by intercepting the exposure pathway. Without the three essential components of a source (hazard), pathway and receptor, there is deemed to be no risk. In other words, the mere presence of a hazard at a site does not mean that there will necessarily be risks.
- 8.0.4 A CLEA CLR 8 provides a selection of contaminants that may be relevant for the assessment of contaminated land, based on site usage, because they are likely to be found on a large number of industrial sites in the UK and have the potential to affect human health and the environment. The CLEA CLR 8 documentation, along with other relevant guidance, forms the basis against which the site has been assessed.

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- 8.0.5 The results from these intrusive site investigations have allowed a geo-environmental risk assessment to be completed in accordance with the guidelines and principals of the Environment Agency CLEA Methodology and with reference to the guidance outlined within CIRIA 552 “Contaminated land risk assessment. A good practise guide”. This risk assessment methodology considers the potential consequence / severity of risks that may be present within soils in comparison with the likelihood of exposure to or and occurrence of said risk.
- 8.0.6 A range of risk classifications are provided within CIRIA 552 further details of which are provided in Table 8.0 below.

Table 8.0: Definition of Risk Class and Consequence.

Risk Class	Definition	Example
Minor	Potential for harm, although not significant, which may result in financial loss to resolve. Ground conditions where the use of PPE would readily mitigate risks posed to human health.	Low level contamination hotspots within made ground / demolition fill materials. Stunted or impeded plant growth due to poor soil quality.
Mild	Pollution of non-sensitive water resources or damage to crops, plant growth, below ground utilities or structures.	Perched groundwater contamination overlying low permeability aquifer or aggressive sulphate concentrations in soils.
Medium	Sources of contamination identified on site have the potential to cause both long and short term health effects on site residents / users. Alternatively (or in conjunction with) sources of contamination may have the potential to impact surface or groundwater quality or impede vegetation growth	Elevated concentrations of hydrocarbon contamination reported within topsoil tested within residential gardens as a result of inadequate or incomplete previous remediation works. Movement of contaminated groundwater from leaking below ground storage tank into adjacent surface water course.
Severe	Sources of contamination pose a credible and acute risk to human health with potential for “Significant Harm” occurring as defined by the Part IIA of the Environmental Protection Act (1990). Alternatively (or in conjunction with risks posed to human health) sources of contamination may pose an immediate risk to controlled water resources or ecosystems.	Grossly contaminated soils are encountered or disturbed during excavation works, causing an immediate release of toxic soil vapour and leachate / contaminated groundwater flow across adjacent land.

- 8.0.7 As previously discussed the contaminated land risk assessment model evaluates both the severity of risks that may be present within soils / groundwaters in the context of threats posed to identified receptors before deriving the actual risk rating based on the probability of occurrence. Table 8.1 (provided overleaf) outlines the range likelihood of risk.

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Table 8.1: Probability Assessment

Classification	Definition
High likelihood	A credible pollutant linkage has been identified and it is very likely contaminants will impact identified receptors in both the short or long term (or is already actively doing so). The potential for harm to be caused is thus highly likely.
Likely	Pollutant linkages between the sources of contamination and identified receptors are present and it is considered likely they will become active given the right set of circumstances (e.g. contaminants currently buried below ground that are likely to be exposed or disturbed during construction / excavation works. The circumstances are such that an event is not inevitable, however, it is possible in the short term and likely over the longer term.
Low likelihood	A theoretical pollutant linkage has been identified that has the potential to exposure receptors to contaminants under the correct circumstances. However, the likelihood of such an event occurring is not a certainty, even in the long term
Unlikely	There is no / minimal likelihood a pollutant linkage would occur, even over the long term.

- 8.0.8 The risk assessment process is a combination of probability and consequence, recognising that it may be possible to have a significant source of contamination beneath a site (such as a large below ground chemical storage tank) that may only present a relatively moderate to low risk (owing to the fact it may be contained within a secure concrete bund). Table 8.2 indicates how the actual nature of risk is established with Table 8.3 illustrating how the risk is interpreted in the context of contaminated land risk assessment.

Table 8.2: Risk Definition

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk
	Likely	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate / Low Risk	Low Risk	Very Low Risk	

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Table 8.3: Description of risks posed

Risk Definition	Description
Very High	Active pollutant linkages between a significant source of contamination and identified receptors have been establish and there is a high likelihood of severe harm occurring to said receptors unless immediate investigation and remediation action is not taken.
High Risk	Harm is likely to arise to receptors from an identified hazard in the short and long term. Urgent investigation of the contaminant issue will be required, and remedial treatment is likely.
Moderate Risk	The possibility of harm has been identified toward receptors under the right circumstances, although the severity of harm would be relatively mild. Further investigation of identified issues would be prudent and possible need for remedial measures in the long term.
Low Risk	It is possible harm could arise to a designated receptor from identified hazard, but it is likely (if realised) any harm would be (at worst) mild.
Very Low Risk	No significant pollutant linkages have been identified and the possibly of harm occurring to receptors is low.

8.0.9 A geo-environmental risk assessment has been completed to quantify the risks posed to identified receptors (as outlined in the preliminary site conceptual model) using the information obtained during site investigation fieldworks. Broadly speaking, this risk assessment process can be divided based on the receptor group in question between:

- 1) Risks posed to human health by soil contamination (both construction persons and future site users).
- 2) Risks posed to human health by hazardous ground gas ingress (both construction persons and future site users).
- 3) Risks posed to controlled waters by soil or groundwater contamination (both surface water features and bedrock aquifers).
- 4) Risks posed to new building construction by aggressive ground conditions (namely elevated sulphate concentrations).

8.0.10 A new learning HUB building and associated landscaping is proposed. Potential exposure pathways exist from the proposed areas of landscaping.

8.0.11 Appropriate assessment have been completed for each of the above utilising the latest statutory and non-statutory guidance documents; for details of risks posed to human health refer to Section 8.1 (soils) and Section 8.2 (ground gas), for details of risks posed to controlled waters refer to Section 8.3 and risks posed to new structures refer to Section 8.4.

8.1 Assessment of Soil Contamination

- 8.1.1 In order to estimate the risks posed to human health from soil contamination, a quantitative risk assessment has been completed utilising the latest Environment Agency CLEA methodology. The assessment utilises the chemical testing results obtained during the site investigation fieldworks to characterise site conditions and facilitate the completion of the risk assessment process.
- 8.1.2 The assessment is based on the comparison of soil chemical testing results with published Environment Agency Category Four Screening Levels (C4SL's) under the proposed end use scenario to determine the sites suitability for use. C4SL values represent the highest acceptable values for contaminants within site soils under the proposed end use and are derived using the Environment Agency CLEA risk assessment methodology. A result in exceedance of a C4SL level may indicate the presence of contaminants within site soils and require further assessment.
- 8.1.3 It is noted only a limited number of C4SL values have been derived by the Environment Agency for use and reference has been made to LQM/CIEH Suitable For Use Values (S4UL's) for a wider range of other contaminants (Heavy Metals, Poly Aromatic Hydrocarbons, TPH, SVOC and VOC's) to increase the depth and robustness of our assessment.
- 8.1.4 Chemical testing results are compared against C4SL and S4UL values for each determinant with any results reported in exceedance of screening criteria identified and their significance reviewed. When determining the significance of any exceedances within the dataset the magnitude and frequency of the exceedance need to be taken into account, for example, a single exceedance of a screening value may be considered a localised hotspot whereas consistently elevated levels of a substance at multiple locations across the site may indicate a more prevalent contamination issue.
- 8.1.5 In addition to this assessment, an Asbestos Identification test (via the visual inspection method) has been completed on all samples of made ground obtained during the investigation to determine risks posed. Any positive occurrences of Asbestos will be subject to quantification analysis to further assess the extent and significance of risks posed.
- 8.1.6 As required, for each exceedance reference will be made to the Conceptual Site Model to establish the most likely source of contaminants and initial commentary given as to the likely scope of remedial measures. In addition, reference will also be made to the assumptions used to derive generic assessment criteria (C4SL and S4UL values) to determine their comparability with the proposed end use.
- 8.1.7 There are no official published soil chemical screening values for schools. Therefore, for the purposes of this assessment we have elected to use the "Residential with Gardens" end use scenario with site specific values considered for any exceedances reported. When reviewing chemical testing data against C4SL / S4UL values; a "worst case" Soil Organic Matter content value of 1% has been assumed for the initial assessment.

Summary and Assessment of Risks Posed by Soil Contamination

- 8.1.8 Results from chemical testing analysis indicate no exceedances by testing criteria when screened against a “residential with gardens” end use criteria.
- 8.1.9 The findings of the above have been used to update the Refined Conceptual Site Model (provided within Section 9.0) as well as inform the scope of any further investigation or remedial works deemed necessary to support the sites development.

8.2 Ground Gas Risk Assessment

- 8.2.1 A ground gas risk assessment was carried out by TerraConsult across the wider MEA site and it was deemed that no gas protection measures were required. Further to this due to the relatively thin layer of made ground and presence of low permeability clay and mudstone beneath the site there is not deemed to be any risk from ground gas.

8.3 Controlled Waters

- 8.3.1 It is understood the site is underlain by a Secondary B Aquifer in the mudstone bedrock and is not said to be located within any Environment Agency Zone source protection zones or in close proximity to sensitive groundwater abstraction boreholes. The nearest surface water feature is indicated 210m to the southwest and is not considered to be at risk of contaminant migration from the study site.
- 8.3.2 Elevated levels of contamination have not been identified during the site investigation. The underlying aquifer and nearby surface water features are not considered to be at risk by mobilised contaminants within site soils.

8.4 Below Ground Concrete Construction

- 8.4.1 Peak potential sulphate concentrations range between 13.0mg/l and 62.5mg/l with soil pH values ranging between 7.5 and 8.1. Based on these results, it is considered that well compacted buried concrete should be designed in accordance with Class DS-1 AC-1 requirements as specified in BRE Digest Special Digest 1:2005 *Concrete in aggressive ground: Version 3*.

8.5 Below Ground Utilities and Service Runs

- 8.5.1 Due to no contamination being identified there is not deemed to be any contamination implications for below ground utilities and service runs.

9.0 Refined Conceptual Site Model

9.0.1 The Environmental Protection Act Part IIA: 1990, defines contamination as land containing levels of contamination which form a risk to human health, controlled waters or other ecosystems. Therefore, contamination in exceedance of the relevant screening values is considered a source. Table 9.0 assesses and summarises the sources, pathways and receptors that may exist at the site;

Table 9.0: Refined Conceptual Site Model

Table 9.0		Preliminary Conceptual Site Model					
Source		Pathway	Receptor	Severity	Probability	Risk definition	Comments
On Site	Current Ground Conditions, including Made Ground	Dermal contact and / or ingestion; inhalation of vapours / dusts	Current Site Users	Minor	Unlikely	Very Low	A review of historical information indicates the site to have been in use as agricultural fields up until and from then until recently has been partially occupied by a single building which has since been demolished. Site investigation have not identified any sources of contamination considered to pose a risk to current site users.
			Construction workers	Minor	Unlikely	Very Low	No sources of contamination were identified during the site investigation works. Whilst unlikely, the presence of as yet unidentified contamination cannot be precluded. It is considered the risks posed to construction personnel, be sources of contamination, can be adequately mitigated against via the use of full PPE and the adoption of good hygiene and site practices. * Appropriate personal ground gas detection equipment should be deployed by all site operatives when working in below ground or confined spaces.
			Future Site Users	Minor	Unlikely	Very Low	The site is to be developed to comprise a new learning HUB building with associated

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Table 9.0		Preliminary Conceptual Site Model					
Source		Pathway	Receptor	Severity	Probability	Risk definition	Comments
On Site							landscaping. Site investigation has not identified any potential sources of contamination that are considered to pose a risk to future site users.
			Ecological	Minor	Unlikely	Very Low	Site investigations have not identified any sources of contamination that are considered to threaten plant health.
	Historical Land Use	Dermal contact and / or ingestion; inhalation of vapours / dusts	Current Site Users	Minor	Unlikely	Very Low	Site investigation has indicated that site soils have not been impacted by past uses.
			Construction workers	Minor	Unlikely	Very Low	It is noted that no sources of contamination were identified during site investigation works. Whilst unlikely, the presence of as yet unidentified contamination cannot be precluded. It is considered the risks posed to construction personnel, be sources of contamination, can be adequately mitigated against via the use of full PPE and the adoption of good hygiene and site practices.* Appropriate personal ground gas detection equipment should be deployed by all site operatives when working in below ground or confined spaces.
			Future Site Users	Minor	Unlikely	Very Low	Site investigation has indicated that site soils have not been impacted by past uses.

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Table 9.0		Preliminary Conceptual Site Model					
Source		Pathway	Receptor	Severity	Probability	Risk definition	Comments
On Site			Ecological	Minor	Unlikely	Very Low	Site investigation has indicated that site soils have not been impacted by past uses.
	Current Ground Conditions	Leaching of contaminated soils & impact beneath site	Controlled Water: Aquifer and nearby surface water features	Minor	Unlikely	Very Low	No sources of contamination have been identified during site investigations that are considered to pose a risk to either underlying aquifers or nearby surface water features.
			Adjacent Sites	Minor	Unlikely	Very Low	No sources of contamination have been noted during site investigations that are considered to pose a risk to adjacent properties.
		Below Ground Service Runs	Below ground infrastructure and construction	Minor	Unlikely	Very Low	Due to no contamination being identified during the site investigation there is not deemed to be any contamination implications for below ground utilities and service runs. Therefore, the use of chemically resistant pipework is not considered warranted. All below ground concrete structures to be designed in accordance with a Class DS-1 AC-1 requirements as specified in BRE Digest Special Digest 1:2005 Concrete in aggressive ground: Version 3.
	Ground Gas Generation	Migration / Accumulation	Current Site Users	Minor	Unlikely	Very Low	A ground gas risk assessment was carried out by TerraConsult across the wider MEA site and it was deemed that no gas protection measures were required. Also given the sites current use site users are not considered at risk from ground gas generation.

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Table 9.0		Preliminary Conceptual Site Model					
Source		Pathway	Receptor	Severity	Probability	Risk definition	Comments
			Construction workers	Minor	Unlikely	Very Low	A ground gas risk assessment was carried out by TerraConsult across the wider MEA site and it was deemed that no gas protection measures were required. Also due to the relatively thin layer of made ground and presence of low permeability clay and mudstone beneath the site there is not deemed to be any risk from ground gas. Nevertheless, it is recommended suitable protection measures are undertaken by construction personnel when working in confined spaces or below ground excavations. Due to greater risk of hazardous gas accumulation within enclosed spaces.
			Future Site Users	Minor	Unlikely	Very Low	A ground gas risk assessment was carried out by TerraConsult across the wider MEA site and it was deemed that no gas protection measures were required.
Off site	Potentially Contaminative Sources; Controlled waters and ground gas generation	Leaching of contaminated soil onto site	Controlled Waters: Aquifer	Minor	Unlikely	Very Low	No areas of likely off-site contaminated soil have been noted in close proximity to the site. Nor was any contamination detected during the site investigation.
			Controlled Waters: Surface Water	Minor	Unlikely	Very Low	No areas of likely off-site contaminated soil have been noted in close proximity to the site. Nor was any contamination detected during the site investigation.
		Ground gas Migration / Accumulation	Construction workers	Minor	Unlikely	Very Low	No areas of likely off-site ground gas generation have been identified in close proximity to the site.
			Future Site Users	Minor	Unlikely	Very Low	
			Proposed development	Minor	Unlikely	Very Low	

*Any sources of contamination uncovered during site development works should be brought to the immediate attention of RoC Consulting for consideration and comment.



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- 9.0.2 The conceptual site model (following completion of investigation works) has failed to reveal any specific sources of contamination that could require specific remedial measures.
- 9.0.3 It is recommended all construction contractors take reasonable precautions to control environmental impacts that may occur as a result of redevelopment works with respect of soil and groundwater quality. These measures should include (and not be limited to):
- 1) Any sources of contamination uncovered during site development works should be brought to the immediate attention of RoC Consulting for consideration and comment. As required, the findings and recommendations of the current assessment may require amendment to reflect changes in site condition.
 - 2) The operation of plant, refuelling facilities and general basement excavation works should include appropriate provision to reduce the risk of leakage / spillage, particularly into the site's groundwater table or exposed natural soils.
 - 3) Appropriate dust mitigation measures should be deployed during basement excavation works, particularly when handling and excavating made ground deposits.
 - 4) All excavated materials stockpiled should be periodically dampened down to control dust release. Similarly, the disposal of any material from site should be completed using covered wagons.

10.0 Geotechnical & Foundation Design Assessment

Background Information

- 10.0.1 It is understood the site is to be redeveloped to comprise a new classroom building with relatively light building and floor slab loadings.
- 10.0.2 Historic ground investigations (TerraConsult 2859/02-1 July 2016) showed the general area to comprise very thin and absent Glacial Till over weathered Bollin Mudstone. Locally there was encountered Made Ground of reworked sandy clay with inclusions of pottery ceramic broken concrete broken brick and mudstone. Where encountered at shallow depth the mudstone was weathered to a stiff light grey mottled yellowish brown slight sandy Clay. The intact slightly weathered mudstone was encountered from a depth in the range 0.85-3.14m.
- 10.0.3 The TerraConsult Continuous Dynamic Sampling borehole have Standard Penetration Tests at 1.0m intervals. The SPTN value (uncorrected) were in the range 11-35. The SPTN values in the mudstone were 50 with incomplete penetration.
- 10.0.4 From the TerraConsult Ground Investigation we have extracted the Water Content and Plasticity Index data from which the assessment of Shrinkage Potential of the Clay and the weathered Mudstone. The plots of the data are included as Figures 10.0 and 10.1 respectively.
- 10.0.5 The ground investigations (TerraConsult 2859/02-1 July 2016) had two trial pits in the general area of the proposed hub development. The trial pits were TP122 and TP123 these were hand excavated to a depth of 0.9m. These show reworked sandy clay with inclusions of pottery ceramic broken concrete broken brick and mudstone, to a depth of 0.6m and 0.7m. The natural soils are described as stiff becoming very stiff light orangish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine-medium mudstone.

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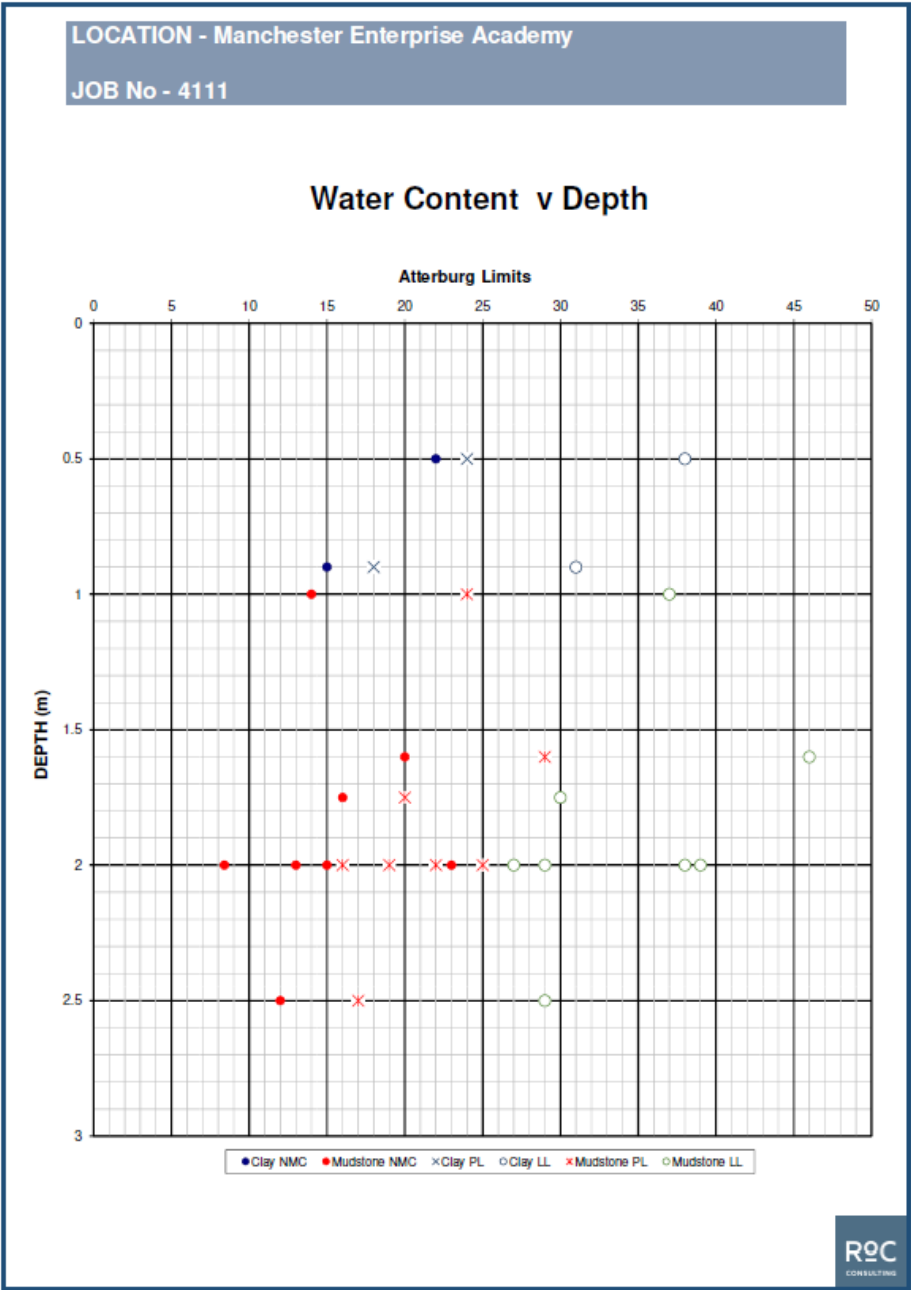


Figure 10.0 Water Content v Depth

10.1 New Building Foundation Design

- 10.1.1 It is not recommended new building foundations be constructed on top of made ground deposits. The variable composition and in situ strength of these materials is such that unacceptable levels of total and differential settlement will occur as a result.
- 10.1.2 The layout plan shows that there is a mature broad-leaved tree in the general locality. Thus, detail will be required to determine the Root Protection Zone or if the tree is to be removed.
- 10.1.3 The ground investigation in this area (both RoC and TerraConsult) show there is a thin Topsoil / Made Ground of clay with anthropogenic inclusions. The TerraConsult investigation showed that at 0.9m the ground encountered was stiff becoming very stiff light orangish brown slightly sandy slightly gravelly CLAY.
- 10.1.4 The Plasticity Indices, see Figure 10.1 below, shows the natural ground Clay to have a Plasticity Index 13-16% and the Mudstone Plasticity Index 13-17% and the soils are in the Low and Intermediate Plasticity.

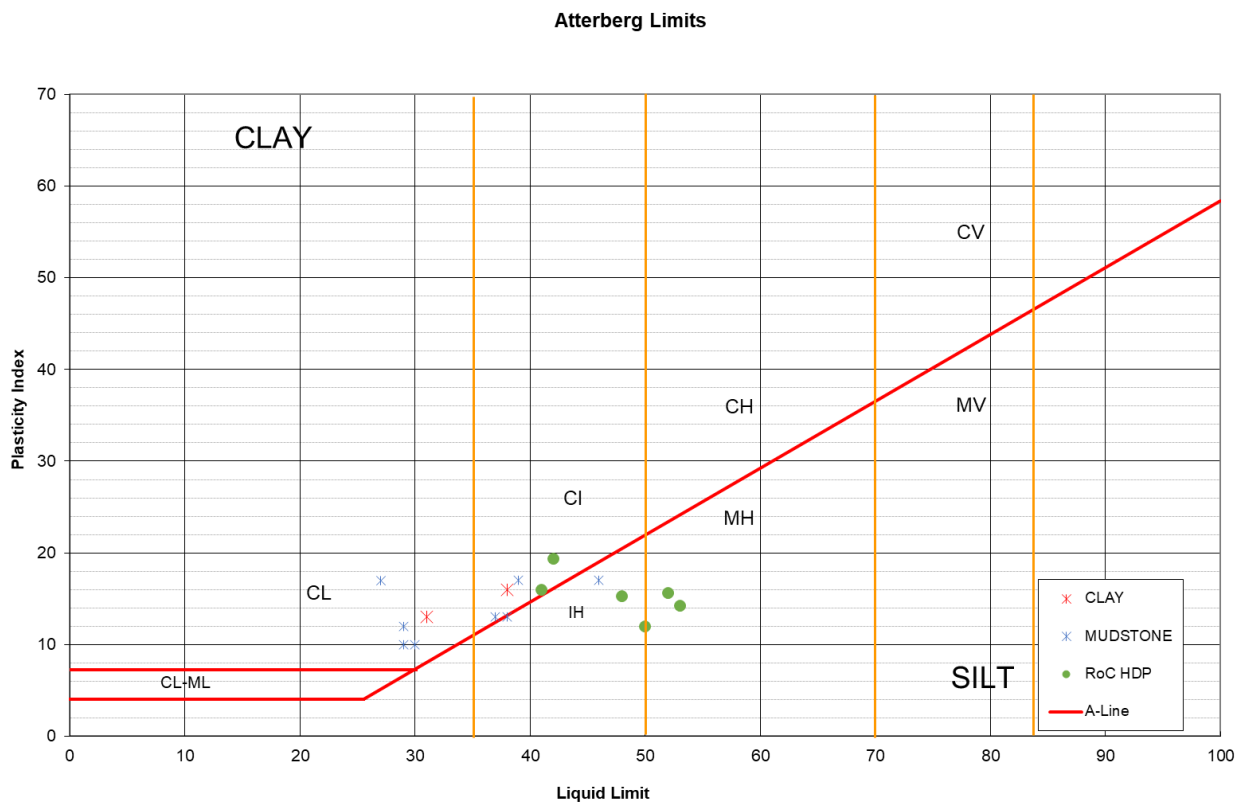


Figure 10.1 Plasticity Indices

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- 10.1.5 The recent Plasticity Indices show that 2 of 6 are Intermediate Plasticity Clay and 4 of 6 are Intermediate Plasticity Silt. The water content of the RoC samples, of shallow depth, are significantly desiccated.
- 10.1.6 Using the NHBC Chapter 4.2.4 Table 1 shows that as the Plasticity Indices are less than 20% the soils are low shrinkage Potential. It will be necessary to adopt a foundation solution that will respect the RPA and the low risk of re-hydration heave should the tree be removed. In at risk areas it is normal to adopt deeper foundations with a slip membrane to prevent heave and adopt a fully suspended floor or compressible slab support systems.
- 10.1.7 With reference to the NHBC guidance the applicable founding depth for Low Shrinkage Potential cohesive subgrade not impacted by trees the minimum founding depth will be 1.0m. However, if the new foundations are in the area of the tree then the founding depth has to be assessed from the tree type, tree size and the relevant plasticity data.
- 10.1.8 A founding depth of 1.0m will encounter the stiff becoming very stiff Clay. At the 1.0m depth, or at a depth required to mitigate the potential for shrinkage of heave, the allowable bearing capacity will be 125kN/m² for strip foundations and 150 kN/m² for isolated pad foundations.
- 10.1.9 Referring to 10.1.6 the floor slab can be ground bearing if there is minimal risk from the impact of the mature tree. If the tree risk is fully mitigated and a suitable granular make up is adopted standard “domestic” ground floor” can be supported. Based on the hand dug pits it is likely that the former topsoil (made ground) will be replaced.
- 10.1.10 Peak potential sulphate concentrations range between 13.0mg/l and 62.5mg/l with soil pH values ranging between 7.5 and 8.1. Based on these results, it is considered that well compacted buried concrete should be designed in accordance with Class DS-1 AC1 requirements as specified in BRE Digest Special Digest 1:2005 Concrete in aggressive ground: Version 3.

10.2 General Comments

- 10.2.1 No entry should be permitted into excavations exceeding 1.2m depth without appropriate risk assessments, shoring and support. Whilst groundwater was not encountered during site investigation works the presence of a perched water table cannot be precluded. Appropriate provisions should be made to dewater excavations as and when required.
- 10.2.2 Similarly it is not recommended foundation excavations to underlying clay be left open and exposed to the elements as rainwater ingress will damage and reduce its strength (and subsequent bearing capacity). Similarly, no vehicular movements should be permitted within exposed foundation locations.

11.0 Conclusions & Recommendations

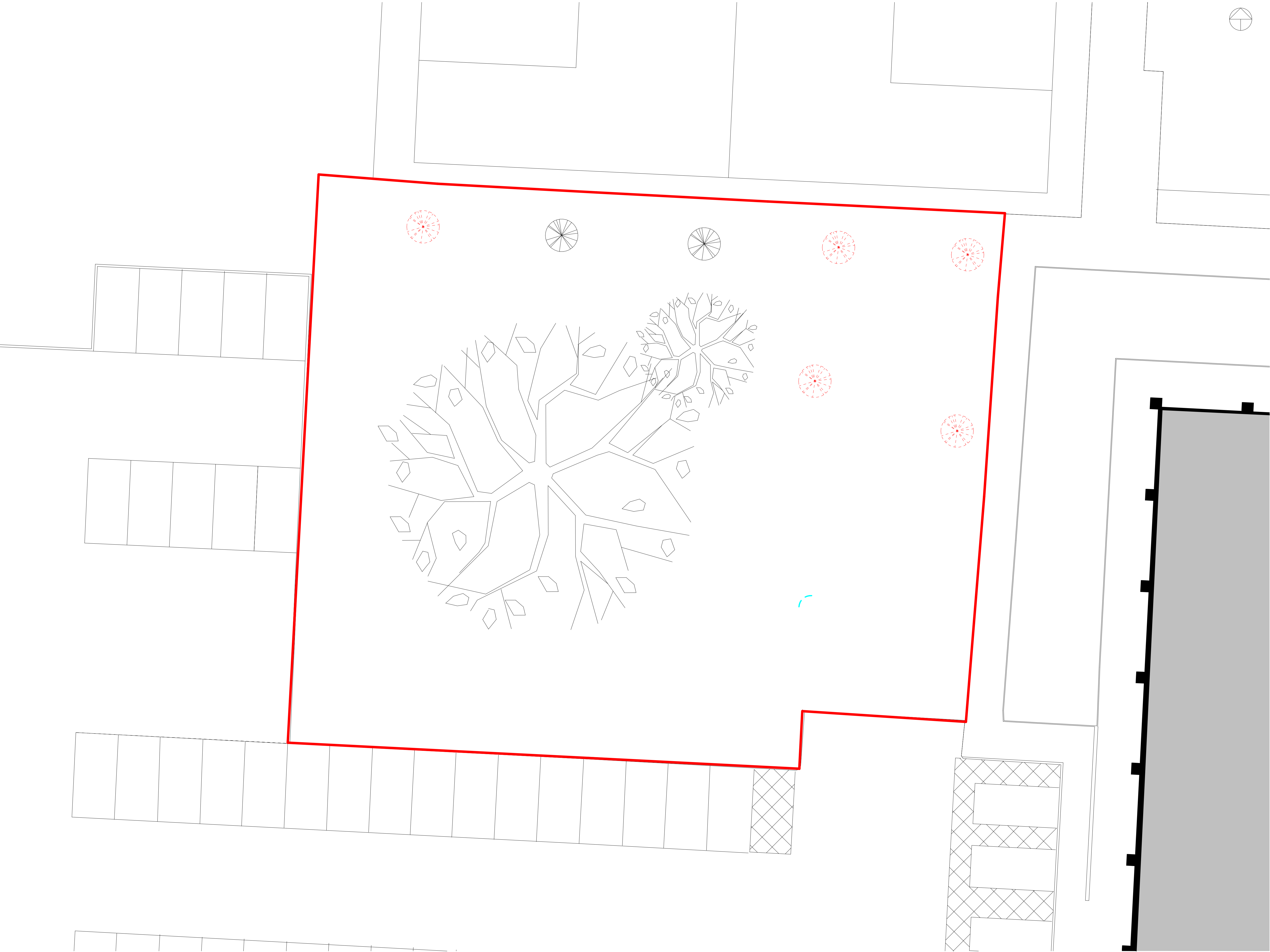
- 11.0.1 The site is to be redeveloped for use as a new learning HUB building with associated soft landscaping.
- 11.0.2 Site investigations have revealed ground conditions to be comprised of a thin surface layer of topsoil underlain by made ground comprised of a sandy gravelly clay to a depth of circa 0.5m below ground level beyond which weathered mudstone deposits are located in the form of a stiff to very stiff orangish brown clay.
- 11.0.3 Chemical assessment of site soils has failed to reveal any sources of soil contamination when compared against a “*residential with gardens*” end use scenario. Due care and attention should be taken at all times when excavating site soils and any suspected sources of contamination identified brought to the immediate attention of RoC Consulting.
- 11.0.4 Using the NHBC Chapter 4.2.4 Table 1 shows that as the Plasticity Indices are less than 20% the soils are low shrinkage Potential. It will be necessary to adopt a foundation solution that will respect the RPA of the tree in close proximity to the proposed development and the low risk of re-hydration heave should the tree be removed. In at risk areas it is normal to adopt deeper foundations with a slip membrane to prevent heave and adopt a fully suspended floor or compressible slab support systems.
- 11.0.5 With reference to the NHBC guidance the applicable founding depth for Low Shrinkage Potential cohesive subgrade not impacted by trees the minimum founding depth will be 1.0m. However, if the new foundations are in the area of the tree then the founding depth has to be assessed from the tree type, tree size and the relevant plasticity data. A founding depth of 1.0m will encounter the stiff becoming very stiff Clay. At the 1.0m depth, or at a depth required to mitigate the potential for shrinkage of heave, the allowable bearing capacity will be 125kN/m² for strip foundations and 150 kN/m² for isolated pad foundations
- 11.0.6 As required, any suspected sources of contamination discovered during the site development (outside those discussed in this report) should be brought to the attention of RoC Consulting and their implications assessed. Depending on the extent and severity, the findings and assessment of the current study may require re-interpretation and a remediation strategy proposed to support the sites development.
- 11.0.7 Copies of the current report should be submitted to the local planning authority for consideration and comment. As required, any feedback received from the local authority should be passed back to RoC Consulting for review.



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APPENDIX A – Existing and Proposed Site Plans

Site Plan - Existing
1 : 100



Notes

The Contractor is to check all dimensions and conditions on site before commencing. Do not scale from this drawing.
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Scale Bars

TO BE USED ONLY AS GUIDANCE

1:100

mm

0

1000

2000

3000

4000

5000

1:200

mm

0

1000

2000

3000

4000

5000

1:500

M

0

10

20

30

40

50

60

70

1:1250

M

0

10

20

30

40

50

60

70

KEY

Application development area

Trees to be removed

Rev	Description	By	Date
Client	Manchester Enterprise Academy		
Job	MEA - The Hub		
Drawing	Existing Site Plan		
Issue	POZZONI	Rev	
Date	03/06/20	Scale	1 : 100 @ A1
By	LY	Approved	JSB AP
Project Status	Planning	Tender	Construction
Design	Contract	As Built	

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P:\MCAD\5601-5650\5606\PAL\Design\Central\5606 The Hub\MODEL-New.rvt
10/07/2020 13:01:23

Site Plan - Proposed
1 : 100



Notes
The Contractor is to check all dimensions and conditions on site before commencing. Do not scale from this drawing.
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Scale Bars		TO BE USED ONLY AS GUIDANCE			
1:100	mm	0	1000	2000	3000
1:200	mm	0	1000	2000	3000
1:500	M	0	10	20	30
1:1250	M	0	10	20	30

KEY:

1. Grass
2. Tarmac
3. Allotments
4. 2.7m high Solid Fence
5. 2.7m high Weldmesh anti-climbing fence

Images below are indicative of drawing



GENERAL NOTES:
Refer to Tree survey for more information

KEY

Application development area

Rev	Description	By	Date
Client	Manchester Enterprise Academy		
Job	MEA - The Hub		
Drawing	Proposed Site Plan		
Issue	5606_8000	Rev	
Date	03/06/20	Scale	1 : 100 @ A1
Design	LY	Approved	AP
Planning	Tender	Construction	
Design	Contract	As Built	

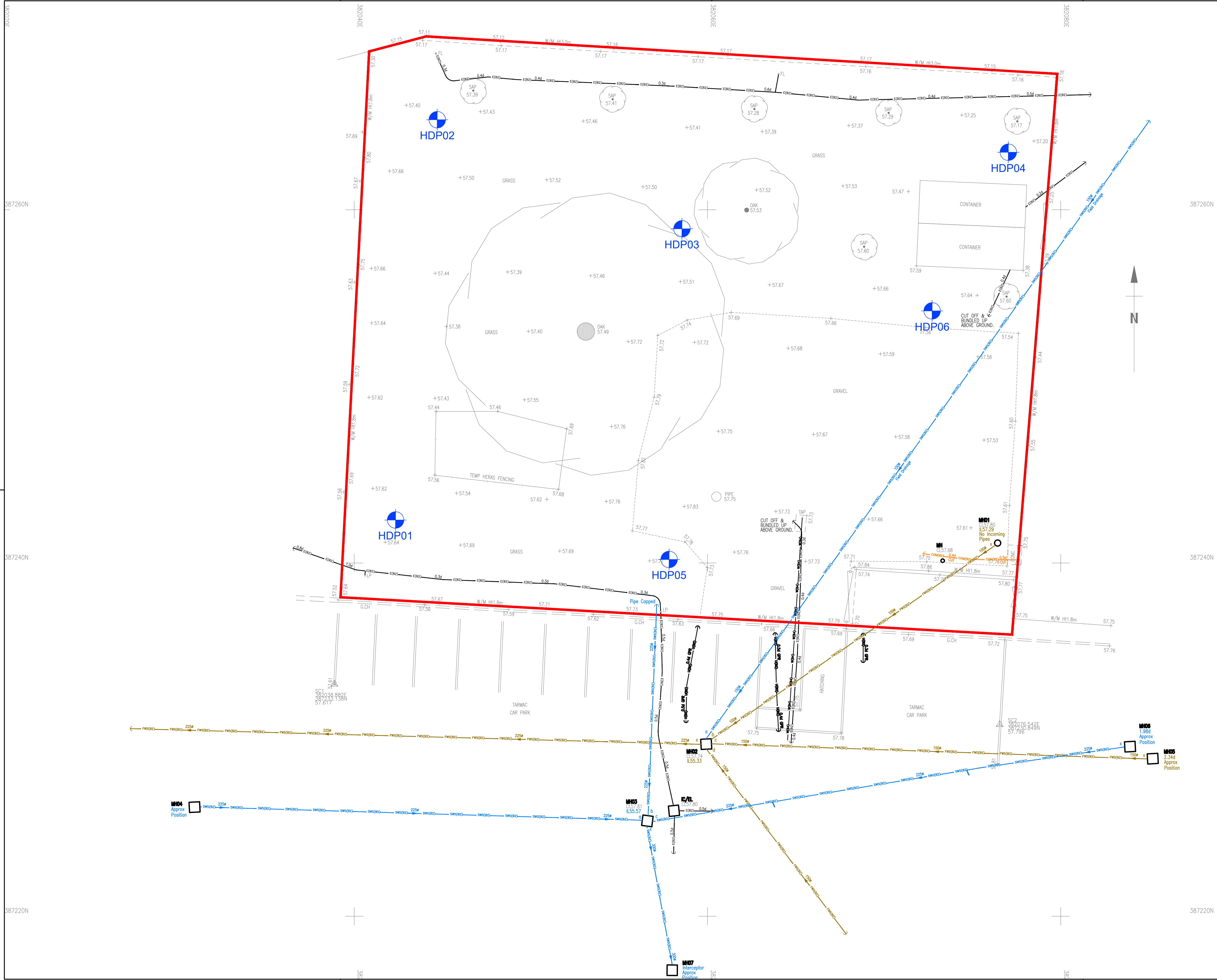
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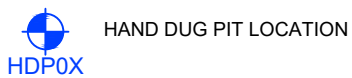
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APPENDIX B – Exploratory Hole Location Plan



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NOTES
ES101 R1 DRAWING NOTES



DRAWING NOTES

- 1) EXPLORATORY HOLE LOCATIONS SHOWN AT APPROXIMATE EXTENTS.
- 2) ROC CONSULTING ACCEPTS NO RESPONSIBILITY FOR ANY DAMAGES OR LOSS ARISING AS A RESULT OF THE USE OF THIS DRAWING

REV	DATE	DETAILS	DRN	CHK
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DRAWING STATUS
INFORMATION

RIBA STAGE

Commercial Wharf
6 Commercial Street
Manchester M15 4PZ
T 0161 214 5390
W rocconsulting.com

DRAWN RM	DATE 30.06.20	SCALES 1:100
CHECKED AS	DATE 30.06.20	THE ABOVE SCALES APPLY WHEN PLOTTED AT 1/1 SCALE -DO NOT SCALE-
APPRVD. AS	DATE 30.06.20	EMAIL FOR DRAWINGS info@rocconsulting.com

CLIENT
**MANCHESTER
ENETERPRISE ACADEMY**

PROJECT TITLE
**PROPOSED TEMPORARY
CLASSROOM
REPLACEMENT BUILDING**

DRAWING TITLE
**SITE INVESTIGATION
HANDPIT LOCATIONS**

PROJECT No. 4111	DRAWING No. ES101	REV. 01
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APPENDIX C – Exploratory Hole Log Sheets

Trial Pit Log

Project Name: Manchester Enterprise Academy				Client: Manchester Enterprise Academy				Date: 16/06/2020			
Location: Wythenshawe				Contractor:				Co-ords: E382042.34 N387242.44			
Project No. : 4111				Crew Name:				Equipment:			
Location Number HDP01		Location Type TP		Level 57.64m AoD		Logged By RM		Scale 1:25		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.10	ES	HVP=24	0.20	57.64		Grass over dark brown sandy slightly gravelly CLAY with frequent roots and rootlets. Gravel fine to medium, subangular to subrounded of brick, mudstone and limestone(TOPSOIL) Brown slightly sandy gravelly CLAY. Gravel fine to medium, subangular to subrounded of brick, limestone and mudstone. (MADE GROUND) End of Borehole at 0.300m			
		0.21			0.30	57.44					
		0.30	D								
Dimensions		Trench Support and Comment				Pumping Data					
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks		Date	Rate	Remarks			
Remarks 1. Location scanned for services prior to excavation. 2. Groundwater was not observed. 3. Upon completion exploratory hole backfilled with arisings.											

Trial Pit Log

Project Name: Manchester Enterprise Academy		Client: Manchester Enterprise Academy		Date: 16/06/2020	
Location: Wythenshawe		Contractor:		Co-ords: E382044.70 N387265.10	
Project No. : 4111		Crew Name:		Equipment:	
Location Number HDP02	Location Type TP	Level 57.40m AoD	Logged By RM	Scale 1:25	Page Number Sheet 1 of 1

[illegible]

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

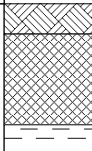
Remarks

1. Location scanned for services prior to excavation. 2. Groundwater was not observed. 3. Upon completion exploratory hole backfilled with arisings.



Trial Pit Log

Project Name: Manchester Enterprise Academy		Client: Manchester Enterprise Academy		Date: 16/06/2020	
Location: Wythenshawe		Contractor:		Co-ords: E382056.31 N387262.22	
Project No. : 4111		Crew Name:		Equipment:	
Location Number HDP03	Location Type TP	Level 57.50m AoD	Logged By RM	Scale 1:25	Page Number Sheet 1 of 1

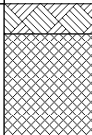
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES	HVP=64	0.10	57.50	 	Grass over dark brown sandy slightly gravelly CLAY with frequent roots and rootlets. Gravel fine to medium, subangular to subrounded of brick, limestone and mudstone. (TOPSOIL)	1
		0.20							
		0.40	D		0.40	57.40		Brown slightly sandy slightly gravelly CLAY. Gravel fine to medium sub rounded to angular of brick, limestone and mudstone. (MADE GROUND)	
					0.50	57.10		Very stiff orangish brown CLAY (WEATHERED BOLLIN MUDSTONE MEMBER) End of Borehole at 0.500m	
									2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks
 1. Location scanned for services prior to excavation. 2. Groundwater was not observed. 3. Upon completion exploratory hole backfilled with arisings.

Trial Pit Log

Project Name: Manchester Enterprise Academy		Client: Manchester Enterprise Academy		Date: 16/06/2020	
Location: Wythenshawe		Contractor:		Co-ords: E382077.03 N387263.26	
Project No. : 4111		Crew Name:		Equipment:	
Location Number HDP04	Location Type TP	Level 57.20m AoD	Logged By RM	Scale 1:25	Page Number Sheet 1 of 1

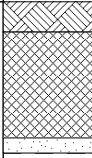
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES	HVP=62	0.10	57.20		Grass over dark brown sandy slightly gravelly CLAY with frequent roots and rootlets. Gravel fine to medium, subangular to subrounded of brick, limestone and mudstone. (TOPSOIL)	1
		0.45	D		0.45	57.10		Brown slightly sandy slightly gravelly CLAY. Gravel fine to medium sub rounded to angular of brick, limestone and mudstone. (MADE GROUND)	
		0.45			0.55	56.75		...slate cobble	
								Stiff orangish brown CLAY (BOLLIN MUDSTONE MEMBER)	
							End of Borehole at 0.550m		5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks
 1. Location scanned for services prior to excavation. 2. Groundwater was not observed. 3. Upon completion exploratory hole backfilled with arisings.

Trial Pit Log

Project Name: Manchester Enterprise Academy		Client: Manchester Enterprise Academy		Date: 16/06/2020	
Location: Wythenshawe		Contractor:		Co-ords: E382053.87 N387241.98	
Project No. : 4111		Crew Name:		Equipment:	
Location Number HDP05	Location Type TP	Level 57.69m AoD	Logged By RM	Scale 1:25	Page Number Sheet 1 of 1

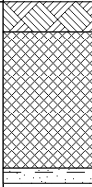
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.25	D ES	HVP=61	0.10	57.69		Grass over dark brown sandy slightly gravelly CLAY with frequent roots and rootlets. Gravel fine to medium, subangular to subrounded of brick, limestone and mudstone. (TOPSOIL)	1
		0.30						Brown slightly sandy slightly gravelly CLAY. Gravel fine to medium, subangular to subrounded of mudstone + limestone (MADE GROUND)	
		0.40			0.45	57.59		Stiff orangish brown slightly sandy CLAY (BOLLIN MUDSTONE MEMBER)	
		0.50		HVP=54	0.50	57.24		End of Borehole at 0.500m	
									2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks
 1. Location scanned for services prior to excavation. 2. Groundwater was not observed. 3. Upon completion exploratory hole backfilled with arisings.

Trial Pit Log

Project Name: Manchester Enterprise Academy		Client: Manchester Enterprise Academy		Date: 16/06/2020	
Location: Wythenshawe		Contractor:		Co-ords: E382073.03 N387255.06	
Project No. : 4111		Crew Name:		Equipment:	
Location Number HDP06	Location Type TP	Level 57.64m AoD	Logged By RM	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	57.64		Grass over dark brown sandy slightly gravelly CLAY with frequent roots and rootlets. Gravel fine to medium, subangular to subrounded of brick, limestone and mudstone. (TOPSOIL)	1
		0.30	ES						
		0.40		HVP=54				Brown slightly sandy slightly gravelly CLAY. Gravel fine to medium, subangular to subrounded of mudstone + limestone (MADE GROUND)	
		0.50	D						
		0.55			0.55	57.54		Orangish brown slightly sandy CLAY (BOLLIN MUDSTONE MEMBER)	2
		0.60			0.60	57.09		End of Borehole at 0.600m	
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks
 1. Location scanned for services prior to excavation. 2. Groundwater was not observed. 3. Upon completion exploratory hole backfilled with arisings.



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APPENDIX D – Chemical Testing Results

**Reece McGuinness**

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Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 20-14777

Project / Site name:	MEA Academy	Samples received on:	17/06/2020
Your job number:	4111	Sample instructed/ Analysis started on:	17/06/2020
Your order number:	1537	Analysis completed by:	26/06/2020
Report Issue Number:	1	Report issued on:	26/06/2020
Samples Analysed:	6 soil samples		

Signed: *A. Czerwińska*

Agnieszka Czerwińska

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

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

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

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

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

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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: 20-14777

Project / Site name: MEA Academy

Your Order No: 1537

Lab Sample Number	1537222	1537223	1537224	1537225	1537226
Sample Reference	HDP01	HDP02	HDP03	HDP04	HDP05
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.10	0.10	0.20	0.20	0.40
Date Sampled	16/06/2020	16/06/2020	16/06/2020	16/06/2020	16/06/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	11
Total mass of sample received	kg	0.001	NONE	1.3	1.3

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.7	8.0	7.7	7.5	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	%	0.005	MCERTS	0.058	0.066	0.051	0.059	0.051
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	36	120	26	24	95
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.018	0.063	0.013	0.012	0.047
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	18.1	62.5	13.0	11.9	47.3
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.031	0.029	0.031	0.028	0.023

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.86	0.41	0.23	0.60	0.43
Anthracene	mg/kg	0.05	MCERTS	0.16	< 0.05	< 0.05	0.16	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.3	0.65	0.43	0.79	0.66
Pyrene	mg/kg	0.05	MCERTS	1.3	0.63	0.44	0.80	0.67
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.97	0.53	0.37	0.66	0.49
Chrysene	mg/kg	0.05	MCERTS	0.56	0.31	0.22	0.43	0.30
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.81	0.49	0.36	0.62	0.41
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.39	0.26	0.21	0.31	0.23
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.92	0.54	0.38	0.66	0.44
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.43	0.30	0.22	0.38	0.22
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.54	0.35	0.27	0.45	0.30

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	8.23	4.47	3.13	5.86	4.15
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	2.5	2.0	2.2	2.6	2.1
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	13	14	15	14
Barium (aqua regia extractable)	mg/kg	1	MCERTS	150	110	110	100	110
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.97	0.87	0.82	0.84	0.84
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.9	0.7	1.2	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2	0.3	0.2	0.2	0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	23	24	22	22	23
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	24	23	22	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	42	32	30	32	31
Lead (aqua regia extractable)	mg/kg	1	MCERTS	69	60	60	64	63
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.5	0.9	0.9	1.1	0.8
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	0.41	< 0.25	< 0.25	< 0.25	< 0.25
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	17	18	18	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	2.3
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	29	26	26	26	29
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	76	78	74	80	80



4041



Environmental Science

Analytical Report Number: 20-14777

Project / Site name: MEA Academy

Your Order No: 1537

Lab Sample Number				1537227				
Sample Reference				HDP06				
Sample Number				None Supplied				
Depth (m)				0.30				
Date Sampled				16/06/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	9.4				
Total mass of sample received	kg	0.001	NONE	1.3				

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

pH - Automated	pH Units	N/A	MCERTS	8.1				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Free Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO ₄	%	0.005	MCERTS	0.041				
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	38				
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.019				
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	19.2				
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.027				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
----------------------------	-------	---	--------	-------	--	--	--	--

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	0.83				
Anthracene	mg/kg	0.05	MCERTS	0.22				
Fluoranthene	mg/kg	0.05	MCERTS	1.0				
Pyrene	mg/kg	0.05	MCERTS	1.0				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.78				
Chrysene	mg/kg	0.05	MCERTS	0.48				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.69				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.33				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.76				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.44				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.43				

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	7.02				
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	2.5				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	100				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.84				
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	23				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	37				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	66				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.0				
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	< 0.25				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	28				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	86				



Analytical Report Number : 20-14777

Project / Site name: MEA Academy

* 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 *
1537222	HDP01	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
1537223	HDP02	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
1537224	HDP03	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1537225	HDP04	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1537226	HDP05	None Supplied	0.40	Brown loam and clay with gravel and vegetation.
1537227	HDP06	None Supplied	0.30	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 20-14777

Project / Site name: MEA Academy

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

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 disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	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
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS

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

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

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



COMPLEX CHALLENGES ...
MADE SIMPLE

APPENDIX E – Geotechnical Testing Results



TEST CERTIFICATE

Liquid and Plastic Limits

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



4041

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

Client: ROC Consulting Ltd
Client Address: Commercial Wharf, 6 Commercial Street,
Castlefield, Manchester,
M15 4PZ
Contact: Reece McGuinness
Site Address: MEA ACADEMY

Client Reference: 4111
Job Number: 20-15347
Date Sampled: 16/06/2020
Date Received: 17/06/2020
Date Tested: 27/06/2020
Sampled By: Not Given

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

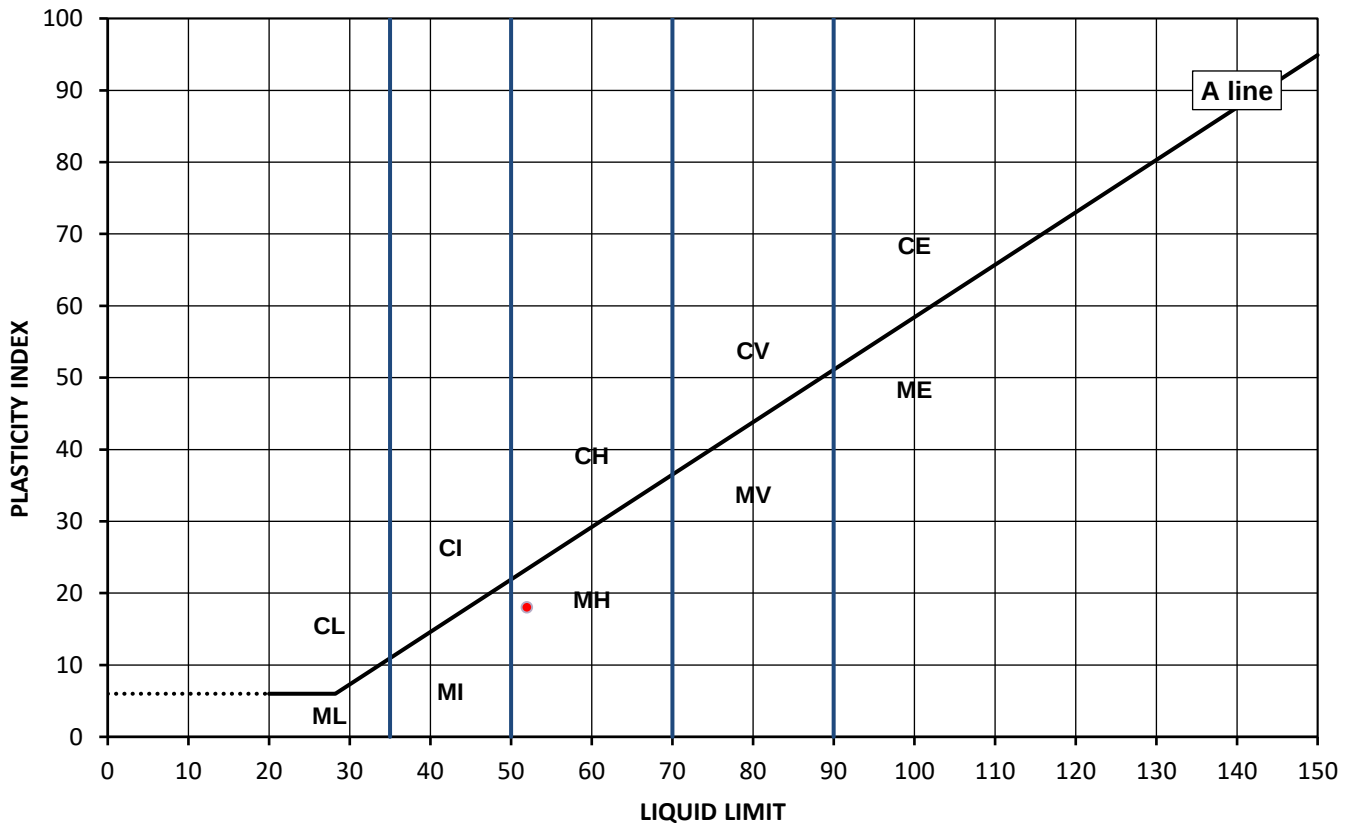
Test Results:

Laboratory Reference: 1540214
Hole No.: HDP01
Sample Reference: Not Given
Soil Description: Greyish brown slightly gravelly TOPSOIL

Depth Top [m]: 0.30
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
14	52	34	18	87



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	below 35
		I	35 to 50
		H	50 to 70
		V	70 to 90
		E	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

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

Remarks:

Signed:

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

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Northampton NN4 7EB



Environmental Science

4041

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Client: ROC Consulting Ltd
Client Address: Commercial Wharf, 6 Commercial Street,
Castlefield, Manchester,
M15 4PZ
Contact: Reece McGuinness
Site Address: MEA ACADEMY

Client Reference: 4111
Job Number: 20-15347
Date Sampled: 16/06/2020
Date Received: 17/06/2020
Date Tested: 27/06/2020
Sampled By: Not Given

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

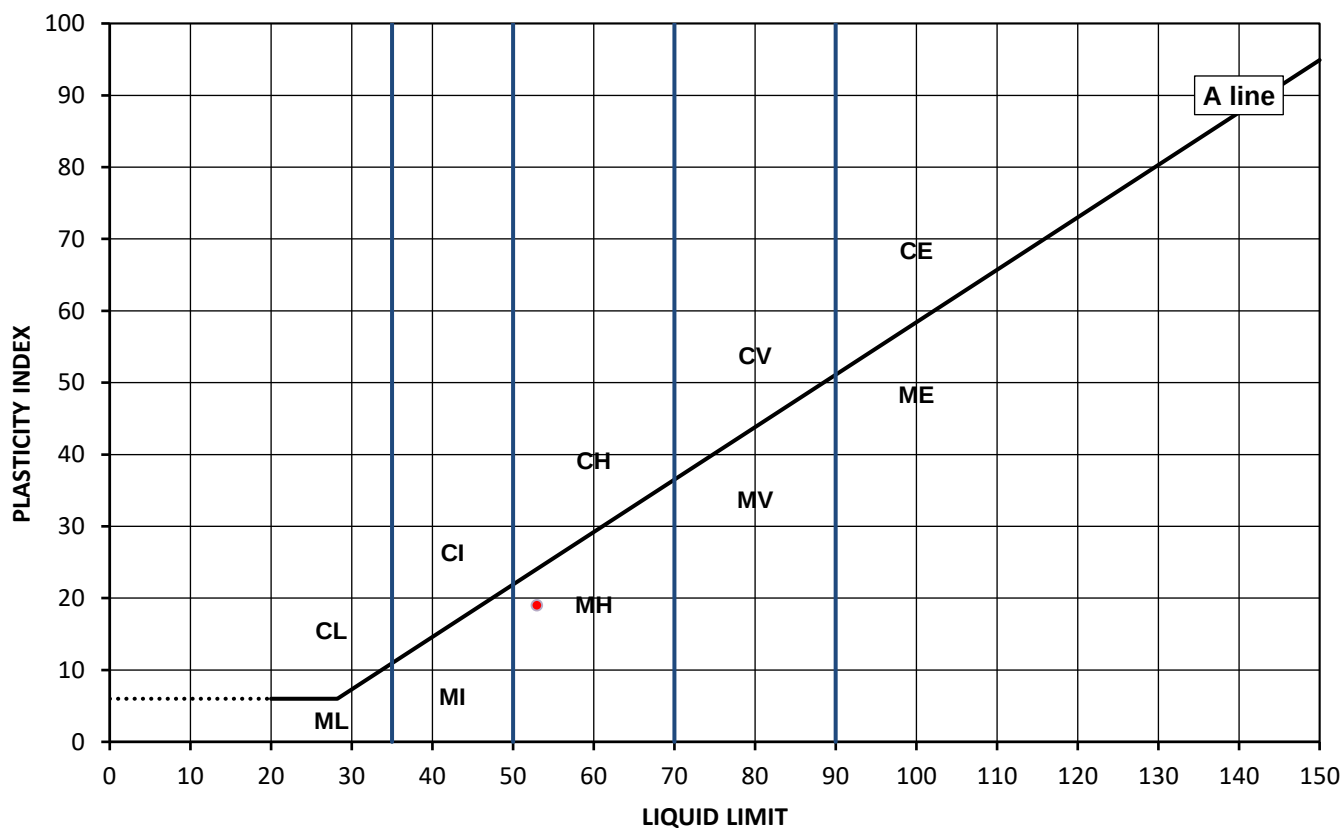
Test Results:

Laboratory Reference: 1540215
Hole No.: HDP02
Sample Reference: Not Given
Soil Description: Greyish brown slightly gravelly TOPSOIL

Depth Top [m]: 0.30
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
16	53	34	19	75



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	below 35
		I	35 to 50
		H	50 to 70
		V	70 to 90
		E	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

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

Remarks:

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Date Reported: 30/06/2020

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TEST CERTIFICATE

Liquid and Plastic Limits

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Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



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Client: ROC Consulting Ltd
Client Address: Commercial Wharf, 6 Commercial Street,
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Date Sampled: 16/06/2020
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Sampled By: Not Given

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

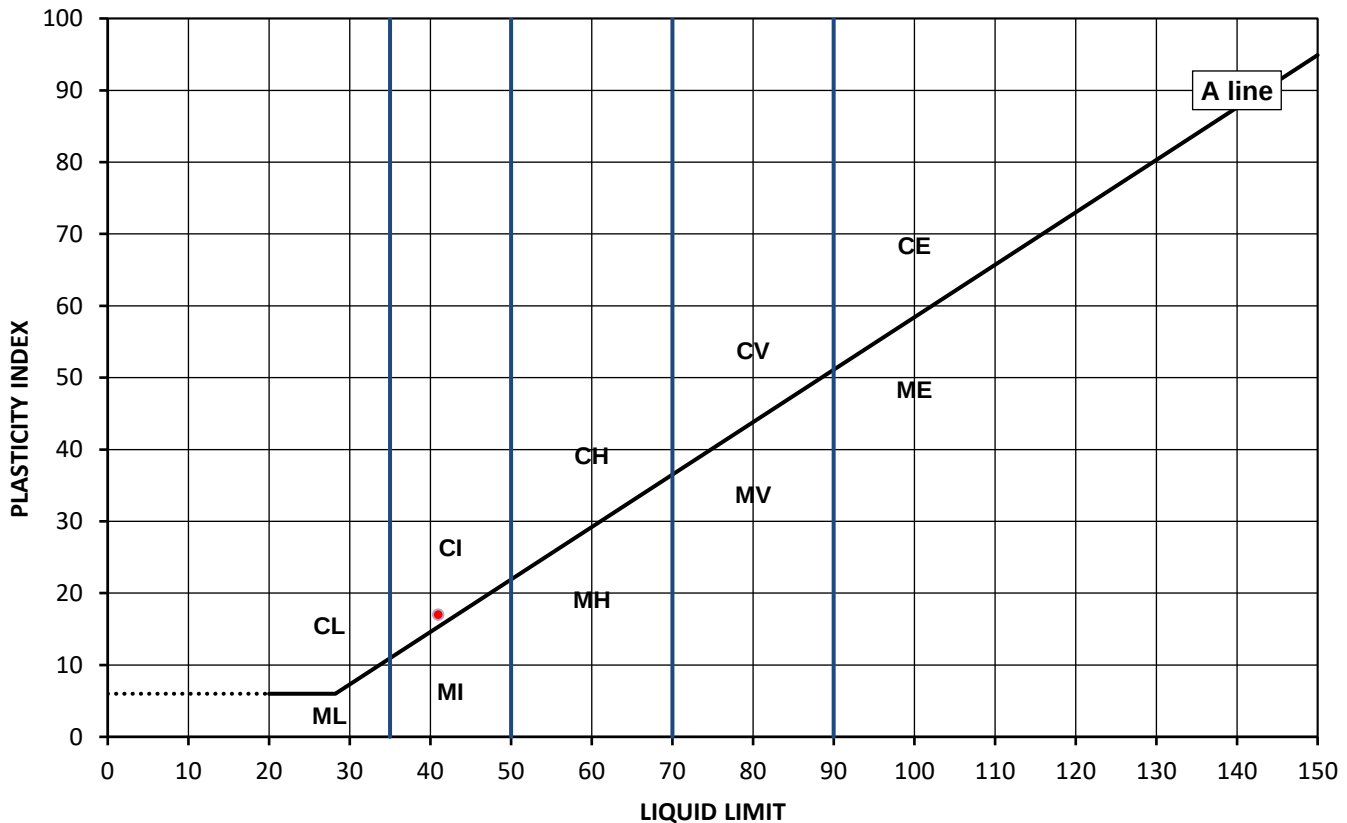
Test Results:

Laboratory Reference: 1540216
Hole No.: HDP03
Sample Reference: Not Given
Soil Description: Greyish brown slightly gravelly TOPSOIL

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

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
17	41	24	17	94



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	below 35
		I	35 to 50
		H	50 to 70
		V	70 to 90
		E	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

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

Remarks:

Signed:

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Liquid and Plastic Limits

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Northampton NN4 7EB



4041

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

Client: ROC Consulting Ltd
Client Address: Commercial Wharf, 6 Commercial Street,
Castlefield, Manchester,
M15 4PZ
Contact: Reece McGuinness
Site Address: MEA ACADEMY

Client Reference: 4111
Job Number: 20-15347
Date Sampled: 16/06/2020
Date Received: 17/06/2020
Date Tested: 27/06/2020
Sampled By: Not Given

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

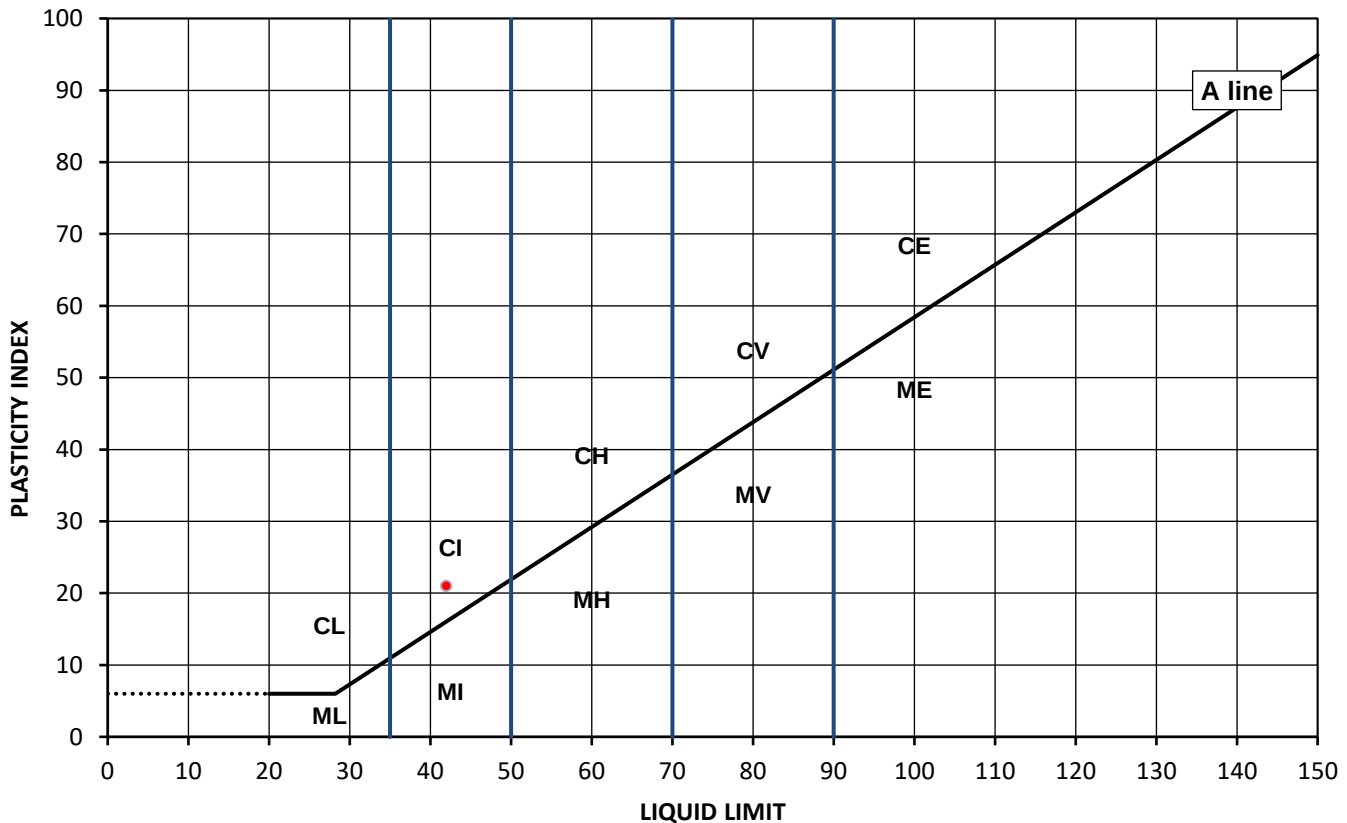
Test Results:

Laboratory Reference: 1540217
Hole No.: HDP04
Sample Reference: Not Given
Soil Description: Greyish brown slightly gravelly TOPSOIL

Depth Top [m]: 0.45
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
16	42	21	21	92



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	below 35
		I	35 to 50
		H	50 to 70
		V	70 to 90
		E	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

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

Remarks:

Signed:

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for and on behalf of i2 Analytical Ltd

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Liquid and Plastic Limits

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Northampton NN4 7EB



Environmental Science

4041

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Client: ROC Consulting Ltd
Client Address: Commercial Wharf, 6 Commercial Street,
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M15 4PZ
Contact: Reece McGuinness
Site Address: MEA ACADEMY

Client Reference: 4111
Job Number: 20-15347
Date Sampled: 16/06/2020
Date Received: 17/06/2020
Date Tested: 27/06/2020
Sampled By: Not Given

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

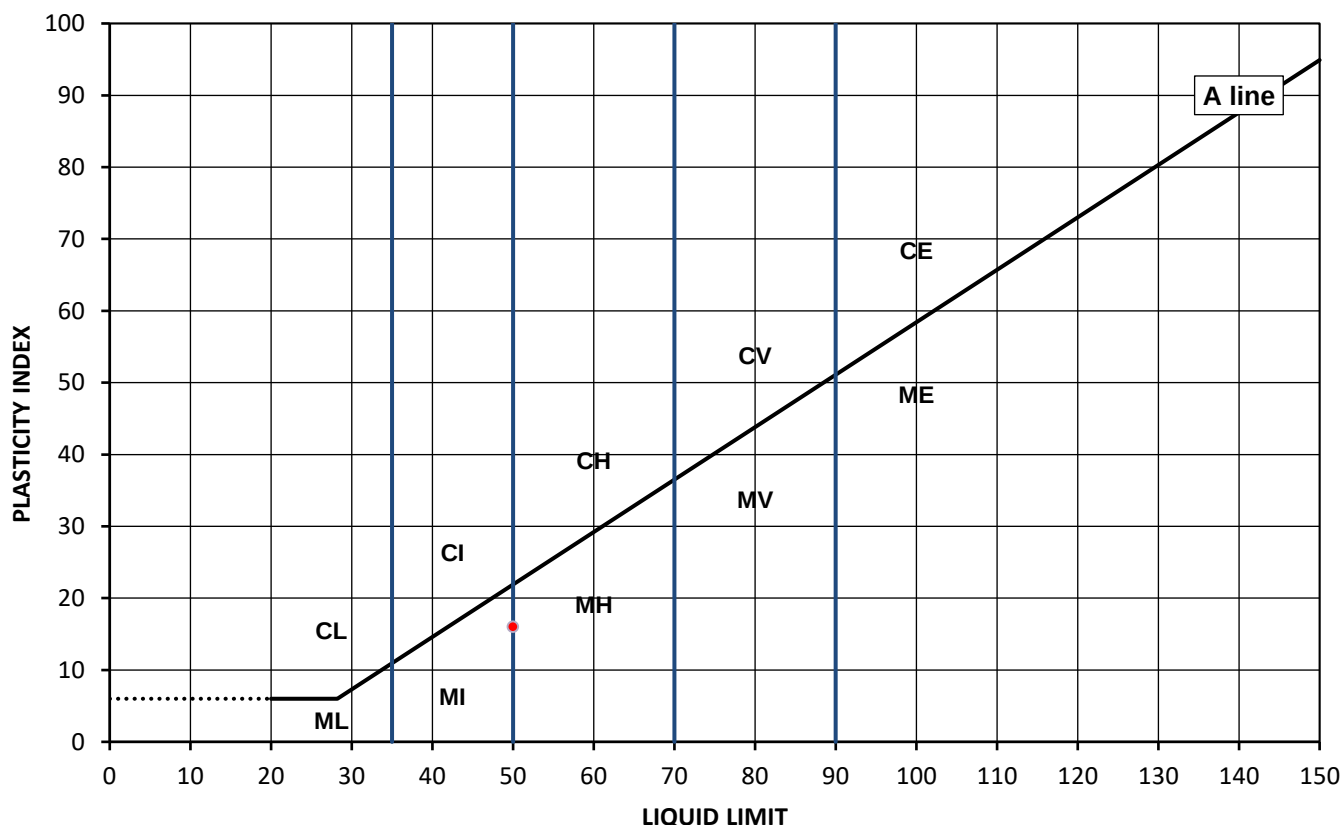
Test Results:

Laboratory Reference: 1540218
Hole No.: HDP05
Sample Reference: Not Given
Soil Description: Greyish brown slightly gravelly TOPSOIL

Depth Top [m]: 0.30
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
15	50	34	16	75



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	below 35
		I	35 to 50
		H	50 to 70
		V	70 to 90
		E	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

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

Remarks:

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TEST CERTIFICATE

Liquid and Plastic Limits

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Environmental Science

4041

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Sampled By: Not Given

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

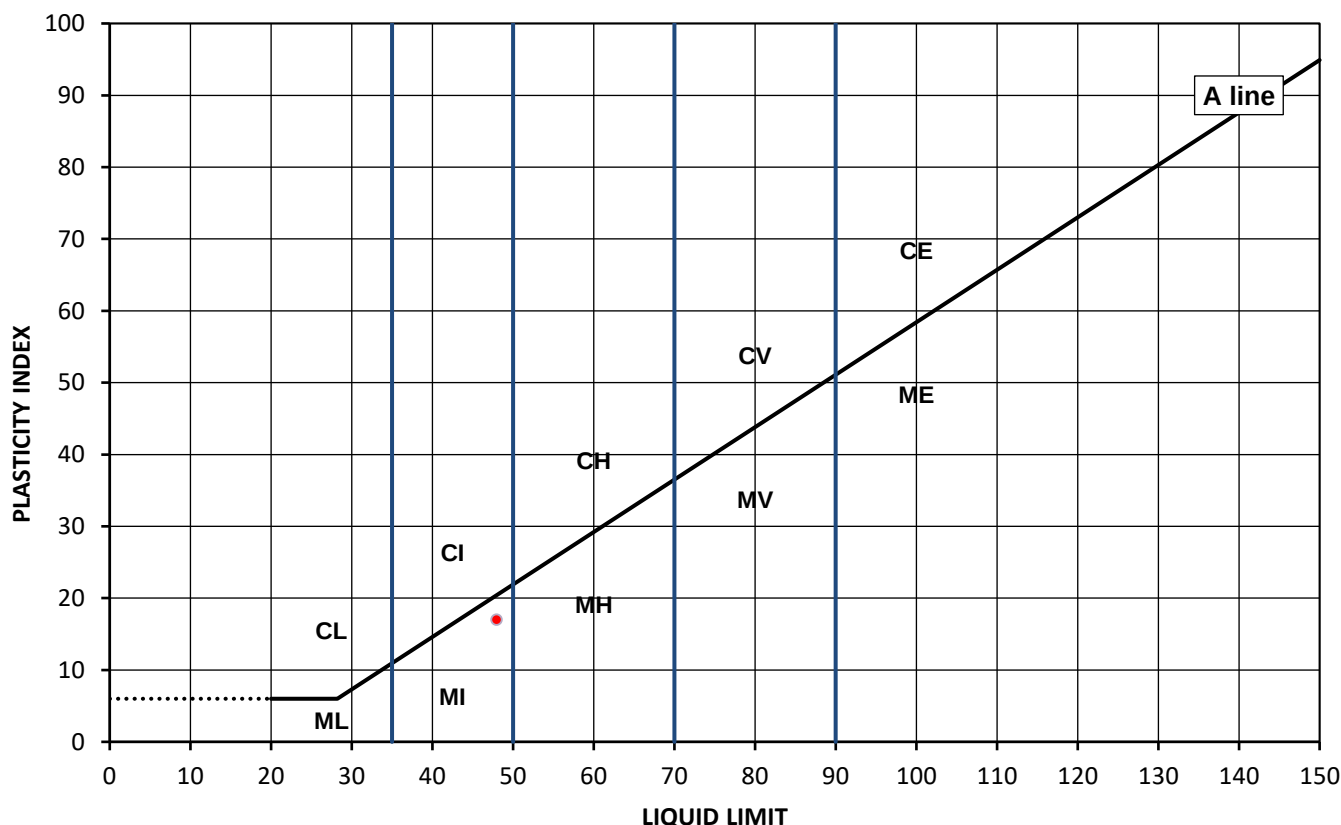
Test Results:

Laboratory Reference: 1540219
Hole No.: HDP06
Sample Reference: Not Given
Soil Description: Greyish brown slightly gravelly TOPSOIL

Depth Top [m]: 0.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
18	48	31	17	90



Legend, based on BS 5930:2015 Code of practice for site investigations

C	Clay	Plasticity	Liquid Limit
M	Silt	L	below 35
		I	35 to 50
		H	50 to 70
		V	70 to 90
		E	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)

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

Remarks:

Signed:

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Szczepan Bielatowicz

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



SUMMARY REPORT

Summary of Classification Test Results

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



Tested in Accordance with:

Client: ROC Consulting Ltd
Client Address: Commercial Wharf, 6 Commercial Street,
Castlefield, Manchester,
M15 4PZ
Contact: Reece McGuinness
Site Address: MEA ACADEMY

MC by BS 1377-2: 1990: Clause 3.2; WC by BS EN 17892-1: 2014; Atterberg
by BS 1377-2: 1990: Clause 4.3, Clause 4.4 and 5; PD by BS 1377-2: 1990:
Clause 8.2

Client Reference: 4111
Job Number: 20-15347
Date Sampled: 16/06/2020
Date Received: 17/06/2020
Date Tested: 27/06/2020
Sampled By: Not Given

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC	WC	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	LL	PL	PI	bulk	dry	PD			
			m	m															
1540214	HDP01	Not Given	0.30	Not Given	D	Greyish brown slightly gravelly TOPSOIL	Atterberg 1 Point	14		87	52	34	18						
1540215	HDP02	Not Given	0.30	Not Given	D	Greyish brown slightly gravelly TOPSOIL	Atterberg 1 Point	16		75	53	34	19						
1540216	HDP03	Not Given	0.40	Not Given	D	Greyish brown slightly gravelly TOPSOIL	Atterberg 1 Point	17		94	41	24	17						
1540217	HDP04	Not Given	0.45	Not Given	D	Greyish brown slightly gravelly TOPSOIL	Atterberg 1 Point	16		92	42	21	21						
1540218	HDP05	Not Given	0.30	Not Given	D	Greyish brown slightly gravelly TOPSOIL	Atterberg 1 Point	15		75	50	34	16						
1540219	HDP06	Not Given	0.50	Not Given	D	Greyish brown slightly gravelly TOPSOIL	Atterberg 1 Point	18		90	48	31	17						

Note: # Non accredited; NP - Non plastic

Comments:

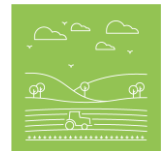
Signed:

Szczepan Bielatowicz
PL Deputy of Head of Geotechnical Section
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