

Hangar 4, Manchester Airport

Ground Investigation Report





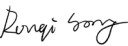
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Ground Investigation Report

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EXECUTIVE SUMMARY

Brief	Tetra Tech was commissioned by Threadneedle Curtis Limited to produce a Ground Investigation Report for Hangar 4 at Manchester Airport.
The Site	The site is located between Wilmslow Old Road, Avro Way and Pinfold Lane. It comprises of a former aircraft hangar which recently served as a vehicle repair depot for the airport with areas of concrete and macadam hardstanding.
Proposed Development	The proposed development for the site is 92,000ft ² distribution centre with an external service yard and car parking in the surrounding areas.
Phase 1 Risk Assessment	This report should be read in conjunction with the Geo-Environmental Desk Study Assessment for Hangar 4 Manchester Airport prepared by Tetra Tech on behalf of Threadneedle Curtis Limited Reference 784-B041631 and dated February 2023.
Ground Investigation	<p>The completed ground investigation works are as follows:</p> <ul style="list-style-type: none"> • 2 No. days concrete coring to penetrate concrete hardstanding prior to hand dug inspection pits to 1.2m bgl. • 5 No. window sample boreholes to allow environmental sampling and in-situ geotechnical testing, located for general site coverage and targeting any specific risk areas identified by the desk study. • 3 No. cable percussive boreholes to a maximum depth of 11.00m bgl to prove bedrock and provide geotechnical information for design of foundations. • 2 No. Rotary boreholes (CP04/CP05) with dynamic sampling to a nominal depth followed by rotary coring to a maximum depth of 15.80m bgl to provide geotechnical information for foundation design. • 5 No. 50mm dia. HDPE dual purpose ground-gas and groundwater monitoring installations with headworks and lockable flush covers. • 1 No. day of in-situ dynamic penetrometer (DP) tests to derive California Baring Ratio (CBR) values. • Full time supervision by an experienced Tetra Tech engineer who logged strata and collected soil samples. • Soil and rock chemical laboratory analysis and geotechnical laboratory testing • 4 No. post fieldwork gas and groundwater monitoring visits.
Ground Conditions	<p>Made Ground, both granular and cohesive in nature, was proven across site to depths between 0.60m and 3.10m bgl overlying superficial deposits of Glacial Till and sand and gravels up to 8.38m thick which in turn overlie mudstone bedrock.</p> <p>Bedrock was proven at variable depth, shallower in the north from 2.25m bgl to 4.60m bgl and deeper in the south between 8.00m bgl to 9.00m bgl. Bedrock was cored at two locations from a minimum depth of 9.60m bgl (CP04) to a maximum depth of 15.80m bgl (CP05) and recorded as Mudstone</p>
Soil Contamination Assessment	<p>Contaminated Soils. No elevated levels of contaminants were identified against commercial GAC. The proposed development will introduce significant hardstanding and building cover so remove the pathway of direct exposure to soils to future site users. Given the site's former landuse and history there is potential for contamination to be present in untested areas on the site.</p> <p>Asbestos. No asbestos containing materials were visually identified in the soils during the investigation and fibres were not detected within the soil samples screened in the</p>

	<p>laboratory. Given the age of the current development, it is possible that asbestos is present in Made Ground between investigation locations. Galbestos was identified within the current building.</p> <p>Water Pipes. Laboratory testing of the Made Ground does not indicate contaminations present that would prevent the use of standard PVC water supply pipes although a watching brief during installation should be maintained and any unsuitable ground removed from the pipe route.</p>
Waste Characterisation Assessment and Materials Management	<p>All tested samples have been subject to waste classification using HazWasteOnline and are non-hazardous.</p> <p>It is the responsibility of the contractor, as waste producer, to classify the waste and to identify a suitable waste disposal facility based on the chemical composition of the material. Further testing and analysis, including Waste Acceptance Criteria (WAC) testing, may be required on the actual soil arisings which constitute the waste prior to disposal at landfill or reclassification as suitable for an inert facility.</p> <p>If site-won material is to be re-used on site or exported from site, or soils other than primary aggregate or aggregates produced under the WRAP Protocol are to be imported to site, a Materials Management Plan will be required, signed off by a Qualified Person.</p>
Ground Gas Assessment	<p>No elevated ground gas concentrations were encountered during monitoring. The development is classified as CS1 in line with CIRIA guidance and no special precautions with respect to gas required. It is recommended that borehole installations are decommissioned prior to development.</p>
Material Properties	<p>Material parameters have been derived for the various strata, these should be reviewed when loadings and settlement tolerances are known.</p>
Assessment of Ground Aggressivity	<p>A conservative concrete classification, based on a worst case for bedrock, has been adopted and describes a Design Sulphate Class of DS-3 and ACEC Class of AC-3 should be adopted for buried concrete at the site.</p>
Preliminary Engineering Assessment	<p>Based on the anticipated design and settlement tolerances anticipated and in conjunction with the nature of the underlying strata, thickness of the Made Ground and superficial deposits, it is considered that vibroconcrete columns beneath pads founded on top of the mudstone will be suitable for proposed new structures.</p> <p>Based on the above foundation solution, a ground bearing floor slab should be utilised subject to the engineer's design.</p> <p>For pavement design purposes a subgrade CBR value of 5% has been determined by the dynamic probe penetration tests at anticipated subgrade level.</p> <p>Groundwater control may be required during excavation of supply routes due to presence of perched water.</p>
Geotechnical Risk Register	<p>The Geotechnical Risk Register (GRR) has been completed for the scheme and will be updated following provision of loadings. Ground risks associated with the development of the site have been identified as comprising:</p> <ul style="list-style-type: none"> • Soft strata at shallow depth; • Potential variable and significant thickness of Made Ground; • Deterioration of strength of Made Ground soils upon saturation; • Variable superficial deposits; • Shallow groundwater inflow into excavations;

	<ul style="list-style-type: none">• Below ground obstructions;• Ground aggressive to concrete; and,• Unencountered services <p>The GRR indicates the mitigation required for each of these aspects.</p>
Conclusions and Recommendations	<p>A Contamination Remediation Strategy addressing the identified contaminants on site and including a strategy for dealing with unexpected contamination will be required. The proposed foundation solution will need to be designed by a specialist engineer.</p>

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DRAWINGS

B041631-TTE-00-XX-DR-U (Site Location Plan)

B041631-TTE-00-XX-DR-U-0002-P01 (Site Boundary Plan)

B041631-TTE-00-XX-DR-U-0003-P02 (Exploratory Hole Location Plan)

THIRD PARTY DRAWINGS

NK018329-RPS-SI-XX-DR-A-9448 (Hangar 4 Plot - Unit 92k Option 01) by RPS dated February 2022

ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
bgl	below ground level
BGS	British Geological Survey
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
C4SL	Category 4 Screening Level
CIEH	Chartered Institute of Environmental Health
CLEA	Contaminated Land Exposure Assessment
CoC	Contaminant of Concern
CSM	Conceptual Site Model
DEFRA	Department of Environment, Food and Rural Affairs
DQRA	Detailed Quantitative Risk Assessment
DTS	Desktop Study
DRO	Diesel Range Organics
DWS	Drinking Water Standard
EA	Environment Agency (England)
ECML	East Coast Main Line
EPH	Extractable Petroleum Hydrocarbons
EQS	Environmental Quality Standards
FOC	Fraction Organic Carbon
GPR	Ground Penetrating Radar
LOD	Limit of detection
LQM	Land Quality Management
NRW	Natural Resources Wales
OD	Ordnance Datum
OS	Ordnance Survey
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PPE	Personal Protection Equipment
ppm	parts per million
PRO	Petroleum Range Organics
SGV	Soil Guideline Values
SOM	Soil Organic Matter
SVOC	Semi-volatile organic compounds
TPH	Total Petroleum Hydrocarbon
TSV	Tier 1 Screening Values
VOC	Volatile Organic Carbon
VPH	Volatile Petroleum Hydrocarbons

1.0 INTRODUCTION

1.1 INSTRUCTION

Tetra Tech, was commissioned by Threadneedle Curtis Limited (the Client), to produce a Ground Investigation Report (GIR) in accordance with current Geotechnical and Environmental Legislation for Hangar 4, Manchester Airport.

The location of the site is shown on Drawing No. B041631-TTE-00-XX-DR-U-0001 (Site Location Plan) and the site layout is shown by B041631-TTE-00-XX-DR-U-0002 (Site Boundary Plan) in Drawings.

1.2 BRIEF AND SCOPE OF SERVICES

The purpose of this report is to provide a summary of the ground and groundwater conditions at the site and to provide an updated geotechnical risk assessment using the historic data combined with Tetra Tech's ground investigation's findings to comply with Eurocode 7 documents.

This report includes the following key elements:

- Full factual records of the site works carried out;
- Summary of the ground conditions encountered;
- In-situ test results;
- Environmental laboratory test results;
- Geotechnical laboratory test results;
- Interpretation of geo-environmental laboratory data, including a qualitative ground contamination risk assessment (compliant with CIRIA 552 (CIRIA, 2001) methodology);
- Preliminary waste disposal classification;
- Review of permeability tests undertaken within boreholes;
- Geotechnical assessment of the investigation data to derive material parameters for use in foundation design;
- Ground aggressivity assessment to provide a design classification for buried concrete; and,
- An executive summary of the report to allow a rapid, layman's overview.

1.3 PROPOSED DEVELOPMENT

The proposed end-use for the site is as a 92,000ft² distribution centre with an external service yard and car parking in the surrounding areas. A masterplan was provided to Tetra Tech and the drawing by RPS is shown on NK018329-RPS-SI-XX-DR-A-9448 (Hangar 4 Plot – Unit 92k Option 01) in third party drawings appended.

1.4 EXISTING INFORMATION

Tetra Tech produced a Geo-environmental Desk Study for the site which informed the ground investigation scope. The full report Reference is:

- Geo-Environmental Desk Study Assessment for Hangar 4 Manchester Airport prepared by Tetra Tech on behalf of Threadneedle Curtis Limited Reference 784-B041631 and dated February 2023.

The report reviewed all of the available reports and for the site and the adjacent DNATA site. The following historical reports reviewed include:

- Hangar 4 Manchester Airport Manchester - J100593 (1) – Asbestos Report (2017) produced by AEC dated December 2017
- AECOM Technical Note - DNATA Ground Investigation - 60585257/TN/16012019 (2019)
- BWB Final Validation Report – DTA-BWB-SGT-XX-RE-CE-0003_A1_P1_EW Val. – MCG2005 (March 2020)
- UXO Desk Study - 230112 DTS Report LOW Risk 23011 Hangar 4 Manchester Airport Tetra Tech by EOD Contracts 2023

A full list of the sources of information reviewed during the preparation of this document is included in the References section.

1.5 LIMITATIONS

This document was prepared by Tetra Tech on behalf of Threadneedle Curtis Limited in connection to Hangar 4, Manchester Airport. This document is subject to the report conditions presented in **Error! Reference source not found..**

The recommendations and opinions expressed in this report are based on information obtained as part of the assessment or provided by others. Information provided from other sources is taken in good faith and Tetra Tech cannot guarantee its accuracy.

The information contained in this report is intended for the use of Threadneedle Curtis Limited and Tetra Tech can take no responsibility for the use of this information by any third party or for uses other than that described in this report or detailed within the terms of our engagement. Other ground contamination or conditions as yet undetected may exist and consequently reliance on this report must be limited accordingly.

2.0 SITE INFORMATION

2.1 LOCATION

The site is located between Wilmslow Old Road, Avro Way and Pinfold Lane and is fully described in the Desk Study produced by Tetra Tech referenced as, B041631.DS.1 – Hangar 4, Manchester Airport Desk Study, dated February 2023. A site location plan is presented in Drawing No. B041631-TTE-00-XX-DR-U-01 Site Location Plan.

Table 2-1 – Site Address and Size

Item	Detail
Address	Pinfold Lane, Manchester Airport, M90 5PQ
National Grid Reference	SJ 81121 84640
Area of Proposed Development	2.10 hectares

2.2 SITE DESCRIPTION

The site currently comprises a Hangar building approximately 15m in height and comprises a steel frame with masonry and steel profile walls and a pitched roof of profiled steel sheet. Internal walls split the hanger into 2 working areas. A 2-storey mezzanine office building is located internally. To the south-west is located a 2-storey office building of brick masonry construction.

A vacant single storey workshop building is located to the northwest. This is of masonry construction with a profiled asbestos cement sheet roof. This is referred to as the Hangar 4 annexe building. In addition to the main buildings, the site contains several ancillary buildings which includes a substation and gas meter building, significant areas of hardstanding (car parks, walkways and access roads).

The fuel farm for the airport is located to the northeast of the site.

The site shows elevation changes between 69m AOD and 70m AOD across the whole site as detailed by Google Earth with a general slope to the south

An asbestos report has been provided for Hangar 4, which notes that Asbestos Containing Materials are present in the hangar. Galbestos is present on external walls, and galbestos sheeting is present on the ground floor. Felt is present behind metal cladding on external doors, behind galbestos on external walls, and on high level metal panels on the ground floor. (Airborne Environmental Consultants Ltd. Dec 2017).

2.3 FORMER USES AND SITE HISTORY

The general historical development of the site and surrounding area has been determined in Tetra Tech Desk Study using the reports listed in section 1.2 above.

2.3.1 Site History

The site comprised of farmland up until approximately 1938 when the site is developed with the RAF base with the Aircraft Hangars recorded from 1954 up until 1976. There is an unspecified mound on the northwestern boundary from between 1954 and 1987 as well as two tanks recorded onsite between 1987 and 2009 located to the centre north and on the western boundary. The Hangar is present to the time of reporting and recently is known to have been used as a garage repair for the airport vehicles.

2.3.2 Surrounding History

The area surrounding site comprised agricultural fields up until the development of the RAF base in 1954, (becoming Manchester Airport), which bordered the site to the north and east. A sewage treatment works is recorded just beyond the southeast boundary between 1976 and 1987. Commercial properties are present surrounding the site from this time period as well.

2.4 PREVIOUS GROUND INVESTIGATIONS

No previous ground investigation works are known at the site although previous ground investigation works relating to the adjacent DNATA site to the west was available and is summarized in Table 2-1.

Table 2-2 – Summary of historic ground investigation used in this report.

Data Review	Scope of Works	Summary of Report Findings (all conclusions are those indicated in the reports)
AECOM Technical Note - DNATA Ground Investigation	<p>Phase I and II Geo-Environmental Ground Investigation Desk Study</p> <p>The Ground Investigation comprised 1 no. trial trench, 4 no. cable percussive boreholes sampling for geotechnical and chemical analysis; 8no. Window sample boreholes 10no. concrete cores. Gas and groundwater monitoring was undertaken in the 9no. of the boreholes over a four-week period.</p>	<p>Cable Percussion drilling was completed up to 11.85m bgl with the window sample boreholes ranging between 2.30m and 4.50m bgl.</p> <p>Perched groundwater was identified within the handpits of three positions.</p> <p>Visual and olfactory evidence was identified however tested concentrations were at a level which was deemed not at an unacceptable level.</p> <p>Subject to the proposed loads of the structures both shallow and deep foundations are considered suitable.</p>

2.5 PUBLISHED GEOLOGY

Details of the geology underlying the site have been obtained from the British Geological Society (BGS) 1:50,000 scale geological map (Sheet 98, Stockport: Solid and Drift) and are detailed in the Tetra Tech Desk Study. These sources indicate the following geological configuration.

2.5.1 Made Ground

The British Geological Survey Geology of Britain Viewer and BGS paper map (Sheet 98, Stockport: Solid and Drift) suggests that Made Ground is not present on-site however, given the historic and current landuse of the site, Made Ground is anticipated.

The DNATA GI suggested the thickness of Made Ground up to 0.70m.

2.5.2 Superficial Geology

The British Geological Survey Geology of Britain Viewer and BGS paper map (Sheet 98, Stockport: Solid and Drift) indicates that the site is entirely underlain by Devensian Glacial Till (Diamicton). Till is described by the BGS as "Till is unsorted and unstratified drift, generally over consolidated, deposited directly by and underneath a glacier without subsequent reworking by water from the glacier. It consists of a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape (Diamicton)."

The DNATA GI indicates the depth of the Superficial strata varies from 3.20m bgl in BH01 to 7.00m BH03 and typically comprised sand and clay layers.

2.5.3 Solid Geology

The published geological plan Stockport, Sheet 98 (1:50,000) and the BGS GeoIndex Onshore 'Bedrock Geology 1:50,000 scale' for the site indicates that the site is underlain by the Bollin Mudstone Member, previously known as the Mercia Mudstone Group or Keuper Marl, Lower. The BGS describe the mudstone as dominantly laminated reddish-brown and greenish-grey mudstone with siltstones in the upper part. The lower part is a structureless and laminated, dominantly reddish-brown mudstone.

The DNATA GI suggested the level of the bedrock strata varies from north to south from 3.20m bgl in BH01 to 7.00m BH03.

2.6 HYDROGEOLOGY

Superficial deposits are classified as a Secondary Undifferentiated Aquifer, described as "Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type".

Bedrock is classified as a Secondary B aquifer, described as "Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers."

The DNATA report suggests that the groundwater table lies at a depth of between 3.30m and 3.77m bgl with perched groundwater present onsite.

2.7 HYDROLOGY

The nearest surface watercourse is Cotterill Clough located 48m to the south which forms part of the Bollin Dean Mersey Upper Operational Catchment and the Mersey Upper management catchment.

The Environment Agency indicate that the watercourse Bollin (River Dean to Ashley Mill) had an Ecological Quality of 'moderate' in 2019 and a chemical quality listed as 'fail'.

2.8 HISTORICAL MINING

The site does not fall within a Coal Mining Reporting Area nor a Development High Risk Area with respect to shallow coal as shown by the Coal Authority Interactive Viewer, therefore a Coal Mining Risk Assessment has not been undertaken.

The historical mapping available for the site detailed as part of the Tetra Tech Desk Study Report does not indicate any onsite non coal mining.

2.9 ENVIRONMENTAL SETTING

A comprehensive review of environmental setting is provided in Tetra Tech Desk Study with the pertinent information summarised below.

Information provided in the Groundsure GeolInsight reports indicates the following:

- There are no historic landfill located within 250m of the site boundary.
- There are 6 separate permit exempt waste storage sites within 500m of the site boundary.

3.0 TETRA TECH 2022 GROUND INVESTIGATION

3.1 GENERAL

Tetra Tech undertook a Ground Investigation at Hangar 4, Manchester Airport, M90 5PQ between 27th February 2023 and the 1st March 2023.

3.2 GEO-ENVIRONMENTAL RATIONALE

The purpose of this report is to summarise and assess information obtained from an intrusive ground investigation (GI). The information will be presented and interpreted to aid in the design and construction of the proposed development. The Ground Investigation was undertaken to address:

- **Geotechnical Ground Model**, Derivation of a geotechnical ground model and characteristic material parameters for the soils/rocks encountered during the Ground Investigation from in-situ testing and geotechnical laboratory testing.
- **Contamination testing**, obtaining samples for chemical and groundwater testing and undertaking lab testing for contaminants, assessment of the total petroleum hydrocarbons (TPH) and to address the potential risk to controlled waters.
- **Gas monitoring** of the Made Ground and natural ground by undertaking four visits over two months and Assessing risks posed by hazardous ground gases to buildings BS 8485:2015+a1:2019.
- **Engineering considerations**, Exploratory holes were undertaken to determine the parameters of the underlying superficial and bedrock strata with respect to proposed foundations, pavements, earthworks, drainage and materials reuse.
- **Geotechnical Ground Risk Register**.

3.3 DESCRIPTION OF FIELDWORK

The exploratory hole locations are presented on Drawing No B041631-TTE-00-XX-DR-U-0003 Exploratory Hole Location Plan, presented in Drawings. The drawing shows the layout of the exploratory holes advanced during the Ground Investigation.

The works were undertaken in general accordance with BS 10175: Code of Practice for Site Investigations of Potentially Contaminative Sites, BS:5930, BS EN1997-2, BS EN ISO 14688/9 and BS:8576.

The completed ground investigation works are as follows:

- 2 No. days concrete coring to penetrate concrete hardstanding prior to hand dug inspection pits to 1.2m bgl.
- 5 No. window sample boreholes to allow environmental sampling and in-situ geotechnical testing, located for general site coverage and targeting any specific risk areas identified by the desk study.
- 3 No. cable percussive boreholes to a maximum depth of 11.00m bgl to prove bedrock and provide geotechnical information for design of foundations.
- 2 No. Rotary boreholes (CP04/CP05) with dynamic sampling to a nominal depth followed by rotary coring to a maximum depth of 15.80m bgl to provide geotechnical information for foundation design.
- 5 No. 50mm dia. HDPE ground-gas and groundwater monitoring installations with headworks and lockable flush covers.
- 1 No. day of in-situ dynamic penetrometer (DP) tests to derive California Baring Ratio (CBR) values.

- 8 No. days full time supervision by an experienced Tetra Tech engineer who logged strata and collected soil samples.
- 4 No. post fieldwork gas and groundwater monitoring visits.
- Soil and rock chemical laboratory analysis and geotechnical laboratory testing.

3.4 GROUNDWATER AND SURFACE WATER MONITORING

As part of the investigation, five gas and groundwater monitoring installations were placed in both Made Ground and natural strata across the site. Gas and groundwater levels have been monitored on four return visits, to monitor ground gas composition and groundwater levels as well as to obtain groundwater samples for laboratory testing. Groundwater samples from selected standpipes were taken on one occasion.

3.5 ENVIRONMENTAL TESTING

Environmental chemistry was investigated by specialist chemical analysis of selected soil samples carried out by Element Materials Technology, an approved supplier in accordance with the requirements of Tetra Tech's quality system and UKAS and MCERTS accredited for a range of chemical analyses. The testing was scheduled by Tetra Tech and is summarised in Table 3.1. The test results are appended in Appendix C.

Table 3-1 – Summary of Environmental Testing

Test suite	No.
Soil Samples: <ul style="list-style-type: none"> • Tetra Tech Suite C <ul style="list-style-type: none"> o Heavy metals including Chromium (Hexavalent), Boron (water soluble), Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Vanadium and Zinc. o Inorganics – including pH, Water soluble Sulphate as SO₄ (2:1 Extract), Cyanide (Easily liberate able- low level. o Speciated Petroleum Hydrocarbons (TPH CWG); o Speciated Polyaromatic Hydrocarbons (PAHs) (USEPA 16); o Volatile Organic Compounds (VOCs) o BTEX and MTBE; o Fraction organic carbon (FOC) o Asbestos Screen; and, o Phenol. 	10
Semi Volatile Organic Compounds (SVOCs)	4
Volatile Organic Compounds (VOCs) including Tentative Indicative Compounds (TICS)	4
Two Stage Waste Acceptance Criteria testing (S)	3

3.6 GEOTECHNICAL TESTING

Geotechnical analysis was scheduled by Tetra Tech on soil samples obtained during the site investigation works. Geotechnical testing was carried out by Professional Soils Laboratory at their laboratory in Doncaster, in accordance with their UKAS Accreditation, and by DETS at their laboratory in County Durham, in accordance with their UKAS Accreditation. The test procedures used were generally in accordance with the methods described in BS1377:1990. Details of the specific tests used in each case are given in Table 3.2. The test results are appended in Appendix D.

Table 3-2 – Summary of Geotechnical Testing

Test	No.	Test Method
Moisture Content	12	BS1377:1990 Part 2:3.2
Atterberg Limits (Liquid & Plastic Limits)	12	BS1377:1990 Part 2:4.3&5.3
Sieve Analysis Wet/Dry	15	BS1377:1990 Part 2:9.4
Sedimentation Analysis	14	ISRM Vol 16 No 2, pp 135-140 (1979)
CBR (2.5 / 4.5 Kg) (Soaked / Unsoaked)	3	BS1377:1990 Part 3 and BS EN 1744-1 Clause 10
Concrete Class Pyritic Suite	12	BRE Special Digest1: 2005
Consolidated Undrained Triaxial	1	BS1377: Part 8: Clause 7
Unconfined Compressive Strength	11	ISRM, pp111 – 116 (1981)
Uniaxial Point Load	12	ISRM Suggested Methods: 2007

4.0 GROUND CONDITIONS ENCOUNTERED

4.1 GENERAL

The ground Investigation has identified the below soils which have been used to develop a ground profile. The encountered strata were consistent across the site and comprised:

- Hardstanding;
- Made Ground;
- Glacial Till – Sand and Clay;
- Weathered bedrock - Mudstone; and
- Bedrock - Mudstone.

4.2 ENCOUNTERED STRATA

Full descriptions of the encountered strata are included on the exploratory hole logs included in Appendix C.

4.2.1 Made Ground

Made Ground was recorded across the site in all of the exploratory holes. There was local variation in composition and thickness likely associated with the historical land use. The Made Ground encountered is described below.

- **Hardstanding**

Black Bituminous Macadam was encountered (CP01, CP02, DS01, DS02, DS03 located outside the hangar) from 0.00m to a maximum encountered depth of 0.20m bgl. Reinforced CONCRETE was encountered (CP03, CP04, CP05, DS04, DS05) from 0.00m to a maximum depth of 0.42m bgl with CP04 and CP03, CP04 and CP05 located within the hangar.

- **Made Ground**

Underlying the hardstanding across site, (within the hangar and outside of) was predominantly a layer of both whole laid bricks and randomly assorted bricks up to 0.20m thick, these were encountered in CP01, CP02, CP03, CP04, CP05, DS04, DS05. The layer of bricks were recorded to a maximum depth of 0.70m bgl in CP05. In CP05, the bricks were recorded as reddish grey cobbles of brick and concrete.

Locally underlying the hardstanding in CP02, CP04, DS02, DS03, DS05 was a gravelly SAND between 0.33m (CP04) and 1.20m (CP02) in thickness comprising orangish brown fine to coarse SAND and light grey gravelly fine to coarse SAND. Gravel is angular fine to coarse sandstone and brick. The sand was recorded from 0.19m bgl in DS02 to a maximum depth of 1.50m bgl CP02.

Encountered across site, except in CP02, is a reworked clay between 0.22m (CP04) and 2.70m (CP03) in thickness. The clay comprised a soft to firm reddish grey and brown very gravelly CLAY and was encountered from 0.22m bgl in DS04 to a maximum encountered depth of 3.10m bgl in CP03. Gravels were encountered as angular fine to coarse sandstone, brick, mudstone, coal.

4.2.2 Superficial Strata

Superficial Strata was encountered across the site from a minimum depth of 0.85m bgl (CP04) and was found to be to a maximum depth of 9.58m bgl (CP05).

Sand of varying lithologies were recorded in all of the boreholes on site from a minimum depth of 1.28m bgl (DS03) to maximum depths 9.58m bgl (CP05).

Typically, the shallow sands across site were recovered as reddish brown slightly gravelly slightly clayey fine to coarse SAND with gravels of angular fine to coarse mudstone and sandstone (CP01 - CP05, DS01 – DS05).

Encountered from 1.28m bgl to a maximum depth of 9.00m bgl. Thickness ranges from 0.25m (DS01) to 5.90m (CP03).

Orangish brown and yellow fine to coarse SAND and subangular to subrounded fine to coarse GRAVEL of mudstone, sandstone and quartzite (CP04, CP05). Encountered from a minimum depth of 6.00m bgl (CP04) and to a maximum depth of 9.58m bgl (CP05) and a maximum thickness of 2.00m (CP04). This strata was noted as overlying the bedrock strata.

In CP04 and CP05 clay was encountered from a minimum depth of 0.85m bgl (CP04) and to a maximum depth of 6.00m bgl (CP04). The clay was recovered as 'Firm to stiff reddish brown gravelly sandy CLAY. Sand is fine to medium. Gravel was subangular to subrounded fine to medium quartzite, sandstone and granite.

4.2.3 Weathered Bedrock

Weathered bedrock was encountered in CP01, CP02, and DS05. This was from a minimum depth of 3.40m bgl (CP01) and to a maximum depth of 5.20m bgl (CP01, CP02) with a maximum investigated thickness of 1.80m (CP01). This was recovered as reddish brown slightly clayey gravelly fine to coarse SAND. Gravel is angular fine to coarse. Occasional clasts of gypsum.

4.2.4 Bedrock

Bedrock was cored at two locations (CP04, CP05), from a minimum depth of 8.00m bgl (CP04) to a maximum depth of 15.80m bgl (CP05). A maximum cored thickness of 7.00m was completed in CP04. With a minimum thickness of 4.5m seen in CP05. The logged core was described as typically 'Medium strong reddish-brown MUDSTONE with veins of gypsum. Discontinuities are sub horizontal, close to medium spaced, planar, smooth, clean'.

Within CP04 and CP05 core logs a band of 'Strong Laminated grey/greyish red SILTSTONE with bands of quartz veins' were recorded between depths of 9.58-9.70m bgl and 13.20-14.40m bgl.

The core photographs are presented in Appendix C.

4.3 VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

No visual and olfactory evidence of contamination was identified during the site works.

4.4 GROUNDWATER

4.4.1 Groundwater Observations

Groundwater wasn't observed as part of the borehole drilling due the requirement for water to ease the drilling process.

4.4.2 Groundwater Monitoring

Dual purpose gas and groundwater installations were installed in five locations as listed in Table 4.4 below.

Results from four return monitoring visits between 22nd March 2023 and 17th April 2023 are summarised in Table 4.1 below and the full field records for each visit are included as Appendix E.

Table 4-1 – Summary of Groundwater Level Monitoring

Exploratory Hole (investigation)	Shallowest recorded Water Depth (m bgl)	Shallowest recorded Water Depth (m AOD)	Deepest recorded Water Depth (m bgl)	Deepest recorded Water Depth (m AOD)	Depth to Base of Standpipe (m bgl / m AOD)	Notes
DS01	0.96	67.71	1.06	67.61	2.02 / 66.65	
DS02	0.70	67.29	0.79	67.20	1.97 / 66.02	
DS03	0.31	66.87	0.53	66.65	2.00 / 65.18	
DS04	1.70	66.30	2.00	66.00	2.88 / 65.12	
DS05	2.80	64.55	2.85	64.50	3.76 / 63.59	Visit 1 is not included as the well was flooded by surface water and required bailing.

4.4.3 Groundwater Levels Summary

Groundwater was encountered in monitoring standpipes with response zones targeting both the natural and Made Ground strata. Given the variable levels of groundwater, it is considered unlikely to be representative of the groundwater table and is likely perched.

4.5 OBSTRUCTIONS

There was a layer of bricks recorded as underlying the hardstanding across site in seven boreholes (CP01-CP05 and DS04 - DS05). In DS02 a concrete obstruction was recorded in the inspection pit wall.

DS04 was relocated to DCP04 due to the presence of services and no suitable location could be determined.

5.0 GAS MONITORING AND GROUND GAS ASSESSMENT

5.1 GROUND GAS MONITORING RESULTS

Table 5.1 below summarises the ground gas monitoring undertaken to date including historic investigations. Results are presented in Appendix F along with calibration certificates for the GA5000 gas Analyser and Mini Rae 3000 PID used for gas and VOC monitoring respectively.

This assessment is based on the four gas and groundwater monitoring visits undertaken by Tetra Tech between March and April 2023.

Table 5-123 – Summary of gas monitoring results

Location	Max. Methane (steady) (% vol)	Max. Carbon Dioxide (steady) (% vol)	Min. Oxygen (steady) (% vol)	Max. Carbon Monoxide (steady) (ppm)	Max. Hydrogen Sulphide (steady) (ppm)	Max. Borehole flow (peak) (l/h)
DS01	0.0	0.5	18.4	3.0	0.0	0.4
DS02	0.0	0.5	19.1	3.0	0.0	0.4
DS03	0.0	0.4	16.1	1.0	0.0	0.4
DS04	0.0	1.0	19.0	0.0	0.0	0.2
DS05	0.40	2.90	11.9	0.0	0.0	0.7

Table Notes: * Note: Results based on worst case steady readings.

5.2 SUMMARY OF MONITORING VISITS

The maximum carbon dioxide concentration 2.90% vol was recorded in DS05 which also recorded a maximum peak flow rate of 0.70 l/hr. The maximum steady methane concentration was 0.40% v/v also recorded in DS05. DS05 had a response zone within the natural strata.

5.3 CARBON MONOXIDE AND HYDROGEN SULPHIDE

Low concentrations of carbon monoxide were detected during Visit 4 up to 3ppm.

Hydrogen sulphide was not detected above the limit of detection for the analyser during the monitoring period.

5.4 ATMOSPHERIC PRESSURE TRENDS

The monitoring rounds were undertaken during variable atmospheric pressure conditions ranging from 985mb (Visit 1) to 1021mb (Visit 4). A review of atmospheric pressure graphs on weatheronline.co.uk indicates that monitoring was undertaken during periods of rising and steady pressure.

5.5 GROUND GAS ASSESSMENT

Ground gas results have been assessed using the CIRIA C665 document Assessing Risks posed by Hazardous Ground Gases to Buildings (2007) and BS:8485(2015) +A1:2019. The assessment methodology is based on both volume percentages and volume flow rate of gases. In accordance with the CIRIA and BS:8485 methodology, a conservative Gas Screening Value (GSV) has been calculated using a worst-case scenario (i.e. highest peak gas concentration combined with highest steady state flow rate). Where readings are not recorded

above the instrument detection limit, the value of the instrument detection limit is used to calculate the GSV. The calculation of the GSV is as follows:

- Gas Screening Value = Gas Concentration in % divided by 100 then multiplied by flow rate in l/h.

Peak Steady State Emission (0.70l/h) Flow Rate

- $2.90\% \text{ CO}_2 \times 0.70 \text{ l/hr} = 0.0203 \text{ l/hr CO}_2$
- $0.40\% \text{ CH}_4 \times 0.70 \text{ l/hr} = 0.0028 \text{ l/hr CH}_4$

Based on the monitoring results, a GSV has been calculated from the worst-case steady gas concentrations and the highest steady state flow rates and results in a site classification of Characteristic Situation 1 (CS1) – Very Low Risk (CIRIA C665). As such, gas protection measures are not required to protect this development from ground gas.

6.0 GROUND CONTAMINATION ASSESSMENT – HUMAN HEALTH

6.1 INTRODUCTION

The UK Contaminated Land Regime (CLR) allows for a tiered approach to the assessment of ground contamination with respect to human health which is designed to allow increasingly site-specific assessment. In order to assess the potential risk to human health posed by contaminants contained within the soils at the study area a generic quantitative risk assessment (gQRA) has been undertaken by comparing recorded concentrations of chemical constituents in soil with Generic Assessment Criteria (GAC) to identify whether, at the concentrations recorded, the presence of the constituent has the potential to adversely affect the health of site users (a Tier 1 assessment). GAC are set at levels where potential exposure is deemed to be within acceptable limits.

If the recorded concentrations of a particular constituent are below the GAC, then the risk is generally considered to be acceptable and further assessment / or mitigation measures are not required. Where a substance is recorded at concentrations higher than GAC this does not necessarily indicate that a particular risk is present, however, it does typically signify the requirement to undertake further assessment in line with the UK tiered risk assessment framework.

6.2 ASSESSMENT CRITERIA

6.2.1 Generic Assessment Criteria

The following GAC for soils have been utilised for the screening process, in order of preference:

- CL:AIRE published C4SL (DEFRA, 2014);
- CIEH/LQM published S4UL (LQM/CIEH, 2015);
- Tetra Tech internal Tier 1 Screening Criteria (issue 15) derived using the derivation tool CLEA version 1.06, in line with the current UK Contaminated Land Regime.

C4SL are currently available for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead¹. The C4SL were originally developed to support the categorisation of sites in accordance with Part 2A are also, based on DEFRA guidance, considered suitable for use during the assessment of sites as part of the planning process.

Where C4SLs are not available, 'Suitable for Use Levels' (S4UL) developed by CIEH/LQM have been used. The S4UL provide GAC based on minimal or tolerable risk intended to be protective of human health for individual or mixtures of substances. It is considered conservative and appropriate to use these values for contaminants for which C4SL are unavailable. GAC for volatile and semi-volatile organic compounds (VOC and SVOC) not presented in the S4UL document are sourced from CL:AIRE (CL:AIRE, January 2010).

Where no published screening values are available Tetra Tech have derived their own values (easily liberatable cyanide).

The CLEA model states that "For most exposure pathways, the contamination is assumed to be at or within one metre of the surface" (Environment Agency, 2009). It is considered that at depths greater than 1.0m, the probability of human exposure via the direct contact pathways are significantly reduced, leaving inhalation of volatile compounds as the dominant pathway with regard to human health risks. Typically, volatile compounds only significantly affect the indoor inhalation pathway. The same screening concentrations have been used for

¹ Arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI, lead assuming 6% SOM (1% SOM C4SL also published for benzene).

all depths at this stage given that some cut and fill works will be undertaken at the site so deeper soils may be used nearer surface in the proposed infrastructure.

The phase of development to which this assessment relates comprises **commercial/Industrial end use scenario**.

6.2.2 Soil Organic Matter

For organic contaminants, the generic soil screening values have been derived for a range of concentrations of soil organic matter (1%, 2.5%, 6%). In order to provide a conservative assessment, the GAC derived for a 1% SOM has been adopted.

6.3 TIER 1 – SOIL SCREENING

A total of eleven soil samples collected from across site and were submitted for chemical laboratory analysis. The results were subsequently screened against commercial/industrial screening values.

Soil screening results are presented in Appendix C.

The tested samples showed no exceedances against the Commercial soil screening values.

6.4 VOLATILE AND SEMIVOLATILE ORGANIC COMPOUNDS

Four samples were tested for volatile and semi volatiles (VOC and SVOC) as well as three samples tested for waste acceptance criteria testing which included VOC and SVOC testing. All the samples returned levels at or below the limits of detection. Therefore, no significant levels of VOC and SVOC were recorded of the samples selected for testing considered representative for the site uses. However, it is possible that areas of contamination is present onsite given the site's history in untested areas of the site and as such would have to be addressed as part of a watching brief during construction works.

6.5 ASBESTOS

Asbestos screening was undertaken as part of the Tetra Tech standard screen. No samples shown detected the presence of asbestos in soils.

Given the historic landuse of the site, asbestos has the potential to be present in Made Ground in untested areas of the site.

7.0 WASTE CHARACTERISATION ASSESSMENT

Waste classification is a two-stage process, with the first step comprising a hazard assessment of the soil quality data in line with the guidance set out in the Environment Agency waste classification technical guidance WM3² document. Once the hazardous properties of the materials are known, the second step is to assess the potential performance of the materials in a landfill, undertaken by considering the results of waste acceptance criteria (WAC) testing. WAC testing has been undertaken on soils anticipated to be likely removed, though further testing maybe required for the selected materials to be disposed of to landfill.

7.1.1 Waste Characterisation

The chemical analysis of all the geo-environmental laboratory data has been used to make a preliminary assessment of whether soils from the study area would be classified as hazardous waste. The assessment provides the classification of the soils in the event that they are disposed to landfill.

Waste Classification has been undertaken using HazWasteOnline, a web-based software for waste classification. The software follows Environment Agency guidance and European regulations. Assessment sheets are presented in Appendix G.

Ten samples tested from the Made Ground have been assessed and the HazWasteOnline assessment indicates that all samples are classified as non-hazardous.

Table 7-1 –HazwasteOnline Classification of TT 2022 Made Ground data

Sample ID	Depth (m)	Initial Classification	Hazardous determinant and property
CP01	0.50	Non-Hazardous	-
CP02	0.50	Non-Hazardous	-
CP02	1.00	Non-Hazardous	-
CP03	0.70	Non-Hazardous	-
DS01	0.50	Non-Hazardous	-
DS02	2.10	Non-Hazardous	-
DS03	0.20	Non-Hazardous	-
DS04	1.00	Non-Hazardous	-
DS05	0.60	Non-Hazardous	-
CP04	0.63-0.85	Non-Hazardous	-

Natural Soil Samples

One sample was tested from the natural strata and the HazWasteOnline assessment indicates that the sample was classified as non-hazardous.

² Environment Agency 2018. Technical Guidance WM3: Guidance on the classification and assessment of waste (Version 1.1).

7.1.2 Waste Recommendations

All samples are classified as non-hazardous using HazWasteOnline and have the potential to be disposed to a facility accepting non-hazardous waste.

Material from other sources, or affected by localized contamination events, particularly those which have not been identified to date, may be classified as hazardous.

It is the responsibility of the contractor, as waste producer, to classify the waste and to identify a suitable waste disposal facility based on the chemical composition of the material. Therefore, prior to disposal the characteristics of any excavated soils will need final classification in consultation with the landfill sites and waste disposal contractors. Further testing and analysis may be required on the actual soil arisings which constitute the waste.

7.1.3 Waste Acceptance Criteria Testing

Three samples were tested for Waste Acceptance Criteria testing from the shallow Made Ground soils. The laboratory testing suggested that these samples were classified as non-hazardous during the waste characterisation. The results are mostly compliant with inert landfill criteria, however the pH is above the stable non-reactive hazardous waste in non-hazardous landfill criteria. The initial WAC testing indicates that, if suitable segregation of the waste is undertaken, some of the non-hazardous material may be accepted by an inert waste landfill. Natural soils can be considered inert. However, additional testing when soil is to be disposed of off-site should be undertaken and liaison undertaken with the landfill to discuss the results of the testing to ensure soils are designated to their suitable facility.

7.1.4 Materials Management

Any material excavated on site may be classified as waste and it is the responsibility of the holder of a material to form their own view on whether or not it is waste. This includes determining when waste that has been treated in some way can cease to be classed as waste for a particular purpose.

If site-won material is to be reused on site, or soils other than primary aggregate or aggregates produced under the WRAP Protocol are to be imported to site, a Materials Management Plan will be required, signed off by a Qualified Person as defined in the 'Definition of Waste Code of Practice' (CL:AIRE, 2011).

8.0 CONCEPTUAL SITE MODEL AND GROUND CONTAMINATION RISK ASSESSMENT

8.1 OVERVIEW

The information presented in the previous sections of this report has been collated and evaluated to establish a qualitative risk assessment for the site. A conceptual model of the site has been generated based on information derived from the findings of this 2022 ground investigation combined with the previous investigation findings.

The site has been considered with regard to current UK legislation and guidance, namely Part 2A of the Environmental Protection Act 1990 and the Contaminated Land (England) Regulations 2006, as amended, and in accordance with current UK good practice guidelines (for example BS10175:2011).

In general, ground contamination can occur through several causes, particularly from historical operations and activities. Contamination can result from either on-site sources or from on-site migration from off-site sources, leading to long term liabilities under recent legislation for any site owner.

For a risk of pollution or environmental harm to occur as a result of ground contamination, all of the following elements must be present:

- Source, i.e. a substance that is capable of causing pollution or harm;
- Pathway, i.e. a route by which the contaminant can reach a target; and
- Receptor (target), i.e. something which could be adversely affected by the contaminant.

If one of these elements is absent there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

8.2 CURRENT SITE USAGE AND PROPOSED DEVELOPMENT

The site comprises a former aircraft hangar which is currently used for vehicle maintenance of the airport vehicles as well as areas of concrete and tarmac hardstanding.

The proposed end-use for the site is as a 92,000ft² distribution centre with an external service yard and car parking in the surrounding areas as shown by the RPS drawing NK018329-RPS-SI-XX-DR-A-9448 (Hangar 4 Plot – Unit 92k Option 01) in third party drawings appended.

8.3 CONCEPTUAL SITE MODEL

The key source, pathways and receptor model is outlined below within the context of the proposed residential with plant up-take end-use.

8.3.1 Sources of Contamination

The contamination testing suggested there was no recorded contaminants identified in the soil however, given the site's history there is potential for contamination to be present in untested areas of the site.

The main potential sources of contamination on the site are associated with the Made Ground on the site as summarised below.

Potential onsite Sources

- Made Ground – potential contaminants associated with historic and current land use.
- Made Ground – associated with former tanks and fuel bunds.

- Made Ground – Ground gas associated with potential infilled land.
- Asbestos in soils – related to previous industrial uses and former structures onsite.

8.3.2 Potential Contaminant Pathways

The following contaminant pathways are considered to potentially be active based on the historic site use and proposed development:

Human Exposure Pathways

- Direct dermal contact or ingestion of soils, or inhalation of dust and/or vapours (i.e. human interaction with surface and sub-surface materials).

Environmental Pathways

- Leaching and horizontal or vertical migration through the unsaturated ground, either through permeable sub-surface materials and/or preferential pathways.
- Lateral and vertical migration of groundwater through permeable sub-surface materials and/ or preferential pathways.
- Leaching to surface water run-off/drainage.
- The migration and accumulation of gases or vapours through permeable sub-surface materials and/ or preferential pathways.

Infrastructure Pathways

- Direct contact with water supply pipes.

8.3.3 Potential Receptors at Risk

The following potential receptors have been identified:

Human Health

- Future site users (commercial/industrial).
- Construction / Maintenance Workers (during and post construction).
- Adjacent site users (commercial).

Environmental Receptors

- Building Infrastructure and supply pipes.
- Adjacent Properties.
- Underlying Superficial Secondary Undifferentiated Aquifer and Bedrock Secondary B Aquifer.
- Designated ancient woodland.
- Surface water course - Cotterill Clough Brook

8.4 GROUND CONDITIONS RISK ASSESSMENT

The source, pathway, receptor linkages identified in the previous section are outlined and a qualitative risk assessment shown in the following Tables 8.1 and 8.2.

The risk assessment considers the site within an area context and assesses potential risks to identified receptors in relation to the existing site setting and the proposed development. CIRIA C552 has been used to define the risk rating presented in the Qualitative Risk Assessment matrix, the methodology for which is presented in **Error! Reference source not found.H**.

Table 8-1 – Matrix of Risk Classification

		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	Very Low Risk

Table 8-2 – Qualitative Risk Assessment (CIRIA C552 methodology)

This matrix is based on CIRIA C552 risk evaluation methodology, definitions for risk ratings is presented in Appendix G						
Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Justification & Potential Risk Management (if required)
Ground Conditions – Made Ground contaminants associated with industrial usage and unknown infill material.	Dermal contact, ingestion and/or inhalation of or dusts	Human Health – Future site users (commercial)	Medium	Unlikely	Low	Laboratory testing for the site identified no elevated contaminants however given the site's history there is still potential for undiscovered contaminants.
		Human Health (Construction and Maintenance Workers with PPE)		Low	Moderate/Low	Risk reduced to low through the use of appropriate site practices and PPE.
	Leaching to groundwater, drainage, and lateral / vertical migration.	Adjacent properties and land users	Mild	Unlikely	Very Low	Laboratory testing for the site identified no presence of asbestos however, given the historic development there is the potential for asbestos to be present in areas of untested areas of soils.
		On-site drainage				
		Secondary Undifferentiated Aquifer				
	Migration along/into service ducts and pipework	Buildings and Services				
Site Conditions - Asbestos within in soils	Dermal contact, ingestion and/or inhalation of or dusts	Human Health – Future site users (residential)	Severe	Unlikely	Moderate/Low	Laboratory testing for the site identified no presence of asbestos however, given the historic development there is the potential for asbestos to be present in areas of untested areas of soils.
		Human Health (Construction and Maintenance Workers with PPE)				Laboratory testing for the site identified no presence of asbestos however, given the site's history there is still potential for undiscovered ACMs therefore, potential for exposure during below ground works. Risk reduced to low through the use of appropriate site practices and PPE.

						As asbestos is recorded as being present within the onsite structure, it is recommended that an Asbestos Management Plan should be in place during construction.
Made Ground - Ground Gas	Generation and migration / accumulation of ground gases	Human Health – Future Site Users	Severe (Asphyxiation & Explosion)	Unlikely	Moderate/Low	Gas monitoring has been undertaken and the site is classified as CS 1, as such gas protection measures are not required. Boreholes, where known, should also be decommissioned in accordance with EA guidance prior to enabling works.
		Buildings and Services	Severe (Explosion)			
Fuels associated with Historic land use (Aviation, HGV's) and for generators	Dermal contact, ingestion and/or inhalation of vapours or dusts	Human Health (Current / Future Site Users)	Medium	Unlikely	Low	Laboratory testing for the site identified no elevated contaminants however given the site's history there is still potential for undiscovered contaminants.
		Human Health (Construction and Maintenance Workers with PPE)				Laboratory testing for the site identified no elevated contaminants however given the site's history there is still potential for undiscovered contaminants. The risk rating is based on the use of Personal Protective Equipment (PPE) and appropriate working procedures.
	Leaching to groundwater, drainage and lateral / vertical migration.	Secondary B Bedrock Aquifer	Medium	Unlikely	Low	Due to the proposed development and through the use of hardstanding, the source pathway receptor linkage is broken by the low permeability hardstanding and surface drainage.
		Secondary Undifferentiated Aquifer Superficial Deposits				
		Building Infrastructure and supply pipes	Medium	Unlikely	Low	Laboratory testing for the site identified no elevated contaminants however given the site's history there is still potential for undiscovered contaminants. As such it is recommended that the pipes are installed under a watching brief.
		Adjacent Properties	Medium	Unlikely	Low	No raised concentrations of contaminants against the limits of detection have been identified on site. However, given the site history there is potential for contaminants to be present in areas of untested soils and as such would have to be addressed as part of a watching brief during construction works.

9.0 MATERIAL PROPERTIES

9.1 GENERAL

The following sections summarise the geotechnical properties of the soils encountered across the site using data obtained from the ground. However, the appropriate choice of characteristic and design values will depend on the particular analysis and design philosophy used and should be selected by the designer.

Where characteristic values are given, these are reasonably conservative estimates of a measured or assessed property that may be used to represent the overall behaviour of the material. Design values are similar but also take into account the ground-structure interaction for a given structure so need to be selected by the designer. It is recommended, however, that design values used do not exceed the characteristic values given in this report. A summary of the material properties is presented in Tables 9-9.

9.2 MADE GROUND

Due to the limited vertical and horizontal extent of the granular Made Ground (hardstanding, bricks, and sand), it has not been considered in the geotechnical assessment. However, cohesive Made Ground underlying the hardstanding has been assessed, and the characteristic parameters for cohesive Made Ground are adopted to apply to the whole made ground in ground model as the most conservative consideration.

9.2.1 Cohesive Made Ground

A summary of the geotechnical testing undertaken on the cohesive Made Ground is presented in Table 9-1. Rationale for the derivation of geotechnical material parameters is presented below.

Table 9-1 – Summary of Laboratory Testing on Cohesive Made Ground

Type of Test	No. of Tests	Results
<i>Laboratory:</i>		
CBR	2	Min Top= 1.5% Max Top = 1.7% Average Top = 1.6% Min Bottom= 1.8% Max Bottom = 2.7% Average Bottom = 2.25%
Moisture Content	2	Min = 16.0% Max = 17.0% Average = 16.5%
Atterberg Limits	2	Liquid Limit = 28– 43% (Avg. 35.5%) Plastic Limit = 15 – 21% (Avg. 18.0%) Plasticity Index = 13 – 22% (Avg. 17.5%)
<i>In Situ:</i>		
SPT	7	N = 9 to 37 (Ave. = 17) N _{char} = 9 to 15 (Ave. = 12) N60 = 7 to 30 (Ave. = 14) N60 _{char} = 8 to 12 (Ave. = 10)
Hand Vane	10	Cu = 5.5 to 9.1kPa (Ave. = 7.36kPa)
Dynamic probe	5	CBR Min = 2.0% CBR Max = 37.0% CBR Average = 10.0% CBR _{char} = 5%

Seven SPT tests were undertaken within cohesive Made Ground. SPT N values typically ranged from 9 to 37, with an average of 17. Corrected N values, N₆₀, have been derived for the SPT data using the methodology outlined in BS EN ISO 22476-3:2005+A1:2011. A plot of SPT vs depth for the cohesive Made Ground is presented in Figure 9-1 to Figure 9-2 and a characteristic trendline has been included. The trendline shows that the characteristic SPT N value ranges from 9 to 15 from a depth of 0m to 3m bgl. The characteristic SPT N₆₀ value ranges from 8 to 12 from a depth of 0m to 3m bgl.

Moisture content testing was undertaken on 2 no. samples of the cohesive Made Ground. The moisture content ranged from 16% to 17%, with an average of 16.5%.

Atterberg limit testing was undertaken on 2 no. samples of the cohesive Made Ground. The results indicate that the materials typically comprise low to intermediate plasticity clay, with an average plasticity index of 17.5%.

Values of undrained shear strength, c_u , have been derived using the relationship between plasticity index and SPT 'N₆₀' suggested by Stroud and Butler (1975). Based on an average PI of 17.5%, an f_1 value of 5.7 is appropriate for these materials. Using this relationship, c_u values ranging from 42 to 172 kPa have been derived (displaying a gradual increase with depth), with an average of 78 kPa. The value of c_u also measured using hand vane test on site, ranges from 5kPa to 9kPa, with an average of 7kPa. The c_u values correlated from SPT N₆₀ and measured in hand vane test have been plotted against depth on Figure 9-3. A cautious trendline has been added to Figure 9-3, which shows c_u to increase with depth from 5 kPa to 40 kPa from 0m to 3m bgl. A characteristic c_u of 5 to 40 kPa is therefore appropriate for these materials, which is a conservative estimate based on the available data. This value relates to an extremely low to medium strength material with reference to BS EN ISO 14688:2-2018.

Based on the record laboratory results and using Figure 1 and Figure 2 of BS 8002:2015, a characteristic unit weight, γ_{char} , of 18 kN/m³ has been adopted for the organic superficial deposits.

Values of the effective angle of shearing resistance, ϕ' , can be derived from empirical relationships between PI and effective angle of shearing resistance. Based on an average Plasticity Index (PI) of 17.5%, a value of 27° is considered appropriate, as suggested by Gibson (1953). On the basis of all of the available data, a characteristic ϕ' of 27° has been selected for the cohesive Made Ground.

For the value of effective cohesion, c' , an appropriate characteristic c' of 0 kPa is considered appropriate for this stratum, which represents a cautious estimate for this material in an effective stress state.

Using the empirical relationship of $E' = 0.9 N_{60}$ (CIRIA 143), a drained modulus of elasticity, E' , of 7.2 MPa to 10.8 MPa can be derived. Similarly, using the empirical relationship $E' / c_u = 270$ for cohesive materials with a PI between 10-20% (Stroud and Butler, 1975), an E' in the range of 1.35 to 10.8 MN/m² can be derived. A characteristic E' of 1.3 MPa to 10.8 MPa (increasing with depth from 0m to 3m bgl) is considered appropriate for these materials.

Using the empirical relationship of $E_u = 1.0-1.2 N_{60}$ for cohesive materials (CIRIA 143, 1995), values of undrained modulus, E_u , in the range of 10 MPa to 14 MPa can be derived. A characteristic E_u of 10 MPa to 14 MPa is considered appropriate (increasing with depth from 0m to 3m bgl).

Using the empirical relationship of $mv = 1/(f_2 \times N_{60})$ with PI, the value of coefficient of volume compressibility have been derived suggested by Stroud and Butler, 1975. Based on an average PI of 17.5%, an f_2 value of 0.6 is appropriate for this material. A characteristic coefficient of volume compressibility, mv , of 0.14 to 0.2 m²/MN can be derived.

Soaked laboratory CBR testing was undertaken on 2 no. samples of cohesive Made Ground strata. CBR values range from 1.5% to 2.7%, with averages of 1.6% and 2.25% on the top and bottom of the samples, respectively. CBR values also were derived from 5 no. DCP tests, the CBR values derived from DCP test have been plotted against depth on Figure 9-4 and a cautious trendline has been added to Figure 9-4. A characteristic CBR value of 5% is therefore appropriate for these materials, which is a conservative estimate based on the available data.

Figure 9-1 – SPT N value VS Depth (Cohesive Made Ground)

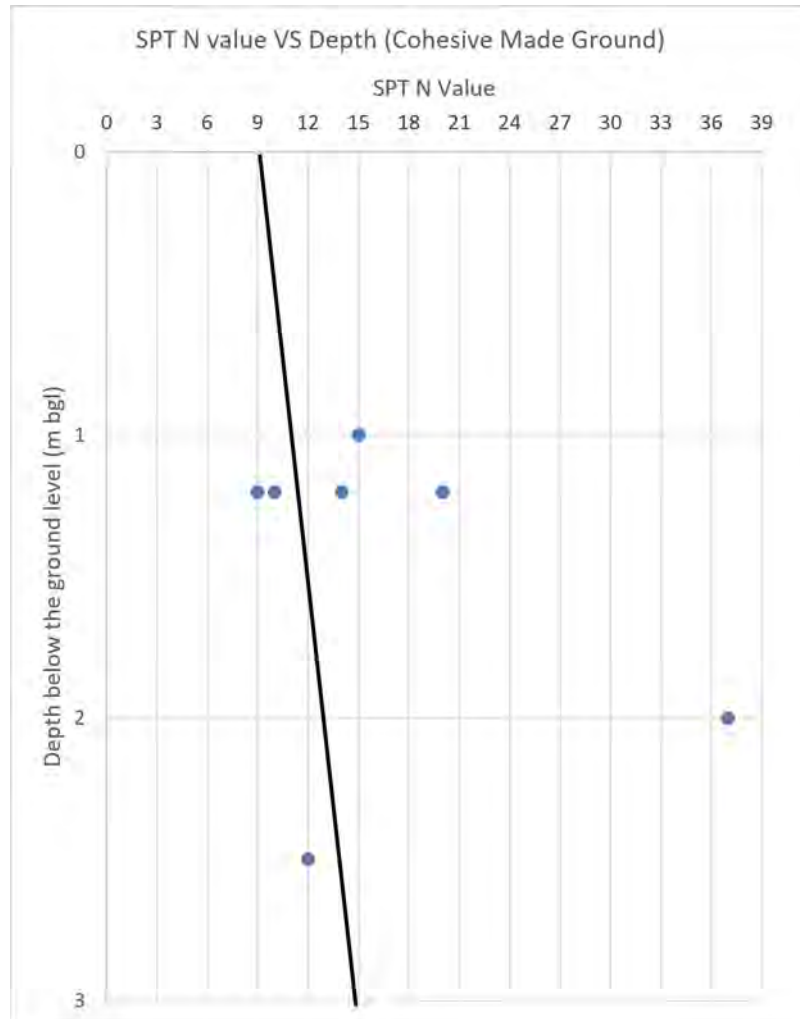


Figure 9-2 – SPT N60 value VS Depth (Cohesive Made Ground)

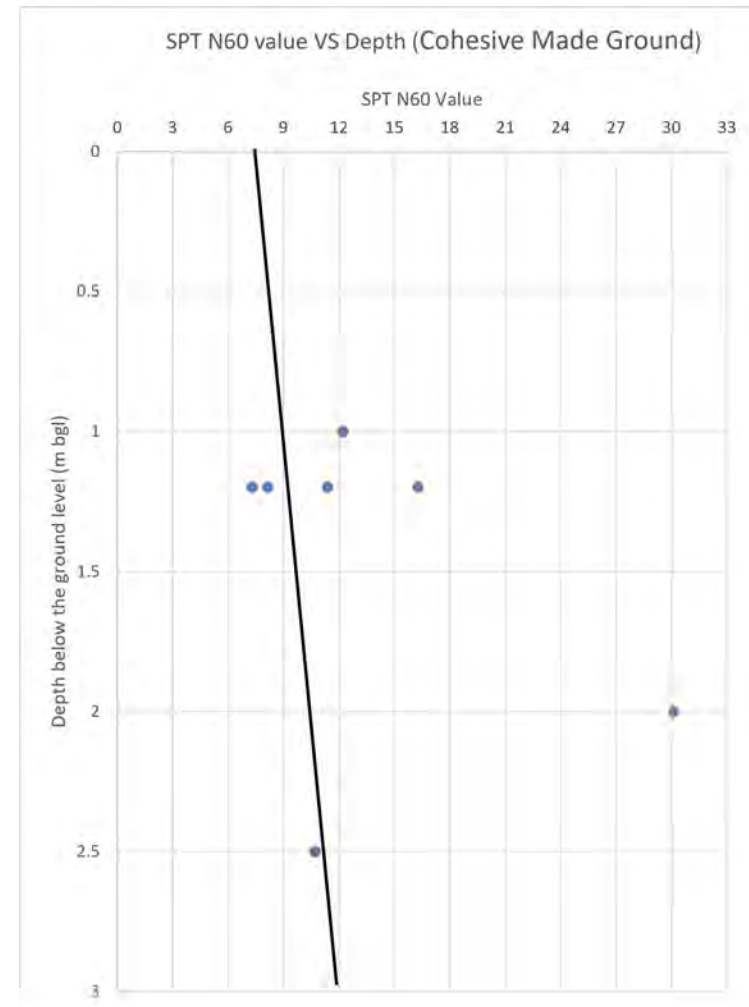


Figure 9-3 - Undrained Shear Strength VS Depth (Cohesive Made Ground)

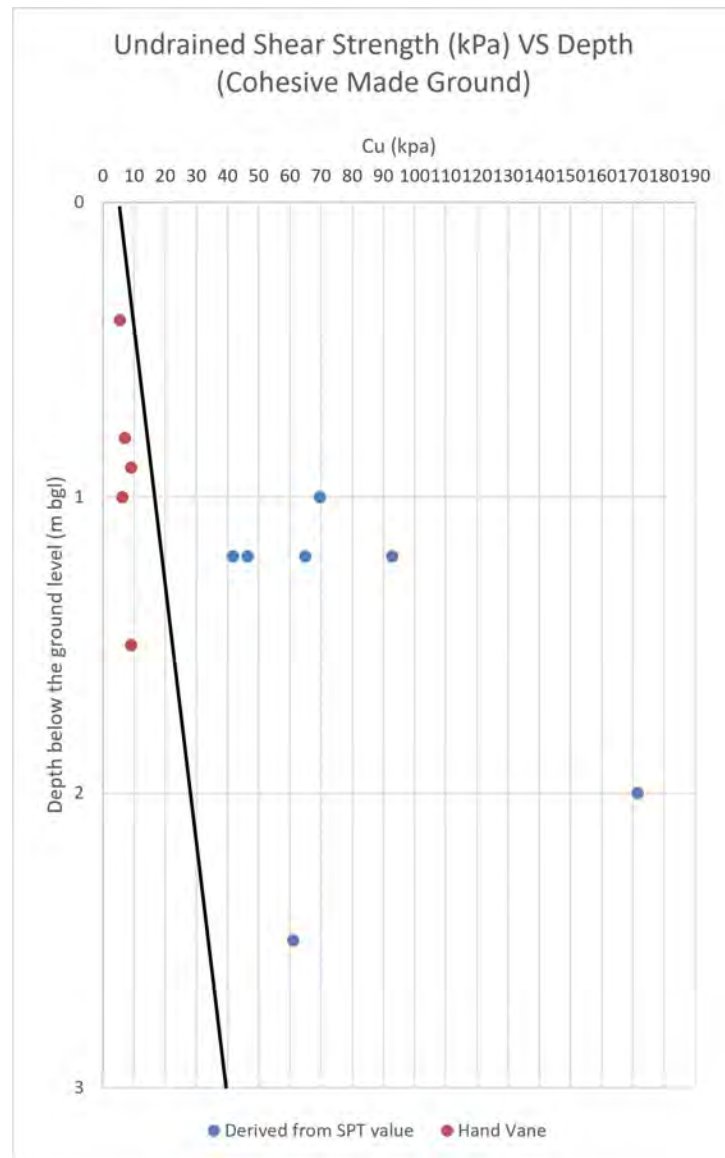
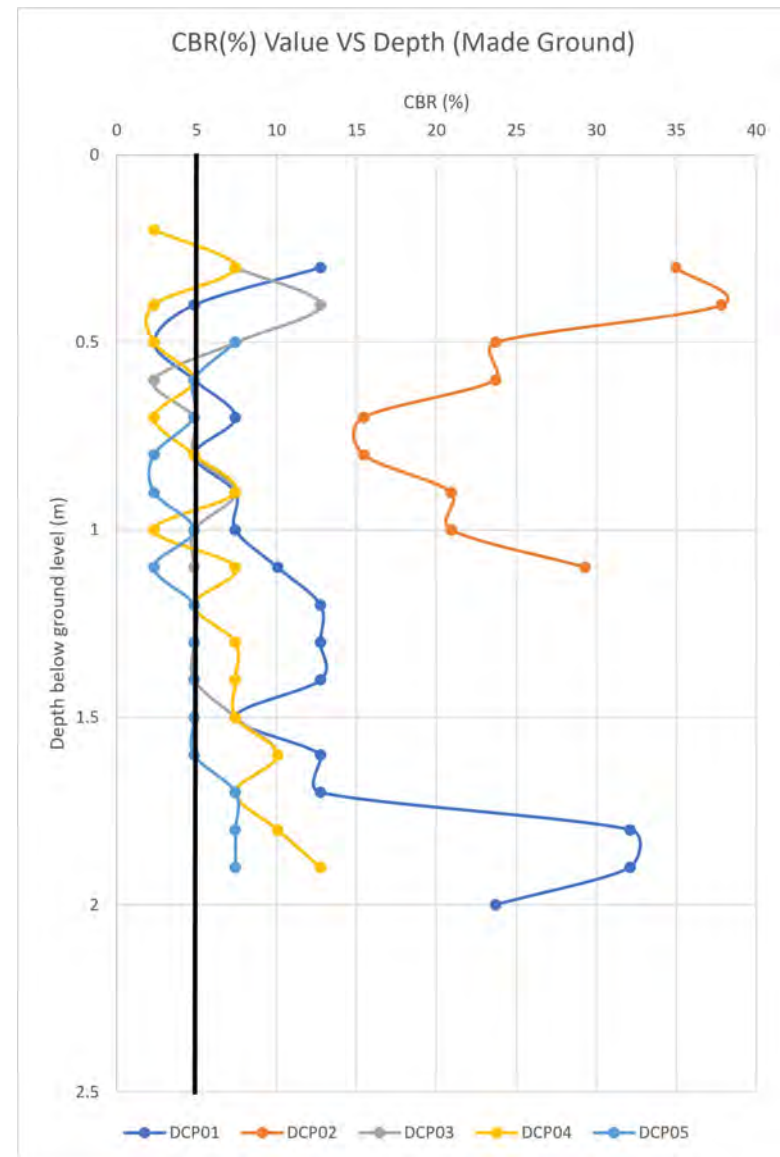


Figure 9-4 – CBR value VS Depth (Cohesive Made Ground)



9.3 COHESIVE SUPERFICIAL DEPOSITS

A summary of the geotechnical testing undertaken on the cohesive superficial deposits is presented in Table 9-2. Rationale for the derivation of geotechnical material parameters is presented below.

Table 9-2 – Summary of Laboratory Testing on Cohesive Superficial Deposits

Type of Test	No. of Tests	Results
<i>Laboratory:</i>		
Particle Size Distribution (PSD)	5	See text below
Moisture Content	5	Min = 9.6% Max = 23.0% Average = 16.12%
Atterberg Limits	5	Liquid Limit = 24– 36% (Avg. 28.8%) Plastic Limit = 15 – 18% (Avg. 15.6%) Plasticity Index = 9 – 18% (Avg. 13.2%)
Triaxial Effective Stress	1	Effective Cohesion= 0kPa Effective Friction= 27.1°
BRE Reduced Suite	2	PH = 7.78 to 7.97 PH _{char} = 7.78 Sulphate = 99.48 to 339.29 mg/l Sulphate _{char} = 340 mg/l
<i>In Situ:</i>		
SPT	11	N = 12 to 46 (Ave. = 22) Remove outliers: N = 12 to 29 (Ave. = 17) N _{char} = 12 to 15 (Ave. = 14) N60 = 11 to 47 (Ave. = 20) Remove outliers: N60 = 11 to 29 (Ave. = 15) N60 _{char} = 10 to 14 (Ave. = 12)
Hand Vane	1	10.2kPa

The Design Sulphate (DS) Class and Aggressive Chemical Environment for Concrete Classification (ACEC Class) have been obtained for Unit B5 using BRE SD1⁽⁴⁾ guidance.

The characteristic water-soluble sulphate concentration measured in the laboratory tests is 220 mg/l. The characteristic pH is 7.88 corresponding to DS-1 and AC-1 assuming mobile groundwater conditions in a brownfield environment.

Eleven no. SPT tests were undertaken within cohesive superficial deposits. SPT N values typically ranged from 12 to 46, with an average of 22. However, there are only two SPT N values over 40 as the localised very stiff CLAY encountered in CP04 while other values are all below 30. Therefore, as the most conservative consideration, localised high values are considered as outliers and removed from the assessment. SPT N values after removing outliers typically ranged from 12 to 29, with an average of 17. Corrected N values, N60, have been derived using the methodology outlined in BS EN ISO 22476-3:2005+A1:2011. A plot of SPT vs depth for the cohesive superficial deposits is presented in Figure 9-5 to Figure 9-6 and a characteristic trendline

has been included. The trendline shows that the characteristic SPT N value ranges from 12 to 15 from a depth of 1m to 5m bgl. The characteristic SPT N60 value ranges from 10 to 14 from a depth of 1m to 5m bgl.

Moisture content testing was undertaken on 5 no. samples of the cohesive superficial deposits. The moisture content ranged from 9.6% to 23%, with an average of 16.12%.

Atterberg limit testing was undertaken on 5 no. samples of the cohesive superficial deposits. The results indicate that the materials typically comprise low to intermediate plasticity clay, with an average Plasticity Index of 13.2%.

Values of undrained shear strength, c_u , have been derived using the relationship between Plasticity Index and SPT 'N60' suggested by Stroud and Butler (1975). Based on the average PI of 13.2%, an f_1 value of 6.8 is appropriate for these materials. Using this relationship, c_u values range from 72kPa to 200kPa, with an average of 100kPa have been derived. A value of c_u of 10.2kPa was also measured using hand vane test on site. The c_u values correlated from SPT N60 and measured in hand vane test have been plotted against depth on Figure 9-7. A cautious trendline has been added to Figure 9-7, which shows c_u to increase with depth from 45 kPa to 105 kPa from 1m to 5m bgl. A characteristic c_u of 45 to 105 kPa is therefore appropriate for these materials, which is a conservative estimate based on the available data. This value relates to a medium to high strength material with reference to BS EN ISO 14688:2-2018.

Based the record laboratory results and using Figure 1 and Figure 2 of BS 8002:2015, a characteristic unit weight, γ_{char} , of 20 kN/m³ has been adopted for the organic superficial deposits.

Values of the effective angle of shearing resistance, ϕ' , can be derived from empirical relationships between PI and effective angle of shearing resistance. Based on an average Plasticity Index (PI) of 13.2%, a value of 30° is considered appropriate, as suggested by Gibson (1953). A value of 27.1° of effective angle was also measured using triaxial effective stress test. On the basis of all of the available data, a characteristic ϕ' of 27° has been selected for the cohesive superficial deposits.

For the value of effective cohesion, c' , an appropriate characteristic c' of 0 kPa is considered appropriate for this stratum, which represents a cautious estimate for this material in an effective stress state.

Using the empirical relationship of $E' = 0.9 N60$ (CIRIA 143), a drained modulus of elasticity, E' , of 9.0 MPa to 12.6 MPa can be derived. Similarly, using the empirical relationship $E' / c_u = 270$ for cohesive materials with a PI between 10-20% (Stroud and Butler, 1975), an E' in the range of 12.2 to 28.3 MN/m² can be derived. A characteristic E' of 9.0 MPa to 13.0 MPa (increasing with depth from 1m to 5m bgl) is considered appropriate for these materials.

Using the empirical relationship of $E_u = 1.0-1.2 N60$ for cohesive materials (CIRIA 143, 1995), values of undrained modulus, E_u , in the range of 12 MPa to 17 MPa can be derived. A characteristic E_u of 12 MPa to 17 MPa is considered appropriate (increasing with depth from 1m to 5m bgl).

Using the empirical relationship of $mv = 1/(f_2 \times N60)$ with PI, the value of coefficient of volume compressibility have been derived suggested by Stroud and Butler, 1975. Based on an average PI of 13.2%, an f_2 value of 0.7 is appropriate for this material. A characteristic coefficient of volume compressibility, mv , of 0.1 to 0.14 m²/MN can be derived.

Particle size distribution (PSD) testing was undertaken on 5 no. samples of the cohesive superficial deposits. The PSD grading curves of all phased investigations are presented on Figure 9-8. A composite grading curve, based on an average value for each particle size, is presented as Figure 9-9. The results indicate that the material generally comprises well graded slightly gravelly slightly sandy CLAY and SILT.

Based on the engineer's field descriptions together with the results of PSD testing, cohesive superficial deposits are likely to be comprise Class 2A/B with reference to Series 600 – Specification for Highway Works. The Earthwork classification of organic superficial deposits is present in Figure 9-10.

Figure 9-5 -SPT N value VS Depth (Cohesive Superficial Deposits)

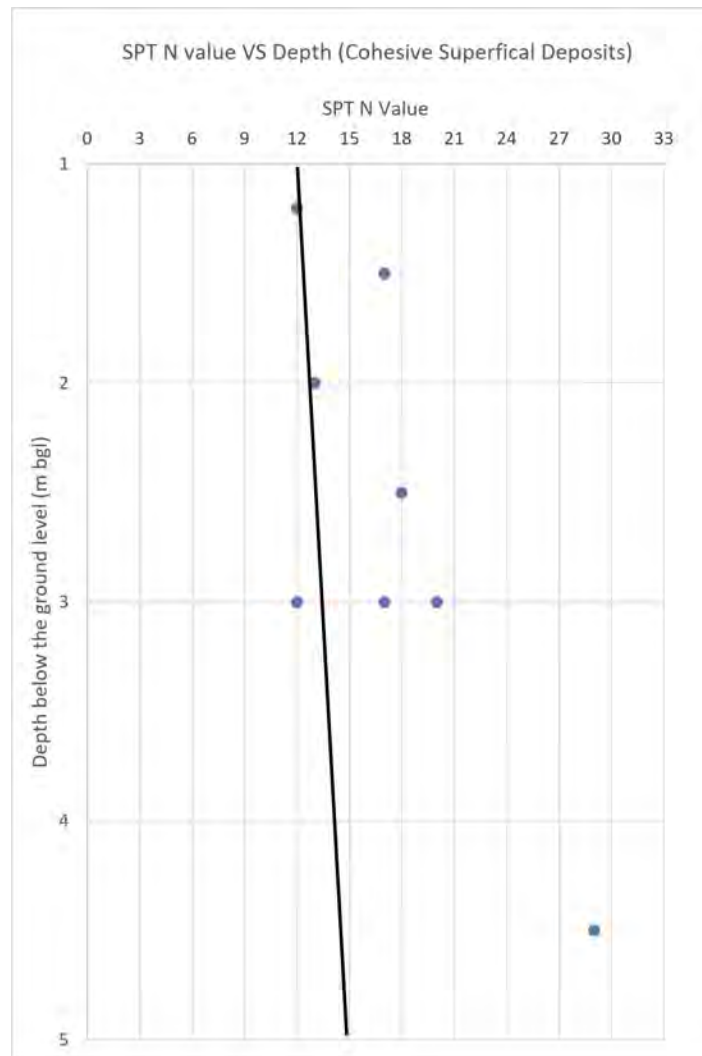


Figure 9-6 - SPT N60 value VS Depth (Cohesive Superficial Deposits)

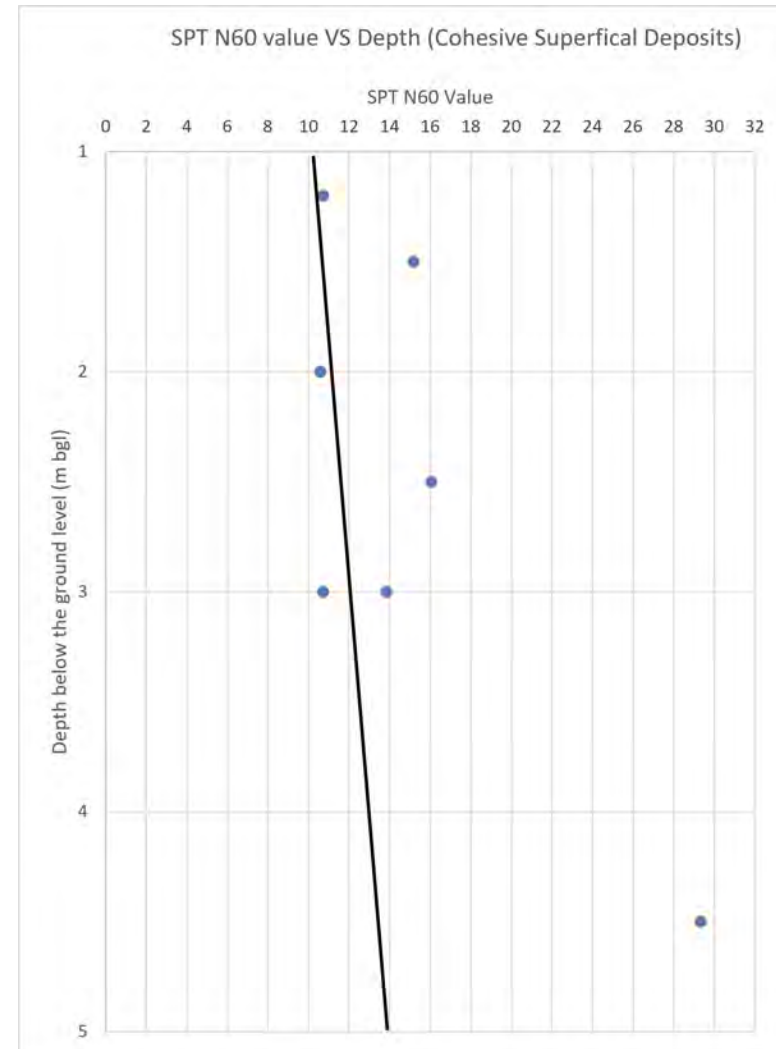


Figure 9-7 - Undrained Shear Strength VS Depth (Cohesive Superficial Deposits)

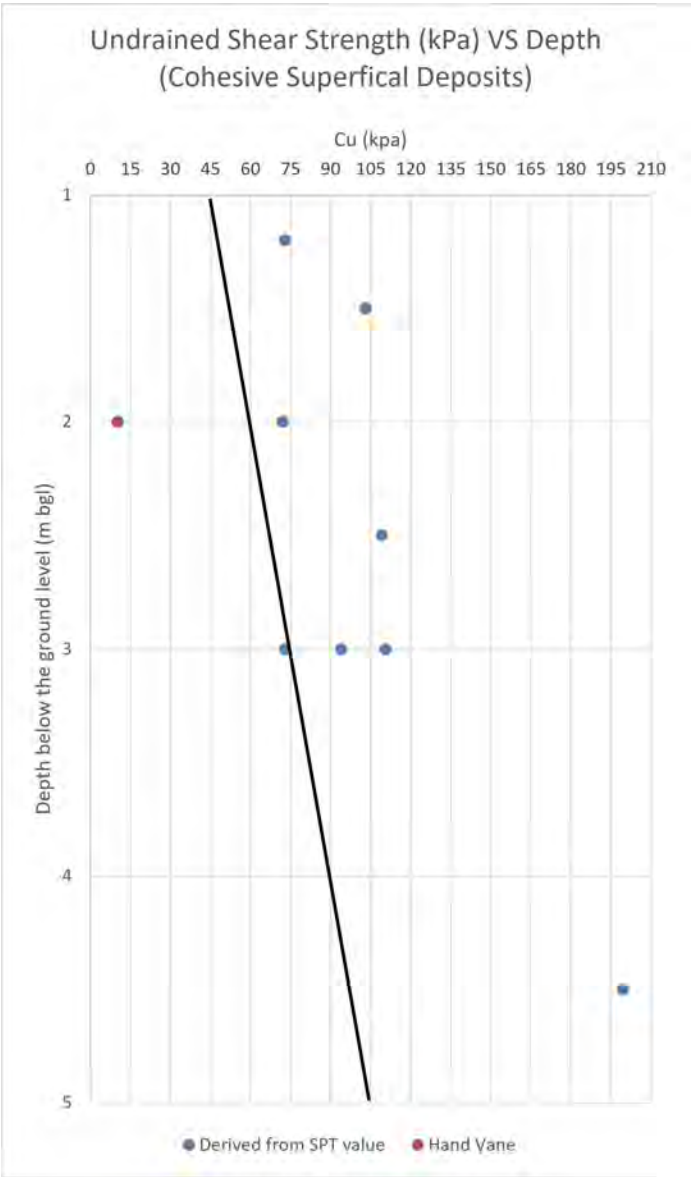


Figure 9-8 - Particle Size Distribution Test Curves (Cohesive Superficial Deposits)

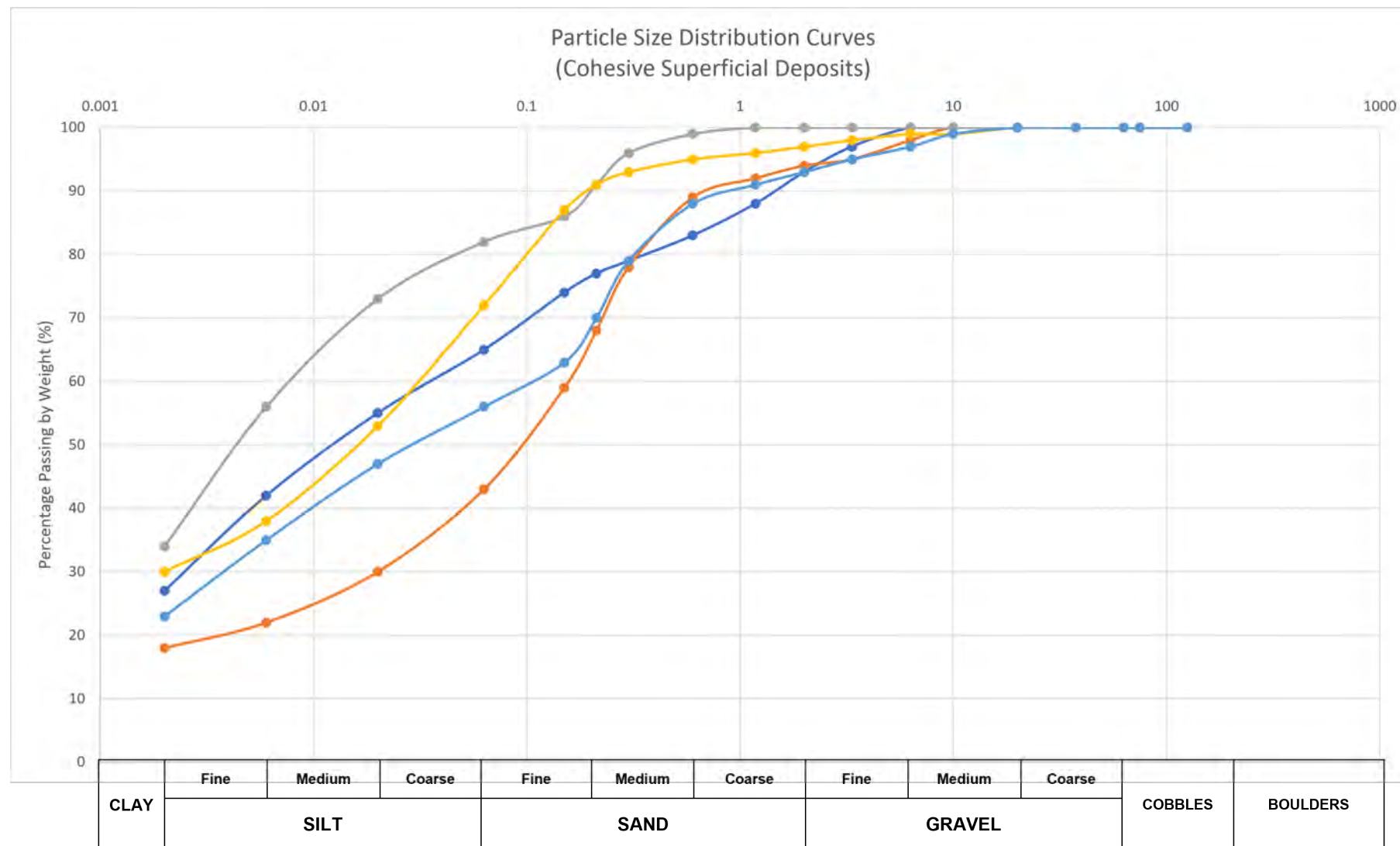


Figure 9-9 - Composite PSD Curve (Cohesive Superficial Deposits)

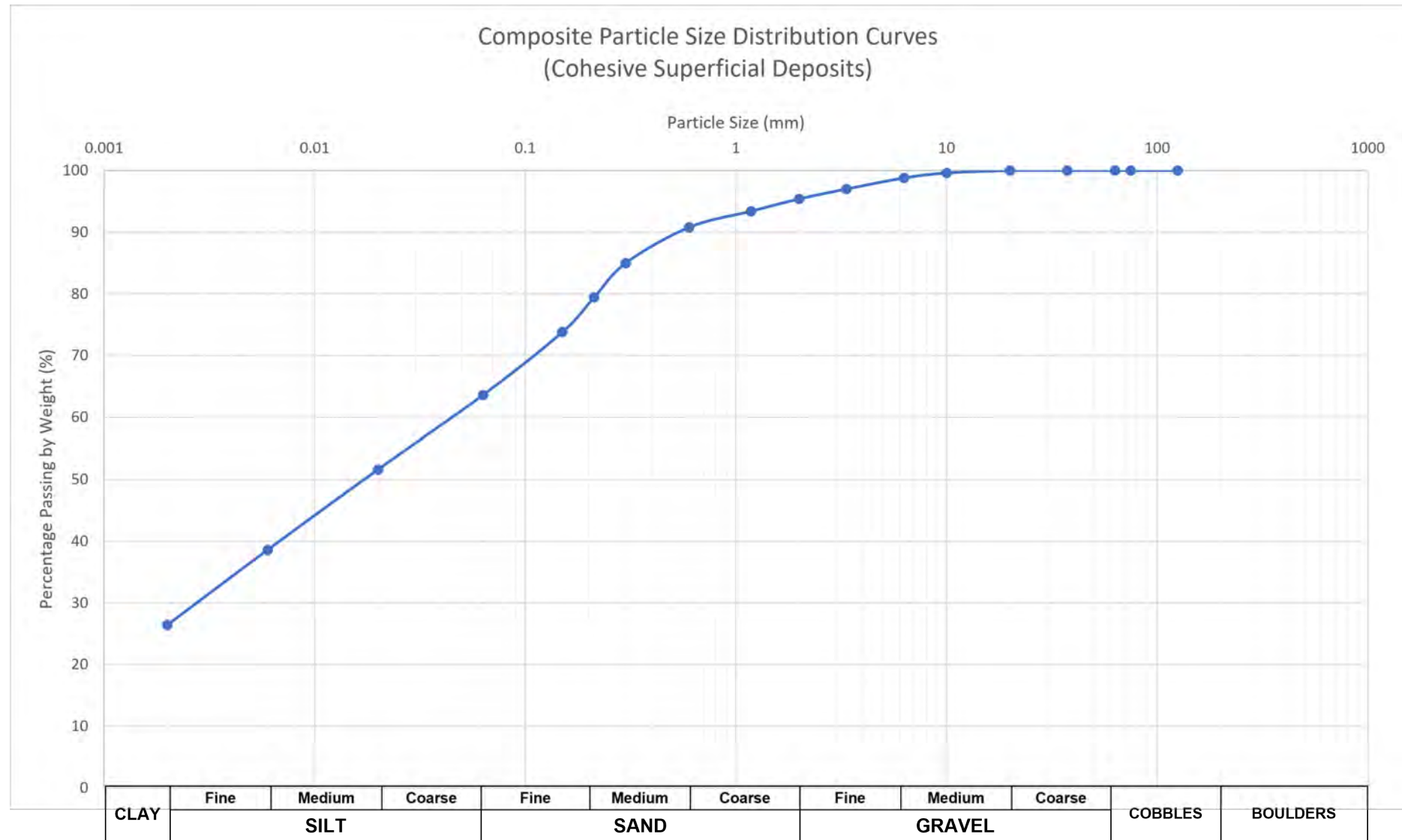
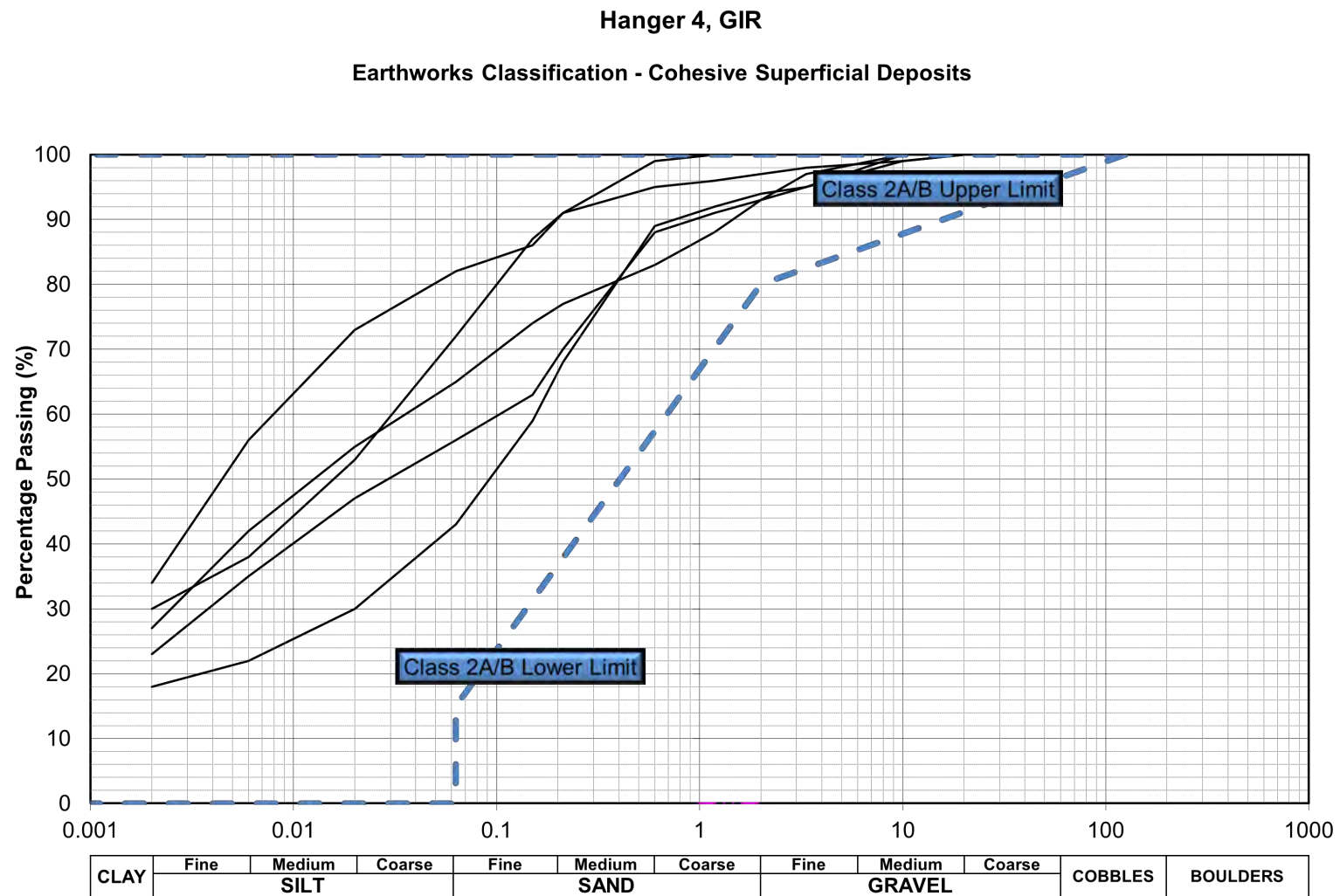


Figure 9-10 – Earthworks Series 600 Classification for Cohesive Superficial Deposits



9.4 GRANULAR SUPERFICIAL DEPOSITS

A summary of the geotechnical testing undertaken on the granular superficial deposits is presented in Table 9-3. Rationale for the derivation of geotechnical material parameters is presented below.

Table 9-3 – Summary of Laboratory Testing on Cohesive Superficial Deposits

Type of Test	No. of Tests	Results
<i>Laboratory:</i>		
Particle Size Distribution (PSD)	9	See text below
Moisture Content	1	18%
Atterberg Limits	1	NP
BRE Reduced Suite	3	PH = 7.43 to 8.31 PH _{char} = 7.43 Sulphate = 60.32 to 110.31 mg/l Sulphate _{char} = 111 mg/l
<i>In Situ:</i>		
SPT	14	N = 11 to 26 (Ave. = 20) N _{char} = 17 N ₆₀ = 12 to 27 (Ave. = 19) N _{60char} = 16 N _{1,60} = 10 to 30 (Ave. = 21) N _{1,60char} = 19

The Design Sulphate (DS) Class and Aggressive Chemical Environment for Concrete Classification (ACEC Class) have been obtained for Unit B5 using BRE SD1⁽⁴⁾ guidance.

The characteristic water-soluble sulphate concentration measured in the laboratory tests is 111 mg/l. The characteristic pH is 7.43 corresponding to DS-1 and AC-1 assuming mobile groundwater conditions in a brownfield environment.

Particle size distribution (PSD) testing was undertaken on 9 no. samples of the granular superficial deposits. The PSD grading curves are presented on Figure 9-11. A composite grading curve, based on an average value for each particle size, is presented as Figure 9-12. The results indicate that the material generally comprises well graded, clayey/silty SAND and GRAVEL.

Based on the engineer's field descriptions together with the results of PSD testing, the majority of materials won from these strata are likely to comprise Class 1A with reference to Series 600 – Specification for Highway Works. Locally, where cohesive fraction is present, the materials may be classed as Class 2C. The Earthwork classification of granular superficial deposits is present in Figure 9-13.

Fourteen SPT tests were undertaken within granular superficial deposits. SPT N values typically ranged from 11 to 26, with an average of 20. The average SPT N value is typical of a medium dense coarse soil (BS 5930:2015+A1:2020). Corrected N values, N₆₀ and N_{1,60} have been derived using the methodology outlined in BS EN ISO 22476-3:2005+A1:2011. A plot of SPT vs depth for the granular superficial deposits is presented in Figure 9-14 to Figure 9-17 and a characteristic trendline has been included. The trendline shows that the characteristic SPT N value is 17 correlating to a relative density of medium dense.

Based the record laboratory results and using Figure 1 and Figure 2 of BS 8002:2015, a characteristic unit weight, γ_{char} , of 19 kN/m³ has been adopted for the granular superficial deposits.

Based on a characteristic $N_{1,60}$ of 19, and using the relationship between SPT 'N' and angle of internal friction, ϕ' , for granular material (after Peck et al, 1973), a value for ϕ' of 33° can be derived. A characteristic ϕ' of 33° is therefore considered appropriate for the granular superficial deposits at the site.

A characteristic effective cohesion (c') of 0 kN/m² is considered appropriate for these strata.

Figure 9-11 - Particle Size Distribution Test Curves (Granular Superficial Deposits)

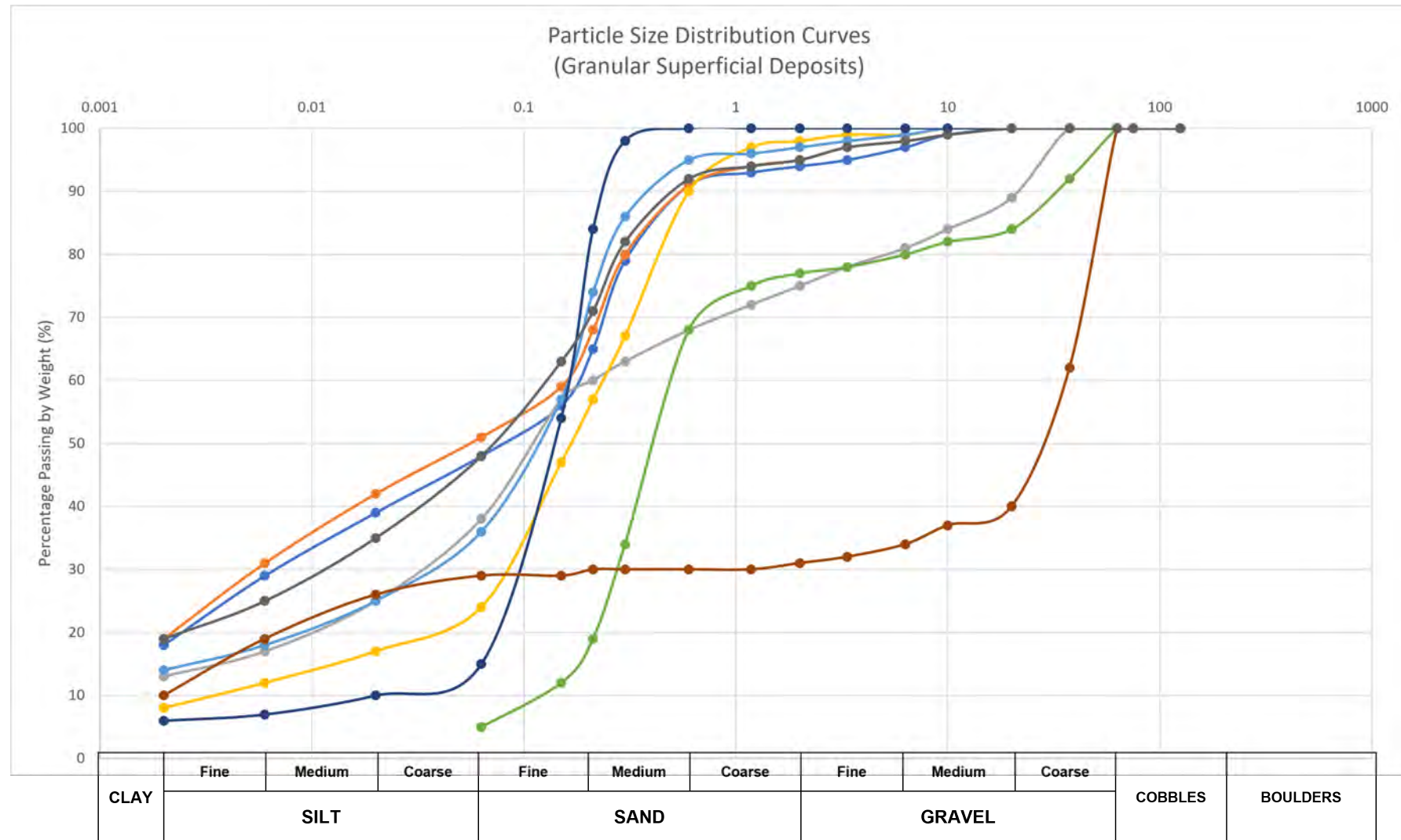


Figure 9-12 - Composite PSD Curve (Granular Superficial Deposits)

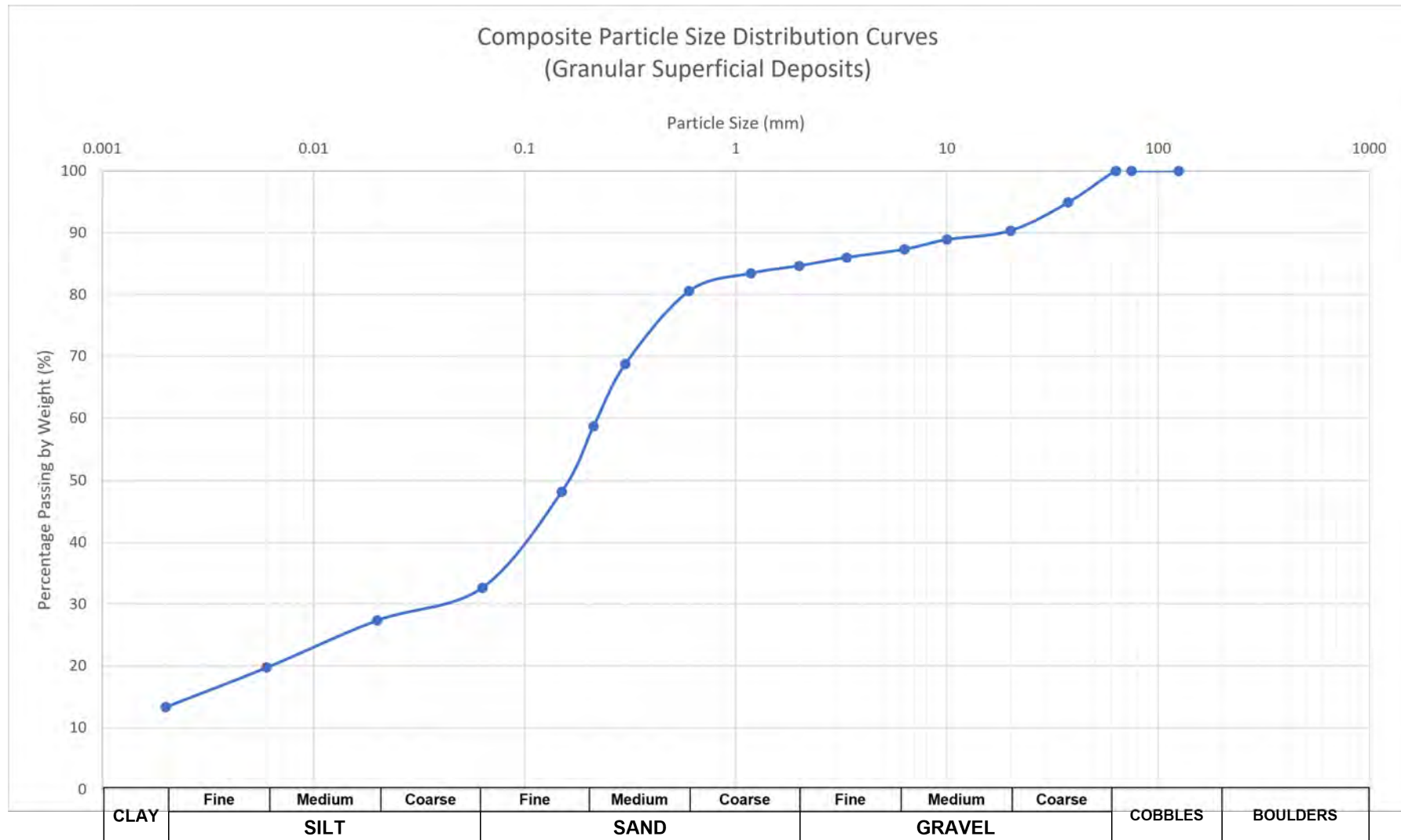


Figure 9-13 - Earthworks Series 600 Classification for Granular Superficial Deposits

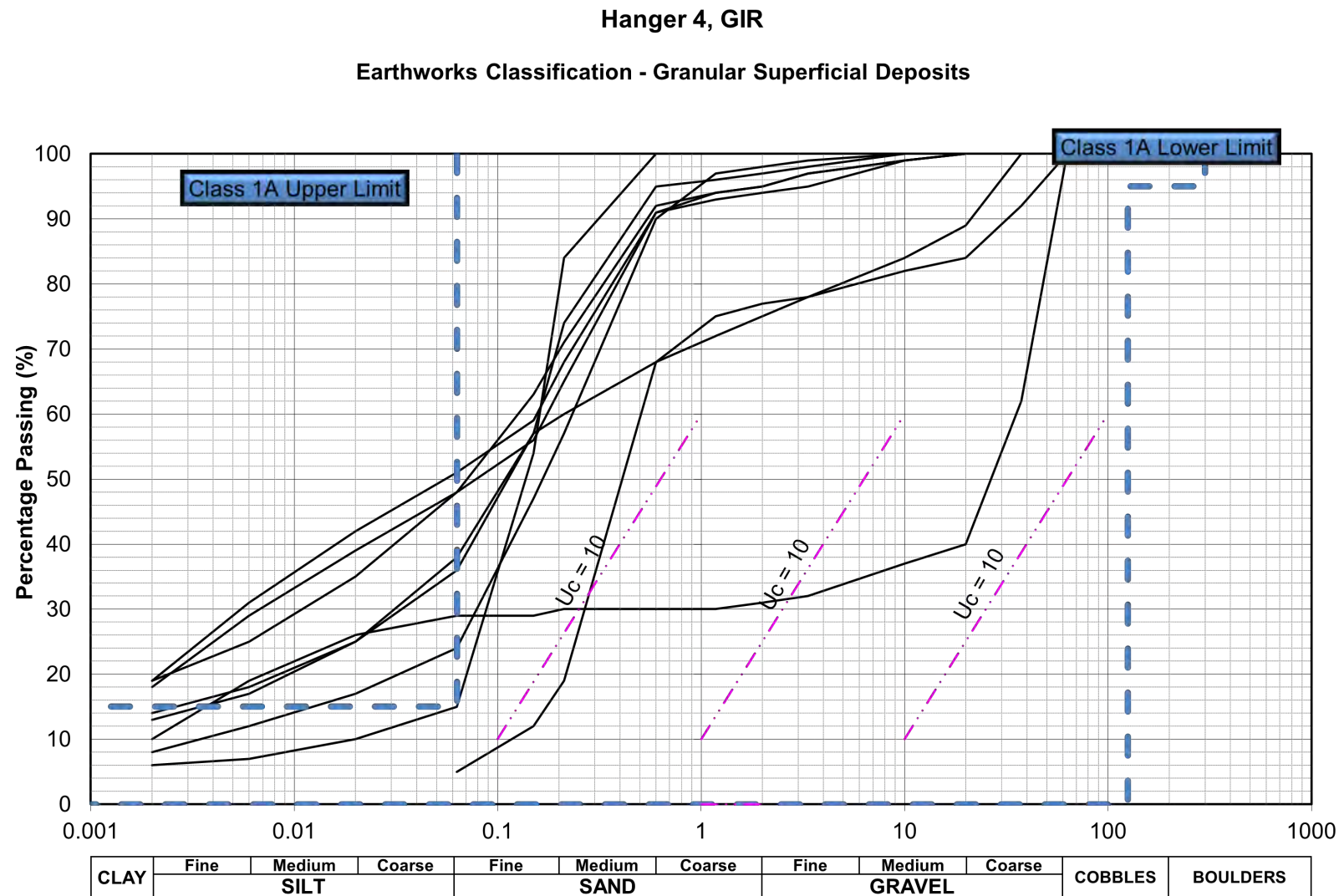


Figure 9-14 - SPT N value VS Depth (Granular Superficial Deposits)

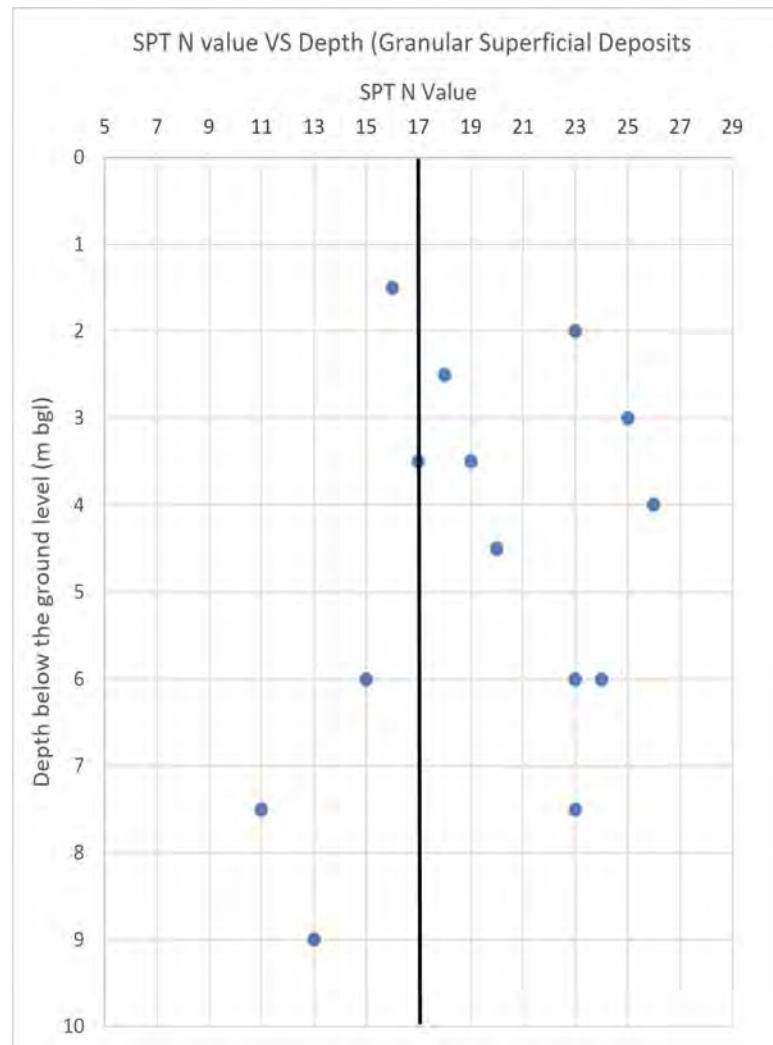


Figure 9-15 - SPT N60 value VS Depth (Granular Superficial Deposits)

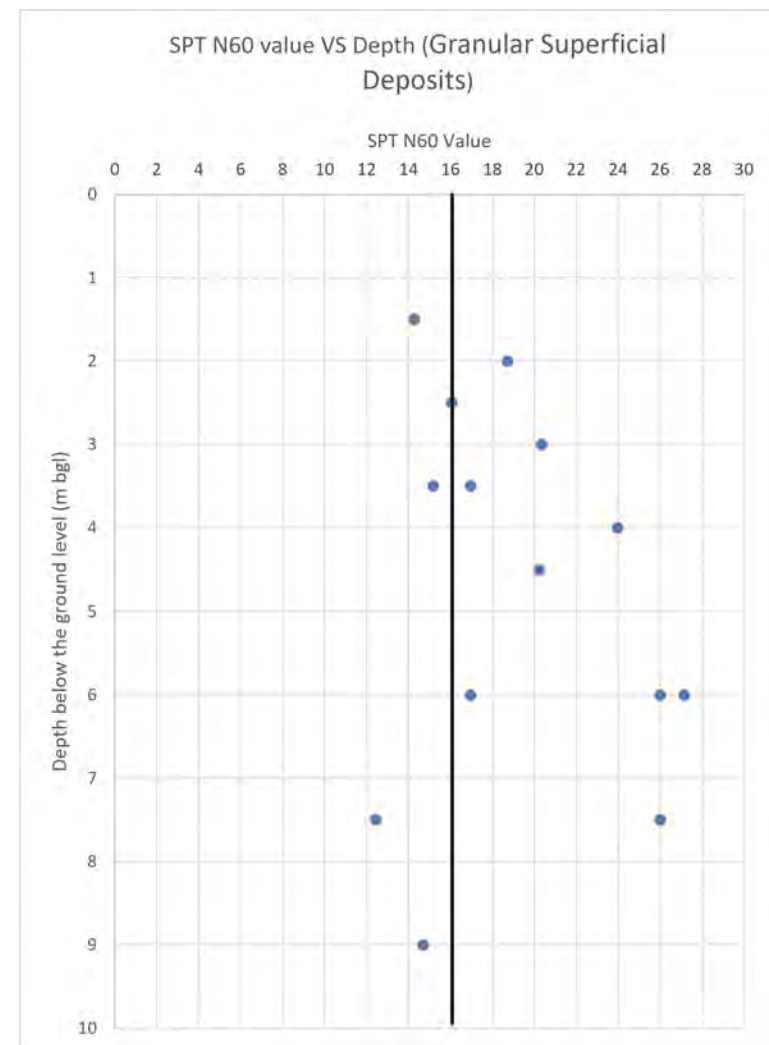


Figure 9-16 - SPT N1,60 value VS Depth (Granular Superficial Deposits)

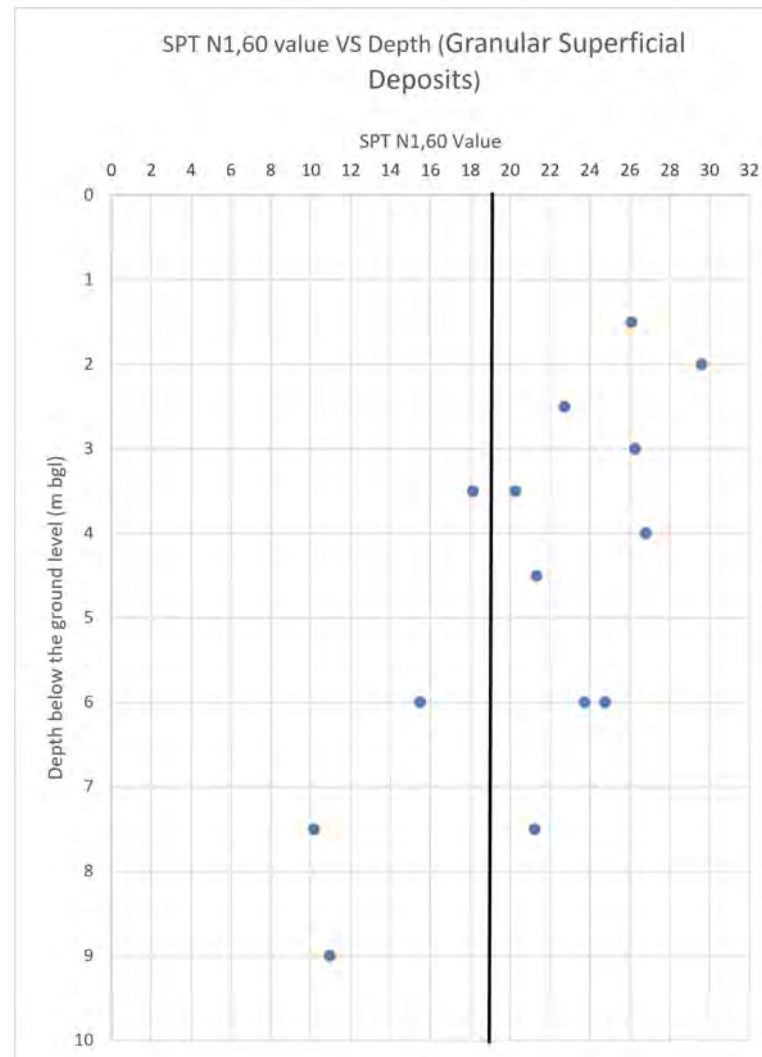


Figure 9-17 - Composite PSD Curve (Cohesive Superficial Deposits)

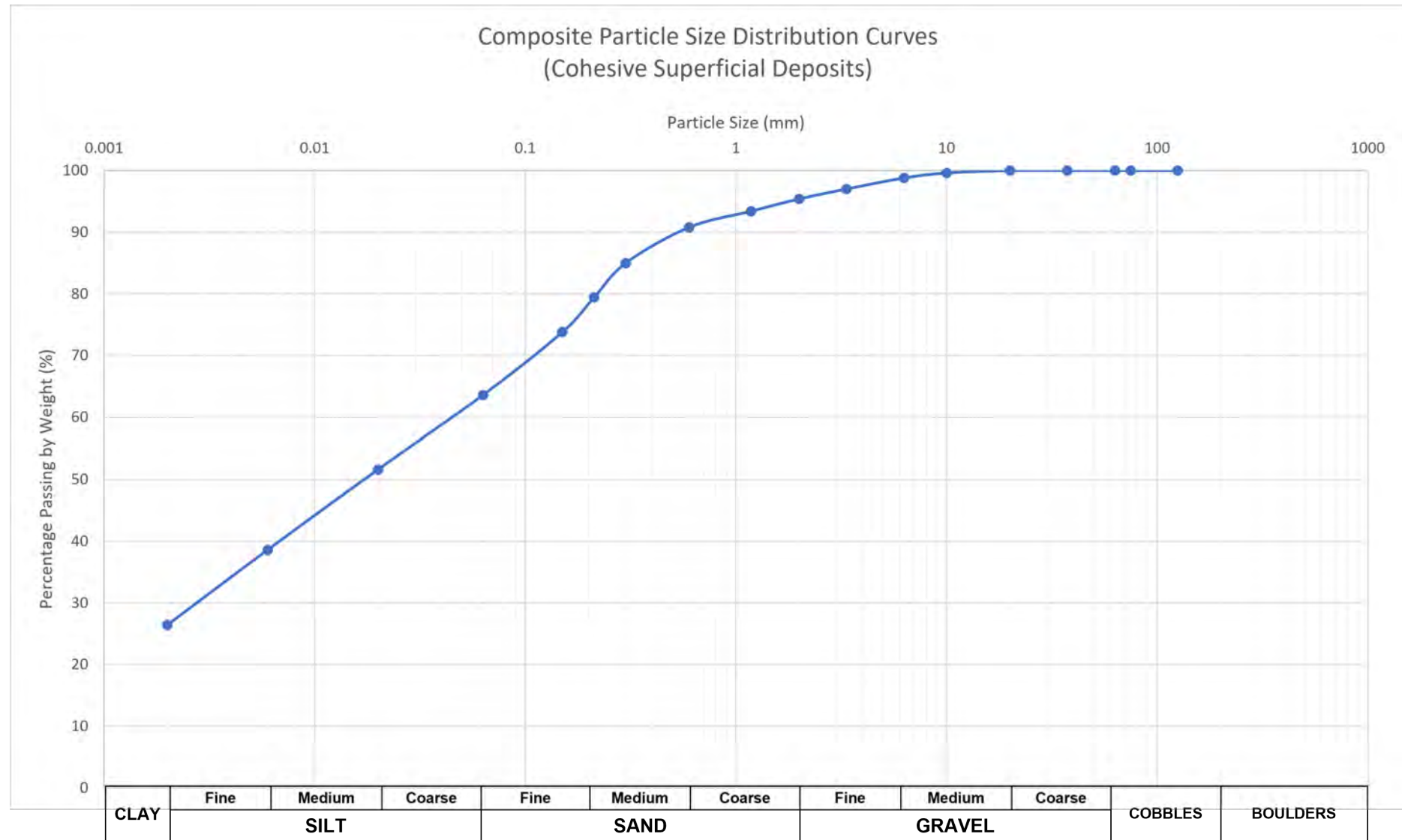
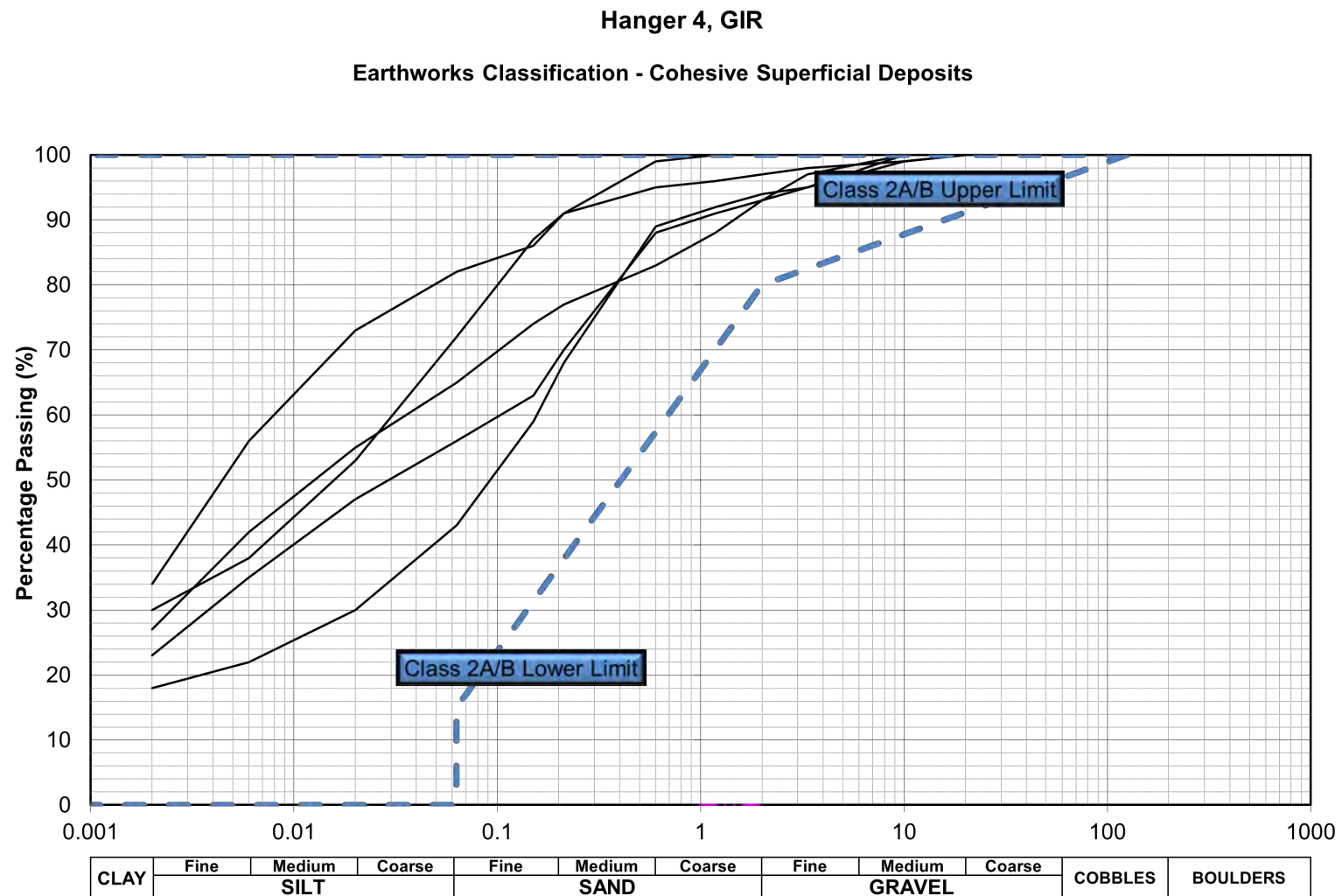


Figure 9-18 – Earthworks Series 600 Classification for Cohesive Superficial Deposits



9.5 BEDROCK (MUDSTONE)

Material parameters are summarised separately below for the different types of bedrock (weathered mudstone and the intact mudstone). Summary tables for each of the identified soils are provided below.

9.5.1 Weathered Mudstone

A summary of the geotechnical testing undertaken on weathered mudstone is presented in Table 9-4. Rationale for the derivation of geotechnical material parameters is presented below.

Table 9-4 – Summary of Laboratory Testing on Weathered Mudstone

Type of Test	No. of Tests	Results
<i>Laboratory:</i>		
Moisture Content	4	Min = 9.1% Max = 25% Average = 15%
Atterberg Limits	4	Liquid Limit = 25– 41% (Avg. 33.75%) Plastic Limit = 15 – 20% (Avg. 17.25%) Plasticity Index = 10 – 21% (Avg. 16.5%)
BRE Reduced Suite	3	PH = 7.79 to 8.0 PH _{char} = 7.8 Sulphate = 100 to 1581.32 mg/l Sulphate _{char} = 1600 mg/l
<i>In Situ:</i>		
SPT	1	N = 50 N ₆₀ = 45 N _{1,60} = 51

The Design Sulphate (DS) Class and Aggressive Chemical Environment for Concrete Classification (ACEC Class) have been obtained for Unit B5 using BRE SD1⁽⁴⁾ guidance.

The characteristic water-soluble sulphate concentration measured in the laboratory tests is 1600 mg/l. The characteristic pH is 7.8 corresponding to DS-3 and AC-3 assuming mobile groundwater conditions in a brownfield environment.

Moisture content testing was undertaken on 4 no. samples of the weathered mudstone. The moisture content ranged from 9.1% to 25%, with an average of 15%.

Atterberg limit testing was undertaken on 4 no. samples of the cohesive superficial deposits. The results indicate that the materials typically comprise low to intermediate plasticity clay, with an average Plasticity Index of 16.5%.

It is noted that these materials were described as clayey GRAVEL on site, therefore these materials are considered as granular material in terms of parameter derive.

One validated SPT tests was undertaken within weathered mudstone. SPT N value of 50 was recorded. The average SPT N value is typical of a very dense coarse soil (BS 5930:2015+A1:2020). Corrected N values, N₆₀ and N_{1,60} have been derived using the methodology outlined in BS EN ISO 22476-3:2005+A1:2011. The characteristic SPT N_{1,60} value is 51 and N₆₀ value is 45 correlating to a relative density of very dense.

Based the record laboratory results and using Figure 1 and Figure 2 of BS 8002:2015, a characteristic unit weight, γ_{char} , of 22 kN/m³ has been adopted for the weathered mudstone.

Based on a characteristic N_{1,60} of 51, and using the relationship between SPT 'N' and angle of internal friction, ϕ' , for granular material (after Peck et al, 1973), a value for ϕ' of 41° can be derived. A characteristic ϕ' of 40° is therefore considered appropriate for the weathered mudstone at the site.

A characteristic effective cohesion (c') of 0 kN/m² is considered appropriate for these strata.

9.5.2 Mudstone

A summary of the geotechnical testing undertaken on weathered mudstone is presented in Table 9-5. Rationale for the derivation of geotechnical material parameters is presented below.

Table 9-5 – Summary of Laboratory Testing on Intact Mudstone

Type of Test	No. of Tests	Results
<i>Laboratory:</i>		
Point Load	22	Min I_{S50} = 0.02 MPa Max I_{S50} = 1.70 MPa Average I_{S50} = 0.26 MPa
BRE Reduced Suite	4	PH = 8.21 to 8.3 PH _{char} = 8.2 Sulphate = 1540 to 1650.64 mg/l Sulphate _{char} = 1650 mg/l

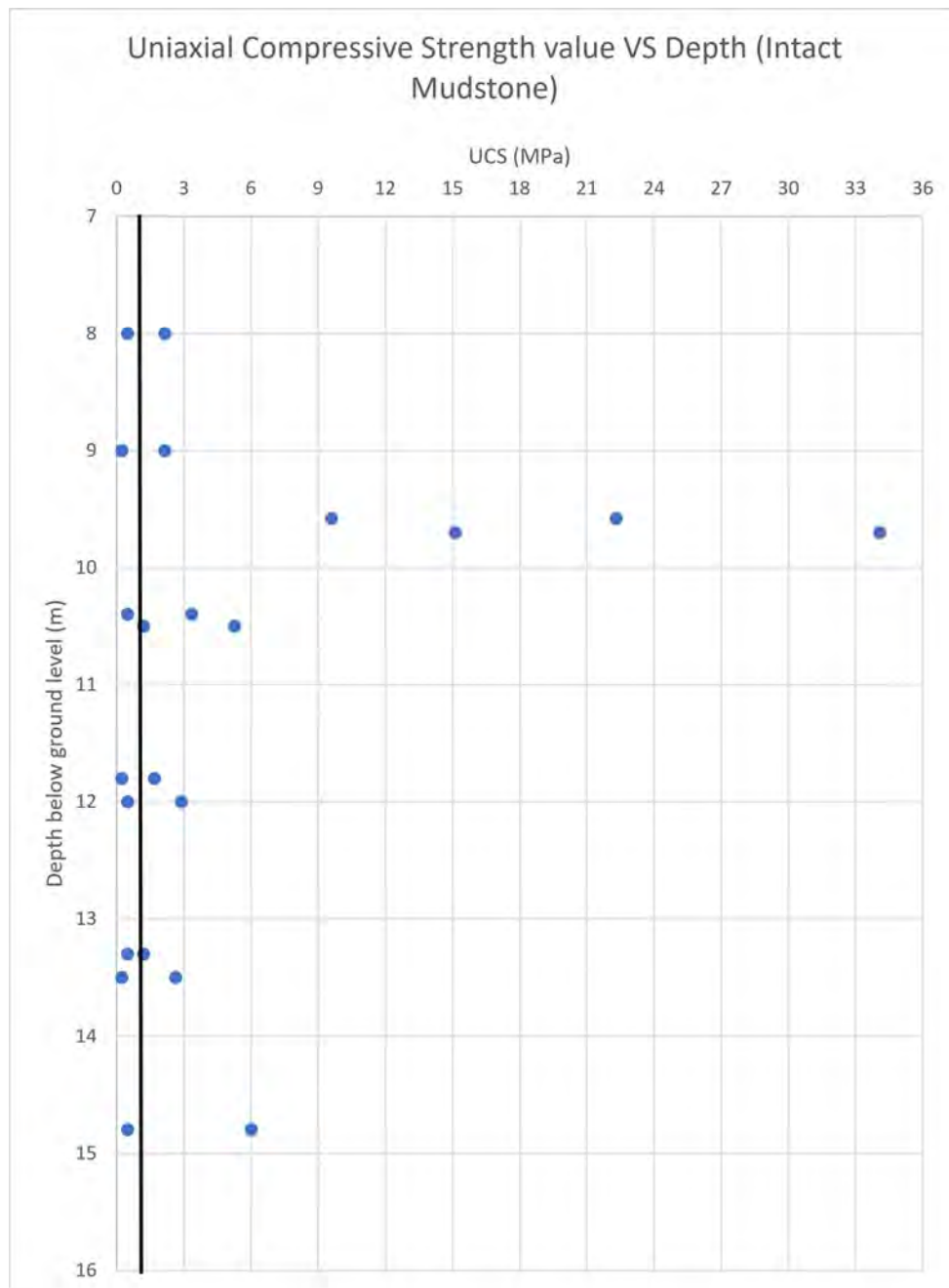
The Design Sulphate (DS) Class and Aggressive Chemical Environment for Concrete Classification (ACEC Class) have been obtained for Unit B5 using BRE SD1⁽⁴⁾ guidance.

The characteristic water-soluble sulphate concentration measured in the laboratory tests is 1650 mg/l. The characteristic pH is 8.2 corresponding to DS-3 and AC-3 assuming mobile groundwater conditions in a brownfield environment.

The values of UCS have been derived using the empirical relationship of $UCS = 24I_{S50}$ (Broch and Franklin, 1972). The results have been plotted against depth in Figure 9-19, and a characteristic trendline has been included. The trendline shows that the characteristic UCS value of 1 MPa. The results indicate that the intact mudstone at site generally comprises very weak mudstone.

A characteristic bulk unit weight of 20 kN/m³ is appropriate for these materials, based on typical value published for the very weak rock classification (BGS, 2002).

Figure 9-19 - Uniaxial Compressive Strength value VS Depth (Intact Mudstone)



9.6 GROUND MODEL

Based on the ground conditions encountered during the ground investigation, which are summarised in the previous sections, six ground models have been derived for the site. Ground Models A-1 and A-2 represent the typical ground conditions across the site. However, due to the significant variability of superficial deposits across the site, analysis of these ground models may lead to under-cautious results, particularly where significant thicknesses of cohesive strata are present. On this basis, additional ground models have been derived to allow assessment of the extreme cases (i.e., where the superficial deposits are entirely cohesive or granular). Ground models B and C represent the case where the superficial deposits comprise entirely cohesive and granular strata, respectively.

The ground models are summarised below:

- Ground Model A – 1
 - o Shallow bedrock. Actual ground model.
- Ground Model A – 2
 - o Deep bedrock. Actual ground model.
- Ground Model B – 1
 - o Shallow bedrock. Superficial deposits modelled as being entirely cohesive material.
- Ground Model B – 2
 - o Deep bedrock. Superficial deposits modelled as being entirely cohesive material.
- Ground Model C – 1
 - o Shallow bedrock. Superficial deposits modelled as being entirely granular material.
- Ground Model C – 2
 - o Deep bedrock. Superficial deposits modelled as being entirely granular material.

Details of each ground model are presented on Tables 9-6 to 9-8.

Table 9-6 - Summary of Site-Specific Ground Model A

Ground Models	Geological Unit	Material Description		Depth to top of unit (m bgl)	Depth to base of unit (m bgl)	Min Proven Thickness (m)	Max Proven Thickness (m)	Comments
Ground Model A - 1	Made Ground (Hardstanding)	Black Bituminous Macadam and bricks		0.0	0.25	0.2	0.3	N/A
	Made Ground	Orangish brown fine to coarse SAND, light grey gravelly fine to coarse SAND, or reddish grey and brown very gravelly CLAY		0.25	2.15	1.1	1.9	Interbedded granular cohesive made ground. Adopted the thickest made ground in ground model as the worst-case consideration.
	Superficial Deposits	Cohesive Superficial Deposits	Firm to stiff reddish brown gravelly sandy CLAY	2.15	4.15	0.25	3.1	N/A
		Granular Superficial Deposits	Slightly gravelly slightly clayey fine to coarse SAND					
	Bedrock	Weathered bedrock	Slightly clayey gravelly fine to coarse SAND	4.15	>4.15	N/A	N/A	N/A
	Made Ground (Hardstanding)	Black Bituminous Macadam and bricks		0.0	0.4	0.22	0.7	N/A

Ground Models	Geological Unit	Material Description		Depth to top of unit (m bgl)	Depth to base of unit (m bgl)	Min Proven Thickness (m)	Max Proven Thickness (m)	Comments
Ground Model A - 2	Made Ground	Orangish brown fine to coarse SAND, light grey gravelly fine to coarse SAND, or reddish grey and brown very gravelly CLAY		0.4	3.1	0.33	2.7	Interbedded granular cohesive made ground. Adopted the thickest made ground in ground model as the worst-case consideration.
	Superficial Deposits	Cohesive Superficial Deposits	Firm to stiff reddish brown gravelly sandy CLAY	3.1	10.1	5.9	8.4	N/A
		Granular Superficial Deposits	Slightly gravelly slightly clayey fine to coarse SAND					
	Bedrock	Weathered bedrock	Slightly clayey gravelly fine to coarse SAND	10.1	11.7	1.6	1.6	N/A
		Intact bedrock	Medium strong to strong reddish-brown MUDSTONE with veins of gypsum	11.7	>11.7	N/A	N/A	N/A

Table 9-7 - Ground Model B (Cohesive Superficial Deposits)

Ground Models	Geological Unit	Material Description		Depth to top of unit (m bgl)	Depth to base of unit (m bgl)	Min Proven Thickness (m)	Max Proven Thickness (m)	Comments
Ground Model B - 1	Made Ground (Hardstanding)	Black Bituminous Macadam and bricks		0.0	0.25	0.2	0.3	N/A
	Made Ground	Orangish brown fine to coarse SAND, light grey gravelly fine to coarse SAND, or reddish grey and brown very gravelly CLAY		0.25	2.15	1.1	1.9	Interbedded granular cohesive made ground. Adopted the thickest made ground in ground model as the worst-case consideration.
	Superficial Deposits	Cohesive Superficial Deposits	Firm to stiff reddish brown gravelly sandy CLAY	2.15	4.15	0.25	3.1	N/A
	Bedrock	Weathered bedrock	Slightly clayey gravelly fine to coarse SAND	4.15	>4.15	N/A	N/A	N/A
	Made Ground (Hardstanding)	Black Bituminous Macadam and bricks		0.0	0.4	0.22	0.7	N/A

Ground Models	Geological Unit	Material Description		Depth to top of unit (m bgl)	Depth to base of unit (m bgl)	Min Proven Thickness (m)	Max Proven Thickness (m)	Comments
Ground Model B - 2	Made Ground	Orangish brown fine to coarse SAND, light grey gravelly fine to coarse SAND, or reddish grey and brown very gravelly CLAY		0.4	3.1	0.33	2.7	Interbedded granular cohesive made ground. Adopted the thickest made ground in ground model as the worst-case consideration.
	Superficial Deposits	Cohesive Superficial Deposits	Firm to stiff reddish brown gravelly sandy CLAY	3.1	10.1	5.9	8.4	N/A
	Bedrock	Weathered bedrock	Slightly clayey gravelly fine to coarse SAND	10.1	11.7	1.6	1.6	N/A
		Intact bedrock	Medium strong to strong reddish-brown MUDSTONE with veins of gypsum	11.7	>11.7	N/A	N/A	N/A

Table 9-8 - Ground Model C (Granular Superficial Deposits)

Ground Models	Geological Unit	Material Description		Depth to top of unit (m bgl)	Depth to base of unit (m bgl)	Min Proven Thickness (m)	Max Proven Thickness (m)	Comments
Ground Model C - 1	Made Ground (Hardstanding)	Black Bituminous Macadam and bricks		0.0	0.25	0.2	0.3	N/A
	Made Ground	Orangish brown fine to coarse SAND, light grey gravelly fine to coarse SAND, or reddish grey and brown very gravelly CLAY		0.25	2.15	1.1	1.9	Interbedded granular cohesive made ground. Adopted the thickest made ground in ground model as the worst-case consideration.
	Superficial Deposits	Granular Superficial Deposits	Slightly gravelly slightly clayey fine to coarse SAND	2.15	4.15	0.25	3.1	N/A
	Bedrock	Weathered bedrock	Slightly clayey gravelly fine to coarse SAND	4.15	>4.15	N/A	N/A	N/A

Ground Models	Geological Unit	Material Description		Depth to top of unit (m bgl)	Depth to base of unit (m bgl)	Min Proven Thickness (m)	Max Proven Thickness (m)	Comments
Ground Model C - 2	Made Ground (Hardstanding)	Black Bituminous Macadam and bricks		0.0	0.4	0.22	0.7	N/A
	Made Ground	Orangish brown fine to coarse SAND, light grey gravelly fine to coarse SAND, or reddish grey and brown very gravelly CLAY		0.4	3.1	0.33	2.7	Interbedded granular cohesive made ground. Adopted the thickest made ground in ground model as the worst-case consideration.
	Superficial Deposits	Granular Superficial Deposits	Slightly gravelly slightly clayey fine to coarse SAND	3.1	10.1	5.9	8.4	N/A
	Bedrock	Weathered bedrock	Slightly clayey gravelly fine to coarse SAND or very dense reddish brown clayey sandy angular fine to coarse GRAVEL of mudstone and gypsum.	10.1	11.7	1.6	1.6	N/A
		Intact bedrock	Medium strong to strong reddish-brown MUDSTONE with veins of gypsum	11.7	>11.7	N/A	N/A	N/A

9.7 SUMMARY OF CHARACTERISTIC GEOTECHNICAL PARAMETERS

Geotechnical parameters derived for the superficial deposits and solid geology encountered across the site are outlined in Table 9-6.

Table 9-9 – Summary of Characteristic Values for The Stratum

Stratum	Material Parameter and unit		Characteristic Parameters
Made Ground	Unit Weight	kN/m ³	18
	Plasticity	%	18
	Friction Angle ϕ'	°	27
	Effective Cohesion c'	kN/m ²	0
	Undrained Shear Strength	kPa	5 to 40 (0 to 3m bgl)
	Coefficient of volume compressibility, m_v	m ² /MN	0.14 to 0.2
	Drained Modulus	kN/m ²	1.35 to 10.8 (0 to 3m bgl)
	Undrained Modulus	MN/m ²	10 to 14 (0 to 3mbgl)
	CBR	%	5
Cohesive Superficial Deposits	Concrete Classification	-	DS-1 AC-1
	Unit Weight	kN/m ³	20
	Plasticity	%	13
	Friction Angle ϕ'	°	27
	Effective Cohesion c'	kN/m ²	0
	Undrained Shear Strength	kPa	45 to 105 (1 to 5 m bgl)
	Coefficient of volume compressibility, m_v	m ² /MN	0.1 to 0.14
	Drained Modulus	kN/m ²	9 to 13 (1 to 5m bgl)
	Undrained Modulus	MN/m ²	12 to 17 (1 to 5mbgl)
	Series 600 Material Class	Class	2A/B
Granular Superficial Deposits	Concrete Classification	-	DS-1 AC-1
	Unit Weight	kN/m ³	19
	Friction Angle ϕ'	°	33

Stratum	Material Parameter and unit		Characteristic Parameters
	Effective Cohesion c'	kN/m ²	0
Weathered Bedrock (mudstone)	Concrete Classification	-	DS-3 AC-3
	Unit Weight	kN/m ³	22
	Friction Angle ϕ'	°	40
	Effective Cohesion c'	kN/m ²	0
Intact Bedrock (mudstone)	Concrete Classification	-	DS-3 AC-3
	Bulk Unit Weight	kN/m ³	20
	Uniaxial Compressive Strength (UCS)	MN/m ²	1

10.0 ASSESSMENT OF GROUND AGGRESSIVITY

10.1 INTRODUCTION

With reference to the guidance published in BRE Special Digest 1:2005, Concrete in aggressive ground, the following design sulphate classes are recommended for buried concrete at the site based on characteristic sulphate and pH values. The tests measured the following.

- pH
- Magnesium (2:1 water soluble)
- Chloride (2:1 water soluble)
- Nitrate (2:1 water soluble)
- Sulphate (2:1 water soluble)
- Sulphate (total – mg/kg SO₄)
- Sulphur (total – mg/kg S)
- Sulphur (total - % w/w S).

10.2 ASSESSMENT

Ten chemical tests which included pH and sulphate testing, as well as BRE testing on eight soil and core samples were tested as part of TT 2022 investigation undertaken on representative samples from across the encountered strata. The results were assessed in accordance with BRE Special Digest 1:2005 3rd Edition with Amendments (2017) to provide design values for in ground concrete. The assessment is presented on Table 10-1.

10.3 CLASSIFICATION

Table 10-1 – Summary of BRE Test Results

Strata	No. of results	pH	Characteristic pH (mean)	Sulphate (mg/l)	Characteristic Sulphate Value (mg/l)
Made Ground	9	7.18 – 8.43	8.00	39.32	100
Sand	6	6.89 – 8.30	7.7	120	100
Weathered bedrock	3	7.80 – 8.00	7.9	723	700
Bedrock	4	8.20 – 8.30	8.25	1575	1600

Based on the results of the pH and 2:1 water soluble sulphate testing, and in accordance with BRE SD1 BRE Special Digest 1: 2005 - Concrete in Aggressive Ground and assuming mobile water presence the following classifications were determined for the strata.

The Made Ground fell into Design Sulphate class of DS-1 and an ACEC Class of AC-1.

The sand fell into Design Sulphate class of DS-1 and an ACEC Class of AC-1.

Weathered bedrock fell into Design Sulphate class of DS-2 and an ACEC Class of AC-2.

Bedrock strata fell into Design Sulphate class of DS-3 and an ACEC Class of AC-3.

Based on the levels of sulphate present within the tested bedrock strata and the anticipated foundation solution of pads and vibroconcrete columns, a conservative concrete classification of Design Sulphate Class of DS-3 and ACEC Class of AC-3 should be adopted for the site.

11.0 PRELIMINARY ENGINEERING ASSESSMENT

11.1 GENERAL

The proposed end-use for the site is as a 92,000ft² distribution centre with an external service yard and car parking in the surrounding areas. A masterplan was provided to Tetra Tech and the drawing by RPS is shown on NK018329-RPS-SI-XX-DR-A-9448 (Hangar 4 Plot – Unit 92k Option 01) in third party drawings appended.

11.2 FOUNDATIONS AND FLOOR SLABS

11.2.1 Ground Conditions

The whole site comprises Made Ground of both granular and cohesive strata underlain by superficial deposits both granular and cohesive strata. Weathered bedrock strata recovered as granular strata comprising slightly clayey gravelly fine to coarse SAND and very dense reddish brown clayey sandy angular fine to coarse GRAVEL of mudstone and gypsum. Intact bedrock was recorded as strong laminated grey/greyish red MUDSTONE with bands of quartz veins.

In the north part of the site, weathered bedrock was generally encountered at a shallow depth between 2.25m bgl to 4.6m bgl. Made Ground extended to between 1.3m and 2.1m, and superficial deposits were encountered with a maximum thickness of 3.1m. In the south part of the site, weathered bedrock was generally encountered at a depth between 8.0m bgl to 9.0m bgl. Made Ground extended to between 0.6m and 3.1m, and superficial deposits were encountered with a maximum thickness of 8.38m. Intact bedrock was cored within two of the boreholes (CP04, CP05), from a minimum depth of 9.6m bgl (CP04) to a maximum depth of 15.80m bgl (CP05).

Groundwater was encountered in monitoring standpipes with response zones targeting both the natural and Made Ground strata. Given the variable levels of groundwater, it is considered unlikely to be representative of the groundwater table and is likely perched.

11.2.2 Foundations

Based on the variability and depth of the Made Ground and superficial deposits across the whole site, there is the potential for adverse total and differential of settlement of shallow foundations placed within these materials. As such, it is considered that conventional shallow foundations are not appropriate at this site.

On the basis of the above, it is recommended that a combined pad and stone column foundation solution, end bearing on the competent bedrock, is adopted across the site, subject to confirmation following detailed design by a specialist contractor.

11.2.3 Floor Slab

Based on the proposed foundation solution of pads with vibroconcrete column onto vibro-compacted ground. Ground bearing floor slabs are considered suitable subject to detailed design.

11.3 ROAD PAVEMENTS

Proposed parking and loading areas are indicated on the proposed development plan and as such dynamic cone penetration tests were undertaken across site as well as laboratory soaked and unsoaked CBR testing has been undertaken on the likely subgrade materials (shallow Made Ground <2.00m). A summary of the CBR results together with the recommended design CBR is presented below.

Table 11-1 – Summary of CBR Testing

Strata	Type of Test	CBR value - Top of sample	Characteristic CBR value
Made Ground	CBR	Min Top= 1.5% Max Top = 1.7% Average Top = 1.6% Min Bottom= 1.8% Max Bottom = 2.7% Average Bottom = 2.25%	5%
	DCP	CBR Min = 2.0% CBR Max = 37.0% CBR Average = 10.0%	

Based on the assessment, an equilibrium CBR of 5% may be assumed, subject to proof-rolling and removal of soft spots. The cohesive Made Ground is considered to be frost susceptible and therefore, a minimum 450mm construction thickness is likely to be required.

11.4 DRAINAGE

Soakaway drainage discharging into Made Ground is not recommended due to the risk of causing inundation settlement. On this basis, soakaway drainage is unsuitable for the site and an alternative form of surface water drainage should be adopted.

11.5 TEMPORARY WORKS

The exploratory holes suggest shallow granular soils are present with some cohesive Made Ground underlying the site therefore, trench support or battering back is recommended for all excavations requiring person entry.

Dewatering may be required given the presence of perched water. Conventional sump pumping is likely to be suitable to control groundwater ingress into excavations.

The materials encountered at the site are expected to be suitable for excavation by conventional plant. Localised obstructions, if encountered, are likely to be broken out using conventional hydraulic breakers.

The site should be subject to assessment before any heavy plant is utilized, (for example a piling rig attending site).

The soft to firm cohesive materials at shallow depth are likely to be susceptible to rutting and softening by heavy construction traffic. Temporary haul roads should be provided during construction.

11.6 BURIED SERVICES

Buried services were identified and detailed on the exploratory holes location plan. The location and depth of these buried services should be considered when designing road pavements at the site and adequate cover should be provided in accordance with the service providers recommendations.

12.0 GEOTECHNICAL RISK REGISTER

This section presents an updated Geotechnical Risk Register (GRR) for the scheme. The risks have been evaluated using the risk evaluation matrix suggested in CD 622 'Managing Geotechnical Risk, which is reproduced as Table 12-1, and are presented in Table 12-2.

For the purposes of this report, risk has been assessed with reference to 'likelihood', 'severity' and 'risk'.

Table 12-1 – Risk Evaluation Matrix

Risk Matrix						
Likelihood		Severity				
		1	2	3	4	5
		Minor	Moderate	Serious	Major	Catastrophic
1	Extremely unlikely	1	2	3	4	5
2	Unlikely	2	4	6	8	10
3	Likely	3	6	9	12	15
4	Extremely likely	4	8	12	16	20
5	Almost certain	5	10	15	20	25
Potential severity of harm occurring						
1	Minor	Minor damage or loss - (no human injury)				
2	Moderate	Moderate damage or loss - (slight injury or illness)				
3	Serious	Substantial damage or loss - (serious injury or illness)				
4	Major	Major damage or loss - (fatal injury)				
5	Catastrophic	Catastrophic damage or loss - (multiple fatalities)				
Risk Classification						
Low (1-8)	Ensure assumed control measures are maintained and reviewed as necessary.					
Medium (9-19)	Additional control measures needed to reduce risk rating to a level that is equivalent to a test of "reasonably required" for.					
High (20-25)	Activity not permitted. Hazard to be avoided or risk to be reduced to tolerable level.					

Table 12-2 – Geotechnical Risk Register

Risk ID	Hazard	Consequence	Likelihood	Severity	Risk	Mitigation	Likelihood	Severity	Residual Risk
1	Soft strata at shallow depth	<ul style="list-style-type: none"> - Temporary works issues, trench instability/collapse. - Injury or death of personnel who enter the temporary works. - Low CBR values. Insufficient pavement design, leading to excessive pavement settlement. - Excessive total and differential settlements. - Bearing capacity failure (attenuation tank and retaining wall foundations) - Construction trafficking issues – rutting. 	4	4	16	<ul style="list-style-type: none"> - Replacement of soft clay material with engineered fill material to appropriate specification. - Temporary excavations greater than 1.20m bgl shall be shored with close sheeting or a sliding trench metal shield to ensure stability. - Foundations to be design based on recorded ground conditions. Pads and vibroconcrete columns onto vibrocompacted ground are recommended for structures. - Redesign of temporary and permanent works where necessary. - Inspection of ground conditions during construction to check conditions are as expected. - Temporary haul roads to be constructed for construction traffic. - Road pavement design to consider recommended design CBR. 	2	4	8

Risk ID	Hazard	Consequence	Likelihood	Severity	Risk	Mitigation	Likelihood	Severity	Residual Risk
2	Potential variable and significant thickness of Made Ground	<ul style="list-style-type: none"> -Exceedance of Long-term settlement limit (SLS failure) -Unacceptable differential settlement leading to uneven pavement surface - Variable CBR values 	4	4	16	<ul style="list-style-type: none"> - Preliminary settlement assessment - Sub-grade CBR value should be confirmed prior to pavement construction. 	2	4	8
3	Deterioration of strength of Made Ground soils upon saturation	<ul style="list-style-type: none"> -Temporary works issues, trench instability/collapse on saturation of Made Ground -Excessive total/differential settlement of structures/infrastructure 	4	4	16	<ul style="list-style-type: none"> - The use of soakaways, or other forms of infiltration drainage should not be used. Surface water run-off shall be controlled during construction and an appropriate permanent surface water drainage solution should be adopted for the site. 	2	3	6
4	Variable superficial deposits	<ul style="list-style-type: none"> -Excessive total and differential settlements of all buildings except lightly loaded buildings (i.e. 2 storey housing) 	4	4	16	<ul style="list-style-type: none"> -Preliminary settlement assessment -Ground improvement solution (e.g. vibro-replacement stone columns or piles) likely needed for all but lightly loaded structures 	2	4	8
5	Shallow groundwater inflow into excavations	<ul style="list-style-type: none"> -Temporary excavation instability leading to collapse – loss of life or serve injury -Problems with construction phase and potential failure of remedial options. - Pathway for pollutants – human health impact to construction workers. 	4	3	12	<ul style="list-style-type: none"> - Dewatering measures comprising sump pumping may be required locally. -Good quality construction, including materials and methods. -Appropriate drainage to be incorporated into the design of the gabion retaining wall. 	2	3	6
6	Below ground obstructions	<ul style="list-style-type: none"> -Obstruction to excavation advancement. 	3	4	12	<ul style="list-style-type: none"> - Appropriate plant and breakout equipment should be available on-site during construction works. 	2	3	6

Risk ID	Hazard	Consequence	Likelihood	Severity	Risk	Mitigation	Likelihood	Severity	Residual Risk
		- Increased costs, delays and potential need to redesign.				- Proper design with robust methodology required to account for the foreseen ground conditions e.g., presence of high boulder content. - Piling methodology should account for presence of obstructions in the ground.			
7	Ground aggressive to concrete	- Damage to any buried concrete structures resulting in serviceability issues or bearing capacity failure.	2	4	8	- Specify structural concrete according to DS3 AC3 specification.	1	4	4
8	Unencountered services	- New construction causes damage to existing services - Restricted maintenance access to utility provider. - Severing / damage to services. - Settlement of services / utilities.	2	4	8	- Adequate service survey drawings shall be obtained prior to construction works. - Use of existing above / below ground service conduits where possible. - Service providers consulted and known services marked out.	1	4	4

13.0 CONCLUSIONS

13.1 GENERAL

This report provides a summary of the ground and groundwater conditions and gives an updated conceptual site model and geotechnical risk assessment following our investigation of the site.

13.2 GROUND CONDITIONS

Made Ground was proven across site to depths between 0.60m and 3.10m and overlying superficial deposits encountered up to 8.38m thick.

Bedrock onsite was encountered in the north between 2.25m bgl and 4.60m bgl. and in the south part of the site between 8.00m bgl to 9.00m bgl. The bedrock was cored within two of the boreholes, from a minimum depth of 9.60m bgl (CP04) to a maximum depth of 15.80m bgl (CP05) and recorded as Mudstone.

13.3 SOIL CONTAMINATION

13.3.1 Summary

A contamination assessment has been completed using data obtained from the ground investigation and was screened against commercial general acceptance criteria and determined that there were no exceedances.

Ground gas and water monitoring was undertaken and determined that the site should be categorized as CS1 in line with CIRIA guidance and as such gas protection measures are not required.

The following items will be taken forward to the Remediation Strategy for discussion and where relevant assessment and/or mitigation:

- **Contaminated Soils.** Whilst no elevated levels of contaminants were identified against commercial GAC, given the former landuse and site history there is potential for contamination to be present in untested areas of the site and as such a watching brief and good site practices should be adopted for the site.
- **Asbestos.** Whilst no asbestos was identified in the soils, Galbestos was identified onsite within the building and given the history of the site there is potential for asbestos to be present in the soil in untested areas of the site. Therefore, the AEC report recommends undertaking an Asbestos Management Plan. If asbestos fragments are encountered during earthworks by visual assessment, then an asbestos pick will be carried out and impacted material disposed of off-site.
- **Ground Gas.** The site is classified as CS1 in line with CIRIA guidance therefore gas protection measures are not required. It is recommended that known boreholes should be grouted at the start of the enabling works.
- **Water Pipes.** Testing of soils indicated that there were no elevated contaminants however given the site's former landuse and history a watching brief is recommended during installation along proposed supply routes once known.

13.3.2 Waste and Materials Management

All of the Made Ground samples have been classified as non-hazardous using HazWasteOnline and have the potential to be disposed to a facility accepting non-hazardous waste or, subject to WAC tests to an inert facility.

Material from other sources, particularly those which have not been identified to date, may also be classified as hazardous.

It is the responsibility of the contractor, as waste producer, to classify the waste and to identify a suitable waste disposal facility based on the chemical composition of the material. Therefore, prior to disposal the

characteristics of any excavated soils will need final classification in consultation with the landfill sites and waste disposal contractors. Further testing and analysis, including Waste Acceptance Criteria (WAC) testing, may be required on the actual soil arisings which constitute the waste.

Any material excavated on site may be classified as waste and it is the responsibility of the holder of a material to form their own view on whether or not it is waste. This includes determining when waste that has been treated in some way can cease to be classed as waste for a particular purpose.

If site-won material is to be reused on site, or soils other than primary aggregate or aggregates produced under the WRAP Protocol are to be imported to site, a Materials Management Plan will be required, signed off by a Qualified Person as defined in the 'Definition of Waste Code of Practice' (CL:AIRE, 2011).

13.4 FOUNDATIONS

Based on the variability and depth of the Made Ground and superficial deposits across the whole site, there is the potential for adverse total and differential of settlement of shallow foundations placed within these materials. As such it is recommended that pads and vibroconcrete columns onto vibrocompacted ground with columns bearing onto bedrock, subject to confirmation following detailed design by a specialist contractor.

Ground bearing floor slabs should be adopted at the site.

There is the potential for differential settlement between structures and the surrounding ground level (areas of driveways/pavement/road construction). Therefore, a preliminary settlement assessment is recommended to determine likely settlement amounts.

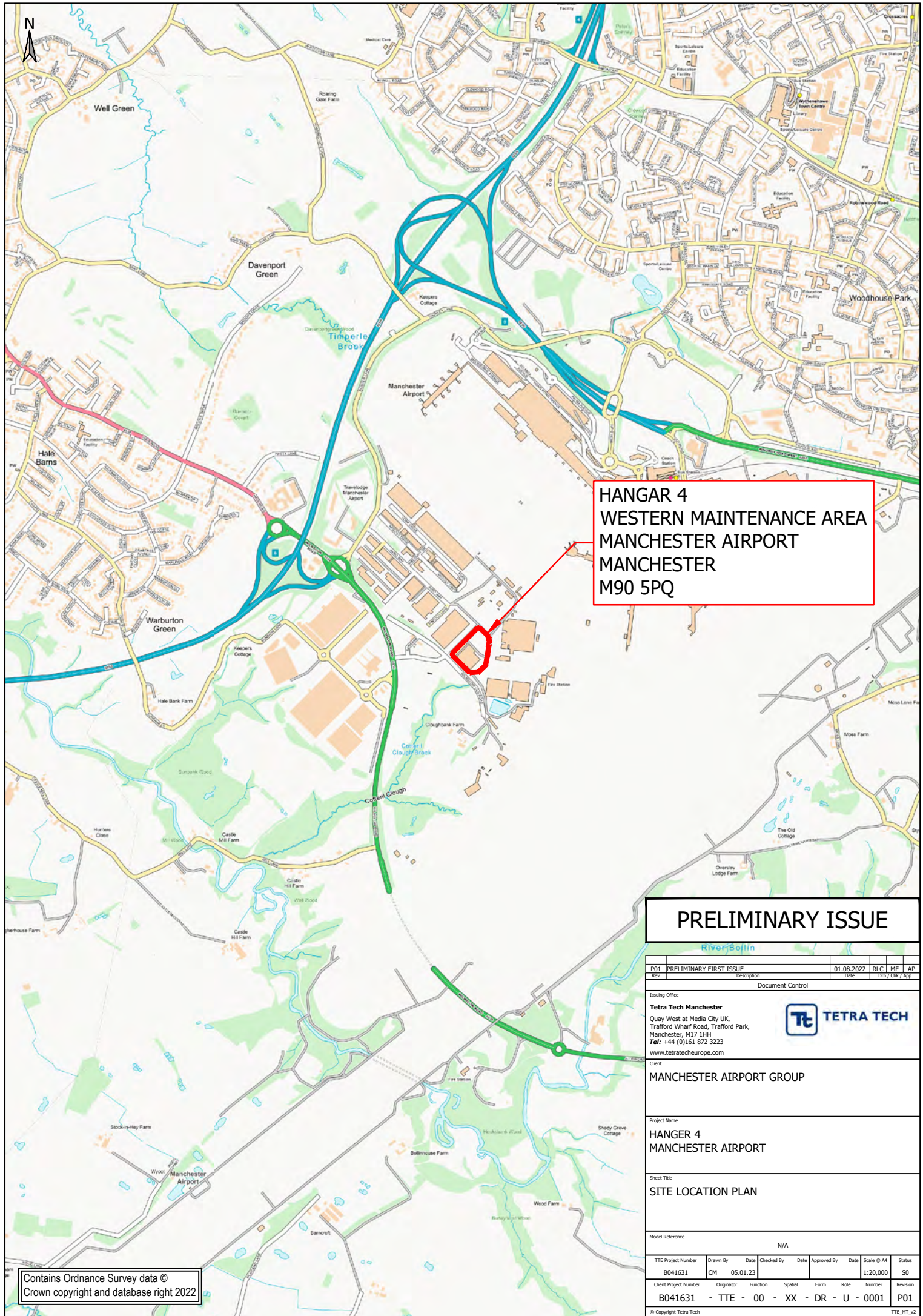
13.5 ROAD PAVEMENTS

A design CBR value of 5% is recommended at formation level with soft spots dug out and replaced with suitable engineered fill.

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DRAWINGS

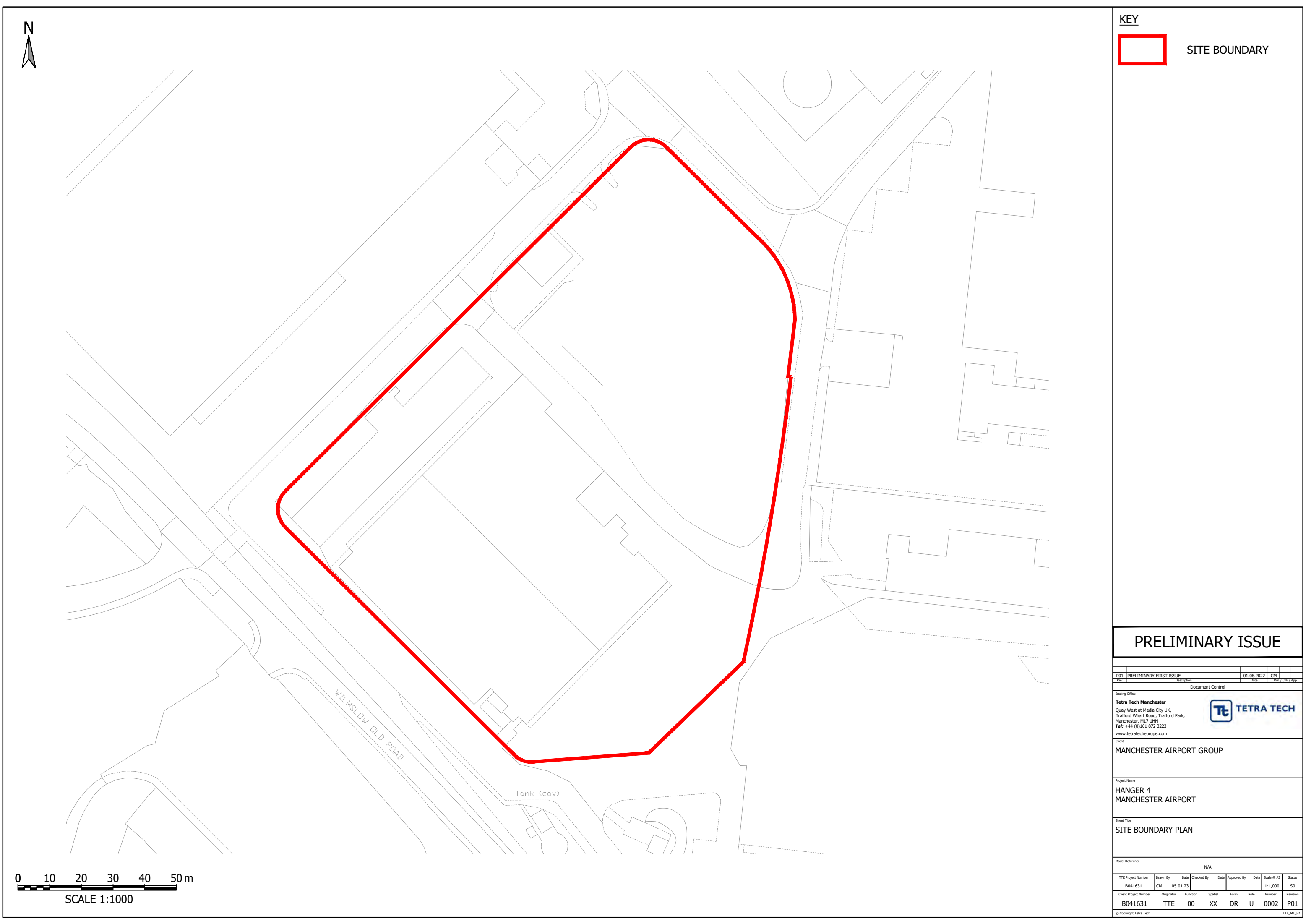


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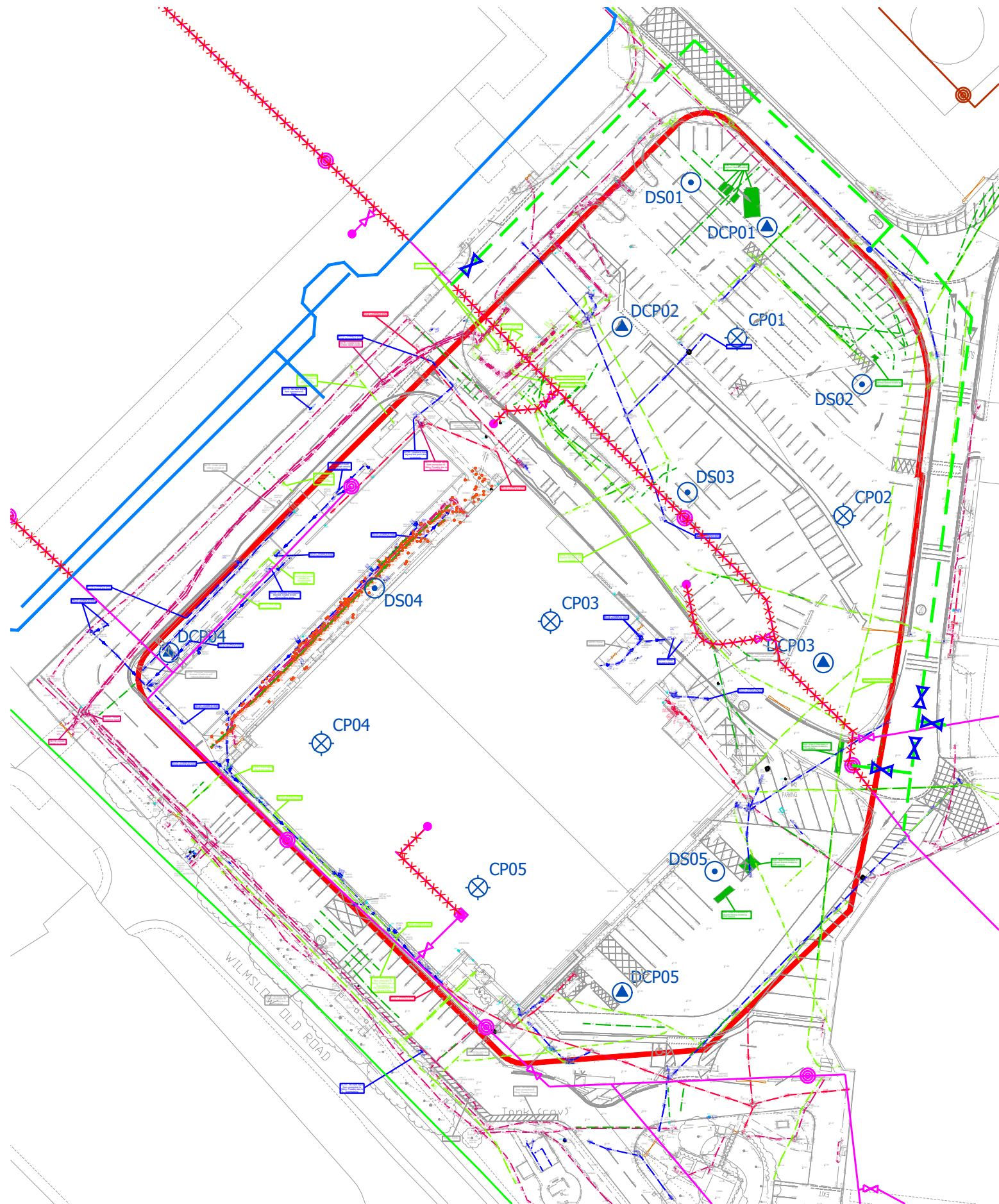
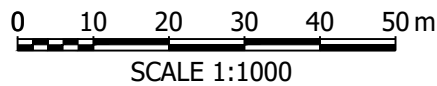
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 **TETRA TECH**

Project Name
HANGER 4
MANCHESTER AIRPORT

Model Reference	N/A
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SERVICES

- SW STORM WATER SEWERS
- FW FOUL WATER SEWERS
- WM WATER MAIN
- GM GAS MAIN
- EL ELECTRIC CABLES
- DUCT CABLE DUCTING
- BT BT (UNDERGROUND)
- CCTV CABLE TV
- UI UNIDENTIFIED FEATURE
- UP UNIDENTIFIED PIPE
- UC UNIDENTIFIED CABLE
- UNPR UNPROVEN FEATURE
- SW END OF TRACE
- FW LATERAL CONNECTIONS
- FW CONNECTIVITY BETWEEN CHAMBERS FROM CCTV REPORT
- SW COVER POSITION FROM CCTV REPORT - NOT SURVEYED ON TOPOGRAPHICAL SURVEY.
- 0.0d BURIED FEATURE FOUND USING RADAR

WATER MAINS

- ROUTE TO BE ABANDONED
- EXISTING WATER MAIN 1
- EXISTING WATER MAIN 2
- EXISTING WATER MAIN 3
- PROPOSED WATER MAIN DIVERSION
- PROPOSED FIRE HYDRANT
- PROPOSED VALVE

NOTE:
SERVICES TAKEN FROM SURVEY OPERATIONS
DRAWINGS 22L135/001, 002 & 003 DATED FEB 23.

WATER MAIN LOCATIONS TAKEN FROM TETRA TECH
DRAWING B071631-TTE-00-XX-DR-C-412305-P03
DATED NOV 22.

KEY

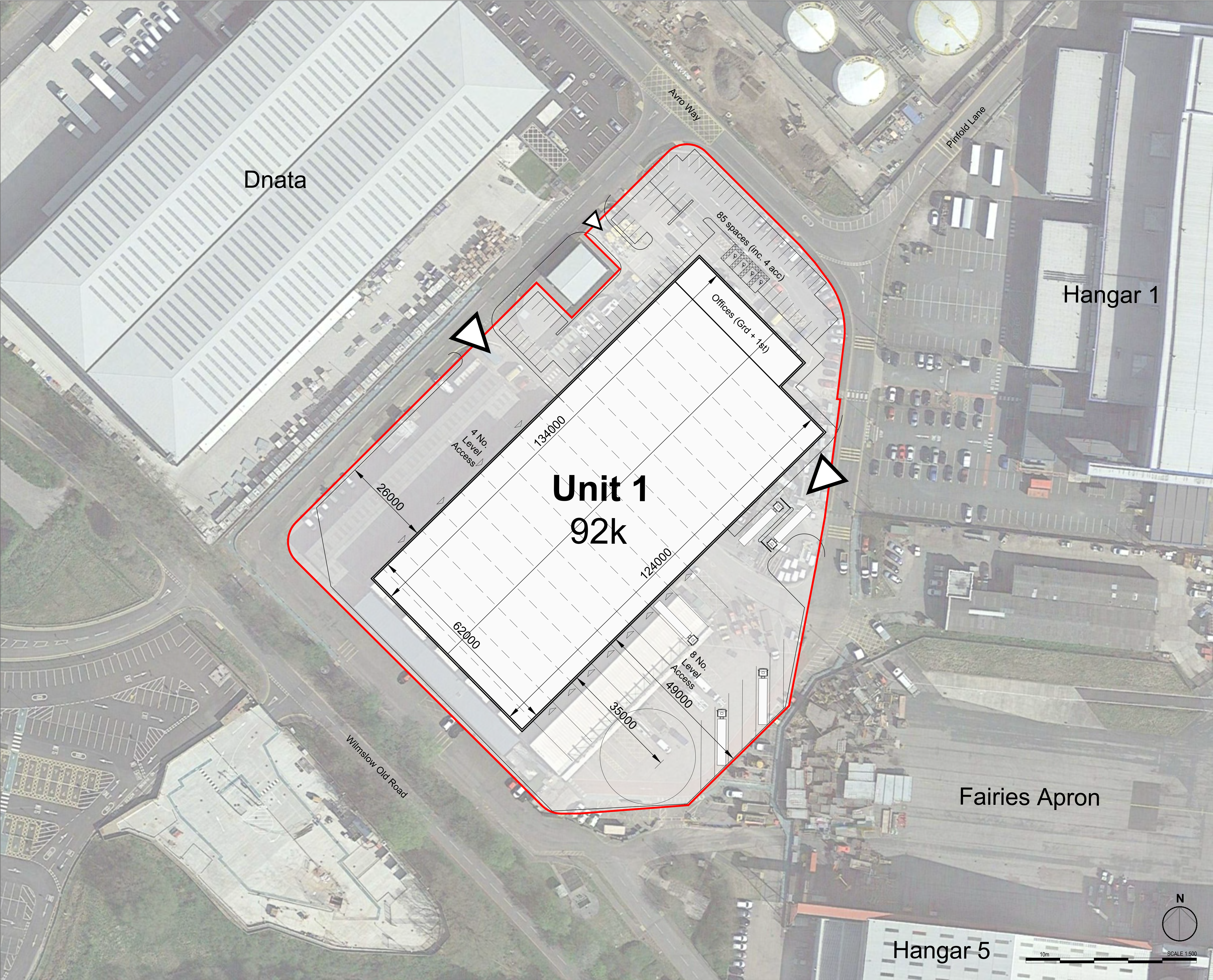
- SITE BOUNDARY
- TETRA TECH GI 2023
- CABLE PERCUSSION BOREHOLE
- WINDOW SAMPLE BOREHOLE
- DYNAMIC CONE PENETRATION TEST

Proposed Ground Investigation			
Point	ID	Easting	Northing
1	DS01	381155.34	384742.63
2	DS02	381190.63	384700.98
3	DS03	381154.64	384678.67
4	DS04	381090.08	384658.91
5	DS05	381160.26	384600.51
6	CP01	381164.85	384710.56
7	CP02	381186.81	384673.89
8	CP03	381126.38	384652.11
9	CP04	381079.11	384626.90
10	CP05	381111.40	384597.16
11	DCP01	381171.05	384733.40
12	DCP02	381141.13	384712.86
13	DCP03	381182.65	384643.52
14	DCP04	381047.69	384645.65
15	DCP05	381141.15	384575.47

FOR INFORMATION ONLY

P02	TOPO/SERVICE SURVEY ADDED, PROPOSED GI	20.02.23	CM	NB	AM
P01	LOCATIONS UPDATED	05.01.23	CM	NB	AM
Rev	DESCRIPTION	DATE	BY	CHK	APP
Document Control					
Issuing Office: Tetra Tech Manchester Quay West at Media City UK, Trafford Wharf Road, Trafford Park, Manchester, M17 1HH Tel: +44 (0)161 872 3223 www.tetrattechurope.com					
Client: MANCHESTER AIRPORT GROUP					
Project Name: HANGER 4 MANCHESTER AIRPORT					
Sheet Title: EXPLORATORY HOLE LOCATION PLAN					
Model Reference: N/A					
TTE Project Number	Drawn By	Date	Checked By	Date	Approved By
B041631	CM	05.01.23	NB	05.01.23	AM
Client Project Number	Originator	Function	Spatial	Form	Role
B041631	TTE	00	XX	DR	U
Revision					Number
0003					P02
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THIRD PARTY DRAWINGS



Notes

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2. If received electronically it is the recipient's responsibility to print to correct scale. Only written dimensions should be used.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.

Schedule of Accommodation

Unit 1	m²	sq ft
Warehouse :	7,688	82,754
Office :	866	9,321
Total GIA :	8,554	92,075

Rev

Description

By

Ckd

Date

rps

MAKING
COMPLEX
EASY

Sherwood House, Sherwood Avenue,
Newark, Nottinghamshire, NG24 1QQ
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Client

MAGPROPERTY

Project

Manchester Airport

Title

Hangar 4
Proposed Unit 92k
Option 01

Status

Preliminary

Scale

1:500 @A1

Date Created

04/02/22

Task Team
Manager

KRP

Information
Author

DEC

Task Information
Manager

MJH

Document Number

NK018329-RPS-SI-XX-DR-A-9448

Project Code - Originator - Zone - Level - Type - Role - Drawing Number

RPS Project Number

NK018329

Suitability

S0

Revision

P01

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APPENDICES

APPENDIX A – REPORT CONDITIONS

GROUND INVESTIGATION

This report is produced solely for the benefit of Threadneedle Curtis Limited and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site.

This report is based on a visual site inspection, reference to accessible referenced historical records, information supplied by those parties referenced in the text and preliminary discussions with local and Statutory Authorities. Some of the opinions are based on unconfirmed data and information and are presented as the best that can be obtained without further extensive research. Where ground contamination is suspected but no physical site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to activities related to the site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, perhaps in higher concentrations, elsewhere on the site cannot be discounted.

Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categoric assurances that they will be accepted by Authorities or Funds etc. without question as such bodies often have unpublished, more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to Tetra Tech. In time improved practices or amended legislation may necessitate a re-assessment.

The assessment of ground conditions within this report is based upon the findings of the study undertaken. We have interpreted the ground conditions in between locations on the assumption that conditions do not vary significantly. However, no investigation can inspect each and every part of the site and therefore changes or variances in the physical and chemical site conditions as described in this report cannot be discounted.

The report is limited to those aspects of land contamination specifically reported on and is necessarily restricted and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents. The opinions expressed cannot be absolute due to the limitations of time and resources imposed by the agreed brief and the possibility of unrecorded previous use and abuse of the site and adjacent sites. The report concentrates on the site as defined in the report and provides an opinion on surrounding sites. If migrating pollution or contamination (past or present) exists further extensive research will be required before the effects can be better determined.

APPENDIX B – EXPLORATORY HOLE LOGS

<div><div><div>Tt</div><div>TETRA TECH</div></div><div>Project: Hangar 4 Demolition</div><div>Location: Hangar 4, Manchester Airport, M90 5PQ</div><div>Client: Manchester Airport Group</div></div>						<div>Location Details</div> <div><div>Easting: 381126.38</div><div>Level: 67.25mAOD</div><div>Logger: BE</div></div> <div><div>Northing: 384652.11</div><div>Depth: 11.00m</div><div>Type: CP</div></div> <div>Inclination: 90°</div>						<div>Status</div> <div>FINAL</div>		<div>Borehole Number</div> <div>CP03</div>																																				
												Sheet 2 of 2																																						
<div>Method, Plant and Crew</div> <table><tr><td>From (m)</td><td>To (m)</td><td>Type</td><td>Plant Used</td><td>Crew</td></tr><tr><td>0.00</td><td>1.20</td><td>Inspection Pit</td><td>Hand Excavation Tools</td><td>MacGeo</td></tr><tr><td>1.20</td><td>11.00</td><td>Cable Percussion</td><td>Dando 2000</td><td>MacGeo</td></tr></table>					From (m)	To (m)	Type	Plant Used	Crew	0.00	1.20	Inspection Pit	Hand Excavation Tools	MacGeo	1.20	11.00	Cable Percussion	Dando 2000	MacGeo	<div>Diameter</div> <table><tr><td>Depth (m)</td><td>Diam (mm)</td></tr><tr><td>1.20</td><td>300</td></tr><tr><td>11.00</td><td>150</td></tr></table>		Depth (m)	Diam (mm)	1.20	300	11.00	150	<div>Casing</div> <table><tr><td>Depth(m)</td><td>Diam (mm)</td></tr><tr><td>11.00</td><td>150</td></tr></table>		Depth(m)	Diam (mm)	11.00	150	<div>Drilling Progress by Time</div> <table><tr><td>Date</td><td>Time</td><td>Depth (m)</td><td>Casing (m)</td><td>Water (m)</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table>					Date	Time	Depth (m)	Casing (m)	Water (m)						<div>Scale: 1:50</div> <div>Checked By: NB</div> <div>Approved By: AM</div> <div>Start Date: 01/03/2023</div> <div>Finish Date: 01/03/2023</div>	
From (m)	To (m)	Type	Plant Used	Crew																																														
0.00	1.20	Inspection Pit	Hand Excavation Tools	MacGeo																																														
1.20	11.00	Cable Percussion	Dando 2000	MacGeo																																														
Depth (m)	Diam (mm)																																																	
1.20	300																																																	
11.00	150																																																	
Depth(m)	Diam (mm)																																																	
11.00	150																																																	
Date	Time	Depth (m)	Casing (m)	Water (m)																																														
<div>Strata Description</div> <div>Non intact extremely weak reddish brown MUDSTONE with occasional gypsum. Recovered as dense reddish brown sandy silty clayey subangular fine to coarse gravel with low cobble content. Sand is fine to coarse. Cobbles are angular to subangular. (BOLLIN MUDSTONE)</div>						<div>Legend</div>	<div>Depth (m)</div>	<div>Reduced Level (mAOD)</div>	<div>Water Level (m)</div>	<div>Inst / Backfill</div>	<div>Samples and Testing</div> <table><tr><td>Depth (m)</td><td>Ref</td><td>Tests / Results</td></tr><tr><td>10.50</td><td>D-NR16</td><td>SPT(S) 10.50m, 50 (10,15/50 for 92mm)</td></tr><tr><td>11.00</td><td>D-NR17</td><td>SPT(S) 11.00m, 50 (25 for 17mm/50 for 19mm)</td></tr></table>				Depth (m)	Ref	Tests / Results	10.50	D-NR16	SPT(S) 10.50m, 50 (10,15/50 for 92mm)	11.00	D-NR17	SPT(S) 11.00m, 50 (25 for 17mm/50 for 19mm)																											
Depth (m)	Ref	Tests / Results																																																
10.50	D-NR16	SPT(S) 10.50m, 50 (10,15/50 for 92mm)																																																
11.00	D-NR17	SPT(S) 11.00m, 50 (25 for 17mm/50 for 19mm)																																																
<div>EOH at 11.00m - Terminated due to SPT refusal</div>							11.00	56.25			11																																							
											12																																							
											13																																							
											14																																							
											15																																							
											16																																							
											17																																							
											18																																							
											19																																							
											20																																							
<div>Observations / Remarks</div> <div>1. Exploratory hole completed at 11.00m bgl due to refusal.</div> <div>2. Backfilled with bentonite upon completion.</div> <div>3. No groundwater encountered.</div> <div>4. Co-ordinates were surveyed</div>						<div>Chiselling</div> <table><tr><td>From (m)</td><td>To (m)</td><td>Time (mins)</td></tr><tr><td>10.60</td><td>11.00</td><td>60</td></tr></table>			From (m)	To (m)	Time (mins)	10.60	11.00	60	<div>Water Added</div> <table><tr><td>From (m)</td><td>To (m)</td></tr><tr><td></td><td></td></tr></table>		From (m)	To (m)			<div>Hammer Information</div> <table><tr><td>Serial No.</td><td>Energy Ratio %</td></tr><tr><td>AR3897</td><td>68</td></tr></table>		Serial No.	Energy Ratio %	AR3897	68																								
From (m)	To (m)	Time (mins)																																																
10.60	11.00	60																																																
From (m)	To (m)																																																	
Serial No.	Energy Ratio %																																																	
AR3897	68																																																	
						<div>Groundwater</div> <table><tr><td>Strike (m)</td><td>Casing (m)</td><td>Sealed (m)</td><td>Time (min)</td><td>Rose To (m)</td><td>Remarks</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>				Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks							<div>Project Number</div> <div>784-B041631</div>																												
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks																																													

<div>Tt</div> <div>TETRA TECH</div> <div>Project: Hangar 4 Demolition</div> <div>Location: Hangar 4, Manchester Airport, M90 5PQ</div> <div>Client: Manchester Airport Group</div>							Location Details						Status FINAL		Borehole Number CP05						
							Easting: 381126.66 Northing: 384592.60 Level: 67.24mAOD Depth: 15.80m Logger: BE Type: WLS+RC Inclination: 90°														
							Sheet 1 of 2														
Method, Plant and Crew						Diameter		Casing		Drilling Progress by Time					Scale: 1:50						
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: NB	Approved By: AM	Start Date: 23/03/2023	Finish Date: 24/03/2023				
0.00 1.20 9.70	1.20 9.70 15.80	Inspection Pit Dynamic Windowless Sampling Rotary Core	Hand Excavation Tools Comacchio 205 Comacchio 205	MacGeo MacGeo MacGeo	1.20 9.70 15.80	300 120 100	9.70	120	23/03 24/03	17:00 17:15	6.00 15.80	-									
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring									
												Depth (m)	Ref	Core Run	FI	TCR	SCR	RQD	Tests / Results		
MADE GROUND: Grey moderate clast supported reinforced CONCRETE. Reinforcing bar is 5mm thick.								0.25	66.98												
MADE GROUND: Grey sandy silty subangular to subrounded fine to coarse GRAVEL of limestone and sandstone. Sand is fine to coarse.								0.50	66.74												
MADE GROUND: Reddish grey angular to subangular COBBLES of brick and concrete.								0.70	66.54												
MADE GROUND: Soft reddish brown slightly gravelly slightly sandy silty CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse brick, sandstone and concrete. Sand is fine to coarse. Cobbles are subangular sandstone and brick.								0.90	66.33			0.80	ES1								
MADE GROUND: Firm to stiff greyish black slightly gravelly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse quartz, sandstone and granite. Sand is fine to coarse. (Possible Reworked)								1.20	66.04			1.00	ES2								
MADE GROUND: Firm to stiff greyish black slightly gravelly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse quartz, sandstone and granite. Sand is fine to coarse. (Possible Reworked)												1.20 - 1.65	D3				SPT(S) 1.20m, N=12 (1,1/2,3,4,3)				
Firm to stiff orangish brown slightly gravelly sandy silty CLAY. Gravel is subangular to subrounded fine to medium quartz, sandstone and granite. Sand is fine to coarse. (DIAMICTON)												2.00	ES4								
												2.50	D5								
												3.00 - 3.45	D6				SPT(S) 3.00m, N=12 (2,2/1,4,3,4)				
Between 3.50m and 4.00m frequent bands of gravelly silty clayey sand.												3.50 - 4.00	B7								
												4.50 - 4.95	D8				SPT(S) 4.50m, N=29 (4,5/5,8,7,9)				
Very dense reddish brown gravelly silty clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse granite, sandstone and mudstone. (DIAMICTON)								5.00	62.24			5.50 - 6.00	B9				SPT(S) 6.00m, N=24 (3,8/9,6,4,5)				
												7.00	D10								
Reddish brown slightly gravelly silty fine to coarse SAND. Gravel is subangular fine sandstone, mudstone and quartz. (DIAMICTON)								7.50	59.74			7.50 - 7.95	D11				SPT(S) 7.50m, N=50 (3,6/50 for 295mm)				
												8.00 - 9.00	B12								
Medium dense orange brown and yellow slightly sandy silty clayey subangular to subrounded fine to coarse GRAVEL of mudstone, sandstone and quartz. Sand is fine to coarse. (DIAMICTON)								9.00	58.24			9.00 - 9.58	B13				SPT(S) 9.00m, N=13 (4,5/4,2,3,4)				
Strong laminated grey SILTSTONE with occasional quartz veins. (BOLLIN MUDSTONE)								9.58	57.66			9.58									
Medium strong laminated grey MUDSTONE. Discontinuities are 0 to 15 degrees, very closely to closely spaced, planar, smooth and clean. (BOLLIN MUDSTONE)								9.70	57.54			9.70 9.70 - 10.40	C				SPT(C) 9.70m, 50 (25 for 40mm/50 for 60mm)				
Observations / Remarks							Sampling Runs				Drilling Fluid						Hammer Information				
1. Exploratory hole completed at 15.80m bgl due to refusal. 2. Backfilled with bentonite upon completion. 3. No groundwater encountered. 4. Co-ordinates were surveyed.							From (m)	To (m)	Diameter (mm)	Recovery %	From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %				
							1.20	3.00	110	100	9.70	15.80			AR3897	68					
							3.00	4.50	110	100											
							4.50	5.00	110	100											
											Groundwater						Project Number				
							Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks									
784-B041631																					

<div><div><div>Tt</div><div>TETRA TECH</div></div><div>Project: Hangar 4 Demolition</div><div>Location: Hangar 4, Manchester Airport, M90 5PQ</div><div>Client: Manchester Airport Group</div></div>						Location Details						Status		Borehole Number											
						Easting: 381126.66 Northing: 384592.60 Level: 67.24mAOD Depth: 15.80m Logger: BE Type: WLS+RC Inclination: 90°																			
						Method, Plant and Crew						Diameter		Casing						Drilling Progress by Time					
Checked By: NB																									
From (m) To (m) Type Plant Used Crew Depth (m) Diam (mm)						Depth(m) Diam (mm) Date Time Depth (m) Casing (m) Water (m)						Checked By: AM Approved By: AM Start Date: 23/03/2023 Finish Date: 24/03/2023													
Strata Description						Legend		Depth (m)		Reduced Level (mAOD)		Water Level (m)		Inst / Backfill		Samples, Tests and Rotary Coring									
																Depth (m) Ref Core Run FI TCR SCR RQD Tests / Results									
Medium strong laminated grey MUDSTONE. Discontinuities are 0 to 15 degrees, very closely to closely spaced, planar, smooth and clean. (BOLLIN MUDSTONE)																									
Assumed zone of core loss.								10.35		56.88						10.40		9.70 10.40		50, 50, 130		43 43 21			
Non intact weak reddish brown locally grey MUDSTONE. Recovered as clayey subangular to subrounded fine to coarse gravel. (BOLLIN MUDSTONE)								10.70		56.54								10.40 11.80		NI		86 36 36			
Medium strong reddish brown MUDSTONE with occasional veins of gypsum. Discontinuities are 0 to 15 degrees, close to medium spaced, planar, smooth and clean. (BOLLIN MUDSTONE)								11.35		55.88															
From 11.95m to 12.00m bgl non intact. Recovered as subangular fine to coarse gravel. At 12.00m to 12.01m bgl band of gypsum. From 12.07m to 12.12m bgl non intact. Recovered as subangular fine to coarse gravel. From 12.25m to 12.30m bgl non intact. Recovered as subangular fine to coarse gravel.																11.80 11.80 - 13.30		C		NI, 200, 350		100 83 83			
From 12.95m to 13.00m bgl non intact. Recovered as subangular fine to coarse gravel. From 13.15m to 13.20m bgl non intact. Recovered as subangular fine to coarse gravel.								13.20		54.04						13.30		13.30 14.80		100 80 40					
Strong laminated greyish red SILTSTONE. Discontinuities are 0 to 15 degrees, closely spaced, planar, smooth and clean. (BOLLIN MUDSTONE)																									
From 13.60m to 13.65m bgl non intact. Recovered as subangular fine to coarse gravel. From 13.85m to 14.00m bgl non intact. Recovered as subangular fine to coarse gravel.								14.40		52.84						14.80		14.80 15.80		NI, 120, 150		70 65 65			
Medium strong laminated reddish brown MUDSTONE. Discontinuities are 0 to 15 degrees, very closely to closely spaced, planar, smooth and clean. (BOLLIN MUDSTONE)																									
From 14.80m to 15.10m bgl assumed zone of core loss.																									
From 15.23m to 15.25m bgl band of grey siltstone. From 15.30m to 15.35m bgl non intact. Recovered as subangular fine to coarse gravel. From 15.60m to 15.63m bgl band of grey siltstone.								15.80		51.44															
EOH at 15.80m - Achieved target depth																									

<div><div><div>Tt</div><div>TETRA TECH</div></div><div><div>Project: Hangar 4 Demolition</div><div>Location: Hangar 4, Manchester Airport, M90 5PQ</div><div>Client: Manchester Airport Group</div></div></div>						Location Details						Status		Borehole Number				
						Easting: 381155.36 Northing: 384742.66 Level: 68.67mAOD Depth: 3.23m Logger: BE Type: WLS Inclination: 90°						FINAL		DS01				
																Sheet 1 of 1		
Method, Plant and Crew					Diameter		Casing		Groundwater						Scale: 1:25			
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose Tol (m)	Time (mins)	Remarks	Checked By: NB	Approved By: AM	Start Date: 01/03/2023	Finish Date: 01/03/2023
0.00 1.20	1.20 3.23	Inspection Pit Dynamic Windowless Sampling	Hand Excavation Tools Windowless Sampler	MacGeo MacGeo	1.20 3.23	300 110	3.23	110										
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing						
												Depth (m)	Ref	Tests / Results				
MADE GROUND: Black MACADAM.								0.20	68.47				0.20	ES1	HV 0.40m, (p)=5.5 kPa (r)= kPa			
MADE GROUND: Stiff dark brown mottled grey slightly sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is angular fine to coarse sandstone and mudstone.													0.30	D2				
													0.50	ES3				
													0.70	D4				
												1.00	ES5	HV 0.90m, (p)=9.1 kPa (r)= kPa				
								1.20	D6	SPT(S) 1.20m, N=14 (2,3/3,3,3,5)								
Stiff reddish brown slightly sandy silty CLAY. Sand is fine to coarse. (DIAMICTON).								2.00	66.67				2.00	D8	SPT(S) 2.00m, N=13 (4,4/3,3,3,4)			
Non intact reddish brown extremely weak MUDSTONE with occasional gypsum. Recovered as very dense sandy silty clayey angular fine to coarse gravel. (BOLLIN MUDSTONE)								2.25	66.42				2.10	ES7	HV 2.00m, (p)=10.2 kPa (r)= kPa			
EOH at 3.23m - Terminated due to SPT refusal								3.23	65.44				3.00	D9	SPT(S) 3.00m, 50 (25 for 105mm/50 for 125mm)			

<div><div><div>Tt</div><div>TETRA TECH</div></div><div>Project: Hangar 4 Demolition Location: Hangar 4, Manchester Airport, M90 5PQ Client: Manchester Airport Group</div></div>		Location Details		Status		Borehole Number																	
		Easting: 381154.66 Level: 68.00mAOD Logger: BE	Northing: 384678.68 Depth: 2.31m Type: WLS Inclination: 90°	FINAL	DS03																		
						Sheet 1 of 1																	
Method, Plant and Crew					Diameter		Casing					Groundwater					Scale: 1:25						
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose Tol (m)	Time (mins)	Remarks	Checked By: NB	Approved By: AM	Start Date: 01/03/2023	Finish Date: 01/03/2023					
0.00 1.20	1.20 2.31	Inspection Pit Dynamic Windowless Sampling	Hand Excavation Tools Windowless Sampler	MacGeo MacGeo	1.20 2.31	300 110	2.31	110															
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing											
												Depth (m)	Ref	Tests / Results									
MADE GROUND: Black MACADAM.								0.12	67.88														
MADE GROUND: Yellow sandy angular to subrounded fine to coarse GRAVEL of limestone (TYPE 2)								0.20	67.80					0.20	ES1								
MADE GROUND: Light grey silty slightly clayey fine to coarse SAND.														0.30	D2								
MADE GROUND: Firm reddish grey slightly sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is angular fine to coarse sandstone, brick, mudstone and coal.								0.80	67.20					0.80	ES3								
													0.90	D4									
													1.00	ES5	HV 1.00m, (p)=6.2 kPa (r)= kPa								
													1.20	D7	SPT(S) 1.20m, N=20 (2,2/3,5,6,6)								
Medium dense reddish brown gravelly very silty clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone. (DIAMICTON)								1.28	66.72				1.30	ES6									
From 2.00m bgl very dense.													2.00	D8	SPT(S) 2.00m, 50 (2,2/50 for 160mm)								
EOH at 2.31m - Terminated due to SPT refusal								2.31	65.69														
Observations / Remarks											Sampling Runs				Hammer Information								
1. Exploratory hole completed at 2.31m bgl due to refusal. 2. Upon completion 50mm diameter gas/groundwater monitoring standpipe installed to 1.20m bgl. 3. Groundwater was not encountered. 4. Coordinates were surveyed.											From (m)	To (m)	Diam (mm)	Recovery %	Remarks	Serial No.	Energy Ratio %						
											1.20	2.00	87	100		DART334	62						
											Project Number												
											784-B041631												

<div><div><div>Tt</div><div>TETRA TECH</div></div><div>Project: Hangar 4 Demolition Location: Hangar 4, Manchester Airport, M90 5PQ Client: Manchester Airport Group</div></div>		Location Details		Status		Borehole Number												
		Easting: 381090.06 Level: 67.18mAOD Logger: BE	Northing: 384658.96 Depth: 4.31m Type: WLS Inclination: 90°	FINAL	DS04													
						Sheet 1 of 1												
Method, Plant and Crew				Diameter		Casing		Groundwater				Scale: 1:25						
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose Tol (m)	Time (mins)	Remarks	Checked By: NB	Approved By: AM	Start Date: 01/03/2023	Finish Date: 01/03/2023
0.00 1.20	1.20 4.31	Inspection Pit Dynamic Windowless Sampling	Hand Excavation Tools Windowless Sampler	MacGeo MacGeo	1.20 4.31	300 110	4.31	110										
Strata Description						Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing							
											Depth (m)	Ref	Tests / Results					
MADE GROUND: Grey CONCRETE.							0.10	67.08										
MADE GROUND: Orangish brown angular COBBLES of bricks. (COBBLE SETT)							0.22	66.96										
MADE GROUND: Soft reddish grey and brown slightly sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is angular fine to coarse sandstone, brick, mudstone and coal.													0.25 0.30	E51 D2	SPT(S) 1.00m, N=15 (2,2/4,3,4,4)			
													0.50	ES3				
													0.70	D4				
													1.00 1.00	D9 ES5				
													1.20	D6				
													2.00 2.00	D10 ES7				
Stiff reddish brown slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone. (DIAMICTON)							2.80	64.38					2.80	ES8	SPT(S) 3.00m, N=17 (3,2/3,3,4,7)			
													3.00	D11				
													3.90 3.90	D D12				
EOH at 4.31m - Terminated due to SPT refusal							4.31	62.87										
Observations / Remarks						Sampling Runs						Hammer Information		Serial No.		Energy Ratio %		
														DART334		62		
												Project Number		784-B041631				
1. Exploratory hole completed at 4.31m bgl due to refusal. 2. Upon completion 50mm diameter gas/groundwater monitoring standpipe installed to 2.80m bgl. 3. Groundwater was not encountered. 4. Coordinates were surveyed.						From (m)		To (m)		Diam (mm)		Recovery %		Remarks				
						1.20		2.00		87		100						
						2.00		3.00		87		100						
						3.00		4.00		87		100						

APPENDIX C – CHEMICAL LABORATORY RESULTS

Tetra Tech
Quay West at MediaCityUK
Trafford Wharf Road
Trafford Park,
Manchester
M17 1HH



Attention : Nicholas Brook
Date : 12th April, 2023
Your reference : 784-B041631
Our reference : Test Report 23/3356 Batch 1
Location : Hangar 4 Manchester Airport
Date samples received : 3rd March, 2023
Status : Final Report
Issue : 1

Forty one samples were received for analysis on 3rd March, 2023 of which nine were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B041631
Location: Hangar 4 Manchester Airport
Contact: Nicholas Brook
EMT Job No: 23/3356

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	4-6	25-27	28-30	46-48	64-66	82-84	85-87	103-105	112-114		Please see attached notes for all abbreviations and acronyms		
Sample ID	CP01	CP02	CP02	CP03	DS01	DS02	DS03	DS04	DS05				
Depth	0.50	0.50	1.00	0.70	0.50	2.10	0.20	1.00	0.60				
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T				
Sample Date	27/02/2023	28/02/2023	28/02/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023				
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil				
Batch Number	1	1	1	1	1	1	1	1	1				
Date of Receipt	03/03/2023	03/03/2023	03/03/2023	03/03/2023	03/03/2023	03/03/2023	03/03/2023	03/03/2023	03/03/2023		LOD/LOR	Units	Method No.
Arsenic #	4.9	-	6.2	9.2	9.7	2.4	4.8	11.7	3.5		<0.5	mg/kg	TM30/PM15
Beryllium	0.9	-	0.9	1.8	2.0	<0.5	0.7	2.0	<0.5		<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	mg/kg	TM30/PM15
Chromium #	41.8	-	45.7	47.3	46.0	28.8	40.0	49.5	36.0		<0.5	mg/kg	TM30/PM15
Copper #	12	-	11	23	22	4	7	26	7		<1	mg/kg	TM30/PM15
Lead #	9	-	9	12	9	<5	6	13	6		<5	mg/kg	TM30/PM15
Mercury #	0.1	-	0.1	<0.1	0.2	<0.1	<0.1	0.1	<0.1		<0.1	mg/kg	TM30/PM15
Nickel #	17.9	-	24.3	31.7	43.7	11.1	12.0	40.1	7.7		<0.7	mg/kg	TM30/PM15
Selenium #	<1	-	<1	<1	<1	<1	<1	1	<1		<1	mg/kg	TM30/PM15
Vanadium	28	-	36	36	40	9	28	48	20		<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.2	-	0.6	0.8	0.4	0.2	0.1	0.7	0.5		<0.1	mg/kg	TM74/PM32
Zinc #	35	-	43	51	53	16	29	72	15		<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04		<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	0.09	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04		<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04		<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	0.12	0.10	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	0.14	0.10	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	0.12	0.09	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06		<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	0.12	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	0.32	0.16	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07		<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	0.21	0.09	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04		<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	0.20	0.09	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04		<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04		<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	0.18	0.09	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04		<0.04	mg/kg	TM4/PM8
Coronene	-	<0.04	-	<0.04	-	-	<0.04	-	-		<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	-	0.8	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6		<0.6	mg/kg	TM4/PM8
PAH 17 Total	-	1.54	-	<0.64	-	-	<0.64	-	-		<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	0.23	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	0.09	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	92	90	78	97	93	94	78	95	88		<0	%	TM4/PM8
VOC TICs	-	-	-	-	ND	-	ND	ND	ND			None	TM15/PM10
Methyl Tertiary Butyl Ether #	-	-	-	-	<2	-	<2	<2	<2		<2	ug/kg	TM15/PM10
Benzene #	-	-	-	-	<3	-	<3	<3	<3		<3	ug/kg	TM15/PM10
Toluene #	-	-	-	-	<3	-	<3	<3	7		<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	-	-	<3	-	<3	<3	<3		<3	ug/kg	TM15/PM10
m/p-Xylene #	-	-	-	-	<5	-	<5	<5	<5		<5	ug/kg	TM15/PM10
o-Xylene #	-	-	-	-	<3	-	<3	<3	<3		<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	-	-	92	-	77	90	81		<0	%	TM15/PM10

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B041631
Location: Hangar 4 Manchester Airport
Contact: Nicholas Brook
EMT Job No: 23/3356

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	4-6	25-27	28-30	46-48	64-66	82-84	85-87	103-105	112-114		Please see attached notes for all abbreviations and acronyms		
Sample ID	CP01	CP02	CP02	CP03	DS01	DS02	DS03	DS04	DS05				
Depth	0.50	0.50	1.00	0.70	0.50	2.10	0.20	1.00	0.60				
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T				
Sample Date	27/02/2023	28/02/2023	28/02/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023				
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil				
Batch Number	1	1	1	1	1	1	1	1	1				
Date of Receipt	03/03/2023	03/03/2023	03/03/2023	03/03/2023	03/03/2023	03/03/2023	03/03/2023	03/03/2023	03/03/2023		LOD/LOR	Units	Method No.
Surrogate Recovery 4-Bromofluorobenzene	-	-	-	-	81	-	64	76	70		<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	348	-	<30	-	-	<30	-	-		<30	mg/kg	TM5/PM8/PM16
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	-	<4	<4	<4	<4	<4	<4	<4		<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	-	<7	<7	<7	<7	<7	<7	<7		<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	-	<7	<7	<7	<7	<7	<7	<7		<7	mg/kg	TM5/PM8/PM16
>C35-C44 (EH_1D_AL)	<7	-	<7	<7	<7	<7	<7	<7	<7		<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44 (EH+HS_1D_AL)	<26	-	<26	<26	<26	<26	<26	<26	<26		<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	<4	<4	<4	<4	<4	<4	<4		<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	-	<7	<7	<7	<7	<7	<7	<7		<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	-	<7	<7	<7	<7	<7	<7	<7		<7	mg/kg	TM5/PM8/PM16
>EC35-EC44 (EH_1D_AR)	<7	-	<7	<7	<7	<7	<7	<7	<7		<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44 (EH+HS_1D_AR)	<26	-	<26	<26	<26	<26	<26	<26	<26		<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics (C5-44) (EH+HS_CU_1D_Total)	<52	-	<52	<52	<52	<52	<52	<52	<52		<52	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5	<5	-	<5	-	-	-		<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	-	<5	-	-	-		<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5	-	<5	-	-	-		<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	-	<5	-	-	-		<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	-	<5	-	-	-		<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5	-	<5	-	-	-		<5	ug/kg	TM36/PM12
PCB 28 #	-	<5	-	<5	-	-	<5	-	-		<5	ug/kg	TM17/PM8
PCB 52 #	-	<5	-	<5	-	-	<5	-	-		<5	ug/kg	TM17/PM8
PCB 101 #	-	<5	-	<5	-	-	<5	-	-		<5	ug/kg	TM17/PM8
PCB 118 #	-	<5	-	<5	-	-	<5	-	-		<5	ug/kg	TM17/PM8
PCB 138 #	-	<5	-	<5	-	-	<5	-	-		<5	ug/kg	TM17/PM8
PCB 153 #	-	<5	-	<5	-	-	<5	-	-		<5	ug/kg	TM17/PM8
PCB 180 #	-	<5	-	<5	-	-	<5	-	-		<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	<35	-	<35	-	-	<35	-	-		<35	ug/kg	TM17/PM8
Total Phenols HPLC	<0.15	-	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15		<0.15	mg/kg	TM26/PM21B

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B041631
Location: Hangar 4 Manchester Airport
Contact: Nicholas Brook
EMT Job No: 23/3356

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Client Name: Tetra Tech
Reference: 784-B041631
Location: Hangar 4 Manchester Airport
Contact: Nicholas Brook
EMT Job No: 23/3356

Please see attached notes for all abbreviations and acronyms

QF-PM 3.1.3 v11

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B041631
Location: Hangar 4 Manchester Airport
Contact: Nicholas Brook
EMT Job No: 23/3356

VOC Report : Solid

EMT Sample No.	64-66	85-87	103-105	112-114							Please see attached notes for all abbreviations and acronyms		
Sample ID	DS01	DS03	DS04	DS05									
Depth	0.50	0.20	1.00	0.60									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	01/03/2023	01/03/2023	01/03/2023	01/03/2023									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1							LOD/LOR	Units	Method No.
Date of Receipt	03/03/2023	03/03/2023	03/03/2023	03/03/2023									
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2							<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2							<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2							<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1							<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2	<2							<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2	<2							<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6	<6							<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<7	<7	<7	<7							<7	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	8	<3	<3	<3							<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6	<6							<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	7							<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	<5	<5							<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
Styrene	<3	<3	<3	<3							<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2							<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3							<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5							<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6	<6	<6							<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
4-Isopropyltoluene	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
n-Butylbenzene	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene	<7	<7	<7	<7							<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4							<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27	45							<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene	<7	<7	<7	<7							<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	92	77	90	81							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	81	64	76	70							<0	%	TM15/PM10

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	19.9
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	83.4
Particle Size <4mm =	>95%		
EMT Job No	23/3356	Landfill Waste Acceptance Criteria Limits	
Sample No	27		
Client Sample No	CP02		
Depth/Other	0.50		
Sample Date	28/02/2023		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	2.33	3	5
Loss on Ignition (%)	3.3	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	348	500	-
PAH Sum of 17(mg/kg)	1.54	100	-
pH (pH Units)	8.43	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	0.16	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀	A ₁₀	
	mg/l	mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.012	0.12	2
Cadmium	<0.0005	<0.005	100
Chromium	0.0023	0.023	300
Copper	0.083	0.83	0.04
Mercury	<0.001	<0.01	1
Molybdenum	<0.002	<0.02	5
Nickel	0.002	<0.02	0.5
Lead	0.009	0.09	10
Antimony	<0.002	<0.02	70
Selenium	<0.003	<0.03	2
Zinc	0.066	0.66	50
Chloride	16.7	167	0.01
Fluoride	<0.3	<3	0.2
Sulphate as SO ₄	0.9	9	30
Total Dissolved Solids	106	1060	0.4
Phenol	<0.01	<0.1	10
Dissolved Organic Carbon	13	130	50
			1000
			4000
			60000
			100000
			1
			-
			-
			500
			800
			1000

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	5.4
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	94.9
Particle Size <4mm =	>95%		
EMT Job No	23/3356	Landfill Waste Acceptance Criteria Limits	
Sample No	48		
Client Sample No	CP03		
Depth/Other	0.70		
Sample Date	01/03/2023		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.30	3	5
Loss on Ignition (%)	2.7	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	<0.64	100	-
pH (pH Units)	8.43	-	>6
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated
ANC to pH 4 (mol/kg)	0.22	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀	A ₁₀	
	mg/l	mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.016	0.16	2
Cadmium	<0.0005	<0.005	100
Chromium	<0.0015	<0.015	300
Copper	<0.007	<0.07	0.04
Mercury	<0.001	<0.01	1
Molybdenum	0.003	0.03	5
Nickel	<0.002	<0.02	0.5
Lead	<0.005	<0.05	10
Antimony	<0.002	<0.02	70
Selenium	<0.003	<0.03	2
Zinc	0.005	0.05	50
Chloride	13.7	137	100
Fluoride	0.6	6	0.01
Sulphate as SO ₄	12.9	129	0.2
Total Dissolved Solids	83	830	2
Phenol	<0.01	<0.1	0.5
Dissolved Organic Carbon	<2	<20	10
			0.06
			0.7
			5
			0.1
			0.5
			7
			4
			50
			200
			800
			15000
			25000
			10
			150
			500
			1000
			20000
			50000
			4000
			60000
			100000
			1
			-
			-
			500
			800
			1000

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	14.5					
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	87.3					
Particle Size <4mm =	>95%							
EMT Job No	23/3356		Landfill Waste Acceptance Criteria Limits					
Sample No	87							
Client Sample No	DS03							
Depth/Other	0.20							
Sample Date	01/03/2023							
Batch No	1							
Solid Waste Analysis			Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill			
Total Organic Carbon (%)	0.90					3	5	6
Loss on Ignition (%)	3.6					-	-	10
Sum of BTEX (mg/kg)	<0.017					6	-	-
Sum of 7 PCBs (mg/kg)	<0.035					1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30					500	-	-
PAH Sum of 17(mg/kg)	<0.64					100	-	-
pH (pH Units)	8.31					-	>6	-
ANC to pH 7 (mol/kg)	<0.03					-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	0.09					-	to be evaluated	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached					Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
	C ₁₀	A ₁₀						
	mg/l	mg/kg						
Arsenic	<0.0025	<0.025	0.5	2	25			
Barium	0.014	0.14	20	100	300			
Cadmium	<0.0005	<0.005	0.04	1	5			
Chromium	0.0021	0.021	0.5	10	70			
Copper	0.013	0.13	2	50	100			
Mercury	<0.001	<0.01	0.01	0.2	2			
Molybdenum	<0.002	<0.02	0.5	10	30			
Nickel	<0.002	<0.02	0.4	10	40			
Lead	<0.005	<0.05	0.5	10	50			
Antimony	<0.002	<0.02	0.06	0.7	5			
Selenium	<0.003	<0.03	0.1	0.5	7			
Zinc	0.006	0.06	4	50	200			
Chloride	0.8	8	800	15000	25000			
Fluoride	0.4	4	10	150	500			
Sulphate as SO4	1.1	11	1000	20000	50000			
Total Dissolved Solids	110	1100	4000	60000	100000			
Phenol	<0.01	<0.1	1	-	-			
Dissolved Organic Carbon	6	60	500	800	1000			

Client Name: Tetra Tech
Reference: 784-B041631
Location: Hangar 4 Manchester Airport
Contact: Nicholas Brook

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
23/3356	1	CP01	0.50	6	Matthew Turner	17/03/2023	General Description (Bulk Analysis)	Light brown soil/Stone
					Matthew Turner	17/03/2023	Asbestos Fibres	NAD
					Matthew Turner	17/03/2023	Asbestos ACM	NAD
					Matthew Turner	17/03/2023	Asbestos Type	NAD
23/3356	1	CP02	1.00	30	Matthew Turner	17/03/2023	General Description (Bulk Analysis)	Dark brown soil/Stone
					Matthew Turner	17/03/2023	Asbestos Fibres	NAD
					Matthew Turner	17/03/2023	Asbestos ACM	NAD
					Matthew Turner	17/03/2023	Asbestos Type	NAD
23/3356	1	CP03	0.70	47	Matthew Turner	17/03/2023	General Description (Bulk Analysis)	Light brown soil/Stone
					Matthew Turner	17/03/2023	Asbestos Fibres	NAD
					Matthew Turner	17/03/2023	Asbestos ACM	NAD
					Matthew Turner	17/03/2023	Asbestos Type	NAD
23/3356	1	DS01	0.50	66	Anthony Carman	17/03/2023	General Description (Bulk Analysis)	Brown Soil/Stones
					Anthony Carman	17/03/2023	Asbestos Fibres	NAD
					Anthony Carman	17/03/2023	Asbestos ACM	NAD
					Anthony Carman	17/03/2023	Asbestos Type	NAD
23/3356	1	DS02	2.10	84	Anthony Carman	17/03/2023	General Description (Bulk Analysis)	Sand
					Anthony Carman	17/03/2023	Asbestos Fibres	NAD
					Anthony Carman	17/03/2023	Asbestos ACM	NAD
					Anthony Carman	17/03/2023	Asbestos Type	NAD
23/3356	1	DS03	0.20	86	Matthew Turner	17/03/2023	General Description (Bulk Analysis)	Light brown soil/Stone
					Matthew Turner	17/03/2023	Asbestos Fibres	NAD
					Matthew Turner	17/03/2023	Asbestos ACM	NAD
					Matthew Turner	17/03/2023	Asbestos Type	NAD
23/3356	1	DS04	1.00	105	Anthony Carman	17/03/2023	General Description (Bulk Analysis)	Brown Clay
					Anthony Carman	17/03/2023	Asbestos Fibres	NAD
					Anthony Carman	17/03/2023	Asbestos ACM	NAD
					Anthony Carman	17/03/2023	Asbestos Type	NAD
23/3356	1	DS05	0.60	114	Anthony Carman	17/03/2023	General Description (Bulk Analysis)	Brown Soil/Stones
					Anthony Carman	17/03/2023	Asbestos Fibres	NAD
					Anthony Carman	17/03/2023	Asbestos ACM	NAD
					Anthony Carman	17/03/2023	Asbestos Type	NAD

Client Name: Tetra Tech
Reference: 784-B041631
Location: Hangar 4 Manchester Airport
Contact: Nicholas Brook

Matrix : Solid

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/3356

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_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
MS	Mass Spectrometry.

EMT Job No: 23/3356

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

EMT Job No: 23/3356

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 23/3356

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM77	Modified DDCE/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes

EMT Job No: 23/3356

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes		AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Tetra Tech
Quay West at MediaCityUK
Trafford Wharf Road
Trafford Park,
Manchester
M17 1HH



Attention : Nicholas Brook
Date : 4th April, 2023
Your reference : 784-B041631
Our reference : Test Report 23/4704 Batch 1
Location : Hangar 4
Date samples received : 24th March, 2023
Status : Final Report
Issue : 1

Six samples were received for analysis on 24th March, 2023 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Liza Klebe

Project Co-ordinator

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B041631
Location: Hangar 4
Contact: Nicholas Brook
EMT Job No: 23/4704

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Element Materials Technology

Client Name: Tetra Tech
Reference: 784-B041631
Location: Hangar 4
Contact: Nicholas Brook
EMT Job No: 23/4704

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	4-6	14-17											
Sample ID	CP04	CP05											
Depth	0.63-0.85	1.00											
COC No / misc													
Containers	V J T	V J T											
Sample Date	20/03/2023	20/03/2023											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	24/03/2023	24/03/2023											
											LOD/LOR	Units	Method No.
Please see attached notes for all abbreviations and acronyms													
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	2.0	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	4.8									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	10									<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C35-C44 (EH_1D_AL)	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44 (EH+HS_1D_AL)	<26	<26									<26	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>EC35-EC44 (EH_1D_AR)	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44 (EH+HS_1D_AR)	<26	<26									<26	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-44) (EH+HS_CU_1D_Total)	<52	<52									<52	mg/kg	TM5/PM8/PM16
Phenols													
MTBE #	17	<5									<5	ug/kg	TM36/PM12
Benzene #	<5	<5									<5	ug/kg	TM36/PM12
Toluene #	<5	<5									<5	ug/kg	TM36/PM12
Ethylbenzene #	11	<5									<5	ug/kg	TM36/PM12
m/p-Xylene #	7	<5									<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5									<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15									<0.15	mg/kg	TM26/PM21B
Moisture													
Natural Moisture Content	19.9	27.5									<0.1	%	PM4/PM0
Heavy Metals													
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0267	0.0096									<0.0015	g/l	TM38/PM20
Chromium III	22.4	49.3									<0.5	mg/kg	NONE/NONE
Free Cyanide	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	0.013	0.010									<0.001	None	TM21/PM24
pH #	7.18	7.69									<0.01	pH units	TM73/PM11

Note:

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

[illegible]

Client Name: Tetra Tech
Reference: 784-B041631
Location: Hangar 4
Contact: Nicholas Brook

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/4704

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_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
MS	Mass Spectrometry.

EMT Job No: 23/4704

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec.1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec.1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

EMT Job No: 23/4704

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

APPENDIX D – GEOTECHNICAL LABORATORY RESULTS



LABORATORY REPORT



Contract Number: PSL23/1466

Report Date: 18 April 2023

Client's Reference: 784-B041631

Client Name: Tetra Tech
11th Floor
1 Angel Court
London
EC2R 7HJ

For the attention of: Nicholas Brook

Contract Title: Hangar 4 Demolition

Date Received: 9/3/2023

Date Commenced: 9/3/2023

Date Completed: 18/4/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins
(Director)

R Berriman
(Quality Manager)

S Royle
(Laboratory Manager)

L Knight
(Assistant Laboratory Manager)

S Eyre
(Senior Technician)


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Page 1 of

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
CP01	2	B	0.80	-	Brown slightly gravelly sandy CLAY.
CP01	7	B	2.50	3.00	Brown slightly gravelly very sandy CLAY.
CP01	11	D	4.20	-	Brown slightly gravelly sandy CLAY.
CP02	2	B	0.80	-	Brown slightly gravelly sandy CLAY.
CP02	7	B	2.50	3.00	Brown slightly gravelly very sandy CLAY.
CP02	10	B	3.50	4.00	Brown slightly gravelly very sandy CLAY.
CP02	14	D	5.20	-	Brown gravelly very sandy CLAY.
CP03	3	B	1.50	2.00	Brown slightly gravelly very sandy CLAY.
CP03	8	B	3.50	4.00	Brown very gravelly very sandy CLAY.
CP03	13	B	7.50	8.00	Brown slightly gravelly very clayey SAND.
DS01	8	D	2.00	-	Brown sandy CLAY.
DS01	9	D	3.00	-	Brown sandy CLAY.
DS02	7	D	1.20	-	Brown very sandy CLAY.
DS02	10	D	4.00	-	Brown very gravelly very silty SAND.
DS03	8	D	2.00	-	Brown slightly gravelly very sandy CLAY.
DS04	9	D	1.00	-	Brown slightly gravelly sandy CLAY.
DS04	11	D	3.00	-	Brown slightly gravelly very sandy CLAY.
DS05	9	D	3.00	-	Brown slightly gravelly very sandy CLAY.
DS05	10	D	4.00	-	Brown slightly gravelly very sandy CLAY.



Hangar 4 Demolition

Contract No:

PSL23/1466

Client Ref:

784-B041631

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**



Hangar 4 Demolition

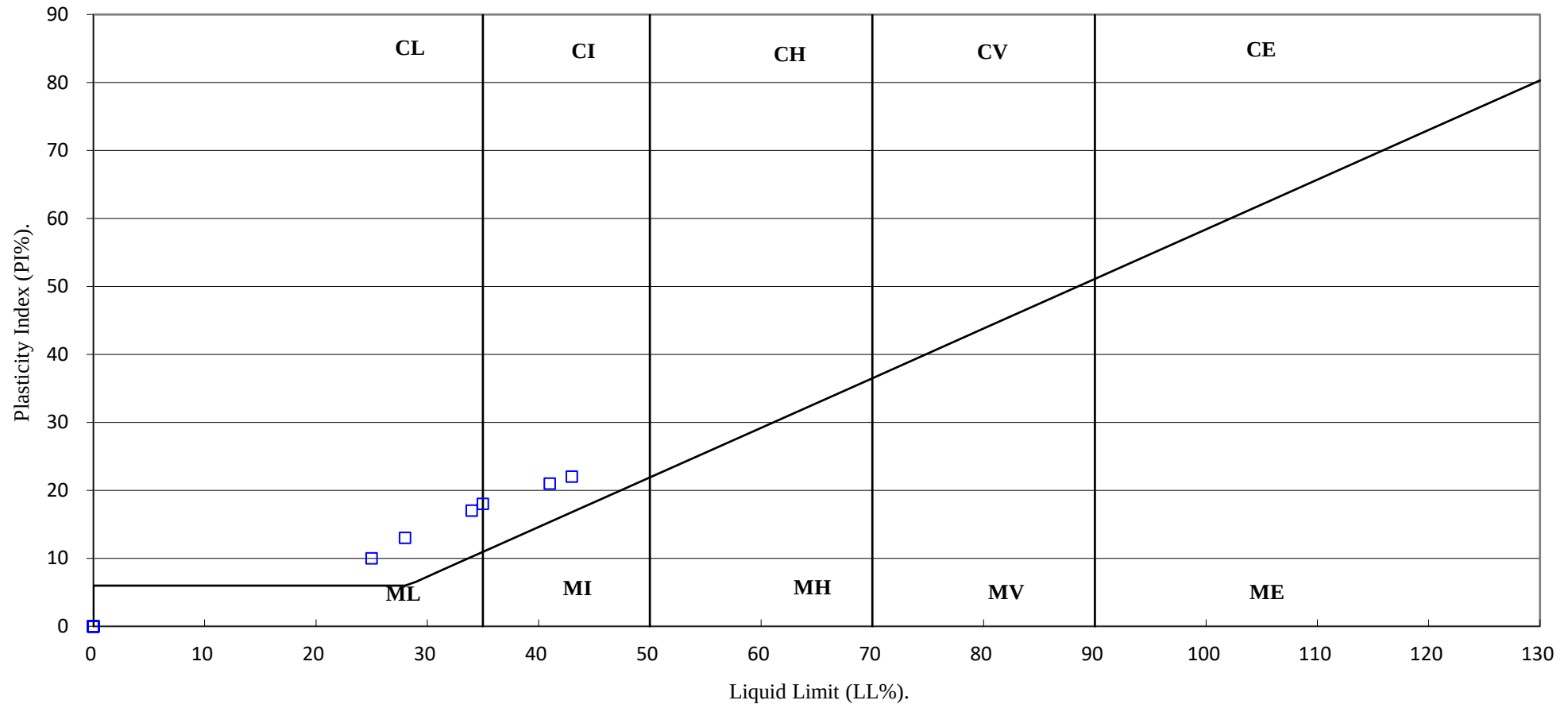
Contract No:

PSL23/1466

Client Ref:

784-B041631

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



Hangar 4 Demolition

Contract No:

PSL23/1466

Client Ref:

784-B041631

PARTICLE SIZE DISTRIBUTION TEST

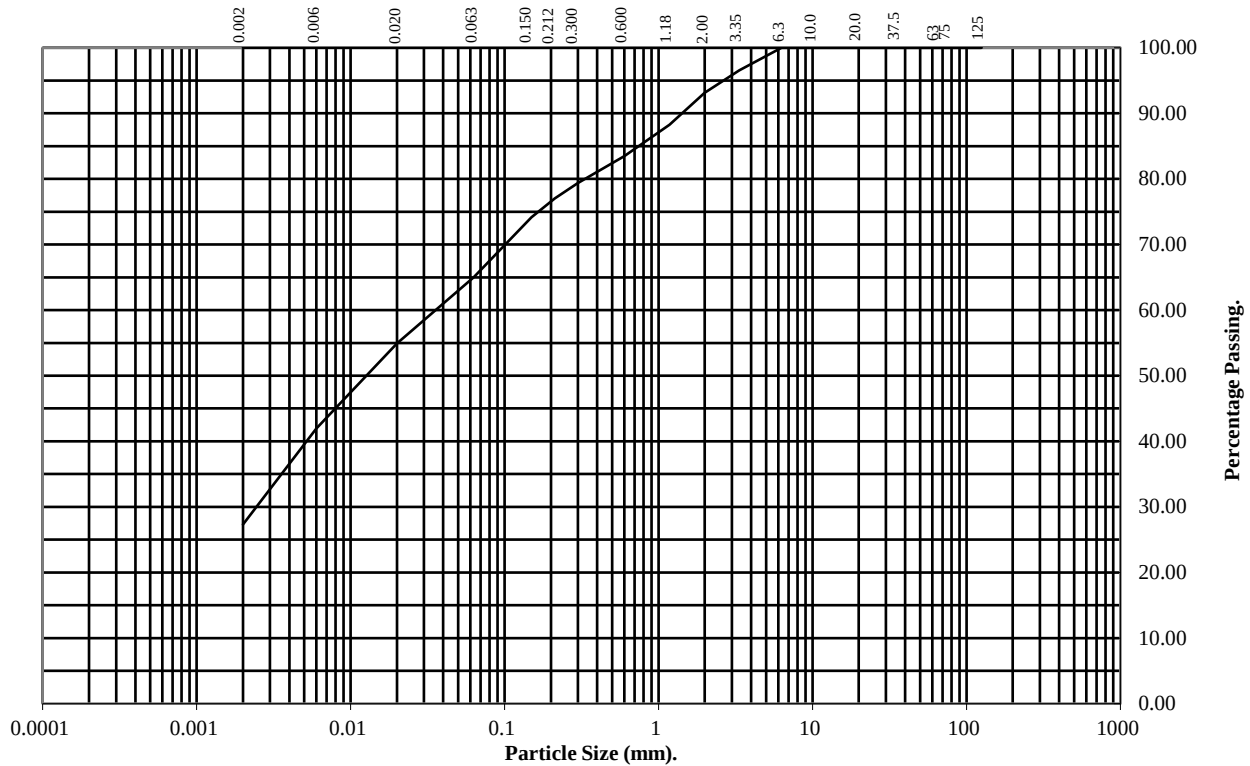
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: CP01 Top Depth (m): 2.50

Sample Number: 7 Base Depth(m): 3.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	97
2	93
1.18	88
0.6	83
0.3	79
0.212	77
0.15	74
0.063	65

Particle Diameter	Percentage Passing
0.02	55
0.006	42
0.002	27

Soil Fraction	Total Percentage
Cobbles	0
Gravel	7
Sand	28
Silt	38
Clay	27

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

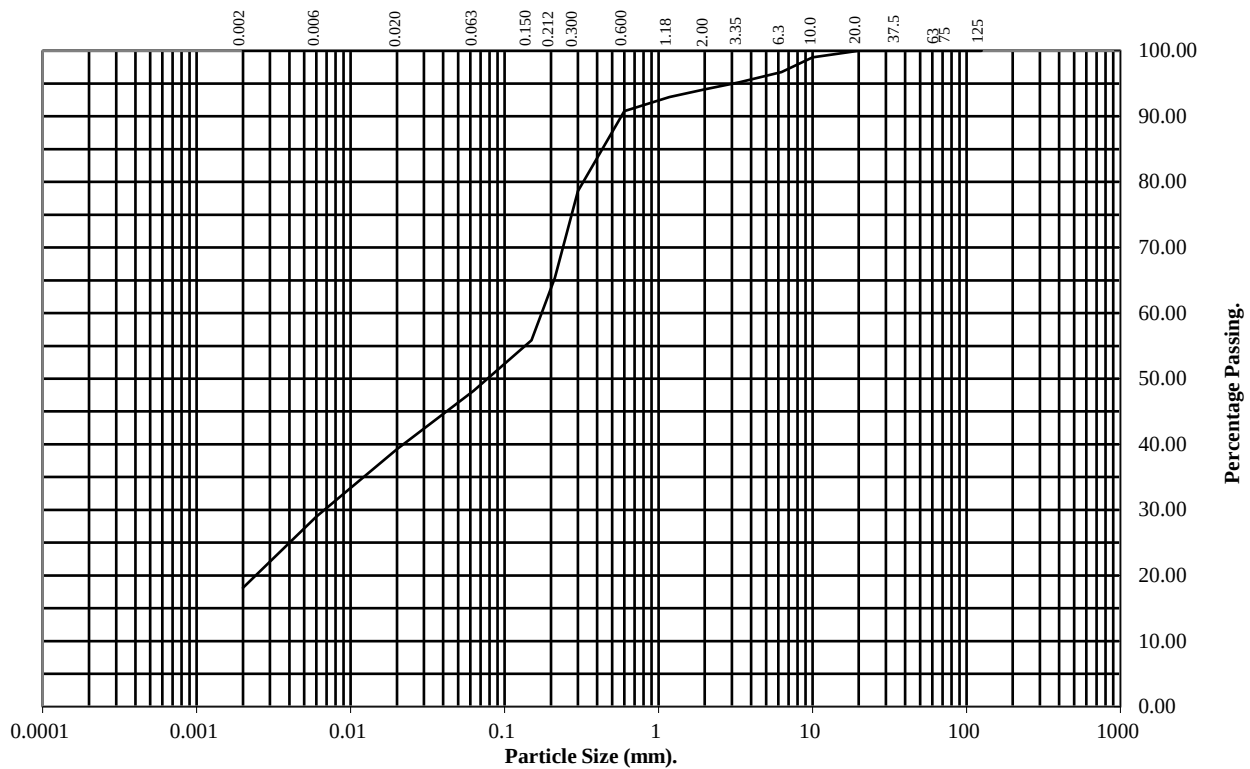
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: CP02 Top Depth (m): 2.50

Sample Number: 7 Base Depth(m): 3.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	97
3.35	95
2	94
1.18	93
0.6	91
0.3	79
0.212	65
0.15	56
0.063	48

Particle Diameter	Percentage Passing
0.02	39
0.006	29
0.002	18

Soil Fraction	Total Percentage
Cobbles	0
Gravel	6
Sand	46
Silt	30
Clay	18

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

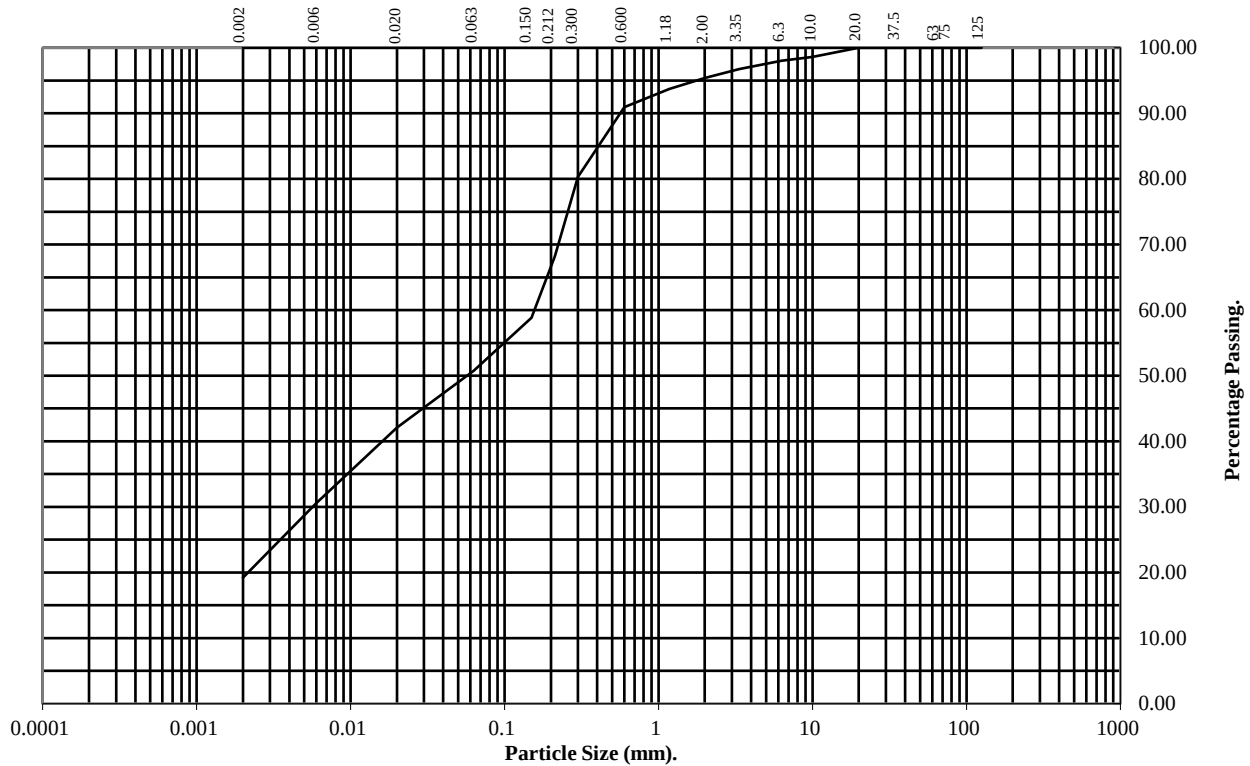
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: CP02 Top Depth (m): 3.50

Sample Number: 10 Base Depth(m): 4.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	98
3.35	97
2	95
1.18	94
0.6	91
0.3	80
0.212	68
0.15	59
0.063	51

Particle Diameter	Percentage Passing
0.02	42
0.006	31
0.002	19

Soil Fraction	Total Percentage
Cobbles	0
Gravel	5
Sand	44
Silt	32
Clay	19

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

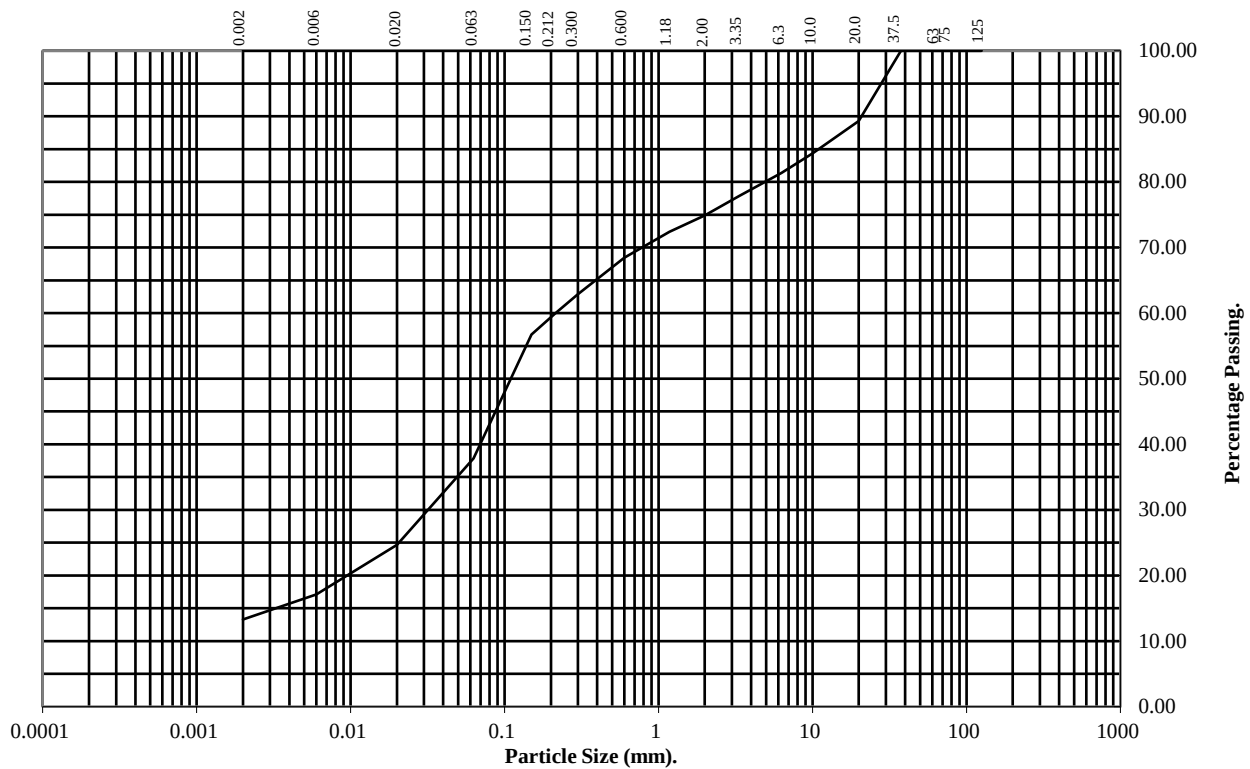
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: CP03 Top Depth (m): 3.50

Sample Number: 8 Base Depth(m): 4.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	89
10	84
6.3	81
3.35	78
2	75
1.18	72
0.6	68
0.3	63
0.212	60
0.15	57
0.063	38

Particle Diameter	Percentage Passing
0.02	25
0.006	17
0.002	13

Soil Fraction	Total Percentage
Cobbles	0
Gravel	25
Sand	37
Silt	25
Clay	13

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

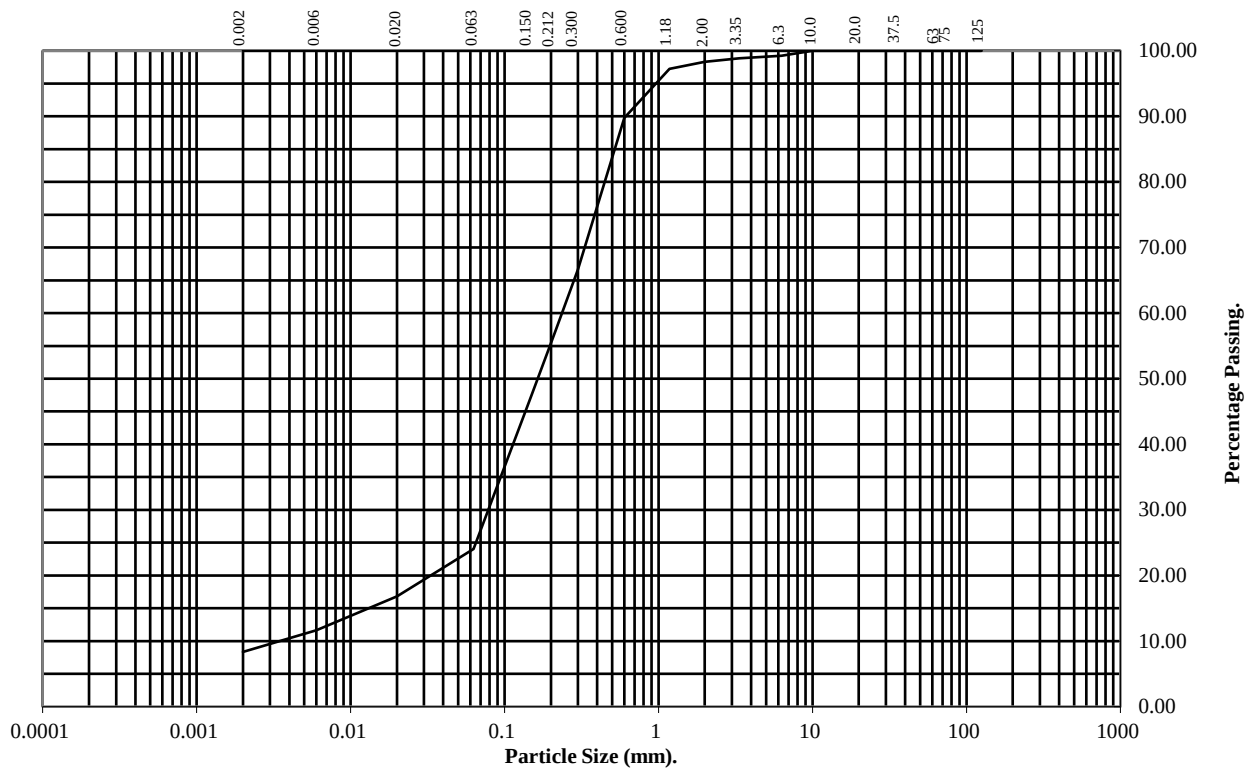
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: CP03 Top Depth (m): 7.50

Sample Number: 13 Base Depth(m): 8.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	99
2	98
1.18	97
0.6	90
0.3	67
0.212	57
0.15	47
0.063	24

Particle Diameter	Percentage Passing
0.02	17
0.006	12
0.002	8

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	74
Silt	16
Clay	8

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

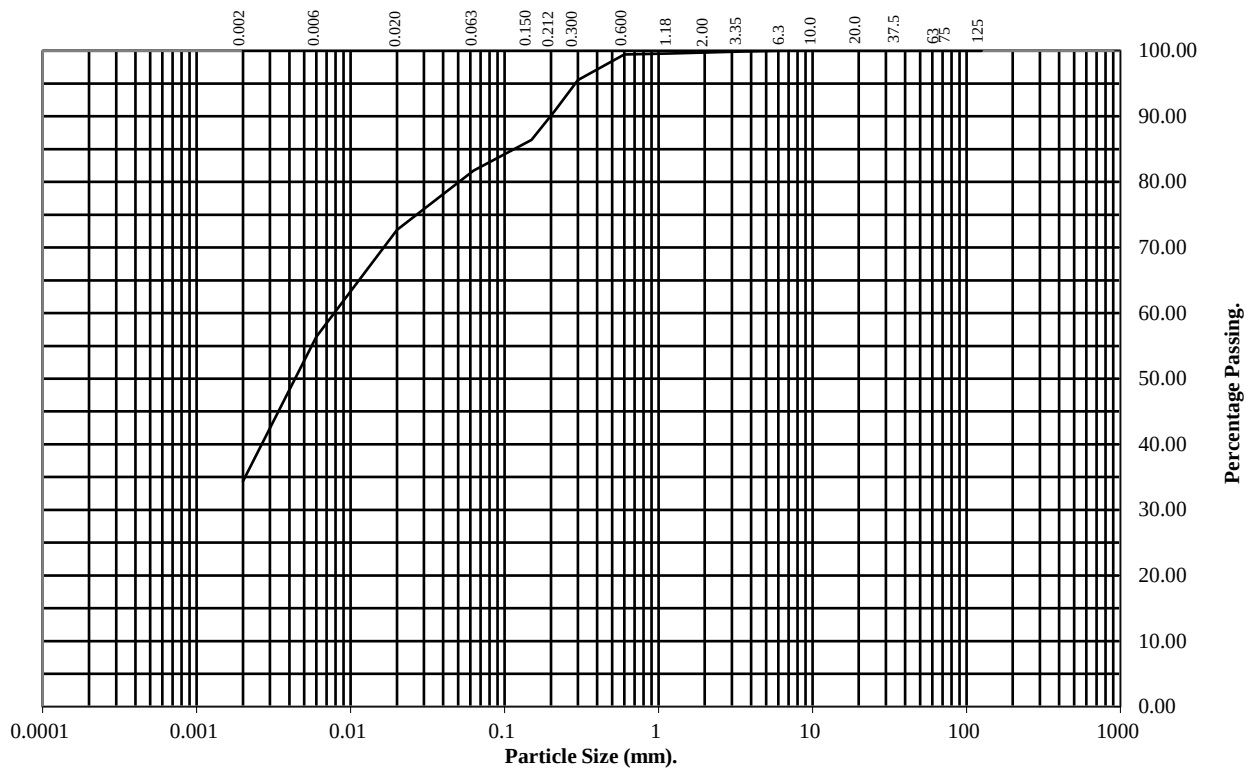
Hole Number: DS01

Top Depth (m): 2.00

Sample Number: 8

Base Depth(m):

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	96
0.212	91
0.15	86
0.063	82

Particle Diameter	Percentage Passing
0.02	73
0.006	56
0.002	34

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	18
Silt	48
Clay	34

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

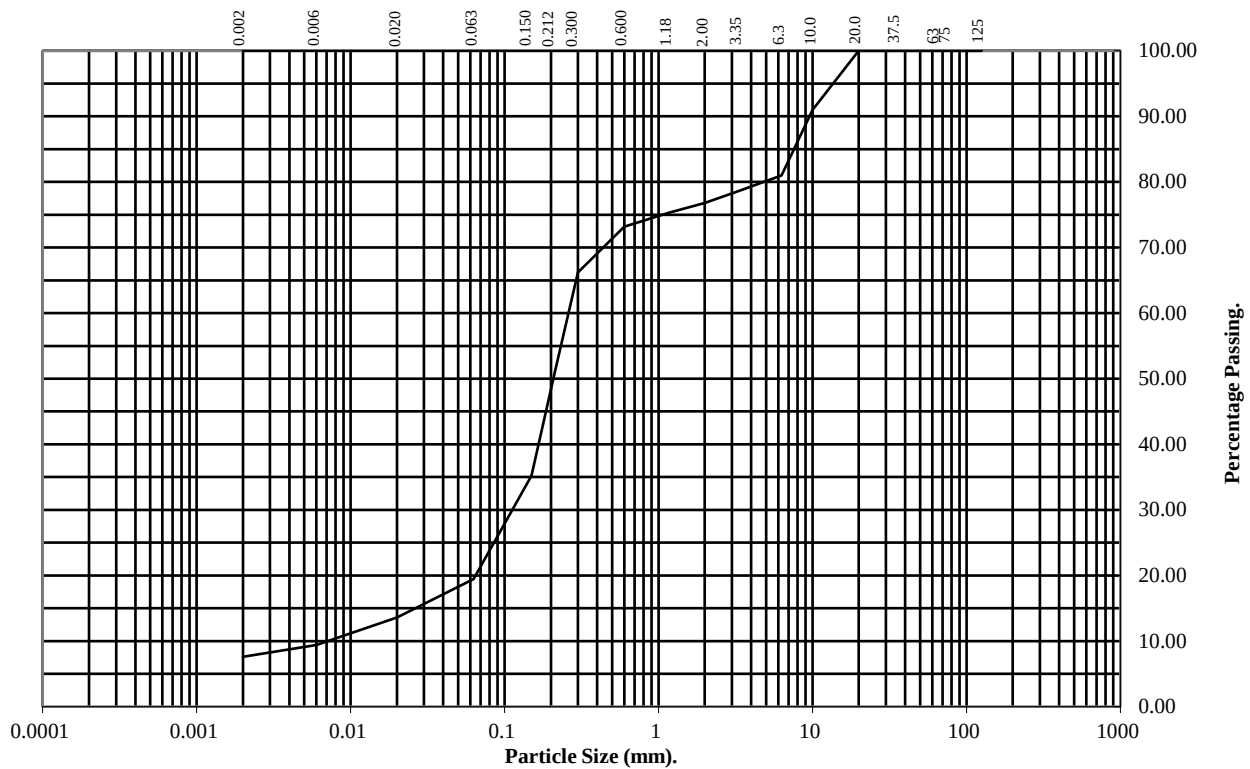
Hole Number: DS02

Top Depth (m): 4.00

Sample Number: 10

Base Depth(m):

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	91
6.3	81
3.35	79
2	77
1.18	75
0.6	73
0.3	66
0.212	51
0.15	35
0.063	19

Particle Diameter	Percentage Passing
0.02	14
0.006	9
0.002	8

Soil Fraction	Total Percentage
Cobbles	0
Gravel	23
Sand	58
Silt	11
Clay	8

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

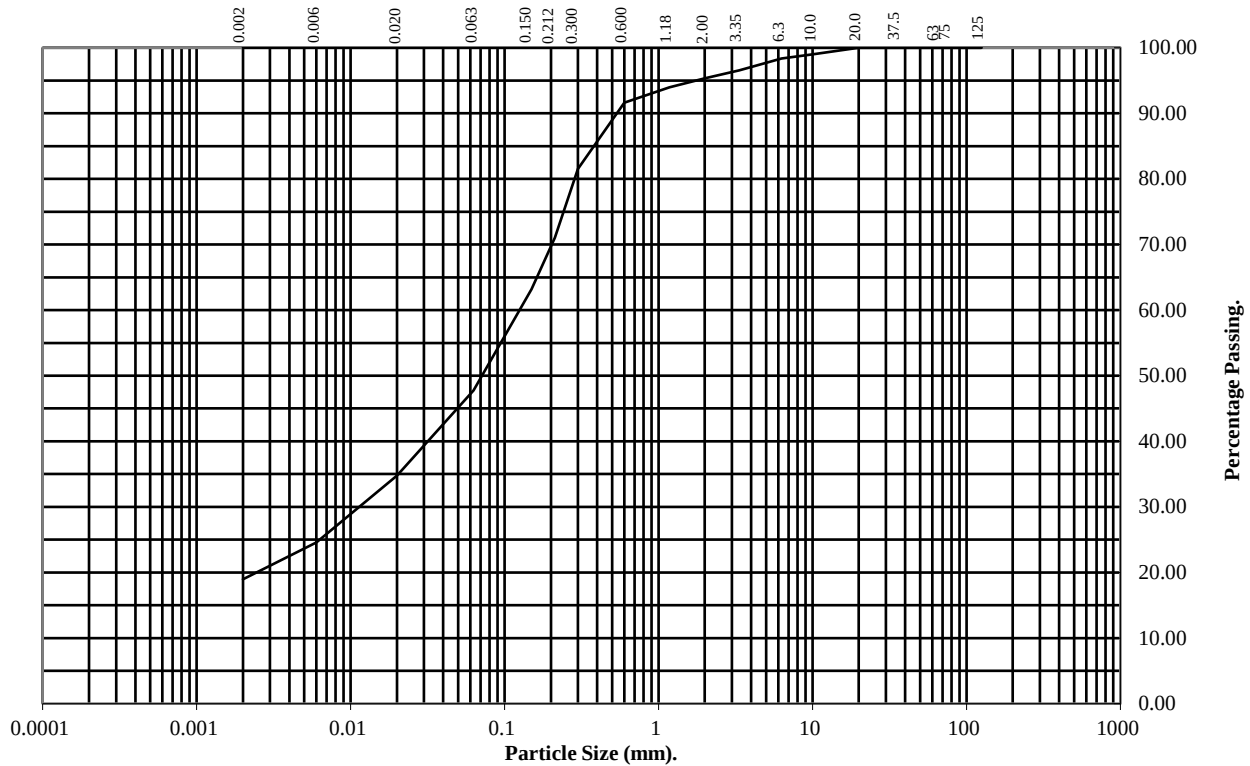
Hole Number: DS03

Top Depth (m): 2.00

Sample Number: 8

Base Depth(m):

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	98
3.35	97
2	95
1.18	94
0.6	92
0.3	82
0.212	71
0.15	63
0.063	48

Particle Diameter	Percentage Passing
0.02	35
0.006	25
0.002	19

Soil Fraction	Total Percentage
Cobbles	0
Gravel	5
Sand	47
Silt	29
Clay	19

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

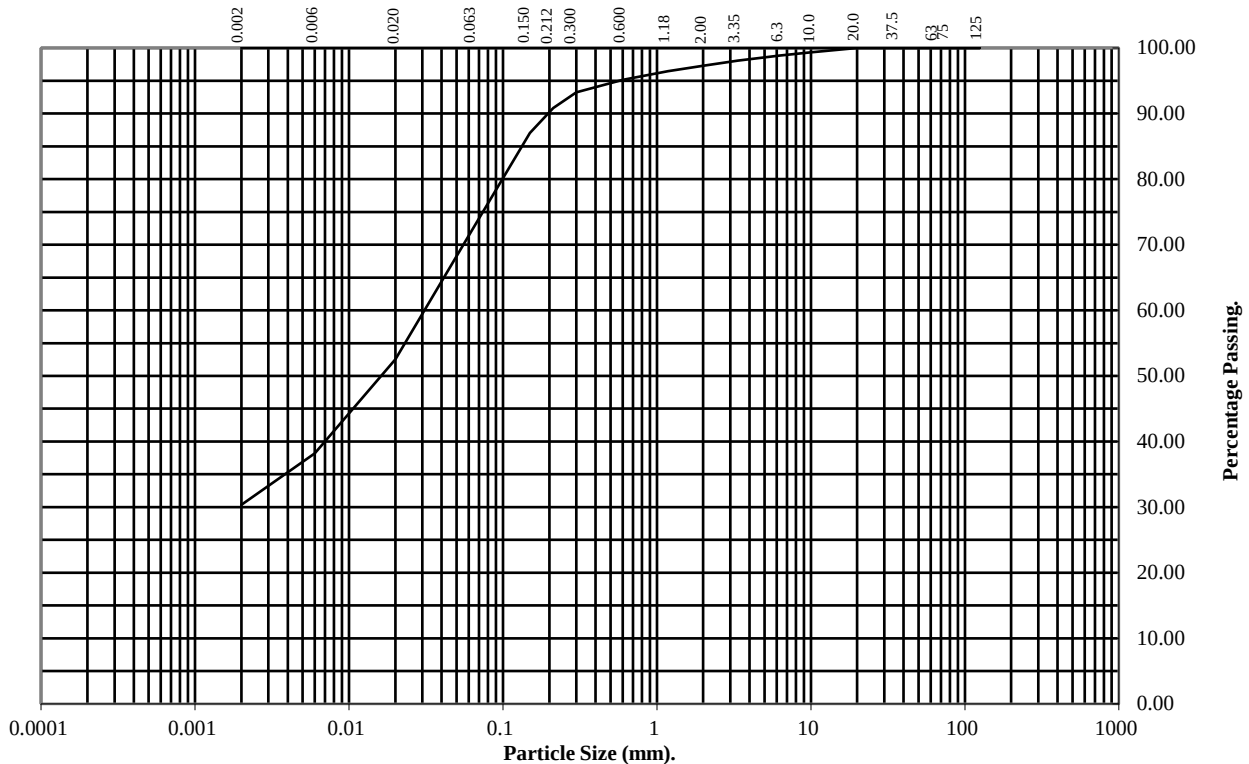
Hole Number: DS04

Top Depth (m): 3.00

Sample Number: 11

Base Depth(m):

Sample Type: D



125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	99
3.35	98
2	97
1.18	96
0.6	95
0.3	93
0.212	91
0.15	87
0.063	72

0.02	53
0.006	38
0.002	30

Cobbles	0
Gravel	3
Sand	25
Silt	42
Clay	30

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

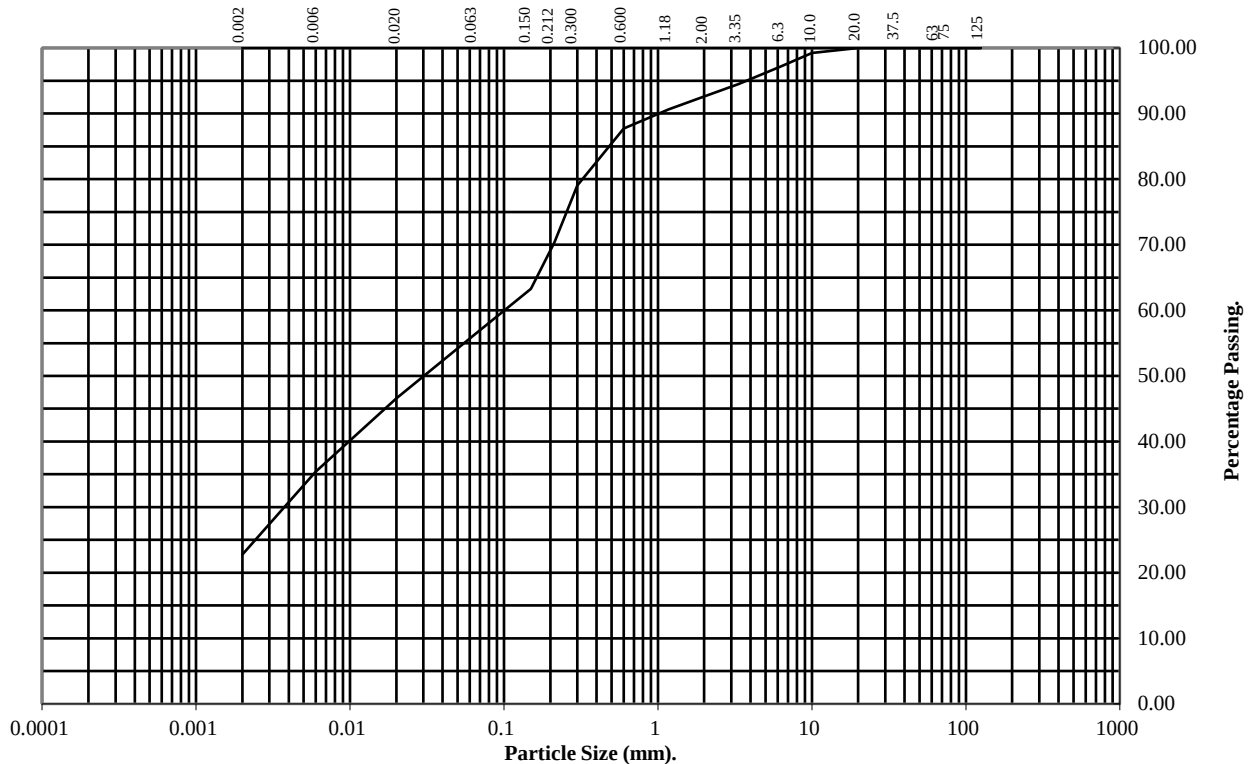
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: DS05 Top Depth (m): 3.00

Sample Number: 9 Base Depth(m):

Sample Type: D



125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	97
3.35	95
2	93
1.18	91
0.6	88
0.3	79
0.212	70
0.15	63
0.063	56

0.02	47
0.006	35
0.002	23

Cobbles	0
Gravel	7
Sand	37
Silt	33
Clay	23

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631

CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

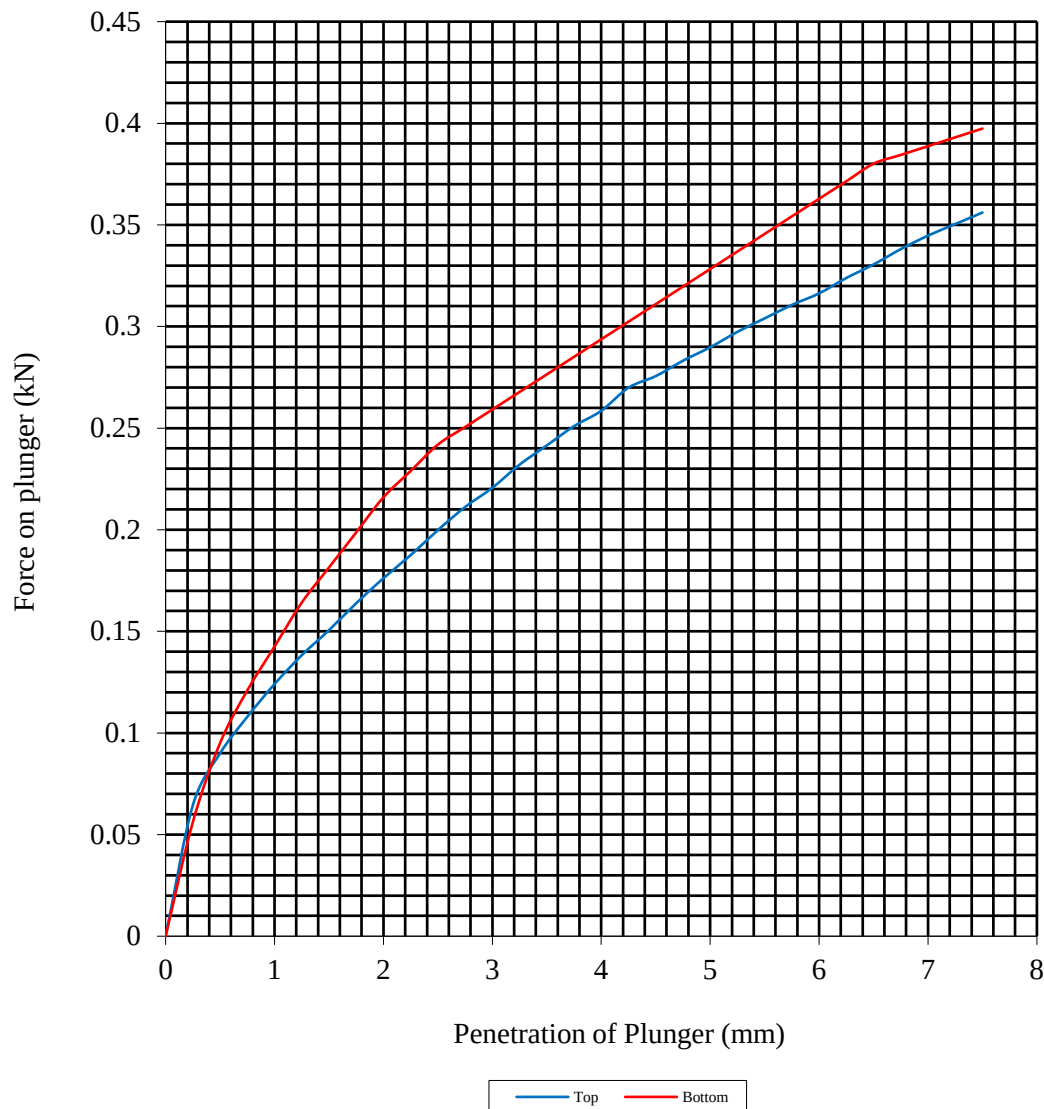
Hole Number: CP01

Top Depth (m): 0.80

Sample Number: 2

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	25	Surcharge Kg:	4.00	Sample Top	26	Sample Top	1.5
Bulk Density Mg/m3:	2.00	Soaking Time hrs	96	Sample Bottom	25	Sample Bottom	1.8
Dry Density Mg/m3:	1.60	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:		1					
Compaction Conditions		2.5kg					



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631

CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

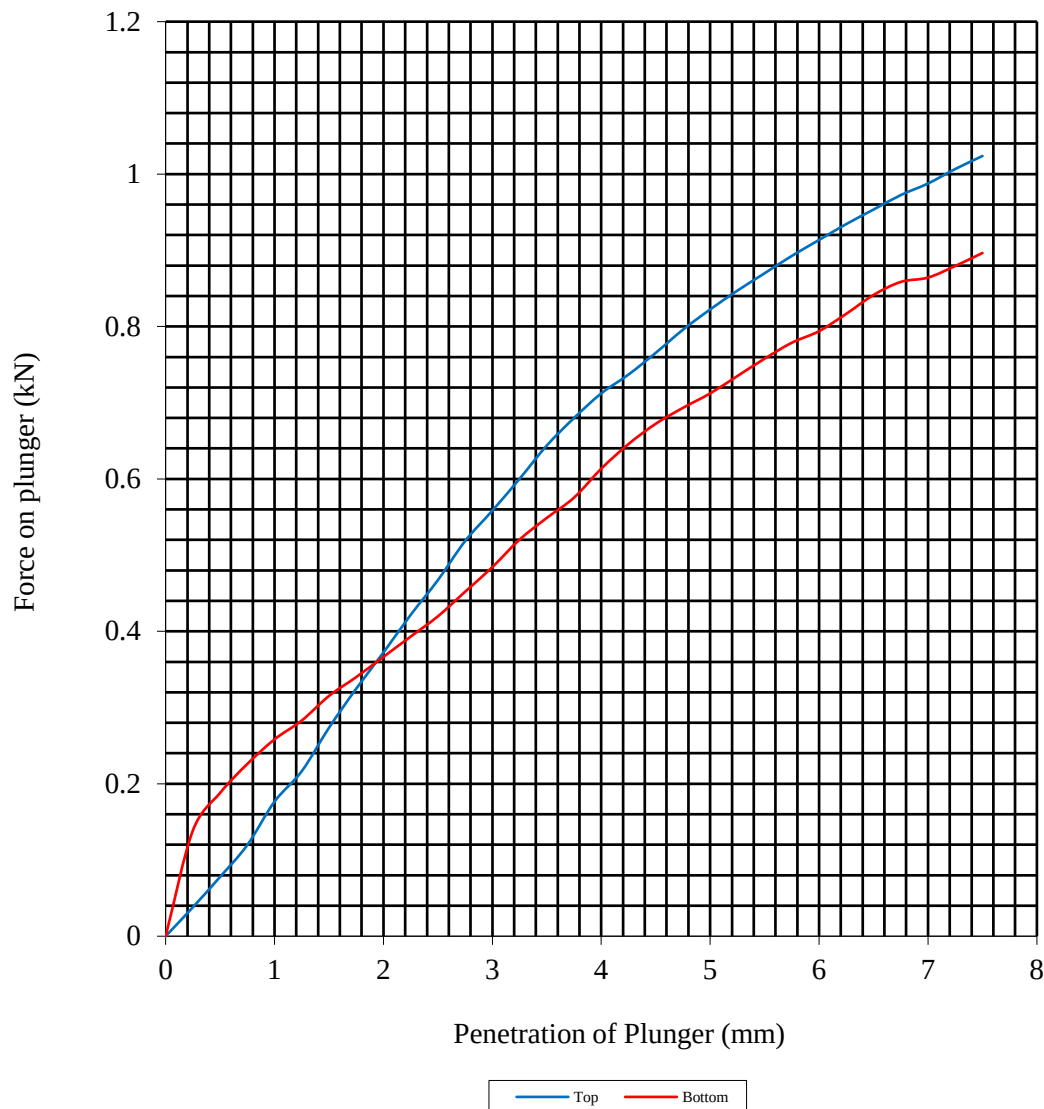
Hole Number: CP02

Top Depth (m): 0.80

Sample Number: 2

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	23	Surcharge Kg:	4.00	Sample Top	23	Sample Top	4.1
Bulk Density Mg/m3:	2.02	Soaking Time hrs	0	Sample Bottom	23	Sample Bottom	3.6
Dry Density Mg/m3:	1.64	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:		0					
Compaction Conditions		2.5kg					



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631

CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

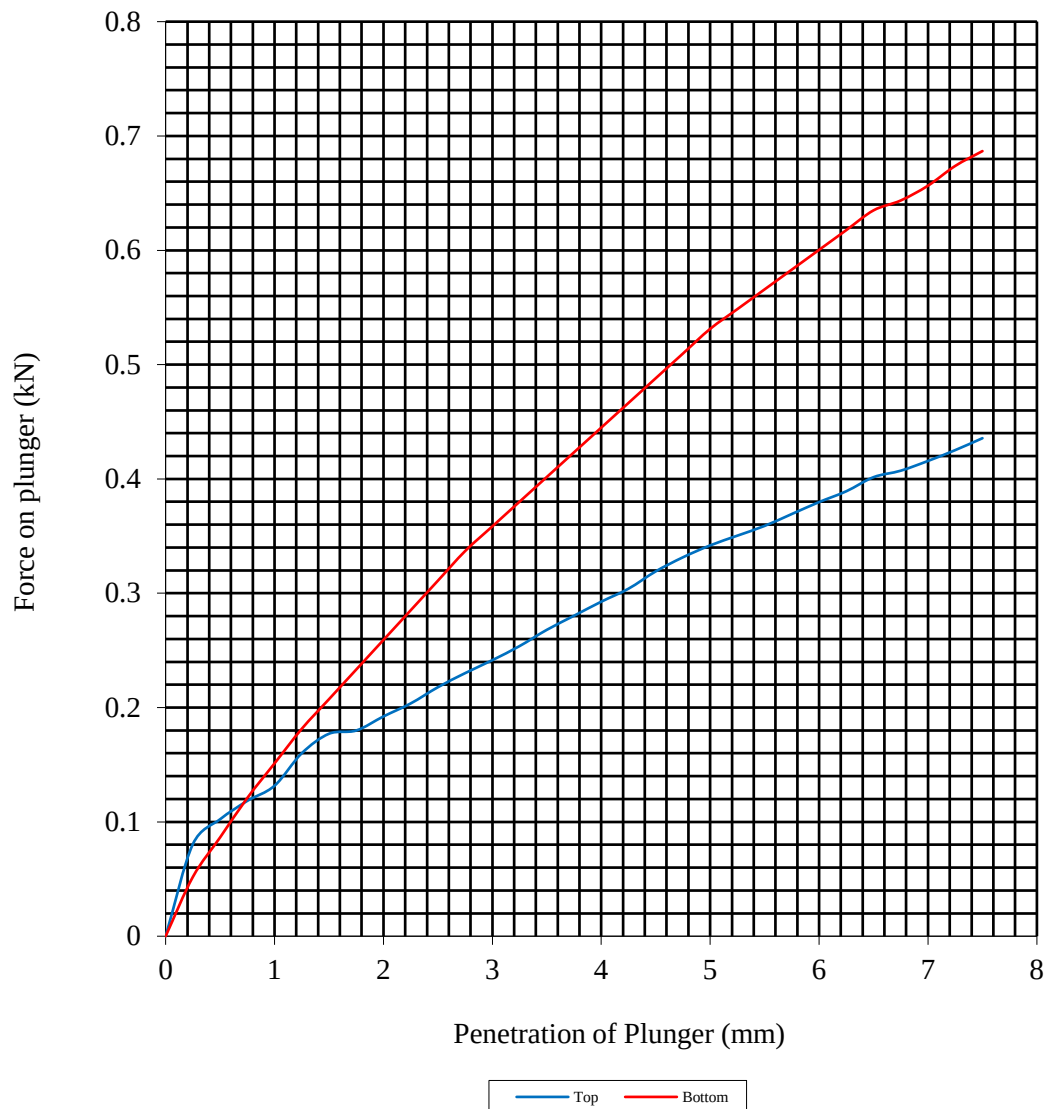
Hole Number: CP03

Top Depth (m): 1.50

Sample Number: 3

Base Depth (m): 2.00

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	16	Surcharge Kg:	4.00	Sample Top	17	Sample Top	1.7
Bulk Density Mg/m3:	2.11	Soaking Time hrs	96	Sample Bottom	16	Sample Bottom	2.7
Dry Density Mg/m3:	1.82	Swelling mm:	0.22	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:		0					
Compaction Conditions		2.5kg					



Hangar 4 Demolition

Contract No:
PSL23/1466
Client Ref:
784-B041631



Certificate of Analysis

Certificate Number 23-06402

Issued: 23-Mar-23

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 23-06402

Client Reference PSL23/1466

Order No (not supplied)

Contract Title Hangar 4 Demolition

Description 8 Soil samples.

Date Received 16-Mar-23

Date Started 16-Mar-23

Date Completed 23-Mar-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-06402

Client Ref PSL23/1466

Contract Title Hangar 4 Demolition

Lab No	2141647	2141648	2141649	2141650	2141651	2141652	2141653	2141654
Sample ID	CP01	CP02	CP02	CP03	CP03	DS02	DS04	DS05
Depth	4.20	2.20	5.20	4.20	9.00	3.00	3.90	2.00
Other ID								
Sample Type	D	D	D	D	D	D	D	D
Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units								
Metals											
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	31	< 10	21	< 10	< 10	< 10	25	< 10
Inorganics											
pH	DETSC 2008#		pH	7.8	7.9	7.9	8.3	8.0	7.4	7.8	8.0
Chloride Aqueous Extract	DETSC 2055	1	mg/l	16	39	55	55	41	51	15	44
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0	< 1.0	< 1.0	< 1.0	4.3	< 1.0	< 1.0	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	1600	110	470	60	100	73	340	100
Sulphur as S, Total	DETSC 2320	0.01	%	0.94	0.04	0.08	0.04	0.09	0.11	0.04	0.04
Sulphate as SO4, Total	DETSC 2321#	0.01	%	2.8	0.04	0.14	0.03	0.03	0.04	0.11	0.03

Information in Support of the Analytical Results

Our Ref 23-06402
 Client Ref PSL23/1466
 Contract Hangar 4 Demolition

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2141647	CP01 4.20 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2141648	CP02 2.20 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2141649	CP02 5.20 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2141650	CP03 4.20 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2141651	CP03 9.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2141652	DS02 3.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2141653	DS04 3.90 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2141654	DS05 2.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Information in Support of the Analytical Results

Our Ref 23-06402
Client Ref PSL23/1466
Contract Hangar 4 Demolition

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



LABORATORY REPORT



Contract Number: PSL23/2193

Report Date: 18 April 2023

Client's Reference: 784-B041631

Client Name: Tetra Tech
11th Floor
1 Angel Court
London
EC2R 7HJ

For the attention of: Nicholas Brook

Contract Title: Hangar 4 Demolition

Date Received: 30/3/2023

Date Commenced: 30/3/2023

Date Completed: 18/4/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins
(Director)

R Berriman
(Quality Manager)

S Royle
(Laboratory Manager)

L Knight
(Assistant Laboratory Manager)

S Eyre
(Senior Technician)


T Watkins
(Senior Technician)

5 – 7 Hexthorpe Road,
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DN4 0AR
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awatkins@prosoils.co.uk

Page 1 of

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
CP04	-	U	1.20	1.65	Brown slightly gravelly very sandy CLAY.
CP04	6	B	1.60	2.20	Brown slightly gravelly very sandy CLAY.
CP04	7	D	1.60	1.70	Brown very sandy CLAY.
CP04	10	B	3.90	-	Brown very sandy CLAY.
CP04	12	B	5.00	6.00	Brown very sandy CLAY.
CP04	13	B	6.00	7.00	Brown very gravelly slightly silty SAND.
CP05	5	D	2.50	-	Brown slightly gravelly sandy CLAY.
CP05	7	B	3.50	4.00	Brown slightly gravelly very sandy CLAY.
CP05	8	D	4.50	4.95	Brown slightly gravelly very sandy CLAY.
CP05	11	D	7.50	7.95	Brown silty SAND.
CP05	12	B	8.00	9.00	Brown silty SAND.
CP05	13	B	9.00	9.58	Brown slightly sandy very silty GRAVEL.



Hangar 4 Demolition

Contract No:

PSL23/2193

Client Ref:

784-B041631

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**



Hangar 4 Demolition

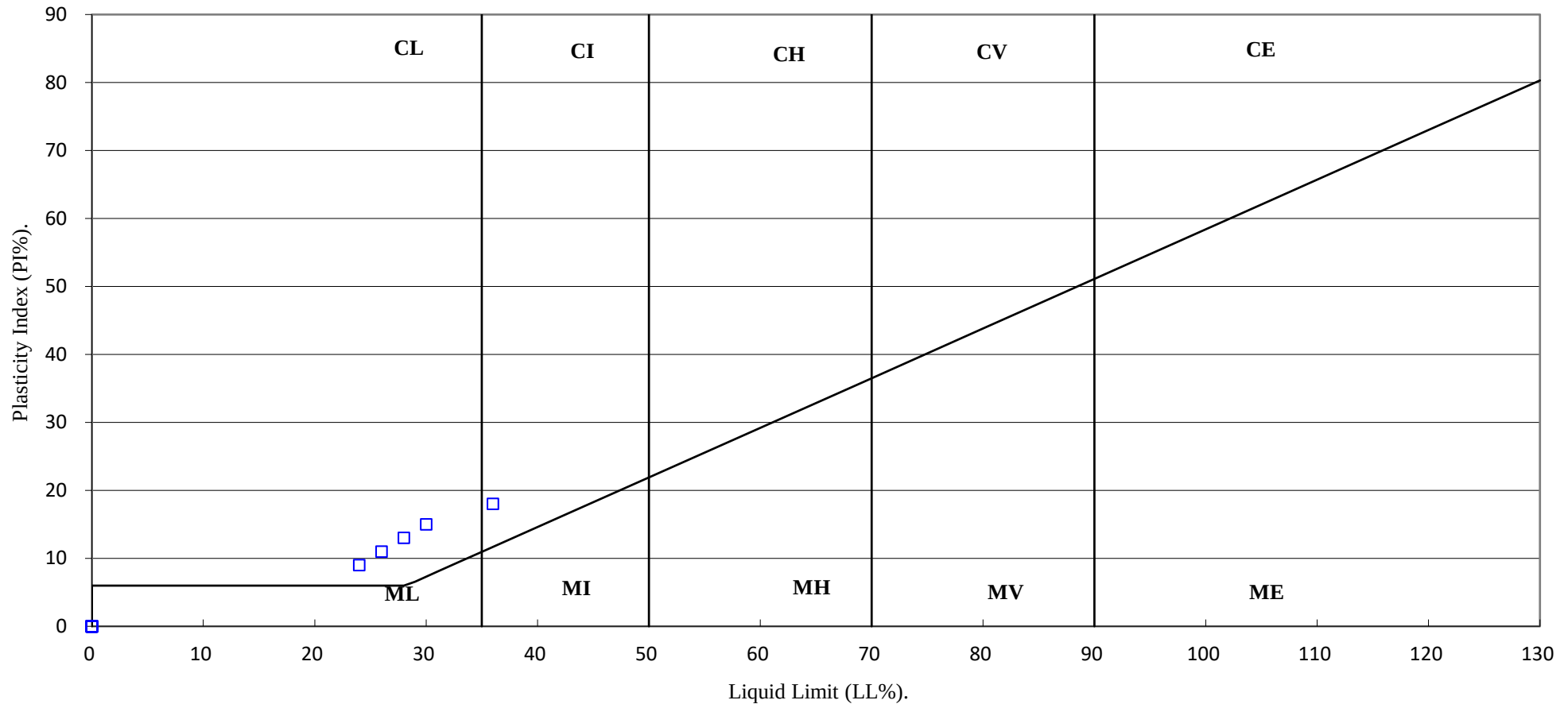
Contract No:

PSL23/2193

Client Ref:

784-B041631

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



Hangar 4 Demolition

Contract No:

PSL23/2193

Client Ref:

784-B041631

PARTICLE SIZE DISTRIBUTION TEST

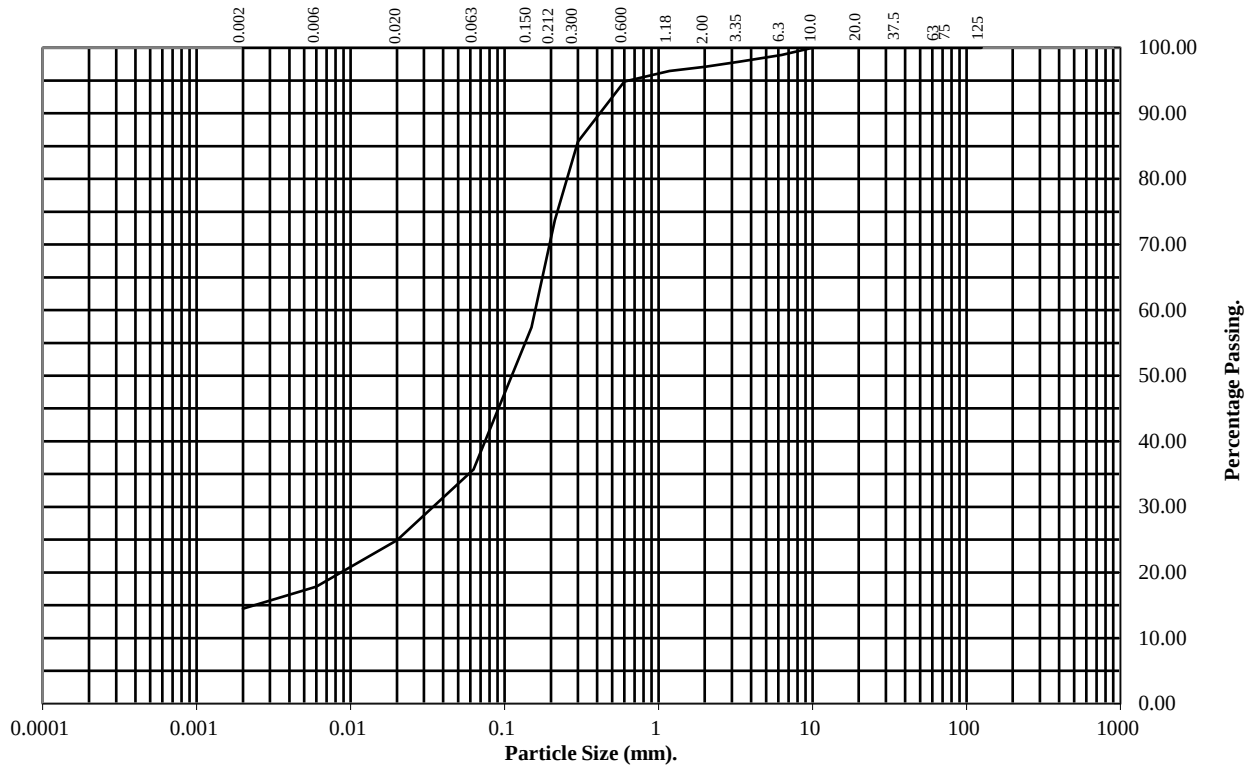
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: CP04 Top Depth (m): 1.60

Sample Number: 6 Base Depth(m): 2.20

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	98
2	97
1.18	96
0.6	95
0.3	86
0.212	74
0.15	57
0.063	36

Particle Diameter	Percentage Passing
0.02	25
0.006	18
0.002	14

Soil Fraction	Total Percentage
Cobbles	0
Gravel	3
Sand	61
Silt	22
Clay	14

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/2193
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

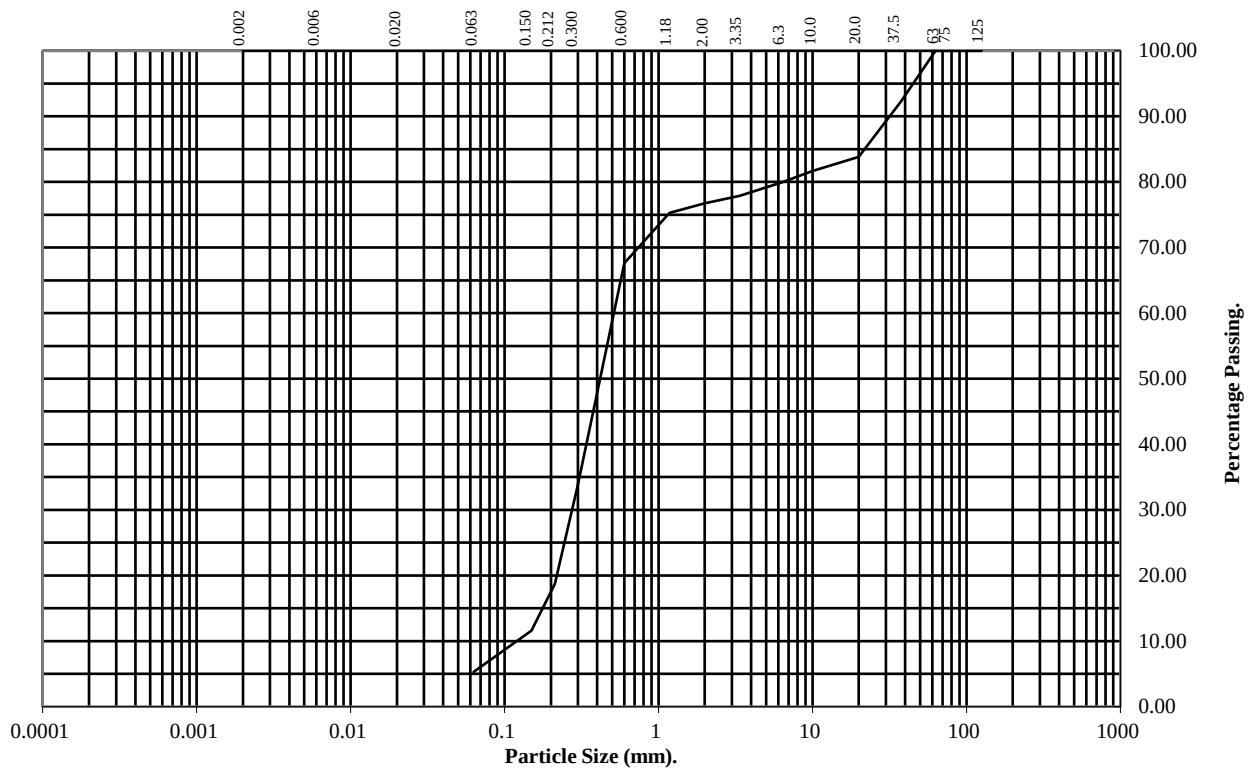
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: CP04 Top Depth (m): 6.00

Sample Number: 13 Base Depth(m): 7.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	92
20	84
10	82
6.3	80
3.35	78
2	77
1.18	75
0.6	68
0.3	34
0.212	19
0.15	12
0.063	5

Soil Fraction	Total Percentage
Cobbles	0
Gravel	23
Sand	72
Silt/Clay	5

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/2193
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

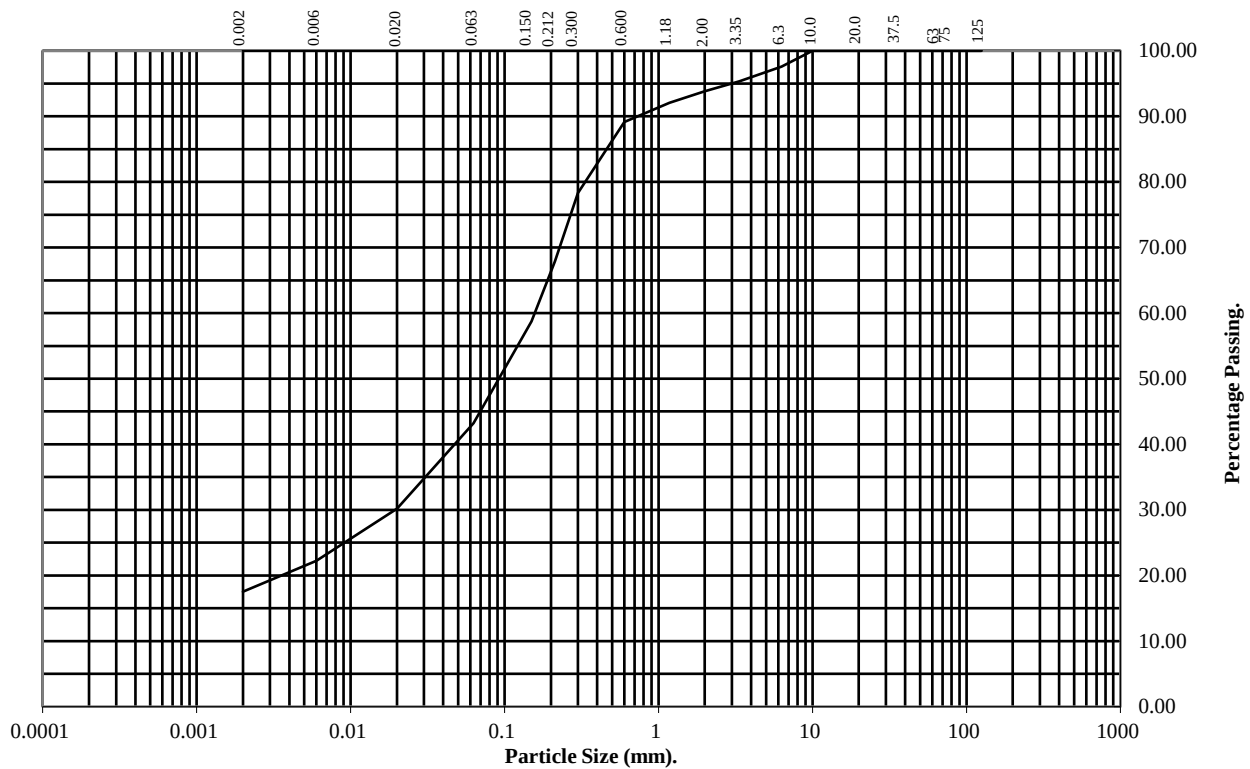
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: CP05 Top Depth (m): 3.50

Sample Number: 7 Base Depth(m): 4.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	98
3.35	95
2	94
1.18	92
0.6	89
0.3	78
0.212	68
0.15	59
0.063	43

Particle Diameter	Percentage Passing
0.02	30
0.006	22
0.002	18

Soil Fraction	Total Percentage
Cobbles	0
Gravel	6
Sand	51
Silt	25
Clay	18

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/2193
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

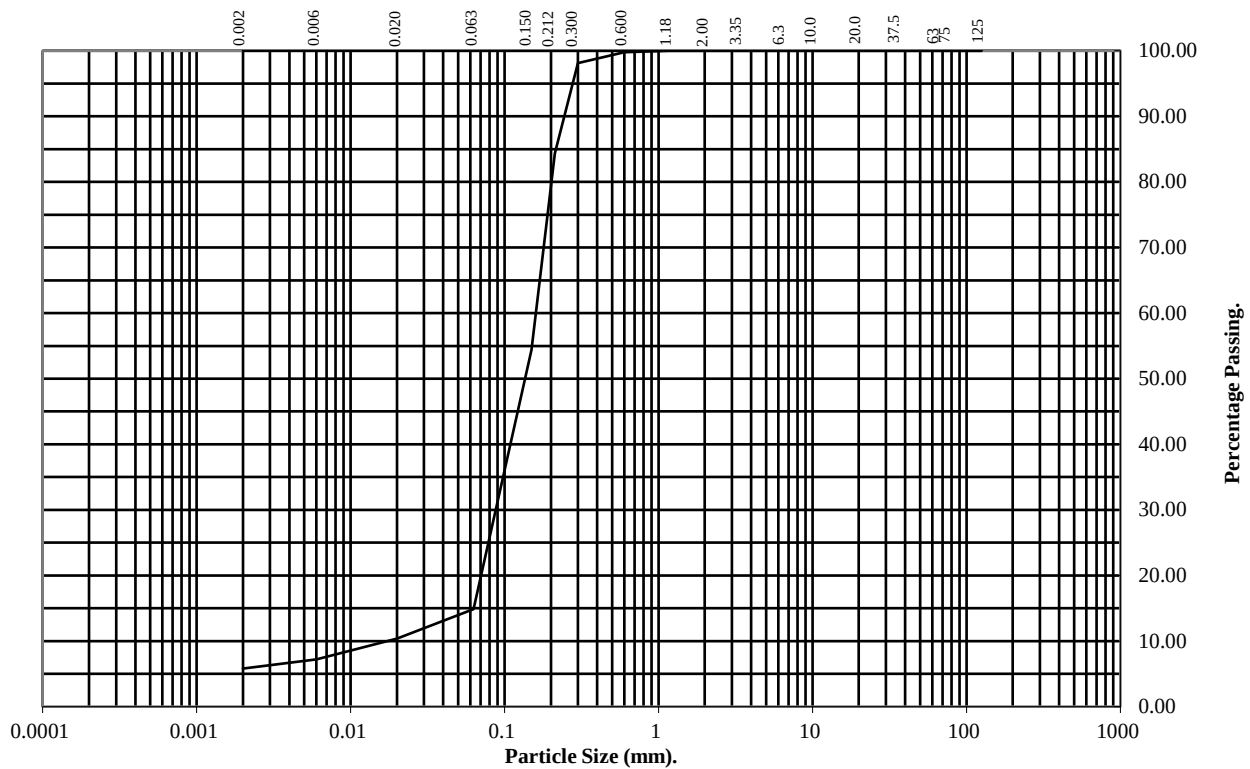
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: CP05 Top Depth (m): 8.00

Sample Number: 12 Base Depth(m): 9.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	98
0.212	84
0.15	54
0.063	15

Particle Diameter	Percentage Passing
0.02	10
0.006	7
0.002	6

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	85
Silt	9
Clay	6

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/2193
Client Ref:
784-B041631

PARTICLE SIZE DISTRIBUTION TEST

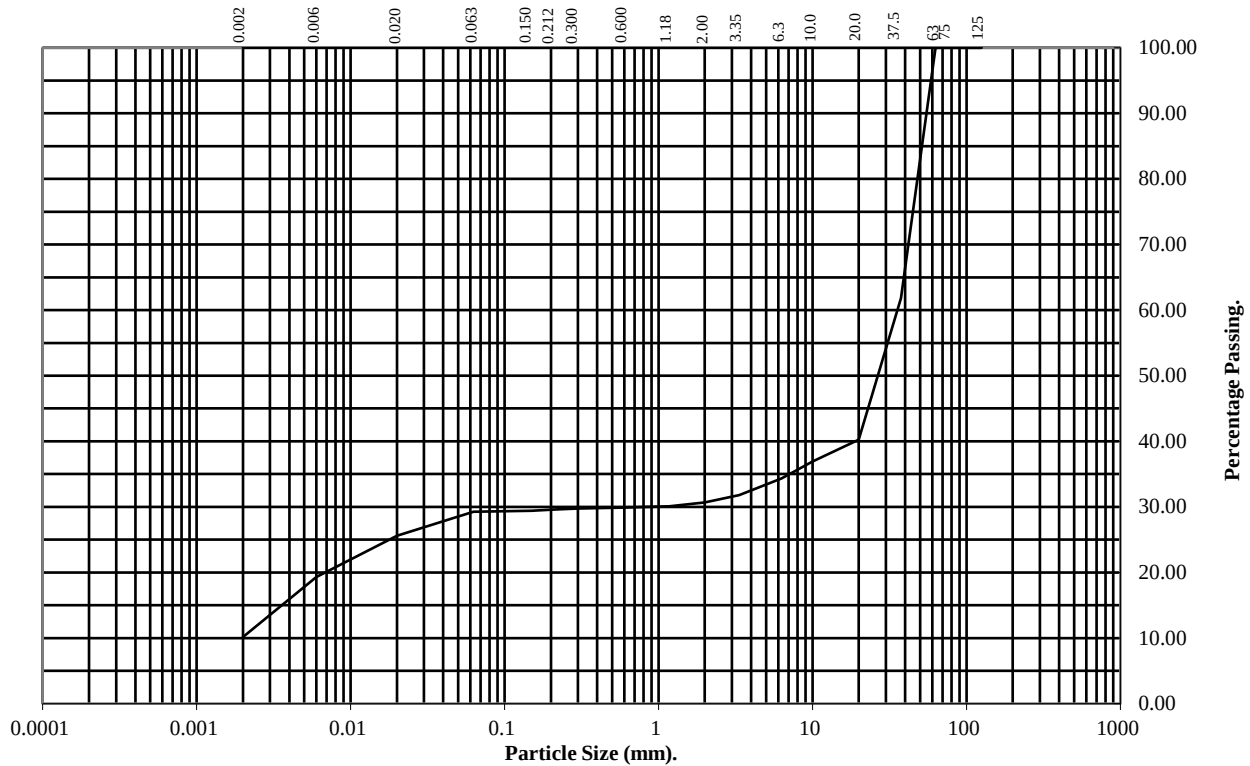
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: CP05 Top Depth (m): 9.00

Sample Number: 13 Base Depth(m): 9.58

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	62
20	40
10	37
6.3	34
3.35	32
2	31
1.18	30
0.6	30
0.3	30
0.212	30
0.15	29
0.063	29

Particle Diameter	Percentage Passing
0.02	26
0.006	19
0.002	10

Soil Fraction	Total Percentage
Cobbles	0
Gravel	69
Sand	2
Silt	19
Clay	10

Remarks:

See Summary of Soil Descriptions



Hangar 4 Demolition

Contract No:
PSL23/2193
Client Ref:
784-B041631

Effective Stress Triaxial Compression

Consolidated Undrained

Summary Report

Sample Details	Depth	1.20-1.65m		
	Description	See summary of soil descriptions.		
	Type	Undisturbed, vertical orientation.		
sketch showing specimen location in original sample	Initial Sample Length	L ₀	(mm)	211.0
	Initial Sample Diameter	D ₀	(mm)	104.4
	Initial Sample Weight	W ₀	(gr)	3909.0
	Initial Bulk Density	ρ ₀	(Mg/m ³)	2.16
	Particle Density	ρ _s	(Mg/m ³)	2.66

Initial Conditions

			Stage 1	2
Initial Cell Pressure	σ _{3i}	(kPa)	580	
Initial Back Pressure	U _{bi}	(kPa)	550	
Membrane Thickness	m _b	(mm)	0.600	
Displacement Input	L _{IP}	(mm)	CH 4	
Load Input	N _{IP}	(N)	CH 1	
Pore Water Pressure Input	u _{pwp}	(kPa)	CH 3	
Sample Volume	V	(cc)	CH 2	
Initial Moisture	ω _i	(%)	16	
Initial Dry Density	ρ _{di}	(Mg/m ³)	1.86	
Initial Voids Ratio	e _i	.	0.428	
Initial Degree of Saturation	S _i	(%)	100	
B Value	B	.	0.98	

Final Conditions

Final Moisture	ω _f	(%)	17	
Final Dry Density	ρ _{df}	(Mg/m ³)	1.87	
Final Voids Ratio	e _f	.	0.426	
Final Degree of Saturation	S _f	(%)	100.0	
			Stage 1	2
Failure Criteria	.		Max. Dev.	
Strain At Failure	ε _f	(%)	13.79	
Stress At Failure	(σ ₁ - σ ₃)	(kPa)	43.7	
Minor Stress At Failure	σ ₃ '	(kPa)	26.0	
Major Stress At Failure	σ ₁ '	(kPa)	69.7	
Principal Stress Ratio At Failure	σ ₁ ' / σ ₃ '		2.679	
PwP At Failure Criteria	u _f		554.0	

Notes



Plastic

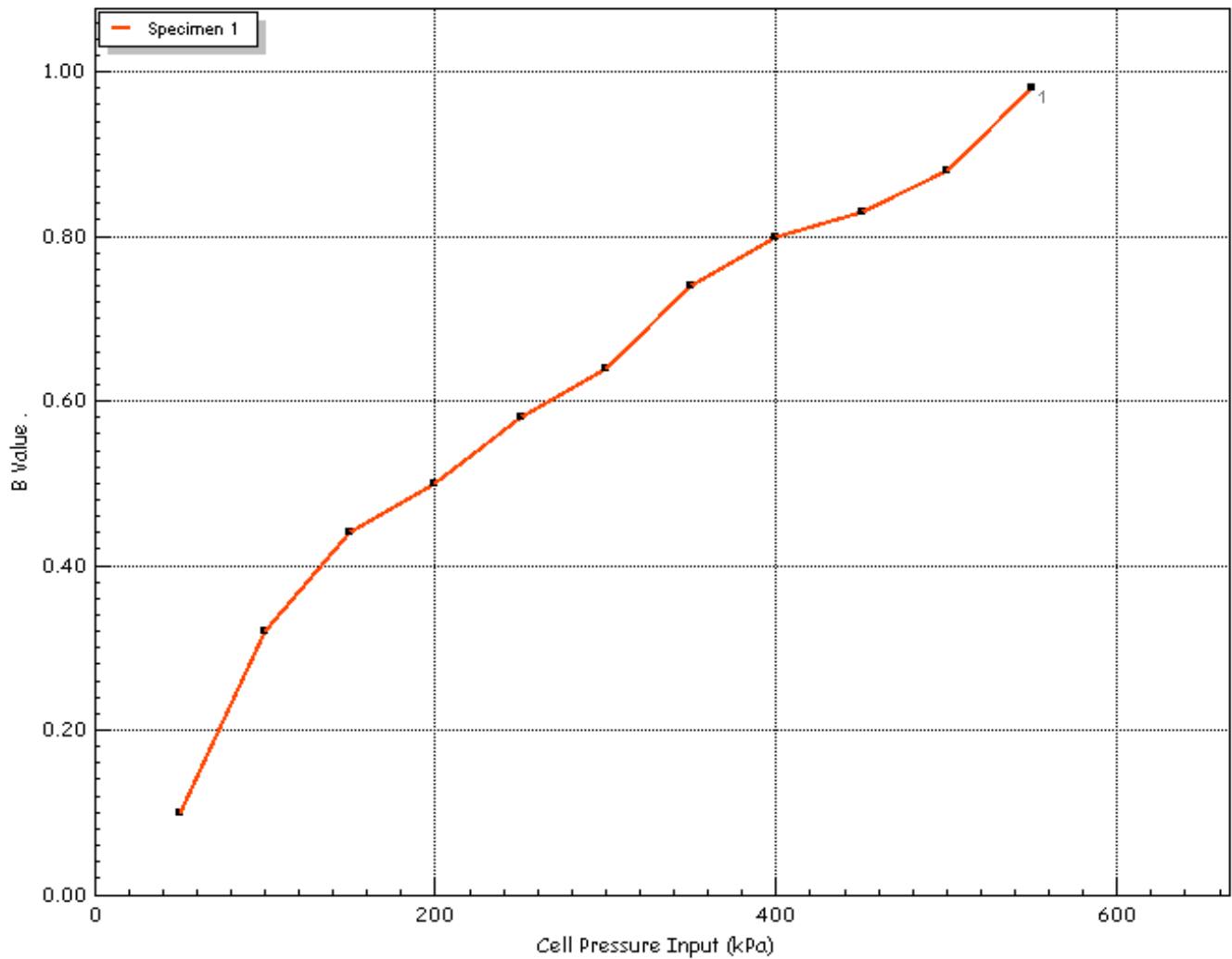
 	Test Method		BS1377-8 : 1990 : Clause 7		Test Name		CP04 1.20-1.65m				
					Test Date		03/04/2023				
	Jobfile		Hangar 4 Demolition		Borehole		CP04				
	Client		Tetra Tech		Sample		1.20-1.65m				
					Depth		1.20-1.65m				
Operator		D.Burton		Checked		S.Rovle		Approved		S.Rovle	

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Plots

Saturation Method		Stepped
Cell Pressure Input	σ (kPa)	550
Pore Water Pressure Input	u_{pwp} (kPa)	533
B Value	B	0.98



  4043	Test Method	BS1377-8 : 1990 : Clause 7		Test Name	CP04 1.20-1.65m	
				Test Date	03/04/2023	
	Jobfile	Hangar 4 Demolition		Borehole	CP04	
	Client	Tetra Tech		Sample	1.20-1.65m	
				Depth	1.20-1.65m	
Operator		D.Burton	Checked	S.Royle	Approved	S.Royle

Effective Stress Triaxial Compression

Consolidated Undrained

Consolidation Plots

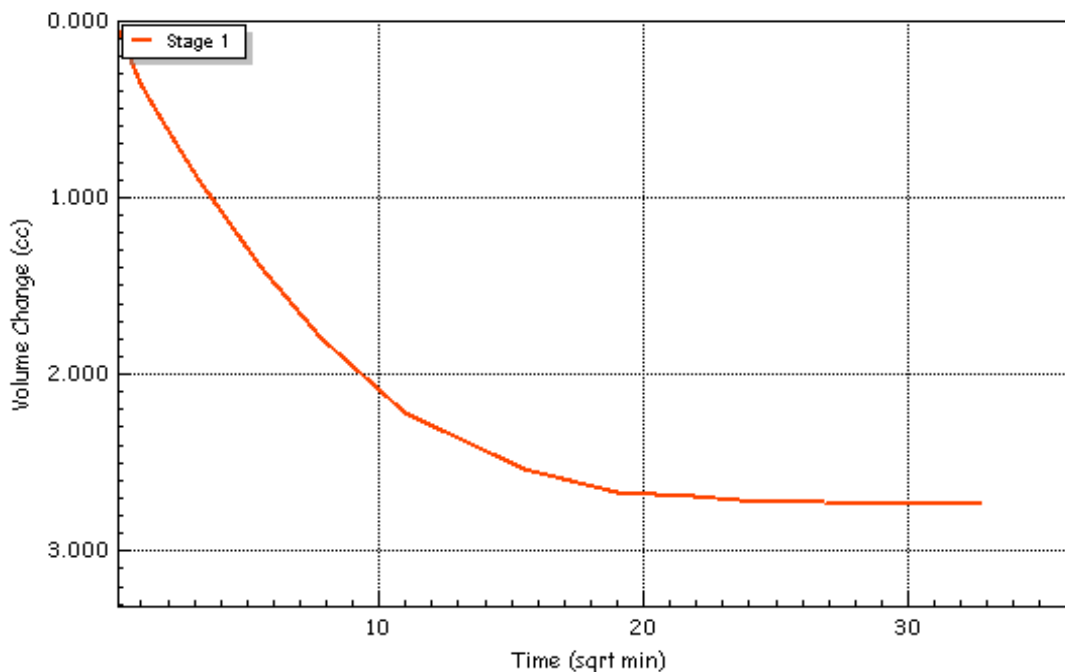
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	580
Initial Back Pressure	u_{bi}	(kPa)	550
Pore Water Pressure Input	u_{pwp}	(kPa)	566
Drainage Method	Radial+One End		

Final Conditions

PWP Dissipation %	U%	(%)	100.00
Volumetric Strain	ϵ_v	(%)	0.15
Corrected Length	L_c	(mm)	210.9
Corrected Area	A_c	(cm ²)	85.52
Corrected Volume	V_c	(cc)	1803.497
t ₁₀₀	t ₁₀₀	(min)	122.04
Consolidation	c _v	(m ² /year)	0.018
Compressibility	m _v	(m ² /MN)	0.095
Test Time	t _F	(h:m:s)	03:39:40
Estimated Strain to Failure	ϵ	(%)	5.0
Shear Machine Speed	d _r	(mm/min)	0.04800

Notes

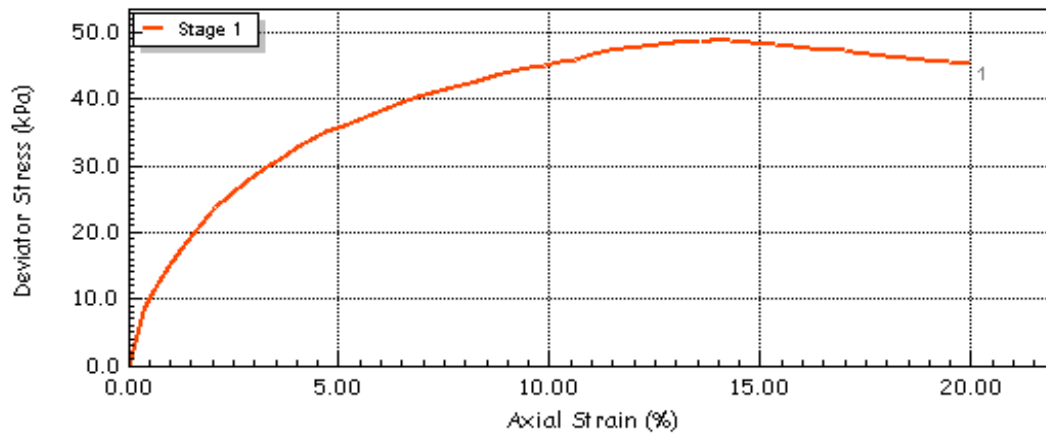
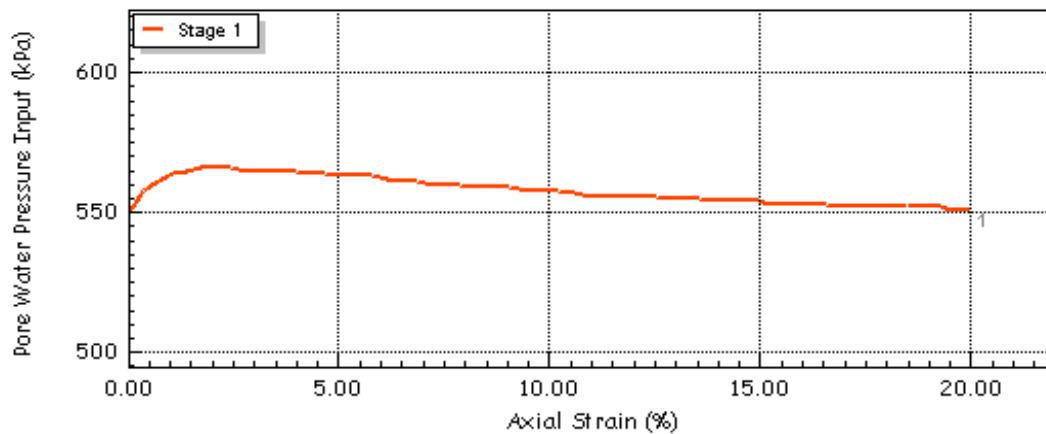
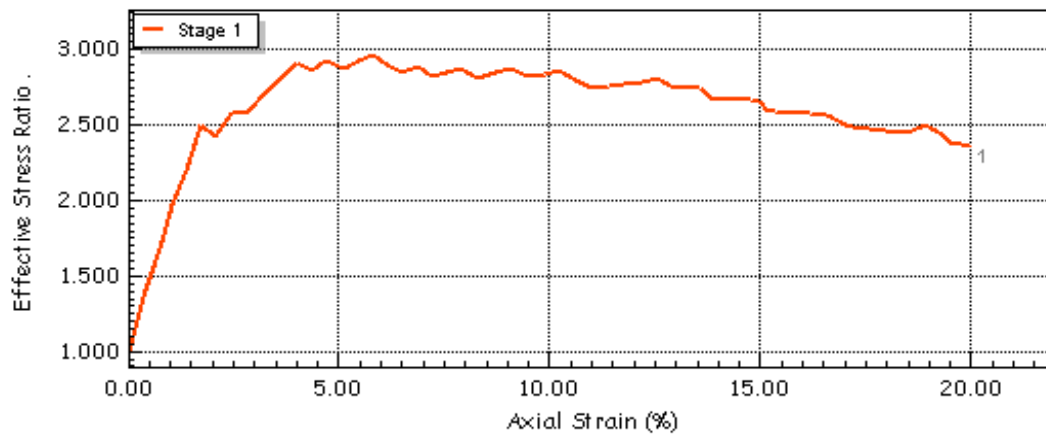


	Test Method	BS1377-8 : 1990 : Clause 7		Test Name	CP04 1.20-1.65m	
				Test Date	03/04/2023	
	Jobfile	Hangar 4 Demolition		Borehole	CP04	
	Client	Tetra Tech		Sample	1.20-1.65m	
				Depth	1.20-1.65m	
	Operator	D.Burton	Checked	S.Royle	Approved	S.Royle

Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots



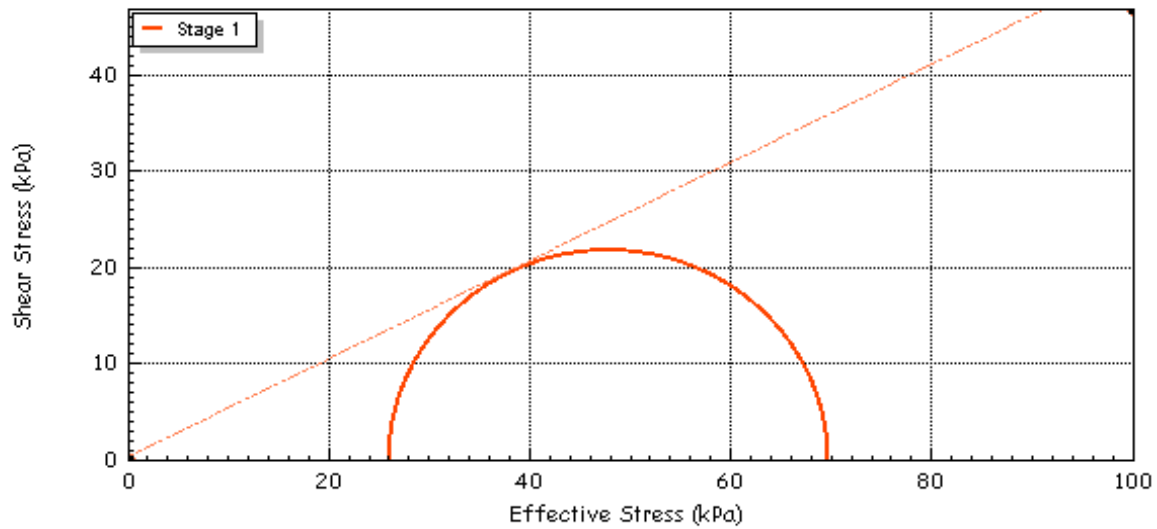
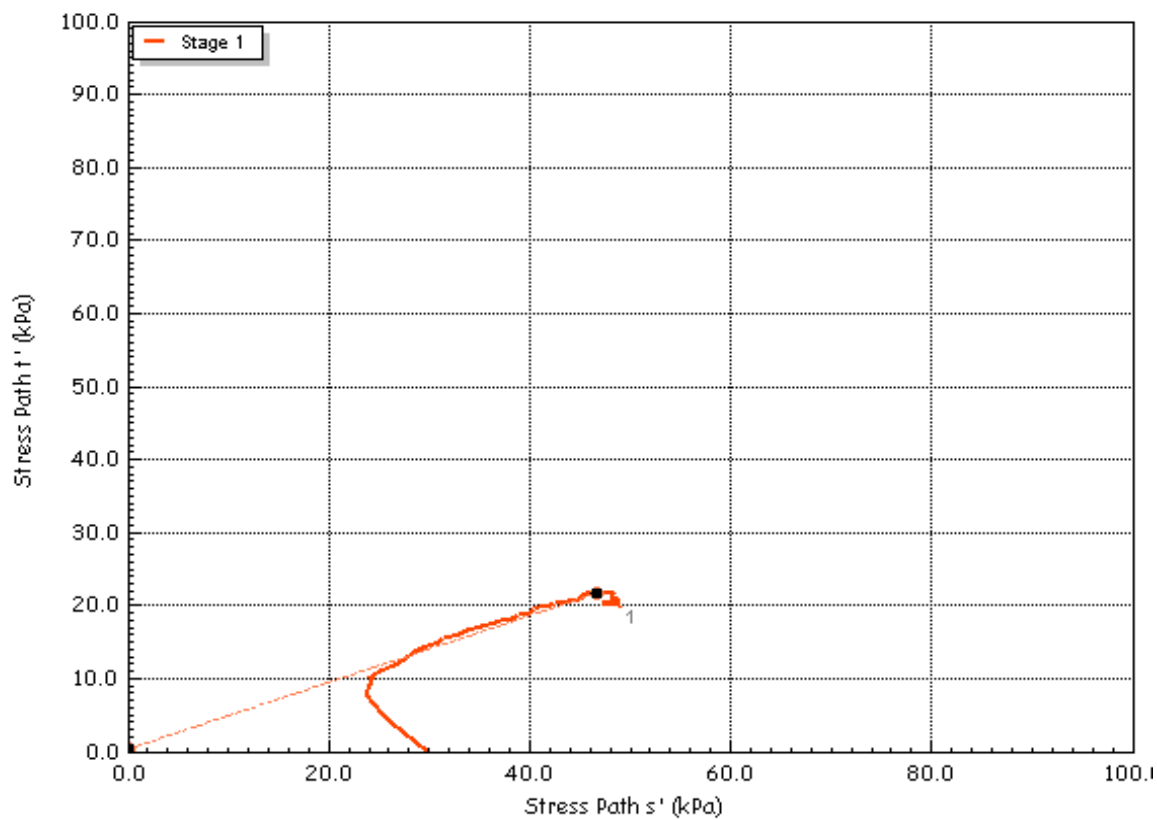
 	Test Method	BS1377-8 : 1990 : Clause 7		Test Name	CP04 1.20-1.65m	
				Test Date	03/04/2023	
	Jobfile	Hangar 4 Demolition		Borehole	CP04	
	Client	Tetra Tech		Sample	1.20-1.65m	
				Depth	1.20-1.65m	
	Operator	D.Burton	Checked	S.Royle	Approved	S.Royle

Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots

Effective	c'	(kPa)	0.00	Effective Cohesion c'	(kPa)	0.00
Effective Friction	ϕ'	(deg)	27.1	Effective Friction ϕ'	(deg)	27.1



 PROFESSIONAL SOILS LABORATORY  4043	Test Method	BS1377-8 : 1990 : Clause 7		Test Name	CP04 1.20-1.65m	
				Test Date	03/04/2023	
	Jobfile	Hangar 4 Demolition		Borehole	CP04	
	Client	Tetra Tech		Sample	1.20-1.65m	
	Operator	D.Burton	Checked	S.Royle	Approved	S.Royle

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

[illegible]

***Note** All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular



Hangar 4 Demolition

Contract No:

PSL23/2193

Client Ref:

784-B041631

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e (mm)	Failure Load		I_s (MPa)	Corr Fac F	I_{s50} (MPa)	Failure Type	Remarks
				Par / Perp	L	D			(Mpa)	(kN)					
CP04	8.00		D	Par	-	90	8100	90.00	-	0.17	0.021	1.303	0.03	Valid	
CP04	9.00		D	Par	-	90	8100	90.00	-	0.12	0.015	1.303	0.02	Valid	
CP04	10.50		D	Par	-	90	8100	90.00	-	0.37	0.046	1.303	0.06	Valid	
CP04	12.00		D	Par	-	90	8100	90.00	-	0.17	0.021	1.303	0.03	Valid	
CP04	13.50		D	Par	-	90	8100	90.00	-	0.11	0.014	1.303	0.02	Valid	
CP05	9.58		D	Par	-	90	8100	90.00	-	3.20	0.395	1.303	0.51	Valid	
CP05	9.70		D	Par	-	90	8100	90.00	-	5.10	0.630	1.303	0.82	Valid	
CP05	10.40		D	Par	-	90	8100	90.00	-	0.19	0.023	1.303	0.03	Valid	
CP05	11.80		D	Par	-	90	8100	90.00	-	0.12	0.015	1.303	0.02	Valid	
CP05	13.30		D	Par	-	90	8100	90.00	-	0.14	0.017	1.303	0.02	Valid	
CP05	14.80		D	Par	-	90	8100	90.00	-	0.19	0.023	1.303	0.03	Valid	

***Note** All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random



Hangar 4 Demolition

Contract No:

PSL23/2193

Client Ref:

784-B041631



Certificate of Analysis

Certificate Number 23-08697

Issued: 19-Apr-23

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 23-08697

Client Reference PSL23/2193

Order No (not supplied)

Contract Title Hanger 4 Demolition

Description 4 Soil samples.

Date Received 13-Apr-23

Date Started 13-Apr-23

Date Completed 19-Apr-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 23-08697

Client Ref PSL23/2193

Contract Title Hanger 4 Demolition

Lab No	2155096	2155097	2155098	2155099
Sample ID	CP04	CP04	CP05	CP05
Depth	10.50-12.00	13.50-15.00	9.70-10.40	11.80-13.30
Other ID				
Sample Type	C	C	C	C
Sampling Date	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Magnesium Aqueous Extract (2:1)	DETSC 2076*	10	mg/l	37	45	30	48
Inorganics							
pH	DETSC 2008#		pH	8.2	8.3	8.2	8.3
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	10	15	6.8	7.2
Nitrate Aqueous Extract as NO3 (2:1)	DETSC 2055	1	mg/l	< 1.0	< 1.0	< 1.0	< 1.0
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	1500	1700	1500	1600
Sulphur as S, Total	DETSC 2320	0.01	%	0.58	1.1	7.4	5.4
Sulphate as SO4, Total	DETSC 2321#	0.01	%	1.5	3.4	21	16

Information in Support of the Analytical Results

Our Ref 23-08697
 Client Ref PSL23/2193
 Contract Hanger 4 Demolition

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2155096	CP04 10.50-12.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2155097	CP04 13.50-15.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2155098	CP05 9.70-10.40 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
2155099	CP05 11.80-13.30 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

APPENDIX E – GAS AND GROUNDWATER MONITORING RESULTS

Client

Project

Job Number

Manchester Airport Group
Hangar 4, Manchester Airport
784-B041631

Date

22/03/23

Visit

1

Start

09:00:00

End

11:00:00

By

BE

AP Trend

Steady

Weather

Cloudy

Instruments used - GA5000 with internal flow pod, Oil/Water Interface Meter.

Background (start)	CH ₄	0.0	CO ₂	0.1	O ₂	20.1%	AP	985
Background (end)	CH ₄	0.0	CO ₂	0.1	O ₂	20.1%	AP	985

Installation	Borehole Level (mAOD)	BH Pressure	CH ₄ (% vol)			CO ₂ (% vol)			O ₂ (% vol)			CO (ppm)	H ₂ S (ppm)	PID		Flow Rate (l/hr)		Atmospheric Pressure (mbar)	Depth to Water (mbgl)	Depth to Water (mAOD)	Depth to Base (mbgl)	Depth to base (m AOD)	Remarks
		mb	Peak	Min	Steady	Peak	Min	Steady	Peak	Min	Steady	Peak	Peak	Peak	Steady	Peak	Steady						
DS01	68.67	0.00	0.00	0.00	0.00	0.40	0.40	0.40	19.30	19.10	19.10	0	0	n/a	n/a	0.6	0.4	985	1.06	67.61	2.00	66.67	
DS02	67.99	0.05	0.00	0.00	0.00	0.40	0.10	0.30	20.10	19.10	19.40	0	0	n/a	n/a	0.5	0.4	985	0.79	67.20	2.00	65.99	
DS03	67.18	0.07	0.00	0.00	0.00	0.40	0.30	0.30	19.10	16.10	17.00	0	0	n/a	n/a	0.6	0.4	985	0.53	66.65	2.00	65.18	
DS04	68.00	0.05	0.00	0.00	0.00	1.00	0.40	0.50	19.50	19.00	19.10	0	0	n/a	n/a	0.4	0.2	985	2.00	66.00	2.8	65.20	
DS05	67.35	0.05	0.00	0.00	0.00	1.20	0.20	0.50	20.10	19.30	19.90	0	0	n/a	n/a	0.7	0.5	985	0.00	67.35	3.00	64.35	

WAB = Wet At Base
SAB = Silty At Base

Client

Project

Job Number

Manchester Airport Group
Hangar 4, Manchester Airport
784-B041631

Date

28/03/23

Visit

2

Start

09:00:00

End

11:00:00

By

BE

AP Trend

Rising

Weather

Cloudy

Instruments used - GA5000 with internal flow pod, Oil/Water Interface Meter.

Background (start)

CH₄

0.0

CO₂

0.1

O₂

20.1%

AP

1012

Background (end)

CH₄

0.0

CO₂

0.1

O₂

20.1%

AP

1012

Installation	Borehole Level (mAOD)	BH Pressure	CH ₄ (% vol)			CO ₂ (% vol)			O ₂ (% vol)			CO (ppm)	H ₂ S (ppm)	PID		Flow Rate (l/hr)		Atmospheric Pressure (mbar)	Depth to Water (mbgl)	Depth to Water (mAOD)	Depth to Base (mbgl)	Depth to base (m AOD)	Remarks
		mb	Peak	Min	Steady	Peak	Min	Steady	Peak	Min	Steady	Peak	Peak	Peak	Steady	Peak	Steady						
DS01	68.67	0.00	0.00	0.00	0.00	0.40	0.20	0.20	20.50	19.10	19.10	0	0	n/a	n/a	0.4	0.1	1012	1.06	67.61	2.00	66.67	
DS02	67.99	-463.30	0.00	0.00	0.00	0.40	0.20	0.20	20.30	19.10	19.40	0	0	n/a	n/a	0.3	0.3	1012	0.79	67.20	2.00	65.99	
DS03	67.18	0.00	0.00	0.00	0.00	0.40	0.20	0.30	19.90	19.10	20.00	0	0	n/a	n/a	0.5	0.4	1012	0.53	66.65	2.00	65.18	
DS04	68.00	-469.90	0.00	0.00	0.00	0.40	0.20	0.20	19.90	19.10	19.10	0	0	n/a	n/a	0.4	0.2	1012	2.00	66.00	2.8	65.20	
DS05	67.35	0.05	0.00	0.00	0.00	1.20	0.40	0.50	20.10	19.40	19.90	0	0	n/a	n/a	0.7	0.5	1012	2.85	64.50	3.76	63.59	

WAB = Wet At Base
SAB = Silty At Base

Client

Project

Job Number

Manchester Airport Group
Hangar 4, Manchester Airport
784-B041631

Date

06/04/23

Visit

3

Start

11:30:00

End

12:45:00

By

JM

AP Trend

Rising

Weather

Overcast

Instruments used - GA5000 with internal flow pod, Oil/Water Interface Meter.

Background (start)

CH₄

0.0

CO₂

0.0

O₂

20.0%

AP

1012

Background (end)

CH₄

0.0

CO₂

0.0

O₂

20.0%

AP

1012

Installation	Borehole Level (mAOD)	BH Pressure	CH ₄ (% vol)			CO ₂ (% vol)			O ₂ (% vol)			CO (ppm)	H ₂ S (ppm)	PID		Flow Rate (l/hr)		Atmospheric Pressure (mbar)	Depth to Water (mbgl)	Depth to Water (mAOD)	Depth to Base (mbgl)	Depth to base (m AOD)	Remarks
		mb	Peak	Min	Steady	Peak	Min	Steady	Peak	Min	Steady	Peak	Peak	Peak	Steady	Peak	Steady						
DS01	68.67	-0.05	0.00	0.00	0.00	0.20	0.00	0.20	20.10	19.60	19.60	0	0	n/a	n/a	0.2	0.2	1012	0.96	67.71	2.02	66.65	
DS02	67.99	-0.07	0.00	0.00	0.00	0.30	0.00	0.30	20.00	19.60	19.60	0	0	n/a	n/a	0.2	0.2	1012	0.71	67.28	1.97	66.02	
DS03	67.18	-0.05	0.00	0.00	0.00	0.40	0.00	0.40	20.10	19.60	19.60	0	0	n/a	n/a	0.2	0.2	1012	0.31	66.87	2.00	65.18	
DS04	68.00	-0.04	0.00	0.00	0.00	0.30	0.00	0.30	20.10	19.60	19.60	0	0	n/a	n/a	0.2	0.2	1012	1.94	66.06	2.88	65.12	
DS05	67.35	-0.04	0.00	0.00	0.00	0.60	0.00	0.60	20.00	19.40	19.40	0	0	n/a	n/a	0.2	0.2	1012	2.81	64.54	3.76	63.59	

WAB = Wet At Base
SAB = Silty At Base

Client

Project

Job Number

Manchester Airport Group
Hangar 4, Manchester Airport
784-B041631

Date

17/04/23

Visit

4

Start

14:00:00

End

14:30:00

By

HM

AP Trend

Rising

Weather

Overcast

Instruments used - GA5000 with internal flow pod, Oil/Water Interface Meter.

Background (start)	CH ₄	0.0	CO ₂	0.2	O ₂	21.0%	AP	1021
Background (end)	CH ₄	0.0	CO ₂	0.1	O ₂	20.9%	AP	1021

Installation	Borehole Level (mAOD)	BH Pressure mb	CH ₄ (% vol)			CO ₂ (% vol)			O ₂ (% vol)			CO (ppm)		H ₂ S (ppm)		PID		Flow Rate (l/hr)		Atmospheric Pressure (mbar)	Depth to Water (mbgl)	Depth to Water (mAOD)	Depth to Base (mbgl)	Depth to base (m AOD)	Remarks
			Peak	Min	Steady	Peak	Min	Steady	Peak	Min	Steady	Peak	Peak	Peak	Steady	Peak	Steady								
DS01	68.67		0.00	0.00	0.00	0.50	0.50	0.50	18.40	18.4	18.40	3	0	n/a	n/a	0.0	0.0	1021	1.10	67.57	2.02	66.65			
DS02	67.99		0.00	0.00	0.00	0.50	0.50	0.50	20.10	20.1	20.10	3	0	n/a	n/a	0.0	0.0	1021	0.70	67.29	1.97	66.02			
DS03	67.18		0.00	0.00	0.00	0.30	0.30	0.30	19.70	19.7	19.70	0	0	n/a	n/a	0.2	0.2	1021	0.44	66.74	2.00	65.18			
DS04	68.00		0.00	0.00	0.00	0.40	0.10	0.10	20.60	20.6	20.60	1	0	n/a	n/a	0.0	0.0	1021	1.70	66.30	2.88	65.12			
DS05	67.35		0.50	0.40	0.40	3.70	2.90	2.90	11.90	11.9	11.90	0	0	n/a	n/a	0.0	0.0	1021	2.80	64.55	3.76	63.59			

WAB = Wet At Base
SAB = Silty At Base

APPENDIX F – SOIL SCREENING RESULTS

Sample Identity	England and Wales (mg/kg) where		CP01	CP02	CP02	CP03	DS01	DS02	DS03	DS04	DS05	CP04	CP05
Depth (m bgl)	Presence Organic Matter <1%		0.50	0.50	1.00	0.70	0.50	2.10	0.20	1.00	0.60	0.63-0.85	1.00
Reference		Screen Value											
Sample Date	Units	Commercial (V.18)	27/02/2023	28/02/2023	28/02/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	01/03/2023	20/03/2023	20/03/2023
pH		<5, >9	7.38	8.43	8.12	8.43	7.64	6.89	8.31	7.84	7.85	7.18	7.69
Asbestos	%	Presence	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD
HEAVY METALS/METALLOIDS													
Arsenic	mg/kg	640	4.90	NA	6.20	9.20	9.70	2.40	4.80	11.70	3.50	4.40	12.10
Beryllium	mg/kg	12.00	0.90	NA	0.90	1.80	2.00	<0.5	0.70	2.00	<0.5	0.80	1.30
Cadmium	mg/kg	410	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (III)	mg/kg	8,600	41.80	NA	45.70	47.30	46.00	28.80	40.00	49.50	36.00	22.40	49.30
Chromium (VI)	mg/kg	49	<0.3	NA	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Copper	mg/kg	68,000	12.00	NA	11.00	23.00	22.00	4.00	7.00	26.00	7.00	10.00	17.00
Lead	mg/kg	2,300	9.00	NA	9.00	12.00	9.00	<5	6.00	13.00	6.00	10.00	21.00
Mercury (Elemental)	mg/kg	58 (25.8)vap	0.10	NA	0.10	<0.1	0.20	<0.1	<0.1	0.10	<0.1	0.10	0.20
Mercury (Inorganic)	mg/kg	1,100											
Mercury (Methyl)	mg/kg	320											
Nickel	mg/kg	980	17.90	NA	24.30	31.70	43.70	11.10	12.00	40.10	7.70	14.30	28.30
Selenium	mg/kg	12,000	<1	NA	<1	<1	<1	<1	<1	1.00	<1	1.00	<1
Vanadium	mg/kg	9,000	28.00	NA	36.00	36.00	40.00	9.00	28.00	48.00	20.00	24.00	37.00
Boron	mg/kg	240,000	0.20	NA	0.60	0.80	0.40	0.20	0.10	0.70	0.50	0.60	1.00
Zinc	mg/kg	730,000	35.00	NA	43.00	51.00	53.00	16.00	29.00	72.00	15.00	25.00	49.00
GENERAL INORGANICS													
Easily Liberatable Cyanide (free)	mg/kg	40	<0.5	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
US EPA PRIORITY PAHs													
Acenaphthylene	mg/kg	84,000 (57.0)sol	<0.03	0.09	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Acenaphthene	mg/kg	83,000 (86.1)sol	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg	520,000	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Benzo(a)anthracene	mg/kg	170	<0.06	0.12	0.09	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Benzo(b)fluoranthene	mg/kg	44	<0.05	0.23	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	mg/kg	1,200	<0.02	0.09	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(g,h,i)perylene	mg/kg	3,900	<0.04	0.18	0.09	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Benzo(a)pyrene	mg/kg	77	<0.04	0.21	0.09	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Chrysene	mg/kg	350	<0.02	0.12	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Di-benzo(a,h)anthracene	mg/kg	3.50	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Fluoranthene	mg/kg	23,000	<0.03	0.12	0.10	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Fluorene	mg/kg	63000 (30.9)sol	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Indeno(1,2,3-cd)pyrene	mg/kg	500	<0.04	0.20	0.09	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Naphthalene	mg/kg	190 (76.4)sol	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Phenanthrene	mg/kg	22,000	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Pyrene	mg/kg	54,000	<0.03	0.14	0.10	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
TPH													
TPH Aliphatic >C5-6	mg/kg	3,200 (304)sol	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aliphatic >C6-8	mg/kg	7,800 (144)sol	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.00	<0.1
TPH Aliphatic >C8-10	mg/kg	2,000 (78)sol	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aliphatic >C10-12	mg/kg	9,700 (48)sol	<0.2	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	4.80
TPH Aliphatic >C12-16	mg/kg	59,000 (24)sol	<4	NA	<4	<4	<4	<4	<4	<4	<4	<4	10.00
TPH Aliphatic >C16-35	mg/kg	1,000,000#	<14	NA	<14	<14	<14	<14	<14	<14	<14	<14	<14
TPH Aliphatic >C35-44	mg/kg	1,000,000#	<7	NA	<7	<7	<7	<7	<7	<7	<7	<7	<7
TPH Aromatic >EC5-7 (Benzene)	mg/kg	27.00	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aromatic >EC7-8	mg/kg	56,000 (869)vap	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aromatic >EC8-10	mg/kg	3,500 (613)vap	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aromatic >EC10-12	mg/kg	16,000 (364)sol	<0.2	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TPH Aromatic >EC12-16	mg/kg	36,000 (169)sol	<4	NA	<4	<4	<4	<4	<4	<4	<4	<4	<4
TPH Aromatic >EC16-21	mg/kg	28,000	<7	NA	<7	<7	<7	<7	<7	<7	<7	<7	<7
TPH Aromatic >EC21-35	mg/kg	28,000	<7	NA	<7	<7	<7	<7	<7	<7	<7	<7	<7
TPH Aromatic >EC35-44	mg/kg	28,000	<7	NA	<7	<7	<7	<7	<7	<7	<7	<7	<7
Total aliphatics and aromatics(C5-44)	mg/kg	28,000	<52	NA	<52	<52	<52	<52	<52	<52	<52	<52	<52
BTEx													
Benzene	mg/kg	27	<5	<5	<5	<5	NA	<5	NA	NA	NA	<5	<5
Toluene	mg/kg	56,000 (869) vap	<5	<5	<5	<5	NA	<5	NA	NA	NA	<5	<5
Ethylbenzene	mg/kg	5,700 (518) vap	<5	<5	<5	<5	NA	<5	NA	NA	NA	11.00	<5
m/p-Xylene	mg/kg	6,200 (625) vap	<5	<5	<5	<5	NA	<5	NA	NA	NA	7.00	<5
o-Xylene	mg/kg	6,600 (478) sol	<5	<5	<5	<5	NA	<5	NA	NA	NA	<5	<5
Xylenes (mixed isomers)	mg/kg	5,900 (576) sol											
Other													
Calorific Value	MJ/Kg	7											
Total Organic Carbon			NA	2.33	NA	0.30	NA	NA	0.90	NA	NA	NA	NA
Fraction Organic Carbon			0.01	NA	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01
Loss on Ignition	%		NA	3.30	NA	2.70	NA	NA	3.60	NA	NA	NA	NA
Mineral oil			NA	348.00	NA	<30	NA	NA	<30	NA	NA	NA	NA
ANC at pH4			NA	0.16	NA	0.22	NA	NA	0.09	NA	NA	NA	NA
ANC at pH7			NA	<0.03	NA	<0.03	NA	NA	<0.03	NA	NA	NA	NA
ANIONS													
Water Soluble Sulphate as SO4 2:1 Extrac	g/l		0.0132	NA	<0.0015	0.1730	0.0812	0.0324	0.0058	0.0414	<0.0015	0.0267	0.0096

Toluene #	ug/kg	56,000 (869) vap	NA	NA	NA	NA	<3	NA	<3	<3	7	NA	NA
Ethylbenzene #	ug/kg	5,700mg/kg (518) vap	NA	NA	NA	NA	<3	NA	<3	<3	<3	NA	NA
m/p-Xylene #	ug/kg	6,200mg/kg (625) vap	NA	NA	NA	NA	<5	NA	<5	<5	<5	NA	NA
o-Xylene #	ug/kg	6,600mg/kg (478) sol	NA	NA	NA	NA	<3	NA	<3	<3	<3	NA	NA
SVOC MS													
Phenols													
2-Chlorophenol #	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
2-Methylphenol	ug/kg	Methyl Phenol)	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
2-Nitrophenol	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
2,4-Dichlorophenol #	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
2,4-Dimethylphenol	ug/kg	16000mg/kg	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
2,4,5-Trichlorophenol	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
2,4,6-Trichlorophenol	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
4-Chloro-3-methylphenol	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
4-Methylphenol	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
4-Nitrophenol	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Pentachlorophenol	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Phenol #	ug/kg	440mg/kg	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
PAHs													
2-Chloronaphthalene #	ug/kg	390mg/kg	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
2-Methylnaphthalene #	ug/kg	detection	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Phthalates													
Bis(2-ethylhexyl) phthalate	ug/kg	detection	NA	NA	NA	NA	<100	NA	<100	<100	<100	NA	NA
Butylbenzyl phthalate	ug/kg		NA	NA	NA	NA	<100	NA	<100	<100	<100	NA	NA
Di-n-butyl phthalate	ug/kg		NA	NA	NA	NA	<100	NA	<100	<100	<100	NA	NA
Di-n-Octyl phthalate	ug/kg		NA	NA	NA	NA	<100	NA	<100	<100	<100	NA	NA
Diethyl phthalate	ug/kg		NA	NA	NA	NA	<100	NA	<100	<100	<100	NA	NA
Dimethyl phthalate #	ug/kg	detection	NA	NA	NA	NA	<100	NA	<100	<100	<100	NA	NA
Other SVOCs													
1,2-Dichlorobenzene	ug/kg	2,000mg/kg (571)sol	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
1,2,4-Trichlorobenzene #	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
1,3-Dichlorobenzene	ug/kg	30mg/kg	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
1,4-Dichlorobenzene	ug/kg	4,400mg/kg (224)vap	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
2-Nitroaniline	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
2,4-Dinitrotoluene	ug/kg	3700mg/kg	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
2,6-Dinitrotoluene	ug/kg	1900mg/kg	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
3-Nitroaniline	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
4-Bromophenylphenylether #	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
4-Chloroaniline	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
4-Chlorophenylphenylether	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
4-Nitroaniline	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Azobenzene	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Bis(2-chloroethoxy)methane	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Bis(2-chloroethyl)ether	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Carbazole	ug/kg	detection	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Dibenzofuran #	ug/kg	240mg/kg	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Hexachlorobenzene	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Hexachlorobutadiene #	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Hexachlorocyclopentadiene	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Hexachloroethane	ug/kg	22mg/kg	NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Isophorone #	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
N-nitrosodi-n-propylamine #	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
Nitrobenzene #	ug/kg		NA	NA	NA	NA	<10	NA	<10	<10	<10	NA	NA
PCB													
PCB 28 #	ug/kg		NA	<5	NA	<5	NA	NA	<5	NA	NA	NA	NA
PCB 52 #	ug/kg		NA	<5	NA	<5	NA	NA	<5	NA	NA	NA	NA
PCB 101 #	ug/kg		NA	<5	NA	<5	NA	NA	<5	NA	NA	NA	NA
PCB 118 #	ug/kg		NA	<5	NA	<5	NA	NA	<5	NA	NA	NA	NA
PCB 138 #	ug/kg		NA	<5	NA	<5	NA	NA	<5	NA	NA	NA	NA
PCB 153 #	ug/kg		NA	<5	NA	<5	NA	NA	<5	NA	NA	NA	NA
PCB 180 #	ug/kg		NA	<5	NA	<5	NA	NA	<5	NA	NA	NA	NA
Total 7 PCBs #	ug/kg		NA	<35	NA	<35	NA	NA	<35	NA	NA	NA	NA

APPENDIX G – WASTE CLASSIFICATION RESULTS

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



ZN566-4UDAJ-M9H8O

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

784-B041631 - Hangar 4 Manchester Airport

Description/Comments

Project

784-B041631

Site

Hangar 4 Manchester Airport

Classified by

Name: **Abigail Walters**
 Date: **21 Apr 2023 09:28 GMT**
 Telephone: **01623 684 565**
 Company: **Tetra Tech (WYG)**
Geneva Building, Lake View Drive,
Sherwood Business Park, Annesley
Nottingham
NG15 0ED

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

Course
 Hazardous Waste Classification
 3 year Refresher overdue

Date
 15 Mar 2018

Purpose of classification

2 - Material Characterisation

Address of the waste

Hangar 4, Pinfold Lane, Manchester Airport

Post Code M90 5UZ

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Commercial demolition works

Description of the specific process, sub-process and/or activity that created the waste

Demolition and earthworks

Description of the waste

Made Ground Soils

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	CP01	0.50	Non Hazardous		3
2	CP02	0.50	Non Hazardous		5
3	CP02[2]	1.00	Non Hazardous		7
4	CP03	0.70	Non Hazardous		9
5	DS01	0.50	Non Hazardous		12
6	DS02	2.10	Non Hazardous		15
7	DS03	0.20	Non Hazardous		17
8	DS04	1.00	Non Hazardous		20
9	DS05	0.60	Non Hazardous		23
10	CP04	0.63-0.85	Non Hazardous		26
11	CP05	1.00	Non Hazardous		28

Related documents

#	Name	Description
1	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Abigail Walters

Created date: 21 Apr 2023 09:28 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	30
Appendix B: Rationale for selection of metal species	31
Appendix C: Version	32

Classification of sample: CP01

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:
CP01	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.50 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
20.5%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 20.5% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				4.9 mg/kg	1.32	5.369 mg/kg	0.000537 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.9 mg/kg	2.775	2.073 mg/kg	0.000207 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide; boric oxide }				0.2 mg/kg	3.22	0.534 mg/kg	0.0000534 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				41.8 mg/kg	1.462	50.7 mg/kg	0.00507 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				12 mg/kg	1.126	11.212 mg/kg	0.00112 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead chromate }			1	9 mg/kg	1.56	11.65 mg/kg	0.000747 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
9	mercury { mercury dichloride }				0.1 mg/kg	1.353	0.112 mg/kg	0.0000112 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel chromate }				17.9 mg/kg	2.976	44.212 mg/kg	0.00442 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc chromate }				35 mg/kg	2.774	80.577 mg/kg	0.00806 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				7.38 pH		7.38 pH	7.38 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.15 mg/kg		<0.15 mg/kg	<0.000015 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
Total:									0.0259 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: CP02

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:
CP02	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.50 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
23.1%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 23.1% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
2	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
3	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
4	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
5	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
6	pH				8.43 pH		8.43 pH	8.43 pH		
			PH							
7	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
8	acenaphthylene				0.09 mg/kg		0.0731 mg/kg	0.00000731 %	✓	
		205-917-1	208-96-8							
9	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
10	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
11	phenanthrene				0.04 mg/kg		0.0325 mg/kg	0.00000325 %	✓	
		201-581-5	85-01-8							
12	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		204-371-1	120-12-7							
13	fluoranthene				0.12 mg/kg		0.0975 mg/kg	0.00000975 %	✓	
		205-912-4	206-44-0							
14	pyrene				0.14 mg/kg		0.114 mg/kg	0.0000114 %	✓	
		204-927-3	129-00-0							
15	benzo[a]anthracene				0.12 mg/kg		0.0975 mg/kg	0.00000975 %	✓	
	601-033-00-9	200-280-6	56-55-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	chrysene				0.12 mg/kg		0.0975 mg/kg	0.00000975 %	✓	
	601-048-00-0	205-923-4	218-01-9							
17	benzo[b]fluoranthene				0.23 mg/kg		0.187 mg/kg	0.0000187 %	✓	
	601-034-00-4	205-911-9	205-99-2							
18	benzo[k]fluoranthene				0.09 mg/kg		0.0731 mg/kg	0.00000731 %	✓	
	601-036-00-5	205-916-6	207-08-9							
19	benzo[a]pyrene; benzo[def]chrysene				0.21 mg/kg		0.171 mg/kg	0.0000171 %	✓	
	601-032-00-3	200-028-5	50-32-8							
20	indeno[123-cd]pyrene				0.2 mg/kg		0.162 mg/kg	0.0000162 %	✓	
		205-893-2	193-39-5							
21	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
22	benzo[ghi]perylene				0.18 mg/kg		0.146 mg/kg	0.0000146 %	✓	
		205-883-8	191-24-2							
23	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.00015 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
<LOD	Below limit of detection

Classification of sample: CP02[2]

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:
CP02[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1.00 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
26.3%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 26.3% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				6.2 mg/kg	1.32	6.481 mg/kg	0.000648 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.9 mg/kg	2.775	1.978 mg/kg	0.000198 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.53 mg/kg	0.000153 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				45.7 mg/kg	1.462	52.884 mg/kg	0.00529 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				11 mg/kg	1.126	9.806 mg/kg	0.000981 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead chromate }			1	9 mg/kg	1.56	11.115 mg/kg	0.000713 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
9	mercury { mercury dichloride }				0.1 mg/kg	1.353	0.107 mg/kg	0.0000107 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel chromate }				24.3 mg/kg	2.976	57.263 mg/kg	0.00573 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc chromate }				43 mg/kg	2.774	94.448 mg/kg	0.00944 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene 601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
20	pH		PH		8.12 pH		8.12 pH	8.12 pH		
21	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
22	acenaphthylene 205-917-1	208-96-8			0.04 mg/kg		0.0317 mg/kg	0.00000317 %	✓	
23	acenaphthene 201-469-6	83-32-9			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
24	fluorene 201-695-5	86-73-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
25	phenanthrene 201-581-5	85-01-8			<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
26	anthracene 204-371-1	120-12-7			<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
27	fluoranthene 205-912-4	206-44-0			0.1 mg/kg		0.0792 mg/kg	0.00000792 %	✓	
28	pyrene 204-927-3	129-00-0			0.1 mg/kg		0.0792 mg/kg	0.00000792 %	✓	
29	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.09 mg/kg		0.0713 mg/kg	0.00000713 %	✓	
30	chrysene 601-048-00-0	205-923-4	218-01-9		0.08 mg/kg		0.0633 mg/kg	0.00000633 %	✓	
31	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.12 mg/kg		0.095 mg/kg	0.0000095 %	✓	
32	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.04 mg/kg		0.0317 mg/kg	0.00000317 %	✓	
33	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.09 mg/kg		0.0713 mg/kg	0.00000713 %	✓	
34	indeno[123-cd]pyrene 205-893-2	193-39-5			0.09 mg/kg		0.0713 mg/kg	0.00000713 %	✓	
35	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	benzo[ghi]perylene 205-883-8	191-24-2			0.09 mg/kg		0.0713 mg/kg	0.00000713 %	✓	
37	phenol 604-001-00-2	203-632-7	108-95-2		<0.15 mg/kg		<0.15 mg/kg	<0.000015 %		<LOD
Total:								0.0289 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: CP03

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:
CP03	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.70 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
19.2%	
(dry weight correction)	

Hazard properties

None identified

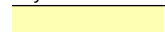
Determinands

Moisture content: 19.2% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				9.2 mg/kg	1.32	10.19 mg/kg	0.00102 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		beryllium { beryllium oxide }				1.8 mg/kg	2.775	4.191 mg/kg	0.000419 %	✓		
		004-003-00-8	215-133-1	1304-56-9								
3		boron { diboron trioxide; boric oxide }				0.8 mg/kg	3.22	2.161 mg/kg	0.000216 %	✓		
		005-008-00-8	215-125-8	1303-86-2								
4		cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD	
		048-002-00-0	215-146-2	1306-19-0								
5		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				47.3 mg/kg	1.462	57.996 mg/kg	0.0058 %	✓		
			215-160-9	1308-38-9								
6		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD	
		024-017-00-8										
7		copper { dicopper oxide; copper (I) oxide }				23 mg/kg	1.126	21.724 mg/kg	0.00217 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
8		lead { lead chromate }			1	12 mg/kg	1.56	15.703 mg/kg	0.00101 %	✓		
		082-004-00-2	231-846-0	7758-97-6								
9		mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
10		nickel { nickel chromate }				31.7 mg/kg	2.976	79.151 mg/kg	0.00792 %	✓		
		028-035-00-7	238-766-5	14721-18-7								
11		selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		028-031-00-5	239-125-2	15060-62-5								
12		zinc { zinc chromate }				51 mg/kg	2.774	118.693 mg/kg	0.0119 %	✓		
		024-007-00-3	236-878-9	13530-65-9								
13		TPH (C6 to C40) petroleum group				<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD	
				TPH								
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		603-181-00-X	216-653-1	1634-04-4								
15		benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		601-020-00-8	200-753-7	71-43-2								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
	006-007-00-5									
20	pH				8.43 pH		8.43 pH	8.43 pH		
			PH							
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		204-371-1	120-12-7							
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-893-2	193-39-5							
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		205-883-8	191-24-2							
37	phenol				<0.15 mg/kg		<0.15 mg/kg	<0.000015 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
38	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0361 %		

 Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: DS01


Non Hazardous Waste
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:	
DS01	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.50 m		
Moisture content:		
19.3%		
(dry weight correction)		

Hazard properties

None identified

Determinands

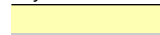
Moisture content: 19.3% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				9.7 mg/kg	1.32	10.735 mg/kg	0.00107 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				2 mg/kg	2.775	4.653 mg/kg	0.000465 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide; boric oxide }				0.4 mg/kg	3.22	1.08 mg/kg	0.000108 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				46 mg/kg	1.462	56.355 mg/kg	0.00564 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				22 mg/kg	1.126	20.762 mg/kg	0.00208 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead chromate }			1	9 mg/kg	1.56	11.767 mg/kg	0.000754 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
9	mercury { mercury dichloride }				0.2 mg/kg	1.353	0.227 mg/kg	0.0000227 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel chromate }				43.7 mg/kg	2.976	109.022 mg/kg	0.0109 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc chromate }				53 mg/kg	2.774	123.244 mg/kg	0.0123 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				7.64 pH		7.64 pH	7.64 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.15 mg/kg		<0.15 mg/kg	<0.000015 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3								
39	tetrachloroethylene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-028-00-4	204-825-9	127-18-4								
40	carbon tetrachloride; tetrachloromethane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %			<LOD
	602-008-00-5	200-262-8	56-23-5								
41	trichloroethylene; trichloroethene				0.008 mg/kg		0.0067 mg/kg	0.000000671 %	✓		
	602-027-00-9	201-167-4	79-01-6								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
42	vinyl chloride; chloroethylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
Total:								0.0391 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: DS02

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:
DS02	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
2.10 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
22.4%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 22.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				2.4 mg/kg	1.32	2.589 mg/kg	0.000259 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				<0.5 mg/kg	2.775	<1.388 mg/kg	<0.000139 %		<LOD
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide; boric oxide }				0.2 mg/kg	3.22	0.526 mg/kg	0.0000526 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				28.8 mg/kg	1.462	34.39 mg/kg	0.00344 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				4 mg/kg	1.126	3.679 mg/kg	0.000368 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead chromate }			1	<5 mg/kg	1.56	<7.799 mg/kg	<0.0005 %		<LOD
	082-004-00-2	231-846-0	7758-97-6							
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel chromate }				11.1 mg/kg	2.976	26.991 mg/kg	0.0027 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc chromate }				16 mg/kg	2.774	36.263 mg/kg	0.00363 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				6.89 pH		6.89 pH	6.89 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.15 mg/kg		<0.15 mg/kg	<0.000015 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
Total:									0.0168 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: DS03

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:
DS03	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.20 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
19.8%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 19.8% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				4.8 mg/kg	1.32	5.29 mg/kg	0.000529 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.7 mg/kg	2.775	1.622 mg/kg	0.000162 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide; boric oxide }				0.1 mg/kg	3.22	0.269 mg/kg	0.0000269 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				40 mg/kg	1.462	48.8 mg/kg	0.00488 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				7 mg/kg	1.126	6.579 mg/kg	0.000658 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead chromate }			1	6 mg/kg	1.56	7.812 mg/kg	0.000501 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
9	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel chromate }				12 mg/kg	2.976	29.812 mg/kg	0.00298 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
11	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc chromate }				29 mg/kg	2.774	67.154 mg/kg	0.00672 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH		PH		8.31 pH		8.31 pH	8.31 pH			
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.15 mg/kg		<0.15 mg/kg	<0.000015 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3								
39	tetrachloroethylene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-028-00-4	204-825-9	127-18-4								
40	carbon tetrachloride; tetrachloromethane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %			<LOD
	602-008-00-5	200-262-8	56-23-5								
41	trichloroethylene; trichloroethene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-027-00-9	201-167-4	79-01-6								

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
42		vinyl chloride; chloroethylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		602-023-00-7	200-831-0	75-01-4							
43	●	polychlorobiphenyls; PCB				<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3							
Total:									0.0222 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: DS04


Non Hazardous Waste
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:
DS04	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1.00 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
23.8%	
(dry weight correction)	

Hazard properties

None identified

Determinands

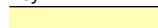
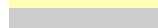
Moisture content: 23.8% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				11.7 mg/kg	1.32	12.478 mg/kg	0.00125 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				2 mg/kg	2.775	4.484 mg/kg	0.000448 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide; boric oxide }				0.7 mg/kg	3.22	1.821 mg/kg	0.000182 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				49.5 mg/kg	1.462	58.439 mg/kg	0.00584 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				26 mg/kg	1.126	23.645 mg/kg	0.00236 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead chromate }			1	13 mg/kg	1.56	16.379 mg/kg	0.00105 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
9	mercury { mercury dichloride }				0.1 mg/kg	1.353	0.109 mg/kg	0.0000109 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel chromate }				40.1 mg/kg	2.976	96.404 mg/kg	0.00964 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.063 mg/kg	0.000206 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc chromate }				72 mg/kg	2.774	161.34 mg/kg	0.0161 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				7.84 pH		7.84 pH	7.84 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.15 mg/kg		<0.15 mg/kg	<0.000015 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
38	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3								
39	tetrachloroethylene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-028-00-4	204-825-9	127-18-4								
40	carbon tetrachloride; tetrachloromethane				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %			<LOD
	602-008-00-5	200-262-8	56-23-5								
41	trichloroethylene; trichloroethene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
	602-027-00-9	201-167-4	79-01-6								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
42	vinyl chloride; chloroethylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
Total:								0.0426 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: DS05

 **Non Hazardous Waste**
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:	
DS05	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.60 m		
Moisture content:		
19.4%		
(dry weight correction)		

Hazard properties

None identified

Determinands

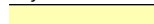
Moisture content: 19.4% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				3.5 mg/kg	1.32	3.87 mg/kg	0.000387 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		beryllium { beryllium oxide }				<0.5 mg/kg	2.775	<1.388 mg/kg	<0.000139 %		<LOD	
		004-003-00-8	215-133-1	1304-56-9								
3		boron { diboron trioxide; boric oxide }				0.5 mg/kg	3.22	1.348 mg/kg	0.000135 %	✓		
		005-008-00-8	215-125-8	1303-86-2								
4		cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD	
		048-002-00-0	215-146-2	1306-19-0								
5		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				36 mg/kg	1.462	44.067 mg/kg	0.00441 %	✓		
			215-160-9	1308-38-9								
6		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD	
		024-017-00-8										
7		copper { dicopper oxide; copper (I) oxide }				7 mg/kg	1.126	6.601 mg/kg	0.00066 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
8		lead { lead chromate }			1	6 mg/kg	1.56	7.838 mg/kg	0.000503 %	✓		
		082-004-00-2	231-846-0	7758-97-6								
9		mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
10		nickel { nickel chromate }				7.7 mg/kg	2.976	19.194 mg/kg	0.00192 %	✓		
		028-035-00-7	238-766-5	14721-18-7								
11		selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		028-031-00-5	239-125-2	15060-62-5								
12		zinc { zinc chromate }				15 mg/kg	2.774	34.851 mg/kg	0.00349 %	✓		
		024-007-00-3	236-878-9	13530-65-9								
13		TPH (C6 to C40) petroleum group				<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD	
				TPH								
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD	
		603-181-00-X	216-653-1	1634-04-4								
15		benzene				<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD	
		601-020-00-8	200-753-7	71-43-2								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	toluene 601-021-00-3	203-625-9	108-88-3		0.007 mg/kg		0.0058 mg/kg	0.000000586 %	✓	
17	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
18	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
20	pH		PH		7.85 pH		7.85 pH	7.85 pH		
21	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
22	acenaphthylene 205-917-1		208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
23	acenaphthene 201-469-6		83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
24	fluorene 201-695-5		86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
25	phenanthrene 201-581-5		85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
26	anthracene 204-371-1		120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
27	fluoranthene 205-912-4		206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	pyrene 204-927-3		129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
29	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
30	chrysene 601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
31	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
32	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
33	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	indeno[123-cd]pyrene 205-893-2		193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	benzo[ghi]perylene 205-883-8		191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
37	phenol 604-001-00-2	203-632-7	108-95-2		<0.15 mg/kg		<0.15 mg/kg	<0.000015 %		<LOD
38	1,1-dichloroethane and 1,2-dichloroethane (combined) 203-458-1, 200-863-5		107-06-2, 75-34-3		<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
39	tetrachloroethylene 602-028-00-4	204-825-9	127-18-4		<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
40	carbon tetrachloride; tetrachloromethane 602-008-00-5	200-262-8	56-23-5		<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
41	trichloroethylene; trichloroethene 602-027-00-9	201-167-4	79-01-6		<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
42		vinyl chloride; chloroethylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		602-023-00-7	200-831-0	75-01-4							
Total:									0.0174 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Relatively low concentrations present and no evidence of free phase product in samples

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene: (conc.: 5.86e-07%)

Classification of sample: CP04


Non Hazardous Waste
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:	
CP04	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.63-0.85 m		
Moisture content:		
19.9%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 19.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				4.4 mg/kg	1.32	4.845 mg/kg	0.000485 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	beryllium { beryllium oxide }				0.8 mg/kg	2.775	1.852 mg/kg	0.000185 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
3	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.611 mg/kg	0.000161 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
4	cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				22.4 mg/kg	1.462	27.305 mg/kg	0.00273 %	✓	
		215-160-9	1308-38-9							
6	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
	024-017-00-8									
7	copper { dicopper oxide; copper (I) oxide }				10 mg/kg	1.126	9.39 mg/kg	0.000939 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead chromate }			1	10 mg/kg	1.56	13.009 mg/kg	0.000834 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
9	mercury { mercury dichloride }				0.1 mg/kg	1.353	0.113 mg/kg	0.0000113 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel chromate }				14.3 mg/kg	2.976	35.497 mg/kg	0.00355 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
11	selenium { nickel selenate }				1 mg/kg	2.554	2.13 mg/kg	0.000213 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
12	zinc { zinc chromate }				25 mg/kg	2.774	57.843 mg/kg	0.00578 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
13	TPH (C6 to C40) petroleum group		TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
15	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				7.18 pH		7.18 pH	7.18 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.15 mg/kg		<0.15 mg/kg	<0.000015 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
Total:									0.0203 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: CP05


Non Hazardous Waste
 Classified as **17 05 04**
 in the List of Waste

Sample details

Sample name:	LoW Code:	
CP05	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.00 m		
Moisture content:		
27.5%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 27.5% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1		arsenic { arsenic trioxide }				12.1 mg/kg	1.32	12.53 mg/kg	0.00125 %	✓	
		033-003-00-0	215-481-4	1327-53-3							
2		beryllium { beryllium oxide }				1.3 mg/kg	2.775	2.83 mg/kg	0.000283 %	✓	
		004-003-00-8	215-133-1	1304-56-9							
3		boron { diboron trioxide; boric oxide }				1 mg/kg	3.22	2.525 mg/kg	0.000253 %	✓	
		005-008-00-8	215-125-8	1303-86-2							
4		cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
		048-002-00-0	215-146-2	1306-19-0							
5		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				49.3 mg/kg	1.462	56.513 mg/kg	0.00565 %	✓	
			215-160-9	1308-38-9							
6		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
		024-017-00-8									
7		copper { dicopper oxide; copper (I) oxide }				17 mg/kg	1.126	15.012 mg/kg	0.0015 %	✓	
		029-002-00-X	215-270-7	1317-39-1							
8		lead { lead chromate }			1	21 mg/kg	1.56	25.691 mg/kg	0.00165 %	✓	
		082-004-00-2	231-846-0	7758-97-6							
9		mercury { mercury dichloride }				0.2 mg/kg	1.353	0.212 mg/kg	0.0000212 %	✓	
		080-010-00-X	231-299-8	7487-94-7							
10		nickel { nickel chromate }				28.3 mg/kg	2.976	66.061 mg/kg	0.00661 %	✓	
		028-035-00-7	238-766-5	14721-18-7							
11		selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
		028-031-00-5	239-125-2	15060-62-5							
12		zinc { zinc chromate }				49 mg/kg	2.774	106.614 mg/kg	0.0107 %	✓	
		024-007-00-3	236-878-9	13530-65-9							
13		TPH (C6 to C40) petroleum group				<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
				TPH							
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4							
15		benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
20	pH				7.69 pH		7.69 pH	7.69 pH			
			PH								
21	naphthalene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		205-912-4	206-44-0								
28	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
		205-883-8	191-24-2								
37	phenol				<0.15 mg/kg		<0.15 mg/kg	<0.000015 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
Total:									0.0336 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

■ chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

■ ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

GB MCL index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ pH (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

■ acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

■ fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

■ anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
 Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
 Data source date: 21 Aug 2015
 Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
 Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
 Data source date: 21 Aug 2015
 Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
 Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
 Data source date: 06 Aug 2015
 Hazard Statements: Carc. 2; H351

▪ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
 Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
 Data source date: 23 Jul 2015
 Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

GB MCL index number: 602-039-00-4
 Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans;

POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

▪ **1,1-dichloroethane and 1,2-dichloroethane (combined)** (EC Number: 203-458-1, 200-863-5, CAS Number: 107-06-2, 75-34-3)

Description/Comments: Combines the hazard statements and risk phrases for 1,1-dichloroethane and 1,2-dichloroethane
 Data source: N/a
 Data source date: 14 Oct 2016
 Hazard Statements: Flam. Liq. 2; H225 , Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 1B; H350 , Aquatic Chronic 3; H412

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**
 HazWasteOnline Classification Engine Version: 2023.110.5568.10273 (20 Apr 2023)
 HazWasteOnline Database: 2023.108.5567.10271 (18 Apr 2023)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

APPENDIX H – CIRIA C552 RISK METHODOLOGY

The following tables are derived from CIRIA C552 and have been used to define the risk rating presented in the Qualitative Risk Assessment matrix.

Classification of consequence

Classification	Definition
Severe	Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution (note; Water Resources Act contains no scope for considering significant pollution) of sensitive water resource. Catastrophic damage to building/property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem. (Note the definitions of ecological systems within the Draft Circular on Contaminated Land DETR, 2000).
Medium	Chronic damage to human health ('significant harm', as defined In DETR, 2000). Pollution of sensitive water resources (note; Water Resources Act contains no scope for considering significant pollution). A significant change in a particular ecosystem, or an organism forming part of such an ecosystem. (Note the definitions of ecological systems within the Draft Circular on Contaminated Land DETR, 2000).
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm', as defined In DETR, 2000). Damage to sensitive buildings/structures/services or the environment.
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.

Classification of probability

Classification	Definition
High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period that such an event would take place and is even less likely in the shorter term.
Unlikely	There is a pollution linkage, but circumstances are such that it is improbable that an event would occur even in the very long term.

Matrix of consequence against probability to gain a risk classification

		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	Very Low Risk