Manchester Airport Group

784-B038962

Argosy Drive Development Phase 1, Manchester Airport

Ground Investigation Report



TETRA TECH

Version 2

February 2023



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Ground Investigation Report

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EXECUTIVE SUMMARY

The Site	The site is located off Argosy Drive at Manchester Airport, Manchester, M90 5TE and is split up into two separate phases of development (Phase 1 & 2). Phase 1 is the focus of this report and has an area of approximately 1.25 hectares. The site currently comprises an existing car park and demolished hotel building with Argosy Drive immediately to the north of this. Grassed areas form the southern boundary of the site.
Ground Investigation	The Ground Investigation comprised: • Three window sample boreholes to a maximum depth of 4.80m bgl. • Three cable percussive boreholes to a maximum depth of 6.30m bgl. • Four gas and groundwater monitoring visits in July and August 2022.
Ground Conditions	• Made Ground was encountered across site and comprised asphalt or topsoil over gravelly Sand or reworked sandy gravelly Clay up to 1.70m bgl. • Superficial glacial deposits were recorded to comprise firm to stiff sandy gravelly Clay up to a maximum depth of 6.00m bgl. • Bedrock strata (Mudstone) was encountered in BH01, BH02 and BH03 at depths of between 4.00m bgl and 6.00m bgl.
Geotechnical Assessment	It is recommended that ground improvement or a piled foundation solution are brought forward for the development. Ground bearing floor slabs may be adopted in conjunction with ground improvement works and rigorous sub-grade preparation. A suspended floor slab may be adopted in conjunction with piled caps and groundbeams. The cohesive strata is considered to be of medium volume change potential and would have to be factored into foundation and floor slab design. In accordance with the guidance of BRE SD1: 2005, design classifications of DS-1 and AC-1s for buried concrete in both the Made Ground and the natural soils. Based upon the derived E values, the Made Ground soils would not require improvement to support pavement foundations, but the natural Clay deposits would require ground improvement works. However, these conclusions are based on a very limited data set. Groundwater control measures are likely to be needed during construction to maintain dry conditions.
Contamination Screening	Environmental laboratory testing indicates that: • No contaminants of concern exceeded the general acceptance criteria. • Elevated pH was reported in shallow soils in BH02, likely due to the presence of limestone gravels.
Preliminary Ground Gas Assessment	The results of the ground gas monitoring indicate slightly elevated CO_2 levels in WS01 (6.0% v/v) and CO levels in BH03 (10ppm). The site classification is CS1 which indicates that no special precautions are required with respect to ground gas. Consideration of CO2 concentrations exceeding 5% has been given and because there is no significant Made Ground present, there are no known landfills within 250m of the site and the ground is generally low in organic content, it is considered that CS1 is the appropriate classification.
Refined Risk Assessment	The risk posed by on-site sources of contamination is considered to be low to all receptors.

Conclusions & Recommendations	The following additional works are recommended: • Sampling of topsoil across Phase 1 and 2 areas to determine re-use potential on future development; • Waste Acceptance Criteria testing on soils if expected to be disposed of off-site; • A watching brief for unexpected gross contamination during construction works; and, • Preparation and submission of a Risk Assessment for proposed water supply pipelines to United Utilities to determine if upgraded water supply pipelines are required. • Further CBR testing of soils to support pavement design; • Rotary Coring of bedrock design to inform a piled solution, if adopted.

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DRAWINGS

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B038962-TTE-00-XX-DR-U-0002-01 (Exploratory Hole Location Plan on Existing Layout)

B038962-TTE-00-XX-DR-U-0003-01 (Exploratory Hole Location Plan on Proposed Layout)

020687-RPS-SI-XX-DR-A-0110 Rev P01 – Proposed Block Plan produced by RPS Group

A0 22A231 Sheets 001 to 007 – Utilities Survey produced by Survey Operations

APPENDICES

APPENDIX A – REPORT CONDITIONS

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ACRONYMS / ABBREVIATIONS

Acronyms/Abbreviations	Definition
AOD	above Ordnance Datum
bgl	below ground level
BGS	British Geological Survey
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
C4SL	Category 4 Screening Levels
CIEH	Chartered Institute of Environmental Health
CLEA	Contaminated Land Exposure Assessment
CoC	Constituent 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)
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
OS	Ordnance Survey
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Poly Chlorinated Biphenyl
PPE	Personal Protective 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 Hydrocarbons
TSV	Tier 1 Screening Values
VOC	Volatile Organic Compounds
VPH	Volatile Petroleum Hydrocarbons

1.0 INTRODUCTION

1.1 INSTRUCTION

Tetra Tech Ltd (Tetra Tech) was commissioned by Manchester Airport Group (the Client) to undertake an intrusive ground investigation at land off Argosy Drive, Manchester Airport, Manchester, M90 5TE, hereafter referred to as “the site”.

The location of the site is shown on Drawing No. B038962-TTE-00-XX-DR-U-0001-01 (Site Location Plan).

1.2 BRIEF & SCOPE OF SERVICES

The brief was to undertake an intrusive Ground Investigation to identify ground conditions and provide a geotechnical and geo-environmental Ground Investigation Report (GIR) to support a planning application and design of the proposed re-development of the site with commercial units and associated car parking.

The development will be split into two phases and this GIR includes the following key elements for Phase 1:

- 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);
- Geotechnical assessment of the investigation data to produce a ground model and derive material parameters for use in foundation design;
- Preliminary waste classification assessment; and,
- Ground aggressivity assessment to provide a design classification for buried concrete.

An executive summary of the report will be provided to allow a rapid, layman’s overview.

1.3 PROPOSED DEVELOPMENT

Following the demolition of existing buildings, the wider subject site is proposed to be developed with three terraces of commercial warehouse units with associated parking, access and landscaping. A proposed development masterplan is shown on Drawing No. 020687-RPS-SI-XX-DR-A-0110 Rev P01 – Proposed Block Plan by RPS Group.

The site is separated into two phases of development (Phase 1 and 2). Phase 1 involves the demolition of an existing hotel building (known as B305) and the construction of one block of portal-framed commercial units, divided into eight premises known as Units 1a – 1h. Phase 1 is the subject of this report.

Phase 2 covers the demolition of existing buildings (B303, B304 & B311) and the erection of commercial buildings Units 2a – 2c & Units 3a – 3d, which will require a ground investigation (following future demolition works) to be reported under separate cover.

The current and proposed site layout plans for each phase of development are shown on Drawing No’s. B038962-TTE-00-XX-DR-U-0002-01 and B038962-TTE-00-XX-DR-U-0003-01, respectively.

A planning application for the development has been made to the local authority, Manchester City Council, under ref. no. 134103/FO/2022.

1.4 GEOTECHNICAL CATEGORY

The Geotechnical Risk Classification for the site is proposed to be Geotechnical Category 2 as defined by BS EN 1997-1: 2004 (and referenced in CD 622 Revision 1).

This encompasses projects which include conventional types of geotechnical structures, earthworks and activities, with no exceptional geotechnical risks, unusual or difficult ground conditions or loading conditions.

1.5 LIMITATIONS

The recommendations and opinions expressed in this report are based on information obtained in previously available reports 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 Manchester Airport Group 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. This report is subject to the conditions presented in Appendix A.

2.0 SUMMARY OF SITE INFORMATION

2.1 LOCATION

Key details for the site are provided in Table 2.1 below. Any information pertinent to the site has been taken from a third-party desk study titled Phase 1 Geo-Environmental and Geotechnical Assessment Report (ref. no.: 60663052-ACM-ArA-XX-RP-G-00001) prepared by AECOM Limited, dated 1 March 2022.

Table 2-1 – Site Address and Size

Item	Detail
Address	Land off Argosy Drive, Manchester Airport, M90 5TE
National Grid Reference	380862, 385150
Area of full proposed development (Phases 1 and 2)	Approximately 2.74 Hectares (Ha)
Area of proposed Phase 1 development	Approximately 1.25 Ha

2.2 SITE DESCRIPTION

Phase 1 currently comprises a surface car park covering the majority of the site boundaries, with a former hotel (building B305) in the south-east corner which has recently been demolished to aid development works. Argosy Drive is located to the north of the former hotel and car park. Soft landscaping runs along the southern boundary of the site and in select areas near the northern boundary.

The surrounding land uses are summarised in Table 2.2 below.

Table 2-2 – Site Surrounds

Item	Detail
North	Commercial properties B303, B304 & B311 (Phase 2 area) with York Drive, Swissport Cargo Services and Manchester Airport beyond.
East	Pinfold Lane with Manchester Airport beyond.
South	Avro Way with commercial properties and Wilmslow Road beyond.
West	Viscount Drive with commercial properties and car parking beyond.

2.3 TOPOGRAPHY

A pre-investigation Ground Penetrating Radar (GPR) survey including topographical survey was completed by Survey Operations in March 2022 which indicates that the site generally falls from south to north from 67m Above Ordnance Datum (AOD) to approximately 65.5m AOD.

2.4 SITE HISTORY

The Desk Study for the site provides a review of historical Ordnance Survey (OS) mapping dating back to 1877. Historical maps indicate the site was occupied by fields used for assumed agricultural purposes until 1987, by which point the site was part of Manchester Airport Cargo Centre with associated commercial buildings, hard standing, car park and access road constructed over the former fields.

2.5 GEOLOGY

Geological information relating to the site has been gathered using the British Geological Survey (BGS) Geology of Britain online map viewer, which utilises the most up to date 1:50,000 scale geological mapping. Lithological descriptions were obtained using the BGS Lexicon of Named Rock Units database. The published BGS 1:50,000 scale map for the area (Sheet No. 98 [Stockport] Drift & Solid Editions dated 1977) has also been consulted.

Made Ground deposits are not recorded by the BGS but are likely to be present on-site due to previous development works in the 1980's.

Superficial deposits are recorded as Till, Devensian – Diamicton from the Quaternary Period.

Bedrock is recorded as Bollin Mudstone Member – Mudstone from the Triassic Period. The BGS Lexicon describes the lithology as "dominantly laminated reddish-brown and greenish-grey mudstone with siltstones" in the upper part of the formation and "a structureless and laminated, dominantly reddish-brown mudstone" in the lower part.

2.6 MINING

The Coal Authority Interactive Map Viewer has been reviewed. The site is not shown to be within a Coal Mining Reporting Area, a Surface Coal Resource Area or a Development High Risk Area.

2.7 SERVICES

Existing underground utilities are present below the proposed development area and will require protection and/or relocation, as appropriate. The location of existing utility runs was identified by a pre-investigation GPR survey. The findings of the survey are presented on Drawing No. A0 22A231 Sheets 001 to 007 Utility Survey by Survey Operations.

2.8 UNEXPLODED ORDNANCE (UXO)

Consultation with the Zetica UXO online mapping service has shown the site to be within a 'Low' UXO risk area.

3.0 TETRA TECH 2022 SITE INVESTIGATION

Tetra Tech undertook a Ground Investigation to investigate potential geo-environmental and geotechnical constraints to development within the Phase 1 development area.

The works were undertaken between 23rd and 28th June 2022. Following the Ground Investigation works, four ground gas and water monitoring events have been undertaken between July and August 2022.

3.1 SCOPE

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 scope of the completed Ground Investigation works is as follows:

- Three dynamic sample boreholes (WS01 – WS03) to a maximum depth of 4.80m bgl with in-situ testing;
- Three cable percussive boreholes (BH01 – BH03) to a maximum depth of 6.30m bgl with in-situ testing;
- Four 50mm dia. ground gas and groundwater monitoring well installations;
- On-site inspection and logging of recovered samples;
- Representative soil sampling for geotechnical laboratory classification testing;
- Representative soil sampling for chemical laboratory analyses; and
- Four return visits to monitor ground gas composition and groundwater levels.

Drawing No. B038962-TTE-00-XX-DR-U-0002 (Exploratory Hole Location Plan on Existing Layout Plan) shows the layout of the exploratory holes advanced during the site investigation in relation to the existing known infrastructure.

4.0 ENCOUNTERED GROUND CONDITIONS

4.1 STRATA ENCOUNTERED

The Ground Investigation works generally describe the sequence of strata encountered beneath site as;

- Hard and soft standing;
- Made Ground;
- Devensian Till; and
- Bollin Mudstone Member (Mudstone).

A summary of each stratum is detailed in the subsequent sections. Exploratory hole logs are described in Appendix B.

4.2 HARD & SOFT STANDINGS

Hard standing comprising asphalt up to 0.20m thickness was encountered in locations WS01, WS02 and BH02. Grassed over topsoil was encountered at WS03, BH01 and BH03 up to 0.20m thick.

4.3 MADE GROUND

Made Ground was encountered across site and was noted as being variable in nature. Underlying the asphalt in WS01, WS02 and BH02 towards the south/south-west of the site, was yellowish brown gravelly Sand up to 1.60m bgl.

Made Ground in WS03 and BH01 comprised of a gravelly Silt over gravelly Clay up to 1.50m bgl. Plastic sheeting was noted at 0.60m bgl in WS03.

Silty sandy gravel was encountered in BH03 up to 1.0m bgl comprising of brick and concrete with a degraded plastic sheet at 0.70m bgl.

4.4 SUPERFICIAL DEPOSITS

Superficial strata were encountered across site and comprised of generally cohesive strata of a firm to stiff sandy slightly gravelly Clay to a maximum depth of 6.0m bgl (BH01).

These strata are representative of Quaternary Glacial Deposits which are recorded as underlying the surrounding area, as depicted by British Geological Survey (BGS) Sheet No. 98 (Stockport) Drift Edition 1:50,000 dated 1977.

4.5 BEDROCK

Weathered bedrock was recovered in BH01, BH02 and BH03 at depths of between 4.0m (BH03) and 6.0m bgl (BH01). It was recovered as reddish brown/grey mudstone.

This is representative of the Bollin Mudstone Member as depicted by British Geological Survey (BGS) Sheet No. 98 (Stockport) Solid Edition 1:50,000 dated 1977.

4.6 FAULTS

BGS mapping indicates that there are no geological faults within close proximity to the site.

4.7 VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

No visual and olfactory evidence of contamination was noted during the ground investigation.

4.8 GROUNDWATER

Groundwater was observed during the Ground Investigation within four exploratory holes (BH02, BH03, WS02 & WS03) from 3.45m bgl in WS03 to 4.45m bgl in WS02.

Groundwater was monitored as part of the gas monitoring works with four visits completed, post-completion of the Ground Investigation. The monitoring results to date are presented in Appendix C and summarised in Table 4.1 below.

Table 4-1 – Groundwater Levels Post Investigation

Location	Base of Borehole (m bgl)	Depth to Water (m bgl)	Notes
WS01	4.50	1.40 - 2.53	-
WS02	4.65	1.96 – 2.54	-
WS03	3.85	1.22 – 2.01	-
BH3	3.85	1.50 - 1.89	-

4.9 OBSTRUCTIONS

No obstructions were encountered in any of the exploratory holes during the investigation.

5.0 LABORATORY TESTING

5.1 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 5.1. The test results are presented in Appendix D.

Table 5-1 – Summary of Environmental Testing

Test Suite	No.
Soil Samples: • **Tetra Tech EPT Suite C** 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 SO_4 (2:1 Extract), Cyanide (Easily liberate able- low level); o Speciated Petroleum Hydrocarbons (TPH CWG); o Speciated Polyaromatic Hydrocarbons (USEPA 16); o BTEX and MTBE; o Asbestos Screen; and, o Phenol.	12

5.2 GEOTECHNICAL TESTING

A programme of laboratory classification testing was carried out on samples taken from the various strata encountered during the site investigation. Geotechnical testing was scheduled by Tetra Tech and carried out by CC Geotechnical (CCG) Ltd. CCG are approved suppliers in accordance with the requirements of Tetra Tech's quality system and UKAS accredited for a range of geotechnical tests.

The test procedures used were generally in accordance with the methods described in BS1377:1990.

The scope of testing is provided in Table 5.2 below.

Laboratory testing is currently ongoing. Upon completion, the full set of test results will be provided on laboratory test certificates to be presented in Appendix E when this GIR is re-issued.

Table 5-2 – Geotechnical Laboratory Testing Scope

Test	No.	Test Method
Moisture Content	11	BS1377:1990 Part 2
Atterberg Limits (Liquid & Plastic Limits)	9	BS1377:1990 Part 2 & 5
Particle Size Distribution (PSD) by Wet Sieve	1	BS1377:1990 Part 2
One Dimensional Consolidation Test	3	BS1377:1990 Part 7
Multi-Stage Undrained Triaxial Test	4	BS1377:1990 Part 7
Soaked California Bearing Ratio (CBR) with 2.5kg rammer	2	BS1377:1990 Part 4

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 which is designed to allow increasingly site-specific assessment. In order to assess the potential risk 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 17) 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 lead[1]. 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 all depths at this stage, though it is noted that these are highly conservative for depths below 1.00m bgl.

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

Assessment of Total Petroleum Hydrocarbons (TPH-CWG) concentrations has been made with reference to the UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils (Science Report P5-080/TR5), Environment Agency, 2005. This calculates the combined toxicological effects of the TPH fractions by calculation of a Hazard Index, which if greater than one may indicate a potential risk to human health.

6.2.2 Proposed End Use

The proposed development on site will consist of new warehouse units. As such the following screening assessment has been undertaken against a Commercial end use scenario.

6.2.3 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%).

The Fraction of Organic Carbon (FOC) of the samples tested with an average value of 0.013. Soil Organic Matter (SOM) is calculated as follows:

SOM (%) = *FOC* × (100/0.58)

The above equation gives SOM of 2.24%. To this end, a conservative SOM of 1.0% has been applied. If required, following the initial screening the SOM will be reviewed in light of applying more site-specific screening criteria.

6.3 TIER 1 – SOIL SCREENING

The samples sent for chemical analysis have been screened against the GACs for commercial land-use and described no elevated values against the criteria. The Total Petroleum Hydrocarbon Hazard Index (TPH HI) is also <1 in all samples.

Slightly elevated pH values (9.5) were reported in shallow soils in BH02. The borehole logs for this location describe the presence of limestone gravels which may be the cause of localised elevation of the pH level.

The laboratory test result certificates are presented in Appendix D.

A summary table of all the chemical test data screened against their respective threshold values is presented in Appendix F.

6.4 ASBESTOS

Asbestos identification screening on 12 No. soil samples across the Phase 1 development site did not detect asbestos or asbestos containing material (ACM) to be present.

7.0 PRELIMINARY GROUND GAS ASSESSMENT

7.1 INTRODUCTION

Following the Ground Investigation works, ground gas monitoring has been completed on four occasions in July and August 2022.

All of the dynamic sample boreholes (WS01 – WS03) and one cable percussive borehole (BH03) were installed with dual purpose ground gas and groundwater monitoring installations, the locations of which are shown on Drawing No's. B038962-TTE-00-XX-DR-U-0002 & B038962-TTE-00-XX-DR-U-0003 (Exploratory Hole Location Plans on Existing and Proposed Layouts).

7.2 GROUND GAS RESULTS

Table 7.1 below summarises ground gas monitoring completed. Full results are presented in Appendix C along with calibration certificates for the GA5000 gas analyser and Mini Rae 3000 photo ionization detector (PID) used for gas and VOC monitoring respectively.

Table 7-1 – Summary of Ground Gas Monitoring Data

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 (Steady) (l/h)
WS01	0.2	6.0	16.4	2	1	0
WS02	0.2	5.9	16.1	1	1	-0.1
WS03	0.2	5.7	15.7	2	1	0
BH03	0.2	1.7	18.0	10	3	0

Note: Results based on steady readings.

Elevated PID recordings were generally not detected. The highest reading was reported in BH03 on 19th July 2022 with a peak reading of 3.3ppm.

7.3 CARBON MONOXIDE AND HYDROGEN SULPHIDE

Maximum concentrations of carbon monoxide (10ppm) were reported in BH03 and the maximum concentration of Hydrogen Sulphide was 3ppm in BH03. The recorded carbon monoxide concentrations do not require additional risk assessment.

7.4 ATMOSPHERIC PRESSURE TRENDS

The monitoring visits completed were undertaken during 2no. rising, 1no. falling and 1no. steady atmospheric conditions.

7.5 PRELIMINARY 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 and NHBC Traffic Light guidance. 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.

Steady State Emission (0.10l/h) Flow Rate

- (6.0% CO_2 / 100) x 0.20 l/hr = 0.012 l/hr CO_2
- (0.2% CH_4 / 100) x 0.20 l/hr = 0.004 l/hr CH_4

Based on two sets of results and the GSV calculated from the worst-case steady gas concentrations and the highest steady state flow rates, the site would fall into a Characteristic Situation 1 (CS1) – Very Low Risk.

CO_2 concentrations are elevated (>5%v/v) and depleted oxygen levels have been observed in WS01. However, no sources of ground gas that may give rise to significant generation rates have been identified eg there is no significant Made Ground present, there are no known landfills within 250m of the site and the ground is generally low in organic content. It is concluded that CS1 is the appropriate classification.

8.0 WASTE CLASSIFICATION

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's technical guidance document WM3 (Environmental Agency, 2018). 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.

8.1 WASTE CHARACTERISATION

Tetra Tech has undertaken a basic waste characterisation of the soils encountered in the investigation using the proprietary web-based tool HazWasteOnline™ (HWO). The software follows Environment Agency guidance and European regulations.

Based on the HWO output, the soils sampled are characterized as Non-Hazardous. The results of the HWO output are provided as Appendix G.

This assessment is based on non-targeted samples i.e. may not be representative of soils to be disposed of during the construction phase of the development. Further testing and waste classification would be required when / if materials identified as requiring removal and disposal are confirmed.

Although the samples tested were classified as non-hazardous, WAC testing and additional testing of site-won material is recommended during the construction phase to determine if excavated materials can be accepted by waste facilities, or if suitable segregation is required. Liaison with landfill operators and waste co-ordinators should include discussions regarding these tests to ensure soils are designated to a suitable disposal facility.

8.2 ASBESTOS

A manual review of the laboratory asbestos data was undertaken which indicated no asbestos was identified within the twelve samples tested from site.

8.3 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 it constitutes waste or not. 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, then a Materials Management Plan (MMP) will be required. Any MMP must be signed off by a Qualified Person as defined in the 'Development Industry Code of Practice' (CL:AIRE, 2011).

9.0 GEOTECHNICAL ASSESSMENT

9.1 INTRODUCTION

This preliminary geotechnical assessment is based on the proposed development of a large new commercial building divided into eight premises, Units 1a – 1h. It is understood that the units are to be portal frame buildings. Structural loadings for the development are not available at the time of writing.

The underlying ground model can be summarised to comprise:

- Made Ground deposits to a maximum depth of 1.70m bgl and a mean depth of 1.00m bgl.
- Glacial Till deposits comprising largely cohesive material with occasional thin granular strata to a maximum depth of 6.00m bgl
- Bollin Mudstone Member proven to a maximum termination depth of 6.30m bgl.

9.2 STANDARD PENETRATION TESTS

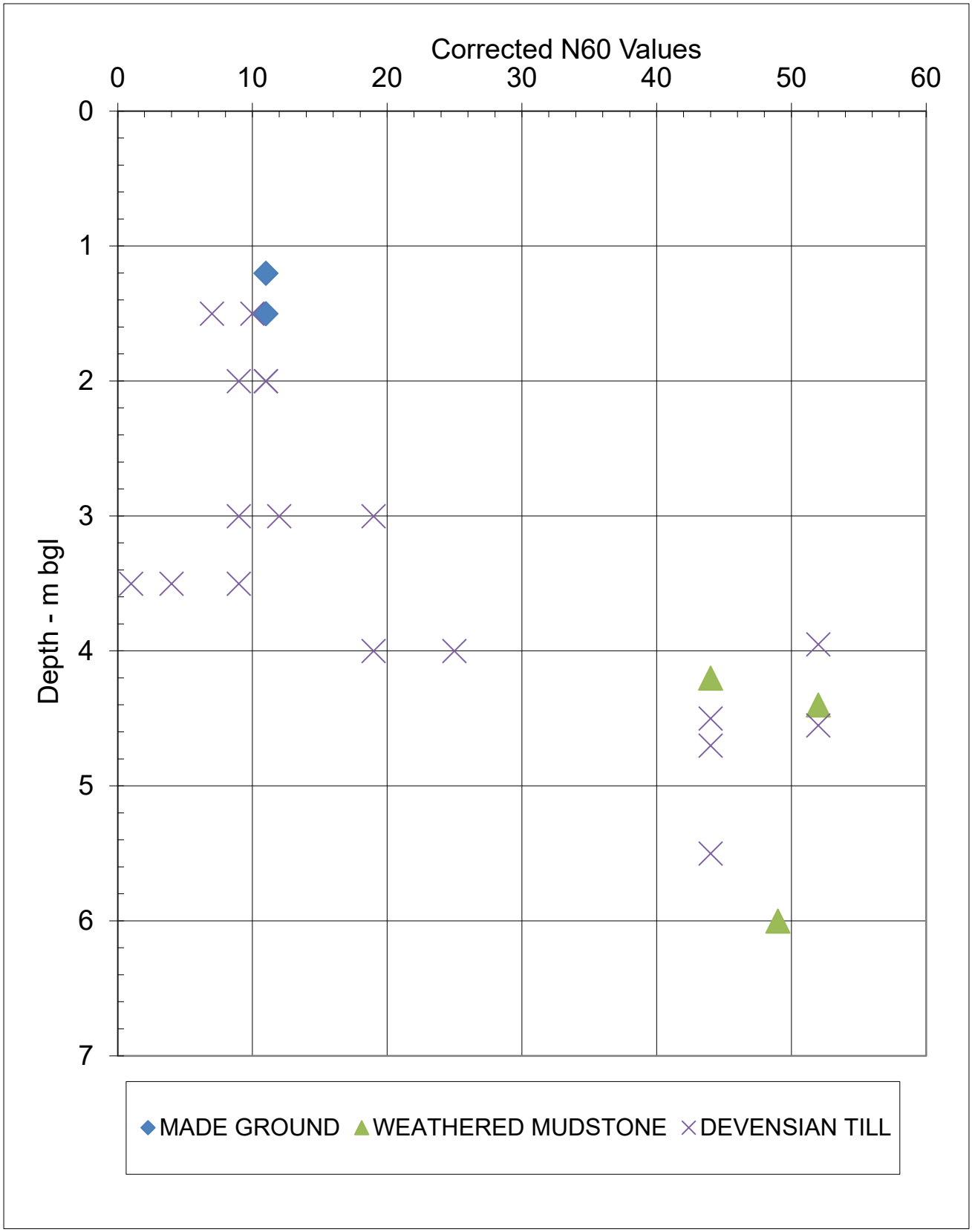
The exploratory holes recorded varied SPT N_{60} values ranging between 1 and 49.

The corrected SPT N_{60} data is provided as a tabulation in Appendix B. Copies of the drilling Contractor's SPT hammer certificates are also included in Appendix B.

A graph of the N_{60} values is presented as Graph 9-1 on the following page.

The graph shows that in-situ soil strength generally increased with depth, excepting two outliers within the Till material at 3.5m bgl.

Graph 9-1 – $N1_{,60}$ SPT over Depth (m bgl)



9.3 CHARACTERISTIC MATERIAL PROPERTIES

Samples retrieved from the ground investigation were submitted to a suite of geotechnical laboratory classification testing. The full set of geotechnical test results is presented on the laboratory certificates in Appendix F.

Laboratory test results are discussed in the following sub-sections for the relevant in-situ soil types. Characteristic geotechnical parameters will be derived for each soil type based on laboratory and in-situ test results, published correlations between test results / material properties, and published values.

Table 9-2 – Summary of Geotechnical Test Results in Made Ground

Parameter	No. of Results	Range (min-max)
Natural Moisture Content (%)	2	3.8 – 19
Liquid Limit (LL %)	1	Non-Plastic
Plastic Limit (PL %)	1	Non-Plastic
Plasticity Index (PI %)	1	Non-Plastic
SPT N_{60} Values	2	11
Lab CBR (2.5kg Rammer)	1	67%
PSD by Wet Sieve	1	71% Gravel, 20% Sand & 9% Fines

One PSD grading and an Atterberg Limits test were undertaken on a layer of Made Ground described as Silt in the field. Testing found that the material was a non-plastic silty sandy Gravel.

Given the small data set available for Made Ground, the variable nature of its composition and the limited thickness present on site (up to a maximum of 1.7m, but generally 1m or less), geotechnical parameters will not be assigned to this unit of the ground model.

The only exception will be use of the CBR test result on granular Made Ground material from BH3 to inform the outline pavement design assessment in Section 9.5 below.

9.3.1 Devensian Till

The Devensian Till largely comprised deposits of Clay with rare thin bands of Sand or Gravel. Geotechnical parameters will not be assigned to the granular deposits due to its limited presence and lack of test data within (a single SPT for WS02 at 3.0m bgl).

Test results undertaken on the cohesive Till deposits are summarised in Table 9-3 below.

Table 9-3 – Summary of Geotechnical Test Results in Cohesive Till

Parameter	No. of Results	Range (min-max)
Natural Moisture Content (%)	9	16 – 32
Liquid Limit (LL %)	8	29 – 43
Plastic Limit (PL %)	8	15 – 20
Plasticity Index (PI %)	8	13 – 26
SPT N_{60} Values	20	1 – 44
Multi-Stage Undrained Triaxial	1	25kPa
One-Dimensional Consolidation (Oedometer)	3	m_v = 0.09 – 0.75m^2/MN

		c_v = 1.2 – 9.4m²/yr
Lab CBR (2.5kg Rammer)	1	2.2%
Bulk Density	5	2.03 – 2.26mg/m³
Dry Density	5	1.68 – 1.92mg/m³

Geotechnical parameters have been derived from the above test data using published correlations and guidance as summarised in Table 9-5 below.

Atterberg Limits testing on 8 No. samples resulted in a mean PI of 18%.

A Triaxial test resulted in an undrained shear strength, c_u of 25kPa (BH02 at 2.5m bgl). Corrected SPT results (N_{60} values) ranged from 1 to 44, with estimated c_u values (N_{60} multiplied by 5) ranging from 5 to 220kPa. The lowest values of N = 1 / Cu = 5 were found in BH02 & BH03 at depths of 3.5m bgl where a soft band of clay was recorded in each borehole however, this is not shown to be present in WS02.

The mean value for Coefficient of Compressibility, mv calculated from all loading stages in each oedometer test is 0.39m²/MN and the median value is 0.33m²/MN. The worst-case result was 0.75 m²/MN. As a conservative measure, a characteristic design value of 0.6m²/MN is proposed.

Bulk and dry density were reported by the laboratory as part of other classification tests (triaxials, oedometers and CBR's). To derive characteristic values, the mean for each density type was taken and the units converted from mg/m³ to kN/m³ (multiplied by 9.81).

The peak angle of internal friction has been cautiously estimated as 30°, based on the empirical relationship with PI outlined in BS 8002:2015. The estimate used the mean PI = 18% and the relationship published by Gibson, 1953.

A conservative estimate for undrained modulus (Eu) of 11MN/m² has been derived based on CIRIA Report 143 The Standard Penetration Test: Methods and Use, 1995 using its suggested calculation Eu = 1.1 x N_{60}. The factor 1.1 was based upon the mean 18% PI and a characteristic N_{60} value of 10 was used (mean N_{60} = 15 and median = 11).

Likewise, a conservative estimated drained modulus (E') of 9MN/m² has been derived based on the aforementioned characteristic values and the suggested calculation of CIRIA 143, E' = 0.9 x N_{60}.

A conservative characteristic estimation of 10^{-7} m/s has been derived for the coefficient of permeability, k, based on Carter and Bowles, 1991 using the material field descriptions. This corresponds to a relative permeability classification of 'low'.

9.3.2 Bollin Mudstone Member

The Bollin Mudstone Member generally comprised grey weathered Mudstone. Test results undertaken on the weathered bedrock material are summarised in Table 8-4 below.

Table 9-4 – Summary of Geotechnical Test Results in Till

Parameter	No. of Results	Range (min-max)
SPT N_{60} Values	3	44 – 49

It should be noted that the uncorrected SPT N values within the Mudstone bedrock all refused, with N values of 50+ obtained. The cable percussion boreholes were terminated due to these SPT refusals.

Geotechnical parameters have been derived from the above test data using published correlations and from published guidance / conservative estimates where SPT results were not applicable.

Based on the bedrock field descriptions, unit weight was estimated using published values for a weathered Shale (Mudstone) from the Handbook of G.I. and Design Tables by Look, 2007.

The uniaxial compressive strength (UCS) of the material has been estimated from published typical values for Shale (Berkman, 2001).

A characteristic peak angle of internal friction, ϕ, 30° has been derived for the competent bedrock on typical values for a Mudstone/Siltstone published by Waltham, 2009.

A conservative characteristic estimation of 10^{-7} m/s has been derived for the coefficient of permeability, k, for the weathered Mudstone based on Carter and Bowles, 1991 using the material field descriptions. This corresponds to a relative permeability classification of 'low'.

9.3.3 Summary of Material Parameters

A summary table of material parameters derived from the foregoing laboratory and in-situ test data is provided below:

Table 9-5 – Summary of Material Parameters

Stratum	Parameter	Characteristic Value	Rationale
Devensian Till (Cohesive)	Dry Weight Density (kN/m^3)	17	Mean result of laboratory test data
	Saturated (Bulk) Weight Density (kN/m^3)	21	Mean result of laboratory test data
	Peak Angle of Internal Friction, ϕ' (°)	30	Conservative estimate based on empirical relationship within BS8002 / Gibson, 1953
	Effective Cohesion, c' (kN/m^2)	0	Cautious estimate
	Coefficient of Compressibility, m_v (m^2/MN)	0.6	Conservative value from lab test results
Devensian Till (Cohesive) North onsite (BH02 and BH03)	Undrained Shear Strength, cu (kPa)	5 (3.5m bgl)	Conservative estimates from lab and in-situ test results
Devensian Till (Cohesive) South onsite		35 (<3.5m bgl) 100 (>3.5m bgl)	Conservative estimates from lab and in-situ test results
	Undrained Modulus, E_u (MN/m^2)	11	Estimate based on empirical relationship with N60 (CIRIA 143, 1995)
	Drained Modulus, E' (MN/m^2)	9	Estimate based on empirical relationship with N60 (CIRIA 143, 1995)

Stratum	Parameter	Characteristic Value	Rationale
	Coefficient of Permeability, k (m/s)	10^{-7}	Conservative estimate based on Carter and Bowles, 1991
Bollin Mudstone Member	Unit Weight (kN/m^3)	21	Cautious estimate from published values by Look, 2007
	Uniaxial Compressive Strength, UCS (MPa)	25	Published value from Berkman, 2001
	Effective Cohesion, c' (kN/m^2)	0	Cautious estimate
	Peak Angle of Internal Friction, ϕ' (°)	30	Published value from Waltham, 2009 for intact Mudstone bedrock
	Coefficient of Permeability, k (m/s)	10^{-7}	Conservative estimate based on Carter and Bowles, 1991

9.4 FOUNDATION AND FLOOR SLAB DISCUSSION

A proposed foundation design is not available at the time of writing.

It is not recommended to adopt spread foundations bearing on the Made Ground soils within the upper 1.7m bgl due to the risk of large total settlement and/or differential settlement.

In-situ and laboratory test results indicate that the natural cohesive Till deposits are of soft to firm consistency with low to medium shear strength values in the upper 3.5m bgl, generally increasing with depth below this. However, very low strength material was recorded at 3.5m bgl in both BH02 and BH03. This material would potentially give rise to differential settlement between traditional spread footings across the proposed building footprint.

The Mudstone bedrock was recorded to lie between 4.0m and 6.0m bgl. Pad footings or trench fill extending to this depth may not be economical and could also be difficult to construct in-situ.

Consideration should therefore be given to ground improvement or deep foundations.

Most of the Till deposits are Clay, some of them very soft and soft, which may mean that ground improvement by vibro stone columns (VSC) is not optimal. A more suitable methodology may be controlled modulus columns (CMC). Consultation with specialist contractors is recommended to confirm the suitability of any ground improvement technique for the observed ground conditions.

Deep foundations e.g. piles would be suitable for adoption within the observed ground conditions. Given the proposed portal frame construction, it is likely that piles would be installed below structural columns and tied into reinforced concrete bases / caps. Various pile types including driven and bored are anticipated to be practical. Continuous flight auger (CFA) piles may not be optimal within the very soft and soft Clay deposits. Piles would likely terminate within the Mudstone bedrock to provide sufficient bearing capacity for the generated structural loadings. Specialist piling contractors should be consulted regarding the preferred pile type for the site. Contractors must provide calculations for their chosen pile type in isolation, and in groups, as appropriate to the pile layout design.

A ground bearing floor slab may be adopted if the in-situ soils are subject to ground improvement and the current surface level Made Ground deposits are replaced by a sub-grade of sufficient thickness engineered fill, placed and compacted to an Engineer's specification.

If a piled foundation solution is brought forward, a suspended floor slab spanning between pile caps and groundbeams is recommended.

Foundations and floor slab designs should account for the minimum depths and void spacings specified by NHBC Standards Chapter 4.2 (2022) for a medium volume change potential site. See the full discussion in Section 9.10 below for details.

9.5 PAVEMENTS

It was originally intended for in-situ DCP testing to be undertaken across the proposed external car park and access road as part of this phase of ground investigation. This was not possible due to access restrictions and permissions, meaning the pavement testing data set is limited to a single in-lab CBR result each for the Made Ground soils and the natural Clay (Till deposits).

The following CBR results were obtained:

- Made Ground CBR = 67%
- Clay (Devensian Till) CBR = 2.2%

The guidance of CD225 Rev.1: Design for New Pavement Foundations states that any sub-grade surface modulus (E) results <30MPa are "unsuitable to support the construction of a pavement foundation".

Equation 2.4 of CD225, E = 17.6 (CBR)^0.64 is used to calculate the design sub-grade surface modulus in MPa. Based on the above in-lab CBR values the following results are calculated:

- Made Ground, E = 260MPa
- Clay (Devensian Till), E = 29MPa

Based upon the derived E values, the Made Ground soils would not require improvement to support pavement foundations, but the natural Clay deposits would require ground improvement works.

However, given the limited data set and the variable nature of Made Ground deposits, it is not advised to use the high 67% / 260MPa results as a characteristic value for pavement design. The 2.2% / 29MPa values may be used in design for the Till deposits, but further testing may find that values >30MPa are more appropriate. It is therefore recommended that in-situ testing (e.g. the proposed DCP's) are undertaken to provide a larger data set and enable the derivation of more robust characteristic CBR values.

9.6 CUTTINGS AND EXCAVATIONS

An earthworks strategy has not been provided at the time of writing. It is anticipated that the proposed development levels will not vary significantly from the current site levels and, therefore, that assessment of embankment slopes or retaining solutions will not be required.

9.7 CHEMICAL ATTACK ON BURIED CONCRETE

Chemical tests undertaken on representative samples of the in-situ soils 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 9-5.

Table 9-5 – Soil Aggressivity Assessment

Strata	No. of results	pH	Characteristic pH	Sulphate (mg/l)	Characteristic Sulphate Value (mg/l)
Made Ground	6	7.41 – 9.50	7.41*	1.5 – 46.8	33**
Natural Ground	6	7.99 – 9.12	7.99*	5.4 – 104.5	83**

*Lowest result

**Mean of the highest two results

Based on the groundwater levels identified in the Ground Investigation and in accordance with the guidance of BRE SD1: 2005, a "mobile" groundwater regime has been assumed for the site. The above results indicate that a design classification of DS-1 and an ACEC class of AC-1 should be adopted for buried concrete in contact with both the Made Ground and natural soils on site.

9.8 DRAINAGE

The undertaking of soil infiltration testing to inform feasibility and design of a sustainable urban drainage system (SUDS) e.g. soakaways was outside the scope of this investigation. However, given the observed deposits of relatively thin Made Ground deposits and the thickness of underlying cohesive Till deposits across the site (up to 6.0m bgl) it is considered that soakaway drainage is unlikely to be effective. A characteristic coefficient of permeability, k = 10^{-7} m/s has been estimated for the Till. Therefore, it is considered that alternative forms of drainage should be utilised for the new development.

9.9 EXCAVATIONS AND GROUNDWATER CONTROL

Obstructions were not encountered within the near surface Made Ground soils, and the underlying natural soils were generally Clay materials. It is therefore considered that excavations are likely practicable with normal construction plant. Excavation sides within the natural soils e.g. Clay will likely be stable, but the overlying granular Made Ground may be loose and require support. Where access to the excavations is required, these should be supported in accordance with CIRIA RR97.

Based on the groundwater levels recorded during the monitoring programme (1.22 to 2.53m bgl) Contractors should make an allowance for pumping operations to maintain dry working conditions during excavations e.g. earthworks, foundation and pavement construction or services installation.

9.10 VOLUME CHANGE POTENTIAL

It is understood that some existing vegetation will be removed, and new planting undertaken, as part of the proposed development. This may affect the water demand at the subject site, which can potentially lead to volume change of the in-situ soils e.g. shrinking or swelling of Clay beneath the development and associated settlement or heave issues.

In accordance with the guidance of NHBC Standards Chapter 4.2 (2022), the results of Atterberg Limits laboratory testing have been used to assess the volume change potential of the in-situ natural Clay. 8 No. tests within this stratum resulted in a Plasticity Index (PI) ranging between 13% and 26%, with a mean PI of 18%.

NHBC guidance states that soils with a PI of 10 – 20% have a 'low' volume change potential and that soils with a PI of 20 – 40% have a 'medium' potential. Given that results exceeding 20% were recorded on site, and the mean value being close to the 20% threshold, it would be prudent to consider all in-situ Clay as being of medium volume change potential.

The NHBC guidance states that a minimum foundation depth of 1.25m is required (within the zone of influence of new trees or shrubs) when building over soils with a medium volume change potential.

The NHBC guidance further recommends the following minimum void dimensions for soils with medium volume change potential:

- 25mm void against side of foundations or ground beams
- 100mm void under suspended cast in-situ concrete ground floor slabs or ground beams
- 250mm void under suspended pre-cast concrete slabs or timber floors

The adoption of heave precautions may also be considered for incorporation into the Engineer's foundation design. Examples of heave protection measures for various foundation types are provided in Table 8 and Figures 4 – 6 of NHBC Standards Chapter 4.2 (2022).

It should be noted that detailed planting plans and aboricultural survey data have not been made available at the time of writing the foregoing discussion. Should this information be made available in future, it would be possible to undertake a full assessment of the draft foundation designs using the relevant tree species' water demands, mature heights and lateral zones of influence.

10.0 GEOTECHNICAL RISK REGISTER

10.1 Geotechnical Risk Assessment

This section presents the preliminary GRR for the scheme as Table 10-1. The risks have been evaluated using the risk evaluation matrix suggested in CD 622 'Managing Geotechnical Risk' which is reproduced as Table 10- 2.

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

Table 10-1 - 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 10-2 – Preliminary Geotechnical Risk Register

Risk ID	Hazard	Consequence	Likelihood	Severity	Risk	Mitigation	Likelihood	Severity	Residual Risk
1	Compressibility of Topsoil / Made Ground deposits at surface	Damage to structures, highways and pavements from: - Unacceptable long-term settlement - Unacceptable differential settlements	4	3	12	- GI has provided factual information for derivation of ground model and suitable geotechnical parameters in revised copy of this GIR. - Design earthworks, highways, pavements and structure foundations for site-specific conditions.	2	3	6
2	Possible underground voids and untreated mine entries from historic coal mining.	- Catastrophic collapse of new highway, pavement, or structures. - Localised settlement of highway, pavement, or structures.	2	5	10	- The site is not within a coal mining reporting area.	1	5	5
3	Possible shallow/perched groundwater	- Instability of excavations - Reduced bearing capacity.	3	4	12	- Groundwater monitoring has so far found groundwater levels ranging from 1.6 to 2.5m bgl. Programme of monitoring will continue. - Design temporary works/excavations and earthworks and structures foundations for site-specific groundwater regime.	2	4	8
4	Increased groundwater/ surface water level/porewater pressures during flooding events.	- Foundation ULS failure - Scour of structure foundations	4	5	20	- Flood water risk assessment to be undertaken (outside scope of this GIR). - Foundation and embankment design to account for site-specific groundwater regime and seasonal variations (and scour potential if required).	1	5	5
5	Unknown composition and strength of Devensian Till deposits	ULS failure of retaining structure foundations that may bear on Till stratum	4	4	16	- GI has provided factual information for derivation of ground model and suitable Devensian Till geotechnical parameters e.g. SPT's and laboratory classification tests. - Design structure foundations for site-specific conditions.	2	4	8
6	Possible weak bedrock (Bollin Mudstone Member)	ULS failure of retaining structure foundations that may bear on bedrock	4	4	16	- GI has provided factual information for derivation of ground model and suitable bedrock geotechnical parameters e.g. SPT's - Design structure foundations for site-specific conditions.	2	4	8
7	Possible strong bedrock (Bollin Mudstone Member)	Difficulty in excavation resulting in delays, the possibility of additional heavy plant requirements and additional costs	3	3	9	- Revised copy of this GIR to include assessment of in-situ test data and/or published values	2	3	6

Risk ID	Hazard	Consequence	Likelihood	Severity	Risk	Mitigation	Likelihood	Severity	Residual Risk
8	Soil and groundwater contamination including Asbestos	- Health risk to site workers - Cut materials may not be suitable for re-use as fill.	3	4	12	- Samples screened as part of this GIR did not identify any Asbestos fibres in soil or ACM - Specify watching brief for contamination during construction phase e.g. earthworks and foundation construction.	1	4	4
9	Unexploded Ordnance (UXO)	Death/injury to site workers	2	4	8	- Zetica UXO mapping confirms the area as 'Low' risk, therefore not requiring any mitigation during construction works.	1	4	4
10	Insufficient pavement design for new car parks and access roads	Structural failure and potential injury to road users	3	4	12	- GI has provided factual information for derivation of ground model and suitable geotechnical parameters. - Design pavement for site-specific conditions. - Carry out in-situ testing on completed sub-grade to verify performance criteria have been achieved.	1	4	4

11.0 CONCEPTUAL SITE MODEL AND REFINED GROUND CONTAMINATION RISK ASSESSMENT

11.1 OVERVIEW

The information presented in the previous sections of this report have been collated and evaluated to establish a refined qualitative risk assessment for the site.

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.

11.2 CURRENT SITE USAGE AND PROPOSED DEVELOPMENT

The site currently comprises of a carpark adjacent to a demolished hotel building. Argosy Drive is to the north. The site is to be redeveloped with warehouse units with associated parking, access and landscaping following demolition of existing buildings. A proposed development plan is shown on Drawing No. 020687-RPS-SI-XX-DR-A-0110 Rev P01 – Proposed Block Plan produced by RPS Group, dated 15/02/2022.

11.3 CONCEPTUAL SITE MODEL

The key source, pathways and receptor model is outlined below within the context of potential development of the site. The following risk assessment is undertaken in the context of a commercial end use scenario.

11.3.1 Potential Sources of Contamination

The main sources of contamination on the site are associated with existing features as well as historical land uses on the site as summarised below.

Onsite Sources

- Potential residual contamination including asbestos presence in soils in areas not investigated.
- Potential small-scale leakages from vehicles either using roads or parked.
- Potential for elevated Ground Gas (elevated CO_2 in WS01 and CO in BH03).

Off Site Sources

Off-site sources of contamination including ground gas are likely to be similar to those within the realms of the site or at sufficient distance from the site and have therefore not been considered further.

11.3.2 Potential Contaminant Pathways

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

Human Exposure Pathways

- Direct dermal contact or ingestion of soils,
- 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;
- Vertical migration of ground gases into proposed buildings.

11.3.3 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)

Wider Environment

- Secondary Undifferentiated Aquifer within superficial deposits.
- Secondary B Aquifer within the bedrock.
- Building Infrastructure and supply pipes.

Surface waters have not been considered further in the risk assessment as the closest surface water receptor to the site is Timperley Brook which is located c. 250m east.

11.4 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.

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 Appendix H.

Table 11-1 – CIRIA C552 Qualitative Risk Assessment

Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Justification & Potential Risk Management (if required)
Ground Conditions – Residual contamination including asbestos in areas not investigated	Dermal contact, ingestion and/or inhalation of or dusts	Human Health – Future site users (Commercial)	Medium	Unlikely	Low	The samples tested did not identify any raised concentrations above the GAC. Furthermore, based on the proposed development and through the use of hardstanding, the source pathway receptor linkage is broken.
		Human Health (Construction and Maintenance Workers with PPE)				The samples tested did not identify any raised concentrations above the GAC. The risk rating is based on the use of Personal Protective Equipment (PPE) and appropriate working procedures. Should unforeseen quantities of contaminants be identified a specialist should be contacted.
	Leaching to groundwater, drainage and lateral / vertical migration.	Adjacent properties and land users	Medium	Unlikely	Low	The soil samples tested did not identify any raised concentrations above the GAC. There are no surface water features within close proximity to the site and the bedrock aquifer is of low sensitivity. Furthermore, the low permeability of cohesive layers within the superficial deposits, will limit the vertical and lateral migration pathways for potential contaminants. Should unforeseen quantities of contaminants be identified a specialist should be contacted.
		Secondary Undifferentiated Aquifer				
		Secondary B Aquifer				
	Migration along/into service ducts and pipework	Buildings and Services	Medium	Unlikely	Low	No elevated TPH-CWG in the soils were identified however, testing of the soil in the locations of proposed service supply lines should be undertaken in accordance with UKWIR and United Utilities guidance.
Ground Gas associated with Made Ground.	Generation and migration / accumulation of ground gases	Human Health – Future site users (Residential)	Severe (Explosion & Asphyxiation)	Unlikely	Low	Based on gas monitoring, slightly elevated CO2 levels at WS01 and CO in BH03 have been reported. No significant gas flow rates are observed and the site is classified as CS1.
		Buildings and Services	Severe (Explosion)	Unlikely	Low	

12.0 CONCLUSIONS AND RECOMMENDATIONS

12.1 CONCLUSIONS

12.1.1 Contamination Summary

The risk posed to the development from on-site sources of contamination is considered to be **Low** for all given receptors.

It is considered that any risk from potential residual contamination at the site during construction works can be managed through the use of appropriate PPE and good site practices. If asbestos containing materials are encountered, then an asbestos specialist should be contacted.

Based on a review of the site historical uses and TPH-CWG soil data, it is not anticipated that upgraded water supply pipework will be required as part of the development. However, this investigation may not be representative of proposed supply routes as they are not known at the time of investigation. A review of proposed water pipe route, depths of pipes in relation to Made Ground and proposed backfill to separate pipes from surrounding soils should be undertaken and included in a Risk Assessment to be submitted to, and agreed with, United Utilities.

12.1.2 Ground Gas

Based on the results of the monitoring rounds completed by Tetra Tech in July and August 2022, it is believed that there is a **Low** risk of ground gas ingress to future development.

12.1.3 Geotechnical

It is recommended that ground improvement or a piled foundation solution are brought forward for the development. The minimum foundation depths recommended for a 'medium' volume change potential site by NHBC Standards Chapter 4.2 (2022) should be incorporated into the foundation design.

Ground bearing floor slabs may be adopted in conjunction with ground improvement works and rigorous sub-grade preparation. A suspended floor slab may be adopted in conjunction with piled caps and groundbeams. The minimum void depths recommended for a 'medium' volume change potential site by NHBC Standards Chapter 4.2 (2022) should be incorporated into the floor slab design.

In accordance with the guidance of BRE SD1: 2005, assessment of soil chemical data has resulted in design classifications of DS-1 and AC-1s for buried concrete in both the Made Ground and the natural soils.

Based upon the derived E values, the Made Ground soils would not require improvement to support pavement foundations, but the natural Clay deposits would require ground improvement works. However, these conclusions are based on a very limited data set and additional testing is recommended to confirm pavement CBR design values.

The adoption of a SUDS system for drainage is not considered practicable.

Groundwater control measures are likely to be needed during construction to maintain dry conditions.

12.2 RECOMMENDATIONS

It is recommended that the following works be carried out to enable development at the site:

- Sampling of topsoil across the Phase 1 and Phase 2 areas to determine re-use potential in landscaping of future development – this will be addressed when undertaking ground investigation works in the Phase 2 area;

- Carry out Waste Acceptance Criteria testing on materials if expected to be taken off-site for disposal;
- Preparation and submission of a Risk Assessment for proposed water supply pipelines to United Utilities to determine if upgraded water supply pipelines are required;
- A watching brief for unexpected gross contamination during construction works specifically visual and olfactory evidence of free phase hydrocarbons and evidence of odours.
- Undertake, additional CBR testing of soils to inform pavement design.
- If piles are to be utilised rotary cored boreholes with appropriate geotechnical testing to inform pile design should be undertaken.

DRAWINGS

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Notes

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3. This drawing should be read in conjunction with all other relevant drawings and specifications.

SCHEDULE OF ACCOMMODATION

Unit 1 (GIA)		m²	sq ft
Unit 1a	:	935	10,064
Unit 1b	:	623	6,705
Unit 1c	:	748	8,051
Unit 1d	:	935	10,064
Unit 1e	:	685	7,373
Unit 1f	:	623	6,705
Unit 1g	:	561	6,038
Unit 1h	:	873	9,395
Unit 1 Total	**:**	**5,983**	**64,395**

All areas include 15% offices at 1st floor

Level Access	:	8
HGV Parking	:	9 (inc.8 Loading)
Car Parking	:	53 (inc 8 Accessible and 3 EV)
Haunch Height	:	8 and 9m

Unit 2 (GIA)		m²	sq ft
Unit 2a	:	1,270	13,670
Unit 2b	:	1,129	12,152
Unit 2c	:	1,411	15,188
Unit 2 Total	**:**	**3,811**	**41,010**

All areas include 15% offices at 1st floor

Level Access	:	6
HGV Parking	:	7 (inc. 6 Loading)
Car Parking	:	38 (inc 3 Accessible and 2 EV)
Haunch Height	:	10m

Unit 3 (GIA)		m²	sq ft
Unit 3a	:	1,129	12,152
Unit 3b	:	847	9,117
Unit 3c	:	847	9,117
Unit 3d	:	1,129	12,152
Unit 3 Total	**:**	**3,952**	**42,538**

All areas include 15% offices at 1st floor

Level Access	:	6
HGV Parking	:	6 (inc.3 Loading)
Car Parking	:	46 (inc 4 Accessible and 2 EV)
Haunch Height	:	10m

Total GIA	**:**	**13,746**	**147,943**
Indicative Site Area	:	2.716Ha	(6.71 acres)
Indicative Site Density	:	50.61% GIA	

Key

Overall Site 6.021Ha 14.88acres

Rev	Description	By	Ckd	Date
P01	First Issue	LL	MJH	14/04/22

RPS MAKING COMPLEX EASY
Sherwood House, Sherwood Avenue,
Newark, Nottinghamshire, NG24 1QQ
T: 01636 605 700 E: rpsnewark@rpsgroup.com

Client: COLUMBIA THREADNEEDLE INVESTMENTS

Project: MAG - Argosy Drive, Manchester Airport

Title: Proposed Block Plan

RPS Project Number	Scale @ A1	Date Created
JK020687	1:500	15/02/22
Task Team Manager	**Information Author**	**Task Information Manager**
KRP	LL	MJH

Status: S2 (Suitable for Information)

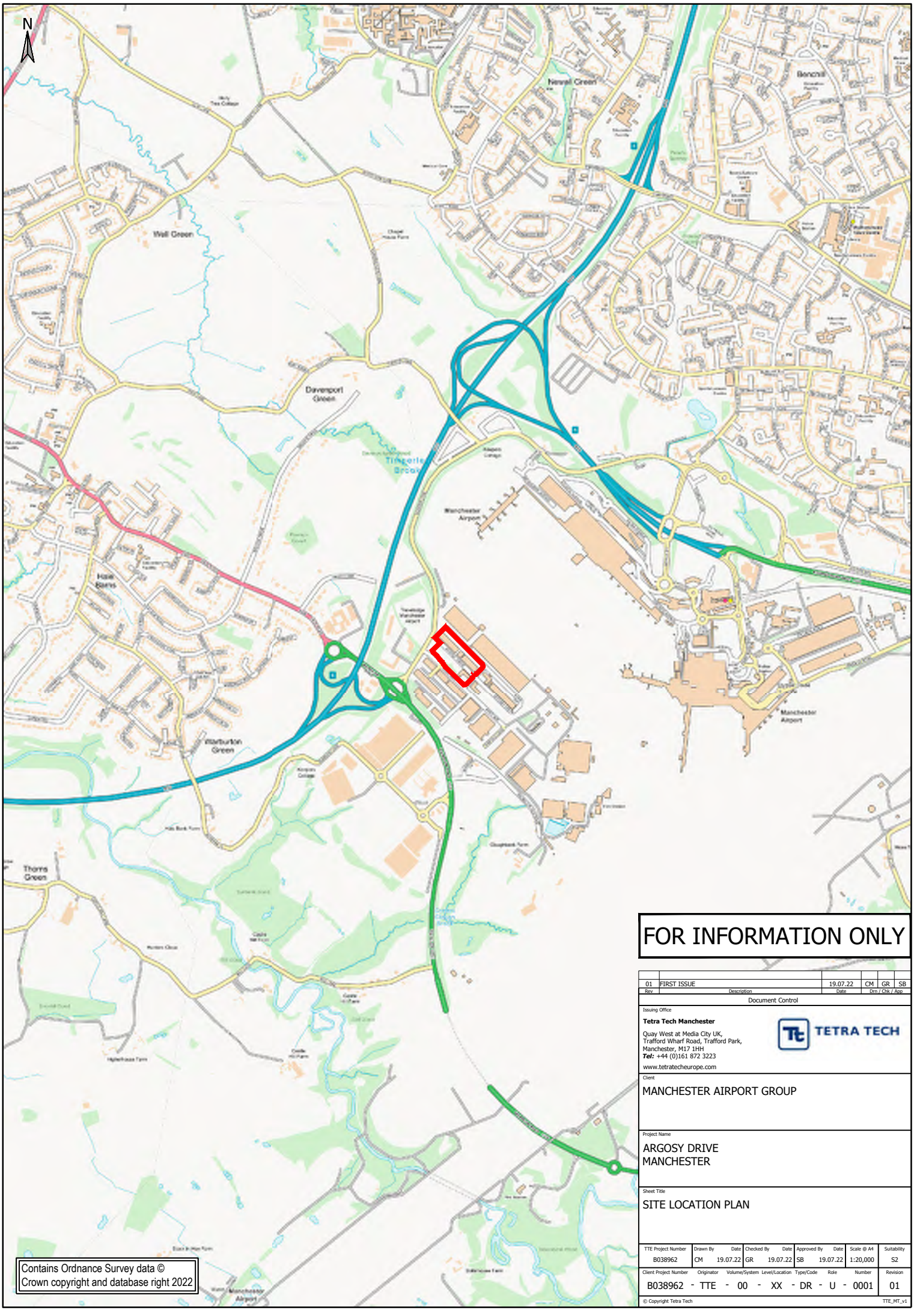
Document Number: 020687-RPS-SI-XX-DR-A-0110 Revision: P01

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

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Uncontrolled

SCALE 1:500



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Rev	Description	Date	Drn / Chk / App
01	FIRST ISSUE	19.07.22	CM / GR / SB

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www.tetratecheurope.com

TETRA TECH

Client

MANCHESTER AIRPORT GROUP

Project Name

ARGOSY DRIVE
MANCHESTER

Sheet Title

SITE LOCATION PLAN

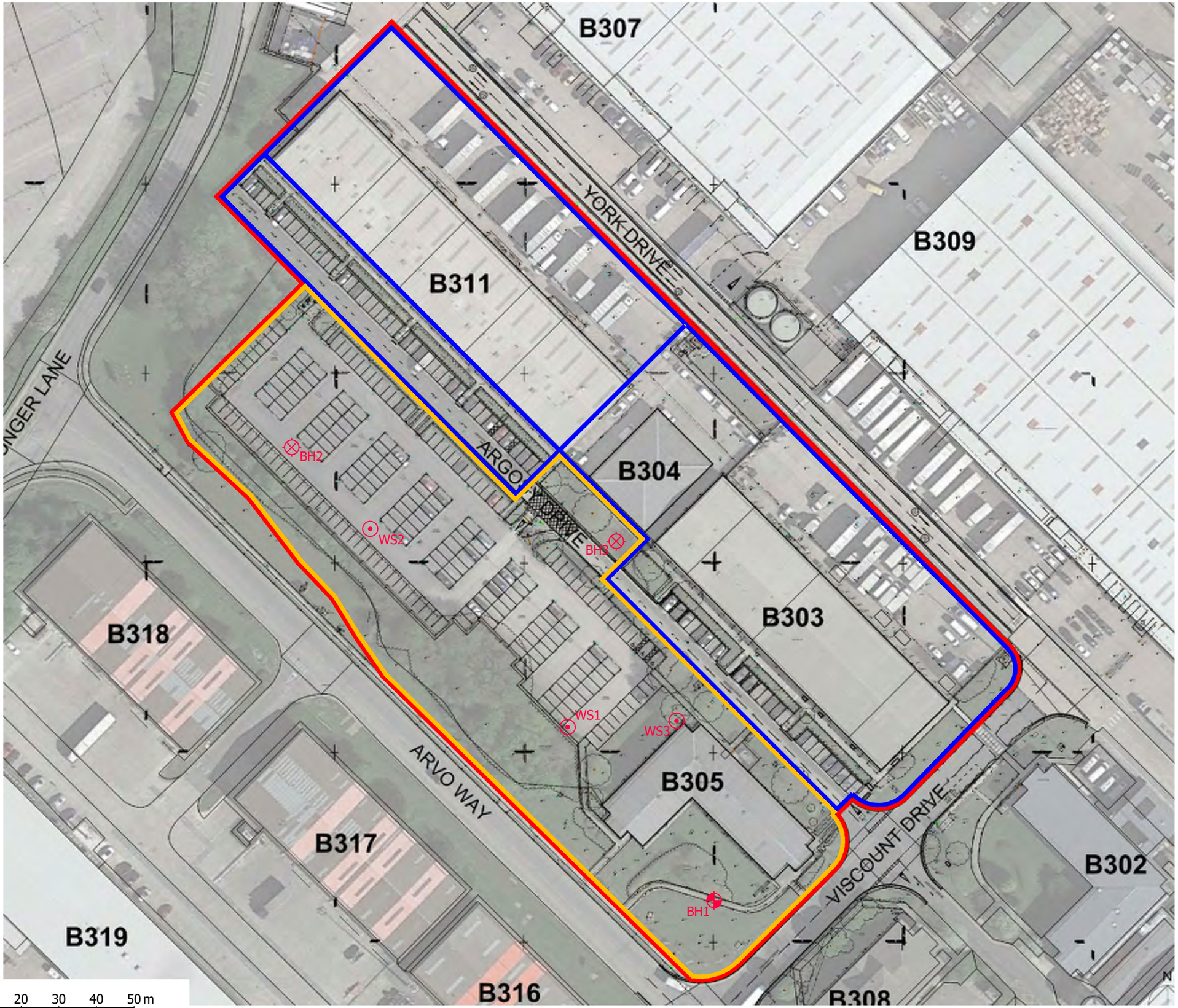
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B038962	CM	19.07.22	GR	19.07.22	SB	19.07.22	1:20,000	S2

Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision
B038962	TTE	00	XX	DR	U	0001	01

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TTE_MT_v1

N



0 10 20 30 40 50 m

SCALE 1:1000

KEY

- SITE BOUNDARY
- PHASE 1 SITE BOUNDARY
- PHASE 2 SITE BOUNDARY

TETRA TECH GROUND INVESTIGATION JULY 2022

- 15m DEEP CABLE PERCUSSION BOREHOLE
- 10m DEEP CABLE PERCUSSION BOREHOLE
- 4m DEEP WINDOW SAMPLE HOLE

FOR INFORMATION ONLY

Rev	Description	Date	Drn / Chk / App
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Document Control

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TETRA TECH

Client

MANCHESTER AIRPORT GROUP

Project Name

ARGOSY DRIVE
MANCHESTER

Sheet Title

GROUND INVESTIGATION LAYOUT PLAN
ON EXISTING LAYOUT PLAN

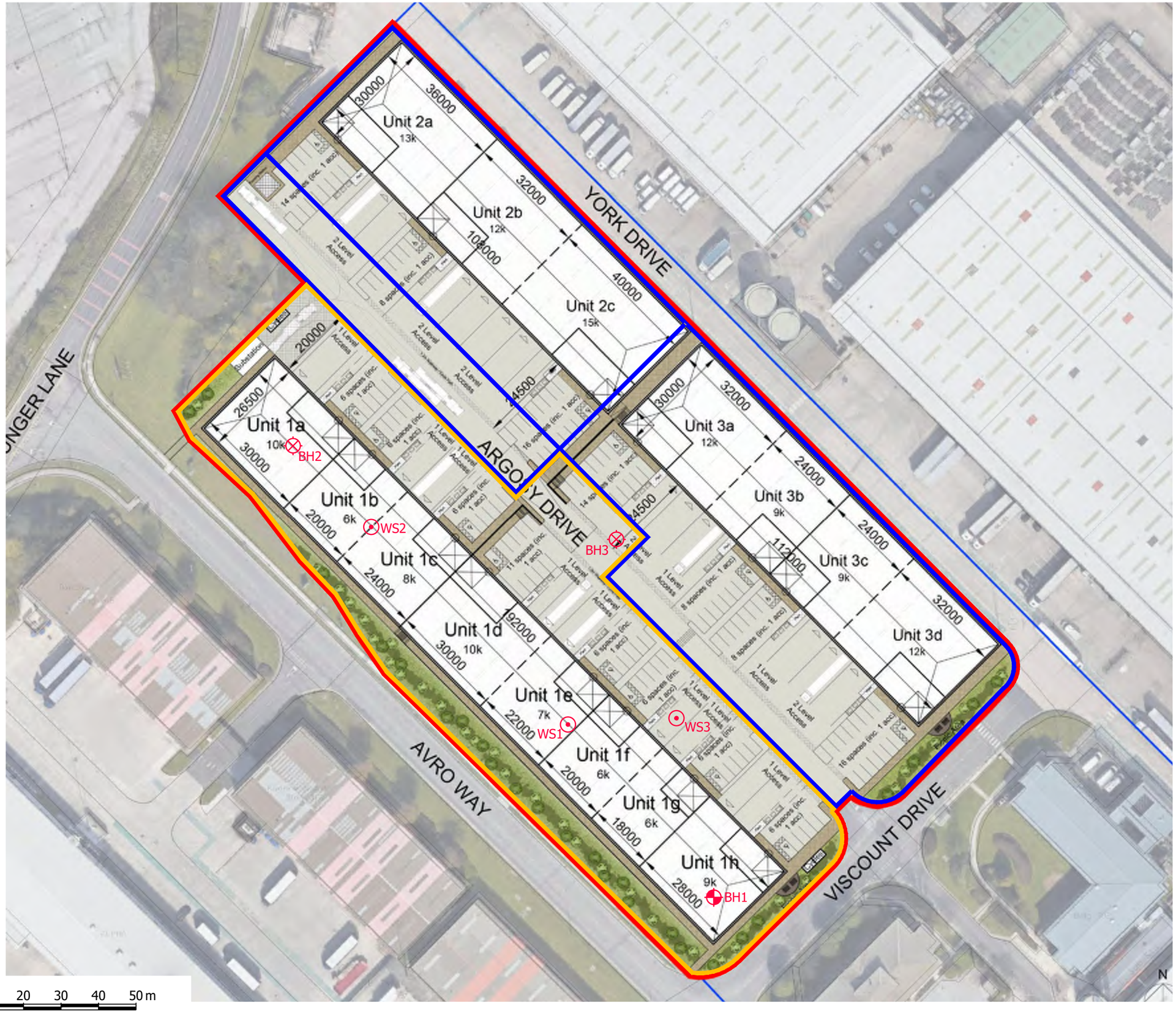
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B038962	CM	19.07.22	GR	19.07.22	SB	19.07.22	1:1,000	S2

Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision
B038962	TTE	00	XX	DR	U	0002	01

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TTE_MT_v1

N



0 10 20 30 40 50 m

SCALE 1:1000

KEY

- SITE BOUNDARY
- PHASE 1 SITE BOUNDARY
- PHASE 2 SITE BOUNDARY

TETRA TECH GROUND INVESTIGATION JULY 2022

- 15m DEEP CABLE PERCUSSION BOREHOLE
- 10m DEEP CABLE PERCUSSION BOREHOLE
- 4m DEEP WINDOW SAMPLE HOLE

FOR INFORMATION ONLY

Rev	Description	Date	Drn / Chk / App
01	FIRST ISSUE	19.07.22	CM / GR / SB

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www.tetratecheurope.com

TETRA TECH

Client

MANCHESTER AIRPORT GROUP

Project Name

ARGOSY DRIVE
MANCHESTER

Sheet Title

GROUND INVESTIGATION LAYOUT PLAN
ON PROPOSED LAYOUT PLAN

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A3	Suitability
B038962	CM	19.07.22	GR	19.07.22	SB	19.07.22	1:1,000	S2

Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision
B038962 - TTE	- 00	- XX	- DR	- U	-	0003	01

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TTE_MT_v1

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
CCTV — CLOSED CIRCUIT TV
UI — UNIDENTIFIED FEATURE
UP — UNIDENTIFIED PIPE
UC — UNIDENTIFIED CABLE
UNPR — UNPROVEN FEATURE
SW — END OF TRACE
FW — LATERAL CONNECTIONS
EXTENT OF SURVEY BY SURVEY OPERATIONS LTD.
EXTENT OF SURVEY BY SURVEY OPERATIONS LTD.()
⊗0.0d BURIED FEATURE FOUND USING RADAR
FW / SW — CONNECTIVITY BETWEEN CHAMBERS FROM CCTV REPORT
BURIED FEATURE FOUND USING RADAR

UNIDENTIFIED - A buried feature or utility that has been located, but we are unable to state what it is.
UNPROVEN - The assumed location of a reported feature or utility, usually taken from records, but not found during the utility trace (due to various conditions).
CAUTION - Electric pot ended cables, even when they are live, are unable to be detected or traced.

UNDERGROUND UTILITIES SERVICES DISCLAIMER

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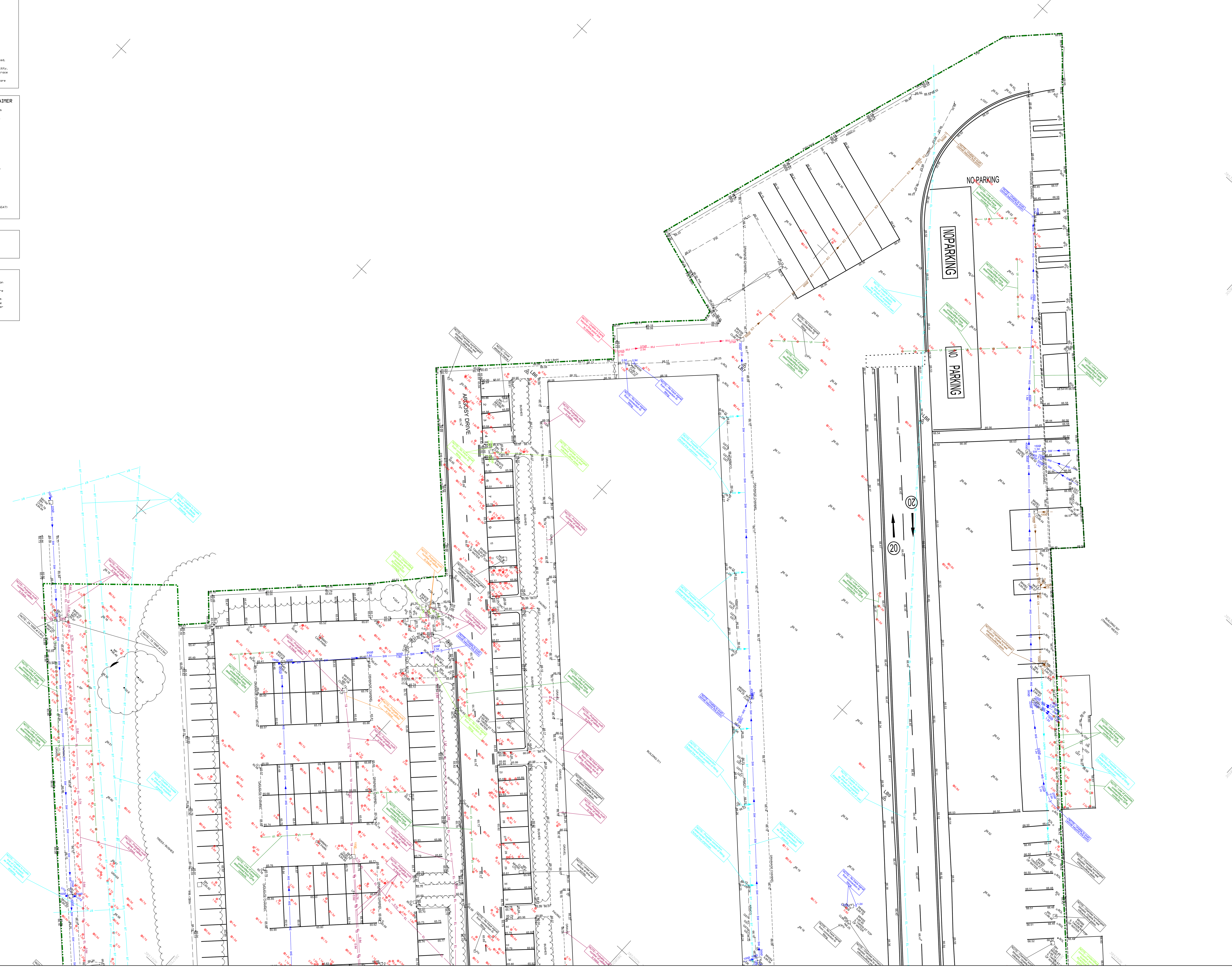
It is the responsibility of the user under Health & Safety (HSG47) Guidelines to satisfy himself of the suspected location of any services prior to excavation of the services shown.

NOTE 1

This utility survey has been undertaken using:
A: Radiodetection RD4000 + RD4000 TIO
B: Mala Geoscience Ground Probing Radar

NOTE 2

Power carrying features shown on this drawing are shown as an individual service line. This does not necessarily represent the number of cables actually present and it is possible that there could be multi numbers of cables including HV, LV and communications transmission cables following the same trace line. These could be at different depths, the trace signal from the deeper cables being masked by signal emitted from the shallower service above. Cable runs could also be present running parallel to the single line shown.



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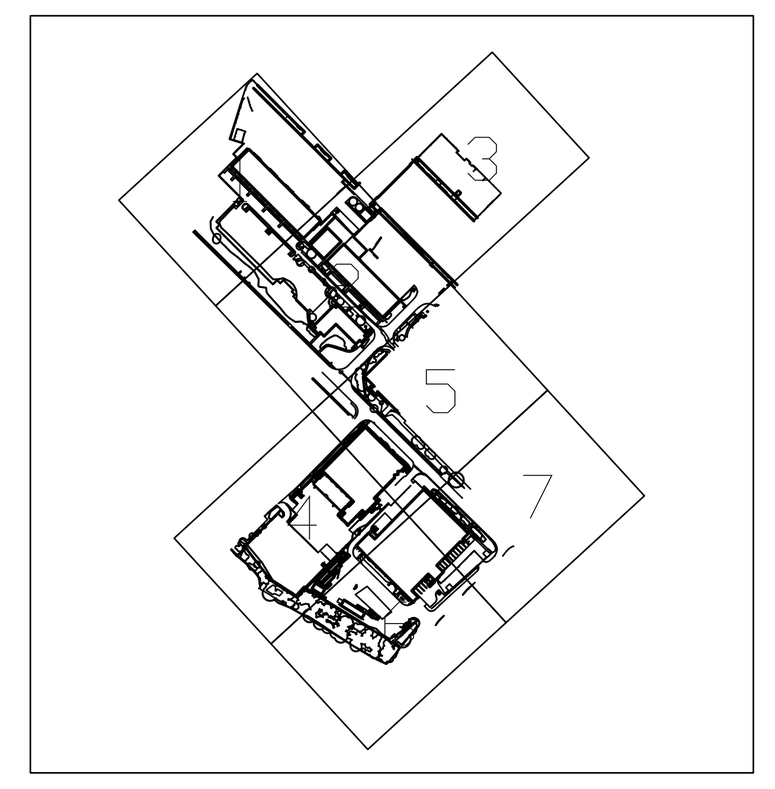
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Note:
The survey is plotted on a plane local Grid. Orientation to National Grid. All levels relate to Ordnance Datum, achieved using the OS National GPS Network.

Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

SURVEY STATIONS

Name	Easting	Northing	Height
S01	380948.22	384937.07	68.18
S02	380907.82	384888.07	67.43
S03	380881.67	384868.62	67.47
S04	380856.96	384849.15	67.11
S05	380871.21	384811.47	67.10
S06	380918.01	384788.29	67.54
S07	380953.17	384770.96	68.30
S08	380984.86	384805.96	68.66
S09	381026.85	384846.04	69.09
S010	380963.87	384904.15	68.69



STANDARD REFERENCE & ABBREVIATIONS

(AR)........Assumed Route
AB..........Air Brick
AV..........Air Valve
B/W.........Barbed Wire
BAR.........Barrier
BB..........Belisha Beacon
BH..........Borehole
BL..........Bed Level
BOL.........Bollard
BS..........Bus Stop
BT Box......British Telecom Box
BT..........British Telecom IC
BRTW........Brick Retaining Wall
BW..........Brick Wall
C/B.........Close Boarded
C/I.........Corrugated Iron
C/P.........Chestnut Paling
CB..........Control Box
CBW.........Concrete Block Wall
CCTV........Closed Circuit TV
CD..........Cable Duct
CEL.........Cellar Light
CH/L........Chain Link
CHY.........Chimney
CL..........Cover Level
CM..........Cable Marker
COL.........Column
CONC........Concrete
CP..........Catch Pit
CRTW........Concrete Retaining Wall
CTV.........Cable Television
CUL.........Culvert
CW..........Concrete Block Wall
DC..........Drainage Channel
DPC.........Damp Proof Course
DR..........Drain
DSW.........Dry Stone Wall
ECP.........Electricity Cable Pit
EIC.........Electricity Inspection Cover
EJ..........Expansion Joint
EJB.........Electricity Junction Box
EL SUB STN..Electricity Sub Station
EL..........Eaves Level
ELB.........Electricity Box
EP..........Electricity Pole
ER..........Earth Rod
ETL.........Electricity Transmission Line
FB..........Flower Bed
FH..........Fire Hydrant
FL..........Floor Level
FP..........Flagpole
G*.*........Girth (of tree)
G...........Gulley
GAB.........Gabion
GIP.........Gas Inlet Pipe
GMKR........Gas Marker
GST.........Gas Stop Tap (Domestic)
GSV.........Gas Stop Valve (Mains)
HSE.........Housing
Ht..........Height
HV..........High Voltage
I/R.........Iron Railing
IC..........Inspection Cover
IL..........Invert Level
IP..........Inlet Pipe
KO..........Kerb Outlet
LB..........Letter Box
LP..........Lamp Post
MG..........Multi-Girth
MH..........Manhole
MKR.........Marker
MP..........Mooring Point
NP..........Street Name Plate
O/H.........Overhead
O/P.........Open Paling
OE..........Overhead Electric Wire
OP..........Outfall Pipe
OSBM........Ordnance Survey Bench Mark
OT..........Overhead Telecom Wire
P/C.........Post & Chain
P/R.........Post & Rail
P/W.........Post & Wire
PAV.........Paving
PB..........Pillar Box
PC..........Pedestrian Crossing
PP..........Petrol Pump
PT..........Post or Pillar
RE..........Rodding Eye
RS..........Road Sign
RTW.........Retaining Wall
RWP.........Rain Water Pipe
SAP.........Sapling
SL..........Sump Level
SoL.........Soffit Level
SP..........Sign Post
SPL.........Springing Level
SRTW........Stone Retaining Wall
SV..........Stop Valve (unspecified)
SVP.........Soil Vent Pipe
SW..........Stone Wall
TAC.........Tactile Paving
TB..........Traffic Bollard
TBM.........Temporary Bench Mark
TCB.........Telephone Call Box
TFR.........Taken From Records
TIE.........Anchor Point (Masts/Poles)
TL..........Traffic Light
TLB.........Traffic Light Control Box
TM..........Ticket Machine
TMC.........Tarmac
TP..........Telecommunications Pole
TPIT........Trial Pit
TS..........Trash Screen
U/C.........Under Construction
U/G.........Underground
UTL.........Unable to Lift (MH,IC etc)
UTS.........Unable to Survey
VDP.........Vehicle Detector Pad
VP..........Vent Pipe
W/M.........Wire Mesh
WL..........Water Level
WM..........Water Meter
WO..........Wash Out
WP..........Waste Pipe
WST.........Water Stop Tap (domestic)
WSV.........Water Stop Valve (mains)

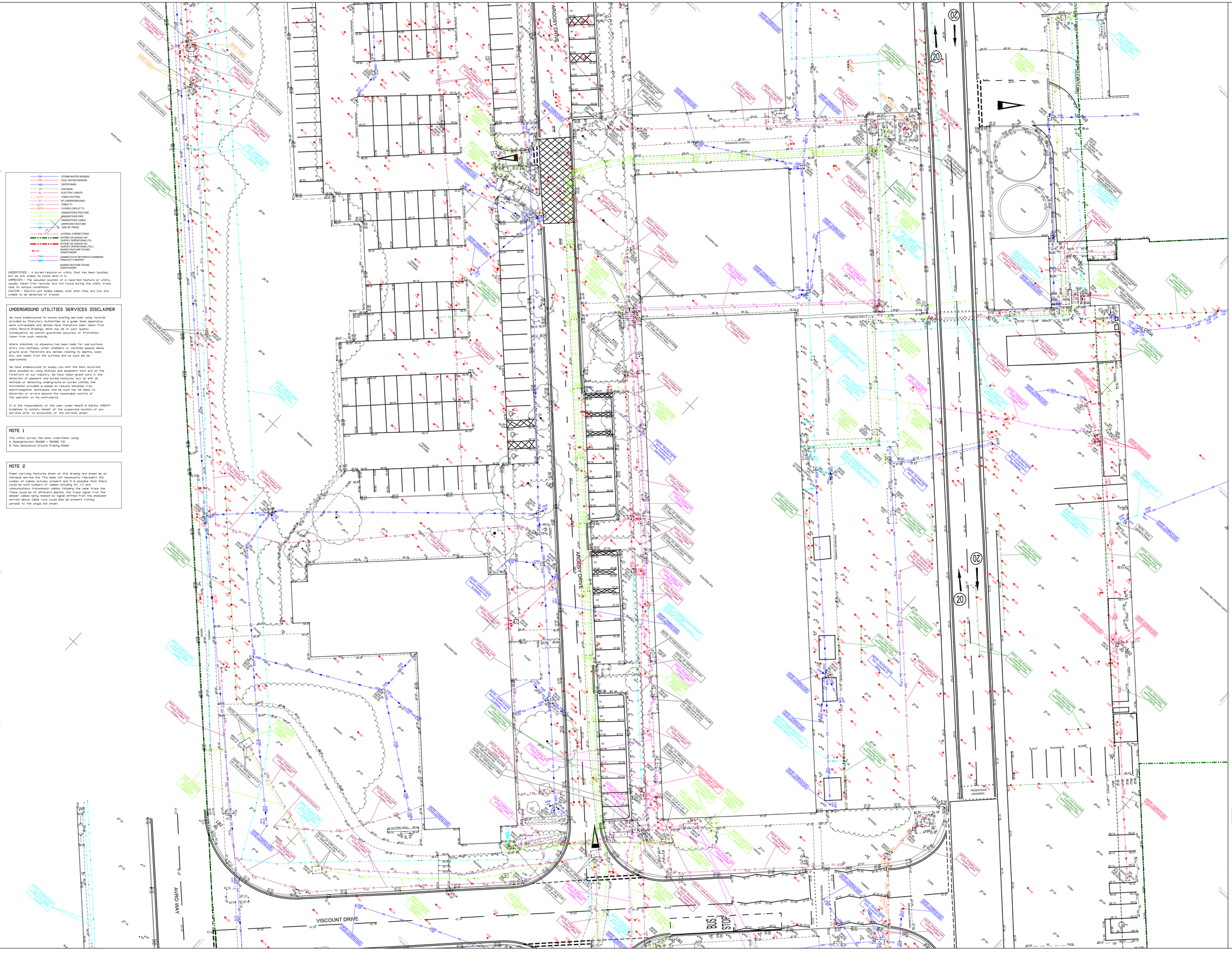
SurveY OPERATIONS
Smith Street, Skelmersdale, Lancs. WN8 8LN
Tel: 01695 725662 Fax: 01695 51816
Email: mail@survops.co.uk — www.survops.co.uk

Client: AECOM

Drawing Title
Utility Survey of Land at:
Building 401, 402 and Argosy Drive
Manchester Airport
Sheet 1 of 7

Scale(s)	1:200	Surveyor	Var
Date	Mar 22	Drawn	AC
Job Number	22B170 22A231-22A233	Checked	SO

Sheet Size & Drg Number & Revision
A0 22A231/001



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
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EXTENT OF SURVEY BY SURVEY OPERATIONS LTD.
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A: Radiodetection RD4000 + RD4000 TX2
B: Tesla Geoscience Ground Probing Radar

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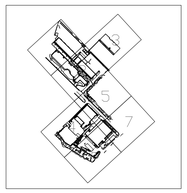
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Name	Easting	Northing	Height
SC1	385501.42	394666.72	67.40
SC2	385881.21	394868.23	67.43
SC4	385804.99	394843.67	67.17
SC5	385987.17	394841.13	67.54
SC6	385918.47	394788.99	67.54
SC7	385734.27	394801.36	67.40
SC8	385556.49	394803.04	68.05
SC9	385526.80	394564.76	68.05
SC10	385556.57	394304.11	68.63



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AV.....Air Valve
B/W.....Barbed Wire
BAR.....Barrier
BB.....Bellaha Beacon
BH.....Borehole
BL.....Bed Level
BOL.....Bollard
BS.....Bus Stop
BT Box.....British Telecom Box
BT.....British Telecom (C
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BW.....Brick Wall
C/B.....Close Boarded
C/I.....Corrugated Iron
C/P.....Chestnut Paling
CB.....Control Box
CBW.....Concrete Block Wall
CCTV.....Closed Circuit TV
CD.....Cable Duct
CEL.....Ceiling Light
CH/L.....Chain Link
CHY.....Chimney
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CONC.....Concrete
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DR.....Drain
DSW.....Dry Stone Wall
EOP.....Electricity Cable Pit
ESI.....Electricity Inspection Cover
Ex.....Expansion Joint
EJB.....Electricity Junction Box
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ELB.....Electricity Box
EP.....Electricity Pole
ER.....Earth Rod
ETL.....Electricity Transmission Line
F.....Flower Box
FH.....Fire Hydrant
FL.....Floor Level
FP.....Flagpole
G*.*.....Girth (of tree)
G.....Gulley
GAB.....Gabion
GIP.....Gas Inlet Pipe
GM.....Gas Marker
GST.....Gas Stop Tap (Domestic)
GSV.....Gas Stop Valve (Mains)
HSE.....Housing
HT.....Height
HV.....High Voltage
I/R.....Iron Railing
IC.....Inspection Cover
IL.....Invert Level
IP.....Inlet Pipe
KO.....Kerb Outlet
LB.....Letter Box
LP.....Lamp Post
MG.....Multi Girth
MH.....Manhole
MKR.....Marker
MP.....Mooring Point
NP.....Street Name Plate
O/H.....Overhead
O/P.....Open Paling
OE.....Overhead Electric Wire
OF.....Outfall Pipe
OSBM.....Ordnance Survey Bench Mark
OT.....Overhead Telecom Wire
P/C.....Post & Chain
P/R.....Post & Rail
P/W.....Post & Wire
PAV.....Paving
PB.....Pillar Box
PC.....Pedestrian Crossing
PP.....Petrol Pump
PT.....Post or Pillar
RE.....Rodding Eye
RS.....Road Sign
RTW.....Retaining Wall
RWP.....Rain Water Pipe
SAP.....Sapling
SL.....Sump Level
SOFF.....Soffit Level
SP.....Sign Post
SPR.....Springing Level
SRTW.....Stone Retaining Wall
STV.....Stop Valve (unspecified)
SVP.....Soil Vent Pipe
T.....Traffic Bollard
TAC.....Tactile Paving
TB.....Temporary Bench Mark
TCB.....Telephone Call Box
TFR.....Token Fire Hydrants
T(I).....Anchor Point (Boats/Poles)
TL.....Traffic Light
TLB.....Traffic Light Control Box
TM.....Ticket Machine
TWC.....Tarmac
TP.....Telecommunications Pole
TP(T).....Trial Pit
TS.....Trash Screen
U/C.....Under Construction
U/G.....Underground
UTL.....Unable to Lift (BM,IC etc)
UTS.....Unable to Survey
VDP.....Vehicle Detector Pad
WM.....Gas Marker
W.M.....Wire Mesh
WL.....Water Level
WM.....Water Meter
WO.....Wash Out
WP.....Waste Pipe
WST.....Water Stop Tap (domestic)
WSV.....Water Stop Valve (mains)

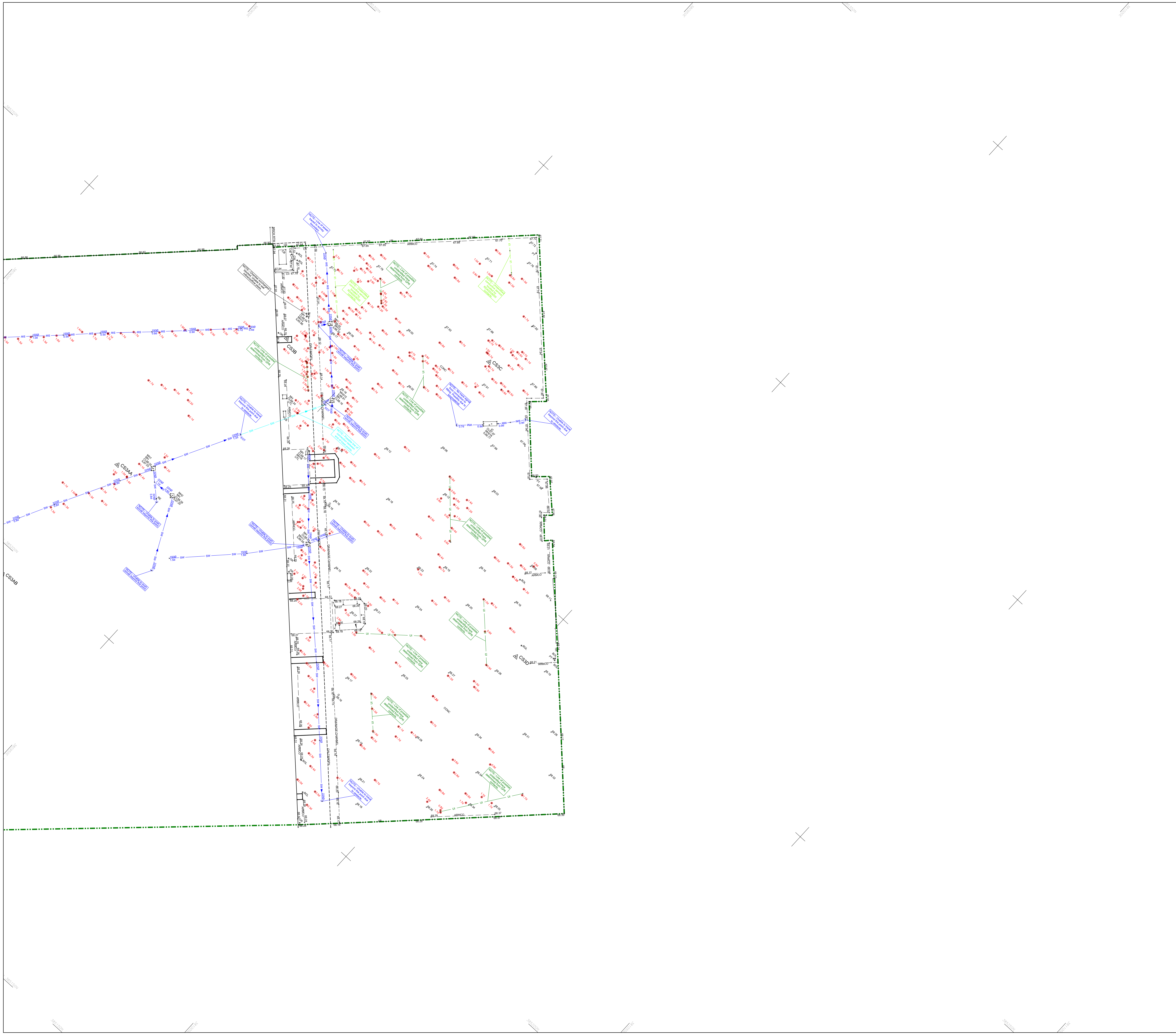
SurveY OPERATIONS
Smith Street, Skelmersdale, Lancs. WN8 8LN
Tel: 01695 725662 Fax: 01695 51816
Email: mail@surveyops.co.uk www.surveyops.co.uk

Client
AECOM

Drawing Title
Utility Survey of Land at:
Building 401, 402 and Argosy Drive
Manchester Airport
Sheet 2 of 7

Scale(s)	1:200	Surveyor	Var
Date	Mar 22	Drawn	AC
Job Number	22B170 22A231-22A233	Checked	SO

Sheet Size & Drg Number & Revision
A0 22A231/002



UNDERGROUND UTILITIES LEGEND

Line	Meaning
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
CCTV	CLOSED CIRCUIT TV
UI	UNIDENTIFIED FEATURE
UP	UNIDENTIFIED PIPE
UC	UNIDENTIFIED CABLE
UNPR	UNPROVEN FEATURE
SW	END OF TRACE
FW C	LATERAL CONNECTIONS
	EXTENT OF SURVEY BY SURVEY OPERATIONS LTD.
	EXTENT OF SURVEY BY SURVEY OPERATIONS LTD.()
0.0d	BURIED FEATURE FOUND USING RADAR
FW / SW	CONNECTIVITY BETWEEN CHAMBERS FROM CCTV REPORT
	BURIED FEATURE FOUND USING RADAR

UNIDENTIFIED – A buried feature or utility that has been located, but we are unable to state what it is.
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CAUTION – Electric pot ended cables, even when they are live, are unable to be detected or traced.

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It is the responsibility of the user under Health & Safety (HSG47) Guidelines to satisfy himself of the suspected location of any services prior to excavation of the services shown.

NOTE 1

This utility survey has been undertaken using:
A: Radiodetection RD4000 + RD4000 TIO
B: Mala Geoscience Ground Probing Radar

NOTE 2

Power carrying features shown on this drawing are shown as an individual service line. This does not necessarily represent the number of cables actually present and it is possible that there could be multi numbers of cables including HV, LV and communications transmission cables following the same trace line. These could be at different depths, the trace signal from the deeper cables being masked by signal emitted from the shallower service above. Cable runs could also be present running parallel to the single line shown.

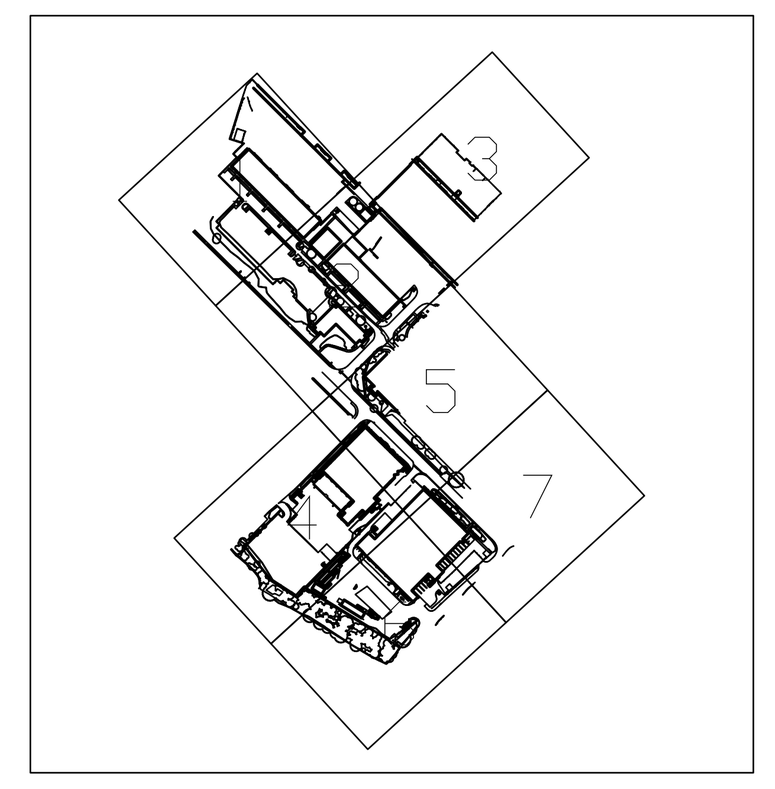
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Note:
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Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

SURVEY STATIONS

Name	Easting	Northing	Height
S01	380948.22	384937.07	68.18
S02	380907.82	384888.07	67.43
S03	380881.67	384868.62	67.47
S04	380856.96	384849.15	67.11
S05	380871.21	384811.47	67.10
S06	380918.01	384788.29	67.54
S07	380953.17	384770.96	68.30
S08	380984.86	384805.96	68.66
S09	381026.85	384846.04	69.09
S010	380963.87	384904.15	68.69



STANDARD REFERENCE & ABBREVIATIONS

(AR)........Assumed Route
AB..........Air Brick
AV..........Air Valve
B/W.........Barbed Wire
BAR.........Barrier
BB..........Belisha Beacon
BH..........Borehole
BL..........Bed Level
BOL.........Bollard
BS..........Bus Stop
BT Box......British Telecom Box
BT..........British Telecom IC
BRTW........Brick Retaining Wall
BW..........Brick Wall
C/B.........Close Boarded
C/I.........Corrugated Iron
C/P.........Chestnut Paling
CB..........Control Box
CBW.........Concrete Block Wall
CCTV........Closed Circuit TV
CD..........Cable Duct
CEL.........Cellar Light
CH/L........Chain Link
CHY.........Chimney
CL..........Cover Level
CM..........Cable Marker
COL.........Column
CONC........Concrete
CP..........Catch Pit
CRTW........Concrete Retaining Wall
CTV.........Cable Television
CUL.........Culvert
CW..........Concrete Block Wall
DC..........Drainage Channel
DPC.........Damp Proof Course
DR..........Drain
DSW.........Dry Stone Wall
ECP.........Electricity Cable Pit
EIC.........Electricity Inspection Cover
EJ..........Expansion Joint
EJB.........Electricity Junction Box
EL SUB STN..Electricity Sub Station
EL..........Eaves Level
ELB.........Electricity Box
EP..........Electricity Pole
ER..........Earth Rod
ETL.........Electricity Transmission Line
FB..........Flower Bed
FH..........Fire Hydrant
FL..........Floor Level
FP..........Flagpole
G*.*........Girth (of tree)
G...........Gulley
GAB.........Gabion
GIP.........Gas Inlet Pipe
GMKR........Gas Marker
GST.........Gas Stop Tap (Domestic)
GSV.........Gas Stop Valve (Mains)
HSE.........Housing
Ht..........Height
HV..........High Voltage
I/R.........Iron Railing
IC..........Inspection Cover
IL..........Invert Level
IP..........Inlet Pipe
KO..........Kerb Outlet
LB..........Letter Box
LP..........Lamp Post
MG..........Multi-Girth
MH..........Manhole
MKR.........Marker
MP..........Mooring Point
NP..........Street Name Plate
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O/P.........Open Paling
OE..........Overhead Electric Wire
OP..........Outfall Pipe
OSBM........Ordnance Survey Bench Mark
OT..........Overhead Telecom Wire
P/C.........Post & Chain
P/R.........Post & Rail
P/W.........Post & Wire
PAV.........Paving
PB..........Pillar Box
PC..........Pedestrian Crossing
PP..........Petrol Pump
PT..........Post or Pillar
RE..........Rodding Eye
RS..........Road Sign
RTW.........Retaining Wall
RWP.........Rain Water Pipe
SAP.........Sapling
SL..........Sump Level
SoL.........Soffit Level
SP..........Sign Post
SPL.........Springing Level
SRTW........Stone Retaining Wall
SV..........Stop Valve (unspecified)
SVP.........Soil Vent Pipe
SW..........Stone Wall
TAC.........Tactile Paving
TB..........Traffic Bollard
TBM.........Temporary Bench Mark
TCB.........Telephone Call Box
TFR.........Taken From Records
TIE.........Anchor Point (Masts/Poles)
TL..........Traffic Light
TLB.........Traffic Light Control Box
TM..........Ticket Machine
TMC.........Tarmac
TP..........Telecommunications Pole
TPIT........Trial Pit
TS..........Trash Screen
U/C.........Under Construction
U/G.........Underground
UTL.........Unable to Lift (MH,IC etc)
UTS.........Unable to Survey
VDP.........Vehicle Detector Pad
VP..........Vent Pipe
W/M.........Wire Mesh
WL..........Water Level
WM..........Water Meter
WO..........Wash Out
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WST.........Water Stop Tap (domestic)
WSV.........Water Stop Valve (mains)

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Client
AECOM

Drawing Title
Utility Survey of Land at:
Building 300
Manchester Airport
Sheet 3 of 7

Scale(s)	1:200	Surveyor	Var
Date	Mar 22	Drawn	AC
Job Number	22B170 22A231-22A233	Checked	SO

Sheet Size & Drg Number & Revision
A0 22A231/003

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
CCTV CLOSED CIRCUIT TV
UI UNIDENTIFIED FEATURE
UP UNIDENTIFIED PIPE
UC UNIDENTIFIED CABLE
UNPR UNPROVEN FEATURE
SW E END OF TRACE
FW LATERAL CONNECTIONS
EXTENT OF SURVEY BY: SURVEY OPERATIONS LTD.
EXTENT OF SURVEY BY: SURVEY OPERATIONS LTD.& UNDERGROUND FEATURE FOUND USING RADAR
FW CONNECTIVITY BETWEEN CHAMBERS FROM CCTV REPORT
SW BURIED FEATURE FOUND USING RADAR

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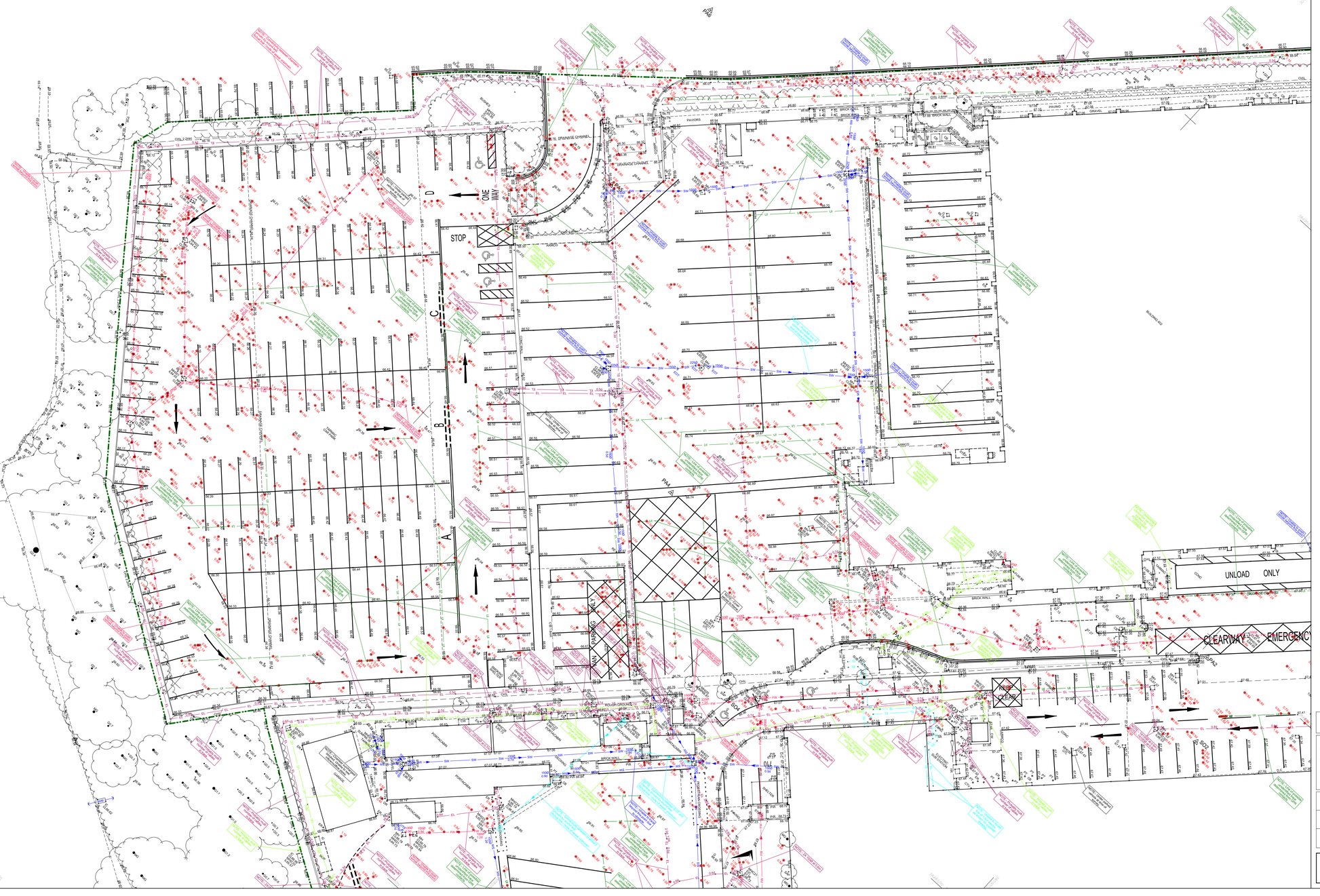
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NOTE 1

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A: Radiodetection RD4000 + RD4000 TX2
B: Mala Geoscience Ground Probing Radar

NOTE 2

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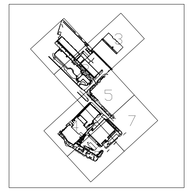
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SURVEY STATIONS

Name	Easting	Northing	Height
SO1	385501.42	384669.75	67.42
SO2	385881.42	384668.25	67.43
SO4	385806.96	384842.47	67.17
SO5	385811.27	384811.47	67.19
SO6	385918.17	384788.39	67.54
SO7	385956.77	384765.09	68.04
SO8	385934.67	384801.98	68.04
SO9	385928.80	384864.96	69.05
SO10	385863.63	384904.71	68.63



STANDARD REFERENCE & ABBREVIATIONS

(AR).....Assumed Route
AB.....Air Brick
AV.....Air Valve
B/W.....Barbed Wire
BAR.....Barrier
BB.....Bellaha Beacon
BH.....Borehole
BL.....Bed Level
BOL.....Bollard
BS.....Bus Stop
BT Box.....British Telecom Box
BT.....British Telecom (U
BRTW.....Brick Retaining Wall
BW.....Brick Wall
C/B.....Close Boarded
C/I.....Corrugated Iron
C/P.....Chestnut Paling
CB.....Control Box
CBW.....Concrete Block Wall
CCTV.....Closed Circuit TV
CD.....Cable Duct
CEL.....Cellar Light
CHL.....Chain Link
CHY.....Chimney
CL.....Cover Level
CM.....Cable Marker
COL.....Column
CONC.....Concrete
CP.....Catch Pit
CRTW.....Concrete Retaining Wall
CTV.....Cable Television
CUL.....Culvert
CW.....Concrete Block Wall
DC.....Drainage Channel
DPC.....Damp Proof Course
DR.....Drain
DSW.....Dry Stone Wall
ECP.....Electricity Cable Pit
EICI.....Electricity Inspection Cover
Ej.....Expansion Joint
EJB.....Electricity Junction Box
EL SUB ETN.....Electricity Sub Station
EL.....Eaves Level
ELB.....Electricity Box
EP.....Electricity Pole
ER.....Earth Rod
ETL.....Electricity Transmission Line
FB.....Flower Bed
FH.....Fire Hydrant
FL.....Floor Level
FP.....Flagpole
G(I).....Girth (of tree)
G.....Gulley
GAB.....Gabion
GCP.....Gas Inlet Pipe
GBMA.....Gas Marker
GBT.....Gas Stop Tap (Domestic)
GSV.....Gas Stop Valve (Mains)
HSE.....Housing
HT.....Height
HV.....High Voltage
I/R.....Iron Railing
IC.....Inspection Cover
IL.....Invert Level
IP.....Inlet Pipe
KO.....Kerb Outlet
LB.....Letter Box
LP.....Lamp Post
MG.....Multi-Girth
MH.....Manhole
MKR.....Marker
MP.....Mooring Point
NP.....Street Name Plate
O/H.....Overhead
OP.....Outfall Pipe
OSBM.....Ordnance Survey Bench Mark
OT.....Overhead Telecom Wire
P/C.....Post & Chain
P/R.....Post & Rail
P/W.....Post & Wire
PAV.....Paving
PB.....Pillar Box
PC.....Pedestrian Crossing
PP.....Petrol Pump
PT.....Post or Pillar
RI.....Rodding Eye
RS.....Road Sign
RTW.....Retaining Wall
RWP.....Rain Water Pipe
SAP.....Sapling
S(L).....Sump Level
SAL.....Soffit Level
SP.....Sign Post
SPL.....Springing Level
SRTW.....Stone Retaining Wall
SV.....Stop Valve (unspecified)
SVP.....Soil Vent Pipe
SW.....Stone Wall
TAC.....Tactile Paving
TB.....Traffic Bollard
TBM.....Temporary Bench Mark
TCB.....Telephone Call Box
TPR.....Taken From Records
T(S).....Anchor Point (Masts/Poles)
TL.....Traffic Light
TLB.....Traffic Light Control Box
TM.....Ticket Machine
TWC.....Tarmac
TP.....Telecommunications Pole
TP(T).....Trial Pit
TS.....Trash Screen
U/C.....Under Construction
U/G.....Underground
UTL.....Unable to Lift (BM,SC etc)
UTS.....Unable to Survey
VDP.....Vehicle Detector Pad
VP.....Vent Pipe
W/M.....Wire Mesh
WL.....Water Level
WM.....Water Meter
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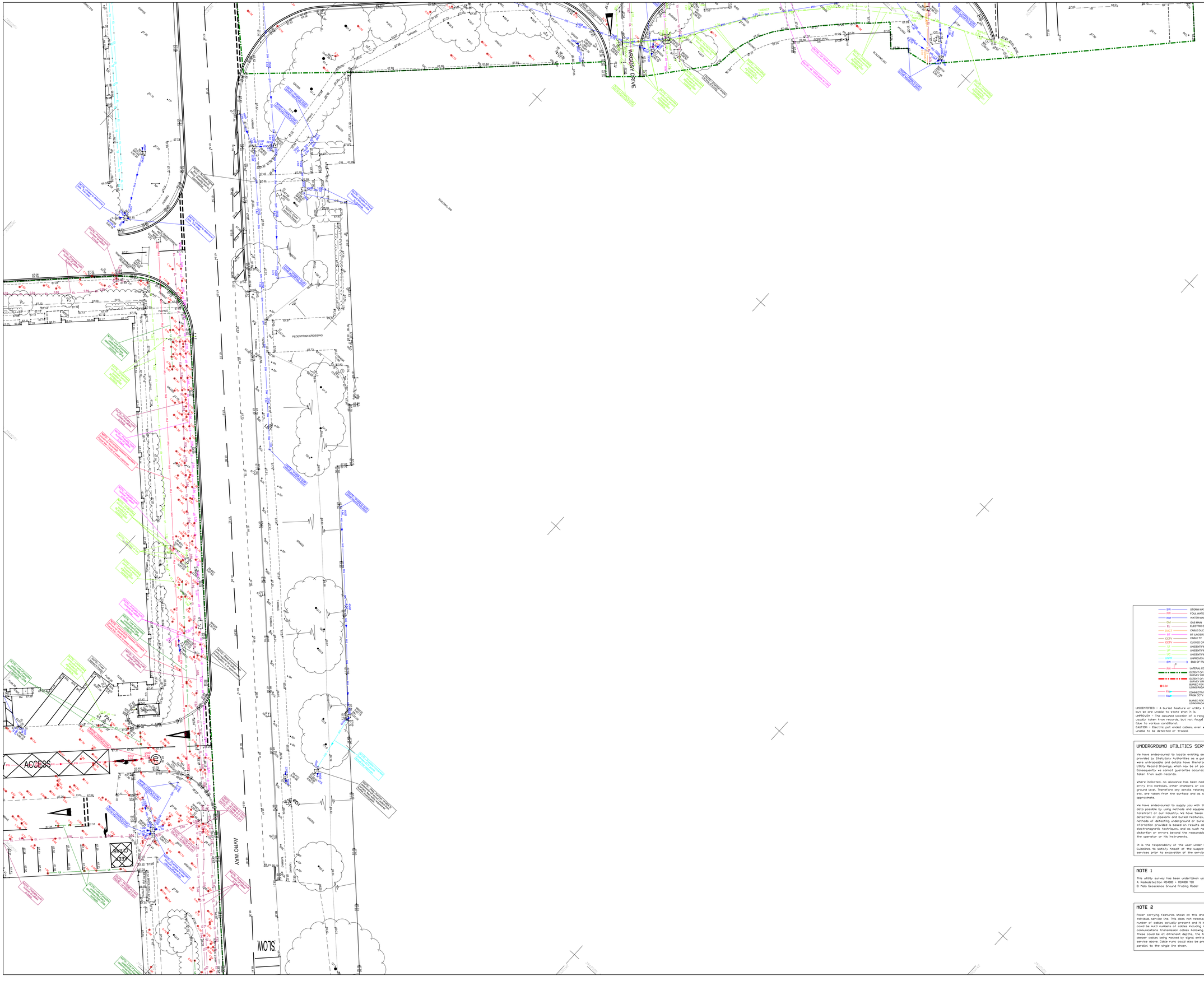
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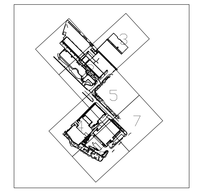
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SC3	385881.04	384468.03	67.43
SC4	385806.98	384840.21	67.17
SC5	385871.27	384811.47	67.13
SC6	385918.77	384788.39	67.54
SC7	385994.46	384751.04	68.04
SC8	385994.66	384851.04	68.04
SC9	381026.80	384564.76	69.05
SC10	385967.57	384304.71	68.43



STANDARD REFERENCE & ABBREVIATIONS

(ARG).....Assumed Route	IL.....Invert Level
AB.....Air Brick	IP.....Inlet Pipe
AV.....Air Valve	MO.....Marb Outlet
B/W.....Barbed Wire	LB.....Letter Box
BAR.....Barrier	LP.....Lamp Post
BB.....Bellaha Beacon	MG.....Multi-Girth
BH.....Borehole	MH.....Manhole
BL.....Bed Level	MRK.....Marker
BOL.....Bollard	MP.....Mooring Point
BS.....Bus Stop	NP.....Street Name Plate
BT Box.....British Telecom Box	O/H.....Overhead
BT.....British Telecom (C	O/P.....Open Paling
BRTW.....Brick Retaining Wall	OE.....Overhead Electric Wire
BW.....Brick Wall	OF.....Outfall Pipe
C/B.....Close Boarded	OSBM.....Ordnance Survey Bench Mark
C/I.....Corrugated Iron	OT.....Overhead Telecom Wire
C/P.....Chestnut Paling	P/C.....Post & Chain
CB.....Control Box	P/R.....Post & Rail
CBW.....Concrete Block Wall	P/W.....Post & Wire
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CD.....Cable Duct	PB.....Pillar Box
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CHM.....Chimney	PT.....Post or Pillar
CL.....Cover Level	RE.....Rodding Eye
CM.....Cable Marker	RS.....Road Sign
COL.....Column	RTW.....Retaining Wall
CONC.....Concrete	RWP.....Rain Water Pipe
CP.....Catch Pit	SAP.....Sapling
CRTW.....Concrete Retaining Wall	SL.....Sump Level
CTV.....Cable Television	SOL.....Soffit Level
CUL.....Culvert	SP.....Sign Post
CW.....Concrete Block Wall	SPL.....Springing Level
DC.....Drainage Channel	SRTW.....Stone Retaining Wall
DPC.....Damp Proof Course	SV.....Stop Valve (unspecified)
DR.....Drain	SVP.....Soil Vent Pipe
DSW.....Dry Stone Wall	SW.....Stone Wall
ECP.....Electricity Cable Pit	TAC.....Tactile Paving
EIC.....Electricity Inspection Cover	TB.....Traffic Bollard
Ex.....Expansion Joint	TBM.....Temporary Bench Mark
EJB.....Electricity Junction Box	TCB.....Telephone Call Box
EL Sub STN..Electricity Sub Station	TFR.....Token Free Records
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FH.....Fire Hydrant	TPIT.....Trial Pit
FL.....Floor Level	TS.....Trash Screen
FP.....Flagpole	U/C.....Under Construction
GT.....Girth (of tree)	U/G.....Underground
G.....Gulley	UTL.....Unable to Lift (BM,SC etc)
GAS.....Gasbin	UTS.....Unable to Survey
GIP.....Gas Inlet Pipe	VDP.....Vehicle Detector Pad
GMA.....Gas Marker	VP.....Vent Pipe
GOT.....Gas Stop Tap (Domestic)	WCH.....Wire Mesh
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- SW — STORM WATER SEWERS
- FW — FOUL WATER SEWERS
- WM — WATER MAIN
- GM — GAS MAIN
- EL — ELECTRIC CABLES
- DUCT — CABLE DUCTING
- BT — BT (UNDERGROUND) CABLE TV
- CCTV — CLOSED CIRCUIT TV
- U — UNIDENTIFIED FEATURE
- UP — UNIDENTIFIED PIPE
- UC — UNIDENTIFIED CABLE
- UNPR — UNPROVEN FEATURE
- SW C — END OF TRACE
- FW — LATERAL CONNECTIONS
- EXTENT OF SURVEY BY SURVEY OPERATIONS LTD.
- EXTENT OF SURVEY BY SURVEY OPERATIONS LTD.) BURIED FEATURE FOUND USING RADAR
- ⊕ SW — BURIED FEATURE FOUND USING RADAR
- FW⇔SW — CONNECTIVITY BETWEEN CHAMBERS FROM CCTV REPORT

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Utility Survey of Land at:
Building 401, 402 and Argosy Drive
Manchester Airport
Sheet 5 of 7

Scale(s)	1:200	Surveyor	Var
Date	Mar 22	Drawn	AC
Job Number	22B170 22A231-22A233	Checked	SO

Sheet Size & Drg Number & Revision
A0 22A231/005

SW STORM WATER SEWERS
FW FOUL WATER SEWERS
WM WATER MAIN
GM GAS MAIN
EL ELECTRIC CABLES
DUCT CABLE DUCTING
BT BT (UNDERGROUND) CABLE TV
CCTV CLOSED CIRCUIT TV
UF UNIDENTIFIED FEATURE
UP UNIDENTIFIED PIPE
UC UNIDENTIFIED CABLE
UNPR UNPROVEN FEATURE
EW END OF TRACE
FW LATERAL CONNECTIONS
EXTENT OF SURVEY BY SURVEY OPERATIONS LTD.
EXTENT OF SURVEY BY SURVEY OPERATIONS LTD.(L BURIED FEATURE FOUND USING RADAR
FW CONNECTIVITY BETWEEN CHAMBERS
FW CCTV REPORT
BURIED FEATURE FOUND USING RADAR

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Where indicated, no allowance has been made for sub-surface entry into manholes, other chambers or confined spaces below ground level. Therefore any details relating to depths, sizes etc, are taken from the surface and as such will be approximate.

We have endeavoured to supply you with the most accurate data possible by using methods and equipment that are at the forefront of our industry. We have taken great care in the detection of pipework and buried features, but as with all methods of detecting underground or buried utilities the information provided is based on results obtained from electromagnetic techniques, and as such may be liable to distortion or errors beyond the reasonable control of the operator or his instruments.

It is the responsibility of the user under Health & Safety (HSG47) Guidelines to satisfy himself of the suspected location of any services prior to excavation of the services shown.

NOTE 1

This utility survey has been undertaken using:
A: Radiodetection RD4000 + RD4000 TID
B: Mala Geoscience Ground Probing Radar

NOTE 2

Power carrying features shown on this drawing are shown as an individual service line. This does not necessarily represent the number of cables actually present and it is possible that there could be multiple numbers of cables including HV, LV, communications transmission cables following the same trace line. These could be at different depths, the trace signal from the deeper cables being masked by signal emitted from the shallower service above. Cable runs could also be present running parallel to the single line shown.

WILMSLOW OLD ROAD

PINFOLD LANE

ONE WAY

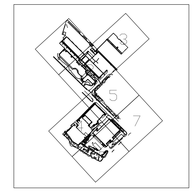
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Note:
The survey is plotted on a plane local Grid. Orientation to National Grid.
All levels relate to Ordnance Datum, achieved using the OS National GPS Network.

Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

SURVEY STATIONS

Name	Easting	Northing	Height
SO1	385501.42	384669.72	67.43
SO2	385581.23	384567.31	67.43
SO3	385804.98	384843.47	67.17
SO4	385817.17	384811.08	67.16
SO5	385918.47	384788.98	67.54
SO6	385954.27	384753.39	68.04
SO7	385984.83	384853.26	68.49
SO8	385926.80	384564.36	69.05
SO10	385967.57	384704.14	68.61



STANDARD REFERENCE & ABBREVIATIONS

(ARD).....Assumed Route
AB.....Air Brick
AV.....Air Valve
B/W.....Barbed Wire
BAR.....Barrier
BB.....Bellcote Beacon
BH.....Borehole
BL.....Bed Level
BOL.....Bollard
BS.....Bus Stop
BT Box.....British Telecom Box
BT.....British Telecom IC
BW.....Brick Retaining Wall
BWL.....Brick Wall
C/B.....Close Boarded
C/I.....Corrugated Iron
C/P.....Chestnut Paling
CB.....Control Box
CBW.....Concrete Block Wall
CCTV.....Closed Circuit TV
CD.....Cable Duct
CEL.....Cellar Light
CH/L.....Chain Link
CHY.....Chimney
CL.....Cover Level
CM.....Cable Marker
COL.....Column
CONC.....Concrete
CP.....Catch Pit
CRTW.....Concrete Retaining Wall
CTV.....Cable Television
CUL.....Culvert
CW.....Concrete Block Wall
DC.....Drainage Channel
DPC.....Damp Proof Course
DR.....Drain
DSW.....Dry Stone Wall
ECP.....Electricity Cable Pit
ECI.....Electricity Inspection Cover
Ex.....Expansion Joint
EJB.....Electricity Junction Box
EL SUB STN..Electricity Sub Station
EL.....Eaves Level
ELB.....Electricity Box
EP.....Electricity Pole
ER.....Earth Rod
ETL.....Electricity Transmission Line
FB.....Flower Bed
FH.....Fire Hydrant
FL.....Floor Level
FP.....Flagpole
G*.*.....Girth (of tree)
G.....Gulley
GAB.....Gabion
GIP.....Gas Inlet Pipe
GMKR.....Gas Marker
GST.....Gas Stop Tap (Domestic)
GSV.....Gas Stop Valve (Mains)
HSE.....Housing
HT.....Height
HV.....High Voltage
I/R.....Iron Railing
II.....Inspection Cover
IL.....Invert Level
IP.....Inlet Pipe
KO.....Kerb Outlet
LB.....Letter Box
LP.....Lamp Post
MG.....Multi-Girth
MH.....Manhole
MK.....Marker
MP.....Mooring Point
MP.....Street Name Plate
O/H.....Overhead
O/P.....Open Paling
OT.....Overhead Telecom Wire
OP.....Outfall Pipe
OSBM.....Ordnance Survey Bench Mark
PB.....Pillar Box
PC.....Pedestrian Crossing
PP.....Petrol Pump
PT.....Post or Pillar
RE.....Rodding Eye
RS.....Road Sign
RTW.....Retaining Wall
RWP.....Rain Water Pipe
SAP.....Sapling
SL.....Sump Level
SoL.....Soffit Level
SP.....Sign Post
SPL.....Springing Level
SRTW.....Stone Retaining Wall
SV.....Stop Valve (unspecified)
SVP.....Soil Vent Pipe
SW.....Stone Wall
TAC.....Tactile Paving
TB.....Traffic Bollard
TBM.....Temporary Bench Mark
TCB.....Telephone Call Box
TFR.....Taken From Records
TIE.....Anchor Point (Boats/Poles)
TL.....Traffic Light
TLB.....Traffic Light Control Box
TM.....Ticket Machine
TMC.....Tarmac
TP.....Telecommunications Pole
TPIT.....Trial Pit
TS.....Trash Screen
U/C.....Under Construction
U/G.....Underground
UM.....Unable to Lift (MH,IC etc)
UTS.....Unable to Survey
VDP.....Vehicle Detector Pad
VP.....Vent Pipe
W/W.....Wire Mesh
WL.....Water Level
WM.....Water Meter
WO.....Wash Out
WP.....Waste Pipe
WST.....Water Stop Tap (domestic)
WSV.....Water Stop Valve (mains)

Survey Operations
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Client
AECOM

Drawing Title
Utility Survey of Land at:
Building 401, 402 and Argosy Drive
Manchester Airport
Sheet 6 of 7

Scale(s)	1:200	Surveyor	Var
Date	Mar 22	Drawn	AC
Job Number	22B170 22A231 - 22A233	Checked	SO

Sheet Size & Drg Number & Revision
A0 22A231/006



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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
CCTV	CLOSED CIRCUIT TV
UI	UNIDENTIFIED FEATURE
UP	UNIDENTIFIED PIPE
UC	UNIDENTIFIED CABLE
UNPR	UNPROVEN FEATURE
SW	END OF TRACE
FW C	LATERAL CONNECTIONS
	EXTENT OF SURVEY BY SURVEY OPERATIONS LTD.
	EXTENT OF SURVEY BY SURVEY OPERATIONS LTD.()
⊗0.0d	BURIED FEATURE FOUND USING RADAR
FW / SW	CONNECTIVITY BETWEEN CHAMBERS FROM CCTV REPORT
	BURIED FEATURE FOUND USING RADAR

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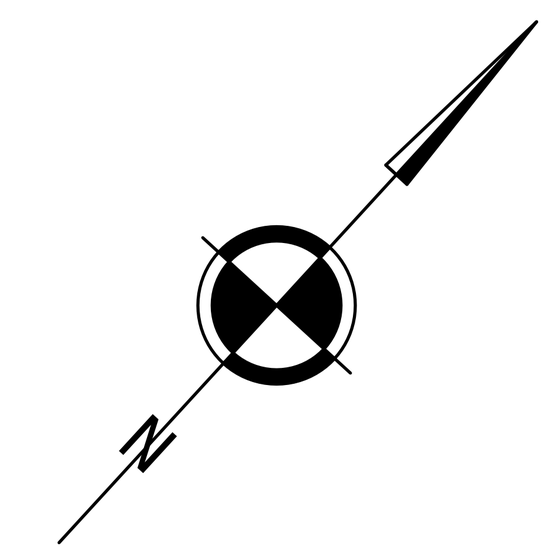
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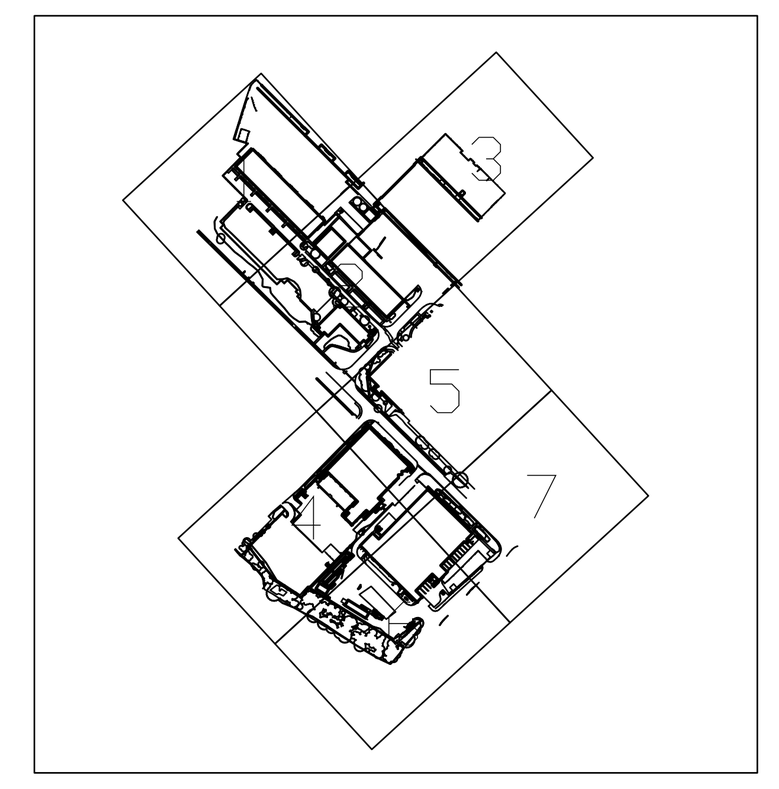


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Name	Easting	Northing	Height
SO1	380948.22	384937.07	68.18
SO2	380907.82	384888.07	67.43
SO3	380881.67	384868.62	67.47
SO4	380856.96	384849.15	67.11
SO5	380871.21	384811.47	67.10
SO6	380918.01	384788.29	67.54
SO7	380953.17	384770.96	68.30
SO8	380984.86	384805.96	68.66
SO9	381026.85	384846.04	69.09
SO10	380963.87	384904.15	68.69



STANDARD REFERENCE & ABBREVIATIONS

(AR)........Assumed Route	IL..........Invert Level
AB..........Air Brick	IP..........Inlet Pipe
AV..........Air Valve	KO..........Kerb Outlet
B/W.........Barbed Wire	LB..........Letter Box
BAR.........Barrier	LP..........Lamp Post
BB..........Belisha Beacon	MG..........Multi-Girth
BH..........Borehole	MH..........Manhole
BL..........Bed Level	MKR.........Marker
BOL.........Bollard	MP..........Mooring Point
BS..........Bus Stop	NP..........Street Name Plate
BT Box......British Telecom Box	O/H.........Overhead
BT..........British Telecom IC	O/P.........Open Paling
BRTW........Brick Retaining Wall	OE..........Overhead Electric Wire
BW..........Brick Wall	OP..........Outfall Pipe
C/B.........Close Boarded	OSBM........Ordnance Survey Bench Mark
C/I.........Corrugated Iron	OT..........Overhead Telecom Wire
C/P.........Chestnut Paling	P/C.........Post & Chain
CB..........Control Box	P/R.........Post & Rail
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G*.*........Girth (of tree)	U/G.........Underground
G...........Gulley	UTL.........Unable to Lift (MH,IC etc)
GAB.........Gabion	UTS.........Unable to Survey
GIP.........Gas Inlet Pipe	VDP.........Vehicle Detector Pad
GMKR........Gas Marker	VP..........Vent Pipe
GST.........Gas Stop Tap (Domestic)	W/M.........Wire Mesh
GSV.........Gas Stop Valve (Mains)	WL..........Water Level
HSE.........Housing	WM..........Water Meter
Ht..........Height	WO..........Wash Out
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I/R.........Iron Railing	WST.........Water Stop Tap (domestic)
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SurveY OPERATIONS

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Sheet 7 of 7

Scale(s)	1:200	Surveyor	Var
Date	Mar 22	Drawn	AC
Job Number	22B170 22A231-22A233	Checked	SO

Sheet Size & Drg Number & Revision
A0 22A231/007

APPENDICES

APPENDIX A – REPORT CONDITIONS

APPENDIX A - REPORT CONDITIONS

GROUND INVESTIGATION

This report is produced solely for the benefit of Manchester Airport Group 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

TETRA TECH

Project: **Argosy Drive**

Location: **Manchester Airport**

Client: **Manchester Airport Group**

Location Details			
Easting:	53.36	Northing:	-2.29
Level:		Depth:	6.30m
Logger:	JM	Type:	CP
		Inclination:	90°

Status: FINAL

Borehole Number: **BH01**

Sheet 1 of 1

Method, Plant and Crew				
From (m)	To (m)	Type	Plant Used	Crew
0.00	1.20	Inspection Pit	Hand Excavated	KR / GJ-C
1.20	6.30	Cable Percussion	Dando	KR/ GJ-C

Diameter	
Depth (m)	Diam (mm)
1.20	300
6.30	150

Casing	
Depth(m)	Diam (mm)
6.00	150

Drilling Progress by Time				
Date	Time	Depth (m)	Casing (m)	Water (m)

Scale: 1:50
Checked By: SB
Approved By: GR
Start Date: 23/06/2022
Finish Date: 24/06/2022

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Grass over very soft brown slightly gravelly very silty organic SAND. Gravel is angular to subangular fine to medium brick and red mudstone.		0.15				0.10 0.20	D1 B2	
MADE GROUND: Brown silty sandy angular to subangular fine to medium GRAVEL of sandstone and mudstone.						0.50 - 0.60	ES1	
MADE GROUND: Firm brown slightly gravelly CLAY. Gravel is angular to subangular fine to medium mudstone (Reworked Natural).		0.80				1.10 1.20	D3 B4	
Firm reddish brown mottled grey slightly gravelly CLAY. Gravel is angular to subangular fine mudstone.		1.50				1.50 1.50 - 2.00	D5 B6	SPT(S) 1.50m, N=11 (2,3/2,3,3,3)
Firm reddish brown mottled bluish grey CLAY.		1.90				1.90 - 2.00 2.20 2.50 - 2.95 3.00 3.20 3.50 3.50 - 4.00 4.20 4.50 - 4.95	ES2 D7 U8 D9 B10 D11 B12 D13 U14	Ublows=41 Recovery=100% SPT(S) 3.50m, N=9 (2,2/3,2,2,2) Ublows=21 Recovery=90%
Stiff to very stiff reddish brown mottled bluish grey slightly gravelly CLAY. Gravel is angular fine to medium mudstone.		4.80				5.00 5.20 5.50	D15 B16 D17	SPT(S) 5.50m, 50 (25 for 136mm/50 for 61mm)
Grey weathered MUDSTONE.		6.00				6.00	D18	SPT(S) 6.00m, 50 (56 for 134mm/50 for 86mm)
EOH at 6.30m - Terminated due to SPT refusal.		6.30						

Observations / Remarks

1. Exploratory hole completed at 6.30m bgl due to SPT refusal.
2. Upon completion exploratory hole was backfilled with bentonite.
3. No groundwater encountered.

Chiselling		
From (m)	To (m)	Time (mins)
5.65	6.00	60

Water Added	
From (m)	To (m)
1.20	6.00

Hammer Information	
Serial No.	Energy Ratio %
AR3152	62

Groundwater					
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks

Project Number: **784-B038962**

TETRA TECH

Project: **Argosy Drive**

Location: **Manchester Airport**

Client: **Manchester Airport Group**

Location Details			
Easting:	53.36	Northing:	-2.29
Level:		Depth:	4.90m
Logger:	JM	Type:	CP
		Inclination:	90°

Status: FINAL

Borehole Number: **BH02**

Sheet 1 of 1

Method, Plant and Crew				
From (m)	To (m)	Type	Plant Used	Crew
0.00	1.20	Inspection Pit	Hand Excavated	KR / KF
1.20	4.90	Cable Percussion	Dando	KR / KF

Diameter	
Depth (m)	Diam (mm)
1.20	300
4.90	150

Casing	
Depth(m)	Diam (mm)
4.90	150

Drilling Progress by Time				
Date	Time	Depth (m)	Casing (m)	Water (m)

Scale: 1:50
Checked By: SB
Approved By: GR
Start Date: 27/06/2022
Finish Date: 27/06/2022

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Black Asphalt.						0.10	D1	
MADE GROUND: Light grey silty sandy GRAVEL. Sand is medium to coarse. Gravel is angular to subangular fine to coarse sandstone.		0.20				0.20	B2	
						0.20 - 0.30	ES1	
Soft low strength reddish brown slightly sandy slightly gravelly silty CLAY. Sand is fine. Gravel is angular to subrounded fine to medium mudstone (GLACIAL TILL).		1.00				1.10	D3	
						1.20	B4	
						1.50	D5	SPT(S) 1.50m, 7 (2,2/,2,2,3)
						1.50 - 1.60	ES2	
						1.50 - 2.00	B6	
						2.20	D7	
Triaxial @ 2.5mbgl: Cu = 25kN/m2.						2.50 - 2.95	U8	Ublows=419 Recovery=100%
						3.00	D9	
						3.20	B10	
3.50m, Locally very soft.						3.50	D11	SPT(S) 3.50m, N=1 (1,0/0,0,1,0)
						3.50 - 4.00	B12	
				▼		4.20	D13	
Stiff reddish brown mottled bluish grey gravelly CLAY. Gravel is angular to subrounded fine to medium mudstone (GLACIAL TILL).		4.40				4.50	D14	SPT(S) 4.50m, 50 (25 for 69mm/50 for 58mm)
Weathered reddish brown/grey MUDSTONE.		4.60						
EOH at 4.90m - Terminated due to SPT refusal.		4.90						

Observations / Remarks

1. Exploratory hole completed at 4.90m bgl due to SPT refusal.
2. Upon completion exploratory hole was backfilled with bentonite.
3. Groundwater was encountered at 4.30m bgl.

Chiselling		
From (m)	To (m)	Time (mins)
4.60	4.90	60

Water Added	
From (m)	To (m)
1.20	4.30

Hammer Information	
Serial No.	Energy Ratio %
AR3152	62

Groundwater					
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks
4.30	-	-	20	4.30	

Project Number: **784-B038962**

TETRA TECH

Project: **Argosy Drive**

Location: **Manchester Airport**

Client: **Manchester Airport Group**

Location Details			
Easting:	52.36	Northing:	-2.29
Level:		Depth:	4.56m
Logger:	JM	Type:	CP
		Inclination:	90°

Status: FINAL

Borehole Number: **BH03**

Sheet 1 of 1

Method, Plant and Crew				
From (m)	To (m)	Type	Plant Used	Crew
0.00	1.20	Inspection Pit	Hand Excavated	KR / GJ-C
1.20	4.56	Cable Percussion	Dando	KR / GJ-C

Diameter		Casing	
Depth (m)	Diam (mm)	Depth(m)	Diam (mm)
1.20	300	4.40	150
4.56	150		

Drilling Progress by Time				
Date	Time	Depth (m)	Casing (m)	Water (m)

Scale:	1:50
Checked By:	SB
Approved By:	GR
Start Date:	28/06/2022
Finish Date:	28/06/2022

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Grass over brown sandy gravelly SILT. Gravel is fine to coarse, angular to subangular brick, sandstone and concrete.		0.10				0.10	D1	
						0.20	B2	
MADE GROUND: Brown very gravelly silty SAND with occasional rootlets. Sand is fine to medium. Gravel is angular to subangular fine to coarse sandstone, brick and concrete.								
Degraded plastic sheeting at 0.70m bgl.								
Soft to firm brown mottled grey slightly sandy slightly gravelly silty CLAY. Sand is fine. Gravel is angular to subrounded fine to medium mudstone (GLACIAL TILL).		1.00				1.10	D3	
						1.20	B4	
						1.50	D5	SPT(S) 1.50m, N=10 (2,3/2,3,3,2)
						1.50 - 2.00	B6	
						2.20	D7	
						2.50 - 2.95	U8	Ublows=19 Recovery=100%
						3.00	D9	
						3.20	B10	
						3.50	D11	SPT(S) 3.50m, N=1 (1,0/0,1,0,0)
						3.50 - 4.00	B12	
Weathered reddish brown/grey MUDSTONE.		4.00				4.20	D13	SPT(S) 4.20m, 50 (25 for 92mm/50 for 114mm)
						4.40	D14	SPT(S) 4.40m, 50 (50 for 115mm/50 for 46mm)
EOH at 4.56m - Terminated due to SPT refusal.		4.56						

Observations / Remarks

1. Exploratory hole completed at 4.56m bgl due to SPT refusal.
2. Upon completion the exploratory hole was installed with 1.00m of plain and 3.00m of slotted pipe for gas and groundwater monitoring.
3. Groundwater was encountered at 4.00m bgl.

Chiselling		
From (m)	To (m)	Time (mins)
4.20	4.40	60

Water Added	
From (m)	To (m)
1.20	4.00

Hammer Information	
Serial No.	Energy Ratio %
AR3152	62

Groundwater					
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks
4.00	-	-	20	4.00	

Project Number: **784-B038962**

TETRA TECH

Project: **Argosy Drive**

Location: **Manchester Airport**

Client: **Manchester Airport Group**

Location Details			
Easting:	53.36	Northing:	-2.29
Level:		Depth:	4.70m
Logger:	JM	Type:	WS
		Inclination:	90°

Status: FINAL

Borehole Number: **WS01**

Sheet 1 of 1

Method, Plant and Crew					Diameter		Casing		Groundwater						Remarks
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose To (m)	Time (mins)		
0.00	1.20	Inspection Pit	Hand Excavated	MacGeo	1.20	300									
1.20	4.70	Window Sampler	Archway Competitor	MacGeo	4.70	101									

Scale: 1:50
Checked By: SB
Approved By: GR
Start Date: 23/06/2022
Finish Date: 23/06/2022

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Black Asphalt.								
MADE GROUND: Light yellowish brown gravelly SAND. Gravel is angular to subangular fine to coarse yellow sandstone.		0.15				0.50 - 0.60	ES1	
MADE GROUND: Firm dark brown slightly sandy gravelly CLAY. Gravel is angular to subangular fine to medium mudstone and sandstone.		1.10				1.20 - 1.65	D1	SPT(S) 1.20m, N=11 (2,2/2,2,3,4)
						1.50 - 1.60	ES2	
Firm reddish brown mottled bluish grey slightly gravelly silty CLAY. Gravel is angular to subangular fine to medium mudstone. (GLACIAL TILL)		1.70				1.70 - 2.00	B6	
						2.00 - 2.45	D2	SPT(S) 2.00m, N=11 (2,2/2,3,3,3)
						3.00 - 3.45	D3	SPT(S) 3.00m, N=9 (2,2/1,2,3,3)
Bluish grey angular to subangular fine to medium GRAVEL of mudstone (GLACIAL TILL).		3.60						
Stiff reddish brown mottled bluish grey silty CLAY (GLACIAL TILL).		3.70				4.00	D5	SPT(S) 4.00m, N=18 (4,5/7,4,4,3)
						4.00 - 4.45	D4	
EOH at 4.70m - Terminated due to SPT refusal.		4.70						SPT(S) 4.70m, 50 (25 for 115mm/50 for 55mm)

Observations / Remarks

1. Exploratory hole completed at 4.70m bgl due to SPT refusal.
2. Upon completion the exploratory hole was installed with 1.00m of plain and 3.70m of slotted pipe for gas and groundwater monitoring.
3. Groundwater was not encountered.

Sampling Runs

From (m)	To (m)	Diam (mm)	Recovery %	Remarks
1.20	2.00	101	100	
2.00	3.00	87	100	
3.00	4.00	77	90	
4.00	4.70	77	60	

Hammer Information

Serial No.	Energy Ratio %
AR3152	62

Project Number: **784-B038962**

TETRA TECH

Project: **Argosy Drive**

Location: **Manchester Airport**

Client: **Manchester Airport Group**

Location Details			
Easting:	56.36	Northing:	-2.29
Level:		Depth:	4.80m
Logger:	JM	Type:	WS
		Inclination:	90°

Status: FINAL

Borehole Number: **WS02**

Sheet 1 of 1

Method, Plant and Crew					Diameter		Casing		Groundwater						Remarks
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose To (m)	Time (mins)		
0.00	1.20	Inspection Pit	Hand Excavated	MacGeo	1.20	300			4.45	-	-	2.30	20		
1.20	4.80	Window Sampler	Archway Competitor	MacGeo	4.80	101									

Scale: 1:50
Checked By: SB
Approved By: GR
Start Date: 23/06/2022
Finish Date: 24/06/2022

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Black Asphalt.		0.15						
MADE GROUND: Light yellowish brown gravelly fine to coarse SAND with high cobble content. Gravel is angular to subangular fine to coarse sandstone. Cobbles are subangular to subrounded of sandstone.		0.50				0.50 - 0.60	ES1	
MADE GROUND: Medium dense brown gravelly fine to coarse SAND with a high cobble content. Gravel is angular to subangular fine to coarse sandstone. Cobbles are subangular to subrounded of subangular of sandstone (Reworked Natural).						1.20 - 1.65	D1	SPT(S) 1.20m, N=29 (10,7/11,8,7,3)
Soft to firm reddish brown mottled bluish grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to medium mudstone (GLACIAL TILL)		1.60				1.80 - 1.90	ES2	
Firm to stiff reddish brown slightly gravelly silty CLAY. Gravel is angular to subangular fine to medium mudstone (GLACIAL TILL).		1.80				2.00 - 2.45 2.00 - 2.50	D2 B6	SPT(S) 2.00m, N=11 (2,2/2,3,3,3)
Medium dense bluish grey slightly clayey medium to coarse SAND (GLACIAL TILL).		2.60				3.00 - 3.45	D3	SPT(S) 3.00m, N=12 (2,2/2,3,4,3)
Stiff to very stiff, reddish brown mottled bluish grey slightly gravelly sandy CLAY. Gravel is angular to subangular fine to medium mudstone (GLACIAL TILL)		3.20				4.00 - 4.45	D4	SPT(S) 4.00m, N=28 (2,2/2,3,4,19)
						4.55 - 4.80	D5	SPT(S) 4.55m, 50 (25 for 125mm/50 for 80mm)
EOH at 4.80m - Terminated due to SPT refusal.		4.80						

1 2 3 4 5 6 7 8 9 10

Observations / Remarks

1. Exploratory hole completed at 4.80m bgl due to SPT refusal.
2. Upon completion the exploratory hole was installed with 1.00m of plain and 3.55m of slotted pipe for gas and groundwater monitoring.
3. Groundwater was encountered at 4.45m rising to 2.30m bgl.

Sampling Runs

From (m)	To (m)	Diam (mm)	Recovery %	Remarks
1.20	2.00	101	100	
2.00	3.00	87	100	
3.00	4.00	87	100	
4.00	4.55	77	100	

Hammer Information

Serial No.	Energy Ratio %
AR3152	62

Project Number: **784-B038962**

TETRA TECH

Project: **Argosy Drive**

Location: **Manchester Airport**

Client: **Manchester Airport Group**

Location Details			
Easting:	53.36	Northing:	-2.29
Level:		Depth:	4.23m
Logger:	JM	Type:	WS
		Inclination:	90°

Status: FINAL

Borehole Number: **WS03**

Sheet 1 of 1

Method, Plant and Crew					Diameter		Casing		Groundwater						Remarks
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose To (m)	Time (mins)		
0.00	1.20	Inspection Pit	Hand Excavated	MacGeo	1.20	300									
1.20	4.23	Window Sampler	Archway Competitor	MacGeo	4.23	101			3.45	-	-	3.40	20		

Scale: 1:50
Checked By: SB
Approved By: GR
Start Date: 24/06/2022
Finish Date: 24/06/2022

Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing: Depth (m)	Ref	Tests / Results
MADE GROUND: Grass over dark brown slightly sandy gravelly SILT with frequents rootlets. Gravel is angular to subrounded fine to medium mudstone.		0.20						
MADE GROUND: Soft to firm dark brown slightly sandy gravelly CLAY with a high cobble content. Gravel is angular to subrounded fine to coarse mudstone and sandstone. Cobbles are subangular to subrounded of sandstone.						0.50 - 0.60	ES1	
Plastic sheeting at 0.60m bgl.								
Firm to stiff reddish brown mottled bluish grey slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is sub angular fine to medium mudstone (GLACIAL TILL).		1.20				1.20 - 1.65	D1	SPT(S) 1.20m, N=12 (1,2/3,3,3,3)
						1.50 - 1.60	ES2	
						2.00 - 2.45	D2	SPT(S) 2.00m, N=9 (1,2/1,4,2,2)
						2.00 - 2.50	B5	
Becomes very stiff.						3.00 - 3.45	D3	SPT(S) 3.00m, N=18 (2,2/4,4,4,6)
Very stiff reddish brown mottled bluish grey CLAY (GLACIAL TILL).		3.95				3.95 - 4.23	D4	SPT(S) 3.95m, 50 (9,14/50 for 205mm)
EOH at 4.23m - Terminated due to SPT refusal.		4.23						

Observations / Remarks

1. Exploratory hole completed at 4.23m bgl due to SPT refusal.
2. Upon completion the exploratory hole was installed with 1.00m of plain and 3.00m of slotted pipe for gas and groundwater monitoring.
3. Groundwater was encountered at 3.40m bgl.

Sampling Runs

From (m)	To (m)	Diam (mm)	Recovery %	Remarks
1.20	2.00	101	100	
2.00	3.00	87	100	
3.00	3.95	87	100	

Hammer Information

Serial No.	Energy Ratio %
AR3152	62

Project Number: **784-B038962**

ARCHWAY ENGINEERING (UK) LIMITED

AINLEYS INDUSTRIAL ESTATE, ELLAND, WEST YORKSHIRE HX5 9JP
TEL: 01422 373101 FAX: 01422 374947
Email: info@archway-engineering.com

REPORT OF A THOROUGH EXAMINATION OF LIFTING EQUIPMENT

Name and Address for whom the examination was made:	Address of the premises at which the examination was made:
MACGEO LTD GRAYLAW BUISNESS PARK SKELMERSDALE LANCASHIRE WN8 9TA	Archway Engineering (UK) Ltd Ainleys Industrial Estate, Elland, West Yorkshire HX5 9JP
Report Number: AR3152 Sales order Ref: 78724 Date of Report: 17.01.2022	Latest date by which the next thorough examination should be carried out: 16.07.2022

Quantity	ID number		Test weight	SWL	Date of test
1	AR3152	AUTO TRIP HAMMER OUTER SLEEVE	635KG	300KG	17.01.2022

Was this equipment:					Was the examination carried out:				
Supplied new:	Yes		No	X	Before being issued for the first time	Yes		No	X
Supplied reconditioned:	Yes		No	X	Within an interval of 6 months	Yes	X	No	
Examined only:	Yes		No	X	Within an interval of 12 months	Yes		No	X
Examined and tested:	Yes	X	No		As part of an examination scheme	Yes		No	X
Examined, repaired and tested	Yes		No	X	After an exceptional circumstance	Yes		No	X

Identification of any part found to have a defect which is or could become a danger to persons and a description of the defect. (If no defects found state "NONE")

Is the above defect a defect which is of immediate danger to persons	Yes		No	X
If the defect is not an immediate danger to persons state required rectification date:				

Particulars of any repair, renewal or alteration required to remedy the defect identified above:

IS THE EQUIPMENT [redacted]

Name of person making this report:
TRAINEE FITTER
M.TONER

This report complies with the requirements of th [redacted] **98**
The EC Declaration of conformity is available if the equipment is new and manufactured and supplied by Archway Engineering (UK) Limited

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP

SPT Hammer Ref:	AR3152
Test Date:	17/01/2022
Report Date:	17/01/2022
File Name:	AR3152.spt
Test Operator:	MT

Instrumented Rod Data

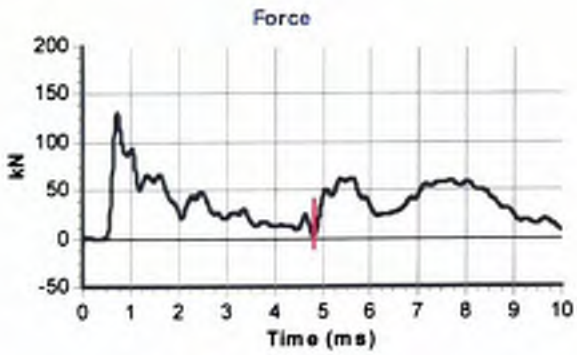
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	200
Accelerometer No.1:	7080
Accelerometer No.2:	11609

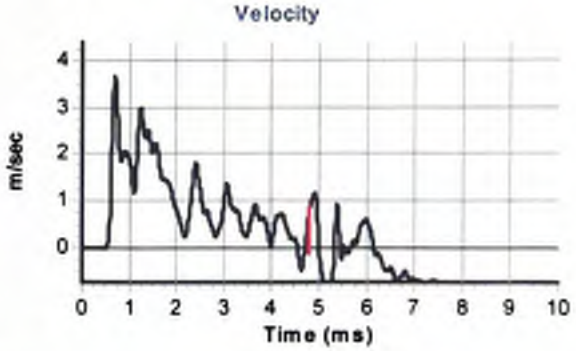
SPT Hammer Information

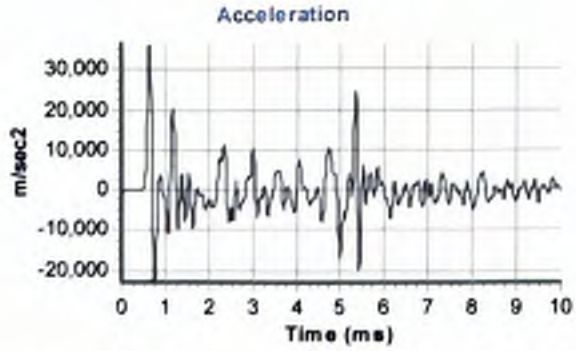
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	10.0

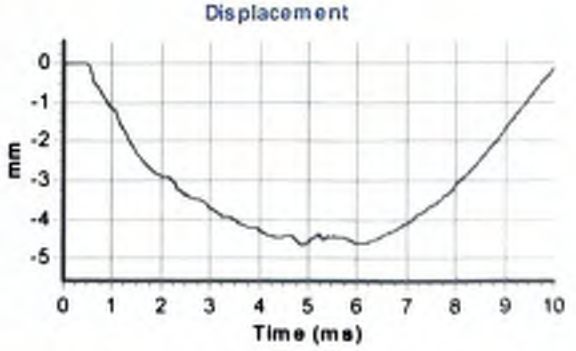
Comments / Location

MACGEO LTD - 78724









Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	292

Energy Ratio E_r (%): **62**

[redacted]

Signed: M.TONER

Title: TRAINEE FITTER

[redacted]

The recommended calibration interval is 12 months

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Tetra Tech

STANDARD PENETRATION TEST SUMMARY

Project Number:	784-B038962	Project Title:	Argosy Drive, Manchester Airport
Client:	Manchester Airport Group (MAG)	Date:	22/07/2022

Hole ID	Hole Type	SPT Depth	Seating Blows	Main Drive Blows	SPT Type	Uncorrected SPT "N" Value	Hammer Energy Ratio	Corrected SPT "N" Value	Rod Correction SPT Value	Strata Type
		m bgl	No	No			%	N60	N60	
BH01	CP	3.5	4	N=9 (2,2/3,2,2,2)	S	9	62	9	7	DEVENSIAN TILL
BH01	CP	6	56	50 (56 for 134mm/50 for 86mm)	S	50	62	52	49	MUDSTONE
BH01	CP	1.5	5	N=11 (2,3/2,3,3,3)	S	11	62	11		MADE GROUND
BH01	CP	5.5	25	50 (25 for 136mm/50 for 61mm)	S	50	62	52	44	DEVENSIAN TILL
BH02	CP	3.5	1	N=1 (1,0/0,0,1,0)	S	1	62	1	1	DEVENSIAN TILL
BH02	CP	4.5	25	50 (25 for 69mm/50 for 58mm)	S	50	62	52	44	DEVENSIAN TILL
BH02	CP	1.5	4	7 (2,2/,2,2,3)	S	7	62	7		DEVENSIAN TILL
BH03	CP	3.5	1	N=1 (1,0/0,1,0,0)	S	1	62	1	1	DEVENSIAN TILL
BH03	CP	4.4	50	50 (50 for 115mm/50 for 46mm)	S	50	62	52	44	MUDSTONE
BH03	CP	1.5	5	N=10 (2,3/2,3,3,2)	S	10	62	10		DEVENSIAN TILL
BH03	CP	4.2	25	50 (25 for 92mm/50 for 114mm)	S	50	62	52	44	MUDSTONE
WS01	WS	4.7	25	50 (25 for 115mm/50 for 55mm)	S	50	62	52	44	DEVENSIAN TILL
WS01	WS	1.2	4	N=11 (2,2/2,2,3,4)	S	11	62	11		MADE GROUND
WS01	WS	2	4	N=11 (2,2/2,3,3,3)	S	11	62	11		DEVENSIAN TILL
WS01	WS	4	9	N=18 (4,5/7,4,4,3)	S	18	62	19	16	DEVENSIAN TILL
WS01	WS	3	4	N=9 (2,2/1,2,3,3)	S	9	62	9	7	DEVENSIAN TILL
WS02	WS	3	4	N=12 (2,2/2,3,4,3)	S	12	62	12	9	DEVENSIAN TILL
WS02	WS	1.2	17	N=29 (10,7/11,8,7,3)	S	29	62	30		DEVENSIAN TILL
WS02	WS	2	4	N=11 (2,2/2,3,3,3)	S	11	62	11		DEVENSIAN TILL
WS02	WS	4	4	N=28 (2,2/2,3,4,19)	S	28	62	29	25	DEVENSIAN TILL
WS02	WS	4.55	25	50 (25 for 125mm/50 for 80mm)	S	50	62	52	44	DEVENSIAN TILL
WS03	WS	3	4	N=18 (2,2/4,4,4,6)	S	18	62	19	14	DEVENSIAN TILL
WS03	WS	1.2	3	N=12 (1,2/3,3,3,3)	S	12	62	12		DEVENSIAN TILL
WS03	WS	2	3	N=9 (1,2/1,4,2,2)	S	9	62	9		DEVENSIAN TILL
WS03	WS	3.95	23	50 (9,14/50 for 205mm)	S	50	62	52	39	DEVENSIAN TILL

APPENDIX C – GAS MONITORING

Client MAG
Project ARGOSY DRIVE, MANCHESTER AIRPORT
Job Number B038962

Date 19/07/22 **Start** 14:00 **End** 14:30 **By** SG **AP Trend** RISING **Weather** SUNNY

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

Background (start) **CH_4** 0.2 **CO_2** 0.0 **O_2** 19.5% **AP** 1002

Background (end) **CH_4** 0.2 **CO_2** 0.0 **O_2** 19.6% **AP** 1002

Installation	BH Pressure	CH_4 (% vol)			CO_2 (% vol)			O2 (% vol)			CO (ppm)	H_2S (ppm)	PID		Flow Rate (l/hr)		Atmospheric Pressure (mbar)	Depth to Water (mbgl)	Depth to Base (mbgl)	Remarks
	mb	Peak	Min	Steady	Peak	Min	Steady	Peak	Min	Steady	Peak	Peak	Peak	Steady	Peak	Steady				
WS01	0.14	0.2	0.1	0.2	5.8	0.0	5.7	19.7	19.6	19.7	2.0	1.0	1.4	1.3	-0.3	-0.2	1002	2.53	4.40	SAB
WS02	0.15	0.2	0.2	0.2	2.8	0.3	2.8	19.0	17.8	17.8	1.0	1.0	2.0	2.0	-0.3	-0.1	1002	*	*	**Bung pushed in. cannoy get water readings.*
WS03	0.14	0.2	0.1	0.2	5.8	0.0	5.7	19.6	15.7	15.7	2.0	1.0	1.4	1.3	-0.3	-0.2	1002	1.56	3.85	SAB
BH03	0.12	0.2	0.2	0.2	1.7	0.1	1.7	19.6	18.3	18.4	4.0	3.0	3.3	2.9	-0.5	-0.1	1002	1.66	3.85	SAB

SAB= Silty at base
WAB= wet at base

Client MAG
Project ARGOSY DRIVE, MANCHESTER AIRPORT
Job Number B038962

Date 27/07/22 **Start** 11:00 **End** 12:00 **By** SG **AP Trend** Steady **Weather** Fair

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

Background (start) **CH_4** 0.2 **CO_2** 0.2 **O_2** 20.8% **AP** 1012

Background (end) **CH_4** 0.2 **CO_2** 0.2 **O_2** 20.8% **AP** 1012

Installation	BH Pressure	CH_4 (% vol)			CO_2 (% vol)			O2 (% vol)			CO (ppm)	H_2S (ppm)	PID		Flow Rate (l/hr)		Atmospheric Pressure (mbar)	Depth to Water (mbgl)	Depth to Base (mbgl)	Remarks
	mb	Peak	Min	Steady	Peak	Min	Steady	Peak	Min	Steady	Peak	Peak	Peak	Steady	Peak	Steady				
WS01	-0.15	0.2	0.1	0.1	6.0	2.0	6.0	18.6	2.0	16.4	0.0	1.0	0.1	0.0	-0.1	0.0	1012	2.31	4.50	SAB
WS02	-0.21	0.2	0.2	0.2	2.9	0.2	2.8	21.1	18.9	18.9	0.0	0.0	0.1	0.0	-0.3	-0.1	1012	1.96	4.65	*0*
WS03	-0.12	0.2	0.2	0.2	1.5	1.4	1.5	19.0	18.5	18.4	0.0	1.0	1.0	0.6	-0.2	-0.1	1012	1.22	3.61	SAB
BH03	-0.17	0.2	0.1	0.1	1.6	0.1	1.6	20.0	19.1	19.0	10.0	1.0	0.5	0.5	-0.2	-0.1	1012	1.5	3.67	SAB

SAB= Silty at base
WAB= wet at base

Client MAG
Project ARGOSY DRIVE, MANCHESTER AIRPORT
Job Number B038962

Date 02/08/2022 **Start** 15:00 **End** 16:00 **By** SG **AP Trend** Falling **Weather** Fair

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

Background (start) **CH_4** 0.2 **CO_2** 0.2 **O_2** 20.1% **AP** 1002

Background (end) **CH_4** 0.2 **CO_2** 0.2 **O_2** 20.2% **AP** 1002

Installation	BH Pressure	CH_4 (% vol)			CO_2 (% vol)			O2 (% vol)			CO (ppm)	H_2S (ppm)	PID		Flow Rate (l/hr)		Atmospheric Pressure (mbar)	Depth to Water (mbgl)	Depth to Base (mbgl)	Remarks
	mb	Peak	Min	Steady	Peak	Min	Steady	Peak	Min	Steady	Peak	Peak	Peak	Steady	Peak	Steady				
WS01	-0.02	0.2	0.2	0.2	1.0	0.3	1.0	20.3	20.0	20.2	0.0	1.0	1.1	0.7	-0.2	-0.1	1002	1.4`	3.84	-
WS02	-0.07	0.2	0.2	0.2	6.3	0.1	5.9	20.4	16.5	16.6	0.0	1.0	0.3	0.2	-0.1	-0.1	1002	2.36	4.35	*SAB*
WS03	-0.04	0.2	0.2	0.2	3.5	1.2	3.5	19.7	19.0	17.7	1.0	0.0	0.8	0.7	-0.2	-0.1	1002	1.75	4.48	SAB
BH03	-0.14	0.2	0.2	0.2	1.4	0.1	1.4	20.9	19.6	19.7	5.0	0.0	0.9	0.8	-0.2	-0.1	1002	1.53	3.78	SAB

SAB= Silty at base
WAB= wet at base

Client MAG
Project ARGOSY DRIVE, MANCHESTER AIRPORT
Job Number B038962

Date 23/8/22 **Start** 15:00 **End** 16:00 **By** JM **AP Trend** Rising **Weather** Sunny

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

Background (start) **CH_4** 0.2 **CO_2** 0.1 **O_2** 20.3% **AP** 1011

Background (end) **CH_4** 0.2 **CO_2** 0.1 **O_2** 20.3% **AP** 1012

Installation	BH Pressure	CH_4 (% vol)			CO_2 (% vol)			O2 (% vol)			CO (ppm)	H_2S (ppm)	PID		Flow Rate (l/hr)		Atmospheric Pressure (mbar)	Depth to Water (mbgl)	Depth to Base (mbgl)	Remarks
	mb	Peak	Min	Steady	Peak	Min	Steady	Peak	Min	Steady	Peak	Peak	Peak	Steady	Peak	Steady				
WS01	-0.05	0.2	0.2	0.2	1.2	0.2	0.9	20.1	19.7	20.0	0.0	0.0	1.4	0.8	-0.1	0.0	1011	1.81	4.42	SAB
WS02	-0.11	0.2	0.2	0.2	3.5	0.1	3.1	20.3	15.9	16.1	0.0	0.0	0.5	0.3	-0.1	-0.1	1011	2.54	4.41	SAB
WS03	-0.02	0.2	0.2	0.2	2.3	1.1	1.8	18.1	17.1	17.1	1.0	0.0	0.9	0.5	-0.3	0.0	1012	2.01	4.46	SAB
BH03	-0.18	0.2	0.2	0.2	0.9	0.4	0.4	19.1	18.0	18.0	3.0	2.0	1.1	0.6	-0.2	0.0	1012	1.89	3.80	SAB

SAB= Silty at base
WAB= wet at base

APPENDIX D – ENVIRONMENTAL TESTING RESULTS

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

Attention :	Josh Montague
Date :	5th July, 2022
Your reference :	B038962
Our reference :	Test Report 22/10550 Batch 1
Location :	Argosy Drive
Date samples received :	28th June, 2022
Status :	Final Report
Issue :	1

Eight samples were received for analysis on 28th June, 2022 of which eight 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.

[redacted]

Liza Klebe
Project Co-ordinator

Please include all sections of this report if it is reproduced

Client Name: Tetra Tech
Reference: B038962
Location: Argosy Drive
Contact: Josh Montague
EMT Job No: 22/10550

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			LOD/LOR	Units	Method No.
Sample ID	BH01	BH01	WS01	WS01	WS02	WS02	WS03	WS03					
Depth	0.50-0.60	1.90-2.00	0.50-0.60	1.50-1.60	0.50-0.60	1.80-1.90	0.50-0.60	1.50-1.60					
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					
Sample Date	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	28/06/2022	28/06/2022	28/06/2022	28/06/2022	28/06/2022	28/06/2022	28/06/2022	28/06/2022					
Arsenic #	10.4	1.7	1.1	9.4	0.8	6.7	4.9	23.1			<0.5	mg/kg	TM30/PM15
Beryllium	1.1	1.6	<0.5	1.4	<0.5	1.5	0.8	2.2			<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	0.8	<0.1	0.5	<0.1	<0.1	<0.1			<0.1	mg/kg	TM30/PM15
Chromium #	48.2	43.2	8.8	51.1	14.1	43.9	35.2	45.0			<0.5	mg/kg	TM30/PM15
Copper #	26	30	3	21	46	16	12	15			<1	mg/kg	TM30/PM15
Lead #	52	<5	9	25	11	5	8	<5			<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM30/PM15
Nickel #	20.8	35.3	4.3	28.5	4.9	27.4	15.6	46.4			<0.7	mg/kg	TM30/PM15
Selenium #	1	2	<1	1	<1	<1	<1	2			<1	mg/kg	TM30/PM15
Vanadium	31	40	3	39	3	31	22	50			<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.7	0.7	<0.1	1.0	0.2	0.2	0.2	0.5			<0.1	mg/kg	TM74/PM32
Zinc #	81	77	18	76	14	37	38	85			<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	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<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	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.14	<0.03	<0.03	<0.03	<0.03	<0.03	0.07	<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	mg/kg	TM4/PM8
Fluoranthene #	0.31	<0.03	<0.03	0.09	<0.03	<0.03	0.10	<0.03			<0.03	mg/kg	TM4/PM8
Pyrene #	0.30	<0.03	<0.03	0.07	<0.03	<0.03	0.10	<0.03			<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.22	<0.06	<0.06	0.09	<0.06	<0.06	0.09	<0.06			<0.06	mg/kg	TM4/PM8
Chrysene #	0.24	<0.02	<0.02	0.06	<0.02	<0.02	0.08	<0.02			<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.38	<0.07	<0.07	0.10	<0.07	<0.07	0.13	<0.07			<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.20	<0.04	<0.04	<0.04	<0.04	<0.04	0.08	<0.04			<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.20	<0.04	<0.04	<0.04	<0.04	<0.04	0.07	<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	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.16	<0.04	<0.04	<0.04	<0.04	<0.04	0.06	<0.04			<0.04	mg/kg	TM4/PM8
PAH 16 Total	2.2	<0.6	<0.6	<0.6	<0.6	<0.6	0.8	<0.6			<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.27	<0.05	<0.05	0.07	<0.05	<0.05	0.09	<0.05			<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.11	<0.02	<0.02	0.03	<0.02	<0.02	0.04	<0.02			<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	91	69 SV	90	91	90	88	90	75			<0	%	TM4/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Tetra Tech
Reference: B038962
Location: Argosy Drive
Contact: Josh Montague
EMT Job No: 22/10550

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			LOD/LOR	Units	Method No.
Sample ID	BH01	BH01	WS01	WS01	WS02	WS02	WS03	WS03					
Depth	0.50-0.60	1.90-2.00	0.50-0.60	1.50-1.60	0.50-0.60	1.80-1.90	0.50-0.60	1.50-1.60					
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					
Sample Date	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	28/06/2022	28/06/2022	28/06/2022	28/06/2022	28/06/2022	28/06/2022	28/06/2022	28/06/2022					
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)#	23	<7	<7	<7	37	<7	73	<7			<7	mg/kg	TM5/PM8/PM16
>C35-C44 (EH_1D_AL)	<7	<7	<7	<7	11	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44 (EH+HS_1D_AL)	<26	<26	<26	<26	48	<26	73	<26			<26	mg/kg	TM5/TM36/PM8/PM12/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)#	26	<7	<7	<7	<7	<7	13	<7			<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	84	<7	<7	<7	14	<7	138	<7			<7	mg/kg	TM5/PM8/PM16
>EC35-EC44 (EH_1D_AR)	<7	<7	<7	<7	12	<7	20	<7			<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44 (EH+HS_1D_AR)	110	<26	<26	<26	26	<26	171	<26			<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-44) (EH+HS_CU_1D_Total)	110	<52	<52	<52	74	<52	244	<52			<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE#	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Benzene#	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Toluene#	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Ethylbenzene#	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
m/p-Xylene#	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
o-Xylene#	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
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
Natural Moisture Content	19.8	23.2	3.7	22.5	3.9	13.8	10.2	14.0			<0.1	%	PM4/PM0
Hexavalent Chromium#	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3			<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext)#	<0.0015	0.1045	0.0084	0.0172	0.0054	0.0426	0.0059	0.0194			<0.0015	g/l	TM38/PM20
Chromium III	48.2	43.2	8.8	51.1	14.1	43.9	35.2	45.0			<0.5	mg/kg	NONE/NONE
Free Cyanide	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	0.029	0.001	<0.001	0.014	<0.001	0.002	0.008	<0.001			<0.001	None	TM21/PM24
pH#	7.59	8.00	9.01	7.41	9.12	7.80	8.37	7.99			<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Tetra Tech
Reference: B038962
Location: Argosy Drive
Contact: Josh Montague

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
22/10550	1	BH01	0.50-0.60	3	Catherine Coles	05/07/2022	**General Description (Bulk Analysis)**	brick, loose soil
					Catherine Coles	05/07/2022	**Asbestos Fibres**	NAD
					Catherine Coles	05/07/2022	**Asbestos ACM**	NAD
					Catherine Coles	05/07/2022	**Asbestos Type**	NAD
22/10550	1	BH01	1.90-2.00	6	Rebecca Collins	05/07/2022	**General Description (Bulk Analysis)**	brown sandy clay
					Rebecca Collins	05/07/2022	**Asbestos Fibres**	NAD
					Rebecca Collins	05/07/2022	**Asbestos ACM**	NAD
					Rebecca Collins	05/07/2022	**Asbestos Type**	NAD
22/10550	1	WS01	0.50-0.60	9	Catherine Coles	05/07/2022	**General Description (Bulk Analysis)**	stones/ white loose soil
					Catherine Coles	05/07/2022	**Asbestos Fibres**	NAD
					Catherine Coles	05/07/2022	**Asbestos ACM**	NAD
					Catherine Coles	05/07/2022	**Asbestos Type**	NAD
22/10550	1	WS01	1.50-1.60	12	Catherine Coles	05/07/2022	**General Description (Bulk Analysis)**	loose soil, stones
					Catherine Coles	05/07/2022	**Asbestos Fibres**	NAD
					Catherine Coles	05/07/2022	**Asbestos ACM**	NAD
					Catherine Coles	05/07/2022	**Asbestos Type**	NAD
22/10550	1	WS02	0.50-0.60	15	Andrew Alker	05/07/2022	**General Description (Bulk Analysis)**	brown soil and stone
					Andrew Alker	05/07/2022	**Asbestos Fibres**	NAD
					Andrew Alker	05/07/2022	**Asbestos ACM**	NAD
					Andrew Alker	05/07/2022	**Asbestos Type**	NAD
22/10550	1	WS02	1.80-1.90	18	Simon Postlewhite	05/07/2022	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	05/07/2022	**Asbestos Fibres**	NAD
					Simon Postlewhite	05/07/2022	**Asbestos ACM**	NAD
					Simon Postlewhite	05/07/2022	**Asbestos Type**	NAD
22/10550	1	WS03	0.50-0.60	21	Rebecca Collins	05/07/2022	**General Description (Bulk Analysis)**	brown sandy soil and debris
					Rebecca Collins	05/07/2022	**Asbestos Fibres**	NAD
					Rebecca Collins	05/07/2022	**Asbestos ACM**	NAD
					Rebecca Collins	05/07/2022	**Asbestos Type**	NAD
22/10550	1	WS03	1.50-1.60	24	Simon Postlewhite	05/07/2022	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	05/07/2022	**Asbestos Fibres**	NAD
					Simon Postlewhite	05/07/2022	**Asbestos ACM**	NAD
					Simon Postlewhite	05/07/2022	**Asbestos Type**	NAD

Client Name: Tetra Tech
Reference: B038962
Location: Argosy Drive
Contact: Josh Montague

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 22/10550						

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.: 22/10550

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 overesitimate 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 calibration range, the result should be considered the minimum value. 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: 22/10550

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			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: 22/10550

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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

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

Attention :	Andy Moore
Date :	12th July, 2022
Your reference :	Argosy
Our reference :	Test Report 22/10956 Batch 1
Location :	Argosy Drive
Date samples received :	2nd July, 2022
Status :	Final Report
Issue :	1

Four samples were received for analysis on 2nd July, 2022 of which four 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.

[redacted]

Liza Klebe
Project Co-ordinator

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tetra Tech
Reference: Argosy
Location: Argosy Drive
Contact: Andy Moore
EMT Job No: 22/10956

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12							LOD/LOR	Units	Method No.
Sample ID	BH02 - ES1	BH02 - ES2	BH03 - ES1	BH03 - ES2									
Depth	0.20-0.30	1.50-1.60	0.30-0.40	1.50-1.60									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	27/06/2022	27/06/2022	28/06/2022	28/06/2022									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	02/07/2022	02/07/2022	02/07/2022	02/07/2022									
Arsenic #	1.4	11.1	6.7	6.2							<0.5	mg/kg	TM30/PM15
Beryllium	<0.5	1.4	1.0	1.2							<0.5	mg/kg	TM30/PM15
Cadmium #	0.8	0.5	<0.1	<0.1							<0.1	mg/kg	TM30/PM15
Chromium #	8.1	33.5	43.3	50.2							<0.5	mg/kg	TM30/PM15
Copper #	3	13	16	15							<1	mg/kg	TM30/PM15
Lead #	9	56	24	10							<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM30/PM15
Nickel #	4.2	25.3	19.1	23.9							<0.7	mg/kg	TM30/PM15
Selenium #	<1	1	<1	<1							<1	mg/kg	TM30/PM15
Vanadium	5	33	28	31							<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.1	0.5	0.6	0.7							<0.1	mg/kg	TM74/PM32
Zinc #	15	106	58	53							<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<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	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.11	<0.03	0.08	<0.03							<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.07	<0.03	0.16	<0.03							<0.03	mg/kg	TM4/PM8
Pyrene #	0.08	<0.03	0.16	<0.03							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	0.15	<0.06							<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	0.11	<0.02							<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	0.23	<0.07							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	0.13	<0.04							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	0.11	<0.04							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	0.11	<0.04							<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	1.2	<0.6							<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	0.17	<0.05							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	0.06	<0.02							<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	104	98	135 SV	102							<0	%	TM4/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Tetra Tech
Reference: Argosy
Location: Argosy Drive
Contact: Andy Moore
EMT Job No: 22/10956

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12									
Sample ID	BH02 - ES1	BH02 - ES2	BH03 - ES1	BH03 - ES2									
Depth	0.20-0.30	1.50-1.60	0.30-0.40	1.50-1.60									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	27/06/2022	27/06/2022	28/06/2022	28/06/2022									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	02/07/2022	02/07/2022	02/07/2022	02/07/2022									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<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	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<0.2	1.1	<0.2	<0.2							<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL)#	<4	19	<4	<4							<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	<7	48	<7	<7							<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	165	11	38	<7							<7	mg/kg	TM5/PM8/PM16
>C35-C44 (EH_1D_AL)	12	<7	<7	<7							<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44 (EH+HS_1D_AL)	177	79	38	<26							<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<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	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<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	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR)#	<4	<4	<4	<4							<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	10	<7	<7	<7							<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	324	<7	103	<7							<7	mg/kg	TM5/PM8/PM16
>EC35-EC44 (EH_1D_AR)	41	<7	30	<7							<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44 (EH+HS_1D_AR)	375	<26	133	<26							<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-44) (EH+HS_CU_1D_Total)	552	79	171	<52							<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE#	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
Benzene#	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
Toluene#	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
Ethylbenzene#	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
m/p-Xylene#	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
o-Xylene#	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15							<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	3.4	13.8	8.6	16.4							<0.1	%	PM4/PM0
Hexavalent Chromium#	<0.3	<0.3	<0.3	<0.3							<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext)#	0.0183	0.0421	0.0468	0.0615							<0.0015	g/l	TM38/PM20
Chromium III	8.1	33.5	43.3	50.2							<0.5	mg/kg	NONE/NONE
Free Cyanide	<0.5	<0.5	<0.5	<0.5							<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	0.016	0.021	0.025	0.020							<0.001	None	TM21/PM24
pH#	9.50	8.51	8.12	8.26							<0.01	pH units	TM73/PM11

Client Name: Tetra Tech
Reference: Argosy
Location: Argosy Drive
Contact: Andy Moore

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
22/10956	1	BH02 - ES1	0.20-0.30	3	Andrew Alker	12/07/2022	**General Description (Bulk Analysis)**	grey clay and stone
					Andrew Alker	12/07/2022	**Asbestos Fibres**	NAD
					Andrew Alker	12/07/2022	**Asbestos ACM**	NAD
					Andrew Alker	12/07/2022	**Asbestos Type**	NAD
22/10956	1	BH02 - ES2	1.50-1.60	6	Andrew Alker	12/07/2022	**General Description (Bulk Analysis)**	brown clay and stone
					Andrew Alker	12/07/2022	**Asbestos Fibres**	NAD
					Andrew Alker	12/07/2022	**Asbestos ACM**	NAD
					Andrew Alker	12/07/2022	**Asbestos Type**	NAD
22/10956	1	BH03 - ES1	0.30-0.40	9	Andrew Alker	12/07/2022	**General Description (Bulk Analysis)**	brown soil and stone
					Andrew Alker	12/07/2022	**Asbestos Fibres**	NAD
					Andrew Alker	12/07/2022	**Asbestos ACM**	NAD
					Andrew Alker	12/07/2022	**Asbestos Type**	NAD
22/10956	1	BH03 - ES2	1.50-1.60	12	Andrew Alker	12/07/2022	**General Description (Bulk Analysis)**	brown soil
					Andrew Alker	12/07/2022	**Asbestos Fibres**	NAD
					Andrew Alker	12/07/2022	**Asbestos ACM**	NAD
					Andrew Alker	12/07/2022	**Asbestos Type**	NAD

Client Name: Tetra Tech
Reference: Argosy
Location: Argosy Drive
Contact: Andy Moore

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 22/10956						

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.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/10956

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 overesitimate 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 calibration range, the result should be considered the minimum value. 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: 22/10956

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			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: 22/10956

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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: 2013l	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: 2013l	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 E – GEOTECHNICAL DATA

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www.ccgeotechnical.com

CC GEOTECHNICAL LTD
Consulting Geoenvironmental and Geotechnical Engineers

LABORATORY REPORT

CONTRACT NUMBER: CCG-C-22-13292

CONTRACT TITLE: ARGOSY STREET, MANCHESTER

CLIENT: TETRA TECH
Quay West at MediaCityUK, Trafford Wharf Road, Trafford Park, Manchester M17 1HH

DATE RECEIVED: 12/07/22
DATE COMMENCED: 15/07/22
DATE COMPLETED: 25/07/22
REPORT DATE: 25/07/22

Test Description	Qty
Determination of Moisture Content BS 1377-2:1990 (a)	11
Determination of Liquid & Plastic Limits BS 1377-2:1990 (a)	9
Particle Size Distribution BS 1377-2:1990 (a)	1
Unconsolidated Undrained Triaxial Compression BS1377-7:1990 (a)	1
One-Dimensional Consolidation BS 1377-5:1990 (a)	3
Laboratory Determination of California Bearing Ratio BS1377-4:1990 (#)	2

Notes: Observations and interpretations are not accredited by UKAS
All testing undertaken at laboratory permanent facilities
# denotes non-accredited test
a denotes UKAS accredited test
s denotes test undertaken by approved subcontractor
Test results only relate to the samples tested
Sample and sample information supplied by client

This report is issued in accordance with the requirements of the United kingdom Accreditation Services and EN ISO/IEC 17025:2017. The results reported herein relate only to the material supplied to the laboratory. This report shall not be reproduced except in full, without the prior written approval of the laboratory.
Approved Signatories: Chris Bolan (Managing Director) – Daniel Kerfoot (Laboratory Manager)

SUMMARY OF LABORATORY SOIL TEST RESULTS

BH / TP / WS Number	Sample Type	Depth From (m)	Depth To (m)	Moisture Content (%)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Shear Strength (kN/m^2)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425mm (%)	Soil Classification	UKAS accredited test (Y/N)	Description / Test Method Samples described in accordance with BS EN ISO 14688-2 2004
BH01	B	0.20	0.20	19	-	-	-	-	-	-	-	NP	Y	Dark brown very silty slightly gravelly fine to medium organic SAND. Gravel is fine subrounded sandstone. (BS1377Pt2:3.2,4.4,5)
BH01	B	1.50	2.00	24	-	-	-	43	17	26	93	CI	Y	Greyish brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular mudstone and coal. (BS1377Pt2:3.2,4.4,5)
BH01	U100	2.50	2.95	-	-	-	40*	-	-	-	-	-	Y	Brown slightly sandy slightly gravelly silty CLAY with frequent pockets of sand and organic inclusions.
BH01	B	3.50	4.00	20	-	-	-	29	15	14	97	CL	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular mudstone. (BS1377Pt2:3.2,4.4,5)
BH01	U100	4.50	4.95	-	-	-	15*	-	-	-	-	-	Y	Reddish brown, occasionally grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse subangular to subrounded mudstone

SITE: ARGOSY DRIVE, MANCHESTER (CCG-C-22-13292) DATE: 25.07.22

CLIENT: TETRA TECH

UKAS TESTING 4514

Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm; WS = Window Sample
CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic
(* Denotes Hand Shear Vane test result)
Sample description not accredited by UKAS

SUMMARY OF LABORATORY SOIL TEST RESULTS

BH / TP / WS Number	Sample Type	Depth From (m)	Depth To (m)	Moisture Content (%)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Shear Strength (kN/m^2)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425mm (%)	Soil Classification	UKAS accredited test (Y/N)	Description / Test Method Samples described in accordance with BS EN ISO 14688-2 2004
BH02	B	0.20	0.20	3.8	-	-	-	-	-	-	-	-	Y	Light grey silty sandy GRAVEL. Gravel is fine to coarse angular to subangular limestone and tarmac. (MADE GROUND) (BS1377Pt2:3.2,9.2)
BH02	B	1.50	2.00	20	-	-	-	41	20	21	94	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular mudstone. (BS1377Pt2:3.2,4.4,5)
BH02	U100	2.50	2.95	21	2.13	1.76	25	-	-	-	-	-	Y	Reddish brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse subangular to subrounded mudstone. (BS1377Pt2:3.2,Pt7:8)
BH02	B	3.50	3.50	32	-	-	-	32	19	13	93	CL	Y	Brown, occasionally grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular mudstone. (BS1377Pt2:3.2,4.4,5)

SITE: ARGOSY DRIVE, MANCHESTER (CCG-C-22-13292) DATE: 21.07.22

CLIENT: TETRA TECH

UKAS TESTING 4514

Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm; WS = Window Sample
CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic
(* Denotes Hand Shear Vane test result)
Sample description not accredited by UKAS

SUMMARY OF LABORATORY SOIL TEST RESULTS

BH / TP / WS Number	Sample Type	Depth From (m)	Depth To (m)	Moisture Content (%)	Bulk Density (Mg/m³)	Dry Density (Mg/m³)	Shear Strength (kN/m²)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425mm (%)	Soil Classification	UKAS accredited test (Y/N)	Description / Test Method Samples described in accordance with BS EN ISO 14688-2 2004
BH03	J	2.20	2.20	21	-	-	-	37	18	19	91	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular mudstone. (BS1377Pt2:3.2,4.4,5)
BH03	U100	2.50	2.95	22	-	-	-	-	-	-	-	-	Y	Brown slightly sandy clayey SILT with frequent clay laminations. (BS1377Pt2:3.2)

SITE: ARGOSY DRIVE, MANCHESTER (CCG-C-22-13292) DATE: 20.07.22

CLIENT: TETRA TECH

UKAS TESTING 4514

Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm; WS = Window Sample
CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic
(* Denotes Hand Shear Vane test result)
Sample description not accredited by UKAS

SUMMARY OF LABORATORY SOIL TEST RESULTS

BH / TP / WS Number	Sample Type	Depth From (m)	Depth To (m)	Moisture Content (%)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Shear Strength (kN/m^2)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425mm (%)	Soil Classification	UKAS accredited test (Y/N)	Description / Test Method Samples described in accordance with BS EN ISO 14688-2 2004
WS01	B	1.70	2.00	22	-	-	-	37	20	17	99	CI	Y	Brown, occasional grey slightly sandy silty CLAY. (BS1377Pt2:3.2,4.4,5)
WS02	B	2.00	2.50	16	-	-	-	35	17	18	95	CL / CI	Y	Brown, occasional grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to meduim subangular mudstone. (BS1377Pt2:3.2,4.4,5)
WS03	B	2.00	2.50	21	-	-	-	33	20	13	96	CL	Y	Brown, occasional grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to meduim subangular mudstone. (BS1377Pt2:3.2,4.4,5)

SITE: ARGOSY DRIVE, MANCHESTER (CCG-C-22-13292) DATE: 20.07.22

CLIENT: TETRA TECH

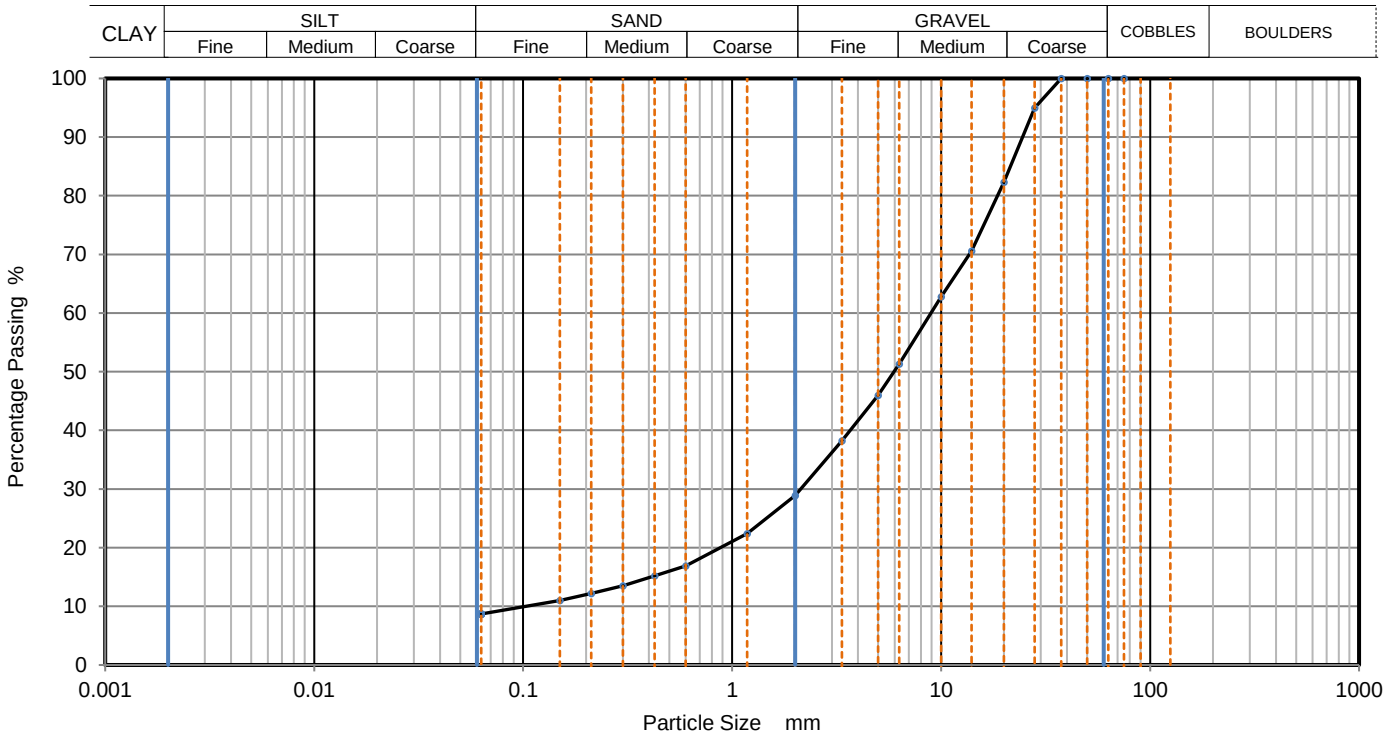
UKAS TESTING 4514

Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm; WS = Window Sample
CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic
(* Denotes Hand Shear Vane test result)
Sample description not accredited by UKAS

CC Geotechnical Ltd
Tel: 0151 545 2750
e: lab@ccgeotechnical.com

PARTICLE SIZE DISTRIBUTION

Job Ref			CCG-C-22-13292
Borehole/Pit No.			BH02
Site Name	ARGOSY STREET, MANCHESTER	Sample No.	1
Specimen Description	Light grey silty sandy GRAVEL	Depth, m	0.20
Specimen Reference	Specimen Depth: m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2	KeyLAB ID	CCGL202207180



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	82		
14	71		
10	63		
6.3	51		
5	46		
3.35	38		
2	29		
1.18	22		
0.6	17		
0.425	15		
0.3	14		
0.212	12		
0.15	11		
0.063	9		

Dry Mass of sample, g

Sample Proportions	% dry mass
Very coarse	0
Gravel	71
Sand	20
Fines <0.063mm	9

Grading Analysis		
D100	mm	
D60	mm	8.94
D30	mm	2.13
D10	mm	0.103
Uniformity Coefficient		86
Curvature Coefficient		4.9

Remarks

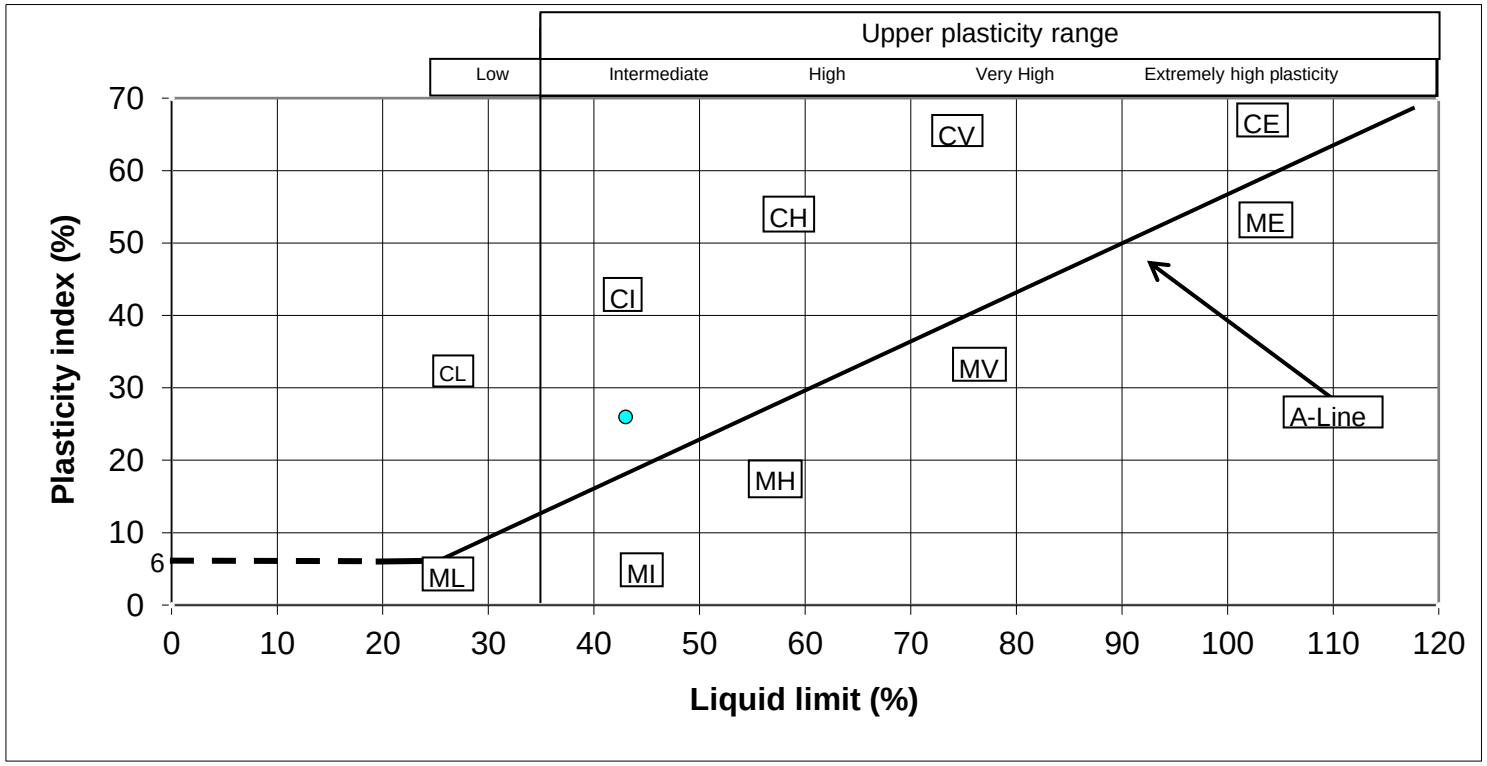
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	Fig 1
JE	DK	DK	21/07/2022 10:13	Sheet

ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
BH01	1.50	43.0	26.0

UKAS TESTING
4514

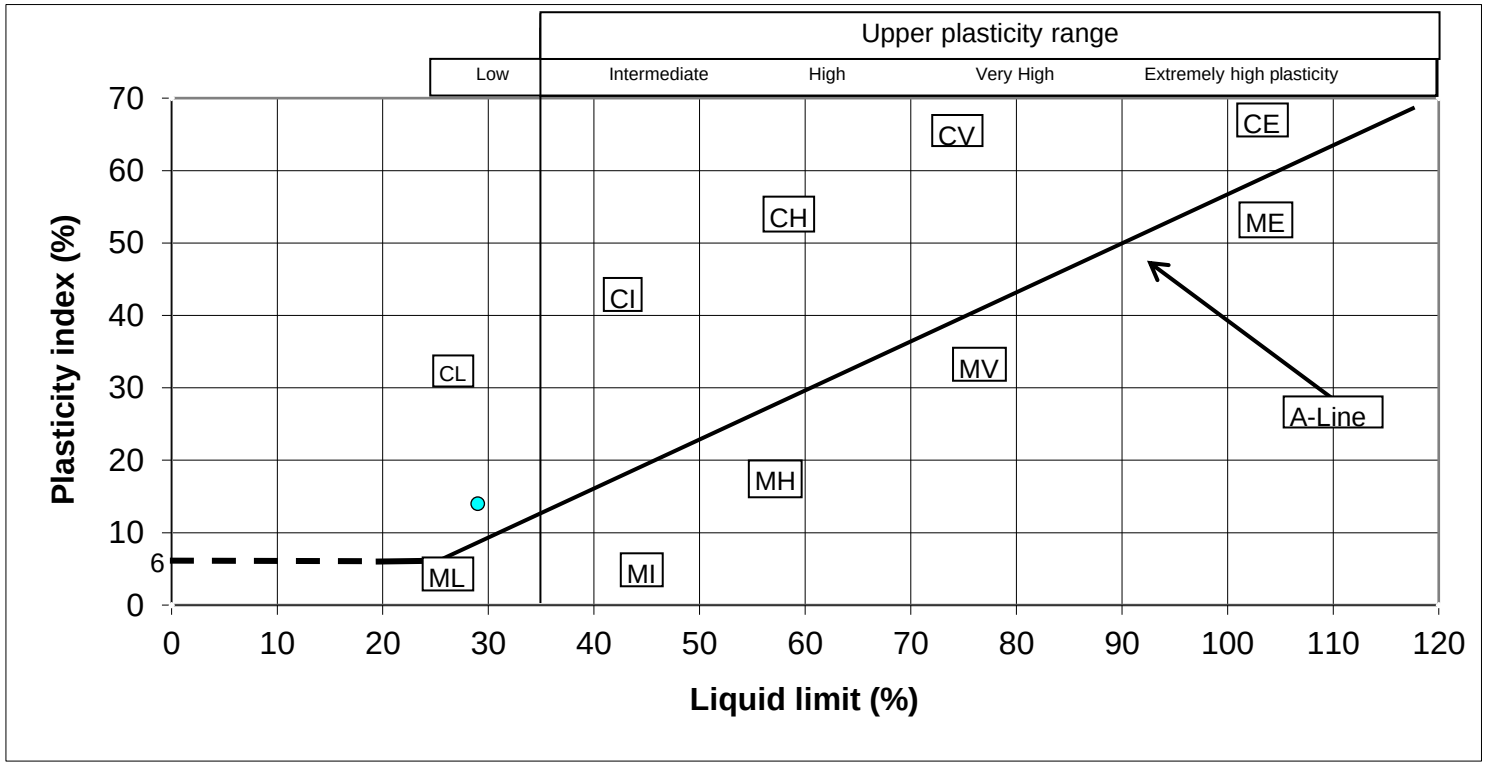
APPROVED BY	DK

CLIENT: TETRA TECH	SITE: ARGOSY DRIVE, MANCHESTER (CCG-C-22-13292)

ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
BH01	3.50	29.0	14.0

UKAS TESTING
4514

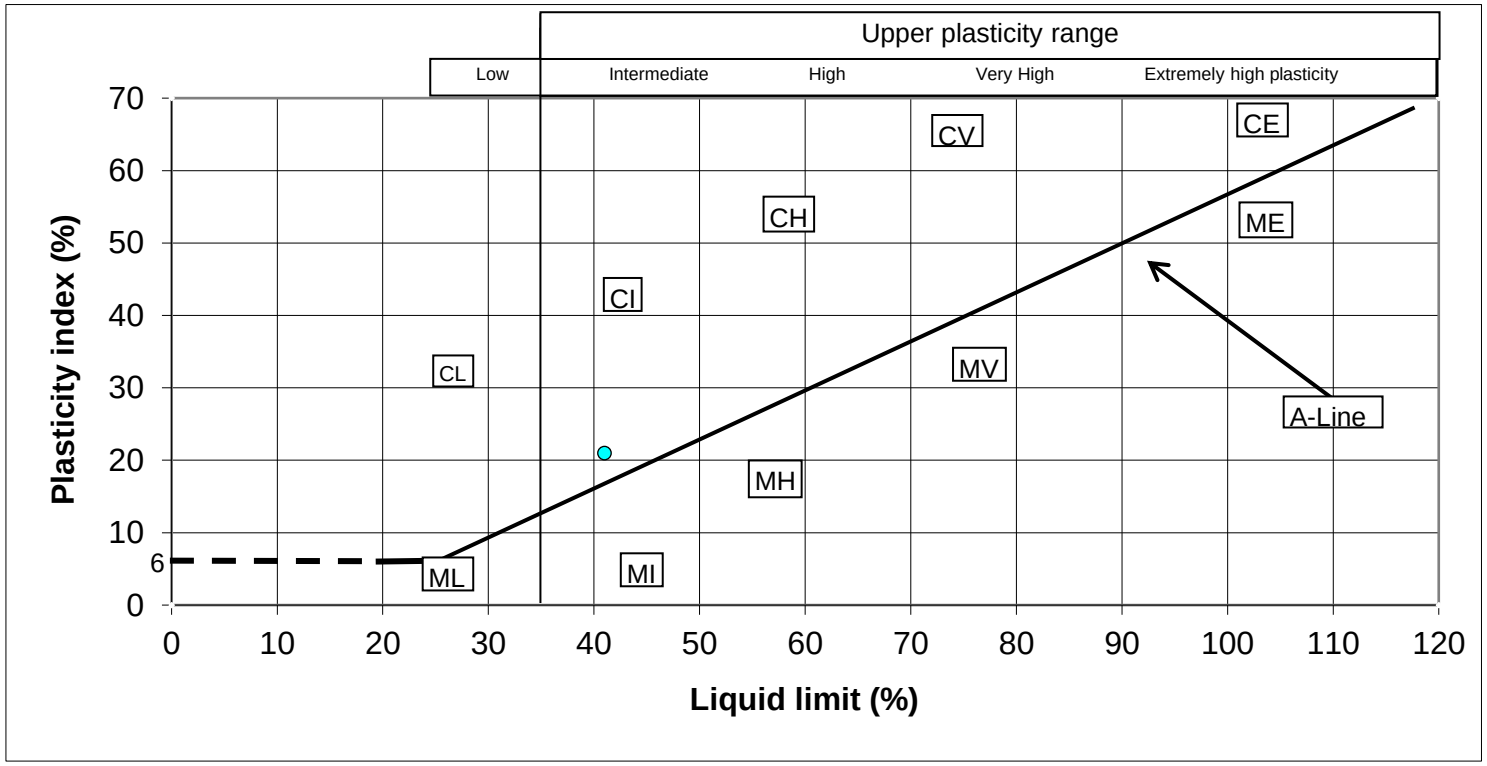
APPROVED BY	DK

CLIENT: TETRA TECH	SITE: ARGOSY DRIVE, MANCHESTER (CCG-C-22-13292)

ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
BH02	1.50	41.0	21.0

UKAS TESTING
4514

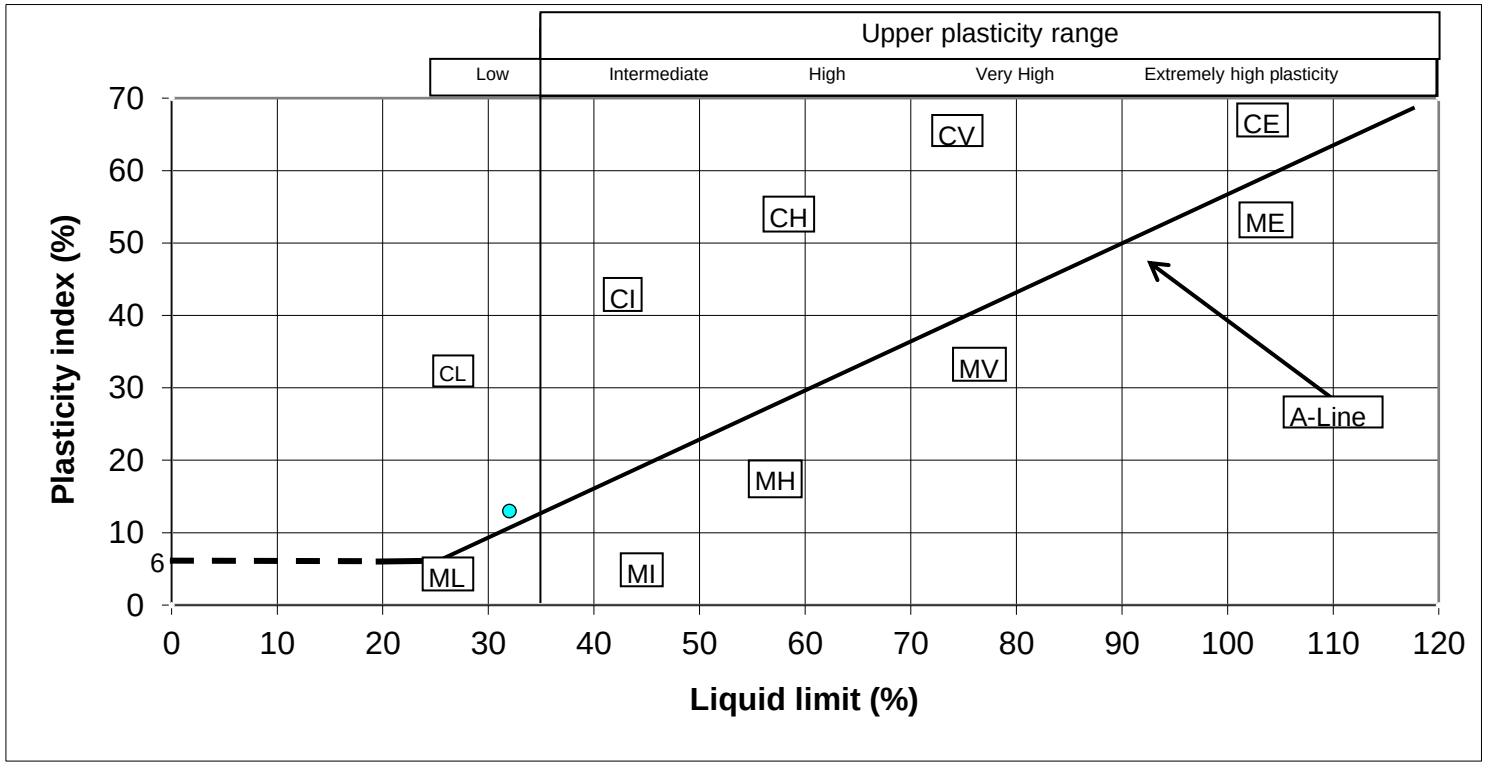
APPROVED BY	DK

CLIENT: TETRA TECH	SITE: ARGOSY DRIVE, MANCHESTER (CCG-C-22-13292)

ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
BH02	3.50	32.0	13.0

UKAS TESTING
4514

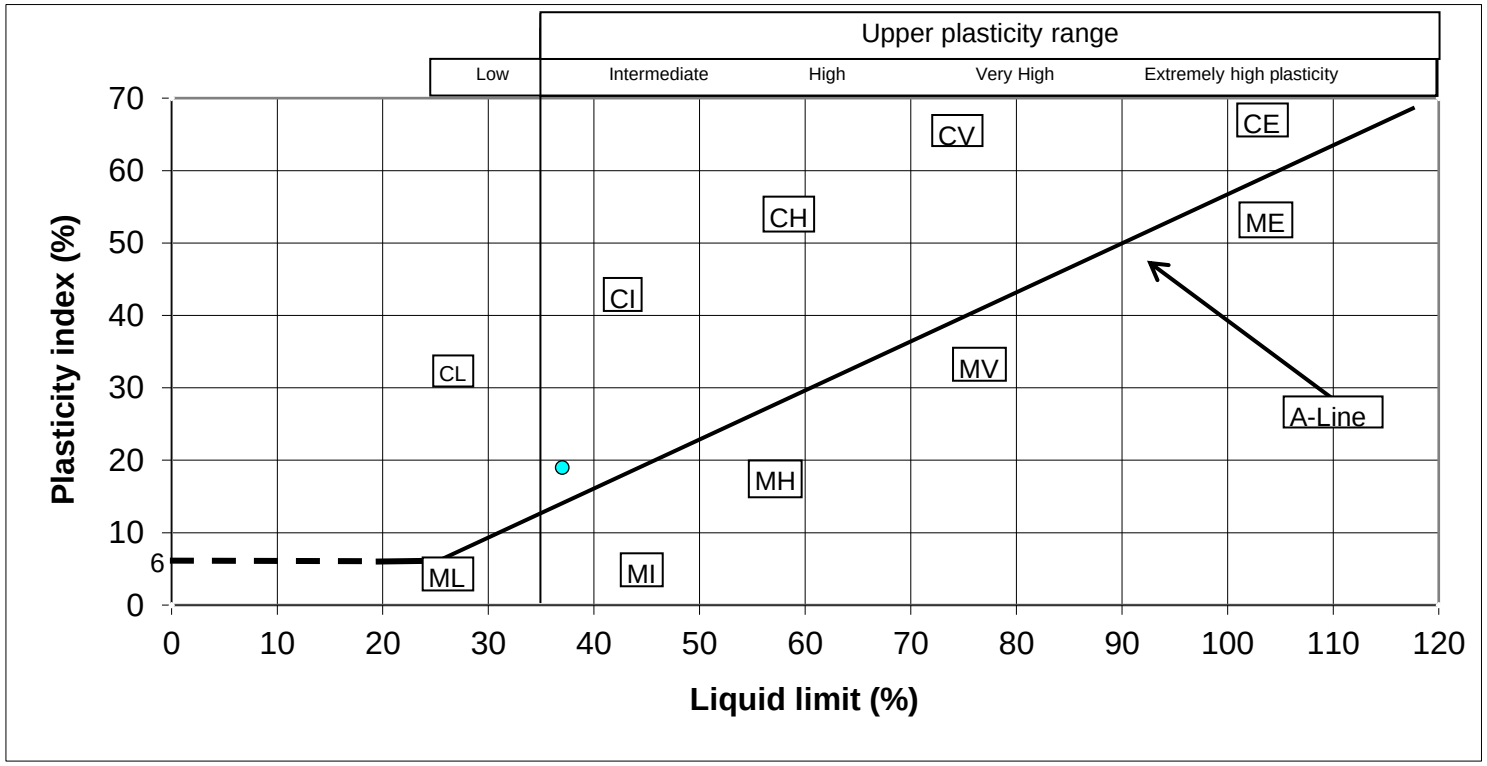
APPROVED BY	DK

CLIENT: TETRA TECH	SITE: ARGOSY DRIVE, MANCHESTER (CCG-C-22-13292)

ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
BH03	2.20	37.0	19.0

UKAS TESTING
4514

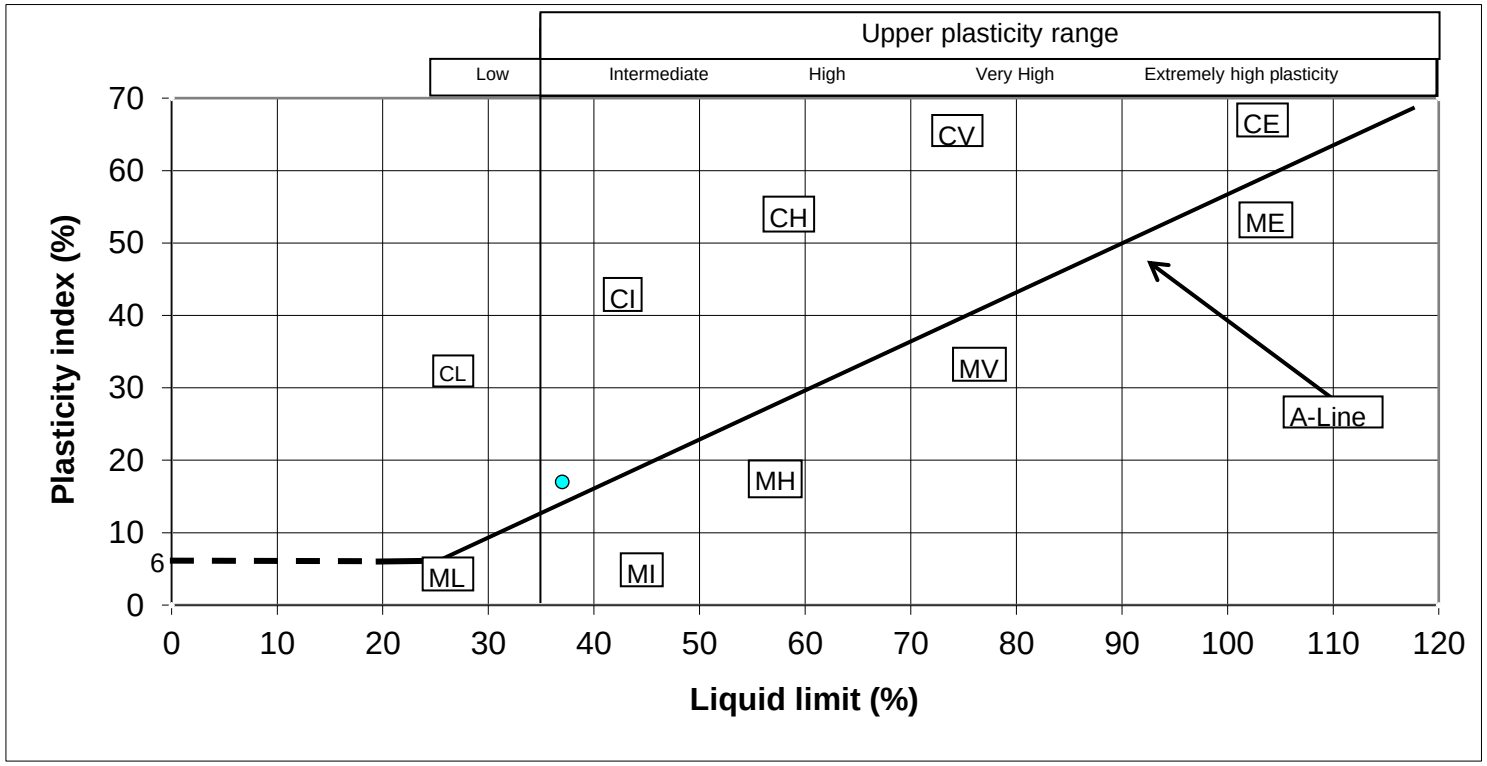
APPROVED BY	DK

CLIENT: TETRA TECH	SITE: ARGOSY DRIVE, MANCHESTER (CCG-C-22-13292)

ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
WS01	1.70	37.0	17.0

UKAS TESTING
4514

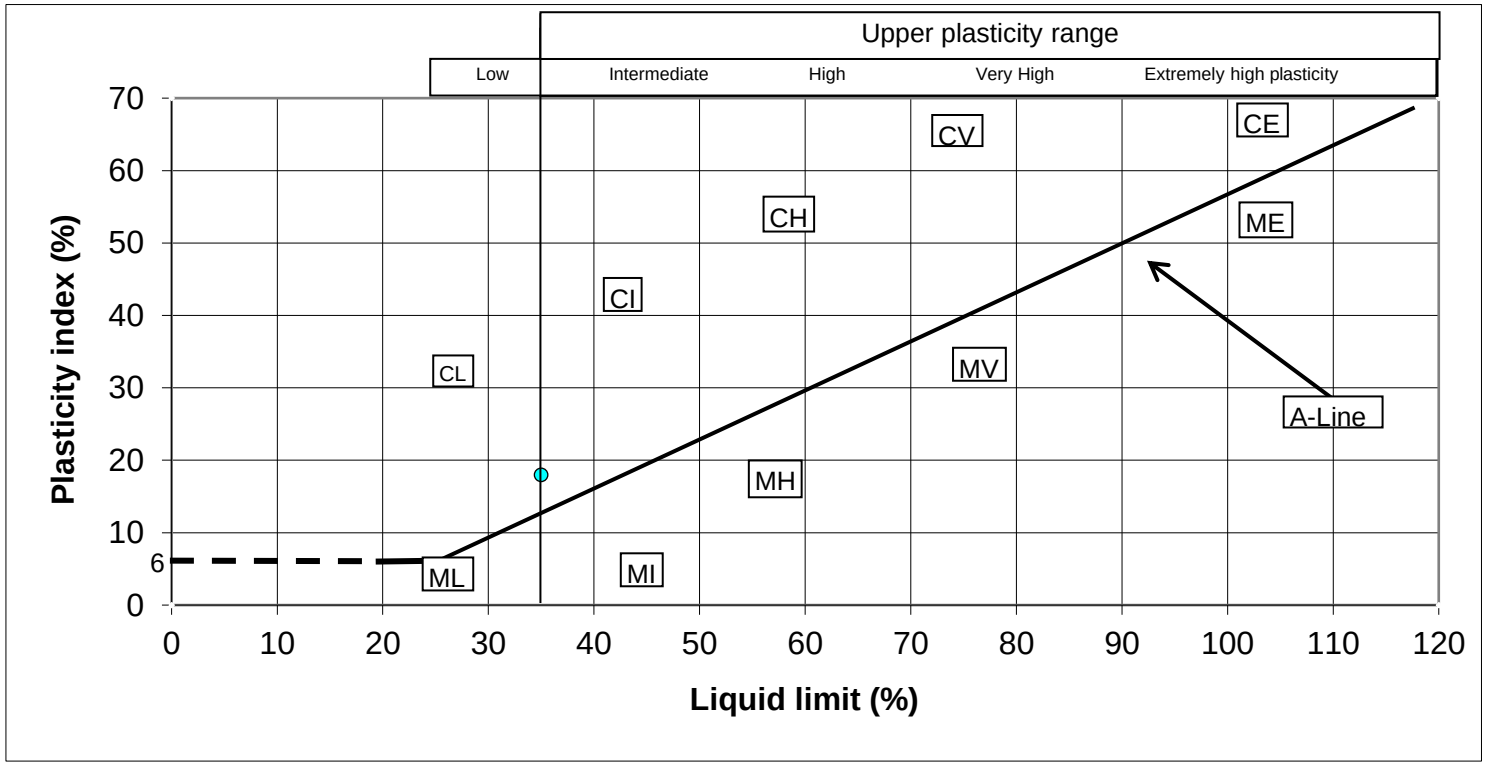
APPROVED BY	DK

CLIENT: TETRA TECH	SITE: ARGOSY DRIVE, MANCHESTER (CCG-C-22-13292)

ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
WS02	2.00	35.0	18.0

UKAS TESTING
4514

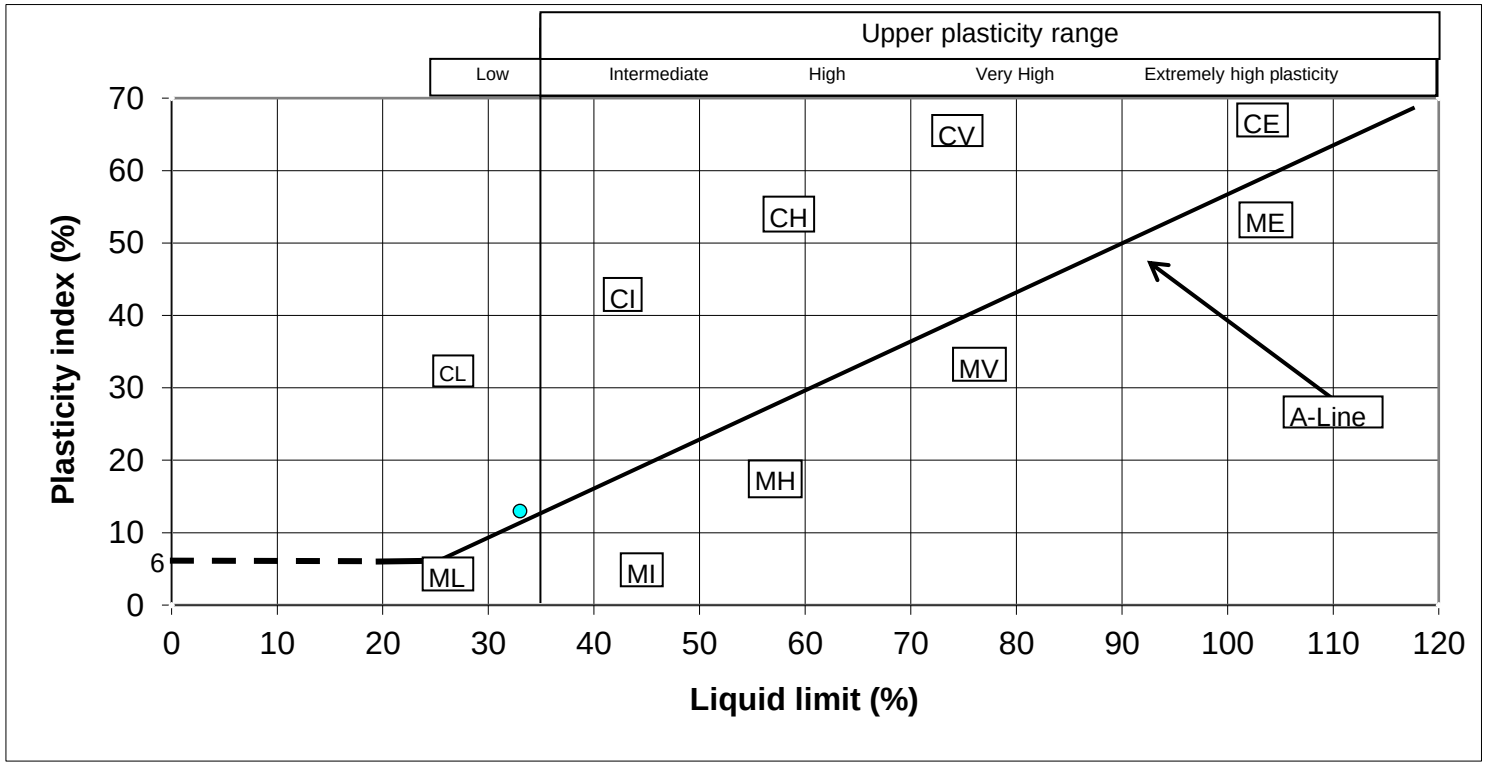
APPROVED BY	DK

CLIENT: TETRA TECH	SITE: ARGOSY DRIVE, MANCHESTER (CCG-C-22-13292)

ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
WS03	2.00	33.0	13.0

UKAS TESTING
4514

APPROVED BY	DK

CLIENT: TETRA TECH	SITE: ARGOSY DRIVE, MANCHESTER (CCG-C-22-13292)

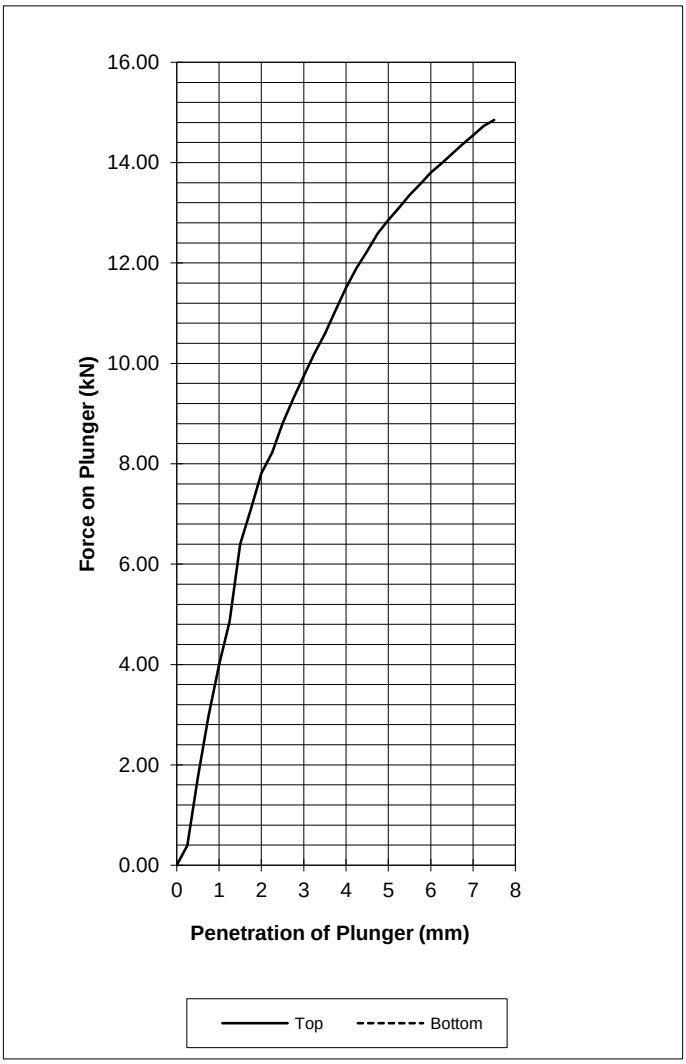
Laboratory Determination of California Bearing Ratio
B.S. 1377 (1990) : Part 4 : Clause 7

PROJECT No.:	CCG-C-22-13292			Proving ring No.	1155/8/15135
SITE:	ARGOSY DRIVE, MANCHESTER			Division interval	0.0076160 kN/division
CLIENT:	TETRA TECH			Surcharge	2 kg
BH / TP :	BH03	DEPTH:	0.2 m	Seating Load	10 N

MATERIAL DESCRIPTION: Brown very gravelly silty SAND with occasional roots. Gravel is fine to coarse subangular concrete and sandstone (MADE GROUND)

Mass of mould	4931 g	Depth of mould	127 mm
Mass of mould & compacted soil	9531 g	Diameter of mould	152 mm
Soaking period	96 hrs		
Swelling	0 mm		

Penetration of plunger	TOP		BOTTOM	
mm	kN	Load Gauge	kN	Load Gauge
0.00	**0.00**	**0.00**		
0.25	0.40	52.00		
0.50	1.76	231.00		
0.75	2.97	390.00		
1.00	3.99	**524.00**		
1.25	4.86	638.00		
1.50	6.40	840.00		
1.75	7.08	930.00		
2.00	7.81	**1025.00**		
2.25	8.23	1080.00		
2.50	8.81	1157.00		
2.75	9.30	1221.00		
3.00	9.75	**1280.00**		
3.25	10.20	1339.00		
3.50	10.59	1391.00		
3.75	11.06	1452.00		
4.00	11.51	**1511.00**		
4.25	11.90	1563.00		
4.50	12.24	1607.00		
4.75	12.59	1653.00		
5.00	12.86	**1688.00**		
5.25	13.10	1720.00		
5.50	13.35	1753.00		
5.75	13.57	1782.00		
6.00	13.80	**1812.00**		
6.25	13.98	1836.00		
6.50	14.17	1861.00		
6.75	14.36	1886.00		
7.00	14.55	**1910.00**		
7.25	14.73	1934.00		
7.50	14.85	**1950.00**		



RESULTS

Penetration	Force		Standard	CBR	
	Top	Bottom	Force	Top	Bottom
(mm)	(kN)	(kN)	(kN)	(%)	(%)
2.50	8.81	0.00	13.2	66.8	
5.00	12.86	0.00	20	64.3	

CBR Values: **67.0** %

CBR result: **67** %

Mass of compacted soil	4600	g
Volume of mould	2305	cm^3
M/C of sample	9.8	%
Bulk density of compacted specimen	1.996	Mg/m^3
Dry density of compacted specimen	1.818	Mg/m^3

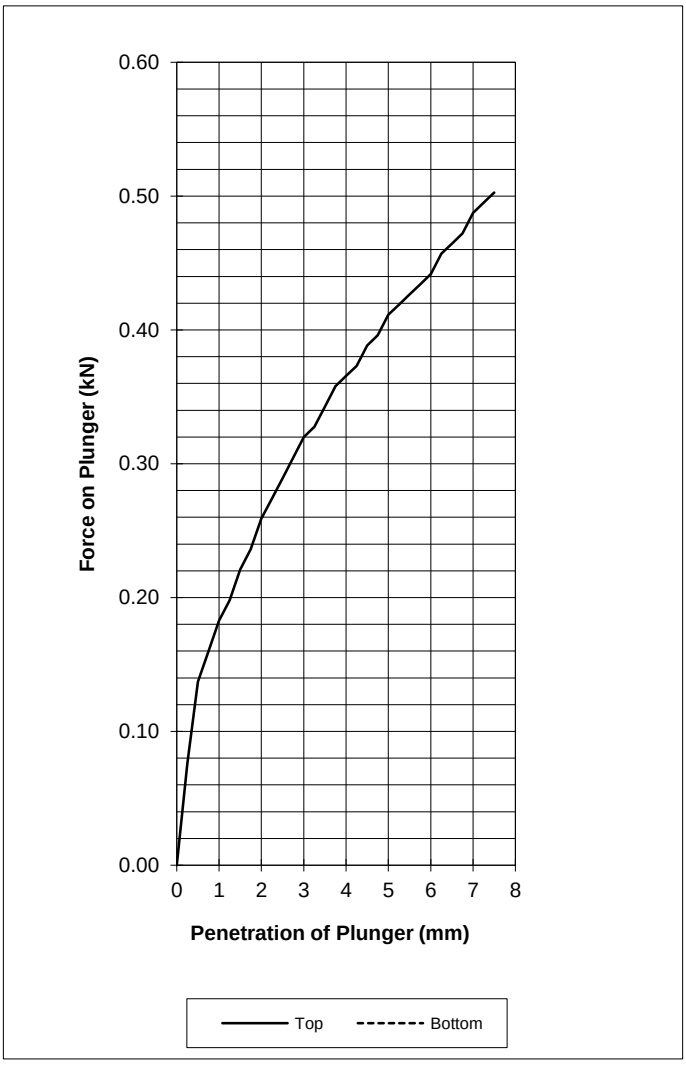
Laboratory Determination of California Bearing Ratio
B.S. 1377 (1990) : Part 4 : Clause 7

PROJECT No.:	CCG-C-22-13292			Proving ring No.	1155/8/15135
SITE:	ARGOSY DRIVE, MANCHESTER			Division interval	0.0076160 kN/division
CLIENT:	TETRA TECH			Surcharge	2 kg
BH / TP :	BH03	DEPTH:	1.2 m	Seating Load	10 N

MATERIAL DESCRIPTION: Brown, occasional grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular mudstone

Mass of mould	4931 g	Depth of mould	127 mm
Mass of mould & compacted soil	9615 g	Diameter of mould	152 mm
Soaking period	96 hrs		
Swelling	0 mm		

Penetration of plunger	TOP		BOTTOM	
mm	kN	Load Gauge	kN	Load Gauge
0.00	**0.00**	**0.00**		
0.25	0.08	10.00		
0.50	0.14	18.00		
0.75	0.16	21.00		
1.00	0.18	**24.00**		
1.25	0.20	26.00		
1.50	0.22	29.00		
1.75	0.24	31.00		
2.00	0.26	**34.00**		
2.25	0.27	36.00		
2.50	0.29	38.00		
2.75	0.30	40.00		
3.00	0.32	**42.00**		
3.25	0.33	43.00		
3.50	0.34	45.00		
3.75	0.36	47.00		
4.00	0.37	**48.00**		
4.25	0.37	49.00		
4.50	0.39	51.00		
4.75	0.40	52.00		
5.00	0.41	**54.00**		
5.25	0.42	55.00		
5.50	0.43	56.00		
5.75	0.43	57.00		
6.00	0.44	**58.00**		
6.25	0.46	60.00		
6.50	0.46	61.00		
6.75	0.47	62.00		
7.00	0.49	**64.00**		
7.25	0.50	65.00		
7.50	0.50	**66.00**		



RESULTS

Penetration	Force		Standard	CBR	
	Top	Bottom	Force	Top	Bottom
(mm)	(kN)	(kN)	(kN)	(%)	(%)
2.50	0.29	0.00	13.2	2.2	
5.00	0.41	0.00	20	2.1	

CBR Values: **2.2** %

CBR result: **2.2** %

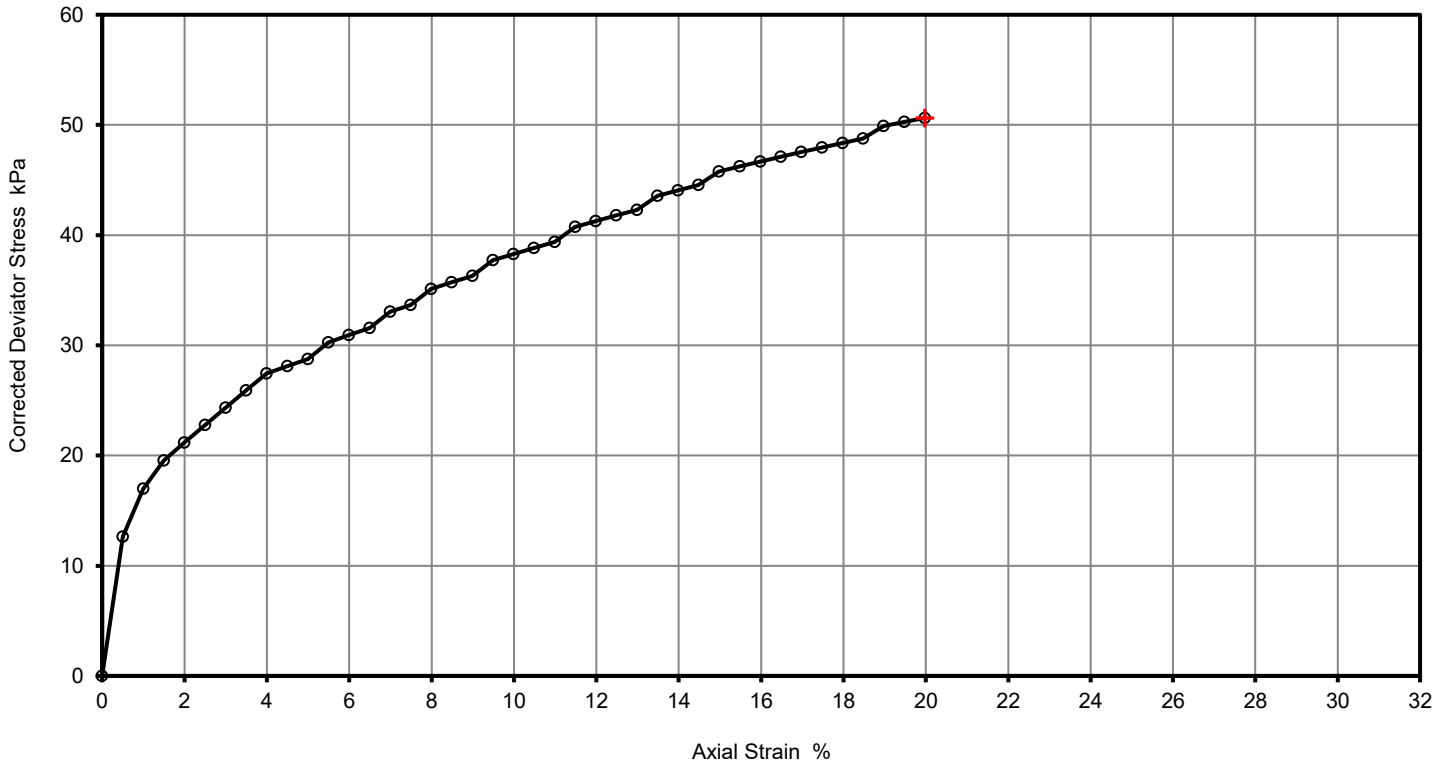
Mass of compacted soil	4684 g
Volume of mould	2305 cm^3
M/C of sample	21.2 %
Bulk density of compacted specimen	2.033 Mg/m^3
Dry density of compacted specimen	1.677 Mg/m^3

CC Geotechnical Ltd Tel: 0151 545 2750 e: lab@ccgeotechnical.com	**Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen**			Job Ref	CCG-C-22-13292
				Borehole/Pit No.	BH02
Site Name	ARGOSY STREET, MANCHESTER			Sample No.	1
Soil Description				Depth	2.50
Specimen Reference		Specimen Depth	m	Sample Type	U100
Specimen Description	Reddish brown slightly sandy slightly gravelly silty CLAY			Date of test	15/07/2022
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen				

UKAS TESTING 4514

Test Number		1	
Length		200.3	mm
Diameter		104.2	mm
Bulk Density		2.13	Mg/m3
Moisture Content		21.4	%
Dry Density		1.76	Mg/m3
Rate of Strain		2.0	%/min
Cell Pressure		50	kPa
At failure	Axial Strain	20.0	%
	Deviator Stress, (σ1 - σ3)f	51	kPa
	Undrained Shear Strength, cu	25	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

Deviator Stress v Axial Strain



Remarks

Approved	Printed
DanielKerfoot	18/07/2022 11:17

Fig. No. 1

Sheet 1

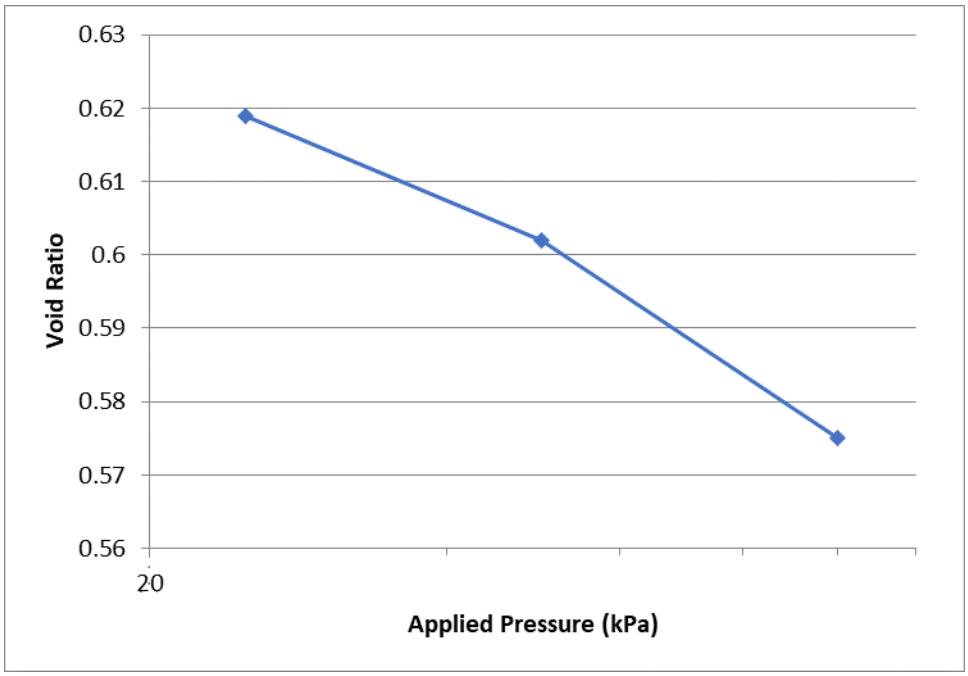
One Dimensional Consolidation Properties
(Oedometer)

Client	TETRA TECH	**Lab Ref**	
Project	ARGOSY DRIVE, MANCHESTER	**Job**	CCG C 22 13292
Borehole	BH01	**Sample**	1

Test Details			
Standard	BS 1377: Part 5: 1990: Clause 3	**Particle Density (assumed)**	2.65 Mg/m3
Sample Type	Undisturbed sample - open drive	**Lab Temperature**	20.0 deg.C
Sample Depth	2.50 m		
Sample Description	Brown slightly sandy slightly gravelly silty CLAY with frequent pockets of sand and organic inclusions		
Variations from Procedure	None		

Specimen Details			
Specimen Reference	A	**Description**	
Depth within Sample	100 mm	**Orientation within Sample**	
Specimen Mass	169.04 g	**Condition**	Natural Moisture
Specimen Height	19.08 mm	**Preparation**	
Comments			

Test Apparatus			
Ring Number	8	**Ring Diameter**	74.92 mm
Ring Height	19.08 mm	**Ring Weight**	117.39 g
Lever Ratio	9.00: 1		



Height of Solid Particles	11.58 mm	**Swelling Pressure**	

One Dimensional Consolidation Properties
(Oedometer)

Client	TETRA TECH	**Lab Ref**	
Project	ARGOSY DRIVE, MANCHESTER	**Job**	CCG C 22 13292
Borehole	BH01	**Sample**	1

Initial Moisture Content*	25.0 %	**Final Moisture Content**	23.8 %
Initial Bulk Density	2.01 Mg/m^3	**Final Bulk Density**	2.08 Mg/m^3
Initial Dry Density	1.61 Mg/m^3	**Final Dry Density**	1.68 Mg/m^3
Initial Void Ratio	0.6478	**Final Void Ratio**	0.5753
Initial Degree of Saturation	102.12 %	**Final Degree of Saturation**	109.52 %

* Calculated from initial and dry weights of whole specimen

Pressure (Loading Stages)	**Coefficient of Volume Compressibility (m_v)**	**Coefficient of Consolidation (c_v)**
0.00		
25.0 kPa	0.71 m^2/MN	**1.9 m^2/ yr**
50.0 kPa	0.42 m^2/MN	**1.2 m^2/ yr**
100.0 kPa	0.33 m^2/MN	**1.2 m^2/ yr**

Method of Time Fitting Used	Log time

Tested by and Date:	DK 25.07.22
Checked by and Date:	DK 25.07.22
Approved by and Date:	CB 25.07.22

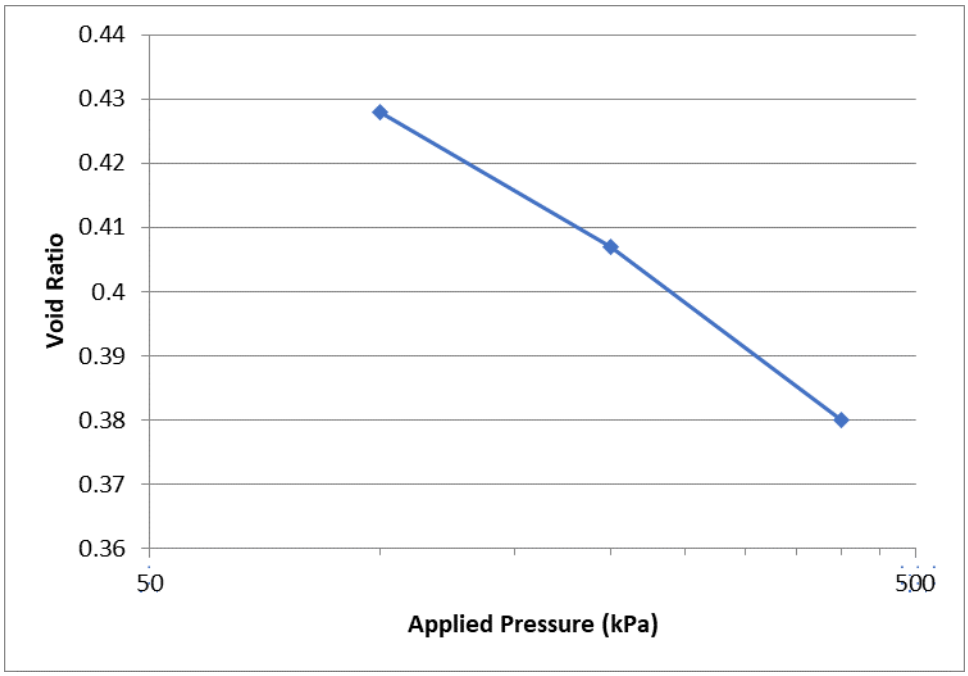
One Dimensional Consolidation Properties
(Oedometer)

Client	TETRA TECH	**Lab Ref**	
Project	ARGOSY DRIVE, MANCHESTER	**Job**	CCG C 22 13292
Borehole	BH01	**Sample**	1

Test Details			
Standard	BS 1377: Part 5: 1990: Clause 3	**Particle Density (assumed)**	2.65 Mg/m3
Sample Type	Undisturbed sample - open drive	**Lab Temperature**	20.0 deg.C
Sample Depth	4.50 m		
Sample Description	Reddish brown, occasionally grey slightly sandy slightly gravelly silty CLAY		
Variations from Procedure	None		

Specimen Details			
Specimen Reference	A	**Description**	
Depth within Sample	95 mm	**Orientation within Sample**	
Specimen Mass	188.85 g	**Condition**	Natural Moisture
Specimen Height	20.01 mm	**Preparation**	
Comments			

Test Apparatus			
Ring Number	1	**Ring Diameter**	74.95 mm
Ring Height	20.01 mm	**Ring Weight**	129.34 g
Lever Ratio	9.00: 1		



Height of Solid Particles	13.27 mm	**Swelling Pressure**	

One Dimensional Consolidation Properties
(Oedometer)

Client	TETRA TECH	**Lab Ref**	
Project	ARGOSY DRIVE, MANCHESTER	**Job**	CCG C 22 13292
Borehole	BH01	**Sample**	1

Initial Moisture Content*	21.8 %	**Final Moisture Content**	17.8 %
Initial Bulk Density	2.14 Mg/m^3	**Final Bulk Density**	2.26 Mg/m^3
Initial Dry Density	1.76 Mg/m^3	**Final Dry Density**	1.92 Mg/m^3
Initial Void Ratio	0.5083	**Final Void Ratio**	0.3803
Initial Degree of Saturation	113.41 %	**Final Degree of Saturation**	124.18 %

* Calculated from initial and dry weights of whole specimen

Pressure (Loading Stages)	**Coefficient of Volume Compressibility (m_v)**	**Coefficient of Consolidation (c_v)**
0.00		
100.0 kPa	0.53 m^2/MN	**4.8 m^2/ yr**
200.0 kPa	0.15 m^2/MN	**7.6 m^2/ yr**
400.0 kPa	0.090 m^2/MN	**9.4 m^2/ yr**

Method of Time Fitting Used	Log time

Tested by and Date:	DK 25.07.22
Checked by and Date:	DK 25.07.22
Approved by and Date:	CB 25.07.22

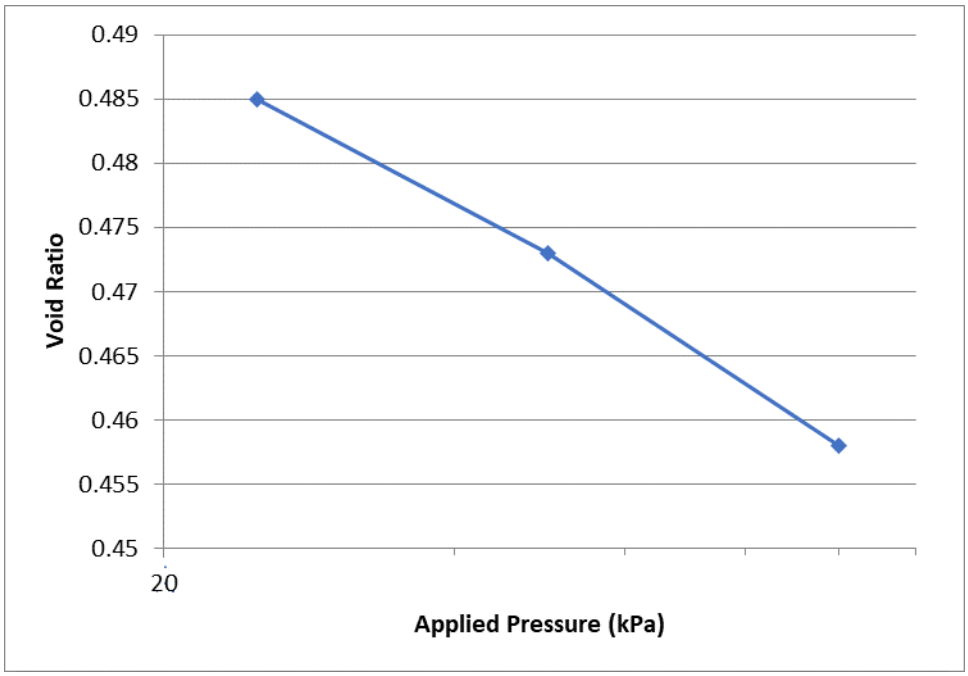
One Dimensional Consolidation Properties
(Oedometer)

Client	TETRA TECH	**Lab Ref**	
Project	ARGOSY DRIVE, MANCHESTER	**Job**	CCG C 22 13292
Borehole	BH02	**Sample**	1

Test Details			
Standard	BS 1377: Part 5: 1990: Clause 3	**Particle Density (assumed)**	2.65 Mg/m3
Sample Type	Undisturbed sample - open drive	**Lab Temperature**	20.0 deg.C
Sample Depth	2.50 m		
Sample Description	Reddish brown slightly sandy slightly gravelly silty CLAY		
Variations from Procedure	None		

Specimen Details			
Specimen Reference	A	**Description**	
Depth within Sample	100 mm	**Orientation within Sample**	
Specimen Mass	189.30 g	**Condition**	Natural Moisture
Specimen Height	20.22 mm	**Preparation**	
Comments			

Test Apparatus			
Ring Number	9	**Ring Diameter**	75.01 mm
Ring Height	20.22 mm	**Ring Weight**	127.43 g
Lever Ratio	9.00: 1		



Height of Solid Particles	13.36 mm	**Swelling Pressure**	

One Dimensional Consolidation Properties
(Oedometer)

Client	TETRA TECH	**Lab Ref**	
Project	ARGOSY DRIVE, MANCHESTER	**Job**	CCG C 22 13292
Borehole	BH02	**Sample**	1

Initial Moisture Content*	21.0 %	**Final Moisture Content**	19.7 %
Initial Bulk Density	2.12 Mg/m^3	**Final Bulk Density**	2.18 Mg/m^3
Initial Dry Density	1.75 Mg/m^3	**Final Dry Density**	1.82 Mg/m^3
Initial Void Ratio	0.5130	**Final Void Ratio**	0.4575
Initial Degree of Saturation	108.26 %	**Final Degree of Saturation**	114.24 %

* Calculated from initial and dry weights of whole specimen

Pressure (Loading Stages)	**Coefficient of Volume Compressibility (m_v)**	**Coefficient of Consolidation (c_v)**
0.00		
25.0 kPa	0.75 m^2/MN	**4.4 m^2/ yr**
50.0 kPa	0.32 m^2/MN	**8.2 m^2/ yr**
100.0 kPa	0.21 m^2/MN	**8.6 m^2/ yr**

Method of Time Fitting Used	Log time

Tested by and Date:	DK 25.07.22
Checked by and Date:	DK 25.07.22
Approved by and Date:	CB 25.07.22

APPENDIX F – TIER 1 SCREENING RESULTS

Soil Screening Data - Argosy Drive

Sample Identity	England and Wales (mg/kg) where		BH01	BH01	WS01	WS01	WS02	WS02	WS03	WS03	BH02 - ES1	BH02 - ES2	BH03 - ES1	BH03 - ES2
Depth (m bgl)	Presence Organic Matter <1%		0.50-0.60	1.90-2.00	0.50-0.60	1.50-1.60	0.50-0.60	1.80-1.90	0.50-0.60	1.50-1.60	0.20-0.30	1.50-1.60	0.30-0.40	1.50-1.60
Reference	Screen Value													
Sample Date	Units	Commercial	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	27/06/2022	27/06/2022	28/06/2022	28/06/2022
pH		<5, >9	7.59	8	9.01	7.41	9.12	7.8	8.37	7.99	9.5	8.51	8.12	8.26
Asbestos	%	Presence	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD
Fraction Organic Carbon	-	-	0.029	0.001	<0.001	0.014	<0.001	0.002	0.008	<0.001	0.016	0.021	0.025	0.02
HEAVY METALS/METALLOIDS														
Arsenic	mg/kg	640	10.4	1.7	1.1	9.4	0.8	6.7	4.9	23.1	1.4	11.1	6.7	6.2
Berylium	mg/kg	12	1.1	1.6	<0.5	1.4	<0.5	1.5	0.8	2.2	<0.5	1.4	1	1.2
Cadmium	mg/kg	190	<0.1	<0.1	0.8	<0.1	0.5	<0.1	<0.1	<0.1	0.8	0.5	<0.1	<0.1
Chromium (III)	mg/kg	8600	48.2	43.2	8.8	51.1	14.1	43.9	35.2	45	8.1	33.5	43.3	50.2
Chromium (VI)	mg/kg	33	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Copper	mg/kg	68000	26	30	3	21	46	16	12	15	3	13	16	15
Lead	mg/kg	2300	52	<5	9	25	11	5	8	<5	9	56	24	10
Mercury (Elemental)	mg/kg	58 (25.8)vap	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	980	20.8	35.3	4.3	28.5	4.9	27.4	15.6	46.4	4.2	25.3	19.1	23.9
Selenium	mg/kg	12000	1	2	<1	1	<1	<1	<1	2	<1	1	<1	<1
Vanadium	mg/kg	9000	31	40	3	39	3	31	22	50	5	33	28	31
Boron	mg/kg	240000	0.7	0.7	<0.1	1	0.2	0.2	0.2	0.5	0.1	0.5	0.6	0.7
Zinc	mg/kg	730000	81	77	18	76	14	37	38	85	15	106	58	53
GENERAL INORGANICS														
Easily Liberatable Cyanide (free)	mg/kg	40	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
US EPA PRIORITY PAHs														
Acenaphthene	mg/kg	84,000 (57.0)sol	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	mg/kg	83,000 (86.1)sol	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Anthracene	mg/kg	520000	<0.04	<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	0.22	<0.06	<0.06	0.09	<0.06	<0.06	0.09	<0.06	<0.06	<0.06	0.15	<0.06
Benzo(b)fluoranthene	mg/kg	44	0.27	<0.05	<0.05	0.07	<0.05	<0.05	0.09	<0.05	<0.05	<0.05	0.17	<0.05
Benzo(k)fluoranthene	mg/kg	1200	0.11	<0.02	<0.02	0.03	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	0.06	<0.02
Benzo(g,h,i)perylene	mg/kg	3900	0.16	<0.04	<0.04	<0.04	<0.04	<0.04	0.06	<0.04	<0.04	<0.04	0.11	<0.04
Benzo(a)pyrene	mg/kg	77	0.2	<0.04	<0.04	<0.04	<0.04	<0.04	0.08	<0.04	<0.04	<0.04	0.13	<0.04
Chrysene	mg/kg	350	0.24	<0.02	<0.02	0.06	<0.02	<0.02	0.08	<0.02	<0.02	<0.02	0.11	<0.02
Di-benzo(a,h)anthracene	mg/kg	3.5	<0.04	<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	23000	0.31	<0.03	<0.03	0.09	<0.03	<0.03	0.1	<0.03	0.07	<0.03	0.16	<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	<0.04
Indeno(1,2,3-cd)pyrene	mg/kg	500	0.2	<0.04	<0.04	<0.04	<0.04	<0.04	0.07	<0.04	<0.04	<0.04	0.11	<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	<0.04
Phenanthrene	mg/kg	22000	0.14	<0.03	<0.03	<0.03	<0.03	<0.03	0.07	<0.03	0.11	<0.03	0.08	<0.03
Pyrene	mg/kg	54000	0.3	<0.03	<0.03	0.07	<0.03	<0.03	0.1	<0.03	0.08	<0.03	0.16	<0.03
TPH														
TPH Aliphatic >C5-6	mg/kg	3,200 (304)sol	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH Aliphatic >C8-10	mg/kg	2,000 (78)sol	<0.1	<0.1	<0.1	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1.1	<0.2	<0.2
TPH Aliphatic >C12-16	mg/kg	59,000 (24)sol	<4	<4	<4	<4	<4	<4	<4	<4	<4	19	<4	<4
TPH Aliphatic >C16-35	mg/kg	1,000,000#	<30	<14	<14	<14	<43	<14	<80	<14	<172	59	<45	<14
TPH Aliphatic >C35-44	mg/kg	1,000,000#	<7	<7	<7	<7	11	<7	<7	<7	12	<7	<7	<7
TPH Aromatic >EC5-7 (Benzene)	mg/kg	27	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<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	<0.1	<0.1	<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	<0.2	<0.2	<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	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
TPH Aromatic >EC16-21	mg/kg	28000	26	<7	<7	<7	<7	<7	13	<7	10	<7	<7	<7
TPH Aromatic >EC21-35	mg/kg	28000	84	<7	<7	<7	14	<7	138	<7	324	<7	103	<7
TPH Aromatic >EC35-44	mg/kg	28000	<7	<7	<7	<7	12	<7	20	<7	41	<7	30	<7
Total aliphatics and aromatics(C5-44)	mg/kg	No Sum	110	<26	<26	<26	26	<26	171	<26	375	<26	133	<26
BTEX														
Methyl Tertiary Butyl Ether	ug/kg		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/kg	27	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	ug/kg	56,000 (869)vap	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ethylbenzene	ug/kg	5,700 (518)vap	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
m/p-Xylene	ug/kg	5,900 (576)sol	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
o-Xylene	ug/kg	6,600 (478)sol	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
ANIONS														
Water Soluble Sulphate as SO4 2:1 Extract	g/l	-	<0.0015	0.1045	0.0084	0.0172	0.0054	0.0426	0.0059	0.0194	0.0183	0.0421	0.0468	0.0615
PHENOLS														
Phenol	mg/kg	440	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
PHYSICAL														
oisture Content Ratio (% of as received sampl	%	-	19.8	23.2	3.7	22.5	3.9	13.8	10.2	14	3.4	13.8	8.6	16.4

---	Analyte not tested for
sol	Suitable 4 Use Level exceeds Presence saturation limit which is given in brackets (note that if Presence data exceeds the solubility limit, free product may be present). For screening consider applicability of both solubility limit and Presence screening value.
vap	Suitable 4 Use Level exceeds vapour saturation limit which is given in brackets.
#	Screening criteria denoted with hash (#) have been capped at 1000000mg/kg, the maximum theoretical value.
	CIEH/LQM S4ULs
	C4SL
	Tt derived value

TETRA TECH

TPH Hazard Indexing		Sample ID	BH01	HI	BH01	HI	WS01	HI	WS01	HI	WS02	HI	WS02	HI	WS03	HI	WS03	HI	[illegible]	HI	[illegible]	HI	[illegible]	HI	[illegible]	HI
		Depth (mbgl)	0.50-0.60		1.90-2.00		0.50-0.60		1.50-1.60		0.50-0.60		1.80-1.90		0.50-0.60		1.50-1.60		0.20-0.30		1.50-1.60		0.30-0.40		1.50-1.60	
Aliphatics	**Units**	**TSV**																								
TPH Aliphatic >C5-6	mg/kg	3,200	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00
TPH Aliphatic >C6-8	mg/kg	7,800	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00
TPH Aliphatic >C8-10	mg/kg	2,000	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00
TPH Aliphatic >C10-12	mg/kg	9,700	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	1.1	0.00	0.2	0.00	0.2	0.00
TPH Aliphatic >C12-16	mg/kg	59,000	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00	19	0.00	4	0.00	4	0.00
TPH Aliphatic >C16-35	mg/kg	1,000,000	30	0.00	14	0.00	14	0.00	14	0.00	43	0.00	14	0.00	80	0.00	14	0.00	172	0.00	59	0.00	45	0.00	14	0.00
TPH Aliphatic >C35-44	mg/kg	1,000,000	7	0.00	7	0.00	7	0.00	7	0.00	11	0.00	7	0.00	7	0.00	7	0.00	12	0.00	7	0.00	7	0.00	7	0.00
Alphatic Hazard Index				0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Aromatics																										
TPH Aromatic >EC5-7 (Benzene)	mg/kg	27	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00
TPH Aromatic >EC7-8	mg/kg	56,000	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00
TPH Aromatic >EC8-10	mg/kg	3,500	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00
TPH Aromatic >EC10-12	mg/kg	16,000	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.00
TPH Aromatic >EC12-16	mg/kg	36,000	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00
TPH Aromatic >EC16-21	mg/kg	28,000	26	0.00	7	0.00	7	0.00	7	0.00	7	0.00	7	0.00	13	0.00	7	0.00	10	0.00	7	0.00	7	0.00	7	0.00
TPH Aromatic >EC21-35	mg/kg	28,000	84	0.00	7	0.00	7	0.00	7	0.00	14	0.00	7	0.00	138	0.00	7	0.00	324	0.01	7	0.00	7	0.00	7	0.00
TPH Aromatic >EC35-44	mg/kg	28,000	7	0.00	7	0.00	7	0.00	7	0.00	12	0.00	7	0.00	20	0.00	7	0.00	41	0.00	7	0.00	7	0.00	7	0.00
Aromatic Hazard Index				0.01		0.00		0.00		0.00		0.01		0.00		0.01		0.00		0.02		0.00		0.00		0.00
Hazard Index				**0.01**		**0.00**		**0.00**		**0.00**		**0.01**		**0.00**		**0.01**		**0.00**		**0.02**		**0.01**		**0.00**		**0.00**

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Sample Identity	England and Wales (mg/kg) where		BH01	BH01	WS01	WS01	WS02	WS02	WS03	WS03	BH02 - ES1	BH02 - ES2	BH03 - ES1	BH03 - ES2
Depth (m bgl)	Soil Organic Matter <1%		0.50-0.60	1.90-2.00	0.50-0.60	1.50-1.60	0.50-0.60	1.80-1.90	0.50-0.60	1.50-1.60	0.20-0.30	1.50-1.60	0.30-0.40	1.50-1.60
		Screen Value												
Sample Date	Units	Commercial	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	23/06/2022	27/06/2022	27/06/2022	28/06/2022	28/06/2022
pH		<5, >9	7.59	8	9.01	7.41	9.12	7.8	8.37	7.99	9.5	8.51	8.12	8.26
Water Soluble Sulphate as SO4 2:1 Extract	g/l		<0.0015	0.1045	0.0084	0.0172	0.0054	0.0426	0.0059	0.0194	0.0183	0.0421	0.0468	0.0615

APPENDIX G – HAZWASTE ONLINE DATA

TETRA TECH

HazWasteOnline™

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:

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

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

I2Z0B-GOSD1-CA2TW

Job name

784-B038962 Argosy Drive

Description/Comments

Project

784-B038962

Site

Argosy Drive

Classified by

Name:
Abigail Walters
Date:
27 Jul 2022 14:44 GMT
Telephone:
01623 684 565

Company:
Tetra Tech (WYG (White Young Green))
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	**Date**
Hazardous Waste Classification	15 Mar 2018
3 year Refresher overdue	-

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH01	0.50-0.60	Non Hazardous		2
2	BH01[2]	1.90-2.00	Non Hazardous		5
3	WS01	0.50-0.60	Non Hazardous		8
4	WS01[2]	1.50-1.60	Non Hazardous		11
5	WS02	0.50-0.60	Non Hazardous		14
6	WS02[2]	1.80-1.90	Non Hazardous		17
7	WS03	0.50-0.60	Non Hazardous		20
8	WS03[2]	1.50-1.60	Non Hazardous		23
9	BH02 - ES1	0.20-0.30	Non Hazardous		26
10	BH02 - ES2	1.50-1.60	Non Hazardous		29
11	BH03 - ES1	0.30-0.40	Non Hazardous		32
12	BH03 - ES2	1.50-1.60	Non Hazardous		35

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: 27 Jul 2022 14:44 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	38
Appendix B: Rationale for selection of metal species	39
Appendix C: Version	40

Classification of sample: BH01

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

Sample details

Sample name:
BH01
Sample Depth:
0.50-0.60 m
Moisture content:
19.8%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

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

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10.4	mg/kg	1.32	11.462	mg/kg	0.00115 %	✓	
2		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.1	mg/kg	2.775	2.548	mg/kg	0.000255 %	✓	
3		boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.7	mg/kg	3.22	1.881	mg/kg	0.000188 %	✓	
4		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<**LOD**
5		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		48.2	mg/kg	1.462	58.804	mg/kg	0.00588 %	✓	
6		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
7		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		26	mg/kg	1.126	24.435	mg/kg	0.00244 %	✓	
8		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	52	mg/kg	1.56	67.705	mg/kg	0.00434 %	✓	
9		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<**LOD**
10		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		20.8	mg/kg	2.976	51.675	mg/kg	0.00517 %	✓	
11		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1	mg/kg	2.554	2.132	mg/kg	0.000213 %	✓	
12		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		81	mg/kg	2.774	187.568	mg/kg	0.0188 %	✓	
13		TPH (C6 to C40) petroleum group			TPH		110	mg/kg		91.82	mg/kg	0.00918 %	✓	
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**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									
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				7.59	pH		7.59	pH	7.59 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				0.14	mg/kg		0.117	mg/kg	0.0000117 %	✓	
			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				0.31	mg/kg		0.259	mg/kg	0.0000259 %	✓	
			205-912-4	206-44-0									
28		pyrene				0.3	mg/kg		0.25	mg/kg	0.000025 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				0.22	mg/kg		0.184	mg/kg	0.0000184 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				0.24	mg/kg		0.2	mg/kg	0.00002 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				0.27	mg/kg		0.225	mg/kg	0.0000225 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				0.11	mg/kg		0.0918	mg/kg	0.00000918 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				0.2	mg/kg		0.167	mg/kg	0.0000167 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				0.2	mg/kg		0.167	mg/kg	0.0000167 %	✓	
			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				0.16	mg/kg		0.134	mg/kg	0.0000134 %	✓	
			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:	0.048 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
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. No evidence of free phase product in samples.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00918%)

Classification of sample: BH01[2]

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

Sample details

Sample name:
BH01[2]
Sample Depth:
1.90-2.00 m
Moisture content:
23.2%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23.2% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		1.7 mg/kg	1.32	1.822 mg/kg	0.000182 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.6 mg/kg	2.775	3.604 mg/kg	0.00036 %	✓	
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.7 mg/kg	3.22	1.829 mg/kg	0.000183 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		43.2 mg/kg	1.462	51.249 mg/kg	0.00512 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		30 mg/kg	1.126	27.416 mg/kg	0.00274 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	<5 mg/kg	1.56	<7.799 mg/kg	<0.0005 %		<LOD
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		35.3 mg/kg	2.976	85.278 mg/kg	0.00853 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	4.146 mg/kg	0.000415 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		77 mg/kg	2.774	173.384 mg/kg	0.0173 %	✓	
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	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<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									
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	pH		8	pH	8pH		
				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:	0.0408 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS01

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

Sample details

Sample name:
WS01
Sample Depth:
0.50-0.60 m
Moisture content:
3.7%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 3.7% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		1.1 mg/kg	1.32	1.401 mg/kg	0.00014 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		<0.5 mg/kg	2.775	<1.388 mg/kg	<0.000139 %		<LOD
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.1 mg/kg	3.22	<0.322 mg/kg	<0.0000322 %		<LOD
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.8 mg/kg	1.142	0.881 mg/kg	0.0000881 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		8.8 mg/kg	1.462	12.403 mg/kg	0.00124 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		3 mg/kg	1.126	3.257 mg/kg	0.000326 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	9 mg/kg	1.56	13.537 mg/kg	0.000868 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		4.3 mg/kg	2.976	12.341 mg/kg	0.00123 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		18 mg/kg	2.774	48.153 mg/kg	0.00482 %	✓	
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	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<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									
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				9.01	pH		9.01	pH	9.01 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:	0.0146 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS01[2]

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

Sample details

Sample name:
WS01[2]
Sample Depth:
1.50-1.60 m
Moisture content:
22.5%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 22.5% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.4	mg/kg	1.32	10.131	mg/kg	0.00101 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.4	mg/kg	2.775	3.172	mg/kg	0.000317 %	✓	
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		1	mg/kg	3.22	2.628	mg/kg	0.000263 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<LOD
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		51.1	mg/kg	1.462	60.968	mg/kg	0.0061 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21	mg/kg	1.126	19.301	mg/kg	0.00193 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	25	mg/kg	1.56	31.833	mg/kg	0.00204 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		28.5	mg/kg	2.976	69.244	mg/kg	0.00692 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1	mg/kg	2.554	2.085	mg/kg	0.000208 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		76	mg/kg	2.774	172.11	mg/kg	0.0172 %	✓	
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	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<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									
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				7.41	pH		7.41	pH	7.41 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				0.09	mg/kg		0.0735	mg/kg	0.00000735 %	✓	
			205-912-4	206-44-0									
28		pyrene				0.07	mg/kg		0.0571	mg/kg	0.00000571 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				0.09	mg/kg		0.0735	mg/kg	0.00000735 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				0.06	mg/kg		0.049	mg/kg	0.0000049 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				0.07	mg/kg		0.0571	mg/kg	0.00000571 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				0.03	mg/kg		0.0245	mg/kg	0.00000245 %	✓	
		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:	0.0415 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS02

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

Sample details

Sample name:
WS02
Sample Depth:
0.50-0.60 m
Moisture content:
3.9%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 3.9% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		0.8 mg/kg	1.32	1.017 mg/kg	0.000102 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		<0.5 mg/kg	2.775	<1.388 mg/kg	<0.000139 %		<**LOD**
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.2 mg/kg	3.22	0.62 mg/kg	0.000062 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5 mg/kg	1.142	0.55 mg/kg	0.000055 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14.1 mg/kg	1.462	19.834 mg/kg	0.00198 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		46 mg/kg	1.126	49.847 mg/kg	0.00498 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	11 mg/kg	1.56	16.514 mg/kg	0.00106 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		4.9 mg/kg	2.976	14.036 mg/kg	0.0014 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		14 mg/kg	2.774	37.38 mg/kg	0.00374 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		74 mg/kg		71.222 mg/kg	0.00712 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**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									
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				9.12	pH		9.12	pH	9.12 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:	0.0212 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
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. No evidence of free phase product in samples.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00712%)

Classification of sample: WS02[2]

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

Sample details

Sample name:
WS02[2]
Sample Depth:
1.80-1.90 m
Moisture content:
13.8%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13.8% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.7 mg/kg	1.32	7.773 mg/kg	0.000777 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.5 mg/kg	2.775	3.658 mg/kg	0.000366 %	✓	
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.2 mg/kg	3.22	0.566 mg/kg	0.0000566 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		43.9 mg/kg	1.462	56.382 mg/kg	0.00564 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		16 mg/kg	1.126	15.83 mg/kg	0.00158 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	5 mg/kg	1.56	6.853 mg/kg	0.000439 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		27.4 mg/kg	2.976	71.661 mg/kg	0.00717 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		37 mg/kg	2.774	90.196 mg/kg	0.00902 %	✓	
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	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<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									
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				7.8	pH		7.8	pH	7.8 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:	0.0308 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS03

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

Sample details

Sample name:
WS03
Sample Depth:
0.50-0.60 m
Moisture content:
10.2%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.2% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		4.9	mg/kg	1.32	5.871	mg/kg	0.000587 %	✓	
2		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.8	mg/kg	2.775	2.015	mg/kg	0.000201 %	✓	
3		boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.2	mg/kg	3.22	0.584	mg/kg	0.0000584 %	✓	
4		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<**LOD**
5		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		35.2	mg/kg	1.462	46.685	mg/kg	0.00467 %	✓	
6		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
7		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		12	mg/kg	1.126	12.26	mg/kg	0.00123 %	✓	
8		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	8	mg/kg	1.56	11.324	mg/kg	0.000726 %	✓	
9		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<**LOD**
10		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		15.6	mg/kg	2.976	42.132	mg/kg	0.00421 %	✓	
11		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<**LOD**
12		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		38	mg/kg	2.774	95.66	mg/kg	0.00957 %	✓	
13		TPH (C6 to C40) petroleum group			TPH		244	mg/kg		221.416	mg/kg	0.0221 %	✓	
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**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									
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				8.37	pH		8.37	pH	8.37 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				0.07	mg/kg		0.0635	mg/kg	0.00000635 %	✓	
			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				0.1	mg/kg		0.0907	mg/kg	0.00000907 %	✓	
			205-912-4	206-44-0									
28		pyrene				0.1	mg/kg		0.0907	mg/kg	0.00000907 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				0.09	mg/kg		0.0817	mg/kg	0.00000817 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				0.08	mg/kg		0.0726	mg/kg	0.00000726 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				0.09	mg/kg		0.0817	mg/kg	0.00000817 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				0.04	mg/kg		0.0363	mg/kg	0.00000363 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				0.08	mg/kg		0.0726	mg/kg	0.00000726 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				0.07	mg/kg		0.0635	mg/kg	0.00000635 %	✓	
			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				0.06	mg/kg		0.0544	mg/kg	0.00000544 %	✓	
			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:	0.0439 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
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. No evidence of free phase product in samples.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0221%)

Classification of sample: WS03[2]

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

Sample details

Sample name:
WS03[2]
Sample Depth:
1.50-1.60 m
Moisture content:
14%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 14% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		23.1 mg/kg	1.32	26.754 mg/kg	0.00268 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		2.2 mg/kg	2.775	5.356 mg/kg	0.000536 %	✓	
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.5 mg/kg	3.22	1.412 mg/kg	0.000141 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		45 mg/kg	1.462	57.693 mg/kg	0.00577 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		15 mg/kg	1.126	14.814 mg/kg	0.00148 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	<5 mg/kg	1.56	<7.799 mg/kg	<0.0005 %		<LOD
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		46.4 mg/kg	2.976	121.139 mg/kg	0.0121 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	4.48 mg/kg	0.000448 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		85 mg/kg	2.774	206.844 mg/kg	0.0207 %	✓	
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	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<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									
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				7.99	pH		7.99	pH	7.99 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:	0.0498 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH02 - ES1

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

Sample details

Sample name:
BH02 - ES1
Sample Depth:
0.20-0.30 m
Moisture content:
3.4%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 3.4% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		1.4 mg/kg	1.32	1.788 mg/kg	0.000179 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		<0.5 mg/kg	2.775	<1.388 mg/kg	<0.000139 %		<LOD
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.1 mg/kg	3.22	0.311 mg/kg	0.0000311 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.8 mg/kg	1.142	0.884 mg/kg	0.0000884 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		8.1 mg/kg	1.462	11.449 mg/kg	0.00114 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		3 mg/kg	1.126	3.267 mg/kg	0.000327 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	9 mg/kg	1.56	13.577 mg/kg	0.00087 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		4.2 mg/kg	2.976	12.089 mg/kg	0.00121 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		15 mg/kg	2.774	40.244 mg/kg	0.00402 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		552 mg/kg		533.849 mg/kg	0.0534 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<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									
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				9.5	pH		9.5	pH	9.5 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				0.11	mg/kg		0.106	mg/kg	0.0000106 %	✓	
			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				0.07	mg/kg		0.0677	mg/kg	0.00000677 %	✓	
			205-912-4	206-44-0									
28		pyrene				0.08	mg/kg		0.0774	mg/kg	0.00000774 %	✓	
			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:	0.0619 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
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. No evidence of free phase product in samples.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0534%)

Classification of sample: BH02 - ES2

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

Sample details

Sample name:
BH02 - ES2
Sample Depth:
1.50-1.60 m
Moisture content:
13.8%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13.8% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11.1 mg/kg	1.32	12.878 mg/kg	0.00129 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.4 mg/kg	2.775	3.414 mg/kg	0.000341 %	✓	
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.5 mg/kg	3.22	1.415 mg/kg	0.000141 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5 mg/kg	1.142	0.502 mg/kg	0.0000502 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		33.5 mg/kg	1.462	43.025 mg/kg	0.0043 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		**<LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		13 mg/kg	1.126	12.862 mg/kg	0.00129 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	56 mg/kg	1.56	76.757 mg/kg	0.00492 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		**<LOD**
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		25.3 mg/kg	2.976	66.168 mg/kg	0.00662 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1 mg/kg	2.554	2.244 mg/kg	0.000224 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		106 mg/kg	2.774	258.4 mg/kg	0.0258 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		79 mg/kg		69.42 mg/kg	0.00694 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		**<LOD**
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		**<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									
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				8.51	pH		8.51	pH	8.51 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:	0.0522 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
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. No evidence of free phase product in samples.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00694%)

Classification of sample: BH03 - ES1

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

Sample details

Sample name:
BH03 - ES1
Sample Depth:
0.30-0.40 m
Moisture content:
8.6%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.6% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.7 mg/kg	1.32	8.146 mg/kg	0.000815 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1 mg/kg	2.775	2.556 mg/kg	0.000256 %	✓	
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.6 mg/kg	3.22	1.779 mg/kg	0.000178 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<**LOD**
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		43.3 mg/kg	1.462	58.274 mg/kg	0.00583 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		16 mg/kg	1.126	16.588 mg/kg	0.00166 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	24 mg/kg	1.56	34.471 mg/kg	0.00221 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		19.1 mg/kg	2.976	52.345 mg/kg	0.00523 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		58 mg/kg	2.774	148.159 mg/kg	0.0148 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		171 mg/kg		157.459 mg/kg	0.0157 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**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									
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				8.12	pH		8.12	pH	8.12 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				0.08	mg/kg		0.0737	mg/kg	0.00000737 %	✓	
			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				0.16	mg/kg		0.147	mg/kg	0.0000147 %	✓	
			205-912-4	206-44-0									
28		pyrene				0.16	mg/kg		0.147	mg/kg	0.0000147 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				0.15	mg/kg		0.138	mg/kg	0.0000138 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				0.11	mg/kg		0.101	mg/kg	0.0000101 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				0.17	mg/kg		0.157	mg/kg	0.0000157 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				0.06	mg/kg		0.0552	mg/kg	0.00000552 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				0.13	mg/kg		0.12	mg/kg	0.000012 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				0.11	mg/kg		0.101	mg/kg	0.0000101 %	✓	
			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				0.11	mg/kg		0.101	mg/kg	0.0000101 %	✓	
			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:	0.0473 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
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. No evidence of free phase product in samples.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0157%)

Classification of sample: BH03 - ES2

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

Sample details

Sample name:
BH03 - ES2
Sample Depth:
1.50-1.60 m
Moisture content:
16.4%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16.4% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.2 mg/kg	1.32	7.033 mg/kg	0.000703 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.2 mg/kg	2.775	2.861 mg/kg	0.000286 %	✓	
3	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.7 mg/kg	3.22	1.936 mg/kg	0.000194 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		50.2 mg/kg	1.462	63.033 mg/kg	0.0063 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3 mg/kg	2.27	<0.681 mg/kg	<0.0000681 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		15 mg/kg	1.126	14.509 mg/kg	0.00145 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	10 mg/kg	1.56	13.4 mg/kg	0.000859 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		23.9 mg/kg	2.976	61.111 mg/kg	0.00611 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		53 mg/kg	2.774	126.314 mg/kg	0.0126 %	✓	
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	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<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									
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				8.26	pH		8.26	pH	8.26 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:	0.0343 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
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

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: 2022.192.5237.9831 (11 Jul 2022)
HazWasteOnline Database: 2022.192.5237.9831 (11 Jul 2022)

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