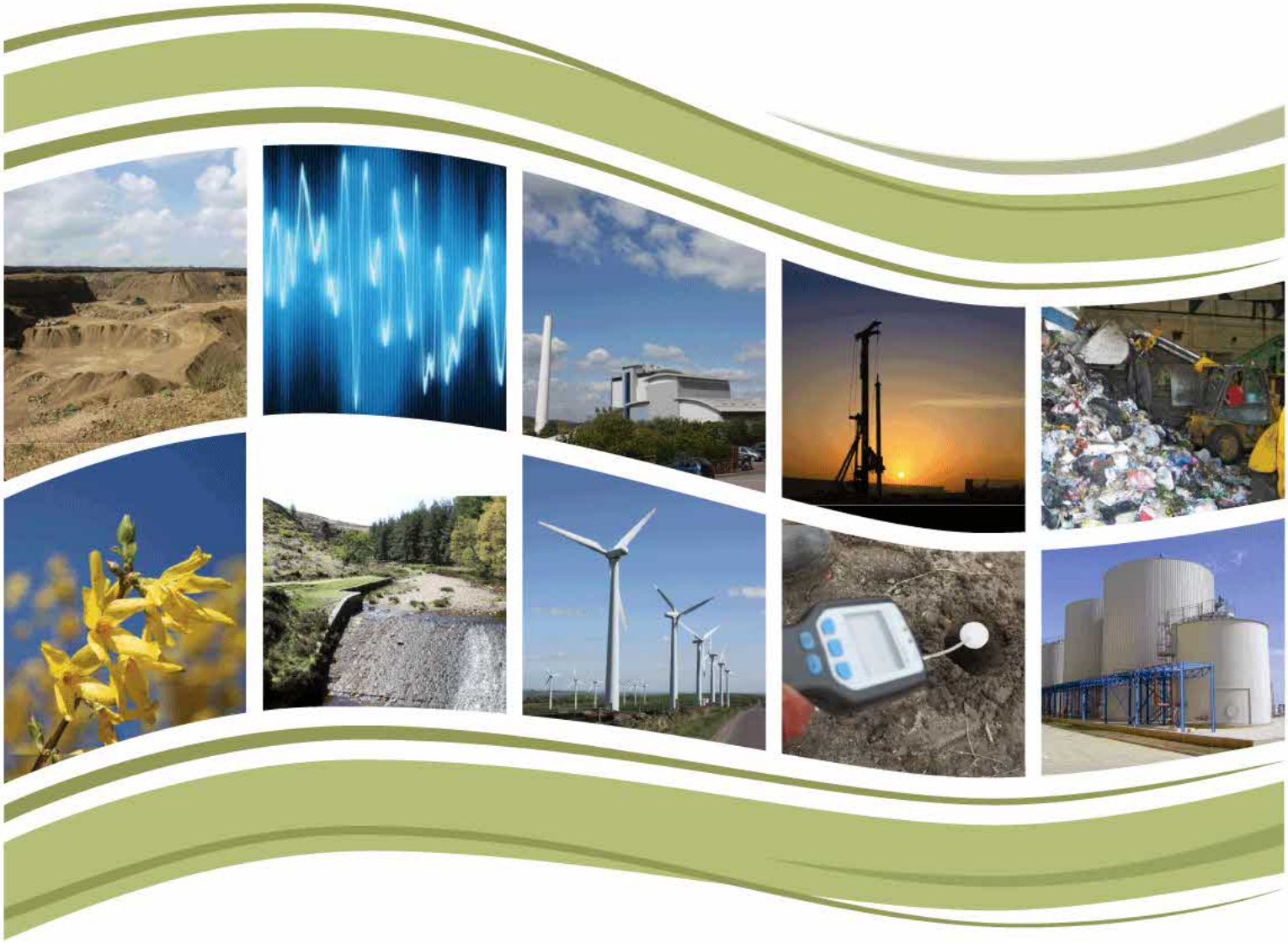
enzygo
geo environmental



Validation Report

Premier Inn, Foss Island, York

Clegg Construction Limited.

SHF.269.002.GE.R.001.B

'Experience and expertise working in union'

enzygo.com

Association of Geotechnical & Geoenvironmental Specialists

Contact Details:

Enzygo Ltd.
Ducie House,
Ducie Street,
Manchester,
M1 2JW

tel: 0114 413 6444
www: enzygo.com

Validation Report

Project:	Premier Inn, Foss Island, York
For:	Clegg Construction Limited.
Ref:	SHF.269.002.GE.R.001
Status:	Rev B
Date:	February 2024
Author:	Reuben Fisher - BSc (Hons.), MSc, FGS, Geo-Environmental Consultant Engineer
Approver:	Nigel Ramsumair - MGeo (Hons.), FGS, Senior Geo-Environmental Engineer

Contents

Drawings and Appendices

1.0 INTRODUCTION

1.1 Background

1.1.1 Enzygo Geo-Environmental Limited (Enzygo) has been commissioned by Clegg Construction Limited (the Client) to prepare a Validation Report for a proposed new Premier Inn Hotel at a site located off Foss Island Road, Layerthorpe, York, YO31 7US.

1.2 Proposed Development

1.2.1 The proposed development is for a new multi-storey hotel with associated parking [road] and landscaping. The proposed development is illustrated in the Enzygo drawing [Ref; SHF.269.002.GE.D.001] included in Appendix 1.

1.3 Existing Information

1.3.1 The existing information presented as part of this assessment is given below:

CBRE Limited, Phase I & II Environmental Assessment [Report Ref: 50BCD0297874], dated February 2020.

Enzygo Geoenvironmental Ltd, Geo-Environmental Report [Report Ref: MAN.1035.006.GE.R.001], dated November 2021.

Enzygo Geoenvironmental Ltd, Remediation Method Statement [Report Ref: MAN.1035.006.GE.R.001.A], dated April 2020.

I.H. Equipment Ltd, Remediation Letter, dated June 2023.

1.4 Planning Consent

1.4.1 Outline Planning Consent [Ref: 20/00940/FULM], dated 11 June 2020, as granted by City of York Council includes the following conditions/directives as set out in 'Condition 10', which state the following.

'Prior to first occupation or use, the approved remediation scheme must be carried out in accordance with its terms and a verification report that demonstrates the effectiveness of the remediation carried out shall be submitted to and approved in writing by the Local Planning Authority.'

1.5 Objectives

1.5.1 The purpose of this report is to provide a record of the remedial works undertaken, as follows.

Any areas of unknown contamination encountered; and the remedial measures undertaken.

Waste disposal notes where appropriate.

Confirmation that the works observed complied with the remedial methodology; and

Details of imported clean cover soils with the results of any chemical analysis.

2.0 REMEDIATION METHOD STATEMENT

2.1 General

2.1.1 An Enzygo Geoenvironmental Ltd, Remediation Method Statement [Report Ref: MAN.1035.006.GE.R.001.A], dated April 2020 was produced concluding the following:

Based upon the quantitative risk assessment undertaken by Enzygo, there are no viable source pathway-receptors identified, and; therefore, there can be no Risk[s]. Based upon this, significant remediation is not required nor is it planned.

2.1.2 Although significant remediation is not required, the following guidance was provided within the following headings.

2.2 Asbestos Management

2.2.1 Asbestos contaminated material has not been identified during the Ground Investigation. Nevertheless, asbestos management measures should be documented in an Asbestos Management Plan which will be incorporated into the Contractors Construction Stage Health and Safety Plan as required under the Construction Design and Management (CDM) regulations to mitigate risk to construction works. The asbestos management plan should document measures to mitigate the risk of potential asbestos materials to construction workers. These measures should be provided by an appropriately qualified asbestos contractor and may include the following however may include additional measures deemed necessary by the asbestos contractor:

Preventing access to the construction site by members of the public;
Use of good hygiene measures, including washing down of plant; and
Use of appropriate PPE, including face masks.

2.3 Validation of Cover Soils

2.3.1 Given the proposed plan and the landscaping requirements across the site it is recommended that the thickness of the imported materials is verified. The works will comprise the following:

Excavation of pits by hand, locations of which are yet to be determined. The number of pits and samples will be based on current NHBC guidance, which was developed in conjunction with the Environment Agency;
Measure the thickness of the cover soils; and
Photograph each pit with a measuring tape of staff used to show the thickness of the cover soils.

2.3.2 Soil samples will be collected from each pit from within the cover soils in appropriate containers provided by the analytical laboratory. One sample of cover soil per pit will be collected. Indicative locations were shown on the 'Exploratory Hole Location Plan Ref: SHF.269.002.GE.D.001, included within Appendix 1.

2.3.3 Samples will be stored in cool boxes prior to dispatch to the laboratory for analysis. All samples will be collected using appropriate sampling equipment that is cleaned at each sampling location and will be analysed at a laboratory which is UKAS and MCERTS accredited. Samples will be tested for the CLEA metal suite, pH, sulphate, cyanide, phenols, speciated Polycyclic

Aromatic Hydrocarbons (PAH), organic carbon, Speciated Total Petroleum Hydrocarbon (TPH) and asbestos screen.

2.3.4 Should soils fail the General Assessment Criteria (GAC) values these will be excavated and discarded off-site. Additional testing will be undertaken around the excavation to confirm that the adjacent soils are clean. Fresh soils will be imported and used to re-construct the cover soils.

2.4 Unforeseen Contaminations

2.4.1 If unforeseen contamination is encountered during construction works, such as localised spillage outside the areas investigated an Environmental Consultant will be available on a 'call out' basis to undertake an assessment of risk. If 'unforeseen contamination' is encountered the discovery strategy will be to remove the source as it is likely to be very limited in extent, and the Local Planning Authority advised.

2.5 Utilities

2.5.1 Results of the chemical analysis will be provided to the water authority and any requirements in relation to protecting potable waste supply pipes will be incorporated into the scheme.

3.0 VALIDATION

3.1 General

3.1.1 Although the site did not require any significant remedial works, the following headings discussed below confirm that site has been developed in accordance with the Enzygo RMS.

3.2 Asbestos Management

3.2.1 As far as Enzygo are aware, Asbestos measures were in accordance with the Asbestos Management Plan. As advised, this should be incorporated into the contractor's Construction Stage Health and Safety Plan, as required under the Construction Design and Management (CDM) Regulations, to mitigate risk to construction works and end users of the site.

3.3 Cover Soils

3.3.1 It is understood that topsoil has been imported to site from the client's chosen supplier. Conveyance notes detailing the movement of 'topsoil' should be kept on file for reference.

3.3.2 Enzygo attended site on 20th December 2023 to validate the soil thickness of the cover soils by excavating hand dug pits within the soft landscaped communal areas. One of the three areas [western area] was completed on the day of attendance proving a topsoil thickness ranging between the ranges of 400mm [S2] and 500mm [S1]. However, a sample was taken from a small stockpile of topsoil within the eastern communal area [S3] prior to completion.

3.3.3 Enzygo attended site on 25th January 2024, to collect a soil sample from a stockpile of topsoil within the within the area of S5. This sample was collected for chemical testing with placement of soils within the areas of S3 - S5 to be undertaken at a later date.

3.3.4 Enzygo attended site on 31st January 2024 to validate the soil thickness of the cover soils by excavating hand dug pits [S3 to S5] within the two remaining soft landscaped communal areas [northern and eastern sections]. These pits proved a topsoil a thickness of 630mm [S5] for the northern section, and thicknesses between the range of 570mm [S4] to 590mm [S3] in the eastern section. An exploratory hole location plan is included within Appendix 1, the logs of the hand excavations are located within Appendix 3, and the photographs of the hand excavations included within Appendix 4.

3.3.5 Representative topsoil samples were collected for chemical testing from the communal areas as discussed above [S1 to S3 & S5]. Soil samples were collected in appropriate containers provided by the analytical laboratory. Samples were stored in cool boxes prior to dispatch to the laboratory for analysis. All samples were collected using appropriate sampling equipment that was cleaned at each sampling location.

3.3.6 Samples for chemical analysis were sent to the laboratories of I2 Analytical Ltd who are MCERTS accredited. Samples were tested for the CLEA metal suite, pH, sulphate, cyanide, phenols, speciated Polycyclic Aromatic Hydrocarbons (PAH), organic carbon, Speciated Total Petroleum Hydrocarbon (TPH CWG) and asbestos screen. The results of the chemical testing [for S1 to S3 and S5] are included with Appendix 2.

3.3.7 An assessment of the risks to human health has been undertaken by comparing the soil quality data with reference values obtained from the Contaminated Land Exposure Assessment (CLEA), Soil Guideline Values (SGV) and General Acceptance Criteria (GAC) published by LQM/CIEH. The

LQM/CIEH S4ULs values are used, and summary tables of the reference values are included in Appendix 6 - Human Health Assessment Reference Values

3.3.8 The development is for a proposed Premier Inn, therefore the GAC values for a 'commercial' end use are considered applicable.

3.3.9 No soils samples tested [S1-S3 and S5] have reported any exceedances when compared to GAC values for a 'commercial' end use and no positive IDs for asbestos were reported.

3.3.10 Based upon the observations made at the study site by Enzygo to date, the results of the attached chemical analysis and a review of information supplied by the Client the following has been established:

Supplied photographic information and site reconnaissance by Enzygo indicates that imported topsoil was placed to a depth of 300mm within communal open space areas; and Laboratory analysis of topsoil imported to the site did not record any elevated concentrations of any of the potential contaminants tested when compared to GAC values for a commercial end use.

3.3.11 It is therefore assessed that the laboratory testing appended to this report provides sufficient evidence to allow for the Local Planning Authority to discharge Condition 10 of the Planning Consent Ref: 20/00940/FULM, dated 11 June 2020.

3.4 Unforeseen Contamination

3.4.1 Enzygo understand that the appointed contractor followed the discovery strategy as per the Enzygo Geoenvironmental Ltd, Remediation Method Statement [Report Ref: SHF.1735.002.GE.R.002], dated February 2020. The I.H. Equipment Ltd Remediation Letter dated June 2023, included within Appendix 5, confirms that no unforeseen contamination was encountered during the works. Therefore, no change to the remedial methodology was considered necessary.

3.5 Utilities

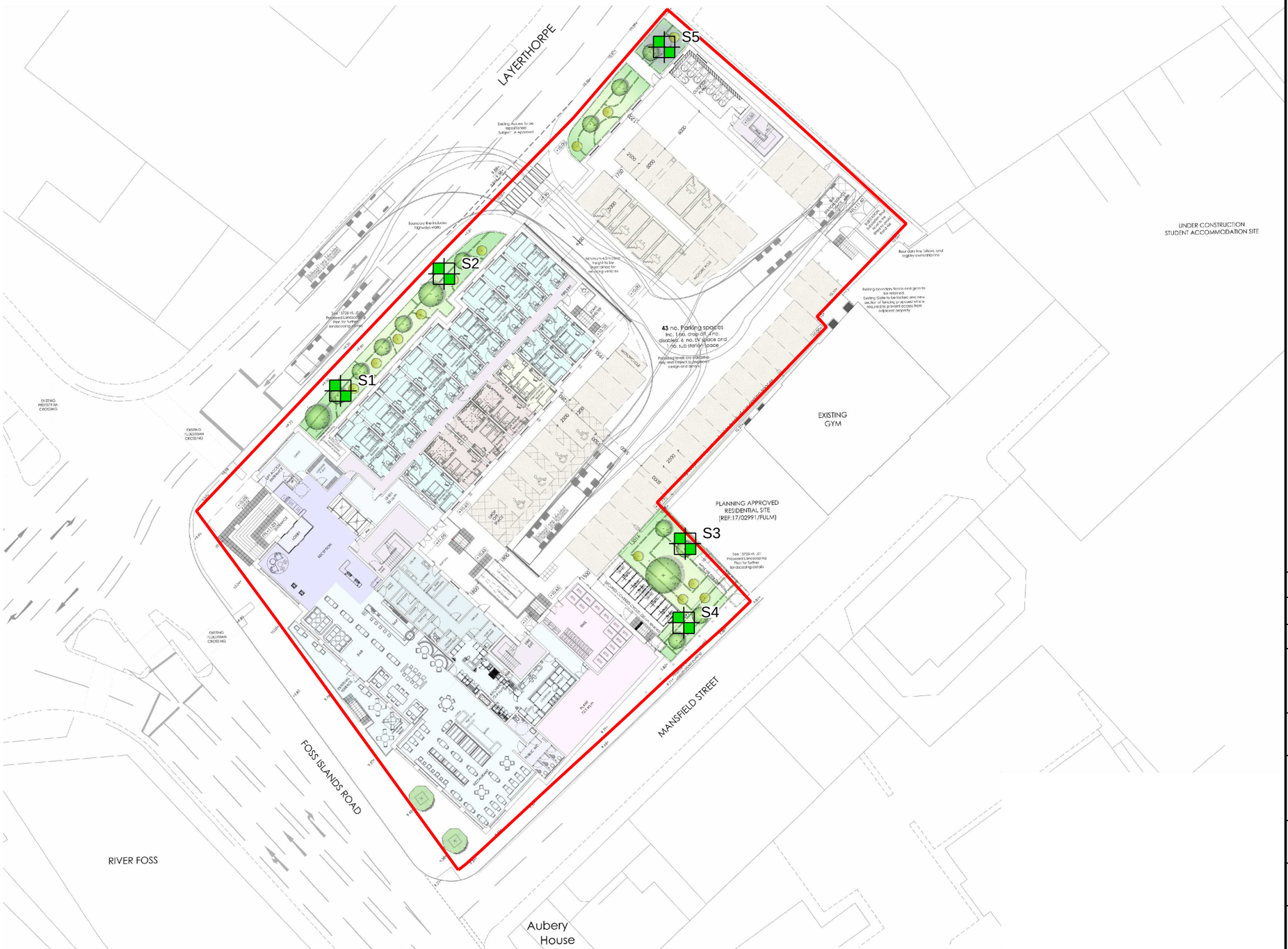
3.5.1 Enzygo understand Clegg Construction Ltd have provided chemical analysis results to the water authority and any requirements in relation to protecting potable waste supply pipes will be incorporated into the scheme.

4.0 CONCLUSION

4.1 General

4.1.1 It is considered that the proposed new Premier Inn hotel has been generally developed in accordance with the Enzygo Geoenvironmental Ltd, Remediation Method Statement [Report Ref: MAN.1035.006.GE.R.001.A], dated April 2020 to date.

Appendix 1 - Drawings



KEY:

Site Boundary

Hand Pits (S1-S5)

NOTES:

DO NOT SCALE FROM THIS DRAWING

ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND DOCUMENTS ASSOCIATED WITH THIS PROJECT.

ALL EXISTING AND PROPOSED DIMENSIONS, LEVELS AND LOCATIONS TO BE CHECKED AND VERIFIED BY THE MAIN CONTRACTOR ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS AND ANY ANOMALIES REPORTED TO THE ENGINEER.

Rev	Date	Description	DRA	CHK	APP
P02	05.02.24	S5 & S3 Location Amended	LB	RF	RF
P01	25.01.24	Issued for comment / approval	LB	NR	NR

Project
Premier Inn, Foss Island, York

Client
Clegg Construction Limited

Drawing Title
Exploratory Hole Location Plan

Scale	Date	Status
1:500 @ A3	25.01.24	Preliminary

DWG No. SHF269002-ENZ-XX-XX-DR-G-0001

Revision P02

Bristol 01454 269 237
Cardiff 02920 023 700
Manchester 0161 413 6444
Cambridge 01799 542 473
Sheffield 0114 321 5151
Belfast 07377673948

enzygo
@enzygo
enzygo.com
hello@enzygo.com

Appendix 2 - Chemical Testing Results

Reuben Fisher
Enzygo Geoenvironmental Ltd☐
Ducie House, Ducie Street,
M1 2JW

e: Reuben.Fisher@enzygo.com

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

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

Analytical Report Number : 23-76460

Replaces Analytical Report Number: 23-76460, issue no. 1
Client sampling date amended.
Sample Date Added To All Samples As Requested By Client.

Project / Site name:	Foss Island York	**Samples received on:**	20/12/2023
Your job number:	SHF 269 002	**Samples instructed on/ Analysis started on:**	21/12/2023
Your order number:	SHF 269 002	**Analysis completed by:**	17/01/2024
Report Issue Number:	2	**Report issued on:**	17/01/2024
Samples Analysed:	3 soil samples		

Signed [redacted]

Joanna Szwagrzak
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 23-76460
Project / Site name: Foss Island York
Your Order No: SHF 269 002

Lab Sample Number				2919637	2919638	2919639
Sample Reference				S1	S2	S3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.30	0.40
Date Sampled				19/12/2023	19/12/2023	19/12/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	25	23
Total mass of sample received	kg	0.001	NONE	1.4	1.4	1.4
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.16	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.2	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	1.7	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	1.4	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	13	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	2.6	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	18	< 0.05	0.08
Pyrene	mg/kg	0.05	MCERTS	14	< 0.05	0.06
Benzo(a)anthracene	mg/kg	0.05	MCERTS	6.7	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	5.7	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	6.3	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	3.3	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.4	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.8	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.88	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	3.1	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	85.6	< 0.80	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.3	2.4	1.7
Boron (water soluble)	mg/kg	0.2	MCERTS	1	0.6	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	5.5	6.1
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	21	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	42	16	11
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	6	4.9
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	43	30

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0

Analytical Report Number: 23-76460
Project / Site name: Foss Island York
Your Order No: SHF 269 002

Lab Sample Number				2919637	2919638	2919639
Sample Reference				S1	S2	S3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.30	0.40
Date Sampled				19/12/2023	19/12/2023	19/12/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Petroleum Hydrocarbons						
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	30	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	NONE	35	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	8.4	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	49	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	130	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	NONE	180	< 10	< 10

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

Analytical Report Number : 23-76460
Project / Site name: Foss Island York

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2919637	S1	None Supplied	0.4	Brown loam and clay with gravel and vegetation.
2919638	S2	None Supplied	0.3	Brown clay and sand with gravel and vegetation.
2919639	S3	None Supplied	0.4	Brown clay and sand with gravel and vegetation.

Analytical Report Number : 23-76460
Project / Site name: Foss Island York

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

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

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

Analytical Report Number : 23-76460

Project / Site name: Foss Island York

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
S1	None Supplied	S	2919637	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
S1	None Supplied	S	2919637	b	TPHCWG (Soil)	L088/76-PL	b
S2	None Supplied	S	2919638	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
S2	None Supplied	S	2919638	b	TPHCWG (Soil)	L088/76-PL	b
S3	None Supplied	S	2919639	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
S3	None Supplied	S	2919639	b	TPHCWG (Soil)	L088/76-PL	b

Enzygo Geoenvironmental Ltd☐
Ducie House
Ducie Street
M1 2JW

e: Reuben.Fisher@enzygo.com

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

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

Analytical Report Number : 24-000964

Replaces Analytical Report Number: 24-000964, issue no. 1
Client references/information amended.
Sample reference amended as per client's request

Project / Site name:	Foss Island	**Samples received on:**	26/01/2024
Your job number:	SHF 269 002	**Samples instructed on/ Analysis started on:**	30/01/2024
Your order number:	SHF 269 002	**Analysis completed by:**	05/02/2024
Report Issue Number:	2	**Report issued on:**	22/02/2024
Samples Analysed:	1 soil sample		

Signed: [redacted]

Joanna Szwagrzak
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 24-000964
Project / Site name: Foss Island
Your Order No: SHF 269 002

Lab Sample Number				106768
Sample Reference				S5
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				25/01/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	15
Total mass of sample received	kg	0.1	NONE	1.3

Asbestos

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.1
Pyrene	mg/kg	0.05	MCERTS	0.08
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenzo(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	3.7
Copper (aqua regia extractable)	mg/kg	1	MCERTS	10
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	4.4
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	24

Analytical Report Number: 24-000964
Project / Site name: Foss Island
Your Order No: SHF 269 002

Lab Sample Number				106768
Sample Reference				S5
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				25/01/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Petroleum Hydrocarbons				
TPHCWG - Aliphatic >C5 - C6 HS_1D_AL	mg/kg	0.02	NONE	< 0.020
TPHCWG - Aliphatic >C6 - C8 HS_1D_AL	mg/kg	0.02	NONE	< 0.020
TPHCWG - Aliphatic >C8 - C10 HS_1D_AL	mg/kg	0.05	NONE	< 0.050
TPHCWG - Aliphatic >C10 - C12 EH_CU_1D_AL_#1_#2	mg/kg	1	MCERTS	< 1.0
TPHCWG - Aliphatic >C12 - C16 EH_CU_1D_AL_#1_#2	mg/kg	2	MCERTS	< 2.0
TPHCWG - Aliphatic >C16 - C21 EH_CU_1D_AL_#1_#2	mg/kg	8	MCERTS	< 8.0
TPHCWG - Aliphatic >C21 - C35 EH_CU_1D_AL_#1_#2	mg/kg	8	MCERTS	< 8.0
TPHCWG - Aliphatic >C5 - C35 EH_CU+HS_1D_AL_#1_#2	mg/kg	10	NONE	< 10
TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	NONE	< 0.010
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	NONE	< 0.010
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	< 0.050
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR_#1_#2	mg/kg	1	MCERTS	< 1.0
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR_#1_#2	mg/kg	2	MCERTS	< 2.0
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR_#1_#2	mg/kg	10	MCERTS	< 10
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR_#1_#2	mg/kg	10	MCERTS	< 10
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR_#1_#2	mg/kg	10	NONE	< 10
VOCs				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0

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

Analytical Report Number : 24-000964
Project / Site name: Foss Island

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
106768	S5	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation

Analytical Report Number : 24-000964
Project / Site name: Foss Island

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088	D/W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Appendix 3 – Exploratory Hole Logs

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site				
Premier Inn, Foss Island				**S1**
Job No: SHF.269.002	Dates: Start 20-12-23, Finish 20-12-23	Ground Level (m)	Co-Ordinates	
Client: Clegg Construction Limited				Sheet: 1 of 1

Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
	0.40	ES		0.50			Brown slightly clayey sandy TOPSOIL. Sand is fine to coarse.
				0.60			MADE GROUND: Medium dense grey slightly silty sandy angular to subangular gravel of limestone. Sand is fine to coarse
				{1.00}			Trial Pit completed at 0.60m.

0

1

General Remarks

Dimensions: xx0.60
1. Hand excavated inspection pit from ground level to 0.60m begl.
2.Densities and soil consistencies are based on insitu tests.
3. No visual or olfactory evidence of contamination observed.
4. Groundwater was not encoutered.

All dimensions in metres Scale 1:6.25		Logged By NR

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site				
Premier Inn, Foss Island				**S2**
Job No: SHF.269.002	Dates: Start 20-12-23, Finish 20-12-23	Ground Level (m)	Co-Ordinates	
Client: Clegg Construction Limited				Sheet: 1 of 1

Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
							Brown slightly clayey sandy TOPSOIL. Sand is fine to coarse.
	0.30	ES					
				0.40			MADE GROUND: Medium dense grey slightly silty sandy angular to subangular gravel of limestone. Sand is fine to coarse
				0.50			Trial Pit completed at 0.50m.
				{1.00}			

0

1

General Remarks

Dimensions: xx0.50
1. Hand excavated inspection pit from ground level to 0.50m begl.
2.Densities and soil consistencies are based on insitu tests.
3. No visual or olfactory evidence of contamination observed.
4. Groundwater was not encoutered.

All dimensions in metres Scale 1:6.25		Logged By NR

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site
Premier Inn, Foss Island

S3

Job No	Dates	Ground Level (m)	Co-Ordinates
SHF.269.002	Start 31-01-24 Finish 31-01-24		

Client
Clegg Construction Limited

Sheet
1 of 1

Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
							Redish brown silty clayey sandy TOPSOIL. Sand is fine to coarse.
	0.40	ES					
				0.59			MADE GROUND: Medium dense greyish brown slightly silty sandy fine to coarse angular to subangular gravel of Limestone. Sand is fine to coarse.
				0.69			Trial Pit completed at 0.69m.
				{1.00}			

0
1

General Remarks

Dimensions: xx0.69
1. Hand excavated inspection pit from ground level to 0.69m begl.
2.Densities and soil consistencies are based on insitu tests.
3. No visual or olfactory evidence of contamination observed.
4. Groundwater was not encoutered.

All dimensions in metres
Scale 1:6.25

Logged By
RF

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site				
Premier Inn, Foss Island				**S4**
Job No: SHF.269.002	Dates: Start 31-01-24, Finish 31-01-24	Ground Level (m)	Co-Ordinates	
Client: Clegg Construction Limited				Sheet: 1 of 1

Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
							Redish brown silty clayey sandy TOPSOIL. Sand is fine to coarse.
				0.57			MADE GROUND: Greyish brown slightly silty sandy fine to coarse angular to subangular gravel of Limestone. Sand is fine to coarse.
				0.67			Trial Pit completed at 0.67m.
				{1.00}			

0

1

General Remarks

Dimensions: xx0.67
1. Hand excavated inspection pit from ground level to 0.67m begl.
2.Densities and soil consistencies are based on insitu tests.
3. No visual or olfactory evidence of contamination observed.
4. Groundwater was not encoutered.

All dimensions in metres Scale 1:6.25		Logged By RF

Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site				
Premier Inn, Foss Island				**S5**
Job No: SHF.269.002	Dates: Start 31-01-24, Finish 31-01-24	Ground Level (m)	Co-Ordinates	
Client: Clegg Construction Limited				Sheet: 1 of 1

Water Levels	Samples & In Situ Testing: Depth (m)	No/Type	Results	Depth (m)	Level (mAD)	Legend	Stratum Description
	0.30	ES		0.63			Redish brown silty clayey sandy TOPSOIL. Sand is fine to coarse.
				0.73			MADE GROUND: Greyish brown slightly silty sandy fine to coarse angular to subangular gravel of Limestone. Sand is fine to coarse.
				{1.00}			Trial Pit completed at 0.73m.

0

1

General Remarks

Dimensions: xx0.73
1. Hand excavated inspection pit from ground level to 0.73m begl.
2.Densities and soil consistencies are based on insitu tests.
3. No visual or olfactory evidence of contamination observed.
4. Groundwater was not encoutered.

All dimensions in metres Scale 1:6.25		Logged By RF

Appendix 4 - Site Photos

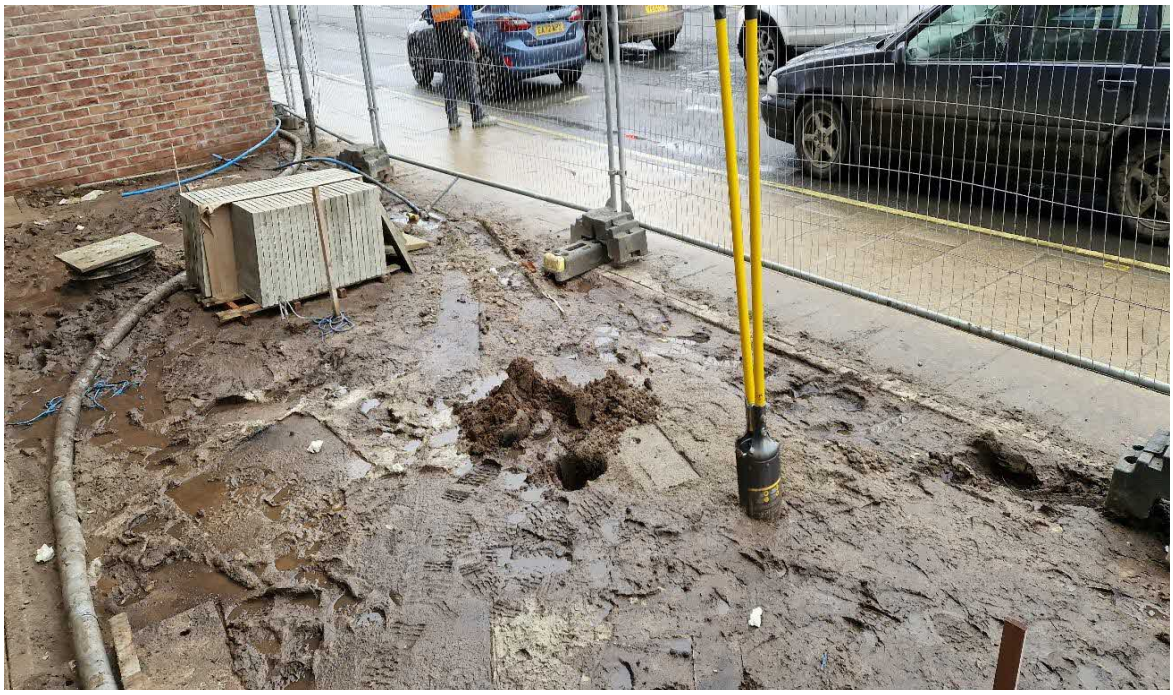


Photo 1: Overview of S1.

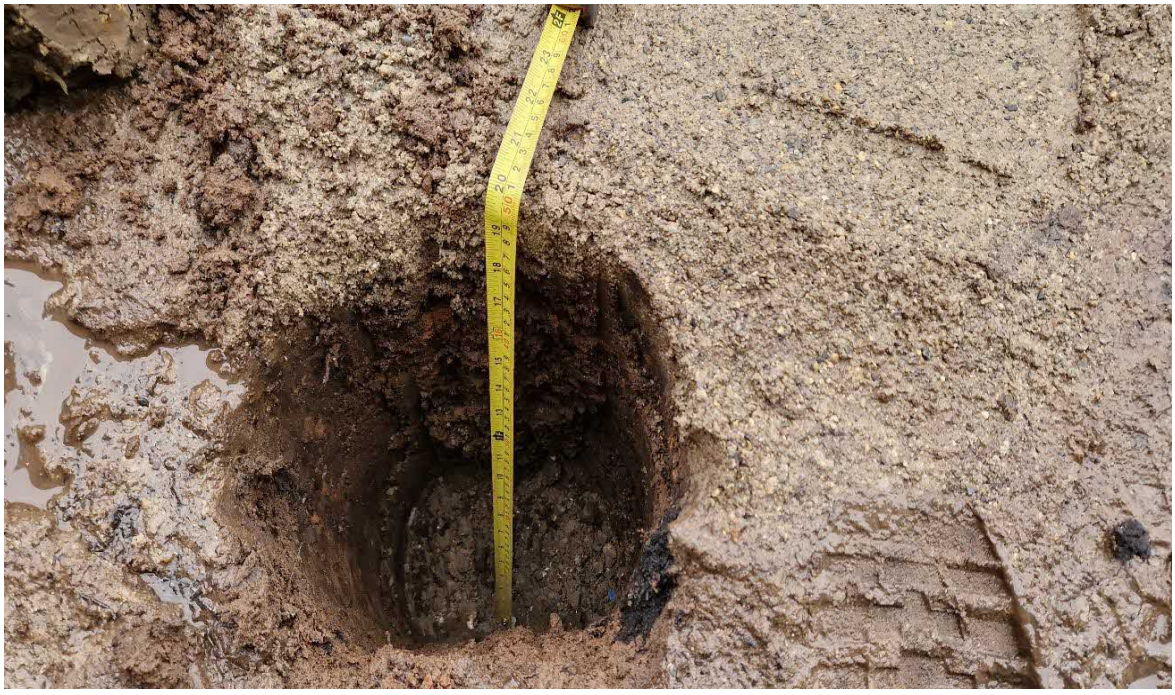


Photo 2: Internal view of S1 excavtaion.

enzygo environmental consultants Enzygo GeoEnvironmental Ltd Manchester 215 Ducie Street Tel: 0161 413 6444	Project Premier Inn, Foss Island, York	Drawing Title Site Photos
	Client Clegg Construction Limited	Project No. SHF.269.002

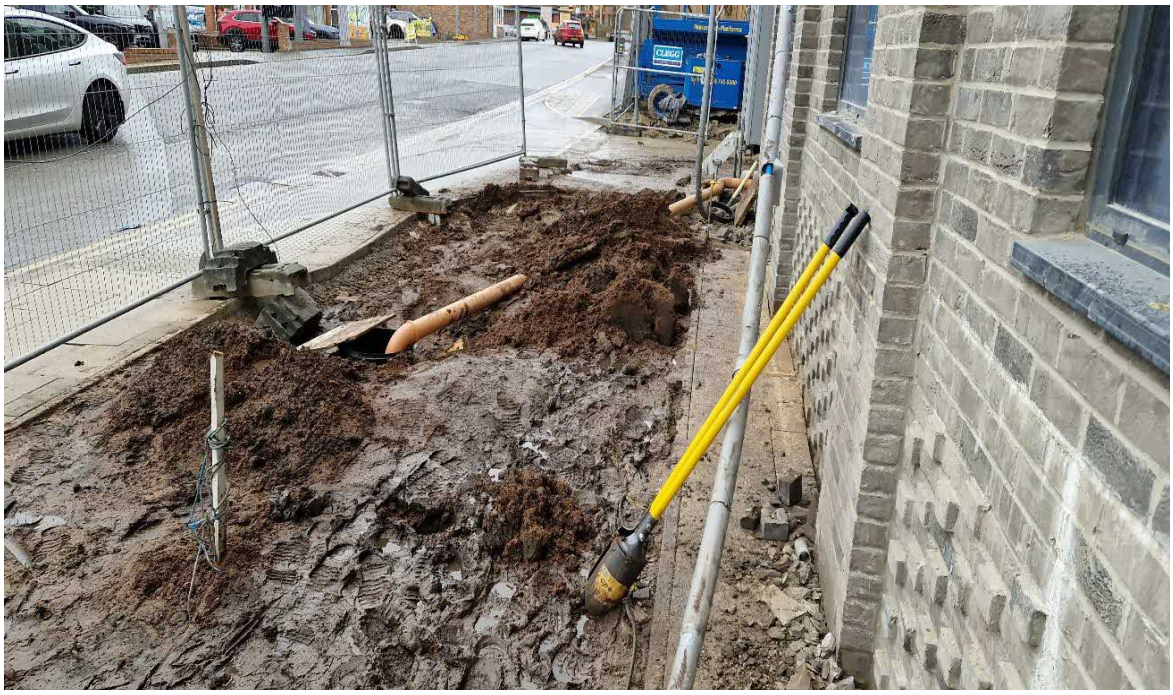


Photo 3: Overview of S2.

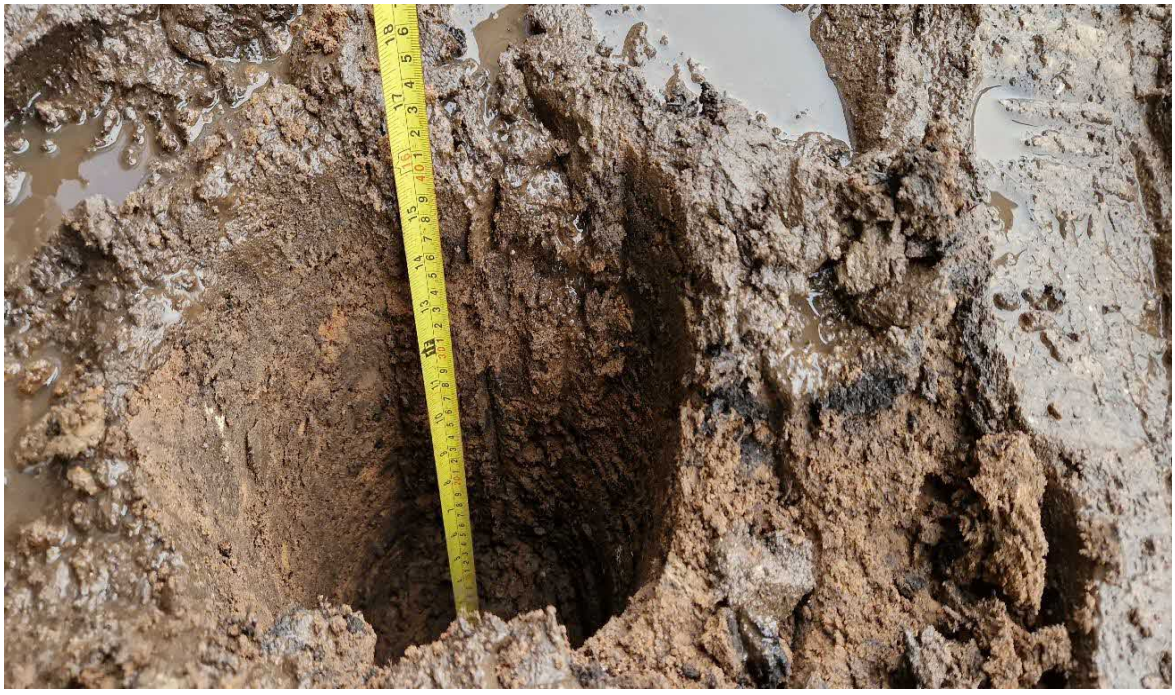


Photo 4: Internal view of S2 excavtaion.

enzygo environmental consultants Enzygo GeoEnvironmental Ltd Manchester 215 Ducie Street Tel: 0161 413 6444	Project Premier Inn, Foss Island, York	Drawing Title Site Photos
	Client Clegg Construction Limited	Project No. SHF.269.002

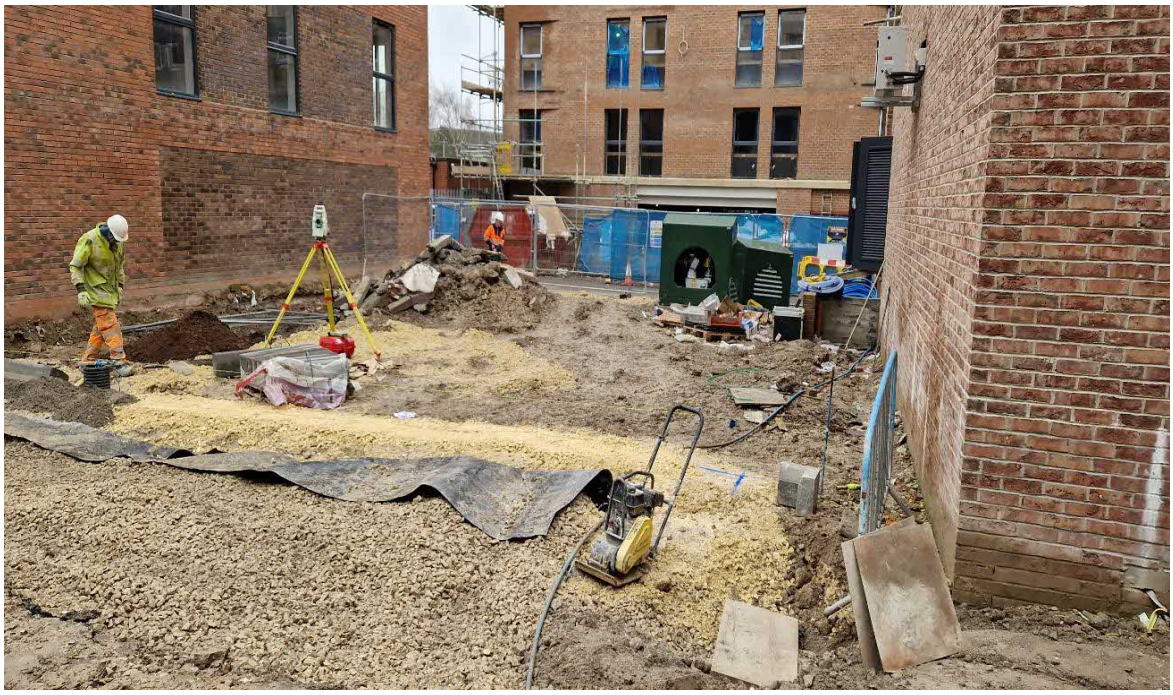


Photo 5: Small stockpile of topsoil within soft landscaping within eastern section of site.

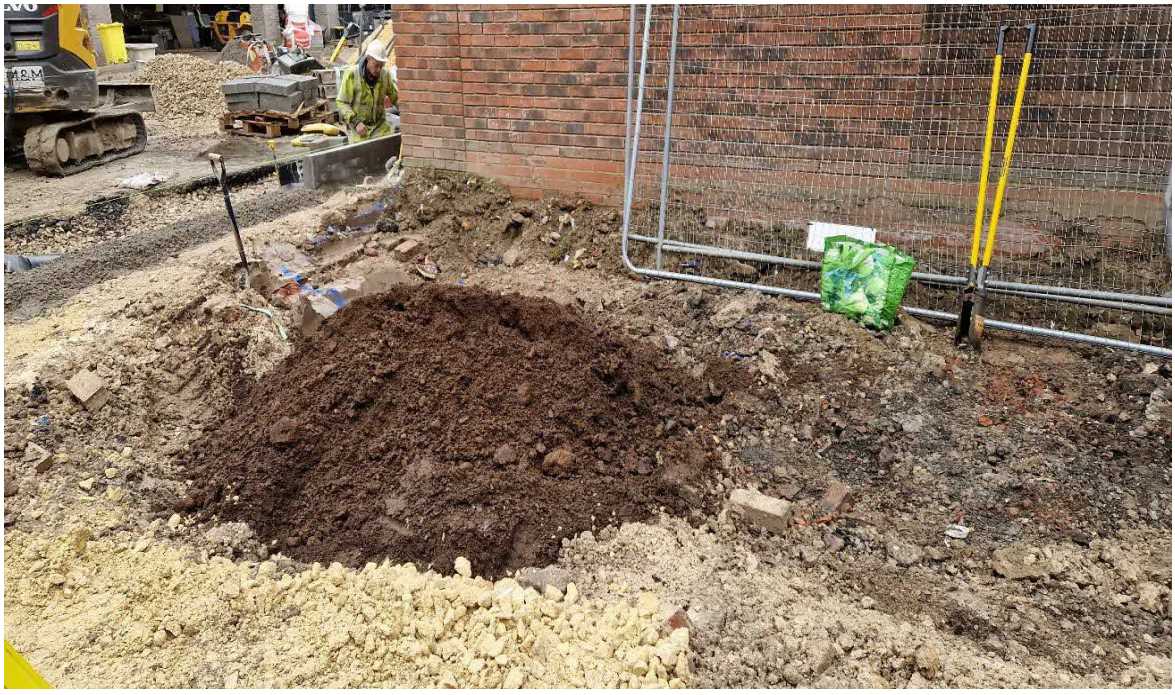


Photo 6: Sampled stockpile of topsoil [S3].

enzygo environmental consultants Enzygo GeoEnvironmental Ltd Manchester 215 Ducie Street Tel: 0161 413 6444	Project Premier Inn, Foss Island, York	Drawing Title Site Photos
	Client Clegg Construction Limited	Project No. SHF.269.002

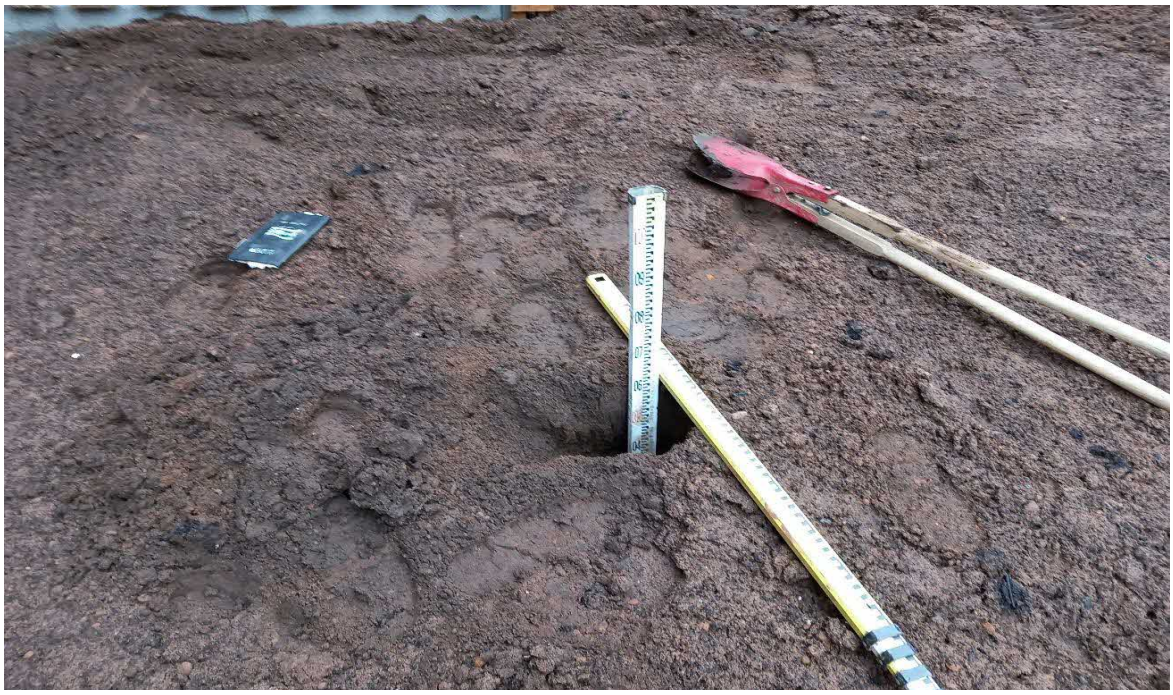


Photo 7: Overview of S3.

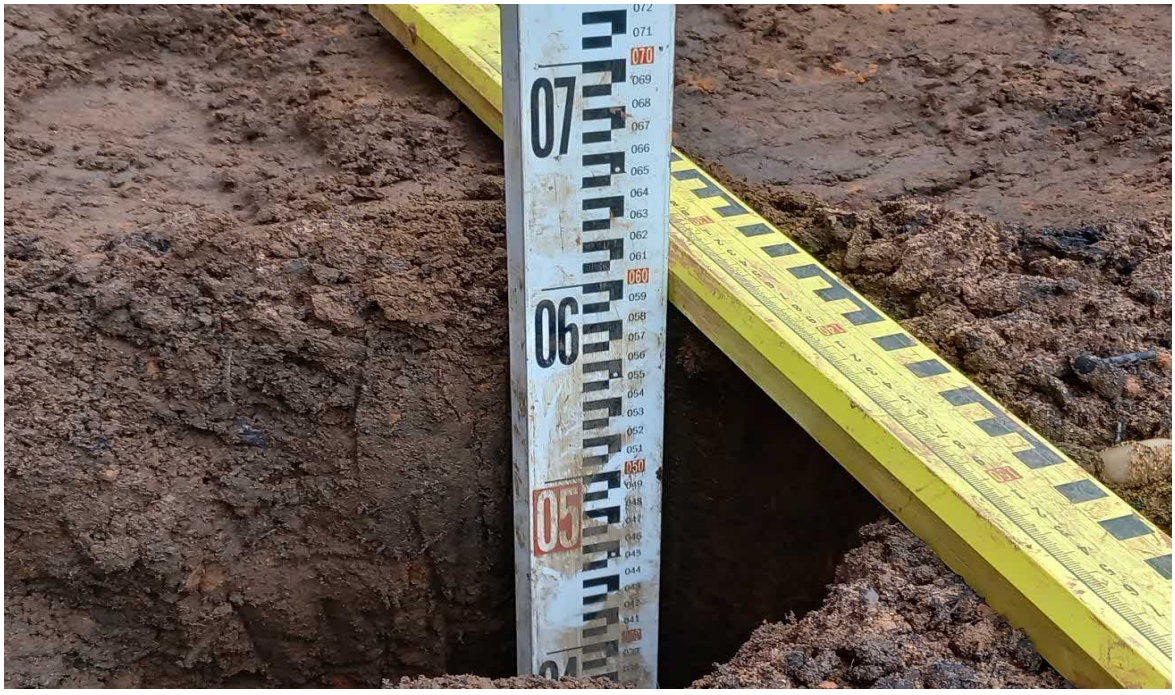


Photo 8: Internal view of S3 excavtaion.

enzygo environmental consultants Enzygo GeoEnvironmental Ltd Manchester 215 Ducie Street Tel: 0161 413 6444	Project Premier Inn, Foss Island, York	Drawing Title Site Photos
	Client Clegg Construction Limited	Project No. SHF.269.002

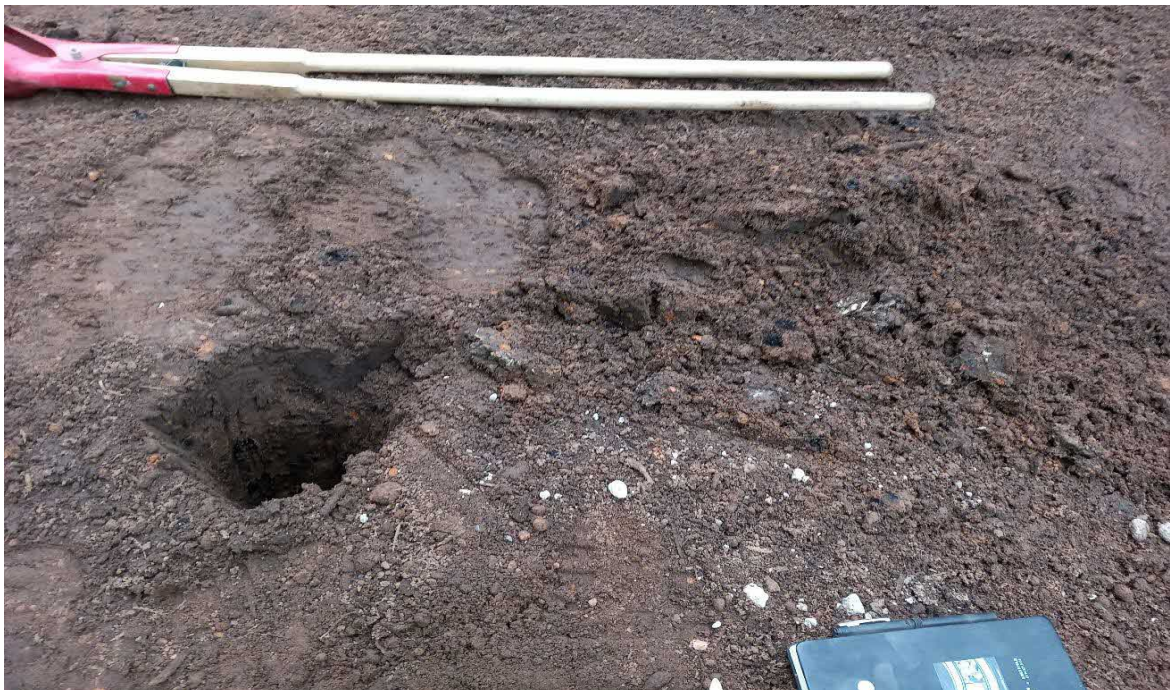


Photo 9: Overview of S4.

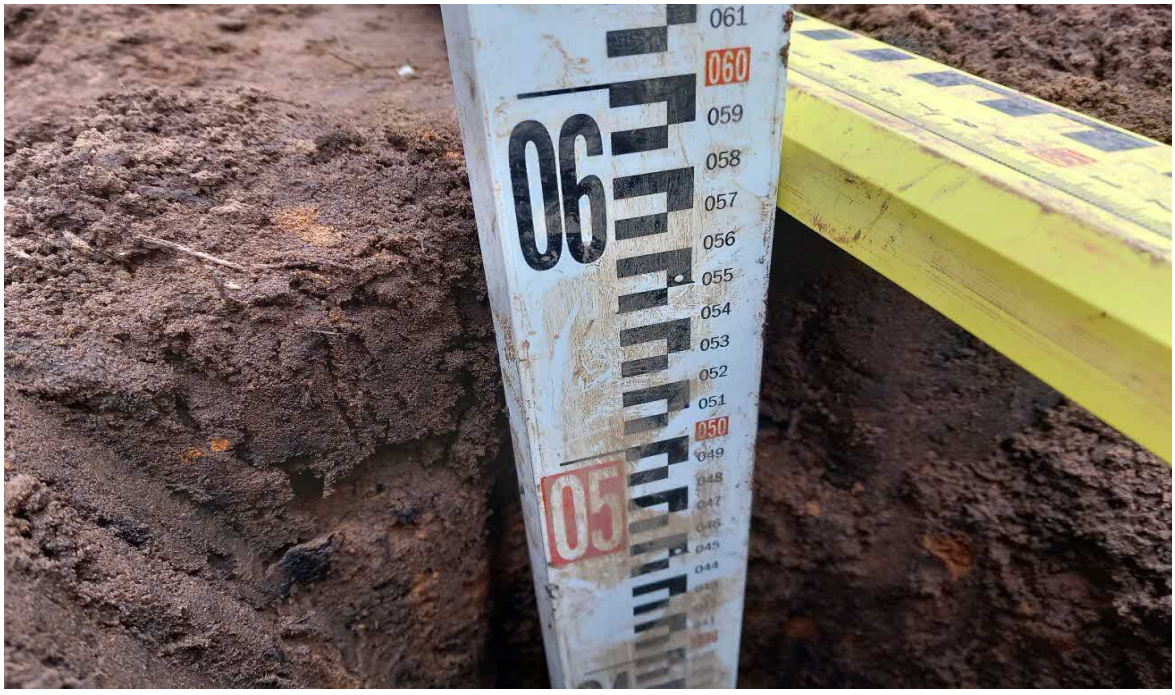


Photo 10: Internal view of S4 excavtaion.

enzygo environmental consultants Enzygo GeoEnvironmental Ltd Manchester 215 Ducie Street Tel: 0161 413 6444	Project Premier Inn, Foss Island, York	Drawing Title Site Photos
	Client Clegg Construction Limited	Project No. SHF.269.002

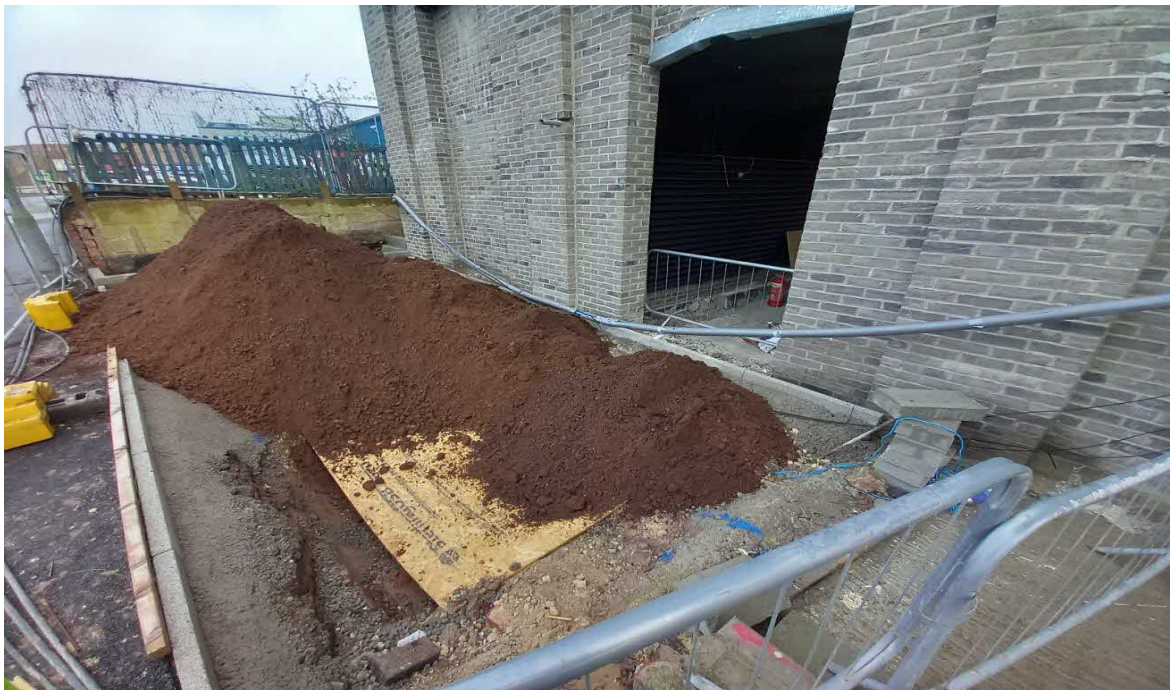


Photo 11: Stockpile of topsoil within soft landscaping within northern section of site.

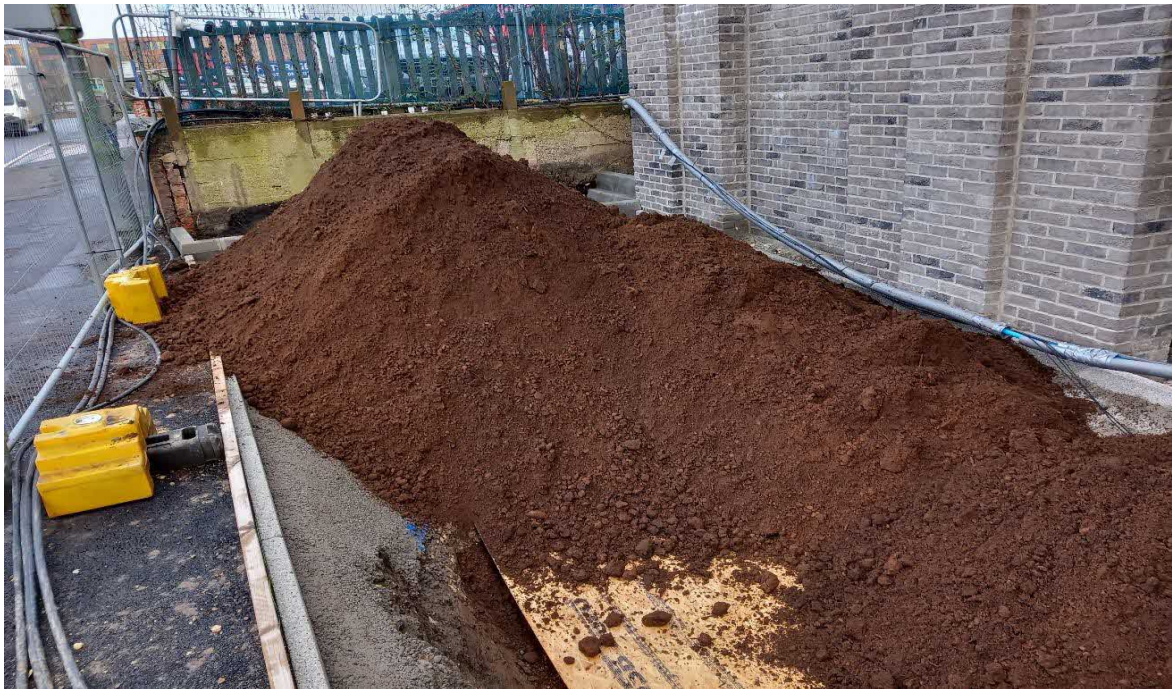


Photo 12: Sampled stockpile of topsoil [S5].

enzygo environmental consultants Enzygo GeoEnvironmental Ltd Manchester 215 Ducie Street Tel: 0161 413 6444	Project Premier Inn, Foss Island, York	Drawing Title Site Photos
	Client Clegg Construction Limited	Project No. SHF.269.002

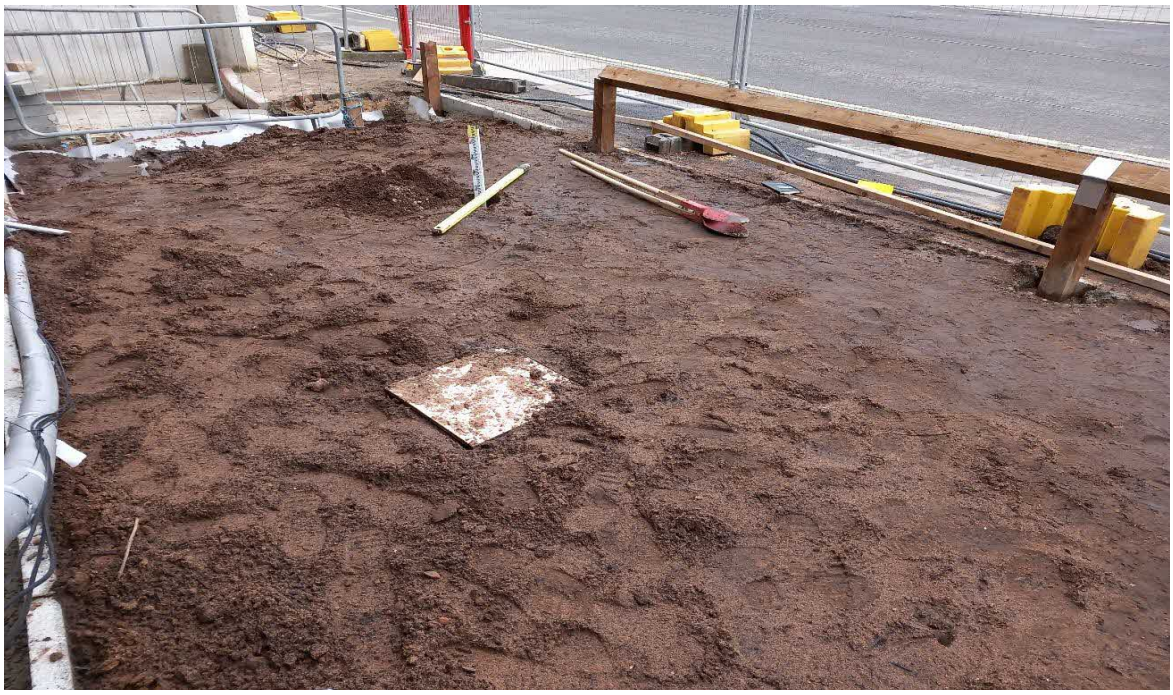


Photo 13: Overview of S5.

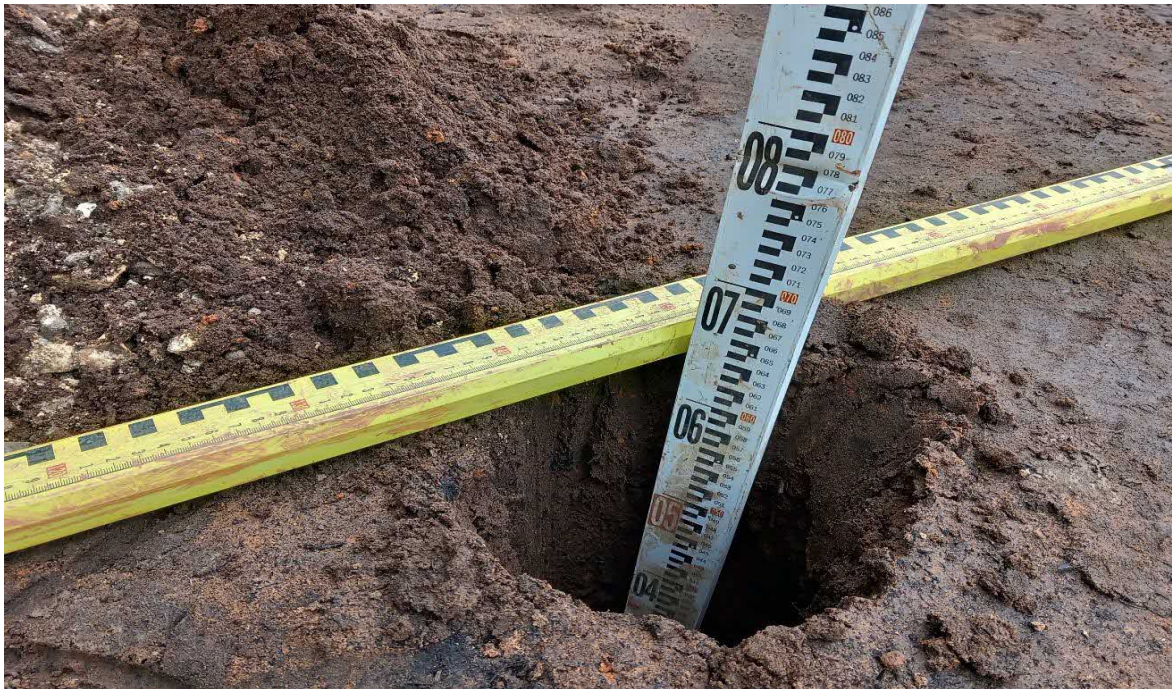


Photo 14: Internal view of S5 excavtaion.

enzygo environmental consultants Enzygo GeoEnvironmental Ltd Manchester 215 Ducie Street Tel: 0161 413 6444	Project Premier Inn, Foss Island, York	Drawing Title Site Photos
	Client Clegg Construction Limited	Project No. SHF.269.002

Appendix 5 - Additional Information

I.H. Equipment Ltd

49A Langthwaite Business Park
South Kirkby
Pontefract
WF9 3NR
Tel: 01977 644489
[redacted]

26th June 2023

Re: Premier Inn, York

This is to confirm that IH Equipment completed the demolition works on the above project.

No remediation works were required due to no ground contamination.

Liam Hobson
Project Manager
I H EQUIPMENT LTD
Mob: [redacted]

Appendix 6 - Human Health Assessment Reference Values

Determinant	Units	GAC Value Residential					
		With Plant Uptake			Without Plant Uptake		
Arsenic	mg/kg	37			40		
Cadmium	mg/kg	11			85		
Chromium	mg/kg	910			910		
Chromium VI	mg/kg	6			6		
Lead	mg/kg	200			310		
Mercury	mg/kg	40			56		
Nickel	mg/kg	130			180		
Selenium	mg/kg	250			430		
Copper	mg/kg	2400			7100		
Zinc	mg/kg	3700			40000		
Cyanide	mg/kg	791			800		
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	280	550	1100	750	1300	2300
Napthalene	mg/kg	2.3	5.6	13	2.3	5.6	13
Acenaphtylene	mg/kg	170	420	920	2900	4600	6000
Acenaphthene	mg/kg	210	510	1100	3000	4700	6000
Flourene	mg/kg	170	400	860	2800	3800	4500
Phenanthrene	mg/kg	95	220	440	1300	1500	1500
Anthracene	mg/kg	2400	5400	11000	31000	35000	37000
Fluoranthene	mg/kg	280	560	890	1500	1600	1600
Pyrene	mg/kg	620	1200	2000	3700	3800	3800
Benzo(a)Anthracene	mg/kg	7.2	11	13	11	14	15
Chrysene	mg/kg	15	22	27	30	31	32
Benzo(b)Flouranthene	mg/kg	2.6	3.3	3.7	3.9	4.0	4.0
Benzo(k)Flouranthene	mg/kg	77	93	100	110	110	110
Benzo(a)Pyrene	mg/kg	2.2	2.7	3.0	3.2	3.2	3.2
Indeno(123-cd)Pyrene	mg/kg	27	36	41	45	46	46
Dibenzo(a,h)Anthracene	mg/kg	0.24	0.28	0.3	0.31	0.32	0.32
Benzo(ghi)Perylene	mg/kg	320	340	350	360	360	360
TPH C_5-C_6 Aliphatic	mg/kg	42	78	160	42	78	160
TPH C_6-C_8 Aliphatic	mg/kg	100	230	530	100	230	530
TPH C_8-C_{10} Aliphatic	mg/kg	27	65	150	27	65	150
TPH C_{10}-C_{12} Aliphatic	mg/kg	130	330	760	130	330	770
TPH C_{12}-C_{16} Aliphatic	mg/kg	1100	2400	4300	1100	2400	4400
TPH C_{16}-C_{35} Aliphatic	mg/kg	65000	92000	110000	65000	92000	110000
TPH C_{35}-C_{44} Aliphatic	mg/kg	65000	92000	110000	65000	92000	110000
TPH C_5-C_7 Aromatic	mg/kg	70	140	300	370	690	1400
TPH C_7-C_8 Aromatic	mg/kg	130	290	660	860	1800	3900
TPH C_8-C_{10} Aromatic	mg/kg	34	83	190	47	110	270
TPH C_{10}-C_{12} Aromatic	mg/kg	74	180	380	250	590	1200
TPH C_{12}-C_{16} Aromatic	mg/kg	140	330	660	1800	2300	2500
TPH C_{16}-C_{21} Aromatic	mg/kg	260	540	930	1900	1900	1900
TPH C_{21}-C_{35} Aromatic	mg/kg	1100	1500	1700	1900	1900	1900
TPH C_{35}-C_{44} Aromatic	mg/kg	1100	1500	1700	1900	1900	1900
Benzene	mg/kg	0.087	0.17	0.37	0.38	0.70	1.4
Toluene	mg/kg	130	290	660	880	1900	3900
Ethylebenzene	mg/kg	47	110	260	83	190	440
Xylene	mg/kg	56	130	310	79	180	430

Determinant	Units	GAC Value					
		Residential POS			Commercial		
Arsenic	mg/kg	79			640		
Cadmium	mg/kg	120			190		
Chromium	mg/kg	1500			8600		
Chromium VI	mg/kg	7.7			33		
Lead	mg/kg	630			2330		
Mercury	mg/kg	120			1100		
Nickel	mg/kg	230			980		
Selenium	mg/kg	1100			12000		
Copper	mg/kg	12000			68000		
Zinc	mg/kg	81000			730000		
Cyanide	mg/kg	N/A			16200		
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	760	1500	3200	760	1500	3200
Napthalene	mg/kg	4900	4900	4900	190	460	1100
Acenaphtylene	mg/kg	15000	15000	15000	83000	97000	100000
Acenaphthene	mg/kg	15000	15000	15000	84000	97000	100000
Flourene	mg/kg	9900	9900	9900	63000	68000	71000
Phenanthrene	mg/kg	3100	3100	3100	22000	22000	23000
Anthracene	mg/kg	74000	74000	74000	520000	540000	540000
Fluoranthene	mg/kg	3100	3100	3100	23000	23000	23000
Pyrene	mg/kg	7400	7400	7400	54000	54000	54000
Benzo(a)Anthracene	mg/kg	29	29	29	170	170	180
Chrysene	mg/kg	57	57	57	350	350	350
Benzo(b)Flouranthene	mg/kg	7.1	7.2	7.2	44	44	45
Benzo(k)Flouranthene	mg/kg	190	190	190	1200	1200	1200
Benzo(a)Pyrene	mg/kg	5.7	5.7	5.7	35	35	36
Indeno(123-cd)Pyrene	mg/kg	82	82	82	500	510	510
Dibenzo(a,h)Anthracene	mg/kg	0.57	0.57	0.58	3.5	3.6	3.6
Benzo(ghi)Perylene	mg/kg	640	640	640	3900	4000	4000
TPH C_5-C_6 Aliphatic	mg/kg	570000	590000	600000	3200	5900	12000
TPH C_6-C_8 Aliphatic	mg/kg	600000	610000	620000	7800	17000	40000
TPH C_8-C_{10} Aliphatic	mg/kg	13000	13000	13000	2000	4800	11000
TPH C_{10}-C_{12} Aliphatic	mg/kg	13000	13000	13000	9700	23000	47000
TPH C_{12}-C_{16} Aliphatic	mg/kg	13000	13000	13000	59000	82000	90000
TPH C_{16}-C_{35} Aliphatic	mg/kg	250000	250000	250000	1600000	1700000	1800000
TPH C_{35}-C_{44} Aliphatic	mg/kg	250000	250000	250000	1600000	1700000	1800000
TPH C_5-C_7 Aromatic	mg/kg	56000	56000	56000	26000	46000	86000
TPH C_7-C_8 Aromatic	mg/kg	56000	56000	56000	56000	110000	180000
TPH C_8-C_{10} Aromatic	mg/kg	5000	5000	5000	3500	8100	17000
TPH C_{10}-C_{12} Aromatic	mg/kg	5000	5000	5000	16000	28000	34000
TPH C_{12}-C_{16} Aromatic	mg/kg	5100	5100	5000	36000	37000	38000
TPH C_{16}-C_{21} Aromatic	mg/kg	3800	3800	3800	28000	28000	28000
TPH C_{21}-C_{35} Aromatic	mg/kg	3800	3800	3800	28000	28000	28000
TPH C_{35}-C_{44} Aromatic	mg/kg	3800	3800	3800	28000	28000	28000
Benzene	mg/kg	72	72	73	27	47	90
Toluene	mg/kg	56000	56000	56000	56000	110000	180000
Ethylebenzene	mg/kg	24000	24000	25000	5700	13000	27000
Xylene	mg/kg	41000	42000	43000	5900	14000	30000

Determinant	Units	GAC Value					
		Park POS			Allotments		
Arsenic	mg/kg	170			43		
Cadmium	mg/kg	532			1.9		
Chromium	mg/kg	33000			18000		
Chromium VI	mg/kg	220			1.8		
Lead	mg/kg	1300			80		
Mercury	mg/kg	240			19		
Nickel	mg/kg	800			53		
Selenium	mg/kg	1800			88		
Copper	mg/kg	44000			520		
Zinc	mg/kg	170000			620		
Cyanide	mg/kg						
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	760	1500	3200	66	140	280
Napthalene	mg/kg	1200	1900	3000	4.1	10	24
Acenaphtylene	mg/kg	29000	30000	30000	28	69	160
Acenaphthene	mg/kg	29000	30000	30000	34	85	200
Flourene	mg/kg	20000	20000	20000	27	67	160
Phenanthrene	mg/kg	6200	6200	6300	15	38	90
Anthracene	mg/kg	150000	150000	150000	380	950	2200
Fluoranthene	mg/kg	6300	6300	6400	52	130	290
Pyrene	mg/kg	15000	15000	15000	110	270	620
Benzo(a)Anthracene	mg/kg	49	56	62	2.9	6.5	13
Chrysene	mg/kg	93	110	120	4.1	9.4	19
Benzo(b)Flouranthene	mg/kg	13	15	16	0.99	2.1	3.9
Benzo(k)Flouranthene	mg/kg	370	410	440	37	75	130
Benzo(a)Pyrene	mg/kg	11	12	13	0.97	2.0	3.5
Indeno(123-cd)Pyrene	mg/kg	150	170	180	9.5	21	39
Dibenzo(a,h)Anthracene	mg/kg	1.1	1.3	1.4	0.14	0.27	0.43
Benzo(ghi)Perylene	mg/kg	1400	1500	1600	290	470	640
TPH C_5-C_6 Aliphatic	mg/kg	95000	130000	180000	730	1700	3900
TPH C_6-C_8 Aliphatic	mg/kg	150000	220000	320000	2300	5600	13000
TPH C_8-C_{10} Aliphatic	mg/kg	14000	18000	21000	320	770	1700
TPH C_{10}-C_{12} Aliphatic	mg/kg	21000	23000	24000	2200	4400	7300
TPH C_{12}-C_{16} Aliphatic	mg/kg	25000	25000	26000	11000	13000	13000
TPH C_{16}-C_{35} Aliphatic	mg/kg	450000	480000	490000	260000	270000	270000
TPH C_{35}-C_{44} Aliphatic	mg/kg	450000	480000	490000	260000	270000	270000
TPH C_5-C_7 Aromatic	mg/kg	76000	84000	92000	13	27	57
TPH C_7-C_8 Aromatic	mg/kg	87000	95000	100000	22	51	120
TPH C_8-C_{10} Aromatic	mg/kg	7200	8500	9300	8.6	21	51
TPH C_{10}-C_{12} Aromatic	mg/kg	9200	9700	10000	13	31	74
TPH C_{12}-C_{16} Aromatic	mg/kg	10000	10000	10000	23	57	130
TPH C_{16}-C_{21} Aromatic	mg/kg	7600	7700	7800	46	110	260
TPH C_{21}-C_{35} Aromatic	mg/kg	7800	7800	7900	370	820	1600
TPH C_{35}-C_{44} Aromatic	mg/kg	7800	7800	7900	370	820	1600
Benzene	mg/kg	90	100	110	0.017	0.034	0.075
Toluene	mg/kg	87000	95000	100000	22	51	120
Ethylebenzene	mg/kg	17000	22000	27000	16	39	91
Xylene	mg/kg	17000	23000	31000	28	67	160

Enzygo specialise in a wide range of technical services:

Property and Sites
Waste and Mineral Planning
Flooding, Drainage and Hydrology
Landscape Architecture
Arboriculture
Permitting and Regulation
Waste Technologies and Renewables
Waste Contract Procurement
Noise and Vibration
Ecology Services
Contaminated Land and Geotechnical
Traffic and Transportation
Planning Services

BRISTOL
The Byre
Woodend Lane
Cromhall
Gloucestershire
GL12 8AA
Tel: 01454 269 237

SHEFFIELD
Samuel House
5 Fox Valley Way
Stocksbridge
Sheffield S36 2AA
Tel: 0114 321 5151

MANCHESTER
Ducie House
Ducie Street
Manchester
M1 2JW
Tel: 0161 413 6444

CARDIFF
Regus House
Malthouse Avenue
Cardiff Gate Buisness Park
CF23 8RU
Tel: 02920 023 700

Please visit our website for more information.

enzygo.com