PRELIMINARY SITE INVESTIGATION

Land adjacent to
Trafford House,
11 Halifax Road,
Huddersfield,
HD3 3AN

Prepared for:

communities

Report Ref: 21-1049-r01
Date Issued: October 2021

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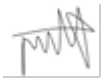
SIGNATURE	
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1. INTRODUCTION

1.1 Background

ERGO were commissioned by Incommunities Ltd to carry out a site investigation of land at Trafford House, Huddersfield. ERGO drawing 21-1049-001 displays the site location plan

The scope of work was provided by the structural engineer and comprised the following elements:

- *Completion of intrusive Ground Investigation in line with specification provided;*
- *Window sample probeholes;*
- *In-situ Geotechnical Testing; and,*
- *Factual Reporting.*

Fieldwork was undertaken generally as specified by the Structural Engineer. The fieldwork was carried out on 15th October 2021. Borehole locations were selected by the client and indicated to ERGO on a plan.

This report presents the factual information obtained during the investigation.

1.2 Limitations

The limitations of this report are presented in Appendix I.

For the avoidance of doubt geotechnical laboratory testing and the interpretation of the findings was beyond the scope of the investigation.

1.3 Confidentiality

ERGO has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from ERGO; a charge may be levied against such approval.

2. GROUND INVESTIGATION

2.1 General

A Ground Investigation has been undertaken in line with the specification provided in order to collect geotechnical information to assist in the design and construction of the proposed development.

Exploratory fieldwork was completed on the 15th October 2021. The works are summarised in Table 2.1 below.

Table 2.1 Summary of Fieldwork

POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (mbgl)	MONITORING WELLS RESPONSE ZONE (mbgl)
General Ground Conditions including the presence / nature of obstructions.	WS101	Window Sample Probehole	2.85	N/A
	WS102		2.60	N/A

Window sample probeholes were advanced to undertaken in-situ geotechnical testing and obtain samples.

The locations of the advanced exploratory probeholes were impacted by the presence of buried Yorkshire Water Infrastructure. The borehole locations were selected by the clients and the approximate locations are illustrated in Drawing 21-1049-003 (Appendix III).

Ground conditions encountered are indicated on the logs which are provided in Appendix VI and summarised in section 3.0.

2.2 In-Situ Standard Penetration Testing (SPT)

In-situ geotechnical testing was conducted using the Standard Penetration Test (SPT) and where the ground is granular, a 60° cone (SPT(C)) was used instead of the sampling tube. The results are shown in the probehole logs in Appendix IV and presented in Table 2.2 (overleaf).

2.3 Laboratory Analysis

Selected soil samples were submitted to Chemtech Environmental for pH and water soluble sulphate (2:1 extract) content.

Laboratory analysis sheets are included in Appendix VI and are summarised in Section 3.2.4.

Table 2.2 Standard/Cone Penetration Test Results

BOREHOLES	DEPTH (mbgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE $(N_1)_{60}$	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m^2)
WS101	1.2	Dense clayey gravelly SAND	20	18.27	Medium Dense	N/A	N/A	N/A
WS101	2	Dense clayey gravelly SAND	42	36.53	Dense	N/A	N/A	N/A
WS101	2.85	Weak SANDSTONE. (probable rockhead)	50	49.06	Dense	N/A	N/A	N/A
WS102	1.2	Medium dense clayey gravelly SAND	24	21.92	Medium Dense	N/A	N/A	N/A
WS102	2	Medium dense clayey gravelly SAND	35	34.34	Dense	N/A	N/A	N/A
WS102	2.6	Weak SANDSTONE. (probable rockhead)	50	45.68	Dense	N/A	N/A	N/A

3. GROUND AND GROUNDWATER CONDITIONS

3.1 Ground and Groundwater Conditions

3.2 Summary of Ground Conditions

The Ground Investigation generally confirms the published geology and identifies the strata set out in Table 3.1 below:

Table 3.1 Summary of Strata

STRATA	GENERAL DESCRIPTION	TYPICAL DEPTH (mbgl):				LOCATION
		TOP:		BASE:		
		MIN:	MAX:	MIN:	MAX:	
MADE GROUND	MADE GROUND: Black bituminous asphalt.	0.00	-	0.10	0.13	WS101-102
MADE GROUND	MADE GROUND: Grey concrete	0.10	-	0.20	-	WS101
MADE GROUND	MADE GROUND: Grey clayey gravelly sand.	0.13	-	0.90	-	WS102
SAND	Medium dense/Dense orangey brown clayey gravelly SAND	0.35	0.90	2.30	2.35	WS101-102
SOILD	Weak weathered light brown SANDSTONE	2.30	2.35	2.60	2.85	WS101-WS102

3.2.1 Made Ground

Made Ground was encountered within both exploratory holes and generally comprised black bituminous asphalt to depths of 0.10-0.13mbgl. overlying concrete in WS101 to 0.20m bgl and a grey clayey gravelly sand in WS102 to a depth of 0.90mbgl.

3.2.2 Drift Deposits

Natural drift deposits were encountered in both advanced exploratory probeholes at depths between 0.35-0.90mbgl. and encountered to maximum depths of 2.35mbgl. Drift was noted to predominantly comprise a medium dense to dense slightly clayey slightly gravelly SAND.

3.2.3 Solid Geology

Although not proven by coring, suspected solid geology was encountered within both exploratory probeholes at depth of 2.30mbgl. (WS101) and 2.35mbgl (WS102). Suspected bedrock was encountered as an extremely weak distinctly weathered SANDSTONE

3.2.3 Groundwater

No groundwater was encountered within the probehole locations during the intrusive site works.

3.2.4 pH and Sulphate

Selected samples were sent for analysis for pH and soluble sulphate content, results sheets are shown in Appendix VI and summarised below in Table 3.2.

Table 3.2 Summary of pH and Sulphate Data

LOCATION	DEPTH (m)	SO_4 IN 2:1 WATER / SOIL (mg/l)	pH VALUE
WS101	1.00	43	7.9
WS102	2.00	18	6.7

END OF REPORT

APPENDIX I
LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between ERGO and the Client as indicated in Section 1.2.

2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.

3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.

4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not be made known or accessible.

5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.

6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.

8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

9. ERGO cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by ERGO is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by ERGO in this connection without their explicit written agreement there to by ERGO.

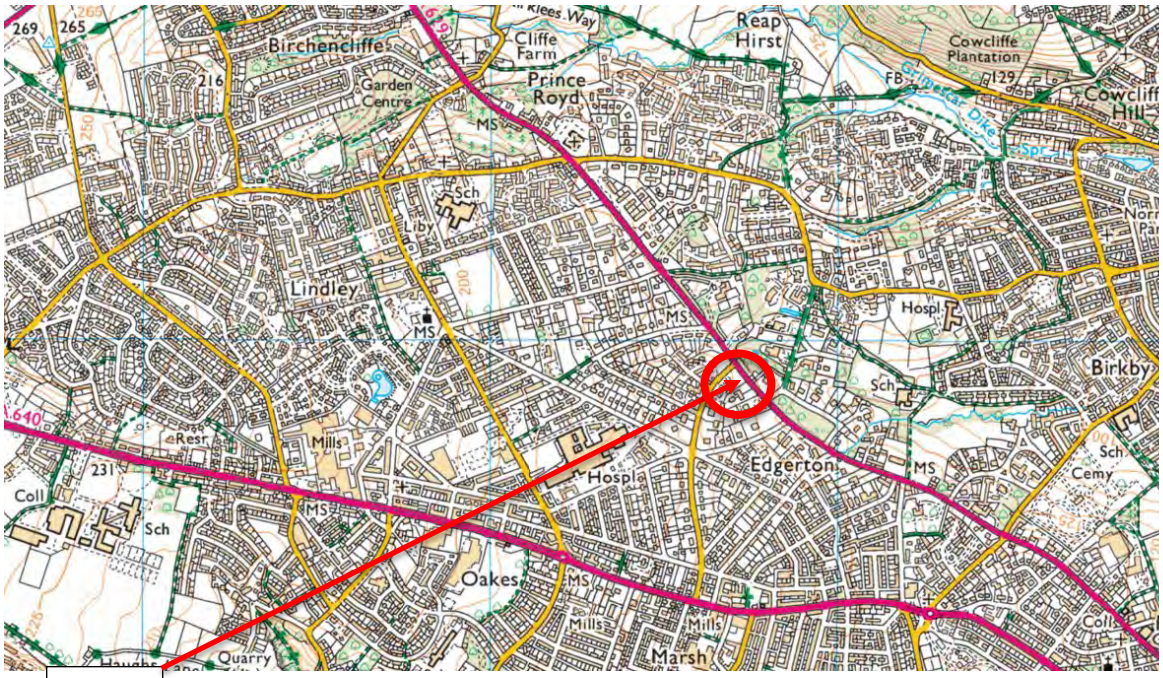
10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

APPENDIX II
GLOSSARY

TERMS

AST	Above Ground Storage Tank	**SGV**	Soil Guideline Value
BGS	British Geological Survey	**SPH**	Separate Phase Hydrocarbon
BSI	British Standards Institute	**TPH CWG**	Total Petroleum Hydrocarbon (Criteria Working Group)
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes	**SPT**	Standard Penetration Test
CIEH	Chartered Institute of Environmental Health	**SVOC**	Semi Volatile Organic Compound
CIRIA	Construction Industry Research Association	**UST**	Underground Storage Tank
CLEA	Contaminated Land Exposure Assessment	**VCCs**	Vibro Concrete Columns
CSM	Conceptual Site Model	**VOC**	Volatile Organic Compound
DNAPL	Dense Non-Aqueous Phase Liquid (chlorinated solvents, PCB)	**WTE**	Water Table Elevation
DWS	Drinking Water Standard	**m**	Metres
EA	Environment Agency	**km**	Kilometres
EQS	Environmental Quality Standard	**%**	Percent
GAC	General Assessment Criteria	**%v/v**	Percent volume in air
GL	Ground Level	**mb**	Milli Bars (atmospheric pressure)
GSV	Gas Screening Value	**l/hr**	Litres per hour
HCV	Health Criteria Value	**µg/l**	Micrograms per Litre (parts per billion)
ICSM	Initial Conceptual Site Model	**ppb**	Parts Per Billion
LNAPL	Light Non-Aqueous Phase Liquid (petrol, diesel, kerosene)	**mg/kg**	Milligrams per kilogram (parts per million)
ND	Not Detected	**ppm**	Parts Per Million
LMRL	Lower Method Reporting Limit	**mg/m^3**	Milligram per metre cubed
NR	Not Recorded	**m bgl**	Metres Below Ground Level
PAH	Polycyclic Aromatic Hydrocarbon	**m bcl**	Metre Below Cover Level
PCB	Poly-Chlorinated Biphenyl	**mAOD**	Metres Above Ordnance Datum (sea level)
PID	Photo Ionisation Detector	**kN/m^2**	Kilo Newtons per metre squared
QA	Quality Assurance	**µm**	Micro metre
SGV	Soil Guideline Value		

APPENDIX III
DRAWINGS

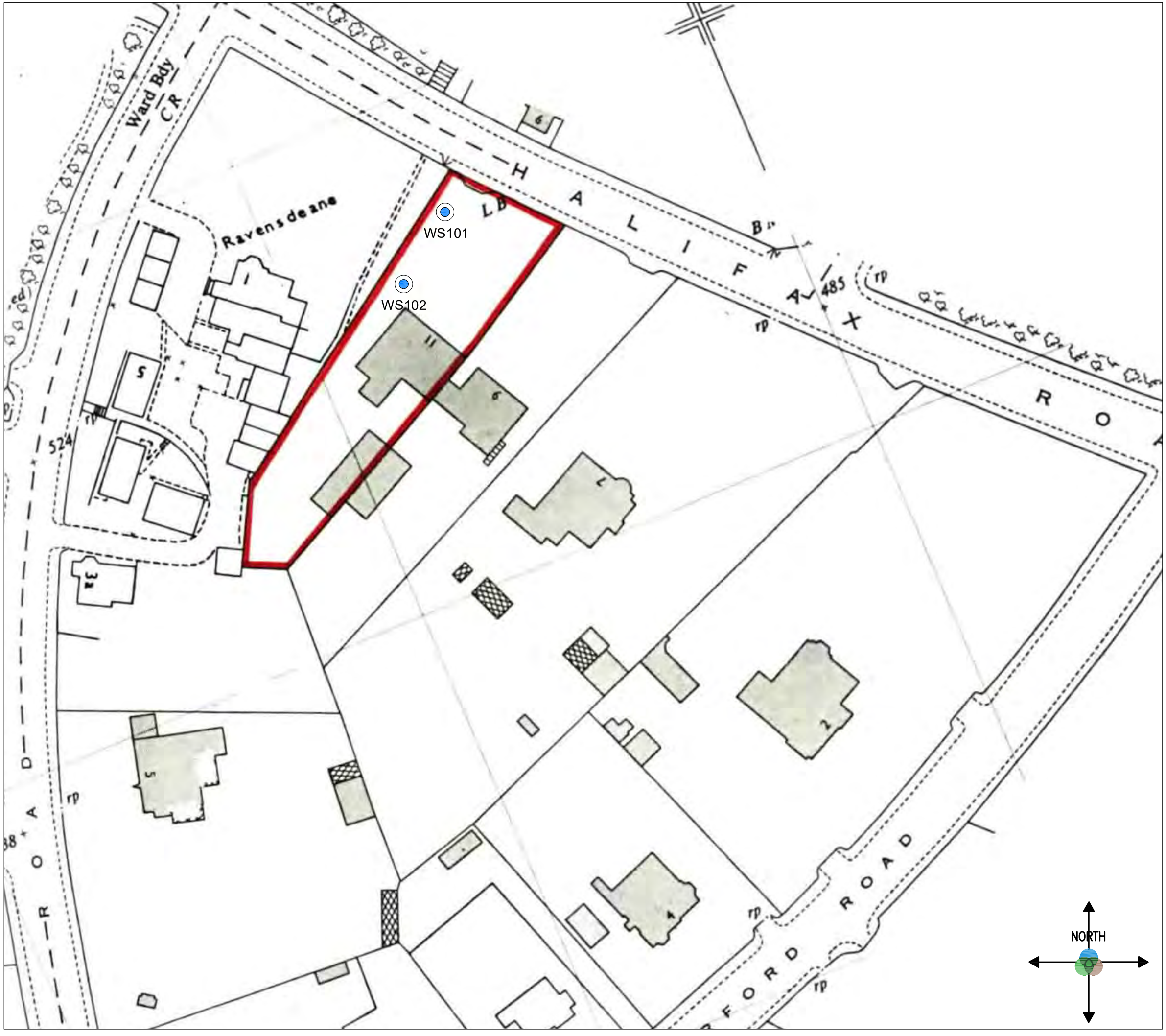




Drawing 21-1049-001

Site Location Plan

ERGO



Key:

Location Symbols

WS101 Approximate Window Sample Probehole Location

Notes:

P1	-	18/10/2021	DRAFT	RB	JN
Phase	Revision	Date	Issue	Drawn	Authorised

Client: Manjur Choudbury

Job No: 21-1049

Date: 18/10/2021

Drawing No: 002

Scale: 1:750 @ A3

Job Title: Land at Trafford House, Huddersfield

Drawing Title: Exploratory Hole Location Plan

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APPENDIX IV
PHOTOGRAPHS



PLATE 1 – GENERAL CONDITON OF HARDSTANDING



PLATE 2 – REINSTATMENT OF WS101



PLATE 3 – REINSTATMENT OF WS102



PLATE 4 – PHOTO OF WALL FAILURE

APPENDIX V EXPPLORATORY HOLE LOGS

Percussion Drilling Log-WS101

Project Name: Land at Trafford House	Client: Incommunities	Date: 15/10/2021
Location: Huddersfield	Contractor: TDS	
Project No. : 21-1049	Crew Name: JA	Drilling Equipment: Window Sample Rig

Borehole Number	Hole Type		Logged By	Scale	Page Number
WS101	WS		JC	1:20	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.10			MADE GROUND: Black bituminous asphalt.
					0.20			MADE GROUND: Grey concrete.
		0.30	D		0.35			Light brown very sandy GRAVEL. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone.
		0.50	D					Medium dense light brown mottled orange slightly clayey slightly gravelly fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to medium of sandstone.
					0.90			
		1.00	D					Dense orangish brown mottled grey slightly clayey slightly gravelly fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to medium of sandstone and mudstone.
		1.20	SPT	N=20 (3,3/4,4,6,6)				
		1.50	D					
		2.00	D					
		2.00	SPT	N=42 (8,14/12,7,9,14)				
					2.35			Extremely weak thinly laminated light brown distinctly weathered micaeous SANDSTONE. (Suspected rockhead). Recovered as very dense sand and gravel.
		2.50	D					
		2.85	SPT	50 (25 for 30mm/50 for 30mm)	2.85			End of Borehole at 2.85m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

1. Terminated at 2.85m bgl on suspected rockhead. 2. No groundwater encountered.

Percussion Drilling Log-WS102

Project Name: Land at Trafford House	Client: Incommunities	Date: 15/10/2021
Location: Huddersfield	Contractor: TDS	
Project No. : 21-1049	Crew Name: JA	Drilling Equipment: Window Sample Rig

Borehole Number	Hole Type		Logged By	Scale	Page Number
WS102	WS		JC	1:20	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.13			MADE GROUND: Black bituminous asphalt.
		0.50	D					MADE GROUND: Grey slightly clayey gravelly fine to coarse sand. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, brick, mudstone and coal.
		0.90	D		0.90			
		1.00	D					Medium dense brown mottled grey laminated slightly clayey slightly gravelly fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to medium of sandstone and mudstone. Laminations are thin very closley spaced of sand.
		1.20	SPT	N=24 (3,3/3,5,8,8)				
		1.50	D					
		2.00	D					
		2.00	SPT	N=35 (3,4/7,8,10,10)				
					2.30			
		2.40	D					Extremely weak thinly laminated light brown distinctly weathered micaeous SANDSTONE. (Suspected rockhead). Recovered as very dense sand and gravel.
		2.60	SPT	50 (25 for 80mm/50 for 20mm)	2.60			End of Borehole at 2.60m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

1. Terminated at 2.60m bgl on suspected rockhead. 2. No groundwater encountered.

APPENDIX VI
LABORATORY TESTING

ANALYTICAL TEST REPORT

Contract no:	101665
Contract name:	Trafford House
Client reference:	21-1049
Clients name:	Ergo Environmental
Clients address:	Maling Exchange Hoults Yard, Walker Road Newcastle NE6 2HL
Samples received:	18 October 2021
Analysis started:	18 October 2021
Analysis completed:	25 October 2021
Report issued:	25 October 2021

Notes:

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

Key:

U UKAS accredited test
M MCERTS & UKAS accredited test
$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing

Approved by:

Rachael Burton
Customer Support Squad Leader

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
101665-1	WS01	1.00	Sandy Loam with Gravel	-	-	13.5
101665-2	WS02	2.00	Sandy Loam with Gravel	-	-	11.9

Chemtech Environmental Limited

SOILS

Lab number			101665-1	101665-2
Sample id			WS01	WS02
Depth (m)			1.00	2.00
Date sampled			15/10/2021	15/10/2021
Test	Method	Units		
pH	CE004 M	units	7.9	6.7
Sulphate (2:1 water soluble)	CE061 U	mg/l SO_4	43	18

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE004	pH	Based on BS 1377, pH Meter	As received	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/l SO_4

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
101665-1	WS01	1.00	N	
101665-2	WS02	2.00	N	