PHASE II GEO-ENVIRONMENTAL SITE ASSESSMENT

FOR

CHINLEY, BUXWORTH & BROWNSIDE PARISH COUNCIL

AT

CHINLEY & BUXWORTH CENTRE

BY

ENSAFE CONSULTANTS

G20232P2R0

JULY 2020

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EXECUTIVE SUMMARY

Site Details	
Site Address	Chinley and Buxworth Community Centre, Lower Ln, Chinley, High Peak SK23 6BE
Grid Reference	403901, 382438
Current Site Use	Community Centre
Proposed Use	Development of a new Community Centre.
Summary of Ground Conditions	Ground conditions typically comprised Made Ground to a maximum depth 1.30mbgl (WS103). Made Ground within WS101 comprised Asphalt over limestone subbase, which was underlain by gravel and clay. Within WS102 Made Ground comprised Asphalt over limestone subbase and ash. Within WS103 – 105 this stratum typically comprised topsoil, this was underlain by gravelly clay within WS103 and WS104. The superficial deposits of Glacial Till was encountered beneath the Made Ground in all locations. This stratum typically comprised firm to stiff dark brown slightly gravelly CLAY. Groundwater was not encountered during the investigation. Perched surface water was identified within the installed wells during return monitoring visit.
Identified Contamination	No visual or olfactory evidence of contamination has been identified. Laboratory results reported all determinands analysed were below the required generic acceptance criteria.
Geotechnical Assessment	Preliminary calculations indicate a safe bearing capacity of 122kN/m^2 can be achieved at 1.20mbgl. pH and SO4 analysis results indicate that the Made Ground and Glacial Till meets with a worst case concrete classification of DS-1 AC-1s in accordance with BRE Special Digest 1 (2005).
Conceptual Site Model (CSM)	
No potentially unacceptable risks have been identified to human health or controlled waters receptors. No unacceptable risk has been identified with regards to ground gas onsite. Based on the results of gas monitoring, the site has been characterised as CS1 and therefore no gas protection measures are required.	

1.0 INTRODUCTION

1.1. Site Details

A Site Location Plan (reference G20232-001) is presented in Appendix III.

Table 1: Site Summary

Site Address	Chinley and Buxworth Community Centre, Lower Ln, Chinley, High Peak SK23 6BE
National Grid Reference	403901, 382438

1.2. Background

Ensafe Consultants is the trading name of Challen Commercial Investigations Limited (03426833) incorporating the wholly owned subsidiary Ensafe Consultants (ROI) LTD (646123).

Ensafe Consultants has been commissioned by D3 Associates on behalf of Chinley, Buxworth & Brownside Parish Council, hereafter referred to as "the Client" to undertake a Phase II Geo-Environmental Site Assessment at Chinley and Buxworth Community Centre.

Ensafe Consultants (formerly REC Ltd) have previously undertaken a Phase I Desk Study at the site (report number 102702p1r0 dated September 2017).

1.3. Proposed Development

It is understood that proposals include for the development of a new Community Centre, located within the footprint of the existing building and construction of associated parking to the west and north.

1.4. Objectives

The objectives of the investigation are to:

- To support discharging of planning conditions for development of a new Community Centre;
- Confirm the findings of the initial conceptual site model;
- Determine foundation design; and,
- Assess depth of Made Ground.

1.5. Confidentiality

Ensafe Consultants 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 Ensafe Consultants. A charge may be levied against such approval.

1.6. Limitations

The full limitations of this report are presented in Appendix I.

2.0 SITE SETTING

2.1. Site Description

Site Walkover

Ensafe Consultants undertook a site walkover on the 20th May 2021.

At the time of the site walkover the site consisted of a flat development platform containing the current hall, MUGA pitch, car park and children's play area. The hall consists of a single storey wooden framed (and constructed) building built around the 1960's. The building was in an obvious state of disrepair. The roof material appeared to be a felt construct. Rainwater drainage from the building was via a series of downpipes exiting into underground drainage, the majority of which appeared to be blocked, as ponding was evident in the majority of locations. The building would appear to be founded on brick pads.

Anecdotal evidence given on the day indicated that the area in general has a large number of spring lines emanating from the hills above (north), and running through underground pipework in gaps between the buildings to the north. At least one of these was believed to be blocked, resulting in a seepage of water approximately 0.8m – 1.0m from the top of the bank.

To the south of the development platform was a steep bank ~3.5m high, dropping onto a playing field with a small skate park. The steep slope from the development platform to the sports field below is the result of levelling works undertaken to facilitate the playing field and skate park, initially the site gently sloped from the upper level for the full extent of the playing surface. It is understood that field drains have been installed near the foot of the bank and in the middle of the playing field. At the time of the investigation the land at the foot of the bank was saturated, with obvious boggy areas. One area had been recently re-seeded.

Access to the site was via a sloping roadway off the elevated Lower Lane to the north

A selection of general site photographs are presented in Appendix IV.

2.2. Preliminary Desk Study Summary

The Phase I Desk Study produced by Ensafe (report number 102702p1r0 dated September 2017) identified the following information pertinent to the investigation:

- The site is underlain by Till overlying bedrock of Millstone Grit (mudstone, siltstone and sandstone) (Secondary A aquifer);
- The site is in an area affected by coal mining. Records indicate that coal reserves exist underneath the site and could be worked in the future but the property is not within a surface area affected by past or current mining;
- The closest surface water features are Black Brook (120m to the south) and a large pond (220m to the south west); and,
- The site currently operates as a community centre, playing fields, skate park and associated car parking / welfare facilities. Hardstanding and Made Ground is expected in some areas. A slope is present between the community centre and the sports pitches.

2.3. Initial Conceptual Site Model Summary

An initial conceptual site model identified the following potentially unacceptable risks:

On-site (Low):

- Made Ground associated with the construction of the site buildings/ hardstanding areas may give rise to heavy metals, sulphates, PAHs, asbestos and hydrocarbons; and,

- Ground gases such as methane and carbon dioxide.

Off-site (Low):

- Container and storage units related to a transport industrial unit at 20m;
- Contaminants related to a Civil engineering service;
- A railway station is located at 138m north of the site; and,
- An electricity substation is located at 170m east of the site.

3.0 SITE INVESTIGATION

3.1. Site Investigation Rationale

A site investigation was designed in light of the above historical information and in accordance with BS10175:2011+A2:2017 in order to confirm the underlying ground conditions, confirm the initial conceptual site model, identify the potential contamination and inform the geotechnical characteristics.

3.2. Summary of Fieldworks

Fieldworks were conducted on the 20th May 2021.

The investigation designed to meet the strategy detailed above is summarised in Table 2.

Table 2: Summary of Initially Proposed Fieldwork

Exploratory Hole	Potential Source / Rationale	Exploratory Hole Type	Max Depth (m bgl)	Monitoring Well Response Zone (m bgl)
WS101	Identify thickness of Made Ground and characterise ground conditions, collect samples for environmental and geotechnical testing, permit in situ geotechnical testing and install ground gas and groundwater monitoring wells.	Window Sample	5.45	0.30 – 0.80
WS102			5.45	0.50 – 2.50
WS103			5.45	1.50 – 5.00
WS104			5.45	0.30 – 1.30
WS105	Identify thickness of Made Ground and characterise ground conditions and permit in situ geotechnical testing.		3.45	N/A

The exploratory hole locations are shown on the Exploratory Hole Location Plan (G20232-003) presented within Appendix III.

Standards employed during the investigation were broadly in accordance with BS5930:2015+A1:2020 ('Code of Practise for Site Investigation').

3.3 Ground Gas & Groundwater Monitoring

The preliminary risk assessment identified ground gas as a potential issue. Two preliminary rounds of monitoring were scheduled and undertaken on the 25th May and 2nd June 2021. Full details of ground gas and groundwater levels recorded during monitoring visits are included within Appendix VII.

4.0 GROUND CONDITIONS

4.1. Ground Conditions

The ground investigation generally confirmed the published geology and identified the strata set out in Table 3 below. Exploratory hole logs are included within Appendix V.

Table 3: Summary of Strata

Stratum	Min Depth to Top/Base of Strata (mbgl)	Max Depth to Top/Base of Strata (mbgl)	Max Thickness (m)
Made Ground	Ground Level / 0.10	Ground Level / 1.30	1.30
Superficial Deposits - Glacial Till*	0.10 / 3.45	1.30 / 5.45	4.75

*Base not proven

Made Ground

Made Ground was encountered in all exploratory hole locations from ground level to a maximum depth 1.30mbgl (WS103). Made Ground within WS101 comprised Asphalt over limestone subbase, which was underlain by gravel and clay. Within WS102 Made Ground comprised Asphalt over limestone subbase and ash. Within WS103 – 105 this stratum typically comprised topsoil, this was underlain by gravelly clay within WS103 and WS104.

Glacial Till

The superficial deposits of Glacial Till was encountered beneath the Made Ground in all locations. This stratum typically comprised firm to stiff dark brown slightly gravelly CLAY. Gravel is rounded to subrounded, fine to coarse of sandstone and shale.

Groundwater

Groundwater was not encountered during the investigation. Water was identified in the installed wells at depths between 0.27mbgl and 0.95mbgl during return monitoring visits. However, this is believed to be perched surface water, given that the water was contained within fine grained material and absent during the ground investigation.

5.0 HUMAN HEALTH SOIL RISK ASSESSMENT

The Preliminary Risk Assessment developed at the Tier I (desk study) stage, identified the following potentially unacceptable risks to human health.

- Potential presence of asbestos, PAH, TPH, sulphates and heavy metals in Made Ground; and
- Potential for ground gas originated from Made Ground.

A total of 3no. soil samples were submitted to UKAS accredited laboratories of i2 Analytical of Watford for testing for the following standard suite of determinands:

- Asbestos Identification;
- Metals;
- Soil Organic Matter;
- Fraction Organic Carbon;
- pH
- Phenols;
- Cyanide;
- Speciated PAH's (EPA 16);
- TPH CWG with BTEX and MTBE.

The laboratory testing results are included within Appendix VI.

5.1. Risk Assessment

At a Tier II stage, the long term (chronic) risk to human health is assessed by utilising appropriate and conservative generic assessment criteria (GAC) to determine whether potentially unacceptable risks are present at the site. To undertake the Tier II Assessment within the context of the development proposal, the most appropriate conservative GAC values available will be those based upon a residential end use with no plant uptake.

The assessment, has primarily adopted the S4UL (Suitable for Use Levels reference values published by LQM/CIEH in 2015, the S4ULs). Currently, no published GAC value is available for cyanide and therefore Ensafe Consultants has utilised the Environmental Agency Contaminated Land Exposure Assessment Tool (CLEA v1.071) to derive the relevant GAC for this proposed land use. Due to the absence of a published lead GAC for direct use within the planning regime, the 2014 Defra C4SL (Category 4 Screening Level) has been used as this value is considered to incorporate the latest toxicological, bio-accessibility and exposure modelling research to date.

3no. samples were analysed for Soil Organic Matter (SOM). The geometric mean SOM value was calculated as 4.8% and therefore the soil results have been compared with a GACs for a soil with 2.5% SOM to be appropriately conservative.

No concentrations of contaminants were recorded exceeding the relevant GAC, a full copy of the results is presented in Appendix VI.

6.0 GROUND GAS RISK ASSESSMENT

The Conceptual Site Model developed at the Tier I (desk study) identified the following potentially unacceptable risks from Ground Gas as a result of the presence of Made Ground on site

6.1. Risk Assessment

Monitoring visits were undertaken on the 25th May and 2nd June 2021. Detailed ground gas monitoring data is included within Appendix VII.

The potential impact on the development from ground gases has been assessed with reference to standards and guidelines published within BS 8485:2015+A1:2019. A summary of results and relevant calculated Gas Screening Values (GSV) are given as Table 4.

Table 4: Summary of Ground Gas Risk Assessment

Location	Max Steady Flow Rate (l/hr)	Max Steady CH_4 (%)	Max Steady CO_2 (%)	CH_4 Ohg (l/hr)	CO_2 Ohg (l/hr)	Implied CH_4 CS	Implied CO_2 CS
WS101	0	0	0.1	0.000	0.0001	1	1
WS102	-0.9	0	0.4	0.000	0.0036	1	1
WS103	-1.1	0	1	0.000	0.0110	1	1
WS104	-1.1	0	0.3	0.000	0.0033	1	1

KEY: CS: Characteristic Situation Qhg: Hazardous Gas Flow Rate

6.2. Discussion of Results

The maximum implied characteristic situation for the site has therefore been calculated by combining the maximum observed flow rate and maximum observed concentrations during any monitoring event. This methodology provides a 'worst case scenario' in order to characterise the highest potential risk to human health from ground gas at the site.

On the basis of measurements in Table 4, the maximum site hazardous gas flow rate encountered across the whole site is 0.0110 L/h, which lies within the range of GSV values for Characteristic Situation 1 (CS2) (>0.07 L/h).

Therefore, no gas protection measures are necessary.

7.0 CONCEPTUAL SITE MODEL

7.1. Previous CSM

Potentially unacceptable risks identified in REC report 102702p1r0 dated September 2017], are as follows:

- Made Ground associated with the construction of the site buildings/ hardstanding areas may give rise to heavy metals, sulphates, PAHs, asbestos and hydrocarbons; and,
- Ground gases such as methane and carbon dioxide.

7.2. Developed Conceptual Site Model

In accordance with LCRM – Land Contamination Risk Management (Environment Agency, Oct 2020) and BS 10175:2011+A2:2017 (Investigation of Potentially Contaminated Land. Code of Practice), Ensafe Consultants has developed a preliminary Conceptual Site Model (CSM) to identify potential contamination sources, migration pathways, and significant receptors within the study area.

A developed conceptual site model is presented as Table 5.

Table 5: Developed Conceptual Site Model

Source	Contaminant	Receptors	Migration Pathway	Unacceptable Risk
Made Ground	Heavy metals	Future site users	Ingestion	No unacceptable risk
	TPH		Ingestion; inhalation	No unacceptable risk
	PAHs		Ingestion; inhalation	No unacceptable risk
	Asbestos fibres		Ingestion; inhalation	No unacceptable risk
	Ground gases		Inhalation / build up of gasses within confined spaces.	Based on the gas monitoring undertaken to date, the site has been characterised as CS1. Therefore, no unacceptable risk has been identified.

8.0 GEOTECHNICAL ASSESSMENT

8.1. Results

It is understood that proposals include for the development of a new Community Centre, located within the footprint of the existing building, and construction of associated parking to the west and north.

A Proposed Development Plan (G20232-003) is provided within Appendix III.

8.2. Summary of Ground Conditions

Ground conditions typically comprised Made Ground to a maximum depth 1.30mbgl (WS103). Made Ground within WS101 comprised Asphalt over limestone subbase, which was underlain by gravel and clay. Within WS102 Made Ground comprised Asphalt over limestone subbase and ash. Within WS103 – 105 this stratum typically comprised topsoil, this was underlain by gravelly clay within WS103 and WS104.

The superficial deposits of Glacial Till was encountered beneath the Made Ground in all locations. This stratum typically comprised firm to stiff dark brown slightly gravelly CLAY.

Groundwater was not encountered during the investigation. Water was identified in the installed wells at depths between 0.27mbgl and 0.95mbgl during return monitoring visits. However, this is believed to be perched surface water, given that the water was contained within fine grained material and absent during the ground investigation.

8.3. Consistency & Density

Standard Penetration Tests (SPT) were carried out within each borehole from 1.2 mbgl at the base of the hand pit and at 1m intervals thereafter until refusal. The testing was carried out to provide validation of ground consistency, strength observations and hand shear vane test results. The results of the in-situ testing are presented in Section 4.2 and on the exploratory hole logs in Appendix V.

A summary of in-situ SPT results is presented in Table 6. All data is included within the Exploratory Hole Logs within Appendix V. SPT results show the site is underlain by Made Ground over Glacial Till.

Table 6: Standard Penetration Test Results

Borehole	Depth (mbgl)	Material Field Description	Geological Stratum	SPT "N" Value	Approx Undrained Shear Strength (Cu) Based SPT n Value	Consistency / Density
WS101	0.8	Sandy clay	Made Ground		22	N/A
WS101	1.2	Slightly sandy gravelly clay	Glacial Till	12	54	Firm
WS101	1.3				53	
WS101	1.3				52	
WS101	1.3				52	
WS101	1.6				60	
WS101	1.6				55	
WS101	1.6				55	
WS101	2			15	67.5	
WS101	2.5				35	Soft
WS101	2.5				40	
WS101	2.5				42	Soft to Firm
WS101	3			16	72	Firm
WS101	3.5				40	Soft
WS101	3.5				40	
WS101	3.5				35	

Borehole	Depth (mbgl)	Material Field Description	Geological Stratum	SPT "N" Value	Approx Undrained Shear Strength (Cu) Based SPT n Value	Consistency / Density
WS101	4			21	94.5	Firm to Stiff
WS101	5			23	103.5	Stiff
WS102	1.2	Slightly gravelly sandy clay	Glacial Till	13	58.5	Firm
WS102	1.5				65	
WS102	1.5				65	
WS102	1.5				60	
WS102	2	Slightly Gravelly Clay		20	90	Firm to Stiff
WS102	2.2				50	Firm
WS102	2.2				55	
WS102	2.2				53	
WS102	3			15	67.5	
WS102	3.3				40	Soft to Firm
WS102	3.3				45	
WS102	3.3				45	
WS102	4			12	54	
WS102	5			20	90	Firm to Stiff
WS103	1.2	Slightly gravelly sandy clay	Made Ground	10	45	N/A
WS103	1.3	Slightly Gravelly Clay	Glacial Till		52	Firm
WS103	1.3				54	
WS103	1.3				55	
WS103	2			17	76.5	Firm to Stiff
WS103	2				60	Firm
WS103	2				70	
WS103	2				50	
WS103	2.6				50	
WS103	2.6				52	
WS103	2.6				50	
WS103	3			14	63	
WS103	3.2				45	Soft to Firm
WS103	3.2				40	
WS103	3.2				45	
WS103	3.8				40	
WS103	3.8				40	
WS103	3.8				42	
WS103	4			20	90	Firm to Stiff
WS103	5			19	85.5	
WS104	1.2			9	40.5	Soft to Firm
WS104	1.2				70	Firm
WS104	1.2				60	
WS104	1.6				74	
WS104	1.6				73	
WS104	2			13	58.5	
WS104	2.5				70	
WS104	2.5				68	
WS104	2.5				68	
WS104	3			12	54	
WS104	3.5				25	Soft
WS104	3.5				30	
WS104	3.5				30	
WS104	4			15	67.5	Firm

Borehole	Depth (mbgl)	Material Field Description	Geological Stratum	SPT "N" Value	Approx Undrained Shear Strength (Cu) Based SPT n Value	Consistency / Density
WS104	5			25	112.5	Stiff
WS105	1	Slightly gravelly slightly cobbly clay	Glacial Till		50	Firm
WS105	1				52	
WS105	1				46	Soft to Firm
WS105	1.2			9	40.5	
WS105	1.5				50	Firm
WS105	1.5				55	
WS105	1.5				52	
WS105	2			12	54	
WS105	2.5				50	
WS105	2.5				50	
WS105	2.5				54	
WS105	3			15	67.5	

8.4. Soil Plasticity

Atterberg Limit determinations, summarised in Table 7, indicate the Glacial Till on site to be of low to medium volume change potential based on modified plasticity indices.

Table 7: Summary of Atterberg Limits

Location	Strata	Depth (m)	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425µm Sieve (%)	Modified Plasticity Index	Vol Change Potential
WS101	GT*	1.50	22	51	24	27	100	27	Medium
WS103		1.60	26	54	25	29	100	27	
WS104		1.30	13	28	15	13	93	12	Low
WS104		1.40	18	41	21	20	88	18	

GT = Glacial Till

8.5. pH & Sulphate

Chemical analyses for pH and water-soluble sulphate content contained in Appendix VIII and summarised in Table 8 indicated that the Made Ground and Glacial Till meets with a worst case concrete classification of DS-1 AC-1s in accordance with BRE Special Digest 1 (2005).

Table 8: Summary of pH & Sulphate Data

Location	Depth (mbgl)	pH Value	Water Soluble SO_4 (mg/l)	Concrete Classification
WS101	0.20	8.3	190	DS-1 AC-1s
WS101	1.00	7.8	28	
WS102	0.20	7.9	210	
WS102	1.30	8.0	12	
WS103	0.60	8.1	110	

8.6. Foundation Conditions & Bearing Capacity

Based on the information provided, the site has been assumed as category 2 (conventional structures) in accordance with BS 1997-1: 2004+A1:2013 Eurocode 7. Geotechnical design. General rules.

Made Ground is not considered a suitable bearing stratum given its inherent variability in composition and strength of material. We recommend that foundations bear onto the underlying Glacial Till, present at depth varying from 0.10 – 1.20 mbgl.

Undrained shear strength values of the underlying natural soils were calculated using in situ SPT results and hand shear vane testing. Given that the underlying geology comprised primarily fine grained material, hand shear vane tests have been used to calculate allowable bearing pressures as their results are likely to be more representative of true geotechnical conditions.

Hand shear vane results were identified to range between 22 and 122.5kPa within natural soils at depths ranging from 0.10 to 5.00mbgl. A slight positive trend was identified between undrained shear strengths with depth as shown within the shear strength plot contained within Appendix IX.

Based on average undrained shear strength value in fine grained soils for a strip foundation with a width of 0.6m, the following allowable bearing pressures have been calculated with a factor safety of 3:

At 1.20mbgl: undrained shear strength 52 kPa. Calculated allowable bearing pressure of 121 kN/m2

This calculation does not account for the presence of shallow groundwater given that groundwater was not encountered during the investigation, and that water encountered within the installed wells during monitoring visits is believed to be perched surface water only.

8.7. Concrete Durability

pH and SO4 results are classed as AC-1s in accordance with BRE Special Digest 1 (2005).

8.8. Floor Slabs

A suspended floor slab should be applied in areas of deeper Made Ground or in the vicinity of trees. Where suspended floor slabs are utilised, a ventilation of the under-floor void will be required to address condensation issues. A ground bearing slab can be utilised in other areas of the site.

8.9. Excavations & Stability

Consideration should be given to support methods for open excavations at shallow depths. In particular, within the Made Ground.

8.10. Frost Susceptibility

The plasticity testing results indicate the soils on site to be of low to medium volume change potential. A modified plasticity index of over 20% was identified within WS101 and WS103, indicating a medium volume change potential, and therefore these soils are deemed to be susceptible to frost. It is likely that these soils will change volume as moisture content fluctuates seasonally.

This seasonal fluctuation of moisture results in two potentially damaging effects associated with frost in, the expansion and lifting of ground in winter (frost heaving) and the loss of bearing capacity through the spring due to thawing. The heaving and thawing effects of frost within founding soils should be considered during the foundation and structural design.

9.0 CONCLUSION & RECOMMENDATIONS

9.1. Conclusions

Contaminated Land

No potentially unacceptable risks have been identified to human health or controlled waters receptors.

Based on the results of gas monitoring, the site has been characterised as CS1, therefore no unacceptable risk has been identified with regards to ground gas onsite.

Geotechnical Assessment

Conventional standard strip foundations can be applied to natural fine-grained strata encountered at an average depth of 1.20mbgl where an Allowable Bearing Pressure in order of 122kN/m^2 can be achieved.

pH and SO4 analysis results indicate that the Made Ground and Glacial Till meets with a worst case concrete classification of DS-1 AC-1s in accordance with BRE Special Digest 1 (2005).

END OF REPORT

APPENDIX I - LIMITATIONS

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LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between Ensafe Consultants and the Client as indicated in Section 1.0.

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. In addition to the above Ensafe Consultants note that when investigating, or developing, potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and also with time. The absence of certain ground, ground gas, and contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Due to the presence of existing buildings and structures access could not be obtained to all areas. Additional contamination may be identified following the removal of the buildings or hard standing.

7. 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.

8. 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.

9. 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.

10. This report presents an interpretation of the geotechnical information established by excavation, observation and testing. Whilst every effort is made in interpretative reporting to assess the soil conditions over the Site it should be noted that natural strata vary from point to point and that manmade deposits are subject to an even greater diversity. Groundwater conditions are dependent on seasonal and other factors. Consequently there may be conditions present not revealed by this investigation.

11. Ensafe Consultants 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 Ensafe Consultants 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 Ensafe Consultants in this connection without their explicit written agreement there to by Ensafe Consultants.

12. Rather, this investigation has been undertaken to provide a preliminary characterisation of the existing sub-surface geotechnical characteristics and make up and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

13. This investigation has been undertaken to reasonably characterise existing sub-surface conditions and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

APPENDIX II - GLOSSARY

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GLOSSARY

AST	Above Ground Storage Tank
BGS	British Geological Survey
BSI	British Standards Institute
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CIEH	Chartered Institute of Environmental Health
CIRIA	Construction Industry Research Association
CLEA	Contaminated Land Exposure Assessment
CSM	Conceptual Site Model
DNAPL	Dense Non-Aqueous Phase Liquid (chlorinated solvents, PCB)
DWS	Drinking Water Standard
EA	Environment Agency
EQS	Environmental Quality Standard
GAC	General Assessment Criteria
GL	Ground Level
GSV	Gas Screening Value
HCV	Health Criteria Value
ICSM	Initial Conceptual Site Model
LNAPL	Light Non-Aqueous Phase Liquid (petrol, diesel, kerosene)
ND	Not Detected
LMRL	Lower Method Reporting Limit
NR	Not Recorded
PAH	Poly Aromatic Hydrocarbon
PCB	Poly-Chlorinated Biphenyl
PID	Photo Ionisation Detector
QA	Quality Assurance
SGV	Soil Guideline Value
SPH	Separate Phase Hydrocarbon
Sp.TPH (CWG)	Total Petroleum Hydrocarbon (Criteria Working Group)
SPT	Standard Penetration Test
SVOC	Semi Volatile Organic Compound
UST	Underground Storage Tank
VCCs	Vibro Concrete Columns
VOC	Volatile Organic Compound
WTE	Water Table Elevation

APPENDIX III - DRAWINGS

Company	Drawing No	Revision	Title
Ensafe	001	-	Site Location Plan
Ensafe	002	-	Site Layout Plan
Ensafe	003	-	Proposed Development Plan
Ensafe	004	-	Exploratory Hole Location Plan

APPENDIX III - DRAWINGS

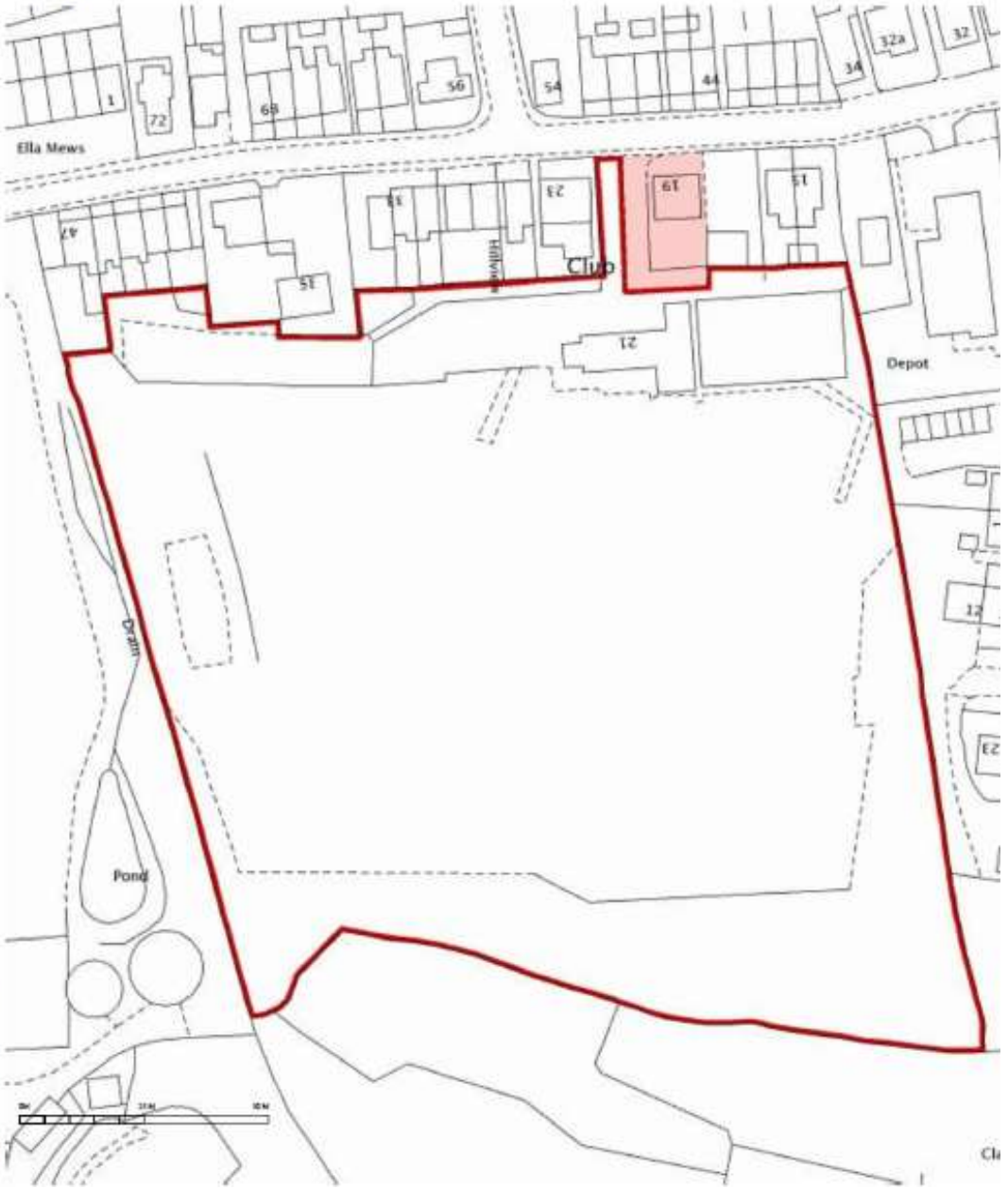
KEY:

N

Site Boundary

1:1250

1:500



SITE LOCATION PLANS

NORTH

Ensafe Consultants Ltd
Capital Business Centre,
22 Carlton Road,
South Croydon, CR2 0BS

t + 44 2034 788076
info@ensafe.co.uk

Job No. & Title:	G20232 Chinley Community Centre
Client:	Chinley, Buxworth & Brownside Parish Council
Drawn by:	PH
Approved by:	HF
Date:	May 2021
Notes:	NOT TO SCALE
Drawing Title:	G20232 001 Site Location Plan

KEY:

N

Ensafe Consultants Ltd
Capital Business Centre,
22 Carlton Road,
South Croydon, CR2 0BS

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info@ensafe.co.uk

Job No. & Title:
G20232 Chinley Community Centre

Client:
Chinley, Buxworth & Brownside Parish Council

Drawn by:	PH
Approved by:	HF
Date:	May 2021

Notes:
NOT TO SCALE

Drawing Title:
G20232 002 Site Layout Plan (1)

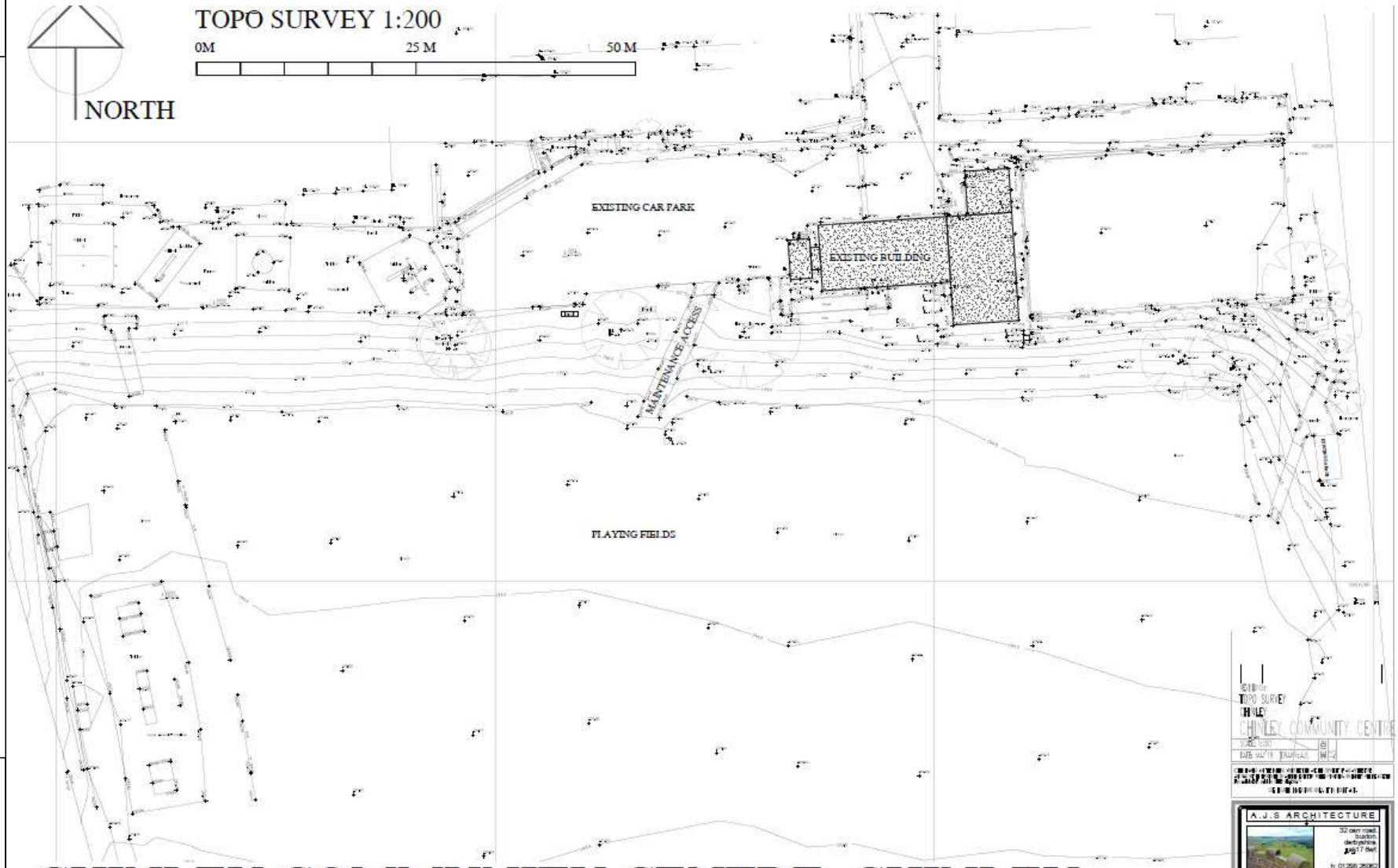
KEY:

N

TOPO SURVEY 1:200

0M 25 M 50 M

NORTH



CHINLEY COMMUNITY CENTRE, CHINLEY

Ensafe Consultants Ltd
Capital Business Centre,
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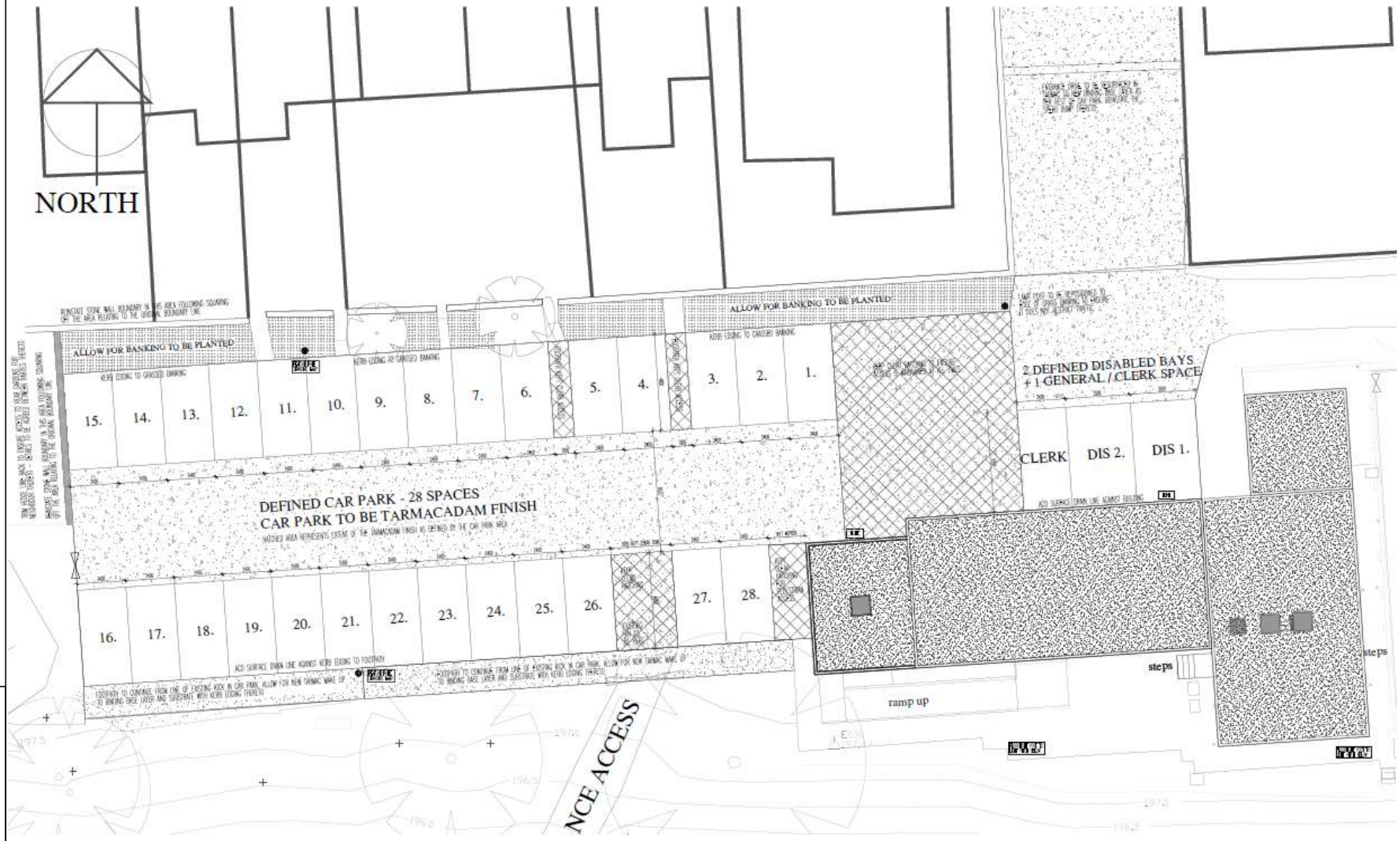
Job No. & Title:	G20232 Chinley Community Centre
Client:	Chinley, Buxworth & Brownside Parish Council
Drawn by:	PH
Approved by:	HF
Date:	May 2021
Notes:	NOT TO SCALE
Drawing Title:	G20232 002 Site Layout Plan (2)

KEY: N



ensafe consultants

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Job No. & Title:
G20232 Chinley Community Centre

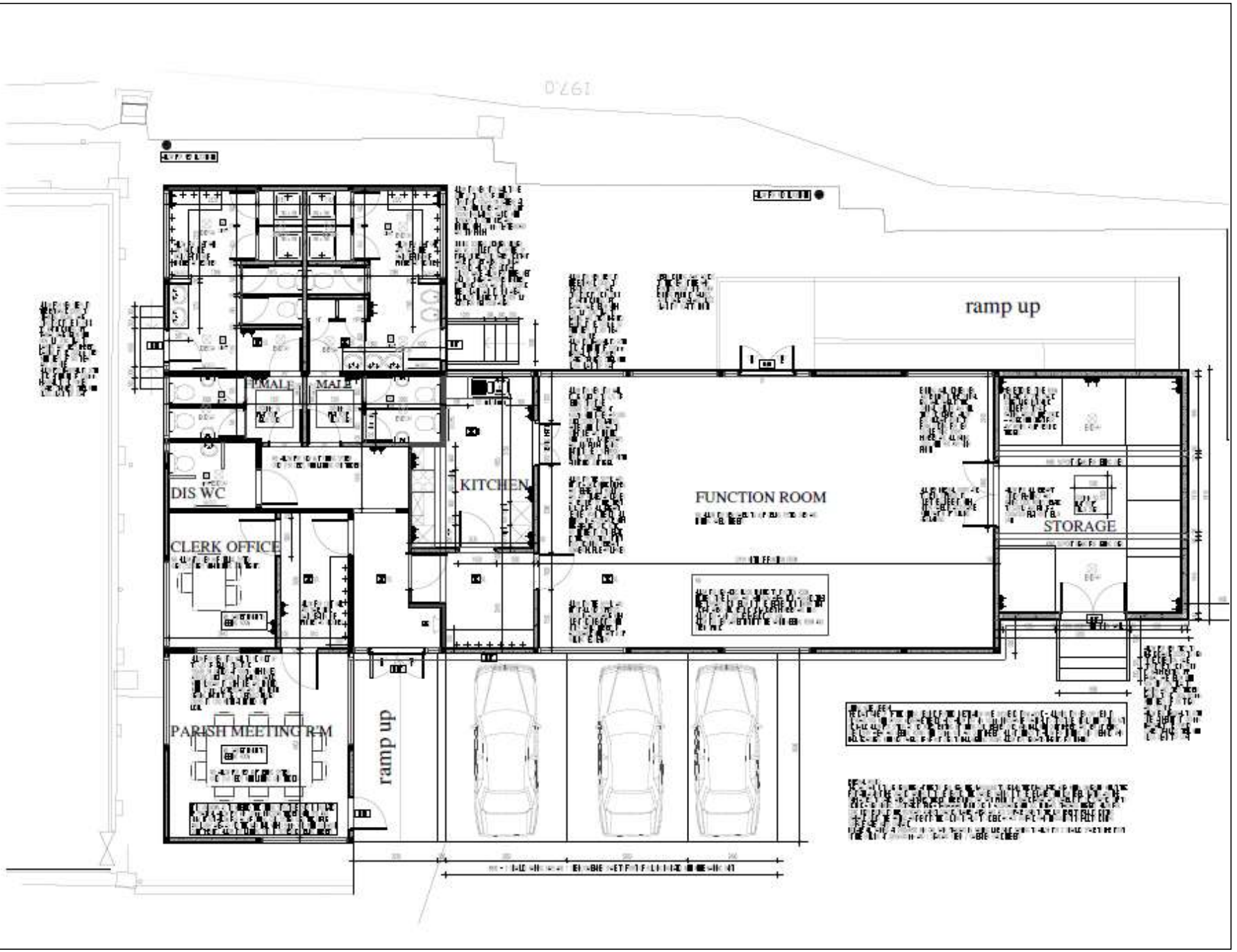
Client:
Chinley, Buxworth & Brownside Parish Council

Drawn by:	PH
Approved by:	HF
Date:	May 2021

Notes:
NOT TO SCALE

Drawing Title:
G20232 003 Proposed Development Plan (1)

KEY: N



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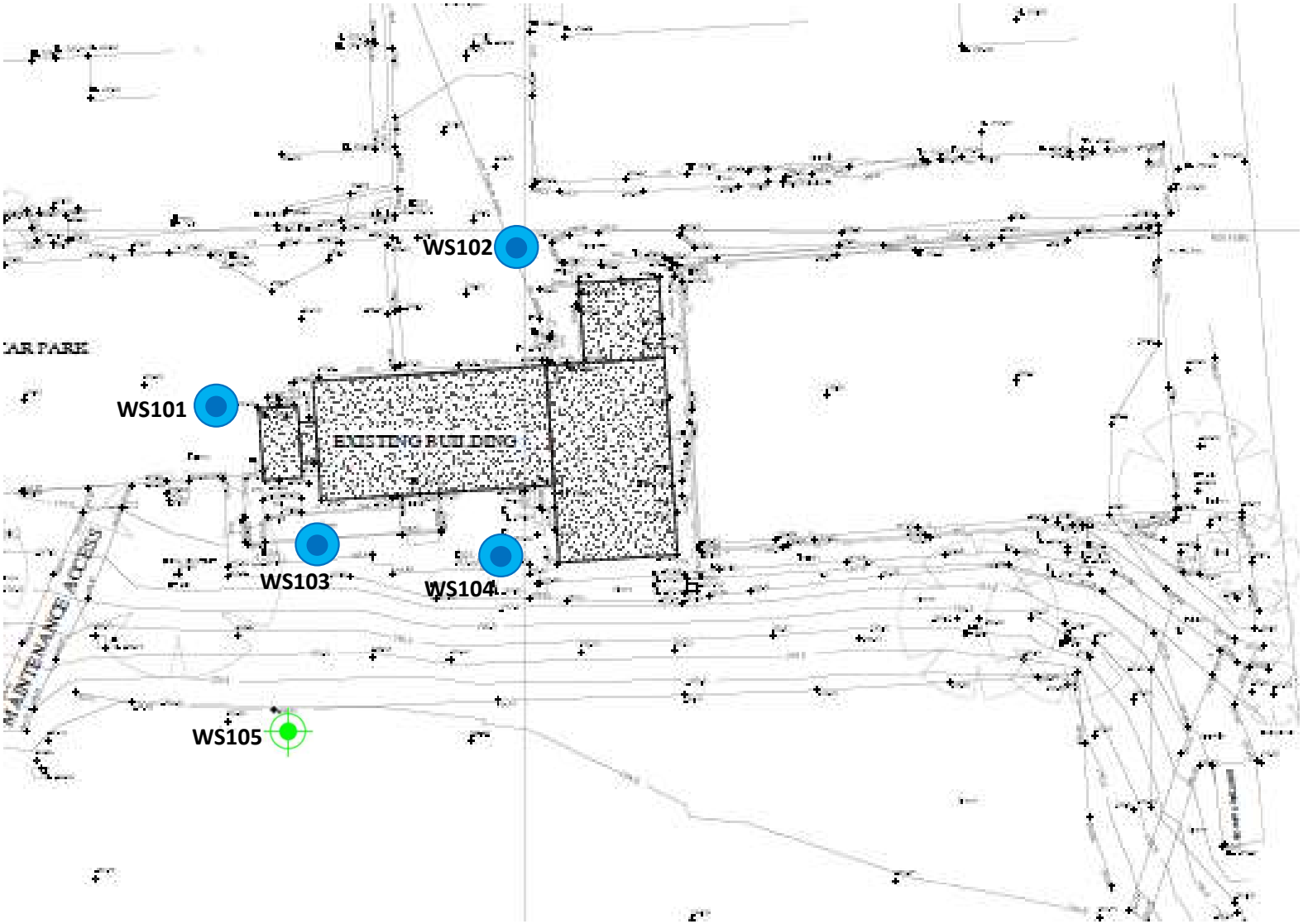
Job No. & Title:	G20232 Chinley Community Centre
Client:	Chinley, Buxworth & Brownside Parish Council
Drawn by:	PH
Approved by:	HF
Date:	May 2021
Notes:	NOT TO SCALE
Drawing Title:	G20232 003 Proposed Development Plan (2)

KEY:

N

Window Sample Locations

Window Sample Location (Installed)



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info@ensafe.co.uk

Job No. & Title:	G20232 Chinley Community Centre
Client:	Chinley, Buxworth & Brownside Parish Council
Drawn by:	PH
Approved by:	HF
Date:	May 2021
Notes:	NOT TO SCALE
Drawing Title:	G20232 002 Exploratory Hole Location Plan

APPENDIX IV – PHOTOGRAPHS

APPENDIX IV – PHOTOGRAPHS

PLATE 1 - MATERIALS RECOVERED FROM WS101

PLATE 2 - MATERIALS RECOVERED FROM WS102

PLATE 3 – SITE FACING NORTH WEST FROM COMMUNITY CENTRE BUILDING

PLATE 4 – SITE FACING SOUTH WEST FROM COMMUNITY CENTRE BUILDING

PLATE 5 – BANKING SOUTH OF CARPARK

PLATE 6 – WELL INSTALLED WITHIN WS103

PLATE 7 – WELL INSTALLED WITHIN WS104

PLATE 8 – COMMUNITY CENTRE FACING NORTH

APPENDIX V – EXPLORATORY HOLE LOGS

APPENDIX V –EXPLORATORY HOLE LOGS

Borehole Log

Borehole No. **WS101**

Sheet 1 of 1

Project Name:	Chinley Community Centre	Proj. ID: G20232	Easting:		Hole Type: WS
			Northing:		
Location:	Chinley & Buxworth	Plant: Window Sampler	Level (m AOD):		Scale: 1:30
			Final Depth (m):	5.45	
Client:	Chinley, Buxworth and Brownside Parish Council	Crew: PM Sampling	Start Date:	20/05/2021	REC Engineer: PH
			End Date:	20/05/2021	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.05			Tarmac
		0.20 - 0.30	ES		0.10			MADE GROUND
								Gravel sub-base (limestone)
								MADE GROUND
								Brown / black sandy gravel with much ash.
					0.50			MADE GROUND
					0.65			Gravel. Gravel is coarse rounded of varying lithologies
								MADE GROUND
		0.80 - 1.00	ES					Firm light brown very sandy clay with much gravel.
		0.80		HVP=20				Gravel is fine to coarea of sandstone (possible
		0.80		HVP=20				reworked natural)
		0.80		HVP=22				MADE GROUND
		1.00 - 1.20	D					
		1.20	SPT	N=12 (1,1/3,3,3,3)	1.20			
		1.30		HVP=52				Dark brown slightly sandy CLAY with occasional
		1.30		HVP=52				gravel. Gravel is fine to medium, sub rounded to
		1.30		HVP=53				rounded of sandstone, limestone and occasional
		1.50 - 1.80	D					shale.
		1.60		HVP=55				GLACIAL TILL
		1.60		HVP=55				
		1.60		HVP=60				
		2.00	SPT	N=15 (2,3/3,3,4,5)				
		2.50		HVP=35				
		2.50		HVP=40				
		2.50		HVP=42				
		3.00	SPT	N=16 (2,3/3,4,4,5)				
		3.50		HVP=35				
		3.50		HVP=40				
		3.50		HVP=40				
		4.00	SPT	N=21 (3,4/5,4,5,7)				
		5.00	SPT	N=23 (3,3/4,5,5,9)				
					5.45			End of Borehole at 5.45m

1 2 3 4 5 6

Remarks:

Location cleared for services using Cable Avoidance Tool (CAT). Groundwater not encountered.

Borehole Log

Borehole No. **WS102**

Sheet 1 of 1

Project Name:	Chinley Community Centre	Proj. ID: G20232	Easting:		Hole Type: WS
			Northing:		
Location:	Chinley & Buxworth	Plant: Window Sampler	Level (m AOD):		Scale: 1:30
			Final Depth (m):	5.45	
Client:	Chinley, Buxworth and Brownside Parish Council	Crew: PM Sampling	Start Date:	20/05/2021	REC Engineer: PH
			End Date:	20/05/2021	

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.05			Tarmac MADE GROUND
		0.20 - 0.25	ES		0.25			Gravel. Gravel is fine to coarse of sandstone, limestone and ash MADE GROUND
								Light brown very sandy CLAY with gravel. Gravel is fine to coarse subrounded to rounded of sandstone and limestone (possible reworked natural) GLACIAL TILL
		1.20 - 1.30	ES					
		1.20	SPT	N=13 (2,2/3,3,3,4)				
		1.30 - 1.40	D					
		1.50		HVP=60				
		1.50		HVP=65				
		1.50		HVP=65				
		2.00	SPT	N=20 (2,2/4,6,4,6)	2.00			Firm to stiff dark brown CLAY with occasional gravel. Gravel is rounded to subrounded, fine to coarse of sandstone and shale GLACIAL TILL
		2.20		HVP=50				
		2.20		HVP=53				
		2.20		HVP=55				
		3.00	SPT	N=15 (3,3/4,3,4,4)				
		3.30		HVP=40				
		3.30		HVP=45				
		3.30		HVP=45				
		4.00	SPT	N=12 (2,2/3,3,3,3)				
		5.00	SPT	N=20 (3,3/3,5,5,7)				
					5.45			End of Borehole at 5.45m

Remarks:

Location cleared for services using Cable Avoidance Tool (CAT). Groundwater not encountered.

Borehole Log

Borehole No. **WS103**

Sheet 1 of 1

Project Name:	Chinley Community Centre	Proj. ID: G20232	Easting:		Hole Type: WS
			Northing:		
Location:	Chinley & Buxworth	Plant: Window Sampler	Level (m AOD):		Scale: 1:30
			Final Depth (m):	5.45	
Client:	Chinley, Buxworth and Brownside Parish Council	Crew: PM Sampling	Start Date:	20/05/2021	REC Engineer: PH
			End Date:	20/05/2021	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.60 - 0.70	ES		0.60			Dark brown sandy topsoil, with many roots and rootlets MADE GROUND
		1.20 - 1.50	ES					Light brown sandy CLAY with some gravel. Gravel is rounded, medium to coarse of sandstone. Rare brick fragment. Probable reworked natural. MADE GROUND
		1.20	SPT	N=10 (1,2/2,2,3,3)	1.30			
		1.30		HVP=52				Firm to stiff dark brown CLAY with occasional gravel. Gravel is rounded to subrounded, fine to coarse of sandstone and shale GLACIAL TILL
		1.30		HVP=54				
		1.30		HVP=55				
		1.60	D					
		1.65 - 2.00	B					
		2.00		HVP=50				
		2.00		HVP=60				
		2.00		HVP=70				
		2.00	SPT	N=17 (2,2/4,4,4,5)				
		2.60		HVP=50				
		2.60		HVP=50				
		2.60		HVP=52				
		3.00	SPT	N=14 (2,2/3,3,3,5)				
		3.20		HVP=40				
		3.20		HVP=45				
		3.20		HVP=45				
		3.80		HVP=40				
		3.80		HVP=40				
		3.80		HVP=42				
		4.00	SPT	N=20 (2,3/4,4,6,6)				
		5.00	SPT	N=19 (3,4/4,4,5,6)				
					5.45			End of Borehole at 5.45m

1 2 3 4 5 6

Remarks:

Location cleared for services using Cable Avoidance Tool (CAT). Groundwater not encountered.

Borehole Log

Borehole No. **WS104**

Sheet 1 of 1

Project Name:	Chinley Community Centre	Proj. ID: G20232	Easting:		Hole Type: WS
			Northing:		
Location:	Chinley & Buxworth	Plant: Window Sampler	Level (m AOD):		Scale: 1:30
			Final Depth (m):	5.45	
Client:	Chinley, Buxworth and Brownside Parish Council	Crew: PM Sampling	Start Date:	20/05/2021	REC Engineer: PH
			End Date:	20/05/2021	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			Dark brown sandy topsoil, with many rootlets MADE GROUND
		0.60 - 0.70	ES		0.70			Light brown very sandy CLAY with gravel. Gravel is fine to coarse subrounded to rounded of sandstone and limestone (possible reworked natural) MADE GROUND
		1.20	ES					Firm to stiff dark brown CLAY with occasional gravel. Gravel is rounded to subrounded, fine to coarse of sandstone and shale GLACIAL TILL
		1.20		HVP=60				
		1.20		HVP=60				
		1.20		HVP=70				
		1.20	SPT	N=9 (1,2/2,2,2,3)				
		1.25	D					
		1.40	B					
		1.60		HVP=70				
		1.60		HVP=73				
		1.60		HVP=74				
		2.00	SPT	N=13 (2,2/2,3,4,4)				
		2.50		HVP=68				
		2.50		HVP=68				
		2.50		HVP=70				
		3.00	SPT	N=12 (1,2/2,3,3,4)				
		3.50		HVP=25				
		3.50		HVP=30				
		3.50		HVP=30				
		4.00	SPT	N=15 (2,2/3,4,3,5)				
		5.00	SPT	N=25 (3,4/5,6,6,8)				
					5.45			End of Borehole at 5.45m

Remarks:

Location cleared for services using Cable Avoidance Tool (CAT). Groundwater not encountered.

Borehole Log

Borehole No. **WS105**

Sheet 1 of 1

Project Name: Chinley Community Centre	Proj. ID: G20232	Easting: / Northing:	Hole Type: WS
Location: Chinley & Buxworth	Plant: Window Sampler	Level (m AOD): / Final Depth (m): 3.45	Scale: 1:30
Client: Chinley, Buxworth and Brownside Parish Council	Crew: PM Sampling	Start Date: 20/05/2021 / End Date: 20/05/2021	REC Engineer: PH

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			Dark brown sandy topsoil, with many rootlets MADE GROUND
								Firm to stiff dark brown CLAY with occasional gravel and rare cobbles. Gravel is rounded to subrounded, fine to coarse of sandstone and shale. Cobbles are fine to medium of Sandstone and Mudstone. GLACIAL TILL
		1.00		HVP=46				
		1.00		HVP=50				
		1.00		HVP=52				
		1.20	SPT	N=9 (1,2/2,2,2,3)				
		1.50		HVP=50				
		1.50		HVP=52				
		1.50		HVP=55				
		2.00	SPT	N=12 (2,2/3,3,3,3)				
		2.50		HVP=50				
		2.50		HVP=50				
		2.50		HVP=54				
		3.00	SPT	N=15 (2,3/3,4,4,4)				
					3.45			End of Borehole at 3.45m

1 2 3 4 5 6

Remarks:

Location cleared for services using Cable Avoidance Tool (CAT). Groundwater not encountered.

APPENDIX VI – CHEMICAL ANALYSIS

APPENDIX VI – CHEMICAL ANALYSIS

Philip Hill
Ensafe Consultants
Osprey House
Pacific Quay
Manchester
M50 2UE

e: phill@ensafe.co.uk

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 : 21-76593

Project / Site name:	Chinley and Buxworth Communtiy Centre	**Samples received on:**	21/05/2021
Your job number:	G20232	**Samples instructed on/ Analysis started on:**	21/05/2021
Your order number:	100	**Analysis completed by:**	28/05/2021
Report Issue Number:	1	**Report issued on:**	28/05/2021
Samples Analysed:	3 soil samples		

Signed: Izabela Wójcik

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

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

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

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

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

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: 21-76593
Project / Site name: Chinley and Buxworth Communtiy Centre
Your Order No: 100

Lab Sample Number				1879643	1879644	1879645
Sample Reference				WS101	WS102	WS103
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.20-0.30	0.20-0.25	0.60
Date Sampled				Deviating	Deviating	Deviating
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	17	14	18
Total mass of sample received	kg	0.001	NONE	1.0	1.0	1.0
General Inorganics						
pH - Automated	pH Units	N/A	MCERTS	8.3	7.9	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	190	210	110
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.093	0.11	0.053
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	93.3	106	52.8
Organic Matter	%	0.1	MCERTS	5.1	6.2	3.1
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.030	0.036	0.018
Total Phenols						
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.48	0.26
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.86	0.65
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.85	0.64
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.51	0.27
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.38	0.40
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.50	0.48
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.36	0.24
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.49	0.41
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.26	0.24
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.33	0.33
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	5.02	3.92

Analytical Report Number: 21-76593
Project / Site name: Chinley and Buxworth Communtiy Centre
Your Order No: 100

Lab Sample Number				1879643	1879644	1879645
Sample Reference				WS101	WS102	WS103
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.20-0.30	0.20-0.25	0.60
Date Sampled				Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Heavy Metals / Metalloids						
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	4.1	< 1.0	1.6
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	16	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	770	410	310
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.0	1.1	0.89
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	0.6	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.8	< 0.2	1.0
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	31	18	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	75	54	39
Lead (aqua regia extractable)	mg/kg	1	MCERTS	62	43	100
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	46	31	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	41	44	30
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	80	65	110
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons						
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	62	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	33	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	68	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	100	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	60	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	32	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	60	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	92	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-76593
Project / Site name: Chinley and Buxworth Communtiy Centre

* 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 *
1879643	WS101	None Supplied	0.20-0.30	Brown clay and sand with gravel.
1879644	WS102	None Supplied	0.20-0.25	Brown clay and sand with gravel.
1879645	WS103	None Supplied	0.6	Brown clay and loam with gravel and vegetation.

Analytical Report Number : 21-76593
Project / Site name: Chinley and Buxworth Communtiy Centre

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
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
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
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
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
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

Analytical Report Number : 21-76593
Project / Site name: Chinley and Buxworth Communtiy Centre

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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.

Sample Deviation Report

Analytical Report Number : 21-76593
Project / Site name: Chinley and Buxworth Communtiy Centre

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
WS101	None Supplied	S	1879643	a	None Supplied	None Supplied	None Supplied
WS102	None Supplied	S	1879644	a	None Supplied	None Supplied	None Supplied
WS103	None Supplied	S	1879645	a	None Supplied	None Supplied	None Supplied

UKAS TESTING
1703

ensafe consultants
ASBESTOS SURVEYING, PROJECT MANAGEMENT, HEALTH & SAFETY AND TRAINING

CERTIFICATE OF ANALYSIS

Certificate Number: J122151

Client:	Chinley, Buxworth & Brownside Parish Council, Parish Room, 3 Lower Lane, Chinley, High Peak, SK23 6BE
Site:	Chinley & Buxworth Centre, 21 Lower Lane, High Peak, SK23 6BE

Date Received:	26/05/2021	Date Sampled:	N/A	Date Analysed:	27/05/2021
Sampled By:		Chinley, Buxworth & Brownside Parish Council		Analysed By:	Joanna Cannon

Certificate Number: J122151

Sample Number	Location	Material	Description	Asbestos Fibre Type(s) Detected
BS005815	1	Soil	WS101@0.2m	No Asbestos Detected
BS005816	2	Soil	WS102@0.2m	No Asbestos Detected
BS005817	3	Soil	WS103@0.6m	No Asbestos Detected

J. Cannon

Laboratory Manager
Issue Date: 27/05/2021

Sample analysis was conducted at Manchester (Osprey)
The methodology is based on procedures within the HSE Document HSG248 'Asbestos: The analysts' guide for sampling, analysis and clearance procedures' and in–house procedures.
Where samples have been supplied by the Client (as specified within the Sampled By section), Ensafe Consultants have no responsibility for any sampling carried out and can only make reference to information supplied by the Client. Ensafe Consultants cannot be held responsible for any errors that occurred during sampling or data handling by the Client.
The opinions and interpretations indicated on this certificate are outside the scope of UKAS accreditation.

APPENDIX VII – GROUND GAS & GROUNDWATER LEVELS

APPENDIX VII – GROUND GAS & GROUND WATER LEVELS

Table 9: Summary of Ground Gas & Ground Water Monitoring Results

Location	Date	CH_4 Max %v/v	CH_4 Steady %v/v	CO_2 Max %v/v	CO_2 Steady %v/v	O_2 %v/v	Flow Max (l/hr)	Flow Steady (l/hr)	Response Zone (mbgl)	Depth to Base (mbgl)	Depth to Water (mbgl)
WS101	25/05/2021	0	0	0.1	0.1	20.3	0	0	0.30 – 0.80	0.9	0.27
	02/06/2021	0	0	0	0	20.3	0	0		0.9	0.37
WS102	25/05/2021	0	0	0.4	0.4	19.5	0	0	0.50 – 2.50	2.62	0.72
	02/06/2021	0	0	0.3	0.3	20.3	0	0		2.53	0.9
WS013	25/05/2021	0	0	0.2	0.2	20.4	-1.1	-1.1	1.50 – 5.00	3.46	0.9
	02/06/2021	0	0	1	1	20.1	0	0		3.5	0.87
WS104	25/05/2021	0	0	0.3	0.3	18.6	-1.1	-1.1	0.30 – 1.30	1.5	0.91
	02/06/2021	0	0	0.3	0.3	19.4	0	0		1.5	0.95

APPENDIX VIII – GEOTECHNICAL RESULTS

APPENDIX VIII – GEOTECHNICAL RESULTS

LABORATORY REPORT

4043

Contract Number: PSL21/4200

Report Date: 24 June 2021

Client's Reference: G20232

Client Name: Ensafe
Capital Business Centre
22 Carlton Road
South Croydon
CR2 0BS

For the attention of: Phill Hill

Contract Title: Chinley & Buxworth

Date Received: 21/5/2021
Date Commenced: 21/5/2021
Date Completed: 24/6/2021

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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

Checked and Approved Signatories:

A Watkins (Director)
R Berriman (Quality Manager)
S Royle (Laboratory Manager)

L Knight (Assistant Laboratory Manager)
S Eyre (Senior Technician)
M Fennell (Senior Technician)

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Doncaster DN4 0AR
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fax: +44 (0)844 815 6642
e-mail: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
WS101		T	1.50	1.80	Brown slightly sandy CLAY.
WS103		T	1.60		Brown slightly sandy CLAY.
WS104		T	1.30		Brown slightly gravelly very sandy CLAY.
WS104		B	1.40		Brown gravelly sandy CLAY.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
WS101		T	1.50	1.80	22			51	24	27	100	High Plasticity CH
WS103		T	1.60		26			54	25	29	100	High Plasticity CH
WS104		T	1.30		13			28	15	13	93	Low Plasticity CL
WS104		B	1.40		18			41	21	20	88	Intermediate Plasticity CI

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Chinley & Buxworth G20232

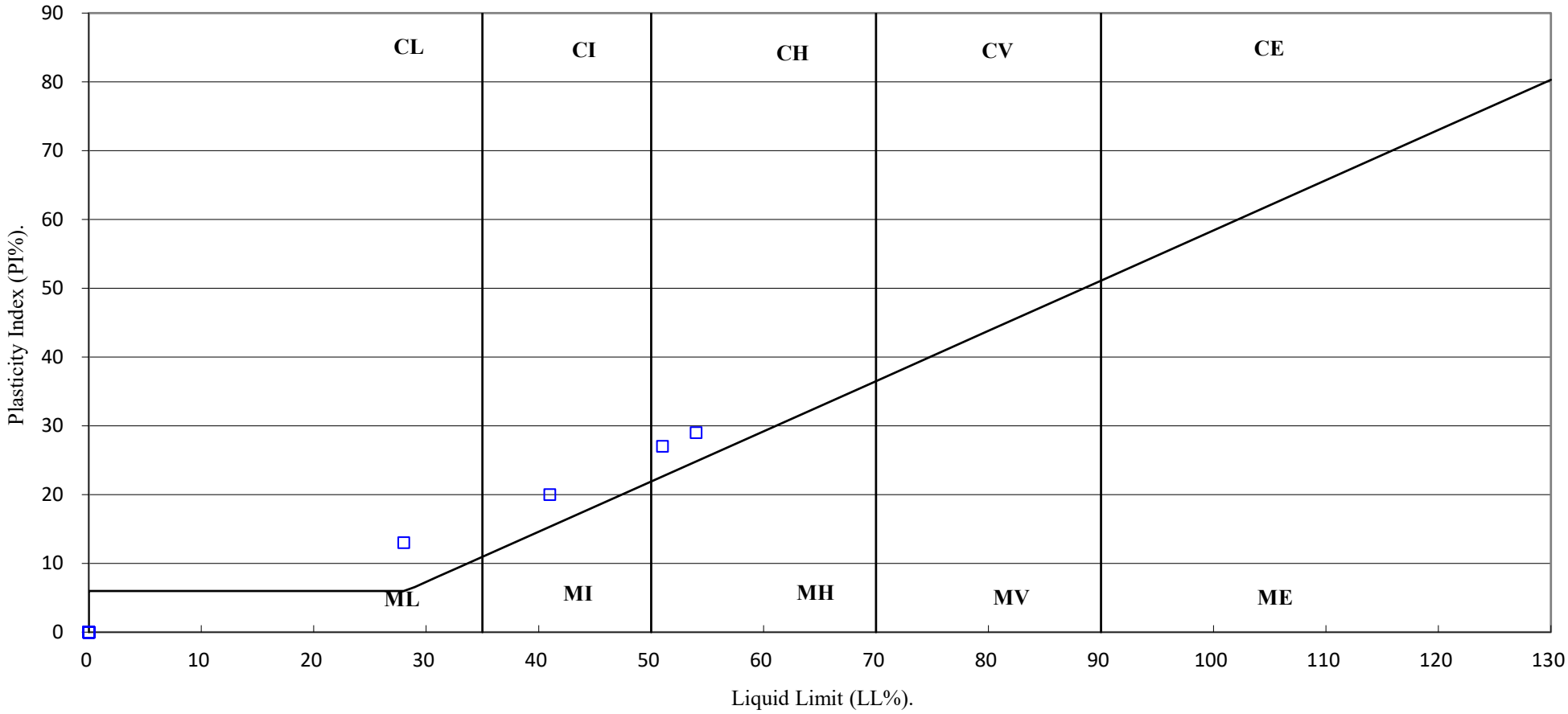
Contract No:

PSL21/4200

Client Ref:

G20232

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Chinley & Buxworth G20232	Contract No: PSL21/4200 Client Ref: G20232

2531

ANALYTICAL TEST REPORT

Contract no: 97103

Contract name: Chinley & Buxworth (G20232)

Client reference: PSL21/4200

Clients name: Professional Soils Laboratory

Clients address: 5/7 Hexthorpe Road
Doncaster
DN4 0AR

Samples received: 09 June 2021

Analysis started: 09 June 2021

Analysis completed: 16 June 2021

Report issued: 16 June 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

SOILS

Lab number			97103-1	97103-2
Sample id			WS101	WS102
Depth (m)			1.00	1.30
Date sampled			20/05/2021	20/05/2021
Test	**Method**	**Units**		
pH	CE004 [U]	units	7.8	8.0
Sulphate (2:1 water soluble)	CE061	mg/l SO_4	28	12

Chemtech Environmental Limited

METHOD DETAILS

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

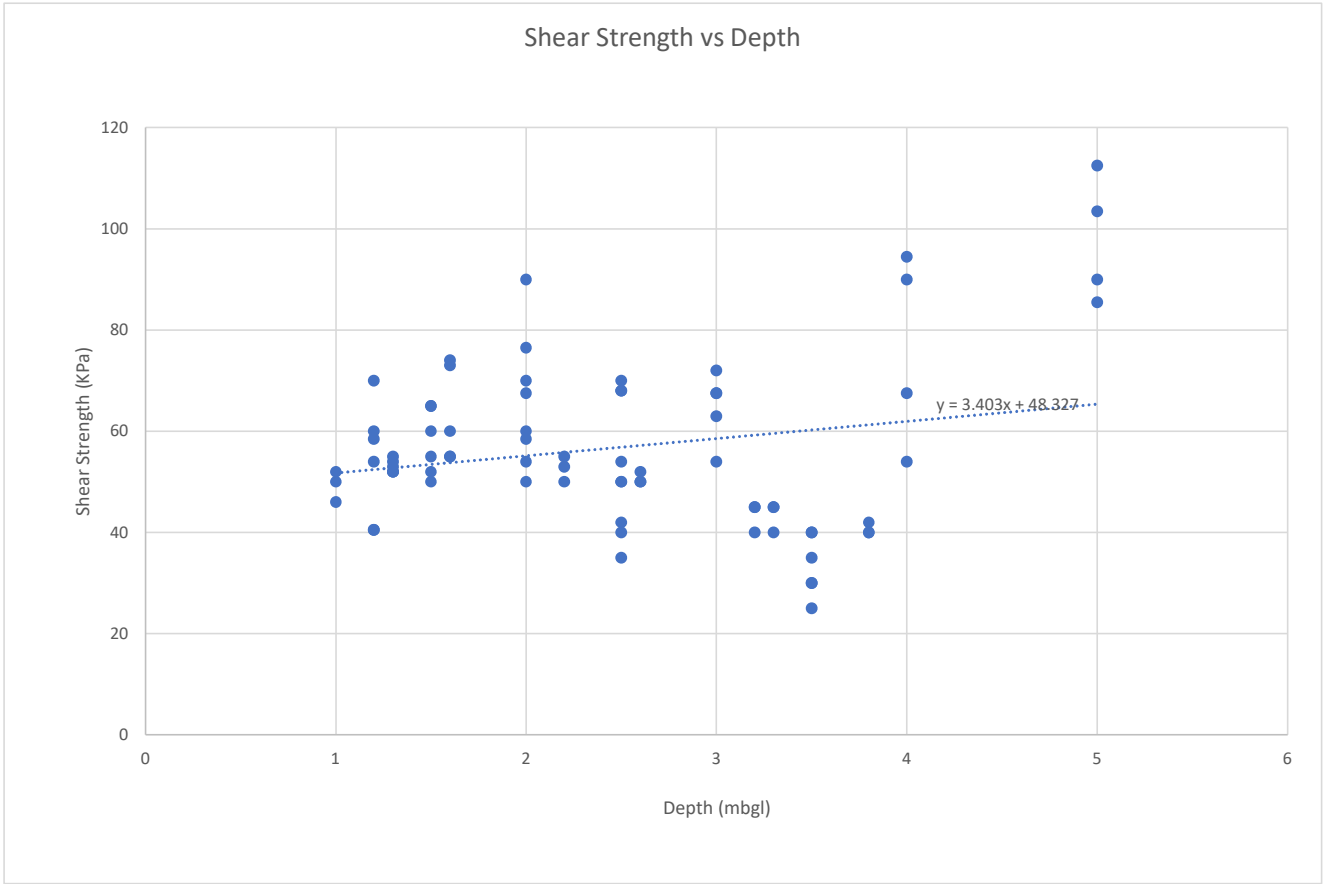
Key

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)
97103-1	WS101	1.00	N	
97103-2	WS102	1.30	N	

APPENDIX IX – SHEAR STRENGTH VS DEPTH PLOT

APPENDIX IX – SHEAR STRENGTH VS DEPTH PLOT


Shear Strength vs Depth
Shear Strength (KPa)
Depth (mbgl)
y = 3.403x + 48.327
120
100
80
60
40
20
0
0
1
2
3
4
5
6