



INVESTIGATE



REMEDiate



REGENERATE



GROUND INVESTIGATION REPORT

**AT
THE OLD FORGE,
27A PARK STREET,
BALDOCK,
SG7 6DY**

**PREPARED FOR
ESSENTIAL WATER SERVICES (UK) LTD**

**REPORT NO. SE1773
JANUARY 2024**

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**GROUND INVESTIGATION FOR THE OLD FORGE, 27A PARK STREET,
BALDOCK, SG7 6DY**

CLIENT: ESSENTIAL WATER SERVICES (UK) LTD

1. INTRODUCTION

This report has been prepared in accordance with an email, dated 21st November 2023, from the Client.

The brief was set out in our estimate, ref. ESE3240 and dated 1st November 2023, with amendments as the investigation proceeded and includes:

- 4 No. mini boreholes
- 4 No follow-on dynamic probes
- Insitu testing
- Geotechnical laboratory testing
- Contamination analysis
- Provision of an interpretative report on the above.

1.1 Site Location and Description

The site is located at The Old Forge, 27a Park Street, Baldock, SG7 6DY, as indicated on Figure 1. The approximate National Grid Reference of the centre of the site is 524392E, 233783N.

As shown on Figure 2, the about 0.07 hectare site is bounded to the north, east and west by residential properties, and to the south by the junction of Saddlers Close and Park Street.

The site consists of a derelict barn located approximately in the centre of the site, with areas of overgrown and cleared vegetation to the east and west. An area of concrete hardstanding is in the southwest of the site. The barn is brick with wooden beams.

1.2 Proposed Development and Purpose of the Ground Investigation

We understand that it is proposed to convert the existing barn into a two-storey 3-bed dwelling and construct a one-storey 1-bed dwelling, as shown on Figure 3.

The purpose of the investigation was to determine the ground conditions at the positions of the exploratory holes, to assess the likelihood of a general pattern of strata being present below the site and to establish the load bearing characteristics of the strata deriving, if possible, an assessment of the suitability of appropriate founding techniques.

In addition contamination analysis and assessment was required in order to determine necessary precautions and/or remedial measures required for the proposed development and to ascertain the need for any further sampling and analysis.

2. INVESTIGATION

2.1 Investigation Details

Four mini boreholes were put down to depths of between 1.60m and 3.70m using a Mini Sampling Rig fitted with windowless sample tubes at the positions determined and set out by Sub Surface South East Limited, as shown on Figure 4. The samples were subsequently logged in accordance with BS.5930:2015+A1:2020 and the resulting Mini Borehole Records are appended. On completion the mini boreholes were continued with dynamic probing then backfilled with bentonite and arisings as no installations were required.

Four dynamic probe holes, following on from the mini boreholes were put down to depths of between 2.70m and 3.60m using a dynamic probing rig at the positions determined and set out by Sub Surface South East Limited, as shown on Figure 4. The equipment conforms with BS.1377: 1990 and SRS15 Apparatus of the German Standard DIN4094 and comprises a 63.5kg rammer dropped through 750mm using 35mm diameter rods and a 20cm² area cone (50mm diameter and 90 degrees). The penetration rate, in blows/100mm, is given on the appended Dynamic Probe Hole Records.

2.2 Sub Surface Detail

Details of the strata encountered in the ground investigation are given on the appended Mini Borehole Records. The exploratory holes generally found Made Ground to between 0.40m and 1.80m, overlying chalk recovered as structureless Grade Dc chalk.

A general summary of the strata found is as follows:

2.2.1 Made Ground

Made Ground was recorded in all the mini boreholes to depths of between 0.40m and 1.80m.

M1 recorded concrete to 0.05m, overlying grey sandy gravel sized fragments of concrete to 0.15m, overlying brownish grey clayey sand to 0.60m.

Grass over topsoil was recorded to 0.10m in M2, overlying black gravelly sandy clay to 0.40m, with gravel sized fragments comprising fine to medium brick.

M3 and M4 recorded, blackish grey in M3 and brownish black in M4, gravelly sandy clay to 0.60m and 1.05m respectively. Gravel sized fragments are fine to coarse brick and concrete in M3, and brick, concrete, chalk and occasional wire in M4.

Below 1.05m, M4 then recorded off-white gravel sized fragments of chalk (reworked) to 1.80m.

2.2.2 Bedrock

The site is indicated to be underlain by the Holywell Nodular Chalk Formation and New Pit Chalk Formation (Undifferentiated).

The boreholes generally recorded structureless (Grade Dc) chalk composed of off-white (sandy in M1 and M3, and clayey in M2 and M3) silty gravel. Gravel is weak to moderately weak, medium to high density in M1, medium density in M2, high density in M3, and low density in M4, with occasional orange to yellow staining and frequent black specks.

2.2.3 Groundwater

No groundwater was encountered in the exploratory holes, however it should be noted that they were only left open for a short period of time and groundwater levels and rates of inflow may be subject to seasonal and/ or climatic variations.

3. SAMPLING AND TESTING

3.1 Sampling

Continuous core and small disturbed samples were obtained for the strata encountered and were subjected to careful examination.

The samples will be retained for a period of one month after the issue of this report, for reference purposes, and then disposed of unless otherwise instructed.

3.2 Field Testing

Ten Standard Penetration Tests (SPTs) were performed in the mini boreholes, the results of which are recorded on the appended Standard Penetration Test Results Sheet with 'N' values and indicative relative density and shear strength, where appropriate, given on the Mini Borehole Records.

3.3 Laboratory Testing

The following laboratory tests were carried out in accordance with BS.1377: 1990, where applicable, and the results are appended.

- Soluble sulphate content and pH value tests
- Saturated moisture content of chalk

Contamination analyses have been performed on four soil samples to determine: pH and concentrations of sulphate, sulphide, cyanide, arsenic, boron (soluble), cadmium, chromium, hexavalent chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, speciated total petroleum hydrocarbons (TPHs), the speciated polynuclear aromatic hydrocarbons (PAHs) suite, the benzene/ ethylbenzene/ toluene/ xylene (BTEX) suite and phenols. In addition the soil samples were subjected to an asbestos screen.

The results of the above analyses are appended.

4. APPRAISAL AND RECOMMENDATIONS

4.1 Comments on the Profile

At the outset it should be appreciated that only a small proportion of the area to be developed has been investigated and consequently the recommendations made and opinions expressed in this report can only be applied to such conditions as were encountered in the exploratory holes.

The exploratory holes indicate a nature and degree of similarity to the extent that we consider them likely to be representative of the natural ground conditions. However, no guarantee can be given.

It should be noted that the site is underlain by chalk strata and that solution features associated with such strata may be present for which no evidence has been found during the ground investigation. Observations should be kept throughout all groundworks for broken and/ or voided ground, found in association with such features, and appropriate action taken in the light of inspection and further investigation where necessary.

Low SPT values were recorded in M4 at 1.15m, however the Phase 1 Report previously undertaken by Groundsure, ref. GSP-2022-2222-2 and dated 1st November, indicates that there is a negligible risk from ground dissolution of soluble rocks within 50m of the site. In addition, the dynamic probing showed no signs of any voids or zones of significantly softer strata within the strata investigated, with the probes refusing at depths of between 2.70m and 4.20m. Therefore, in our opinion the low SPT values recorded at 1.15m in M4 are unlikely to reflect a solution feature and it is likely that the chalk in this area has been reworked.

Details of the findings of the investigation are given on the appended Mini Borehole Records and a summary of the ground conditions is given in Section 2.2.

4.2 Foundations

We understand that it is proposed to convert the existing barn into a two-storey 3-bed dwelling and construct a one-storey 1-bed dwelling. However, at the time of writing this report no specific details regarding the proposed foundations and design loadings were available and consequently the recommendations given are in general terms only.

The ground investigation generally found Made Ground to between 0.40m and 1.80m, overlying chalk recovered as Grade Dc structureless chalk.

We would not recommend founding in the Made Ground in its present condition because of its inherent variability in consistency and compaction, and in parts the nature of its constituents.

Providing there is sufficient load bearing capability we recommend that the proposed buildings are founded on strip footings for wall loads and pad foundations for column loads in the natural Grade Dc structureless chalk, at a minimum depth of 1.15m in M1, M2 and M3, and 1.95m in M4. The allowable bearing capacity for Grade Dc chalk is 225 kN/m². This value should not be exceeded at the proposed minimum foundation depths.

All formation levels should be carefully inspected by an experienced and qualified engineer to confirm the appropriateness of the design figures used with any soft, loose, or rubbly zones removed and replaced with lean mix concrete. The formation should then be blinded with lean mix concrete as soon as possible after exposure, if there is to be a delay before construction, to prevent water softening or disturbance.

It should be noted that the safe bearing pressures given for the chalk strata do not take into consideration settlement. Settlement is dependent upon loading intensity, the width of the foundation and the coefficient of volume compressibility (M_v) of the compressible strata. When details of the foundations are formulated we recommend that total and differential settlements are assessed to ensure that they are within acceptable limits.

4.3 Floor Slab Construction

With regard to the design and construction of floor slabs in the area represented by M1, M2 and M3 we would recommend the removal of any topsoil and/or Made Ground and the level brought up as required using a graded granular hardcore placed and compacted in layers of not greater than 150mm followed by the construction of a concrete ground bearing floor slab.

In the area represented by M4 due to the thickness of Made Ground there will be a risk of significant total and differential settlements, the extent of which will be a matter of chance rather than being assessable by calculation.

To obviate any significant damaging settlements we would recommend using a suspended floor slab with intermediate support designed on the same basis as the main foundations where the spans are too large for economical single suspended slab design.

4.4 Excavations and Groundwater

There should be no particular difficulties in excavating the strata indicated in the exploratory holes utilising an appropriate and suitably sized mechanical excavator. However, any concrete will need to be broken out prior to excavation.

It is recommended that all excavations to greater than 1.20m depth, or for shallower excavations where groundwater is encountered above this level, are closely supported, especially where man entry is required. Alternatively, where space permits, the excavations might be battered back to an appropriate angle.

The exploratory holes did not encounter groundwater, however it should be noted that they were only left open for a relatively short period of time and groundwater levels and rates of inflow may be subject to seasonal and/ or climatic variations.

Given the limited information, groundwater seepages or inflows are not anticipated in shallow excavations. Should groundwater seepages occur and water accumulate in the excavation it should be able to be removed by pumping from a filtered sump.

Care will need to be taken when reducing groundwater levels to ensure that adjoining/ nearby buildings, structures and services are not affected.

4.5 Buried Concrete

For the design of buried concrete the recommendations given in Building Research Establishment (BRE) Special Digest 1 (February 2017 revision), "Concrete in Aggressive Ground", should be followed.

Determination of pH on the soil samples gave values in the range of 7.9 to 9.7.

Soluble sulphate concentrations were also determined for the soil samples and the results ranged from 0.01 to 0.36 g/l.

The results indicate that the Design Sulphate Class for the site should be DS-1.

Our knowledge of the site and ground conditions indicates that the site is "brownfield" with potentially mobile groundwater. Consequently, in accordance with the Design Sulphate Class for the site together with the site and groundwater conditions an Aggressive Chemical Environment for Concrete (ACEC) classification of AC-1 should be used as detailed on the appended extract.

4.6 Contamination Considerations

Groundsure have previously undertaken a Phase I Report, ref. GSP-2022-2222-2 and dated 1st November and this Phase II ground investigation has been undertaken to provide an initial contamination risk assessment in accordance with the Phase I Conceptual Ground Model. Based upon the findings of the above additional sampling, analysis and assessment may be required.

It should be appreciated that the suite of determinants analysed for consists of a range of contaminants identified in the Conceptual Ground Model. However, the absence of any other specific contaminants cannot be guaranteed.

4.6.1 Assessment (Soil)

In order to provide an assessment of the presence of contamination four soil samples have been analysed for a suite of determinants and the results are appended.

Levels of the determinants have been compared against the most recently published guideline values. Contaminated Land: Applications in Real Environments (CL:AIRE) published guideline values in December 2009 to supplement previous guideline values. The Department for Environment, Food and Rural Affairs (DEFRA) published in March 2014 Category 4 Screening Levels (C4SLs) for arsenic, cadmium, lead, hexavalent chromium, benzo(a)pyrene and benzene. Land Quality Management Limited (LQM)/ Chartered Institute of Environmental Health (CIEH) then published Suitable for Use Levels (S4ULs) in November 2014, which largely superseded the previous guideline values. Updated S4ULs values for cadmium and phenols were published in July 2015 and for nickel in August 2015. The guideline values (S4ULs and occasionally C4SLs and CL:AIRE) are derived using the Environment Agency's CLEA Model and vary dependent upon the land use; allotment and residential use being the most sensitive and commercial/ industrial use being the least sensitive.

For the purposes of assessment, as the proposed development is to convert the existing barn into a 3-bed dwelling, and construct a 1-bed dwelling, contamination analyses have been compared with the guideline values for a standard land use of residential with plant uptake (with homegrown produce).

When compared with published guideline values for a standard land use of residential with plant uptake (with homegrown produce) the contamination analysis determined elevated levels of a number of contaminants with varying distribution, as tabulated below:

TABLE 2 ASSESSMENT OF SOIL CONTAMINATION

Determinant	Expl. Hole No.	Depth (m)	Recorded Level (mg/kg)	Published Guideline Value (mg/kg)
Arsenic	M3	0.40	48	37
Lead	M2	0.15	680	200
TPH C10-C24	M2	0.15	910	380#
Benzo(a)anthracene	M2	0.15	30	13
Benzo(b)fluoranthene	M2	0.15	19	3.7
Benzo(a)pyrene	M2	0.15	27	3.0
Dibenzo(ah)anthracene	M2	0.15	4.6	0.3

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Based on aromatic TPHs in this range.

Guideline values for the assessment can be supplied directly to the Regulator, if requested.

An asbestos screen was undertaken on four soil samples and no asbestos was detected.

4.6.2 Conclusions and Recommendations

Section 78a(2) of the Environmental Protection Act: 1990 as amended by the Contaminated Land (England) (Amendment) regulations 2012, and Section 86 of the Water Act 2003, defines CONTAMINATED LAND for the purposes of Part IIA as:

“any land which appears to the LOCAL AUTHORITY in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:

- (a) SIGNIFICANT HARM is being caused or there is a SIGNIFICANT POSSIBILITY of such harm being caused; or
- (b) SIGNIFICANT POLLUTION OF CONTROLLED WATERS is being, or is likely to be, caused”

Before a LOCAL AUTHORITY can make the judgement that land appears to be CONTAMINATED LAND on the basis that SIGNIFICANT HARM is being caused, or that there is a SIGNIFICANT POSSIBILITY of such harm being caused, the LOCAL AUTHORITY must identify a SIGNIFICANT POLLUTANT LINKAGE. This means that each of the following has to be identified:

- (a) a CONTAMINANT;
- (b) a relevant RECEPTOR (defined as living organisms, ecological systems, controlled waters or property); and
- (c) a PATHWAY by means of which either:
 - (i) the CONTAMINANT is causing SIGNIFICANT HARM to that RECEPTOR, or
 - (ii) there is a SIGNIFICANT POSSIBILITY of such harm being caused by that CONTAMINANT to that RECEPTOR

It should be noted that the words in capitals have a legal definition within the legislation.

Without a clear identification of all three elements of the pollutant linkage, land cannot be identified as contaminated under the regime.

The National Planning Policy Framework states that, “after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990”. Therefore, the general principles detailed above apply to this assessment.

Our assessment, based on four soil samples, indicates elevated levels of arsenic, lead, petroleum hydrocarbons (TPH C10-C24), benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(ah)anthracene are present in the near surface Made Ground/ soils (source). The pathway from the source to site operatives during earthworks, the end users of the development and any proposed planting (receptors) will need to be removed by precautions and/ or remedial measures.

M2 was found to have an elevated level of TPHs in the C10-C24 range which may produce hydrocarbon vapours that may require a hydrocarbon vapour barrier incorporated into the building design. This area is therefore considered to be a “hot spot” of contamination with a potential vapour risk. We recommend that the area affected is defined by further sampling and contamination analysis to speciate the TPH's into aliphatic and aromatic split, in order that the material can be assessed in greater detail or removed to a licensed waste disposal facility.

Where the contaminated materials are covered by buildings or a hard surface cover of concrete or bituminous macadam no clean cover will be required. However, in gardens and other open space areas the end users should be protected from the contaminated materials and plants should be provided with a medium in which they can safely grow.

We recommend a 450mm blanket of imported clean topsoil/ subsoil is provided in gardens and other open spaces. If there is a potential for fruit and/or vegetables to be grown in the gardens the thickness of topsoil/ subsoil should be increased to 600mm. In addition deeper rooted bushes and trees should be pit planted on and in clean topsoil.

Contaminated materials should, where possible, be retained on site. However, it should be appreciated that contaminated material left on site is the legal responsibility of the landowner, unless the person who created the contamination can be identified.

If waste materials are to be removed from the site, classification of the waste should be undertaken to determine the most appropriate tip to use and the associated costs. It should be noted that significant cost savings can sometimes be made on waste disposal by correct classification of the waste, a service that we can provide.

It should be noted that all vehicles carrying contaminated material should be securely sheeted and the wheels and undercarriages cleaned before leaving site to ensure that hazardous materials are not dropped onto public roads.

S4ULs, C4SLs and CL:AIRE assume long term contact with contamination and assess chronic health risk. The risk of short term acute exposure to site personnel is dealt with in the remit of the Health and Safety Executive under the Health and Safety at Work Act: 1974 and Regulations made under the Act, including the Control of Substances Hazardous to Health (COSHH) Regulations. The levels of contamination and risk to site personnel should be considered under the Construction Design and Management (CDM) Regulations at the planning stage and in the development of the designers and contractors Health and Safety Plans and Method Statements. The risk of contact with on-site soils should be minimised and the following precautions should be taken as a minimum requirement.

Site personnel involved in earthworks and excavations should be made aware of the hazards of working with contaminated materials found on the site. Strict personal hygiene should be observed and gloves, overalls and boots should be worn. In addition smoking should be prohibited to minimise the potential for transfer of contaminants from hand to mouth.

Earthworks undertaken during dry weather might generate dust and in this instance dust should be damped down and dust masks made available to site operatives. In addition stockpiled materials should be sheeted over to prevent excessive airborne dust being formed.

4.7 General

It should be noted that when developing a “brownfield site” a phased investigation should be undertaken in order that each phase informs the next. A typical phased investigation comprises the following:

- Phase I: desk study report
- Phase II: ground investigation with report
- Phase III: remediation statement report
- Phase IV: validation with report.

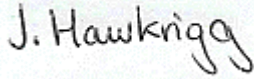
In the preparation of this report no consideration has been given to flora and fauna as this was outside our brief. This should be addressed prior to development.

It should be noted that we have made recommendations for further investigation in Section 4.6 to address the “hot spot” of TPH contamination with a potential vapour risk in the area of M2.

We recommend that consultation should be undertaken with, and the written approval obtained from, the Local Authority Environmental Health Officer and the Local Authority Building Control Officer prior to commencing development.

We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please contact the undersigned or Mr Jonathan Mahoney at our High Wycombe office.

SUB SURFACE CONSULTANTS LIMITED
REPORT No. SE1773
JANUARY 2024



J. M. Hawkrigg M.Earth.Sc. (Hons.)
Geotechnical Engineer
For and on behalf of
Sub Surface Consultants Limited



C. A. Marsden B.Sc.(Hons.), C.Eng., M.I.C.E.
Director
For and on behalf of
Sub Surface Consultants Limited.

INSITU TEST RESULTS

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907							Standard Penetration Test Results						
Site : THE OLD FORGE, 27A PARK STREET, BALDOCK, SG7 6DY											Job Number		
Client : ESSENTIAL WATER SERVICES (UK) LTD											SE1773		
Engineer:											Sheet		
											1 / 1		
Borehole Number	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each 75mm penetration				Result	Comments	
					1	2	1	2	3	4			
M1	1.00	1.15	1.45	SPT	3	3	2	5	5	8	N=20		
M1	2.00	2.15	2.45	SPT	8	14	12	8	10	14	N=44		
M1	3.00	3.15	3.45	SPT	3	4	7	7	10	9	N=33		
M2	1.00	1.15	1.45	SPT	5	5	12	12	11	11	N=46		
M2	1.60	1.75	2.05	SPT	19	13	11	12	11	11	N=45		
M3	1.00	1.15	1.45	SPT	5	8	6	8	16	16	N=46		
M3	2.00	2.15	2.45	SPT	9	14	11	8	9	8	N=36		
M3	3.00	3.15	3.45	SPT	9	6	8	11	10	10	N=39		
M4	1.00	1.15	1.45	SPT	1	0	0	0	0	0	N=0	Sank under own weight	
M4	1.80	1.95	2.22	SPT	9	14	11	15	15	8	49/265mm		

LABORATORY TEST RESULTS

Saturation Moisture Content of Chalk
BS 1377 : Part 2 : 1990 Section 3.3

Contract Number	70303	
Project Name	The Old Forge, 27A Park Street, Baldock	
Date Tested	21/12/2023	

[illegible]

<u>Key</u>	<u>Reported As</u>	<u>Clause</u>
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Moisture Content	%	3.2
Bulk Density	Mg/m ³	7.2
Dry Density	Mg/m ³	7.2
SMC	%	3.3.6

If there is a NON-STANDARD in the remarks next to the reported SMC result this means there was no lump of chalk of sufficient volume (300mL-500mL) present in the samples received to meet the testing requirements of the stated standard.

Operator
Julian Jones



2788

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907						Laboratory Test Results								
Site : THE OLD FORGE, 27A PARK STREET, BALDOCK, SG7 6DY Client : ESSENTIAL WATER SERVICES (UK) LTD Engineer:													Job Number SE1773 Sheet 1 / 1	
DETERMINATION OF pH, SULPHATE CONTENT AND TOTAL SULPHUR OF SOIL AND GROUNDWATER AND MAGNESIUM, CHLORIDE, AMMONIA AND NITRATE CONTENT														
Borehole/ Trial Pit	Depth (m)	Sample	Concentration of Sulphate			Total Sulphur %	Magnesium mg/l	Ammonium NH4 mg/l	Water Soluble Chloride mg/l	Water Soluble Nitrate mg/l	pH	Design Class	Laboratory Description	
			Soil		Ground Water g /l									
			Total S03 %	S04 in 2:1 water:soil g /l										
M1	0.75	D		0.36							9.6	DS-1	Structureless CHALK composed of off-white sandy silty GRAVEL. Gravel is weak, medium to high density chalk with occasional orangish yellow staining (Grade DC)	
M2	1.00	D		0.01							8.5	DS-1	Structureless CHALK composed of off white silty clayey GRAVEL with occasional rootlets. Gravel is weak to moderately weak, medium density with frequent black specks (Grade DC)	
M3	0.70	D		0.02							8.7	DS-1	Structureless CHALK composed of off-white sandy silty GRAVEL with occasional rootlets, Gravel is weak, high density with occasional orange staining and frequent black specks (Grade DC)	
M3	1.50	D		0.01							8.7	DS-1	Structureless CHALK composed of off-white sandy silty GRAVEL with occasional rootlets, Gravel is weak, high density with occasional orange staining and frequent black specks (Grade DC)	
M4	0.55	ES		0.04							9.2	DS-1	MADE GROUND: brownish black gravelly sandy clay with occasional rootlets. Gravel sized fragments are fine to coarse subangular to angular brick, concrete, chalk and occasional wire.	
M4	0.80	D		0.05							7.9	DS-1	MADE GROUND: brownish black gravelly sandy clay with occasional rootlets. Gravel sized fragments are fine to coarse subangular to angular brick, concrete, chalk and occasional wire.	
Method of Preparation : BS 1377:PART 1:1990:7.5 Preparation of soil for chemical tests BS 1377:PART 3:1990:5.2, 5.3, 5.4 & 9.4 Method of Test : Lab in-house methods based on BS1377: Part 3 for contents of water sol sulphate, pH, chloride and magnesium. Lab in-house method based on MEWAM (EA, 2006) for total sulphur Remarks : Classification relates to Design Sulphate Class of BRE Special Digest 1 (2005)														

**SUB SURFACE**

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

BRE Special Digest 1

AGGRESSIVE CHEMICAL ENVIRONMENT FOR CONCRETE (ACEC) SITE CLASSIFICATION.**Table C1 Aggressive Chemical Environment for Concrete (ACEC) classification for natural ground locations^a**

Sulfate Design Sulfate Class for location	2:1 water/soil extract ^b	Groundwater	Total potential sulfate ^c	Groundwater Static water	Mobile water	ACEC Class for location
1	2 (SO ₄ mg/l)	3 (SO ₄ mg/l)	4 (SO ₄ %)	5 (pH)	6 (pH)	7
DS-1	< 500	< 400	< 0.24	≥ 2.5	> 5.5 ^d 2.5–5.5	AC-1s AC-1 ^d AC-2z
DS-2	500–1500	400–1400	0.24–0.6	> 3.5 2.5–3.5	> 5.5 2.5–5.5	AC-1s AC-2 AC-2s AC-3z
DS-3	1600–3000	1500–3000	0.7–1.2	> 3.5 2.5–3.5	> 5.5 2.5–5.5	AC-2s AC-3 AC-3s AC-4
DS-4	3100–6000	3100–6000	1.3–2.4	> 3.5 2.5–3.5	> 5.5 2.5–5.5	AC-3s AC-4 AC-4s AC-5
DS-5	> 6000	> 6000	> 2.4	> 3.5 2.5–3.5	≥ 2.5	AC-4s AC-5

Notes

- a** Applies to locations on sites that comprise either undisturbed ground that is in its natural state (ie is not brownfield – Table C2) or clean fill derived from such ground.
b The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered relative to previous Digests (Box C7).
c Applies only to locations where concrete will be exposed to sulfate ions (SO₄) which may result from the oxidation of sulfides (eg pyrite) following ground disturbance (Appendix A1 and Box C8).
d For flowing water that is potentially aggressive to concrete owing to high purity or an aggressive carbon dioxide level greater than 15 mg/l (Section C2.2.3), increase the ACEC Class to AC-2z.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static.
- Concrete placed in ACEC Classes that include the suffix 'z' primarily have to resist acid conditions and may be made with any of the cements or combinations listed in Table D2 on page 42.

Table C2 Aggressive Chemical Environment for Concrete (ACEC) classification for brownfield locations^a

Sulfate and magnesium						Groundwater		ACEC
Design Sulfate Class for location	2:1 water/soil extract ^b		Groundwater		Total potential sulfate ^c	Static water	Mobile water	Class for location
1	2 (SO ₄ mg/l)	3 (Mg mg/l)	4 (SO ₄ mg/l)	5 (Mg mg/l)	6 (SO ₄ %)	7 (pH) ^d	8 (pH) ^d	9
DS-1	< 500		< 400		< 0.24	≥ 2.5	> 6.5 ^d 5.5–6.5 4.5–5.5 2.5–4.5	AC-1s AC-1 AC-2z AC-3z AC-4z
DS-2	500–1500		400–1400		0.24–0.6	> 5.5 2.5–5.5	> 6.5 5.5–6.5 4.5–5.5 2.5–4.5	AC-1s AC-2 AC-2s AC-3z AC-4z AC-5z
DS-3	1600–3000		1500–3000		0.7–1.2	> 5.5 2.5–5.5	> 6.5 5.5–6.5 2.5–5.5	AC-2s AC-3 AC-3s AC-4 AC-5
DS-4	3100–6000	≤ 1200	3100–6000	≤ 1000	1.3–2.4	> 5.5 2.5–5.5	> 6.5 2.5–6.5	AC-3s AC-4 AC-4s AC-5
DS-4m	3100–6000	> 1200 ^a	3100–6000	> 1000 ^a	1.3–2.4	> 5.5 2.5–5.5	> 6.5 2.5–6.5	AC-3s AC-4m AC-4ms AC-5m
DS-5	> 6000	≤ 1200	> 6000	≤ 1000	> 2.4	> 5.5 2.5–5.5	≥ 2.5	AC-4s AC-5
DS-5m	> 6000	> 1200 ^a	> 6000	> 1000 ^a	> 2.4	> 5.5 2.5–5.5	≥ 2.5	AC-4ms AC-5m

Notes

- a** Brownfield locations are those sites, or parts of sites, that might contain chemical residues produced by or associated with industrial production (Section C5.1.3).
b The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered from previous Digests (Box C7).
c Applies only to locations where concrete will be exposed to sulfate ions (SO₄), which may result from the oxidation of sulfides such as pyrite, following ground disturbance (Appendix A1 and Box C8).
d An additional account is taken of hydrochloric and nitric acids by adjustment to sulfate content (Section C5.1.3).
e The limit on water-soluble magnesium does not apply to brackish groundwater (chloride content between 12 000 mg/l and 17 000 mg/l). This allows 'm' to be omitted from the relevant ACEC classification. Seawater (chloride content about 18 000 mg/l) and stronger brines are not covered by this table.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static.
- Concrete placed in ACEC Classes that include the suffix 'z' have primarily to resist acid conditions and may be made with any of the cements in Table D2 on page 42.
- Suffix 'm' relates to the higher levels of magnesium in Design Sulfate Classes 4 and 5.

CONTAMINATION ANALYSIS RESULTS



Certificate of Analysis

Certificate Number 23-29423

Issued: 04-Jan-24

Client Sub Surface Laboratories Ltd
3 Peel Street
Preston
Lancashire
PR2 2QS

Our Reference 23-29423

Client Reference SE1773

Order No SE1773

Contract Title The Old Forge, 27A Park Street, Baldock SG6 7DY

Description 9 Soil samples.

Date Received 13-Dec-23

Date Started 13-Dec-23

Date Completed 04-Jan-24

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

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

Approved By

Kirk Bridgewood
General Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 23-29423

Client Ref SE1773

Contract Title The Old Forge, 27A Park Street, Baldock SG6 7DY

Lab No	2276796	2276797	2276798	2276799	2276800	2276801	2276802
Sample ID	M1	M2	M3	M4	M1	M2	M3
Depth	0.50	0.15	0.40	0.55	0.75	1.00	0.70
Other ID					620	627	630
Sample Type	ES	ES	ES	ES	D	D	D
Sampling Date	11/12/2023	11/12/2023	11/12/2023	11/12/2023	11/12/2023	11/12/2023	11/12/2023
Sampling Time	0815	0900	1000	1100	0830	0915	1015

Test	Method	LOD	Units							
Preparation										
Moisture Content	DETSC 1004	0.1	%	12	16	17	16			
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	16	21	48	25			
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	1.2	0.8	0.7	0.9			
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	1.6	0.3	0.3			
Chromium	DETSC 2301#	0.15	mg/kg	13	12	15	14			
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0			
Copper	DETSC 2301#	0.2	mg/kg	35	59	25	36			
Lead	DETSC 2301#	0.3	mg/kg	180	680	160	200			
Mercury	DETSC 2325#	0.05	mg/kg	0.55	0.85	0.41	0.59			
Molybdenum	DETSC 2301#	0.4	mg/kg	1.2	2.2	0.9	0.9			
Nickel	DETSC 2301#	1	mg/kg	12	19	14	14			
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5			
Zinc	DETSC 2301#	1	mg/kg	71	740	74	180			
Inorganics										
pH	DETSC 2008#		pH	9.7	8.1	8.2	9.2	9.6	8.5	8.7
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.1	0.7	0.2	0.3			
Sulphate Aqueous Extract as SO ₄ (2:1)	DETSC 2076#	10	mg/l				39	360	12	23
Sulphide	DETSC 2024*	10	mg/kg	44	55	36	91			
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.19	0.14	0.11	0.14			
Petroleum Hydrocarbons										
C5-C10 Gasoline Range Organics (GRO): HS_1D_Total	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1			
C10-C24 Diesel Range Organics (DRO): EH_1D_Total	DETSC 3311#	10	mg/kg	< 10	910	35	71			
EPH (C10-C40): EH_1D_Total	DETSC 3311#	10	mg/kg	15	1800	68	150			
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01			
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01			
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01			
m+p Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01			
o Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01			
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01			
C24-C40 Lube Oil Range Organics (LORO): EH_1D_Total	DETSC 3311#	10	mg/kg	< 10	930	33	75			
PAHs										
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	0.5	< 0.1	< 0.1			
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	2.8	1.3	0.2			
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	0.4	0.2	< 0.1			
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	2.0	< 0.1	< 0.1			
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	16	0.6	1.7			
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	7.3	0.2	0.5			

Summary of Chemical Analysis Soil Samples

Our Ref 23-29423

Client Ref SE1773

Contract Title The Old Forge, 27A Park Street, Baldock SG6 7DY

Lab No	2276796	2276797	2276798	2276799	2276800	2276801	2276802
Sample ID	M1	M2	M3	M4	M1	M2	M3
Depth	0.50	0.15	0.40	0.55	0.75	1.00	0.70
Other ID					620	627	630
Sample Type	ES	ES	ES	ES	D	D	D
Sampling Date	11/12/2023	11/12/2023	11/12/2023	11/12/2023	11/12/2023	11/12/2023	11/12/2023
Sampling Time	0815	0900	1000	1100	0830	0915	1015

Test	Method	LOD	Units						
Fluoranthene	DETSC 3301	0.1	mg/kg	0.2	45	1.6	4.3		
Pyrene	DETSC 3301	0.1	mg/kg	0.3	39	1.6	4.2		
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	30	1.3	2.1		
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	25	0.9	2.0		
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	19	0.6	1.2		
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	14	0.4	0.8		
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	27	1.0	1.8		
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	14	0.9	1.5		
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	4.6	0.2	0.2		
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	15	0.6	1.2		
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	260	11	22		
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3		

Summary of Chemical Analysis

Soil Samples

Our Ref 23-29423

Client Ref SE1773

Contract Title The Old Forge, 27A Park Street, Baldock SG6

Lab No	2276803	2276804
Sample ID	M3	M4
Depth	1.50	0.80
Other ID	632	635
Sample Type	D	D
Sampling Date	11/12/2023	11/12/2023
Sampling Time	1025	1120

Test	Method	LOD	Units		
Preparation					
Moisture Content	DETS 1004	0.1	%		
Metals					
Arsenic	DETS 2301#	0.2	mg/kg		
Boron, Water Soluble (2.5:1)	DETS 2311#	0.2	mg/kg		
Cadmium	DETS 2301#	0.1	mg/kg		
Chromium	DETS 2301#	0.15	mg/kg		
Chromium, Hexavalent	DETS 2204*	1	mg/kg		
Copper	DETS 2301#	0.2	mg/kg		
Lead	DETS 2301#	0.3	mg/kg		
Mercury	DETS 2325#	0.05	mg/kg		
Molybdenum	DETS 2301#	0.4	mg/kg		
Nickel	DETS 2301#	1	mg/kg		
Selenium	DETS 2301#	0.5	mg/kg		
Zinc	DETS 2301#	1	mg/kg		
Inorganics					
pH	DETS 2008#		pH	8.7	7.9
Cyanide, Total	DETS 2130#	0.1	mg/kg		
Sulphate Aqueous Extract as SO ₄ (2:1)	DETS 2076#	10	mg/l	13	46
Sulphide	DETS 2024*	10	mg/kg		
Sulphate as SO ₄ , Total	DETS 2321#	0.01	%		
Petroleum Hydrocarbons					
C5-C10 Gasoline Range Organics (GRO): HS_1D_Total	DETS 3321*	0.1	mg/kg		
C10-C24 Diesel Range Organics (DRO): EH_1D_Total	DETS 3311#	10	mg/kg		
EPH (C10-C40): EH_1D_Total	DETS 3311#	10	mg/kg		
Benzene	DETS 3321#	0.01	mg/kg		
Ethylbenzene	DETS 3321#	0.01	mg/kg		
Toluene	DETS 3321#	0.01	mg/kg		
m+p Xylene	DETS 3321#	0.01	mg/kg		
o Xylene	DETS 3321#	0.01	mg/kg		
MTBE	DETS 3321	0.01	mg/kg		
C24-C40 Lube Oil Range Organics (LORO): EH_1D_Total	DETS 3311#	10	mg/kg		
PAHs					
Naphthalene	DETS 3301	0.1	mg/kg		
Acenaphthylene	DETS 3301	0.1	mg/kg		
Acenaphthene	DETS 3301	0.1	mg/kg		
Fluorene	DETS 3301	0.1	mg/kg		
Phenanthrene	DETS 3301	0.1	mg/kg		
Anthracene	DETS 3301	0.1	mg/kg		

Summary of Chemical Analysis

Soil Samples

Our Ref 23-29423

Client Ref SE1773

Contract Title The Old Forge, 27A Park Street, Baldock SG6

Lab No	2276803	2276804
Sample ID	M3	M4
Depth	1.50	0.80
Other ID	632	635
Sample Type	D	D
Sampling Date	11/12/2023	11/12/2023
Sampling Time	1025	1120

Test	Method	LOD	Units		
Fluoranthene	DETSC 3301	0.1	mg/kg		
Pyrene	DETSC 3301	0.1	mg/kg		
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg		
Chrysene	DETSC 3301	0.1	mg/kg		
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg		
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg		
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg		
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg		
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg		
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg		
PAH 16 Total	DETSC 3301	1.6	mg/kg		
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		

Summary of Asbestos Analysis

Soil Samples

Our Ref 23-29423

Client Ref SE1773

Contract Title The Old Forge, 27A Park Street, Baldock SG6 7DY

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2276796	M1 0.50	SOIL	NAD	none	Lee Kerridge
2276797	M2 0.15	SOIL	NAD	none	Lee Kerridge
2276798	M3 0.40	SOIL	NAD	none	Lee Kerridge
2276799	M4 0.55	SOIL	NAD	none	Lee Kerridge

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-29423
 Client Ref SE1773
 Contract The Old Forge, 27A Park Street, Baldock SG6 7DY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2276796	M1 0.50 SOIL	11/12/23	GJ 250ml, GJ 60ml, PT 500ml		
2276797	M2 0.15 SOIL	11/12/23	GJ 250ml, GJ 60ml, PT 500ml		
2276798	M3 0.40 SOIL	11/12/23	GJ 250ml, GJ 60ml, PT 500ml		
2276799	M4 0.55 SOIL	11/12/23	GJ 250ml, GJ 60ml, PT 500ml		
2276800	M1 0.75 SOIL	11/12/23	PT 1L		
2276801	M2 1.00 SOIL	11/12/23	PT 1L		
2276802	M3 0.70 SOIL	11/12/23	PT 1L		
2276803	M3 1.50 SOIL	11/12/23	PT 1L		
2276804	M4 0.80 SOIL	11/12/23	PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

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

Soil Analysis Notes

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

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

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

Disposal

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

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

Information in Support of the Analytical Results

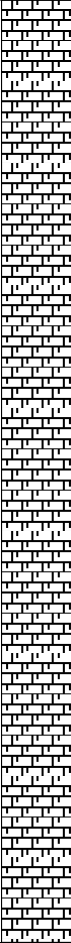
List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

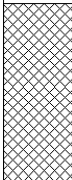
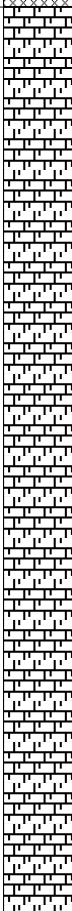
Det	Acronym
C5-C10 Gasoline Range Organics (GRO)	HS_1D_Total
C10-C24 Diesel Range Organics (DRO)	EH_1D_Total
EPH (C10-C40)	EH_1D_Total
C24-C40 Lube Oil Range Organics (LO)	EH_1D_Total

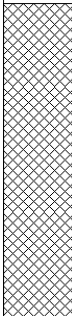
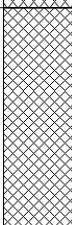
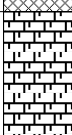
End of Report

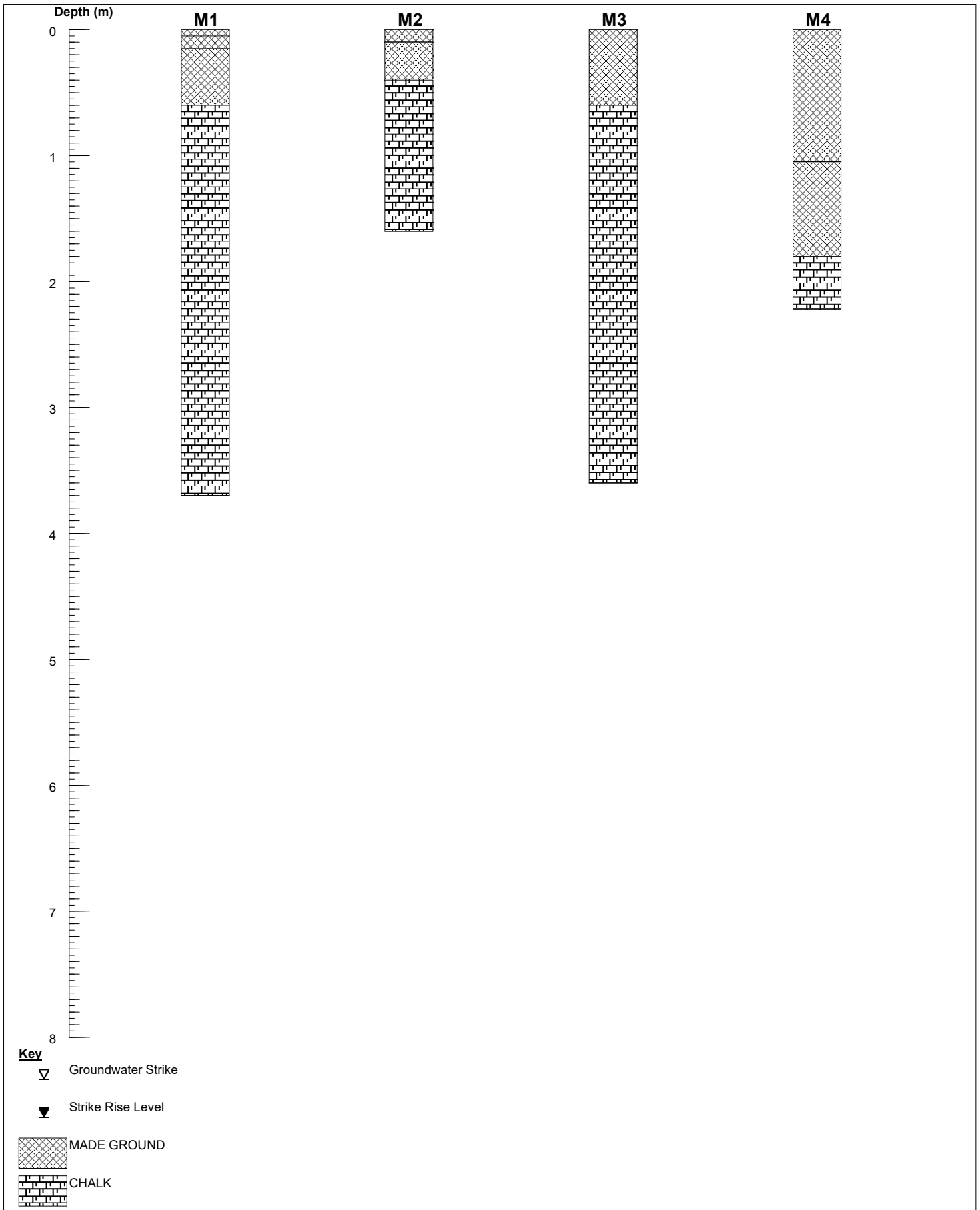
MINI BOREHOLE RECORD SHEETS

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907						Site THE OLD FORGE, 27A PARK STREET, BALDOCK, SG7 6DY		Borehole Number M1	
Boring Method MINI PERCUSSIVE		Casing Diameter		Ground Level (mOD)		Client ESSENTIAL WATER SERVICES (UK) LTD		Job Number SE1773	
		Location AS PLAN		Dates 11/12/2023		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	ES					0.05 (0.10) 0.15	MADE GROUND: concrete (no reinforcement observed)		
						0.15 (0.45)	MADE GROUND: grey sandy gravel sized fragments of concrete		
						0.45 0.60	MADE GROUND: brownish gravelly clayey sand with occasional rootlets. Gravel sized fragments are fine to medium subangular to angular brick and occasional chalk ...below 0.40m: no rootlets		
0.75	D						Structureless CHALK composed of off-white sandy silty GRAVEL. Gravel is weak, medium to high density chalk with occasional orangish yellow staining (Grade Dc)		
1.00-1.45 1.00	SPT N=20 D			3,3/2,5,5,8					
1.50	D								
2.00-2.45 2.00	SPT N=44 D			8,14/12,8,10,14		(3.10)			
2.50	D								
3.00-3.45	SPT N=33			3,4/7,7,10,9					
3.50	D					3.70			
				11/12/2023:DRY			Complete at 3.70m		
Remarks Hand dug inspection pit from GL to 1.0m to check for services No groundwater encountered Borehole continued from 3.70m with dynamic probing On completion backfilled with bentonite and arisings								Scale (approx) 1:25	Logged By HB
								Figure No. SE1773.M1	

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907						Site THE OLD FORGE, 27A PARK STREET, BALDOCK, SG7 6DY		Borehole Number M2		
Boring Method MINI PERCUSSIVE		Casing Diameter			Ground Level (mOD)		Client ESSENTIAL WATER SERVICES (UK) LTD		Job Number SE1773	
		Location AS PLAN			Dates 11/12/2023		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.15	ES					(0.10)	MADE GROUND: grass over topsoil			
						(0.30)	MADE GROUND: black gravelly sandy clay. Gravel sized fragments are fine to medium subangular to angular brick			
0.50	D			5,5/12,12,11,11		0.40	Structureless CHALK composed of off white silty clayey GRAVEL with occasional rootlets. Gravel is weak to moderately weak, medium density with frequent black specks (Grade Dc) ...below 0.50m: no rootlets			
1.00-1.45	SPT N=46					(1.20)				
1.00	D									
1.30	D									
1.60	D			11/12/2023:DRY		1.60	Complete at 1.60m			
1.60-2.05	SPT N=45			19,13/11,12,11,11						

SS SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907 Site THE OLD FORGE, 27A PARK STREET, BALDOCK, SG7 6DY Borehole Number M3										
Boring Method MINI PERCUSSIVE		Casing Diameter			Ground Level (mOD)		Client ESSENTIAL WATER SERVICES (UK) LTD		Job Number SE1773	
		Location AS PLAN			Dates 11/12/2023		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.40	ES					(0.60)	MADE GROUND: blackish grey gravelly sandy clay. Gravel sized fragments are fine to coarse subangular to angular brick and concrete.			
0.70	D					0.60	Structureless CHALK composed of off-white sandy silty GRAVEL with occasional rootlets, Gravel is weak, high density with occasional orange staining and frequent black specks (Grade Dc) ...below 0.65m: no rootlets			
1.00-1.45	SPT N=46			5,8/6,8,16,16						
1.20	D									
1.50	D									
2.00-2.45	SPT N=36			9,14/11,8,9,8		(3.00)				
2.20	D									
3.00-3.45	SPT N=39			9,6/8,11,10,10						
3.00	D									
				11/12/2023:DRY		3.60	Complete at 3.60m			
Remarks Hand dug inspection pit from GL to 1.00m to check for services No groundwater encountered Borehole continued from 3.60m with dynamic probing On completion backfilled with bentonite and arisings								Scale (approx) 1:25	Logged By HB	Figure No. SE1773.M3

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907						Site THE OLD FORGE, 27A PARK STREET, BALDOCK, SG7 6DY		Borehole Number M4		
Boring Method MINI PERCUSSIVE		Casing Diameter			Ground Level (mOD)		Client ESSENTIAL WATER SERVICES (UK) LTD		Job Number SE1773	
		Location AS PLAN			Dates 11/12/2023		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.55	ES			1,0/0,0,0,0		(1.05)	MADE GROUND: brownish black gravelly sandy clay with occasional rootlets. Gravel sized fragments are fine to coarse subangular to angular brick, concrete, chalk and occasional wire. ...below 0.60m: no rootlets			
0.80	D									
1.00-1.45	SPT N=0					1.05	MADE GROUND: off-white gravel sized fragments of chalk (reworked).			
1.20	D				(0.75)					
1.80-2.22	SPT 49/265			9,14/11,15,15,8		1.80	Structureless CHALK composed of off-white silty GRAVEL. Gravel is weak to moderately weak low density with yellow staining (Grade Dc).			
1.80	D				(0.42)					
				11/12/2023:DRY		2.22	Complete at 2.22m			
Remarks Hand dug inspection pit from GL to 1.00m to check for services No groundwater encountered Borehole continued from 2.50m with dynamic probing On completion backfilled with bentonite and arisings								Scale (approx) 1:25	Logged By HB	
								Figure No. SE1773.M4		



SS SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907	Nominal Section			
Site THE OLD FORGE, 27A PARK STREET, BALDOCK, SG7 6DY	Date Drawn 09/02/2024	Date Checked	Sheet 1/1	Job Number SE1773
Client ESSENTIAL WATER SERVICES (UK) LTD	Drawn By	Checked By	Scale 1:40[V]	Figure No. SE1773

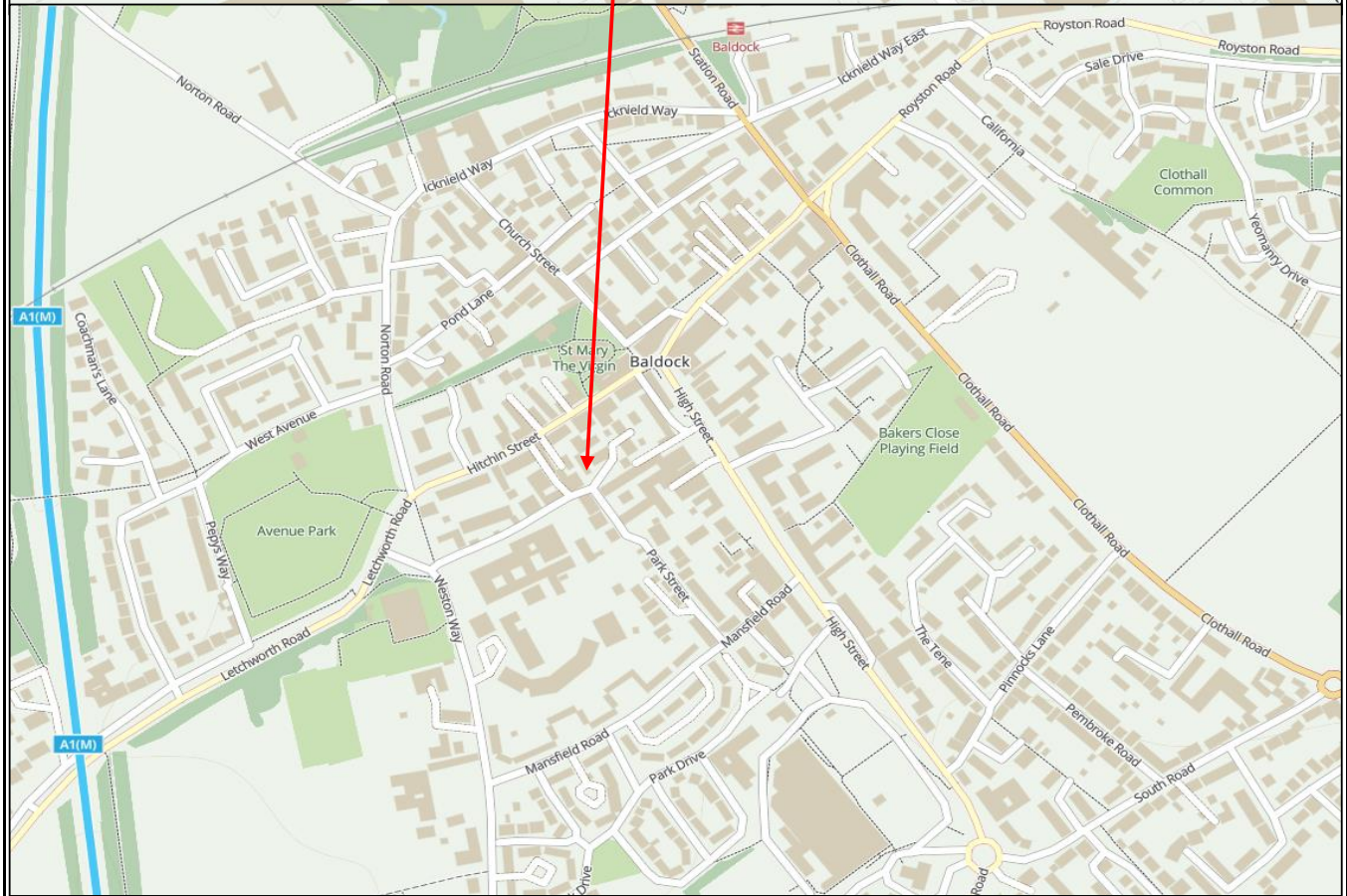
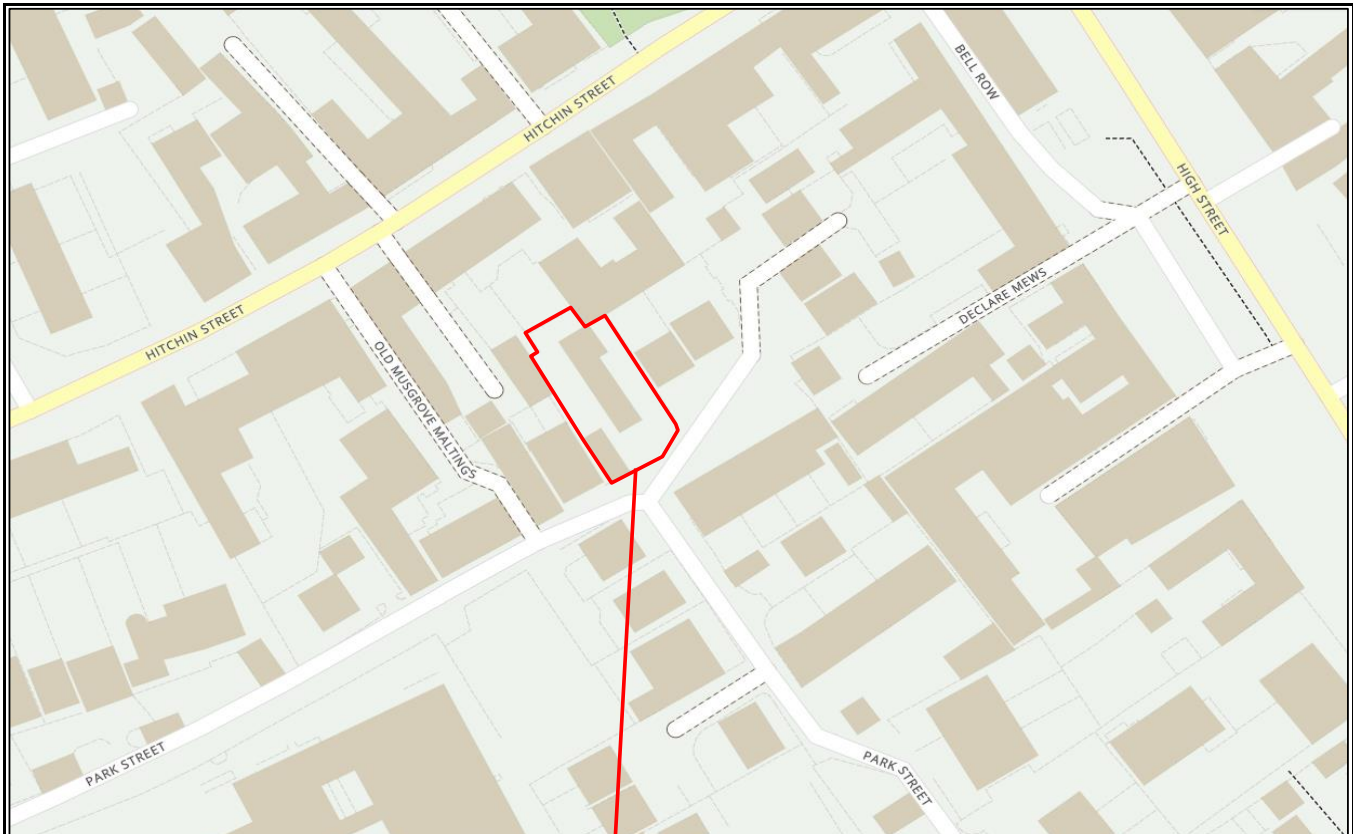
DYNAMIC PROBE HOLE RECORD SHEETS

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907					Site THE OLD FORGE, 27A PARK STREET, BALDOCK, SG7 6DY					Probe Number DP1						
Method Dynamic Probing		Cone Dimensions Diameter 50mm, Angle 90°		Ground Level (mOD)		Client ESSENTIAL WATER SERVICES (UK) LTD					Job Number SE1773					
		Location AS PLAN		Dates 11/12/2023		Engineer					Sheet 1/1					
Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment 05101520253035404550											
				0.00												
				0.50												
				1.00												
				1.50												
				2.00												
				2.50												
				3.00												
				3.50												
				4.00												
3.70-3.80	13															
3.80-3.90	23															
3.90-4.00	22															
4.00-4.10	14	Torque = 0Nm														
4.10-4.20	14															
4.20-4.30	14															
4.30-4.40	15															
4.40-4.50	24															
4.50-4.60	50	Torque = 20Nm														
				4.50												
				5.00												
Remarks Weight = 63.5kg Fall = 750mm										Scale (approx) 1:25		Logged By HB				
										Figure No. SE1773.DP1						

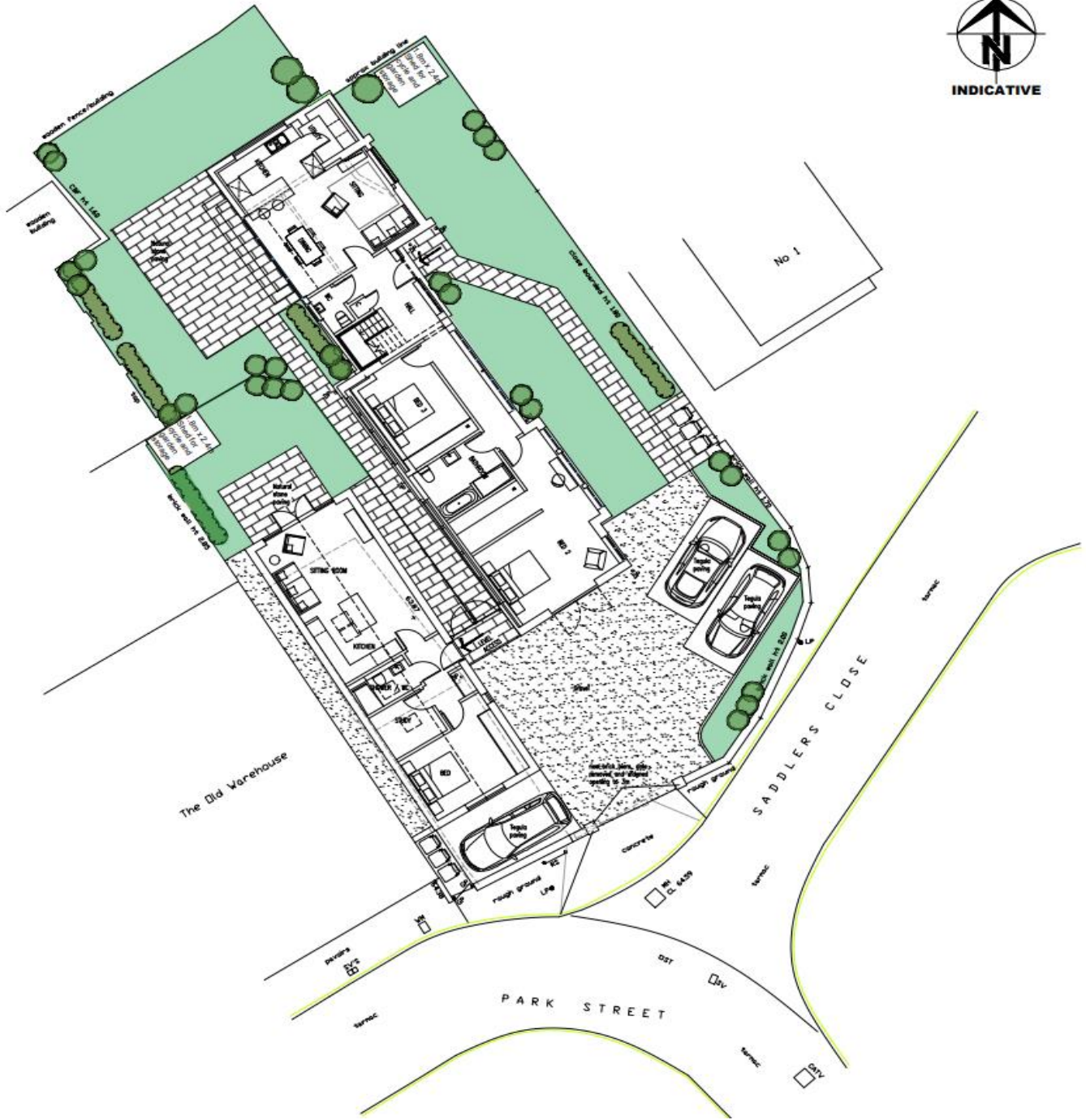
S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907					Site THE OLD FORGE, 27A PARK STREET, BALDOCK, SG7 6DY					Probe Number DP2				
Method Dynamic Probing		Cone Dimensions Diameter 50mm, Angle 90°		Ground Level (mOD)		Client ESSENTIAL WATER SERVICES (UK) LTD					Job Number SE1773			
		Location AS PLAN		Dates 11/12/2023		Engineer					Sheet 1/1			
Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment 05101520253035404550									
				0.00										
				0.50										
				1.00										
				1.50										
1.60-1.70	14	Torque = 0Nm												
1.70-1.80	13													
1.80-1.90	11													
1.90-2.00	7													
2.00-2.10	13													
2.10-2.20	20													
2.20-2.30	12													
2.30-2.40	4													
2.40-2.50	8													
2.50-2.60	33													
2.60-2.70	50													
				2.00										
				2.50										
				3.00										
				3.50										
				4.00										
				4.50										
				5.00										
Remarks Weight = 63.5kg Fall = 750mm										Scale (approx) 1:25	Logged By HB			
										Figure No. SE1773.DP2				

S S SUB SURFACE SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907					Site THE OLD FORGE, 27A PARK STREET, BALDOCK, SG7 6DY					Probe Number DP3						
Method Dynamic Probing		Cone Dimensions Diameter 50mm, Angle 90°		Ground Level (mOD)		Client ESSENTIAL WATER SERVICES (UK) LTD					Job Number SE1773					
		Location AS PLAN		Dates 11/12/2023		Engineer					Sheet 1/1					
Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment 05101520253035404550											
				0.00												
				0.50												
				1.00												
				1.50												
				2.00												
				2.50												
				3.00												
				3.50												
3.60-3.70	18															
3.70-3.80	25															
3.80-3.90	19															
3.90-4.00	19															
4.00-4.10	38	Torque = 0Nm		4.00												
4.10-4.20	50															
				4.50												
				5.00												
Remarks Weight = 63.5kg Fall = 750mm										Scale (approx) 1:25		Logged By HB				
										Figure No. SE1773.DP3						

FIGURES



 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	General Site Location			
Site THE OLD FORGE, 27A PARK STREET, BALDOCK, SG7 6DY	Date Drawn 11-Jan-23	Date Checked	Orientation 	Job No. SE1773
Client ESSENTIAL WATER SERVICES (UK) LTD	Drawn By JMH	Checked By	Scale —	Figure No. 1



Site THE OLD FORGE, 27A PARK STREET, BALDOCK, SG7 6DY	Date Drawn 11-Jan-23	Date Checked	Orientation 	Job No. SE1773
Client ESSENTIAL WATER SERVICES (UK) LTD	Drawn By JMH	Checked By	Scale —	Figure No. 3

