Geotechnical and
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Consultants

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GROUND INVESTIGATION SERVICES (Southern) Ltd

Our Ref: S.5988/r

Your Ref:

30 November 2022

Solid Structures
Solid Studio
12 Albion Street
Chipping Norton
Oxfordshire
OX7 5BJ

FAO David Girling

Dear Sirs

GROUND INVESTIGATION: ALL SAINTS CHURCH SOUTHAM

We write to inform you of the ground conditions encountered in respect of the above and attach herewith the location plan, inspection pit logs, laboratory test results and site photographs.

Ground Investigation Services (Southern) Ltd have been commissioned to undertake a soils investigation to determine existing foundations at the western end of the south aisle and establish the soil profile thereof.

Reference to the geological map for the area indicates the site is underlain by bedrock represented by Charmouth Mudstone Formation overlying Rugby Limestone Member.

GEOTECHNICAL SURVEY

The investigation comprised the excavation of three hand dug inspection pits in order to establish the type and depth of existing foundations and hand auguring at the base of each pit to locate the underling bedrock limestone. Soil samples were also retrieved immediately below the foundations and at 1.00m depths for later laboratory analysis.

The trial Pit Location Plan, presented to the rear of the report illustrates the various test positions.

Site work was conducted on the 11 November 2022. The weather was mild and dry.

Soil samples were submitted for laboratory testing to establish atterburg limits/water content.

All information pertaining to the excavation works above is presented in the Borehole Logs and Inspection Pit Log and with reference to the Notes and Abbreviations Sheet, presented to the rear of this report.

RESULTS OF SITE INVESTIGATION

In summary, the results of the intrusive site work indicate the site is underlain by a mantle of made ground extending down to depths of 0.45m/0.55m overlying Charmouth Mudstone Formation.

Made ground was encountered in each inspection pit which consists of dark soft brown humic clayey sand with gravel sized general stone and roots observed in TP1 and TP2.

Made ground overlies the Charmouth Mudstone Formation which consists of soft to firm brown mottled grey slightly gravelly clay with fine and medium roots observed in TP1 and TP2. With progressive depth the clay stratum becomes firm to stiff and uniform. A weak limestone layer was recorded between 1.10m and 1.30m depth in TP1. Between 1.40m and 1.55m depths limestone rock was encountered which was impenetrable.

Roots were observed in TP1 and TP2 to a maximum depth of 1.10m.

Groundwater was not encountered in the trial pits.

The foundation inspection pits reveal the following:

TP1: Stone wall surmounts layered stone at GL extending out from the wall face by 150mm and continues down to 0.55m depth underpinned by firm brown mottled grey slightly gravelly clay.

TP2: Stone wall surmounts weak concrete foundation at 0.20m depth extending out from the wall face by 190mm and continues down to 0.55m depth underpinned by soft to firm brown mottled grey slightly gravelly clay.

TP3: Stone wall surmounts layered stone at 0.40m depth and continues down to 0.75m depth underpinned by soft to firm brown mottled grey slightly gravelly clay.

The results of geotechnical laboratory testing indicate the Charmouth Mudstone Formation from 0.55m to 1.20m depths is classified as inorganic clay of high plasticity and medium volume change potential.

The majority of samples, apart from the 1.00m depth samples from TP1/TP2 which were desiccated[1] were normally hydrated with natural water content values in equilibrium condition.

See also accompanying document for further information about dessication statement and full review by Client, Structural Engineer and Architect.

[1] BRE 412 Desiccation in clay soils

CONCLUSIONS

Existing foundations comprise a composite of tabular natural stone layers of cobble size in two of the trial pits and a weak concrete composed of some extraneous brick component in TP2. Foundation depths range between 0.55m to 0.75m. The founding material is a clay classified as medium volume change potential with desiccation evident in TP1 and TP2 at 1.00m depths also allied with tree roots which were present to 1.10m depths. The clay stratum in TP3 was normally hydrated.

see attached sheet

Clearly some environmental factors have been responsible for the dehydration of the clay substrate in TP1/TP2, the likely cause being the trees nearby. In order to stabilise foundations around the porch area where cracking has been observed, either the tree (Yew) will have to be removed to allow the clay to rehydrate and reduce the impact of tree root dehydration or given the likely Protection Order to the Yew Tree, foundations will have to be underpinned in depth in accordance with NHBC Standards Chapter 4.2 *Building near trees.* Alternatively new underpins can found upon the bedrock limestone rock which will offer stability with very low settlement values.

The cracking masonry is near TP1, not the porch as written

Should you have any queries with regard to the report, please do not hesitate to contact the undersigned.

For and on behalf of
Ground Investigation Services (Southern) Ltd
Yours faithfully

Martyn P Boughton (Director)

Email: martyn@gis-geotec.com

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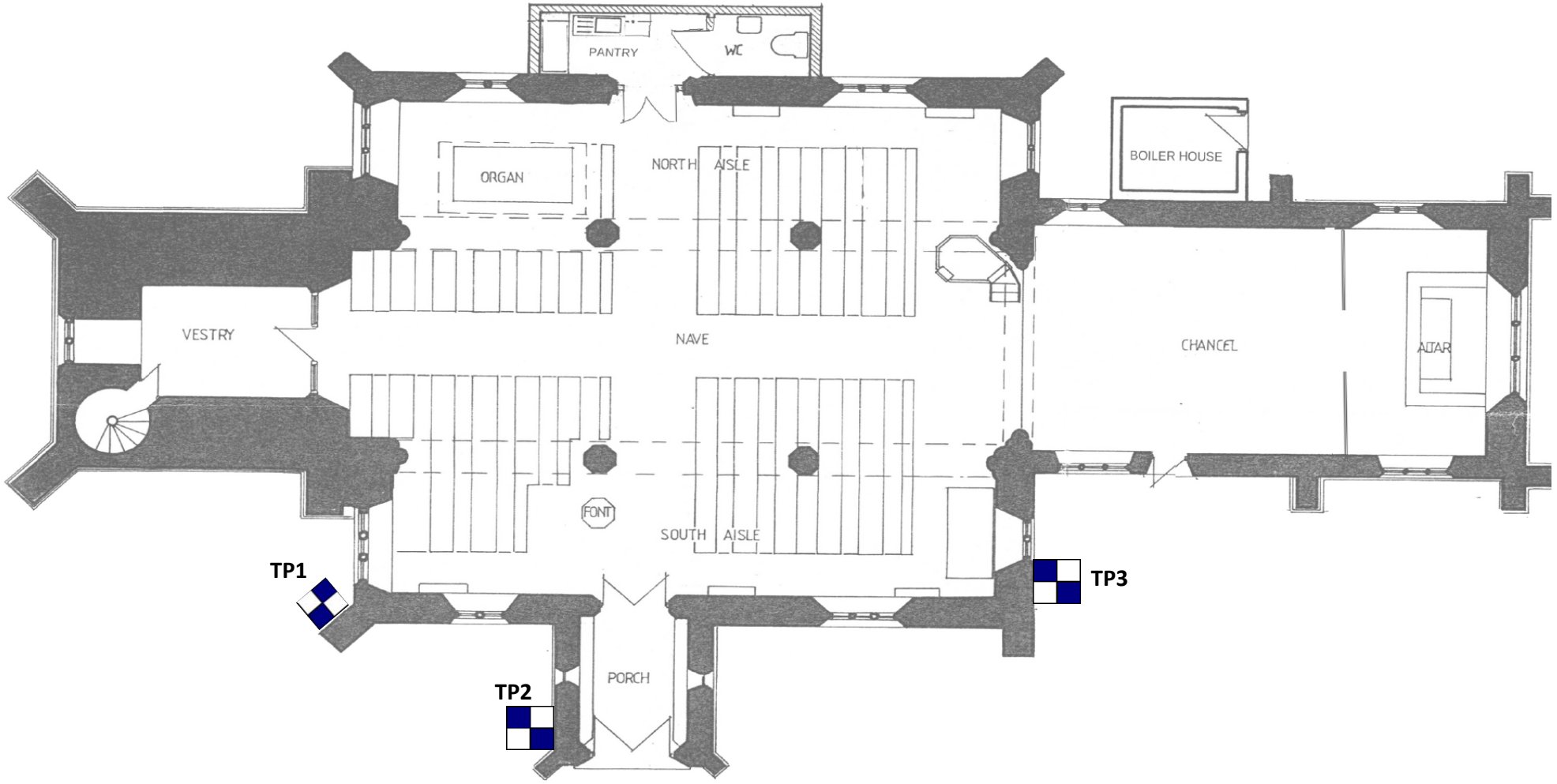
Trial Pit Location Plan
Trial Pit Log
Notes and Abbreviations Sheet
Laboratory Test Data



Client: **Solid Structures**

Site: **All Saints Church, Ladbroke, Southam**

Date: **November 2022**

Trial Pit

Ground Investigation Services (Southern) Ltd
40 Home Close, Wootton OX13 6DD
Tel 01865 326011

TRIAL PIT LOCATION PLAN

Report No. S.5988

Fig 1

NOTES ON EXPLORATORY HOLE RECORDS

GENERAL NOTES

1 OPERATING PROCEDURES

The procedure used for cable percussion boring, rotary drilling, trial pitting, sampling, in situ and laboratory testing and sample descriptions are generally in accordance with BS5930:2015+A1:2020 'Code of practice for ground investigations', BS EN ISO 14688-1:2018 'Geotechnical investigation and testing – Identification and classification of soil – Part 1 Identification and description', BS EN ISO 14689-1:2018 'Geotechnical investigation and testing – Identification and classification of rock – Part 1 Identification and description' as appropriate, and BS1377:1990 'Methods of test for soils for civil engineering purposes', unless stated otherwise.

2 GROUNDWATER

Exploratory hole water levels are recorded together with the depths at which seepages or inflows of water are detected. These observations are noted on the Records, but may be misleading for the following reasons:

a) The exploratory hole is rarely left open at the relevant depth for a sufficient time for the water level to reach equilibrium.

b) A permeable stratum may have been sealed off by the borehole casing.

c) Water may have been added to the borehole to facilitate progress.

d) The permeability may have been altered by the excavation/boring/drilling process.

Standpipes or piezometers should be installed when an accurate record of groundwater level is required, however, it should be noted that groundwater levels may vary significantly due to seasonal, climatic or man made effects. Water levels recorded during the investigation and any advice or comment made accordingly may, therefore, not be appropriate to particular foundation, geotechnical design, or temporary works solutions. Long term monitoring of standpipes or piezometers is always recommended when water levels are likely to have a significant effect on design.

3 CHISELLING

The remarks in the Borehole Records contain information on the time spent advancing the borehole by 'Chiselling Techniques', and the depth of borehole over which it was required. Such information may be affected by a wide range of variable factors, unrelated to the geotechnical properties of the strata. Such factors include, but are not restricted to: plant, equipment and operator. The data should, therefore, only be used subjectively and with extreme caution.

4 IDENTIFICATION AND DESCRIPTION OF SOILS - SEE SEPARATE SHEET

The identification system follows the Company's Engineering: Geotechnical Procedures Manual which is based on BS EN ISO 14688-1:2018 and appropriate clarifications in the National Foreword, BS 5930:2015 and BS EN ISO 14689- 1:2018

Relative density terms are given where supported by SPT N values, with the exception of Made Ground. The field assessment of compactness or relative density for coarse grained soils is only given on trial pit records where appropriate assessment of the soils has been undertaken.

Where the terms 'soft to firm', 'firm to stiff' etc. are used they indicate a strength which is close to the borderline between the two terms and cannot be precisely defined by inspection only, and/or which is indicated as borderline or ranging between the two terms after consideration also of in situ and laboratory test results. Consistencies may have been amended in the light of test results

Where 'to' links two terms, as in 'slightly sandy to sandy' this again represents a borderline case or a range, where the precise proportions cannot be determined as outlined previously.

The name of the geological formation is only given where this has been requested and can be determined with confidence (see Clause 41.5 of BS 5930:1999).

5 INTERPRETATION OF THE RESULTS OF THE INVESTIGATION

The description of ground conditions encountered and any engineering interpretation included in the report are based on the results of the boreholes and trial pits and the field and laboratory testing carried out. There may be ground conditions at the site which have not been revealed by the investigation and consequently have not been taken into account.

Any interpolation or extrapolation of strata between exploratory holes shown on any cross sections or site plans is an estimate only of the likely stratification based on general experience of the ground conditions and is subject to the interpretation of the reader.

The term "TOPSOIL" is used in this report to describe the surface, usually organic rich, layer including turf, subsoil and weathered material with roots. The use of this term may not imply that the soil satisfies the requirements of Clause 3 of BS 3882:2007, 'Specification for topsoil', or is suitable for general horticultural and agricultural purposes.

Laboratory test results in this report give the soil properties of individual specimens tested under specified conditions. Individual results or groups of results may not be appropriate for use as design parameters for some geotechnical analyses. The samples may be non-representative, disturbed internally, or prepared and tested under conditions suited for different geotechnical applications. Unless the selection of design parameters is discussed in this report, it is recommended that the advice of a Geotechnical Specialist is sought.

NOTES ON EXPLORATORY HOLE RECORDS

IN SITU TESTING AND SAMPLING

STANDARD PENETRATION TESTS

S( ) Standard Penetration Test (SPT). A 50mm diameter split barrel sampler is driven 450mm into the soil using a 63.6kg hammer with a 760mm drop. The penetration resistance (also known as the 'N' value) is expressed as the number of blows required to obtain 300mm penetration below an initial seating drive of 150mm which is taken through any ground which may be disturbed at the base of the borehole. The test is usually completed when the number of blows recorded during the test drive only reaches 50 in soils or 100 in weak rock. If a sample is not recovered in the sampler, a disturbed sample is taken on completion of the test and given the same depth as the top of the Standard Penetration Test drive.

C( ) Standard Penetration Test carried out with a 60 degree cone. The test is usually conducted in coarse granular soils or weak rock using the same procedure as for the SPT, but with a 50mm diameter, 60 degree apex, solid cone fitted to the split barrel. A bulk disturbed sample is taken and given the same depth as the top of the test drive.

The depth on the borehole record at the left hand side of the 'depth' column is that at the start of the normal 450mm penetration. Where the full penetration of 300mm for the test drive is obtained, the penetration resistance ('N' value) is reported in the 'SPT Blows/N' column. If the full penetration of 300mm in the test drive is not obtained, then the length of drive (test length in mm) and the penetration resistance (number of blows) are both reported. Blows through the initial seating drive (normally 150mm) are not reported. Both tests are based on BS EN ISO 22476-3 (2005) Geotechnical Investigation and Testing – Field Testing Part 3 Standard Penetration Test and BS5930:2015+A1:2020 'Code of practice for ground investigations'

* in the 'Test Length' column denotes that the blows and penetration were all in the initial Seating Drive section.

OTHER IN SITU TESTS

The following in situ tests are reported on the **Exploratory Hole Records**, in the 'Test' or 'Type' and 'Results' columns where appropriate.

k In situ Permeability Test - refer to detailed test results for permeability values

PMT Pressuremeter Test - refer to detailed test results for modulus values, etc.

VN/R( ) Borehole Shear Vane Test (undrained shear strength - c_u - in kPa) - refer also to detailed test results, N - 'Natural' or peak shear strength, R - Remoulded shear strength

V( ) Hand Shear Vane Test (Direct reading of undrained shear strength in kPa). 'N' and 'R' as above. The values are indicative and should not be taken as being equivalent to laboratory test results. The Pilcon vane results have a factor varying from about a sixth for the 33mm vane to a third for the 19mm vane which reduces the BS1377 shear vane value. The values presented are therefore approximate and should be treated with great caution if used for design purposes

PP( ) Pocket Penetrometer. Unconfined Strength (UCS) reported in kg/cm^2 to the nearest 0.25 kg/cm^2 or kPa with the same accuracy. Equivalent c_u in kPa is very approximately UCS x 50. Pocket Penetrometers are an aid to logging of cohesive soils, the results are indicative and should not be relied upon. The equipment used is not calibrated

CBR( ) California Bearing Ratio Test (CBR%) - refer also to detailed test results

PID( ) Photo-Ionisation Detector Readings in headspace of small disturbed chemical samples. Result given in ppm by volume

SAMPLES

U General purpose open tube sample. Sample normally taken with open tube sampler approximately 0.1m diameter and 0.45m long and driven with 80kg sinker bar and 56kg sliding hammer, unless noted otherwise. "XX" in U100 blows column denotes the number of hammer blows. The height of hammer drop can be variable depending on operator technique. Depths are given to the top of the sample if full penetration and recovery are achieved, otherwise actual lengths of penetration and recovery are given in the appropriate columns.

U(X) General purpose open tube sample (X) mm diameter

TW(X) Thin wall (push) sample (X) mm diameter

P(X) Piston sample (X) mm diameter

CBR Sample taken in CBR Mould

D Small disturbed sample (plastic tub or jar with air tight lid)

B Bulk disturbed sample (polythene bag, tied at neck - size dependent on purpose)

W Water sample

Sample not recovered

C Core sample (CS – short core, generally about 100mm; CL – long core, generally 200mm to 300mm)

CD Sample for chemical analysis in a plastic tub

K Sample for chemical analysis in an amber glass jar

V Sample for chemical analysis in a glass vial

CDKV Set of samples for chemical analysis as above

WAC Sample for Waste Acceptance Criteria

ES Environmental Sample

EW Environmental Water Sample

Recommended symbols for soils and rocks – BS 5930:2015+A1:2020


Made ground


Topsoil


Boulders and Cobbles


Gravel


Sand


Silt


Clay


Peat

Composite soil types may signified
By combined symbols, e.g.


Sandy CLAY with a trace of fine medium gravel


Silty slightly clayey SAND


Chalk


Limestone


Conglomerate


Brecia


Coal


Shale


Siltstone


Sandstone


Mudstone/Claystone

NOTES ON EXPLORATORY HOLE RECORDS

IDENTIFICATION AND DESCRIPTION OF SOILS

	Basic Soil Type	Particle Size (mm)		Visual Identification
Very Coarse Soils	BOULDERS		200	Large Boulders >630mm. These soils only seen complete in pits or exposures. Often difficult to recover from boreholes.
	COBBLES			
COARSE SOILS (Typically over 65% Sand & Gravel Sizes)	GRAVEL	coarse	63	Easily visible to naked eye; particle shape can be described, grading can be described. Well graded: wide range of grain sizes, well distributed. Poorly graded: not well graded. (May be uniform: size of most particles lies between narrow limits; or gap graded; an intermediate size of particle is markedly under represented).
		medium	20	
		fine	6.3	
			2	
	SAND	coarse	0.63	Visible to naked eye; no cohesion when dry; grading can be described. Well graded and poorly graded: as above
		medium	0.2	
		fine		
FINE SOILS (Typically over 35% Silt & Clay Sizes)	SILT	coarse	0.063	Only coarse silt visible with hand lens; exhibits little plasticity and marked dilatancy; slightly granular or silky to touch. Disintegrates in water; lumps dry quickly; possesses cohesion but powders easily between fingers. Term "SILT" or "CLAY" must be used, "SILT/CLAY" not allowed. Dry lumps can be broken but not powdered between the fingers; they also disintegrate under water but more slowly than silt; smooth to the touch; exhibits plasticity but no dilatancy; sticks to the fingers and dries slowly; shrinks appreciably on drying usually showing cracks. Intermediate and high plasticity clays show these properties to a moderate and high degree, respectively.
		medium	0.02	
		fine	0.0063	
	CLAY		0.002	
Organic Soils	ORGANIC CLAY, SILT or SAND	Varies		Contains varying amounts of organic vegetable matter - defined by colour: grey - slightly organic; dark grey – organic; black – very organic.

Composite Soil Types
(Mixtures of basic soil types)

Scale of secondary constituents with coarse and very coarse soils. Term before, description after

Term before (term in ' [ ] ' may be used for 2nd'ry parts, matrix etc)	Principal Soil Type	Description after soil type	Approx % 2nd'ry
Slightly (sandy*) [occasional / little]	SAND. GRAVEL; (COBBLES OR BOULDERS (See notes)	Used to describe components of secondary constituents. e.g. Gravel is fine and medium subangular fine sandstone and mudstone.	<5
--(sandy*) [some]			5 – 20
Very (sandy*) [much / many]			20 to 40†
--		and (sand*) or and (cobbles+)	50†

* Fine or coarse soil type as appropriate
\+ Very coarse soil type – see Notes
† described as fine soil depending on behaviour

Scale of secondary constituents with fine soils. Terms before, description after principal constituent.

Term before	Principal Soil Type	Description after soil type	Approx % 2nd'ry
Slightly (sandy*)	CLAY OR SILT	Used to describe components of secondary constituents e.g. gravelly sandy CLAY. Gravel is coarse rounded quartzite	<35
-- (sandy*)			35 to 65†
Very (sandy*)			>65†

* Coarse soil type as appropriate
† or described as coarse soil depending on mass behaviour

EXAMPLES OF COMPOSITE TYPES
(indicating preferred order for description)

Loose brown very sandy subangular coarse GRAVEL with many pockets (<5mm across) of soft grey clay.

Firm thinly interlaminated brown SILT and CLAY. Dense light brown clayey fine and medium SAND.

Density / Consistency / Peat Condition

For very coarse soils qualitative description by inspection of voids and particle packaging.

Standard Penetration Test in Boreholes for Coarse Soils

No of blows	Relative Density
<4	Very Loose
4-10	Loose
10-30	Medium Dense
30-50	Dense
>50	Very Dense
Slightly cemented	Visual Examination: pick removes soil in lumps which can be abraded.

Silty CLAY or clayey SILT – use prefix only when secondary constituent has significant affect on material characteristics. Terms 'slightly' or 'very' not applicable.

Consistency

Very soft	Finger easily pushed in up to 25mm. Exudes between fingers
Soft	Finger pushed in up to 10mm. Moulded by fingers
Firm	Thumb makes impression easily. Rolls to thread
Stiff	Can be indented slightly by thumb. Crumbles if rolled
Very Stiff	Indented by thumbnail. Cannot be moulded
Hard	Can be scratched by thumb nail
Firm Peat	Fibres compressed together
Spongy Peat	Very compressible, open
Plastic Peat	Moulded in hand, smears

Structure

Term	Field Identification
Homo-geneous	Deposit consists essentially of one type
Interbedded or interlaminated	Alternating layers of varying types. Pre-qualified by thickness term if in equal proportions. Otherwise thickness of, and spacing between, subordinate layers defined
Hetero-geneous	A mixture of types
Weathered (granular)	Particles may be weakened and may show concentric layering
Weathered (cohesive)	Usually has crumb or columnar structure
Fissured	Breaks into blocks along unpolished discontinuities
Sheared	Breaks into blocks along polished discontinuities
Intact	No fissures
Fibrous Peat	Plant remains recognisable and retain some strength. When squeezed only water, no solids
Pseudo-fibrous Peat	Plant remains recognisable, strength lost. Partial decomposition. Turbid water when squeezed, <50% solids
Amorphous Peat	Recognisable plant remains absent, full decomposition. When squeezed only paste with >50% solids
Gyttja	Decomposed plant & animal remains, maybe inorganic constituents
Humus	Plant remains, living organisms & inorganic constituents in topsoil

Interval Scales

Scale of Bedding Spacing	Mean Spacing (mm)	Scale of Spacing of Other Discontinuities / [Blocks]
Very thickly bedded	over 2000	Very widely spaced / [Very large]
Thickly bedded	2000-600	Widely spaced / [Large]
Medium bedded	600-200	Medium spaced / [Medium]
Thinly bedded	200-60	Closely spaced / [Small]
Very thinly bedded	60-20	Very closely / [Very small]
Thickly laminated	20-6	Extremely closely spaced
Thinly laminated	under 6	

Spacing terms may also be used for distance between partings, isolated beds or laminae, desiccation cracks, rootlets etc. Terms such as partings or dustings may be used for laminae less than 2mm and less than 0.6mm respectively.

Discontinuity Shape (See Standard for Persistence/Openness)	Small scale (mm's) rough, smooth Medium scale (cm's) planar, stepped, undulating Large scale (m's) wavy, curved, straight

Particle Nature

Particle Shape & Form

Very angular
(Sub) angular
(Sub) rounded
Well rounded

Low Sphericity
Flat or Elongate

High Sphericity
Cubic

Particle Surface Texture

Rough
Smooth
Polished

NOTES Identification and descriptive method, and descriptions, generally in accordance with BS5930:2015 Section 6 clauses 41 and 43 and BS EN ISO 14688-1:2002
Additional notes relating to BS EN ISO 14688-2:2004 – modified terms for content of secondary fraction given in Annex B Table B1 are not comparable to 5930 and are not be used.
Organic Content :- Low – 2 to 6%; Medium - 6 to 20%; High - >20%. Terms not used on borehole records
Carbonate content :- Only noted if field test with dilute HCl undertaken – Carbonate free if no effervescence; Calcareous if slight effervescence; Highly calcareous if strong reaction
Undrained shear strength :- terms from laboratory or in situ tests not given on borehole records.
Very Coarse Soils – described by initially removing very coarse materials and describing residue before adding back the very coarse soils. If residue is cohesive then described as ' (COBBLES / BOULDERS) with low (cobble / boulder) content with (some / much etc) matrix of ' If residue is granular then described as ' with matrix of ' or as a coarse soil. **Cobbles :-** <10% - low cobble content; 10 to 20% - medium content; >20% - high content; **Boulders** <5% - low boulder content; 5 to 20% - medium content; >20% - high content

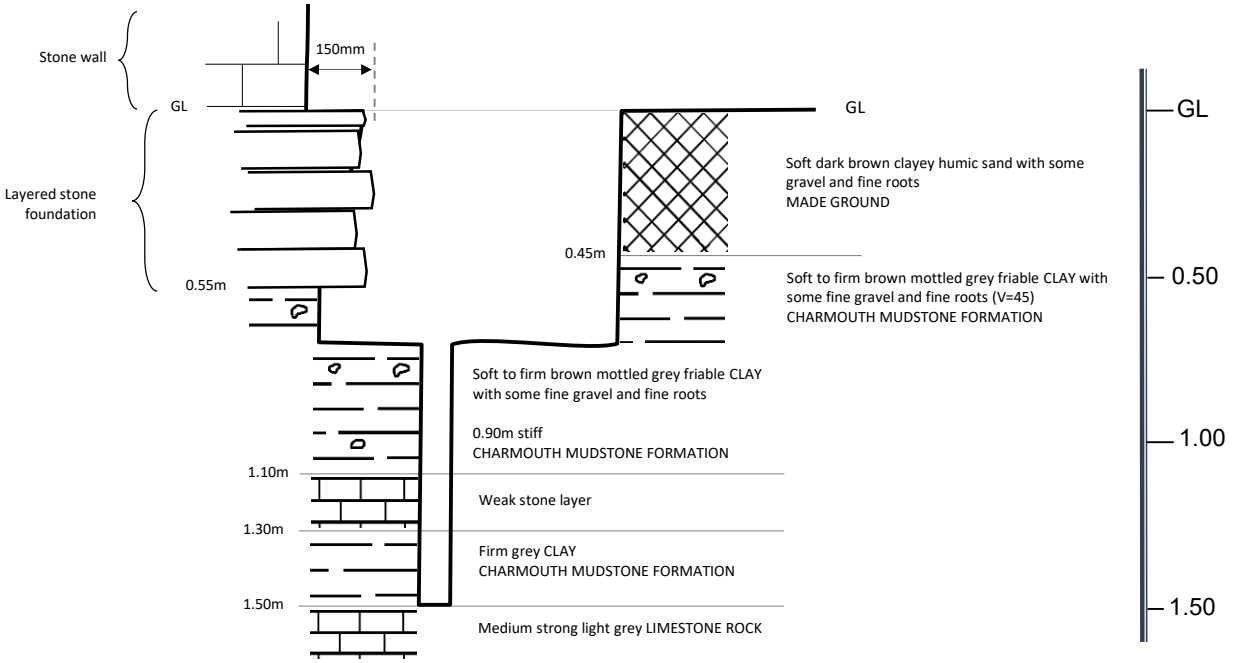
TRIAL PIT ONE	Coordinates: Ground level:

PROFILE VIEW

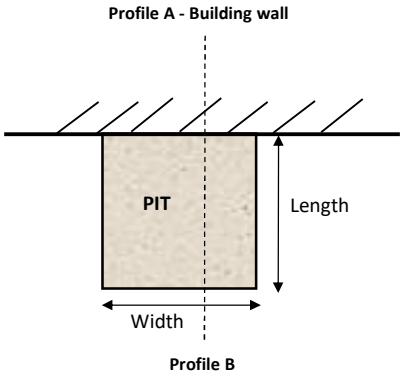
Profile A

Profile B

Depth - metres



PLAN VIEW



Date of Logging:	11 November 2022
Excavation Plant:	Hand excavated
Groundwater:	dry
Pit Dimensions:	0.40m x 0.40m x 0.65m (Width x length x depth-metres)
Pit Orientation:	
Pit Stability:	Stable
Weather:	Mild and dry
Remarks:	Hand auger sunk and terminated upon limestone rock at 1.50m depth

KEY

U	Undisturbed sample
D	Disturbed sample
B	Bulk sample
W	Water sample
J	Jar sample
CD	Contamination sample
Cm	CBR mould sample
V	Hand shear vane test (values in kpa)
PID	Photo-Ionisation Device (Readings given in PPM by volume)

Logged by: MPB

Checked by: JMH

CLIENT: **Solid Structures**

SITE: **All Saints Church, Ladbroke, Southam CV47 2DF**

Ground Investigation Services (Southern) Ltd
40 Home Close, Wootton, Abingdon OX13 6DD
Tel 01865 326011

INSPECTION PIT LOG

Report No. S.5988

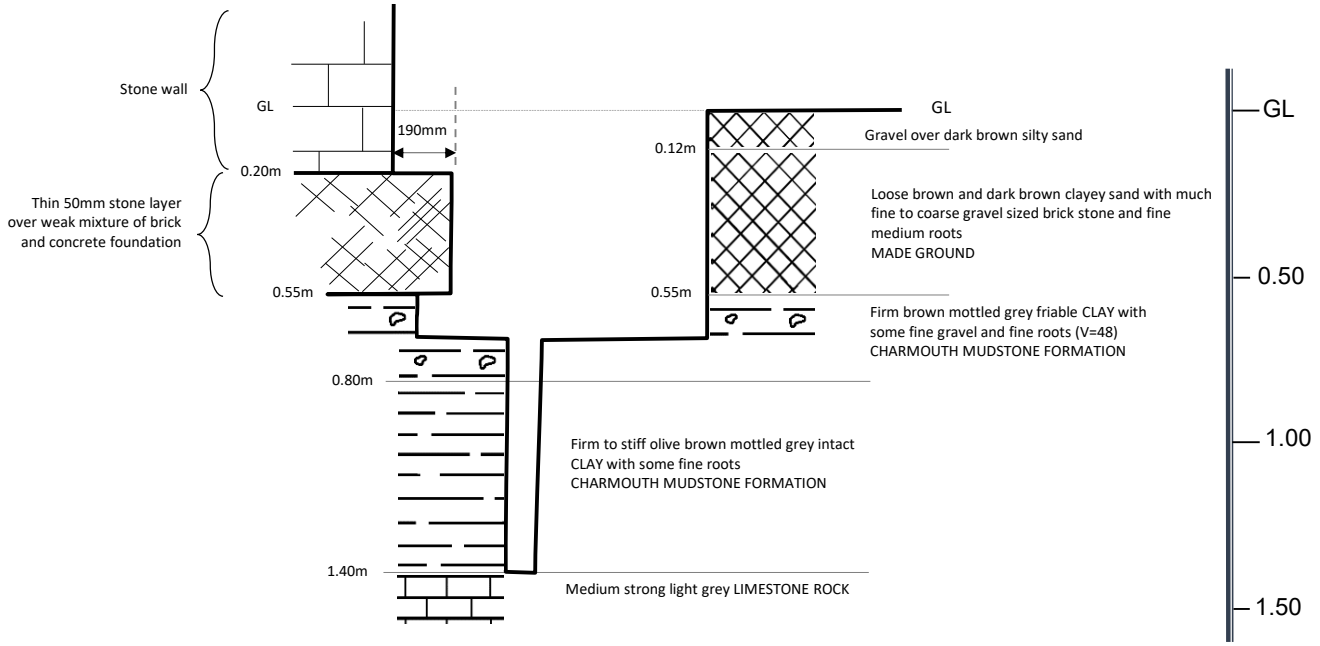
Fig 2

TRIAL PIT TWO

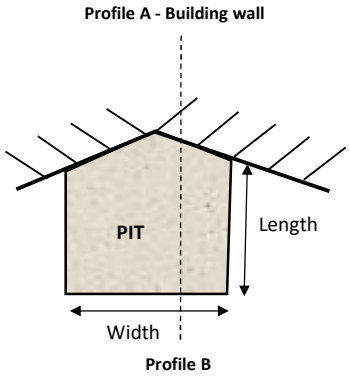
Coordinates:
Ground level:

PROFILE VIEW

Profile A — Profile B — Depth - metres



PLAN VIEW



Date of Logging:	11 November 2022
Excavation Plant:	Hand excavated
Groundwater:	dry
Pit Dimensions:	0.40m x 0.40m x 0.65m (Width x length x depth-metres)
Pit Orientation:	
Pit Stability:	Stable
Weather:	Mild and dry
Remarks:	Hand auger sunk and terminated upon limestone rock at 1.40m depth

KEY

U	Undisturbed sample
D	Disturbed sample
B	Bulk sample
W	Water sample
J	Jar sample
CD	Contamination sample
Cm	CBR mould sample
V	Hand shear vane test (values in kpa)
PID	Photo-Ionisation Device (Readings given in PPM by volume)

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INSPECTION PIT LOG

Report No. S.5988

Fig 3

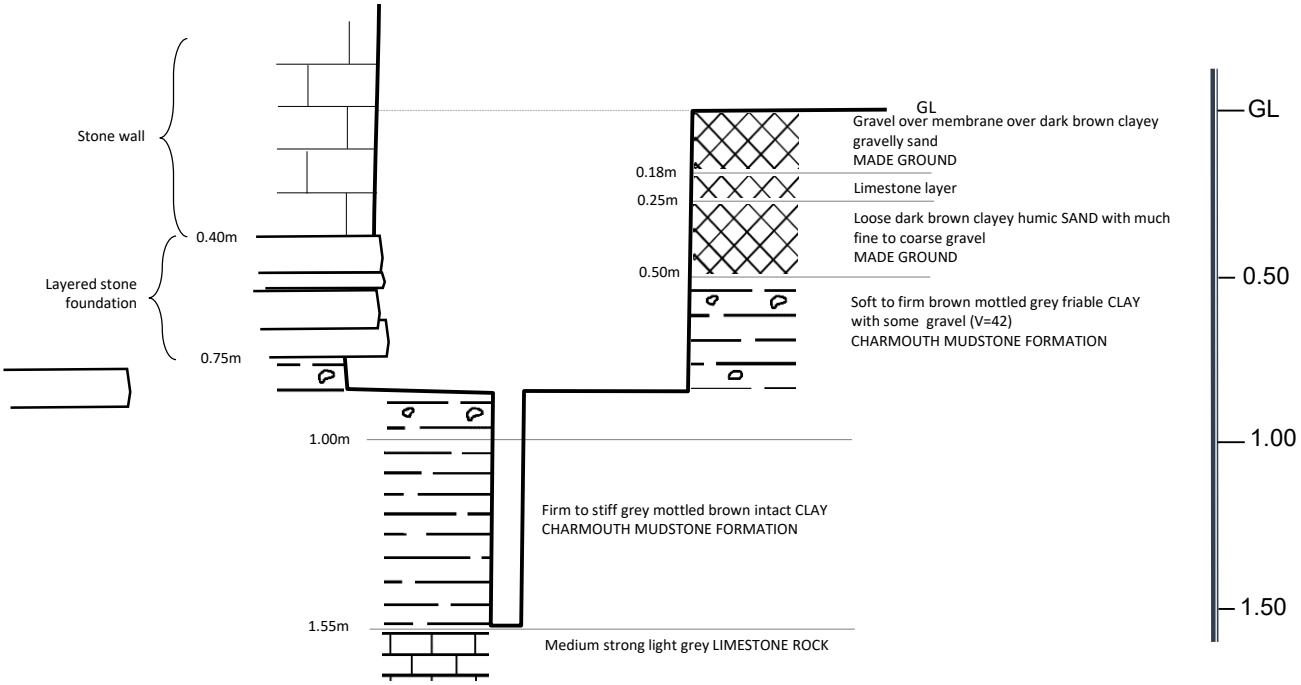
TRIAL PIT THREE

Coordinates:
Ground level:

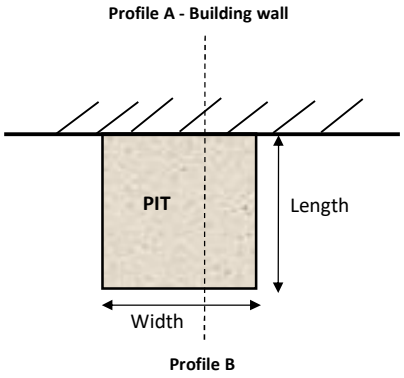
PROFILE VIEW

Profile A — Profile B

Depth - metres



PLAN VIEW



Date of Logging:	11 November 2022
Excavation Plant:	Hand excavated
Groundwater:	dry
Pit Dimensions:	0.40m x 0.40m x 0.80m (Width x length x depth-metres)
Pit Orientation:	
Pit Stability:	Stable
Weather:	Mild and dry
Remarks:	Hand auger sunk and terminated upon limestone rock at 1.55m depth

KEY

U	Undisturbed sample
D	Disturbed sample
B	Bulk sample
W	Water sample
J	Jar sample
CD	Contamination sample
Cm	CBR mould sample
V	Hand shear vane test (values in kpa)
PID	Photo-Ionisation Device (Readings given in PPM by volume)

Logged by: MPB
Checked by: JMH

CLIENT: **Solid Structures**

SITE: **All Saints Church, Ladbroke, Southam CV47 2DF**

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INSPECTION PIT LOG

Report No. S.5988

Fig 4

Ref No.	Sample No.	Sample Depth m	Water content %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Plasticity Index (Adjusted) %	Mass Passing 425µm %	Shrinkage potential NHBC Guidelines	Classification BS 1377-Part 2: 1990	Sample Description
TP1		0.55	26	56	25	31	28	90	M	CH	Slightly gravelly clay
TP1		1.00	24	60	23	37	35	95	M	CH	Slightly gravelly clay
TP2		0.60	24	56	22	34	31	90	M	CH	Slightly gravelly clay
TP2		1.00	21	56	21	35	35	100	M	CH	Clay
TP3		0.80	28	60	26	34	27	80	M	CH	Gravelly clay
TP3		1.20	22	54	20	34	34	100	M	CH	Clay

REMARKS:

22 *Desiccated in accordance with BRE Digest 412 Desiccation in clay soils*

CL	Inorganic CLAY low plasticity	ML	Inorganic SILT low compressibility
CI	Inorganic CLAY medium plasticity	MI	Inorganic SILT medium compressibility
CH	Inorganic CLAY high plasticity	MH	Inorganic SILT high compressibility
CV	Inorganic CLAY very high plasticity	MV	Inorganic SILT very high compressibility
CE	Inorganic CLAY extremely high plasticity	ME	Inorganic SILT extremely high compressibility
N	Non shrinkage Potential	(O)	Organic matter
L	Low shrinkage Potential		
M	Medium shrinkage Potential		
H	High shrinkage Potential		

CLIENT: **Solid Structures**

SITE: **All Saints Church, Ladbroke, Southam CV47 2DF**

DATE: **November 2022**

(BS EN ISO 17892-12 : Clauses 5.3 and 5.5 : 2018)

Natural water content

Liquid limit - cone penetrometer method (definitive method)

Plastic limit and plasticity index

Checked by

Approved by

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INDEX PROPERTIES

Report No. S.5988

Table 1