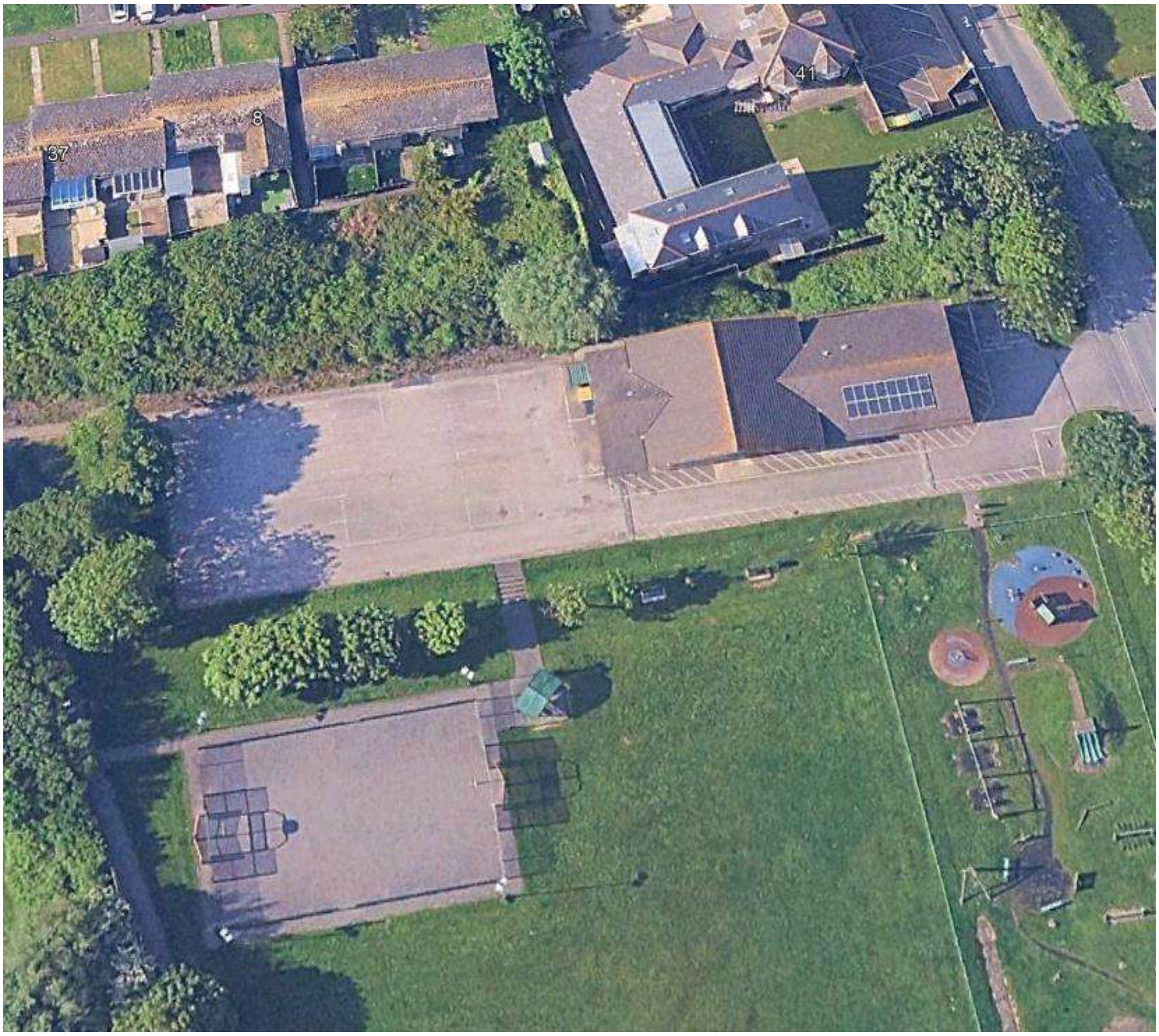
AG Geo-Consultants Ltd

Phase 2 Ground Investigation

Chickerell Town Hall, Putton Lane, Chickerell



Contract No./Report Type: 25-010/P2

Produced for Chickerell Town Council

AG Geo-Consultants Ltd

Report Title
Phase 2 Ground Investigation

Project	**Project No./Report Type**
Chickerell Town Hall, Putton Lane, Chickerell	25-010/P2

Client Name
Chickerell Town Council

Issue Date/Version	**Status**	**Comments, Description of Amendments**
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Specialist In Land Condition (SiLC) No. A1201 *Qualified Person* (QP), No.086 (CL:AIRE *Definition of Waste, Industry Code of Practice*, DoWCoP)

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Appendices

Executive Summary

Client	Chickerell Town Council
Site and Location	Chickerell Town Hall, Putton Lane, Chickerell Approximate postcode = DT3 4AJ
Proposed Development	Proposed hall extension, plus car park adjustments.
Client Brief	Undertake two soakaway tests. We recommended full geotechnical investigation at the same time and so added a foundation exposure pit, geotechnical sampling, lab testing, and interpretive reporting.
History of Site & Surroundings	**On Site** Fields, then the current hall and car park. **In the Surroundings** Fields, then increasing housing.

Note: depths within this report are written as either:

- Metres depth below existing ground level (mbegl).
- Metres depth below original ground level (mbogl).
- Metres depth below finished ground level (mbfgl)(i.e. after redevelopment).

The above could be (about) the same as one another, or could significantly differ, as discussed in the report.

Ground Conditions

BGS Mapping Suggests:

- **Drift Deposits**: None
- **Solid Geology**: Kellaways Formation - Mudstone and sandstone, interbedded.
- **The nearest relevant BGS boreholes (on the same geology) suggest:**
  - 0m-4m: yellow and grey clay (occasional bands of limestone, up to ~0.6m)
  - 4m->7m: Grey Limestone.

Our Investigation Found (MG = Made ground):

Strata	Depth Encountered (mBGL)		Description & Comments
	Top	Bottom	
Tarmac and MOT Type 1 (MG) Or Topsoil (over sub-base)(MG)	0	0.2 (SP2) 0.6	-
Very clayey SAND & Soft sandy CLAY	0.2 (SP2) 0.6 0.5	>=3 >1.4 3.0	Brown/orange/grey mottled. Slightly silty.
Stiff CLAY	3.0	3.7	Grey and slightly sandy. Only proven in SP1.

There were no anthropogenic components in the above made ground.

Hydrogeology & Hydrology

- **Watercourses, Aquifers, Source Protection Zones (SPZ), Abstractions:** Not currently checked as unlikely to be significantly affected by the current site.
- **Groundwater (GW)**: expected to occur as shallow seepages.
  1no. pit remained dry to 3m depth whilst the other 2no. had seepages at 1m and ~2.5m depth. We estimate that groundwater might stand at ~2.5m depth.

Geotechnical Considerations

Excavations

- Should be possible to >3m depth with conventional earthmoving plant.
- Should remain stable in the short term.
- Groundwater could occur as seepages, but should be possible to keep excavations dry by sump pumping.

Existing Foundations

TP2 was excavated adjacent to the existing building and found the existing foundations to comprise a concrete footing from 0.7mbegl to 1.26mbegl. It stepped out from the building wall by 0.26m.

Foundations & Ground Floor Slabs

- The clays are of **medium volume change potential**.
- Any made ground should be assumed to be unsuitable to bear within.

	• Field logging and lab testing appears to suggest that the soils on site could be borderline sandy CLAY or clayey SAND. We recommend assuming the soils to be cohesive, with a shear strength of Cu>65kPa below ~1m depth. • We recommend use of strip foundations, founding into the clayey SANDS/sandy CLAY and founding no shallower than 0.9mbfgl. The allowable bearing capacities for 0.45m and 0.6m wide strip foundations are Qa(0.9mbfgl) = 150kN/m^2 and 145kN/m^2. Such requires, and is based on (our findings which suggest), a shear strength of >=65kPa. • Note that foundations will need to found below any **soft clays** (as were suggested to be present in SP1 down to 1.5m depth). • Suspended ground floor slabs are recommended. **Drainage** • For both deep soakaways and shallow permeable paving, we found the soils not to drain (maximum water level drop during testing was 0.01m in 1hr). **Ground Aggressivity to Buried Concrete** • 0m-1m depth: Design Sulphate Class DS-1 and ACEC class AC-1s (assumes no groundwater). • 1m-~2.5m depth: Design Sulphate Class DS-3 and ACEC class AC-2s (assumes no groundwater). • >~2.5m depth: Design Sulphate Class DS-3 and ACEC class AC-3 (assumes below groundwater).

The above table is only a summary and should not be read in isolation from the main text.

1 Introduction

1.1 Introduction and Brief

AG Geo-Consultants Ltd (AGGC) were commissioned by GAP on behalf of Chickerell Town Council (the Client) to produce a Phase II Ground Investigation report for a site known as Chickerell Town Hall, Putton Lane, Chickerell, DT3 4AJ (the "Site", see plan in Appendix A).

The client's brief was to for:

..site investigation works to develop a drainage strategy. Two soakaway test locations.

Test Location 1

- *Soakaway test to BRE365 at a depth of approximately 2.0m below ground level (assuming a permeable stratum is found at this depth)*

Test Location 2

- *Soakaway testing at a shallow depth to determine whether permeable paving is viable*

1.2 Proposed Development

The proposed development (see location plan in Appendix A) comprises a proposed hall extension, plus car park adjustments.

1.3 Scope of Works

We advised that a full ground investigation would be more cost-effective in the long run than just soakaway testing. The client accepted AGGC's proposed detailed scope of work for a brief Phase 1 Desk Study, followed by a Phase 2 investigation (based on the findings of the desk study). The scope was designed to primarily identify foundation requirements and the soakage potential of the site.

Geotechnical Aspects:

- foundations for proposed structures.
- ground floor slab types.
- soakaway potential.
- Investigation of existing foundations.

Other Aspects:

- CAT and GPR scanning for underground services across all of the site and surrounding pavements, plus CAD drawing. These are reported separately.

1.4 Depths

Note that depths within this report are written as either:

- Metres depth below existing ground level (mbegl).
- Metres depth below original ground level (mbogl).
- Metres depth below finished ground level (mbfgl)(i.e. after redevelopment).

The above could be (about) the same as one another, or could significantly differ, as discussed in the report.

1.5 Limitations

Until all invoices associated with the production of this report have been paid in full, then it remains the property of AGGC and not the client, and AGGC do not grant legal reliance upon it to satisfy (or remove) planning permission conditions, or to be used for engineering design, etc.

This report is provided for the benefit only of the party to whom it is addressed and their advisors. No other developer or party may use it without our express written permission (i.e. reassignment). We do not accept responsibility to any other third party for the whole or any part of the contents and we exercise no duty of care in relation to this report to any third party.

Where intrusive investigations have been completed, information, comments and opinions given in this report are based on the ground conditions encountered during the site work and on the results of laboratory and field tests performed during the investigation. However, subsoils are inherently variable and hidden from view such that no investigation can be exhaustive to the extent that all soil conditions are revealed. Conditions may therefore be present beneath the site that were not apparent in the data reviewed as part of this assessment. In particular, it should be noted that groundwater levels vary due to seasonal and other effects, and may at times differ to those measured during the investigation.

Unless specifically noted to the contrary, it should be assumed that this report has not been submitted to any other regulatory authorities for approval. Redevelopment sites in particular may have planning conditions attached in respect of contaminated land assessment. Apart from the usual generic contaminated land planning conditions, **there can occasionally be site-specific contamination and geotechnical conditions**. Where we are made aware of such conditions in advance of scoping the works, we can tailor the report to the regulatory authority requirements. Where we are not made aware of any such requirements there can be no certainty that our investigation will meet any or all of the regulatory authority requirements.

2 Phase 1 Desk Study

2.1 Introduction

The following research has been undertaken in order to aid accurate design of the subsequent **Phase 2 ground investigation** (which is always recommended).

2.2 Desk Study

Table 2.1: Desk Study

Current Use of Site and Surroundings N=North E=East S=South W=West	**<u>On Site Conditions</u>** Town Hall and adjacent car parking areas. **<u>In the Surroundings</u>** Park area, farmland and residential area
Historical Land Uses (from maps) (from limited mapping)	**<u>On Site</u>** Fields then the current hall and car park. **<u>In the Surroundings</u>** Fields then increasing housing.
Aerial Photographs (Dec 2001 to date)	Show nothing extra of significance.
Anticipated Ground Conditions	<u>BGS Mapping Suggests</u>: • **Fault Lines**: None lie significantly close enough to the site. • **Made ground (MG):** None >1m thickness shown. • **Drift Deposits**: None • **Solid Geology**: Kellaways Formation - Mudstone and sandstone, interbedded. • **The nearest relevant BGS boreholes (on the same geology) suggest:** - 0m-4m: yellow and grey clay (occasional bands of limestone, up to ~0.6m) - 4m->7m: Grey Limestone. <u>Other</u> From our significant experience, we'd expect ~0.5m of man-made ground.
Hydrology and Hydrogeology	**Watercourses, Aquifers, Source Protection Zones (SPZ), Abstractions:** Not checked as unlikely to be significantly affected by the current site. **Groundwater** (GW): expected to occur as shallow seepages.
Landfills?	No licensed ones shown on or significantly near to the site. No other potential unlicensed landfilling is evident.
Potential Ground Risks	There could be ***Geotechnical Risks*** (e.g. to foundations, etc) which one should consider assessment of as <u>an optional extra</u>: • Shrink/swell risks especially from removal or retention of trees (a tree survey is recommended and especially before any are removed), • Possible soft ground, • Possible shallow rockhead, complicating excavations (e.g. drainage) • Probable impermeable ground (unsuitable for soakaways). • Possible sulphate attack on buried concrete.

3 Phase 2 Site Investigation

3.1 General

An intrusive site investigation was carried out on 19th and 20th March 2025 and employed trial pits. In-situ soakaway testing was also undertaken. The holes are summarised as follows:

Table 3.1: Exploratory Hole Details

Exploratory Hole ID	Technique	Hole Depth (mBGL)	Comments & Reasons for Holes
FP1	Hand dug	1.4	To uncover existing foundation
SP1	Mechanical Excavator & hand auger	2.8m, then extended to 3.7m with hand auger	Soak Tests. Hand augering allowed us to get deeper into the geology.
SP2		2.5, then extended to 3.0m with hand auger	

FP1 had been planned for the corner of the building, but the CAT scanner was picking up signals at both building corners (possible lighting cables?) and so the pit had to be moved.

A plan showing the exploratory hole locations is presented as Appendix B. Final hole locations are measured or estimated and were not surveyed.

3.2 Trial Pitting

2no. trial pits were excavated using a midi excavator. The trial pits were logged by an on-site engineer and samples were taken from the resulting spoil for geotechnical laboratory analysis.

1no. hand pit, FP1, was formed for the reason above.

Photographs of the trial pits are available if required. Detailed log sheets for the trial pits are included in Appendix C.

3.3 Hand Augering

The 2no. soakaway pits were deepened using hand augering from the base of each pit.

The augering retrieved continuous soil samples from the holes, which were logged by an on-site engineer. Representative samples were taken for geotechnical laboratory analysis.

Detailed log sheets for the dynamic sample holes are included in Appendix C.

3.4 Backfilling

On completion the holes were backfilled with arisings.

There had been the plan to form a monitoring well in one pit, if groundwater was found, but due the ground not draining at all (and so soakaways not feasible), then no well was installed.

3.5 In-Situ Testing

Where possible, pocket penetrometer (PP) tests were undertaken on recovered soil samples that were as undisturbed as possible.

Soakaway tests were undertaken in the following pits in general accordance with recommended practice given in BRE Digest 365. The results are contained in Appendix D.

The civil engineer had asked for a test in SP2 at shallow depth (e.g. ~0.6m), but we also managed to deepen the pit and conduct a deep test.

Table 3.2: Soakaway Tests

Pit Reference	Comments
SP1 (deep) #	3no. fillings of the pits were not undertaken due to near-zero infiltration rates
SP2 (shallow)	
SP2 (deep)	

#: Test was done when the pit was 2.5m deep. It did not drain at all. We then deepened the pit to 3m and the hand augered to 3.7m. We did think of doing another soak test at 3m but the soils suggested no better draining capability and so we did not. For the same reason, we did not install an optional monitoring well pipe, despite possible seepage at 3-3.7m depth.

3.6 Sample Collection and Laboratory Analysis

Samples obtained during the investigation were subjected to a range of geotechnical testing at appropriate UKAS accredited laboratories.

Samples were submitted for **geotechnical laboratory testing** to characterise the engineering properties of the soil. The following testing was scheduled:

- Moisture Content.
- Classification tests (Atterberg Limits).

Geotechnical laboratory test data is presented in Appendix E.

4 Ground Conditions

4.1 General

The following table provides a summary of the strata encountered in the exploratory holes and the depth to the base of each stratum. MG = man-made ground.

Table 4.1: Typical Strata

Strata	Depth Encountered (mBGL)		Description & Comments
	Top	Bottom	
Tarmac and MOT Type 1 (MG) Or Topsoil (over sub-base)(MG)	0	0.2 (SP2) 0.6	-
Very clayey SAND & Soft sandy CLAY	0.2 (SP2) 0.6 0.5	>=3 >1.4 3.0	Brown/orange/grey mottled. Slightly silty.
Stiff CLAY	3.0	3.7	Grey and slightly sandy. Only proven in SP1.

Photos of the soils/pits are available upon request.

There were no anthropogenic components in the above made ground.

4.2 Groundwater

Groundwater observations were as follows. We estimate that groundwater might stand at ~2.5m depth.

Table 4.2: Groundwater Observations

Exploratory Hole	Depth to Groundwater (mBGL)	
	During site works	Standing Depths Post-site works
FP1	Seepage at 1.0m (this could be water trapped in the looser backfill to the foundation)	-
SP1	Slight seepage to ~2.5m	-
SP2	Dry to pit base at 3.0m	-

4.3 Geotechnical Parameters

Plasticity

Plasticity indices (Appendix E)(Liquid limits= 45% to 55%) indicate the clays to be of intermediate to high plasticity. The plasticity indices (PI) range from 32% to 36%.

Results are summarised as follows:

Table 4.3: Modified Plasticity Indices Summary (arranged in depth order)

Sample/Hole Reference	Depth (mbegl)	Plasticity index %	% Passing 0.425mm	Remarks (C= clay, M=silt)	Modified Plasticity Index %	Shrinkability
FP1	1.0	34	100	CI/CH Intermediate/High Plasticity	34	M
SP2	1.0	32	100	CI Intermediate Plasticity	32	M
SP1	2.0	32	100	CI Intermediate Plasticity	32	M
SP2	2.0	36	100	CH High Plasticity	36	M
SP2	3.0	36	100	CH High Plasticity	36	M
SP1	3.5	33	100	CH High Plasticity	33	M

L=Low M=Medium H=High NP=non plastic

The modified plasticity indices (MPI) indicate the soils to possess **medium** volume change potentials with changes in moisture content, according to the criteria of NHBC Standards, Chapter 4.2 (2025) Building Near Trees. Based on these results, it is recommended that a **medium volume change potential** be assumed for design purposes, with corresponding minimum founding depths of 0.9m (in areas away from existing and proposed trees).

Densities & Strengths

The client team declined the use of the DCP (hand probe) and so we are unable to estimate sand densities.

All of the lab tests suggest the soils to be cohesive, but in the field, the engineer felt that the soils were mostly very clayey sands. Hand vane tests gave the following results, with engineer's site interpretation for comparison.

Table 4.4: Pocket Penetrometer Results (Shear strength, kPa)

Test depth (mbegl)	SP1	SP2
1.0	-	"Very clayey SAND" (135-162)
2.0	"Very clayey SAND" (95-120)	"Very clayey SAND" (190-215)
3.5	"Siff CLAY", 150-162	-

We recommend assuming the soils to be cohesive, with a shear strength of Cu>65kPa below ~1m depth.

5 Geotechnical Assessment

5.1 Introduction

The current development proposals are discussed in Section 1.2.

Likely wall loadings are currently unknown, but a standard construction is assumed, for which wall loadings could be as follows for a residential house (in the absence of working out 1-storey loads, 2-storey loads are given).

Table 5.1: Potential Building Loads

House Size	Potential Maximum Line Load (kN per m run of wall)	Corresponding Max' Bearing Pressure (kPa) for Strip Footing Widths of:		
		0.45m	0.6m	1.0m
2-storey semi-detached	63	140	105	63

5.2 Excavations

Excavations to >3m depth should be suitable with conventional earthmoving plant, although pneumatic tools are likely to be required to break out existing foundations and masonry obstructions.

It is unlikely that shallow excavations will encounter significant groundwater. Groundwater could occur as seepages and should this happen, then it should be possible to keep excavations dry by pumping from a conveniently located sump to a nearby sewer. If this is required, a temporary discharge licence will be required from the water authority.

All of our trial pits remained stable and open during the short time of their formation. Temporary excavations are therefore expected to stand unsupported in the short term, either vertically, or with steep cut gradients, and therefore should not require shoring or to be battered back to a safe angle of repose. Excavations below approximately 1m depth will require sheeting and shoring for personnel to enter safely. The stability of all excavations could deteriorate on wetting either from groundwater or surface water. Excavations could therefore be protected from rain and surface water runoff.

Any areas of particularly poor quality underlying soils (i.e. wet, soft, loose materials) should be removed from beneath all proposed foundation and hardstanding areas, and the deficit made good with suitable compacted granular fill (placed to an engineering specification).

Carbon & Sustainability
Attempt to retain & reuse surplus soils on site, provided there is legitimate reason for reuse.

5.3 Earthworks

No significant earthworks are envisaged.

5.4 Existing Foundations

Existing foundations within pit FP1 were found to comprise:

FP1	
0.56m thick ("Poor") concrete footing. Founding at 1.26m depth. Protruding 0.26m from house face.	

5.5 Foundation Assessment

General

Made Ground was present across the site (albeit of <0.6m proven thickness at the locations investigated) and should not be relied upon to form a suitable bearing stratum for buildings, due to the high potential for varying strengths/densities and compositions, that such soils usually have.

Based on the *Modified Plasticity Indices* range showing medium volume change potentials with changes in moisture content, then we recommend a minimum founding depth of 0.9m bfgl away from existing or former tree locations.

The various options for foundations are discussed as follows, starting with an assessment of shallow foundations, then assessing other options of increasing complexity and cost.

Taking account of the strata revealed by this investigation we recommend that shallow/strip foundations are adopted for the proposed development.

The following foundation guidance should be reviewed if, during development, the ground conditions are found to vary significantly from those highlighted in Section 4.

All foundation formations should be inspected and approved by a suitably qualified geotechnical engineer. Any 'soft' spots where exposed should be excavated and replaced with suitably compacted engineering fill.

Carbon & Sustainability

For sustainability, one should consider the following:

- Propose the use of cement-types with less impact than the classical Portland Cement. (use CEMII or CEMIII to replace CEMI).
- Earth Friendly Concrete (EFC): Replacement of Cement by the use of GGBS (Ground Granulated Blast Furnace Slag)(and fly ash geopolymer).
- Propose alternative materials. E.g. alkali activated materials (AAM's) and micro-macro synthetic fibre to replace steel reinforcement.
- Design cement-free ground improvement solutions and specify low Ordinary Portland Cement (OPC) mixes. For example, by cement replacement with Ground Granular Blast Furnace Slag (GGBS) / Pulverised Fly Ash (PFA) (e.g. CEMIII B) where locally available.
- Consider other, non/less- cement based techniques of ground improvement (e.g. stone columns or well-designed soil-mixing), or driven **timber piles** #.

#: One of the main drawbacks to using timber is that it is biodegradable. Decay occurs fastest when the timber is exposed to the air, which allows fungal decay and rot to occur. As such, a typical life span for timber placed in an **unsaturated environment is c. 25 years**. Timber placed **below groundwater level**, in a saturated, anoxic environment, will decay at a much slower rate and can have a design life of **up to 100 years** depending on the timber species used.

Shallow Strips, Pads and Trench Fill Foundations

We recommend that shallow **strip foundations** be seated into the clayey SANDS/sandy CLAY that lies as shallow as 0.2mBEGL.

Carbon & Sustainability

Foundation depths and widths should be assessed to find the minimum volume of soil arisings that could occur, and so minimise the amount of concrete used in foundations (if surplus soils need to go off site, such will also minimise the carbon footprint of exporting).

Minimum founding depths for new foundations should be the greater of the following depths:

1. 0.9m below **finished** ground levels (mbfgl) (due to shrinkage potential) with no tree effects.
2. Deepened to comply with NHBC requirements if within the influence zones of trees.

To minimise differential settlements, **new foundations** should attempt to found upon the same strata type (and the same soil strength) as the **existing foundations**, where the two meet.

At the minimum foundation depth of 0.9mbfgl, the allowable bearing capacity for strip foundations is (adopting a factor of safety of 3 on the ultimate calculated value):

0.45m wide strips: $Qa_{(>0.9mBGL)} = 150kN/m^2$

0.6m wide strips: $Qa_{(>0.9mBGL)} = 145kN/m^2$

which satisfies the aforementioned estimated maximum loads from a semi-detached 2- storey building (Table 5.1)(requires clay strengths at founding level to be >=65kPa, as suggested by our work)

Note that foundations will need to found below any **soft clays** (as were suggested to be present in SP1 down to 1.5m depth).

At the intensities of loading given above, total settlements should not exceed 25mm, with differential settlements between adjacent pad footings of approximately half this value. In the event that shallow foundations are employed for the development, the detailed design should include a serviceability check for settlement between differentially loaded foundation elements when foundation loads are determined.

Note that if detailed design causes individual foundations to be closer to one another than about 5x their width/breadth, then their pressure bulbs could interact and the above advice will need to be rechecked.

The above values are based on a fresh cut formation for foundation level. If the formation is left exposed to the weather for a period of time, then further excavation may be required until the strengths/densities discussed above for the bearing stratum are obtained.

Other Options

Since pad/strip footings appear feasible, then other options (having increasing complexity and cost) have not been assessed.

5.6 Floor Slabs

Suspended floor slabs (designed in accordance with NHBC guidelines) are recommended at the site because the shallow soils are likely to be susceptible to volume change with changes in moisture content.

5.7 Drainage

There are simple ways to approach a drainage design differently and provide multiple benefits, without increasing cost or build complexity to the scheme, e.g. **large rainwater harvesting tanks,** rain gardens, tree pits, swales, etc.

The long-term maintenance and ownership responsibility has advanced with the release of the *Design & Construction Guidance* (*Sewers for Adoption*, 8th Edition, April 2020) and the increasing use of new appointments and variations (NAVs), with the scope to adopt and maintain infrastructure not usually accepted by the water authorities.

Soakaway infiltration was undertaken in 2no. trial pits). The results are contained in Appendix D and are summarised as follows:

Table 5.2: Soakaway Results

Trial Pit	Test Depth range (mbegl)	Corresponding Stratum	Soil Infiltration Rate (m/s)
SP1 (deep test)	1.47-2.5 (1.03m head)	Very clayey SAND	Did not drain. Water dropped 0.01m in 1hrs.
SP2 (Shallow test)	0.46-0.7 (0.24m head) (for possible permeable paving)	Very clayey SAND	Did not drain. Water dropped 0.01m in 1hrs.
SP2 (deep test)	1.41-2.5 (1.09m head)	Very clayey SAND	Did not drain at all

5.8 Chemical Attack on Buried Materials

Concrete

Carbon & Sustainability
See Section 5.5, General.

Samples were tested for sulphate suites as outlined in *BRE Special Digest 1, Concrete in Aggressive Ground: 2005* (SD1).

The site can be classed as Greenfield (not Brownfield[1]) and with groundwater lying at a possible 2.5m depth, water conditions are taken to be static above that depth and mobile below.

The water-soluble sulphate results for the natural soils were 107, 229, 1790 and 21000mg/l. This first two fall into Design Sulphate Class DS-1 in Table C1 of BRE Special Digest 1 (SD1) and the latter two are DS-3.

Soil pH values varying from 7.4 to 8.0 were recorded and from these results a 'Characteristic Value' of 7.4 is derived.

As the geology at the site may be potentially pyritic (grey soils), and assuming that the concrete (e.g. foundations, drainage pipes, etc) may be exposed to disturbed ground in which pyrite may oxidize to sulphate, the oxidisable sulphide content of the soils must be calculated, using the total sulphur and acid soluble sulphate results.

The results show that none of the oxidisable sulphide contents exceed the 0.3% level given in the Digest and therefore pyrite is probably not present.

From consideration of the sulphate, pH and groundwater conditions it is concluded that the Aggressive Chemical Environment for Concrete (ACEC) classes are:

- 0m to 1m depth: AC-1s if there is no risk of concrete being in contact with groundwater,
- 1m to ~2.5m depth: AC-2s if there is no risk of concrete contacting with groundwater
- >~2.5m depth: AC-3 where concrete contacts with groundwater.

Recall:

- 0m to 1m depth : DS1
- >1m depth: DS3

The designer should utilise these classifications in order to produce the concrete specification.

Other Materials

The parties responsible for selecting all other materials that will be placed in the ground as part of this development, shall ensure that they are resistant to the chemical concentrations identified in the appendix of this report (e.g. pipe joint seals).

[1] The definition of "Brownfield" adopted by SD1 is one that has been *subject to industrial development, storage of chemicals, or deposition of waste, and which <u>may contain aggressive chemicals</u> in residual surface materials or in ground penetrated by leachates.*

Appendices

A. Proposed Development Plan
B. Exploratory Hole Locations (Existing Site Layout)
C. Exploratory Hole Logs
D. In-situ Test Results: Soakaways
E. Geotechnical Laboratory Results
F. Chemical Laboratory Results

Appendix A

DESIGNERS RISK ASSESSMENT-
HEALTH AND SAFETY
THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2015

For significant hazards specific to the project please refer to Drawing CDM01 where appropriate

NOTES:-

REV.	REVISION DETAILS	BY	CKD	DATE
C	Revised landscaping for BNG	RS	MW	24.02.25
B	Revised landscaping - ecology recomendations	RS	MW	29.01.25
A	Revised landscape based on ARB recommendations	RS	MW	21.01.25

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CLIENT
Chickerell Town Council

PROJECT
Willowbed Hall, Chickerell

DRAWING TITLE
Proposed Site Plan

DRAWN BY	CHECKED BY	DATE
RS	MW	13.12.2024

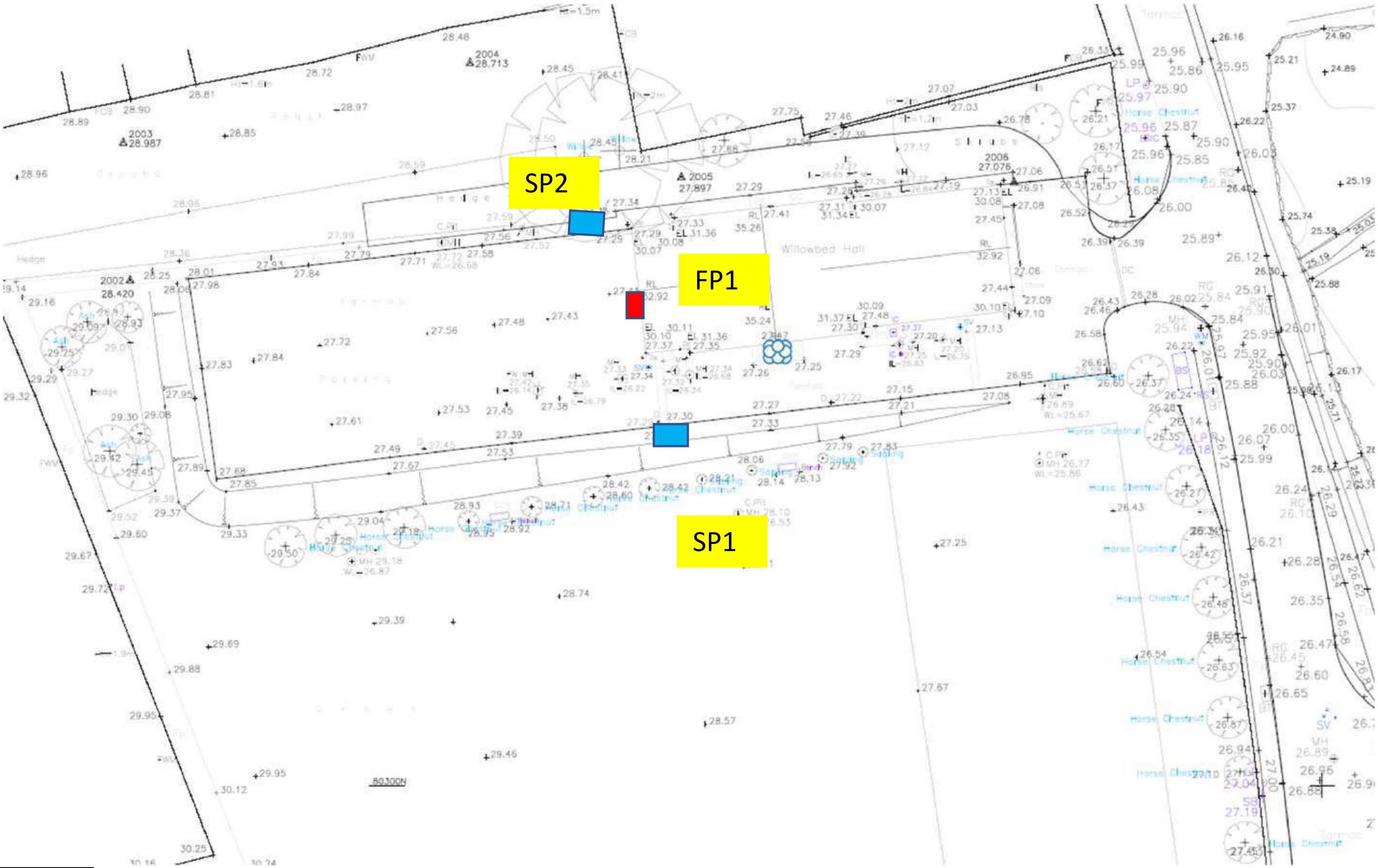
SCALE	JOB NO.
1:200@A1	2425051

DRAWING NO.	REVISION
04	C

PLANNING

Appendix B

Exploratory Hole Location Plan



Version	Date
0	27/03/25

Appendix C

Key to Exploratory Hole Symbols and Abbreviations

SAMPLE TYPES

B	Bulk disturbed sample	ES	Environmental soil sample	U	Undisturbed sample
C	Core sample	EW	Environmental water sample	UT	Undisturbed thin wall sample
CBR-D	Disturbed sample from CBR test area	G	Gas sample	W	Water sample
CBR-U	Undisturbed sample from CBR test area	L	Liner sample		
D	Small disturbed sample	SPT	SPT split spoon sample		

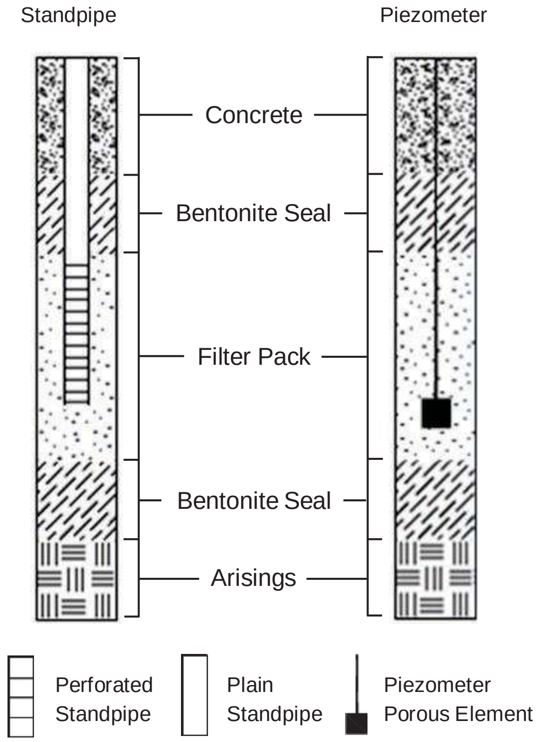
IN-SITU TESTING

SPTs	Standard Penetration Test (using a split spoon sampler)
SPTc	Standard Penetration Test (using a solid 60 degree cone)
N	Recorded SPT 'N' Value *
-/-	Blows/Penetration (mm) after seating blows totalling 150 mm
MX	Mexi Probe Test (records CBR as %)
HV	Hand Shear Vane Test (undrained shear strength quoted in kPa)
HP	Hand Penetrometer Test (kg/m^3)
( )	Denotes residual test value
PID	Photo Ionisation Detector (ppm) *
Kf/Kr	Permeability Test (f = falling head, r = rising head quoted in ms^{-1})
HPD	High Pressure Dilatometer Test (pressure meter)
PKR	Packer / Lugeon Permeability Test
CBR	California Bearing Ratio Test

ROTARY CORE DETAILS

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation (% of intact core >100 mm)
FI	Fracture Spacing (average fracture spacing; in mm, over indicated length of core) * *
NI	Non-Intact Core
AZCL	Assumed Zone of Core Loss

INSTALLATION & BACKFILL DETAILS



GROUNDWATER

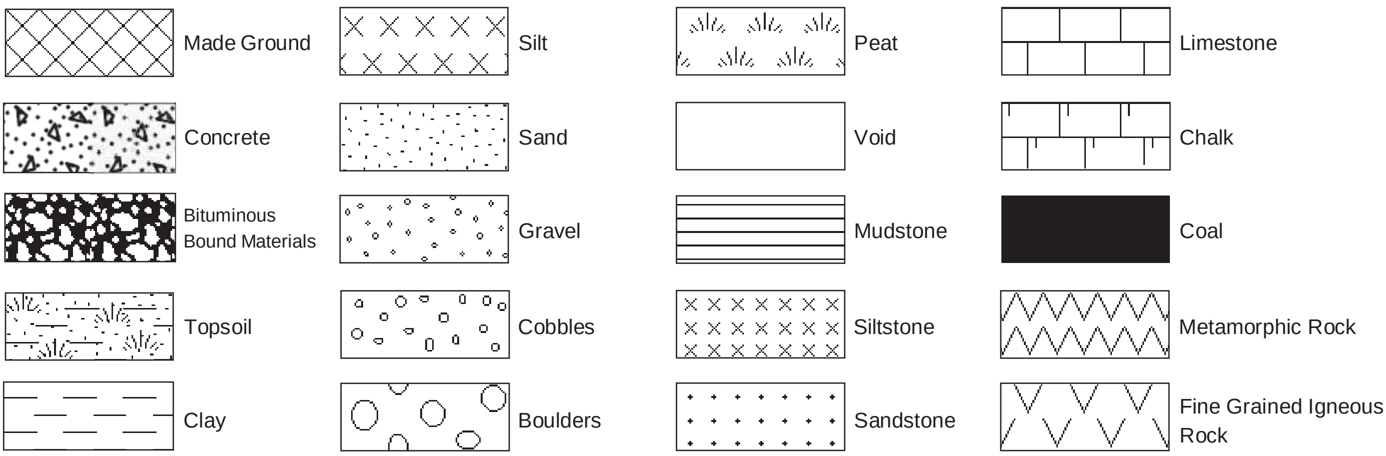
Groundwater strike

Standing water level after 20 minutes; 1st, 2nd etc (number denotes level order)

STRATUM BOUNDARIES

Unit boundary

STRATA LEGENDS - Note: Composite strata types are shown by combining symbols



* Where a single value is quoted this is the uncorrected 'N' value for a full 300 mm test drive following a seating drive of 150mm. Where the full test drive penetration is not achieved the number of blows is quoted for the penetration below the test total of 300mm, e.g.: 50/75.

* * The minimum, average and maximum are shown e.g. 5/45/125.

THAMESIDE GROUNDWORKS

Foundation Pit Log

Site:	Willowbed Hall, Chickerell, Weymouth DT3 4AJ	Job No.	25-010
Client:		Date:	19/03/2025
Engineer:	AG Geo	Hole No:	FP1

STRATA

TOP DEPTH (m)	DESCRIPTION	SAMPLES			
		TYPE	DEPTH (m)	NO.	HP (kN/m^2)
0 - 0.1	Tarmac				
0.1 - 0.6	Type 1 MOT				
0.6 - 1.4	Light brown, orange and grey mottled slightly silty very clayey fine SAND.	Atter & Chem	1.00	1 each	

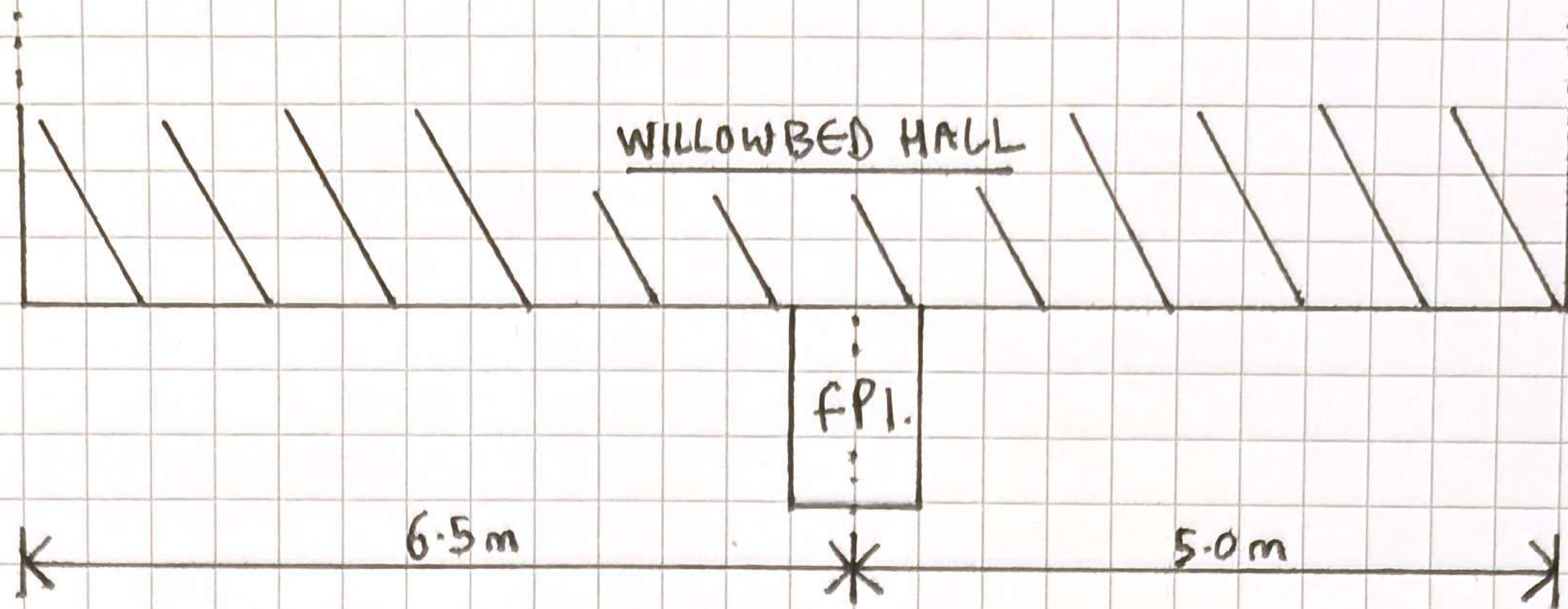
REMARKS:

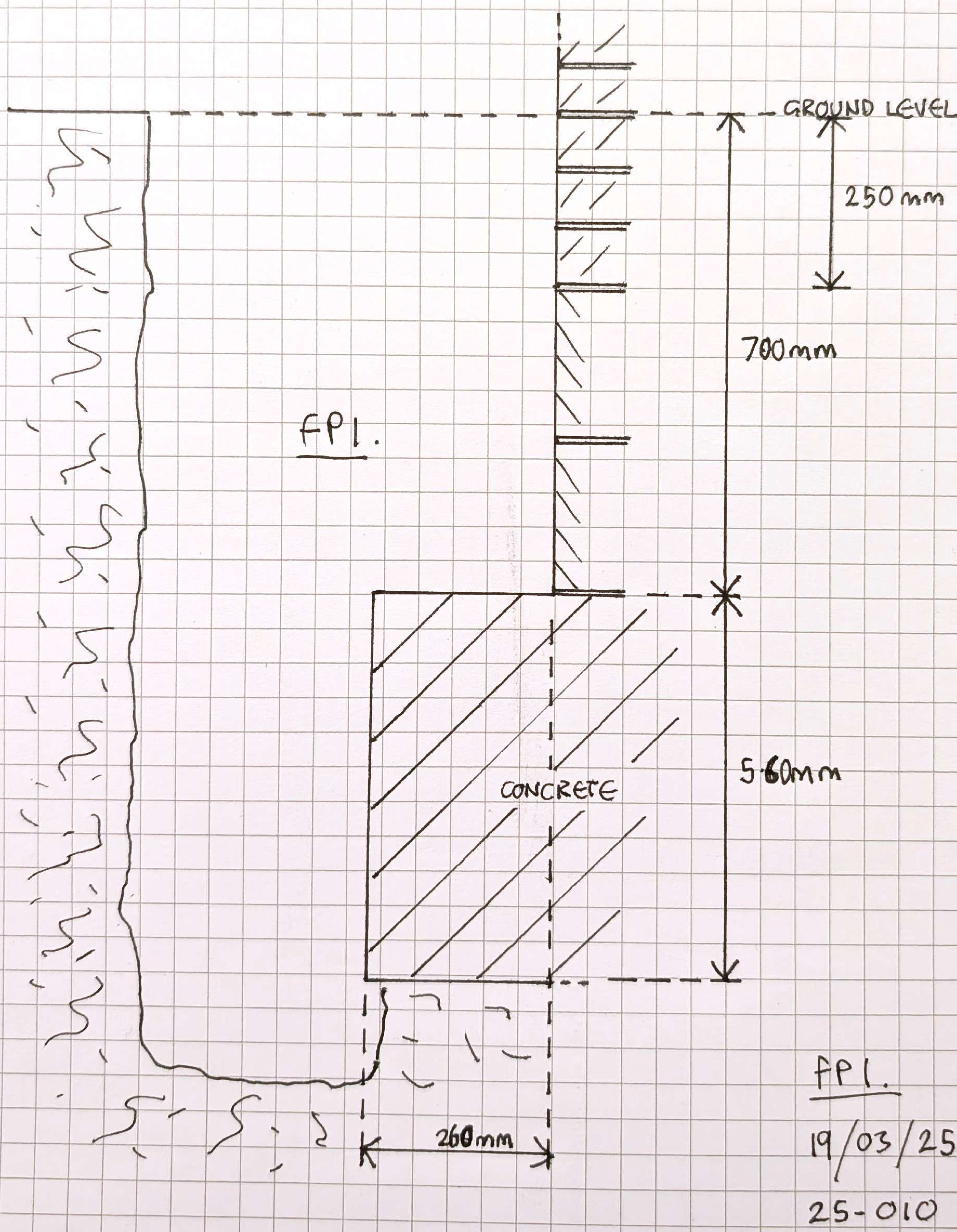
Groundwater: Seepage noted at 1.0m

Pitwall Stability: Good

Dimensions: 0.6 x 0.3 x 1.4

Backfill: With arising





FP1.

19/03/25

25-010

WILLOWBED HALL, WEYMOUTH, DT3 4AJ, AG GEO

THAMESIDE GROUNDWORKS	Trial Pit Log

Site:	Willowbed Hall, Chickerell, Weymouth DT3 4AJ	Job No. 25-010
Client:		Date: 20/03/2025
Engineer:	AG Geo	Hole No: SP1

STRATA

TOP DEPTH (m)	DESCRIPTION	SAMPLES			
		TYPE	DEPTH (m)	NO.	HP (kN/m^2)
0 - 0.2	TOP SOIL. Drak brown slightly silty fine to medium sand. Roots and organic matter present.				0.2m 3.5
0.2 - 0.5	MADE GROUND. Type 1 sub base				0.5m 3.5 - 4.5
0.5 - 1.5	SOFT orangish brown and grey mottled slightly silty sandy CLAY. Rare rounded gravel of flint. White calcereous (not tested) very fine present. Occasional crystal present. Occassional shell fragments.	Atter & Chem	1.0m	1 each	
1.5 - 3.0	Light brown and grey mottled slightly silty very clayey SAND. Occasional fine to medium rounded gravel of flint. Occasional shell fragments.	Atter & Chem	2m & 3m	1 each (1m) & 1 each (2m)	2m 3.5 - 4.5
3.0 - 3.7	STIFF grey slightly sandy CLAY	Atter & Chem	3.5m	1 each	3.5m 5.5 - 6

REMARKS:

Groundwater: Slightly seepage at c.2.5m

Pitwall Stability: Stable

Dimensions: 1.5 x 0.5 x 2.8 (3.7 with Hand Auger)

Backfill: With arising

THAMESIDE GROUNDWORKS	Trial Pit Log

Site:	Willowbed Hall, Chickerell, Weymouth DT3 4AJ	Job No. 25-010
Client:		Date: 20/03/2025
Engineer:	AG Geo	Hole No: SP2

STRATA

TOP DEPTH (m)	DESCRIPTION	SAMPLES			
		TYPE	DEPTH (m)	NO.	HP (kN/m^2)
0 - 0.2	TOP SOIL. Drak brown slightly silty fine to medium sand. Roots and organic matter present.				0.2m 2.5 - 3
0.2 - 2.5	Orangish brown and grey mottled slightly silty very clayey fine to medium SAND. White calcereous (not identified) content. Occasional fine crystal structures.	Atter & Chem	1.0m & 2m	1 each (1m) & 1 each (2m)	1m 5 - 6
2.5 - 3.0	Grey and brown mottled slightly silty very clayey fine to medium SAND.	Atter & Chem	3m	1 each	2m 7 - 8

REMARKS:

Groundwater: None

Pitwall Stability: Stable

Dimensions: 1.5 x 0.5 x 2.5 (3 with Hand Auger)

Backfill: With arising

Appendix D

THAMESIDE GROUNDWORKS

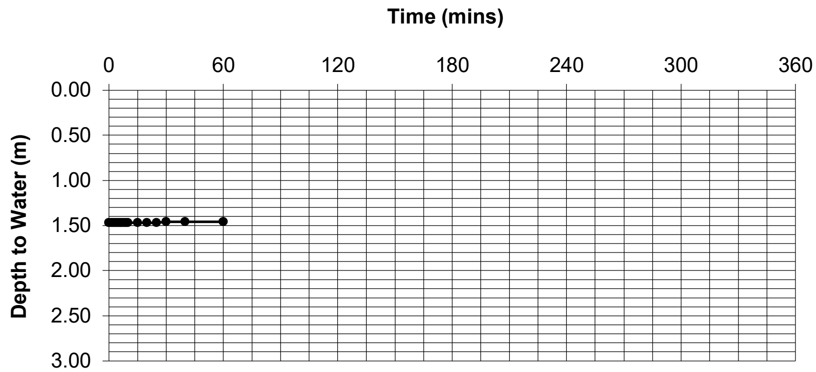
Insitu Test Results

Site:	Willowbed Hall, Chickerell, Weymouth, DT3 4AJ	Job Number	25-010
Client:		Sheet:	1 / 1
Engineer:	AG Geo		

Soakaway Test

Hole No: **SP1**

TEST NO: 1
DATE: 20/03/25



Time (min)	Depth (m)
0	1.47
1	1.47
2	1.47
3	1.47
4	1.47
5	1.47
6	1.47
7	1.47
8	1.47
9	1.47
10	1.47
15	1.47
20	1.47
25	1.47
30	1.46
40	1.46
60	1.46
80	
120	
180	
240	
300	
360	

Length of pit:	L =	1.50	m
Width of pit:	W =	0.50	m
Depth of pit	D =	2.50	m
Base area of pit:	A =	0.75	m^2
100% effective depth	D100 =	1.47	m
75% effective depth	D75 =	1.73	m
50% effective depth	D50 =	1.99	m
25% effective depth	D25 =	2.24	m
time to D75	T75 =		sec
time to D25	T25 =		sec
time from D75 to D25 (T25 - T75)	t_{p75-25} =	0	sec
volume between D75 & D25 (A x (D25 - D75))	V_{p75-25} =	0.39	m^3
surface area to D50 inc. base ((2x(D-D50)x(W+L)) + A)	a_{p50} =	2.81	m^2

SOIL INFILTRATION RATE **f =** $\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$

f = #DIV/0! m/sec

Test Strata: Very clayey SAND
(see Trial Pit)

Remarks: No movement. Test aborted

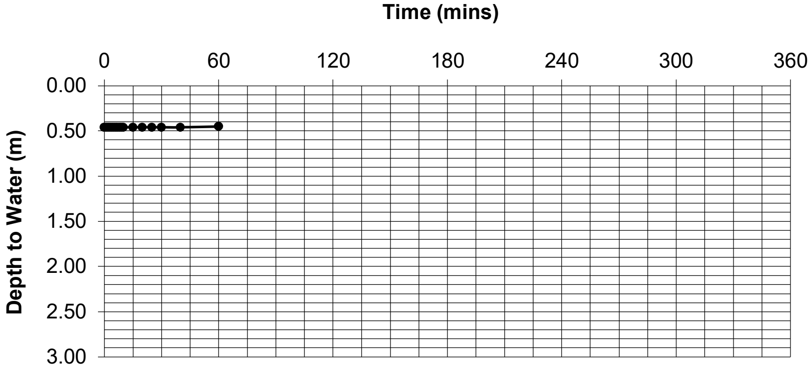
THAMESIDE GROUNDWORKS	Insitu Test Results

Site:	Willowbed Hall, Chickerell, Weymouth, DT3 4AJ	Job Number 25-010
Client:		Sheet: 1 / 1
Engineer:	AG Geo	

Soakaway Test

Hole No: **SP2 (Shallow)**

TEST NO: 1
DATE: 20/03/25



Time (min)	Depth (m)
0	0.46
1	0.46
2	0.46
3	0.46
4	0.46
5	0.46
6	0.46
7	0.46
8	0.46
9	0.46
10	0.46
15	0.46
20	0.46
25	0.46
30	0.46
40	0.46
60	0.45
80	
120	
180	
240	
300	
360	

Length of pit:	L =	1.50	m
Width of pit:	W =	0.50	m
Depth of pit	D =	0.70	m
Base area of pit:	A =	0.75	m^2
100% effective depth	D100 =	0.46	m
75% effective depth	D75 =	0.52	m
50% effective depth	D50 =	0.58	m
25% effective depth	D25 =	0.64	m
time to D75	T75 =		sec
time to D25	T25 =		sec
time from D75 to D25 (T25 - T75)	t_{p75-25} =	0	sec
volume between D75 & D25 (A x (D25 - D75))	V_{p75-25} =	0.09	m^3
surface area to D50 inc. base ((2x(D-D50)x(W+L)) + A)	a_{p50} =	1.23	m^2

SOIL INFILTRATION RATE **f =** $\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$

f = #DIV/0! m/sec

Test Strata: Very clayey SAND
(see Trial Pit)

Remarks: No movement. Test aborted

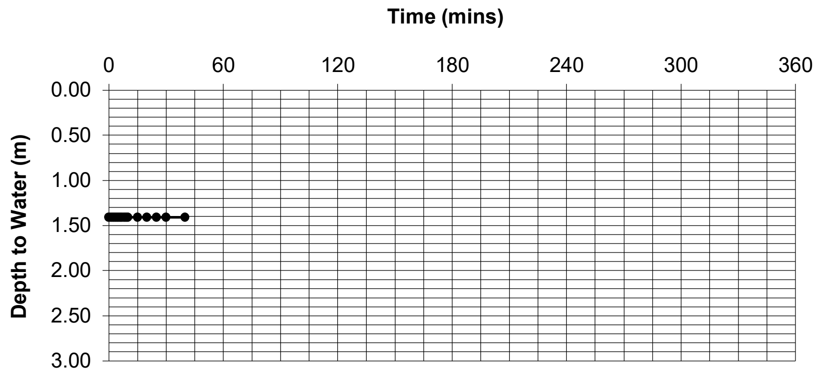
THAMESIDE GROUNDWORKS	Insitu Test Results

Site:	Willowbed Hall, Chickerell, Weymouth, DT3 4AJ	Job Number: 25-010
Client:		Sheet: 1 / 1
Engineer:	AG Geo	

Soakaway Test

Hole No: SP2

TEST NO: 1
DATE: 20/03/25



Time (min)	Depth (m)
0	1.41
1	1.41
2	1.41
3	1.41
4	1.41
5	1.41
6	1.41
7	1.41
8	1.41
9	1.41
10	1.41
15	1.41
20	1.41
25	1.41
30	1.41
40	1.41
60	
80	
120	
180	
240	
300	
360	

Length of pit:	L =	1.50	m
Width of pit:	W =	0.50	m
Depth of pit	D =	2.50	m
Base area of pit:	A =	0.75	m^2
100% effective depth	D100 =	1.41	m
75% effective depth	D75 =	1.68	m
50% effective depth	D50 =	1.96	m
25% effective depth	D25 =	2.23	m
time to D75	T75 =		sec
time to D25	T25 =		sec
time from D75 to D25 (T25 - T75)	t_{p75-25} =	0	sec
volume between D75 & D25 (A x (D25 - D75))	V_{p75-25} =	0.41	m^3
surface area to D50 inc. base ((2x(D-D50)x(W+L)) + A)	a_{p50} =	2.93	m^2

SOIL INFILTRATION RATE $f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$

f = #DIV/0! m/sec

Test Strata: Very clayey SAND
(see Trial Pit)

Remarks: No movement. Test aborted

Appendix E

Laboratory Report

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES
A PHENNA GROUP COMPANY

UKAS TESTING 2788

Contract Number: 77905

Client Ref: **25-010**
Client PO: **25-010**

Client: **AG Geo-Consultants Ltd**

Contract Title: **Chickerell Town Hall**
For the attention of: **Andre Gilleard**

Date Received: **26-03-2025**
Date Completed: **31-03-2025**
Report Date: **31-03-2025**

This report has been checked and approved by:

Richard John
Quality/Technical Manager

Description	Qty
Determination of water content BS EN ISO 17892-1:2014	6
1 point Liquid & Plastic Limit.. BS EN ISO 17892-12 - * UKAS	6

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

Approved Signatories:
Brendan Evans (Senior Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (HR & HSE Manager)

GEO Site & Testing Services Ltd
Unit 3-4 Heol Aur, Dafen Ind Est, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784 040 Fax: 01554 784 040 info@gstl.co.uk https://gstl.co.uk

	WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX BS EN ISO 17892-12:2018+A2:2022 1 Point Liquid Limit BS EN ISO 17892-1:2014+A1:2022 Determination of Water Content	
Contract Number	77905	
Project Name	Chickerell Town Hall	
Date Tested	28/03/2025	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
FP1		D	1.00	-		Brown silty CLAY
SP1		D	2.00	-		Brown silty CLAY
SP1		D	3.50	-		Brown silty CLAY
SP2		D	1.00	-		Brown silty CLAY
SP2		D	2.00	-		Brown silty CLAY
SP2		D	3.00	-		Brown silty CLAY
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		

Operator
Clayton Jenkins

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX** **BS EN ISO 17892-12:2018+A2:2022 1 Point Liquid Limit** **BS EN ISO 17892-1:2014+A1:2022 Determination of Water Content**	
Contract Number	77905	
Project Name	Chickerell Town Hall	
Date Tested	28/03/2025	
Test Comments	80g/30° Fall cone used	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Water Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Factor Applied	Remarks
FP1		D	1.00	-		21.5	50	16	34	100	1.005	CI/H Inter/High Plasticity
SP1		D	2.00	-		15.5	46	14	32	100	0.998	CI Intermediate Plasticity
SP1		D	3.50	-		21.2	51	18	33	100	1.015	CH High Plasticity
SP2		D	1.00	-		19.0	45	13	32	100	0.982	CI Intermediate Plasticity
SP2		D	2.00	-		17.8	51	15	36	100	0.996	CH High Plasticity
SP2		D	3.00	-		20.4	55	19	36	100	1.005	CH High Plasticity
				-								
				-								
				-								
				-								
				-								
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				-								
				-								
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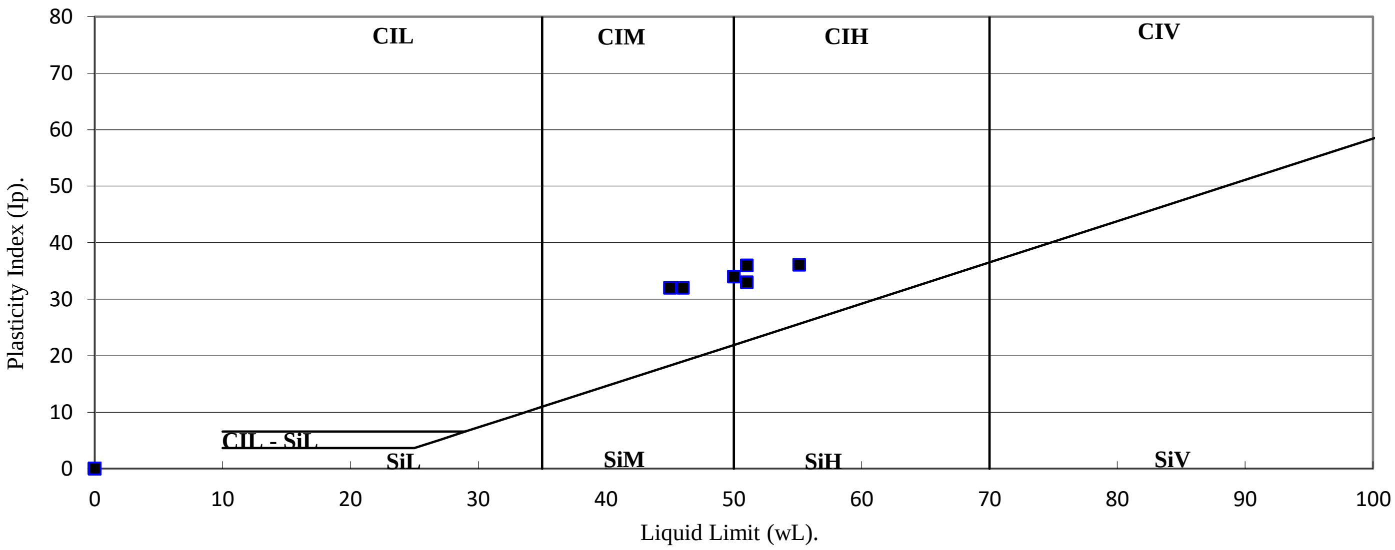
				-								
				-								

SYMBOLS : NP = Non Plastic **NB: All liquid limits are 4 point and wet sieved**

PLASTICITY CHART
BS EN ISO 14688-2:2018 Clause 4.4



***For sample descriptions please see sample descriptions sheet**

Operator
Clayton Jenkins

Appendix F

ANALYTICAL TEST REPORT

Report Number	25-02855, issue number 1
Contract name:	Chickerell Town Hall
Client reference:	25-010
Clients name:	AG Geo-Consultants Ltd
Clients address:	AGGEOCONLTD 58 Church Road Horfield BS7 8SE
Samples received:	26/03/2025
Analysis started:	26/03/2025
Analysis completed:	28/03/2025
Report issued:	28/03/2025

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
U/S	Sample not suitable for testing
NAD	No Asbestos Detected

ANeasham-Bourn

Approved by: Abbie Neasham-Bourn
Senior Reporting Administrator

SAMPLE INFORMATION

MCERTS (Soils):

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

Lab ref	Sample ID	Depth (m)	Sample description	Material removed	% Removed	% Moisture
41746	FP1	1.00	Brown Clay with Gravel and Vegetation.	-	-	15.2
41747	SP2	1.00	Brown Clay with Gravel and Vegetation.	-	-	14.5
41748	SP2	2.00	Brown Clay with Gravel and Vegetation.	-	-	12.5
41749	SP2	3.00	Brown Clay with Gravel and Vegetation.	-	-	13.8
41750	SP1	1.00	-	-	-	-
41751	SP1	2.00	-	-	-	-
41752	SP1	3.00	-	-	-	-
41753	SP1	3.50	-	-	-	-

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

a	Sampling date not provided
b	Sampling time not provided (waters only)
c	Sample not received in appropriate containers
d	Storage Temperature
e	Headspace present in sample container
f	Sample exceeded sampling to reciept
g	Sample exceeded holding time(s)

Lab ref	Sample ID	Depth (m)	Deviating	Tests (Reason for deviation)
41746	FP1	1.00	N	
41747	SP2	1.00	N	
41748	SP2	2.00	N	
41749	SP2	3.00	N	

CHEMTECH environmental part of Cawood

SOILS

Lab Number					41746	41747	41748	41749
Client Reference					1	1	1	1
Sample ID					FP1	SP2	SP2	SP2
Depth (m)					1.00	1.00	2.00	3.00
Sampling Date					20/03/2025	20/03/2025	20/03/2025	20/03/2025
Test	**Method**	**Accred**	**LoD**	**Units**				
Metals								
Water Soluble Sulphate	CE061	M	10	mg/l	229	107	1790	2100
Acid Soluble Sulphate (SO4)	CE062	M	0.01	%	0.06	0.07	2.06	2.43
Sulphur %	CE264	N	0.0032	%	0.0507	0.0255	0.590	0.767
Combustion								
Moisture Content	CE001	N	0.1	%	15.2	14.5	12.5	13.8
Wet Chem								
pH	CE004	M	0.1	pH units	8.0	7.7	7.5	7.4

METHOD DETAILS

METHOD	TESTNAME	METHOD SUMMARY	ANALYSIS BASIS
CE061	W. Sol Metals	ICPOES	Air dried sample
CE004	pH of Solids	Potentiometric	As submitted sample
CE062	Acid Soluble Sulphate in Solids	HCl Extract and ICPOES	Air dried sample
CE264	Metals by ICP in Soil	ICPOES	Air dried sample

REPORT INFORMATION

Report No.:25-02855, issue number 1

Key	
U	ISO17025 Accredited Result
M	ISO17025 and MCERTS Accredited Result
N	Do not currently hold accreditation
^	MCERTS accreditation not applicable for sample matrix
*	ISO17025 accreditation not applicable for sample matrix
S	Subcontracted
I/S	Insufficient Sample
U/S	Unsuitable sample
N/T	Not tested
<	Means "less than"
>	Means "greater than"

LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

This report shall not be reproduced except in full, without prior written approval.

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

The results relate only to the sample received.

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Moisture Content Calculated on a Wet Weight basis

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

Sampling was undertaken by Chemtech Environmental Limited and is outside the UKAS accreditation scope.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying

For soils and solids, analytical results are inclusive of stones, where applicable.

Sample Retention and Disposal

All soil samples will be retained for a period of 4 weeks from the point of receipt
All water samples will be retained for a period of 2 weeks from the point of Reporting
Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

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
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
2D	GC-GC - Double coil gas chromatography
#1	EH_Total but with humics mathematically subtracted
#2	EH_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry