STM environmental

ENVIRONMENTAL CONSULTING , SOFTWARE & TRAINING

Geotechnical Ground Investigation Report

Site
Land between 60-66 Alwyne Road
Wimbledon
SW19 7AF

Client
Guy Shorney

Report Reference
GT-2022-000120

Prepared by
STM Environmental Consultants Ltd

Date
09/02/2023

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1 DOCUMENT CONTROL

GEOTECHNICAL GROUND INVESTIGATION REPORT

Site Address:	Land Between 60-66 Alwyne Road Wimbledon SW19 7AF
Site Coordinates:	524644, 170853
Prepared for:	GBS Architectural
Report Reference:	GT-2022-000120
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Date:	09/02/2023
Report Author:	Gregory Northwood (MSc) GeoEnvironmental Consultant & Senior Parminder Bhatia (MSc) Geoenvironmental Engineer
Authorised by:	Simon Makoni (MSc) Director

2 DISCLAIMERS

This report and any information or advice which it contains, is provided by STM Environmental Consultants Ltd (STM) and can only be used and relied upon by GBS Architectural (Client).

STM has exercised such professional skill, care and diligence as may reasonably be expected of a properly qualified and competent consultant when undertaking works of this nature. However, STM gives no warranty, representation or assurance as to the accuracy or completeness of any information, assessments or evaluations presented within this report. Furthermore, STM accepts no liability whatsoever for any loss or damage arising from the interpretation or use of the information contained within this report. Any party other than the Client using or placing reliance upon any information contained in this report, do so at their own risk.

Due to budgetary and physical constraints, sampling and in-situ testing was not possible over the entire site during the ground investigation. Therefore, we can offer no guarantee as to the validity of the data in any areas other than those investigated. While this Report may offer comments and opinions on the nature of the strata, both between the excavations and below the maximum depth achieved by the investigation, these are for guidance only and no liability can be accepted for their accuracy.

It should also be noted that some of the findings presented in this report are based on information obtained from third parties (i.e. laboratory). Whilst we assume that all information presented is accurate, we can offer no guarantee as to the validity.

The undertaking of an aboricultural/tree survey was not part of the scope of works. Therefore, the opinions provided in relation to tree heights and species are provided for information only and should not be relied upon. It is recommended that a tree identification survey is undertaken by a suitably qualified Aboriculturist if accurate information is required.

We recommend careful observations during construction to verify our interpretations. Should variation from our interpretations be noted, we recommend that a competent Geotechnical Engineer be engaged to advise and to evaluate what, if any, revisions should be made to our recommendations.

3 EXECUTIVE SUMMARY

SECTION	SUMMARY
Site Location and Description	The site is located at Land Between 60-66 Alwyne Road, Wimbledon, SW19 7AF. It is approximately centred at national grid reference 524644, 170853 and occupies an area of approximately 121m^2.
Proposed Development	The development proposal is for the construction of a new two-storey residential dwelling with a basement.
Published Geology and Hydrogeology	According to mapping provided by the BGS, the site is located on superficial deposits consisting of Head (Clay, Silt, Sand and Gravel). The bedrock pertains to the London Clay Formation (Clay and Silt). According to BGS mapping information, groundwater is likely to be less than 3mbgl for at least part of the year.
Summary of Ground Investigation	The ground investigation works were carried out on the 15th of December 2022. 2no. boreholes (BH01 and BH02) were excavated at the site for the purpose of undertaking geotechnical in-situ testing and soil sampling using a dynamic windowless sampler rig. Borehole BH01 was advanced to a maximum depth of 10mbgl, while BH02 was advanced to 4mbgl. In-situ Standard Penetration Tests (SPT) were carried out at 1m intervals. Disturbed soil samples were collected and submitted to a UKAS/MCERTS accredited laboratory for Plasticity Index (6no.), Sulphate water soluble (6no.), pH(6no.) analysis. BH01 was installed with a standpipe equipped with monitoring apparatus to a depth of 10mbgl to allow for the estimation of groundwater levels.
Summary of and Findings	The investigation encountered ground conditions consistent with the published geological records of the area. Made Ground consisting of gravelly SILT with an abundance of brick fragments was encountered to a maximum depth of 1.2mbgl. The Made Ground was underlain by brown and grey CLAY to 10mbgl the maximum depth of the boreholes. The results of the SPT testing undertaken within the CLAY gave N values that ranged from a minimum of 5 at 2mbgl to a maximum of 42 at 10mbgl. The tested samples produced results ranging from Clay of high to very high plasticity. The Modified Plasticity Index values ranged between 37% at 4mbgl to 40% at 3mbgl indicating that the volume change potential of the Clay is High.

SECTION	SUMMARY
	The results of the Sulphate tests ranged from 44 to 2760mg/l SO_4 indicating that the tested soils fall into Class DS-3 of the Building Research Establishments (BRE) classification system Special Digest Part 1:2005 “Concrete in aggressive ground”. 7no. trees (Rowen (2no.), Pine (2no.), Cedar (1no.) and Wild Cherry(2no.)), were identified as lying within the potential zone of influence of the proposed development. Root activity was, however, not recorded in any of the boreholes. Groundwater was not encountered in any of the boreholes during the investigation or subsequent monitoring of BH01 one week after the investigation.
Conclusions and Recommendations	Based on the results of the ground investigation, any shallow foundations (i.e. underpins, strip, trench fill, pads, raft) may be formed within the stiff CLAY encountered at 4mbgl. An allowable bearing capacity in the order of 145kPa can be assumed at this depth. If due to the magnitude of the anticipated loads, shallow foundations are not deemed suitable, the installation of a pile foundations at depth can be undertaken as an alternative. Although groundwater was not encountered as part of the investigation, some seepages could occur. No particular difficulties are envisaged in removing such water by conventional internal pumping methods from open sumps. The results of the Water-Soluble Sulphate tests indicate that conditions in which the deterioration of buried concrete due to sulphate or acid attack are unlikely to exist at the site. The final design of buried concrete should therefore be in accordance with Class DS-3 of the Building Research Establishments (BRE) classification system Special Digest Part 1:2005 “Concrete in aggressive ground” and ACEC Site Class AC-3.

4 INTRODUCTION

4.1 Commissioning

STM Environmental Consultants Limited were commissioned by GBS Architectural (Client) to undertake a ground investigation at Land Between 60-66 Alwyne Road, Wimbledon, SW19 7AF (the Site).

4.2 Development Proposal

It is understood that the development proposal is to construct a two-storey residential dwelling with a basement.

4.3 Report Objectives

The purpose of the investigation was to provide an interpretive report on current ground conditions to assist with the design of foundations for structures associated with a planned redevelopment at the Site.

This report should be read in conjunction with Flood Risk Assessment produced for the site by STM Environmental Consultants in January 2022.

5 SITE DESCRIPTION

5.1 Site Location and Current Use

The site is located at Land Between 60-66 Alwyne Road, Wimbledon, SW19 7AF at grid reference 524644, 170853 and has an area of approximately 121m^2.

The site lies within the jurisdiction of Merton Council in terms of the planning process. It is currently used as a vacant land between 60-66 Alwyne Road.

5.2 Published Geology and Hydrogeology

5.2.1 Geology

According to mapping provided by the BGS, the superficial deposits consist of Head (Clay, Silt, Sand and Gravel), while the bedrock is classified as belonging to the London Clay Formation (Clay and Silt),

5.2.2 Hydrogeology

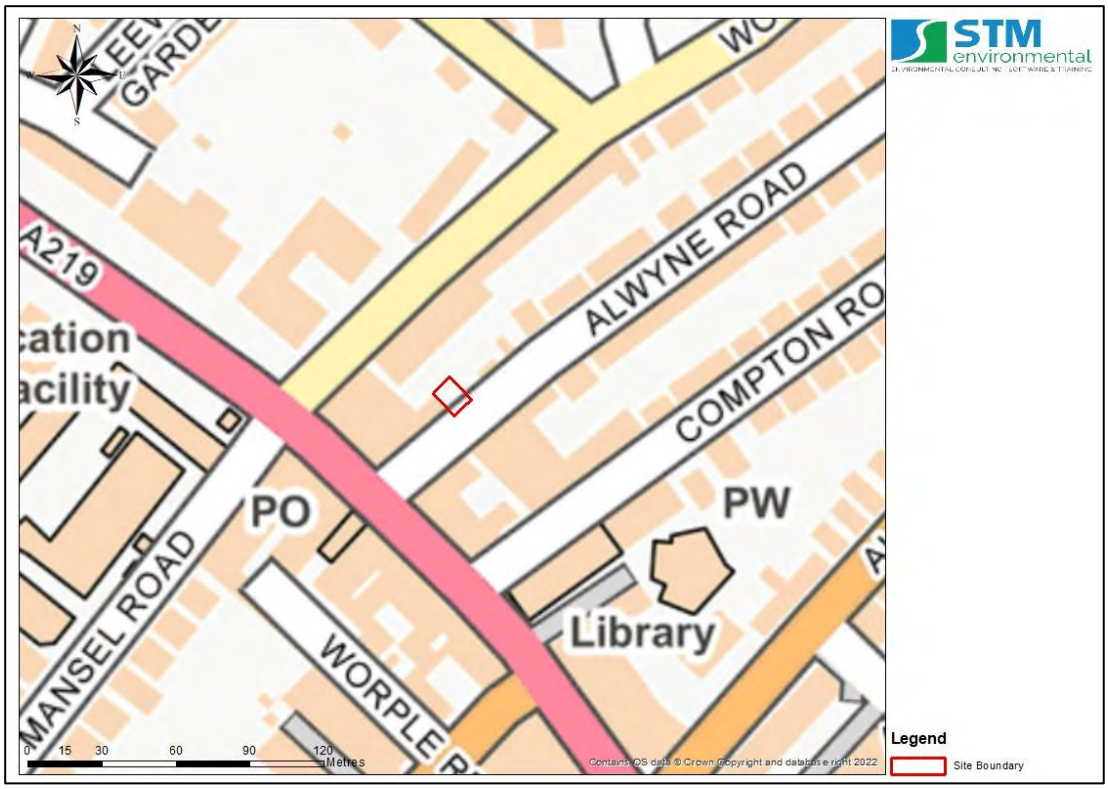
The Environment Agency classifies the superficial deposits as a Secondary (undifferentiated) aquifer and the bedrock as Unproductive. There are no groundwater source protection zones within 250m of the site.

According to BGS mapping information, groundwater is likely to be less than 3m below the ground surface for at least part of the year.

5.3 Topography

The site is stepped. Based on LiDAR imagery the ground levels are estimated as ranging from 25mAOD to 27mAOD.

Figure 1 – Maps showing location of site



6 SUMMARY OF GROUND INVESTIGATION WORKS

The ground investigation works were carried out on 15th of December 2022 and were generally in accordance with the following standards where relevant:

- BS5930:2015 Code of Practice for Ground Investigation.
- BS EN 1997-2 Ground investigation and testing
- BS EN ISO 14688 Geotechnical investigation and testing – Identification and classification of soil
- BS EN ISO 14689 Geotechnical investigation and testing – Identification and classification of rock
- BS EN ISO 22476 Geotechnical investigation and testing - Field testing

6.1 Avoidance of Buried Services and Utilities

All exploratory locations were cleared for buried services using a calibrated Catscan device and hand pits were excavated to a depth of 1.0mbgl at each exploratory hole location prior to commencing drilling.

6.2 Boreholes and Trial Pits

A total of 2no. boreholes were excavated at the site for the purpose of undertaking geotechnical soil sampling and in-situ testing. The boreholes were advanced to a maximum depth of 10mbgl using a dynamic windowless sampling rig. A summary of the boreholes undertaken is provided in **Error! Reference source not found.** below.

Table 1: Summary of boreholes

Borehole ID	Easting*	Northing*	Level at surface (mAOD)	Level at Base (mAOD)	Depth (m)	Comments
BH01	524640	170854	26	16	10	Installation of groundwater monitoring well
BH02	524642	170847	25.30	21.3	4	-

*Note: coordinates and levels are approximate based on OS mapping and LIDAR data

In addition, 1no. external trial pit was excavated to a maximum depth of 1.5mbgl for the purposes of exposing the current foundation profile of properties adjoining the site.

A map showing the locations of the boreholes and trial pits is available in Appendix 2.

6.3 Groundwater Level Monitoring

1no. borehole (BH01) was installed with a standpipe equipped with monitoring apparatus to a depth of 10mbgl to allow for the estimation of groundwater levels. The well was constructed using 63mm HDPE plain pipe in a bentonite seal from existing ground level to 1.00mbgl and 63mm HDPE slotted pipe in a gravel surround to the base of pipe. They were fitted with a gas tap assembly and a lockable cover at ground level to provide protection.

1no. groundwater level monitoring visit was carried out on the week following the investigation.

6.4 Standard Penetration Tests

In-situ Standard Penetration Tests (SPT) were undertaken at the base of the initial hand dug hole and at 1.00m intervals as the boreholes were advanced.

The tests were carried out in accordance with BS EN ISO 22476-3 and consisted of driving a 50 mm split spoon sampler into the soil with a 64 kg weight having a free fall of 760 mm. The blows required to drive the split –barrel sample a distance of 305 mm, after an initial penetration of 152 mm, is referred to as the SPT –N value. They were undertaken at the base of the initial hand dug hole and at 1.00m intervals as the boreholes were advanced.

6.5 Geotechnical Sampling and Laboratory Testing

12no. disturbed samples were recovered from a range of depths within each borehole for geotechnical analysis.

The samples were put into sample containers which were typically tubs, jars or polyethylene bags and tightly sealed. The samples were then transported to the laboratory for analysis.

A programme of geotechnical laboratory testing agreed with the Client and was carried out by i2 Analytical an MCERTS/UKAS accredited laboratory. The requested testing consisted of the following:

- Plasticity Index (6no.)
- Sulphate water soluble (6no.)
- pH (6no.)

7 GROUND INVESTIGATION FINDINGS

7.1 Existing Foundations

The excavation of TP01 took place within the garage structure present on site, and involved the undercutting of the garage foundations in order to expose the profile of the adjoining property's foundation. The exposed foundation profile recorded within TP01 alongside the South Western site boundary is summarised below:

TP01 – Beneath a 30mm thick layer of floor tile, the flat facing external brick wall of the garage was found to extend down 300mm to a depth of 0.33mbgl. This brick wall was sat upon a 250mm thick concrete footing that extended out 200mm from the wall, with the base of the footing residing at 0.53mbgl. The grey plastic shuttering of the adjoining property's concrete foundation was encountered beneath the concrete footing of the garage, and was set back approximately 300mm from the garage footing's front face. The adjoining property's concrete footing was encountered down to a maximum depth of 1.5mbgl and its base was not found.

The trial pit log from the site investigation is available in Appendix 4.

7.2 Ground Conditions

7.2.1 Geology

The investigation revealed ground conditions that were generally consistent with the geological records of the area. Made Ground consisting of gravelly SILT with an abundance of brick fragments was encountered to a maximum depth of 1.2mbgl. The Made Ground was underlain by brown and grey CLAY to 10mbgl.

The borehole logs from the site investigation are available in Appendix 3. Photographs of the soils extracted from the boreholes and trial pit are presented in Appendix 6.

7.2.2 Groundwater

Groundwater was not encountered in any of the boreholes during the site investigation.

1no. round of groundwater monitoring was carried out using BH01 on the 22/12/2022. No groundwater was recorded within the borehole.

It should be noted that due to seasonal variations, accurate groundwater levels can only be determined through long term measurements in monitoring wells. A monitoring well was installed as part of the works.

7.3 Trees

The undertaking of an arboriculture/tree survey was not part of the scope of works. Therefore, the opinions provided in this section in relation to tree heights and species are provided for information only and should not be relied upon. It is recommended that a tree identification survey is undertaken by a suitably qualified Arboriculturist.

The Client provided an Arboricultural Impact Assessment Method Statement & Tree Protection Plan undertaken by Trevor Heaps Arboricultural Consultancy Ltd in November 2022. Based on this the distance from the proposed development to the nearest trees are shown in the table below.

Table 2: Tree information

Tree Type	Height	Distance from Development	Water Demand
Pine	7	1	Moderate
Pine	7	3	Moderate
Wild Cherry	6	1	Moderate
Rowan	4	2	Moderate
Rowan	4	6	Moderate
Wild Cherry	8	4	Moderate
Cedar (Western Red)	16	7	Moderate

7.3.1 Root Activity

Abundant root activity in the form of roots and rootlets were recorded within the Made Ground at location BH01 between 0-1.2mbgl. The roots approximately measured between 1-3mm in diameter.

7.4 Results of Standard Penetration Tests

The results of the in-situ Standard Penetration Tests (SPT) are presented on the borehole logs in Appendix 3 and in tabular form in Appendix 7.

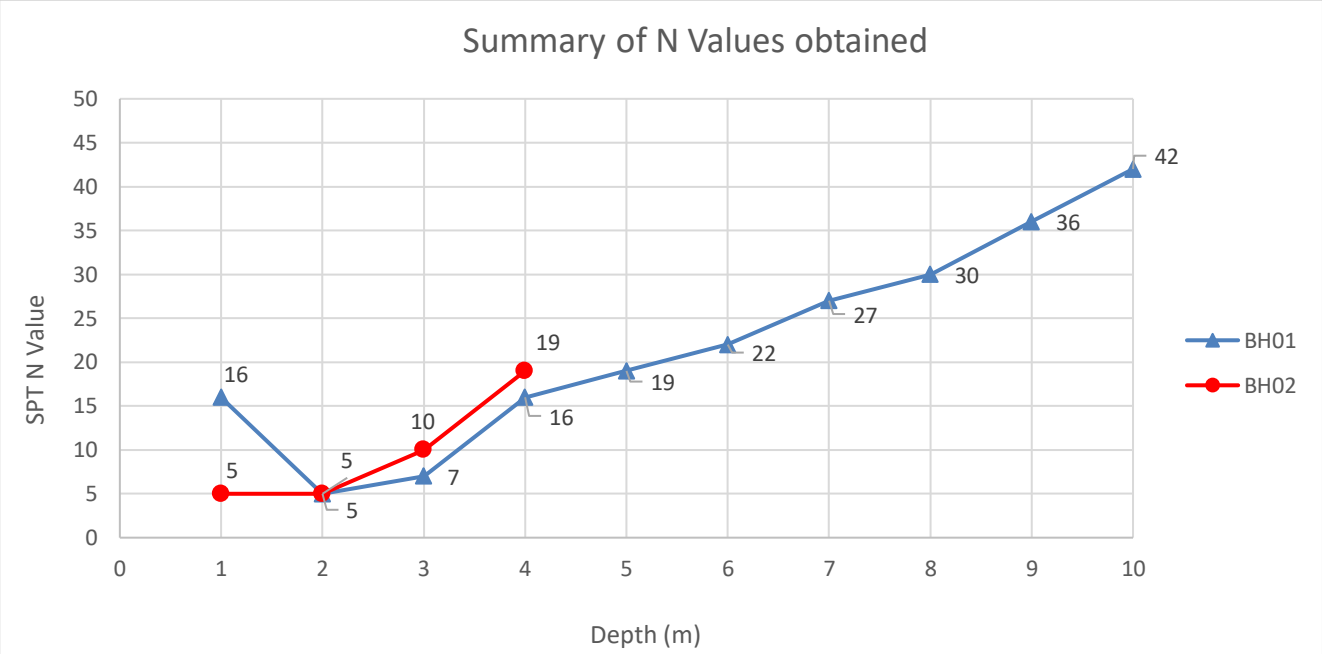
A statistical summary of the results is presented in Table 3 below.

Table 3: Statistical Summary of N Values

Depth	Average N Value	Minimum N Value	Maximum N Value
1	11	5	16
2	5	5	5
3	9	7	10
4	18	16	19
5	-	19	-
6		22	

Depth	Average N Value	Minimum N Value	Maximum N Value
7		27	
8		30	
9		36	
10		42	

Figure 2 - SPT N Values



7.5 Laboratory Test Results

Copies of all laboratory test certificates are available in Appendix 5

7.5.1 Plasticity Index

Atterberg Limit tests were carried out on 6no. samples retrieved from boreholes BH01 and BH02 at depths between 2 and 8mbgl. The results of the index testing are summarised in Table 4 below.

Table 4: Summary of Classification Test Results

Borehole ID	Depth (mbgl)	Sample Description	Plasticity Index (PI) (%)	Modified Plasticity Index (MPI) (%)	Classification	Volume Change Potential
BH01	3	CLAY with Slight Gravel	50	40	CV	High
BH01	5		42	39	CH	High
BH01	8		42	38	CH	High
BH02	2		42	39	CV	High
BH02	3		41	39	CH	High
BH02	4		41	38	CV	High

The samples tested produced results ranging from Clay of high plasticity to very high plasticity.

The samples were found to have Modified Plasticity Index values ranging between 37 % at 4 mbgl to 40 % at 3 mbgl indicating that the volume change potential of the clay is high.

7.5.2 Sulphate and pH Analyses

pH and Water-Soluble Sulphate content analyses were carried out on 7no. soil samples. The results are available in Appendix 5 and are summarised in Table 5 below.

Table 5: Summary of pH and Sulphate Test Results

Borehole ID	BH01	BH01	BH01	BH02	BH02	BH02	BH02
Sample Depth (m)	2	6	10	1	2	3	4
Sulphate Results (mg/l)	68	2760	738	44	186	2410	2660
pH	7.7	7.3	7.4	7.3	7.4	7.1	6.8

The pH values were variable and ranged from 6.8 to 7.7 indicating that acidic to alkaline soil conditions exist at the site.

The results of the Sulphate tests ranged from 44 mg/l SO4 to 2760 mg/l SO4.

8 DISCUSSION AND CONCLUSIONS

8.1 Ground Model

Based on the results of ground investigation to date the simplified conceptual ground model for preliminary design is given in Table 6 below.

Table 6: Simplified Conceptual Ground Model

Stratum	Depth (mbgl)	Inferred Geological Member
Made Ground	0 – 1.2	-
Soft becoming hard CLAY	1.2 – 10	London Clay

8.2 Allowable Bearing Capacity of the Soils

The insitu SPT testing carried out gave N Values that ranged from a minimum of 5 at 2mbgl to a maximum of 42 at 10mbgl suggesting that the CLAY can be described as soft becoming hard.

The inferred allowable bearing capacities by depth are summarised in Table 7 below. It should be noted that for reasons of prudence, the values are based the minimum measured and estimated N values obtained from testing. Also the inferred bearing capacities have been restricted to a maximum of 300kPa for the purposes of minimising unacceptable settlement.

Table 7: Inferred Allowable bearing Capacities

Depth (mbgl)	Strata Description	Minimum N Value	Presumptive Bearing Capacity (kPA) [a]	Allowable Bearing Capacity (kPa) [b]
1	Made Ground	5	<200	55
2	Soft CLAY	5	<75	50
3	Firm CLAY	7	75 - 150	65

4	Stiff CLAY	16	150 - 300	145
5		19		175
6	Very Stiff CLAY	22	300 - 600	200
7		27		245
8		30		275
9		36		300
10	Hard CLAY	42		300

a. For preliminary design purposes, BS 8004:2015 Code of practice for foundations gives typical values of allowable bearing capacity which should result in an adequate factor of safety against shear failure without accounting for the settlement criteria. Acceptable settlement is often taken to lie within the range of 10-25mm, but is structure dependent. Anticipated settlement can be calculated using elastic methods and will vary according to foundation shape and soil stiffness.
b. Stroud and Butler's (1975) graph which shows Cu=4.5N for PI>30%, and increasing to Cu=8N for low plasticity clays (PI=15%). Allowable Bearing Capacity is assumed to be equal to 2 * Cu.

8.3 Influence of Trees on Required Foundation Depth

The NHBC recommends that except where founded on rock, any strip foundations should have a minimum depth of 450mm, measured from finished ground level, to their underside to avoid the action of frost. The depth of the foundation will however need to be varied depending on whether the building is likely to be in the zone of influence of trees and the volume change potential of the bearing strata.

In this case the site contains both Clay soils and is in the zone of influence of trees meaning that special precautions will need to be taken to protect against subsidence and/or heave.

The NHBC foundation depth calculator was used to determine the minimum foundation required for the development. The nearest trees are noted to be situated approximately between 1-7m from the proposed development. The tree species were ascertained to be Rowen (2no.), Pine (2no.), Cedar (1no.) and Wild Cherry(2no.), all considered to have a medium water demand. The Clay was found to have a maximum Modified Plasticity Index of 40% indicating a high volume change potential. The slope of the site was considered to be less than 1 in 7. The results of the calculation, which are available in Appendix 8, indicate that a minimum foundation depth of 2.29m is required. This mainly influenced by the Wild Cherry.

8.4 Basement Construction

The information presented in this section is concerned with the potential applicability of a variety of foundation types for the proposed development. It largely based on technical guidance issued by the NHBC (to which the user is referred for further clarification). Materials and workmanship should meet the requirements set out in this guidance. It is strongly recommended that the advice of a specialist Chartered Structural Engineer (and a specialist piling contractor if relevant) is sought before proceeding with any foundation design.

It is proposed to construct a two storey dwellinghouse with basement. It is assumed that the new basement will be single level with excavations being undertaken to a depth of approximately 3.0mbgl.

The full details of the development were not available at the time of writing so the observations below are relatively generic.

8.4.1 Excavations

Based on the findings of the site investigation, the excavations are expected to encounter Made Ground and soft to firm CLAY.

Shallow excavations (i.e. <1.5mbl) for foundations and services are likely to require nominal side support in the short term. Temporary trench support, or battering of excavation sides, is likely to be required for all excavations that are to be left open for any length of time or where man entry is required. Normal safety precautions should be taken if excavations are to be entered.

The design of basement support in the temporary and permanent conditions should take account of the need to maintain the stability of the excavation and the surrounding structures. Earth retaining systems such as sheet piled or contiguous piled walls could be used provide stability. The use of contiguous piled walls may prove to be most practical and cost effective, as the walls can be incorporated into the permanent works to provide support for the structural loads.

Any earth retaining systems used will be subject to lateral earth pressures from the surrounding soil, groundwater and surcharge loads. Prior to construction, the lateral earth pressures should be computed and the earth retaining designed to adequately withstand these pressures.

If is anticipated that ground movements resulting from the excavation may give rise to an unacceptable impact on any adjacent structures, the temporary supports for the retaining walls should be strengthened to further reduce the wall deflection.

In line with BS:6031 (2009), a risk assessment of the stability of any open excavation should be undertaken by a competent person and appropriate measures adopted to ensure safe working practise in and around open excavations. Further guidance on responsibilities and requirements for working near, and in, excavations can be obtained from the Construction Design and Management Regulations (2015).

8.4.2 Groundwater Control

Although groundwater was not encountered as part of the investigation, some seepages could occur requiring pumping to be undertaken. No particular difficulties are envisaged in removing such water by conventional internal pumping methods from open sumps.

Any water pumped from excavations is likely to need to be passed via settlement tanks before being discharged to the sewer; discharge consents will also be required.

8.4.3 Retaining Walls

For retaining wall design, careful selection of the appropriate parameters will be needed, incorporating allowances for factors such as the presence of groundwater and the possibility of soil softening. The following table of unfactored coefficients has been assessed using data from the site investigation as well as data from published information. The soil parameters listed below are given strictly for guidance purposes only and should be used for the preliminary design purposes only.

Table 8: Parameters for Retaining Wall Design

Stratum/Depth	Depth (mbgl)	Unit Weight (kN/m3)[a, c]	Effective Cohesion c' (kPa)[a]	Effective Friction Angle ϕ˚(degrees)[a]
Made Ground	0 – 1.2	18 - 20	0	26
London Clay (Inferred)	1.2 – >10	19	0	25

Source:
a) Burt Look – Handbook of Geotechnical Investigations and Design Tables (2007)

b) Obrzud and Truty (2012)

8.4.4 Foundations

It should be noted that the information given below is for guidance purposes only. The foundation design is the responsibility of the selected structural engineer.

8.4.4.1 Shallow Foundations

Shallow foundations (i.e. underpins, strip, trench fill, pads, raft) are typically used where the loads imposed by a structure are low relative to the bearing capacity of the surface soils.

Based on the results of the ground investigation, any shallow foundations may be formed within the stiff CLAY encountered at 4mbgl and for which an allowable bearing capacity in the order of 145kPa was inferred. This conclusion will need to be reassessed by the Structural Engineer once the anticipated loads are known.

8.4.4.2 Piled Foundations

If due to the magnitude of the anticipated loads, shallow foundations are not deemed suitable, the installation of a pile foundations at depth should be undertaken as an alternative.

It is beyond the scope of works to provide a full and detailed pile design and therefore the advice of a specialist structural engineer and piling contractor should be sought in this respect.

8.4.5 Basement Slab

The basement slab could be designed as either a fully suspended structure supported on the main foundations or alternatively, as a ground bearing slab.

When designing the basement slab, the potential long term effects of heave in the underlying Clay as it recovers from the removal of overburden associated with the excavation, the potential impact of heave/shrinkage associated with the nearby trees and potential hydrostatic uplift (where lateral drainage is not present) should be taken into account.

In the case of a suspended slab, the incorporation of an appropriate effective void or a proprietary compressible material is likely to be sufficient to mitigate against heave.

A ground bearing slab would have to be designed with an appropriate weight, thickness and stiffness. Formations should be adequately proof rolled and any soft / loose or otherwise unsuitable materials excavated and replaced with a suitable engineered fill.

8.4.6 Basement Heave

Assuming a basement depth of 3.0m, the excavation of gravel soils will result in an unloading of approximately 60 kPa which may result in heaving of the underlying Clay. The movements are likely to mainly be short term elastic movements with subsequent longer term swelling occurring in following years. Although the anticipated heave will be mitigated to some extent by the proposed load of the new structure is recommended that the effects any potential movements are considered in more detail once levels and loads have been finalised.

8.5 Chemical Attack on Buried Concrete

The soil samples tested were found to have water soluble sulphate contents ranging from 44 mg/l SO4 to 2760 mg/l SO4, associated with acidic to alkaline pH values. The characteristic value (i.e. average of the highest two values) was calculated to be 2710 mg/l indicating that the tested soils fall into Class

DS-3 of the Building Research Establishments classification system Special Digest Part 1:2005 “Concrete in aggressive ground” (BRESD).

In these conditions, it is considered that deterioration of buried concrete due to sulphate or acid attack is likely to occur. The final design of buried concrete according to Tables C1 and C2 of BRESD should be in accordance with Class DS-3 conditions and Aggressive Chemical Environment for Concrete ACEC Site Class AC-3.

9 INFORMATION GAPS AND UNCERTAINTIES

A number of assumptions have been made regarding the nature of the strata present at the site and its properties. It is possible that there may be areas of the site that have different characteristics to those observed during the ground investigation and outlined in this report. Should ground conditions differing significantly from those described in our report be encountered during foundation excavation, then the authors should be contacted immediately so that the details of this report can be updated accordingly.

10 ABBREVIATIONS

Abbreviations used in the report

ABBREVIATION	DESCRIPTION
mbgl	metres below ground level
OS	Ordnance Survey
NPPF	National Planning Policy Framework
PI	Plasticity Index
MPI	Modified Plasticity Index
VCP	Volume Change Potential

11 REFERENCES

1. NHBC Standards 2022
2. BS 8004: (2015): Code of practice for foundations
3. Craig, R. F. (1986), Soil Mechanics, 4th ed., ISBN 0-412-38430-2
   Terzaghi, K. (1943): Theoretical soil mechanics, John Wiley and sons, New York

12 APPENDICES

12.1 Appendix 1 - Development Proposals

PROPOSED SITE PLAN
1:50 @ A3

1:200
0m 4m 8m 12m 16m 20m

GBS ARCHITECTURAL
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Revisions

Rev	Date	Notes	Initial

Project

Client: Ernle Estates

Address: Land Between 60 & 66
Alwyne Road
London
SW19 7AE

Stage: Planning

Drawing

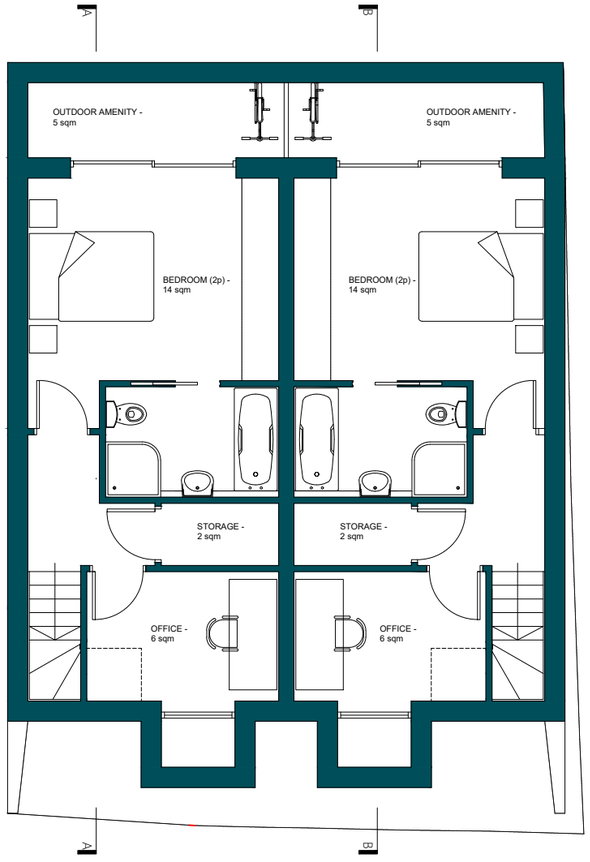
Title: SITE PLAN

Drawn By:

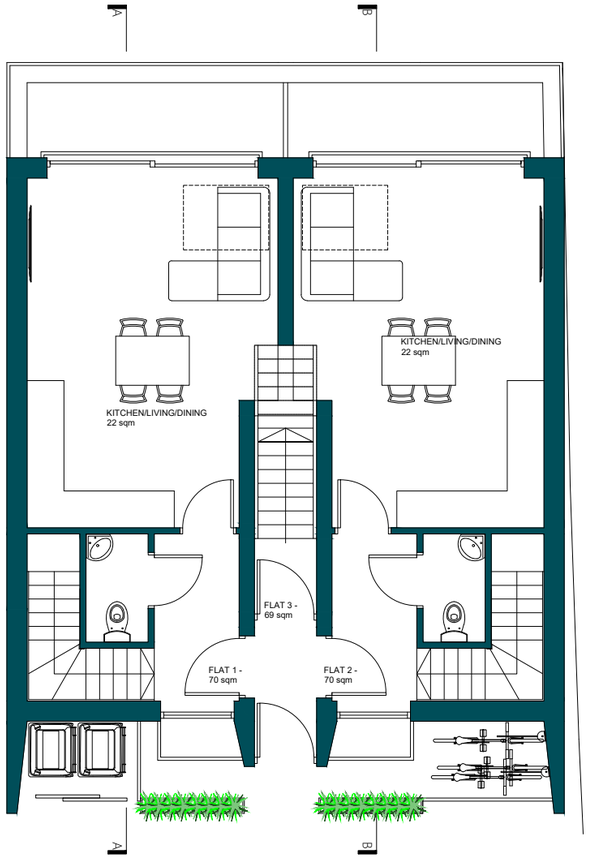
Date: JUN 22

Scale: 1:200 @ A3

Dwg No.: 2022-026-01 Rev: -



BASEMENT PLAN
1:100 @ A3



GROUND FLOOR PLAN
1:100 @ A3

1:100
0m 2m 4m 6m 8m 10m

GBS ARCHITECTURAL

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Important Note

Whilst due care and attention is taken to ensure all surveys, drawings, dimensions and details provided are accurate, it is the Builders responsibility to check and verify all dimensions, details, levels and sewer invert levels on site prior to ordering any materials or commencing works. Should any discrepancies be found these should be relayed to the Architect immediately for review. Should these drawings be used without adequate site investigations and subsequent issues arise, liability will lie solely with the Builder.Do not scale off this drawing, work to figured dimensions only.This drawing must be read and checked with all structural and relevant specialist drawings.The Builder is to comply in all respects with the current Building Regulations and latest Codes of Practice.

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Revisions

Rev	Date	Notes	Initial

Project

Client: Ernle Estates

Address: Land Between 60 & 66
Alwyne Road
London
SW19 7AE

Stage: Planning

Drawing

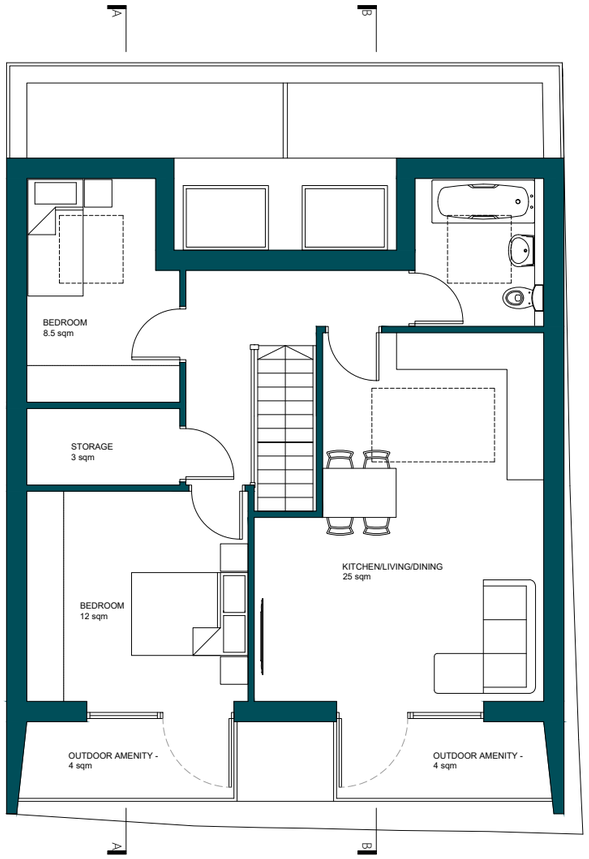
Title: FLOOR PLANS

Drawn By:

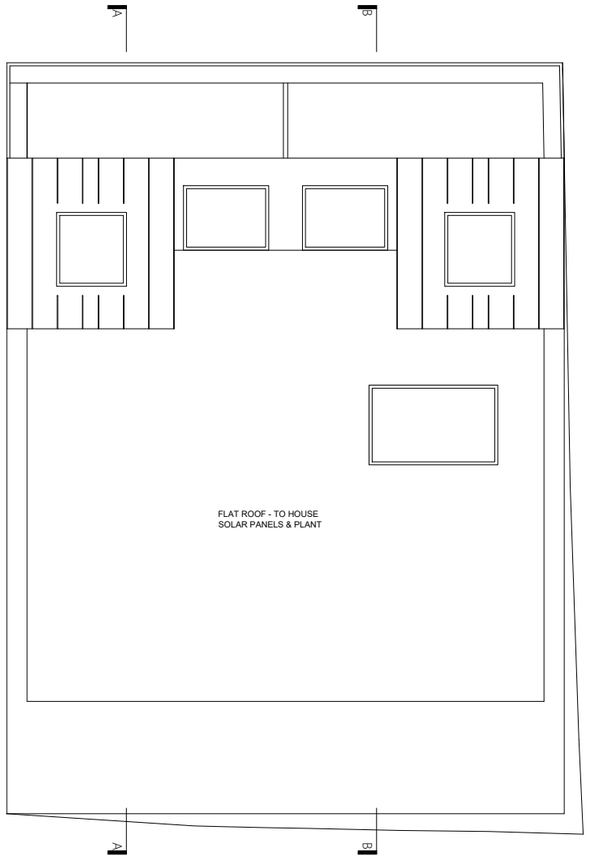
Date: JUN 22

Scale: 1:100 @ A3

Dwg No.: 2022-026-02 Rev: -



FIRST FLOOR PLAN
1:100 @ A3



ROOF PLAN
1:100 @ A3

1:100
0m 2m 4m 6m 8m 10m

GBS ARCHITECTURAL

T: 020 3384 9464 / E: info@gbs.co.uk / W: gbs.co.uk

Important Note

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Revisions

Rev	Date	Notes	Initial

Project

Client: Ernle Estates

Address: Land Between 60 & 66
Alwyne Road
London
SW19 7AE

Stage: Planning

Drawing

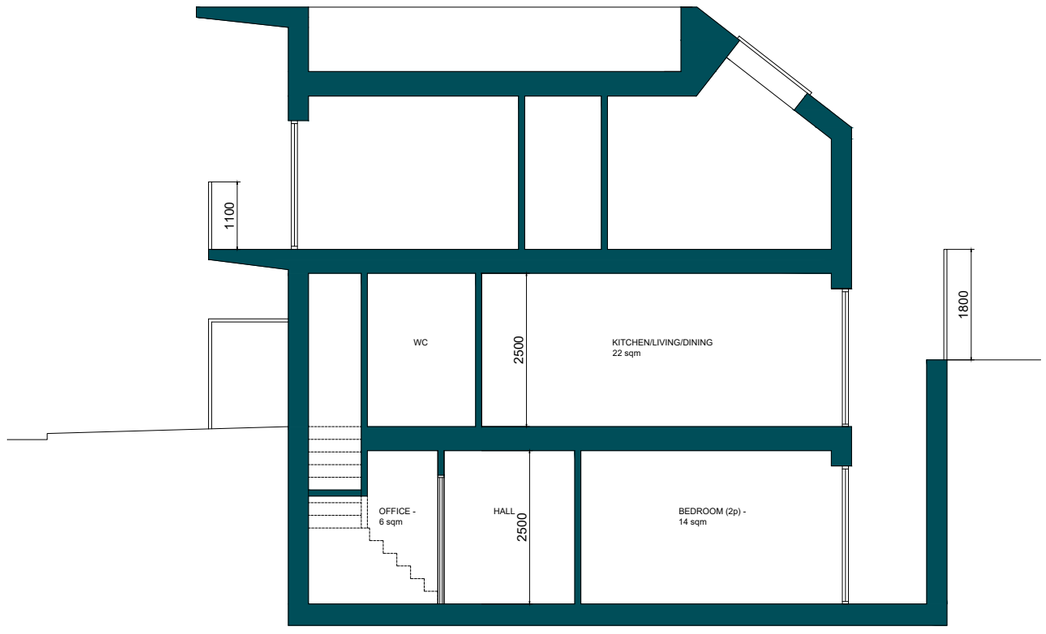
Title: FLOOR PLANS

Drawn By:

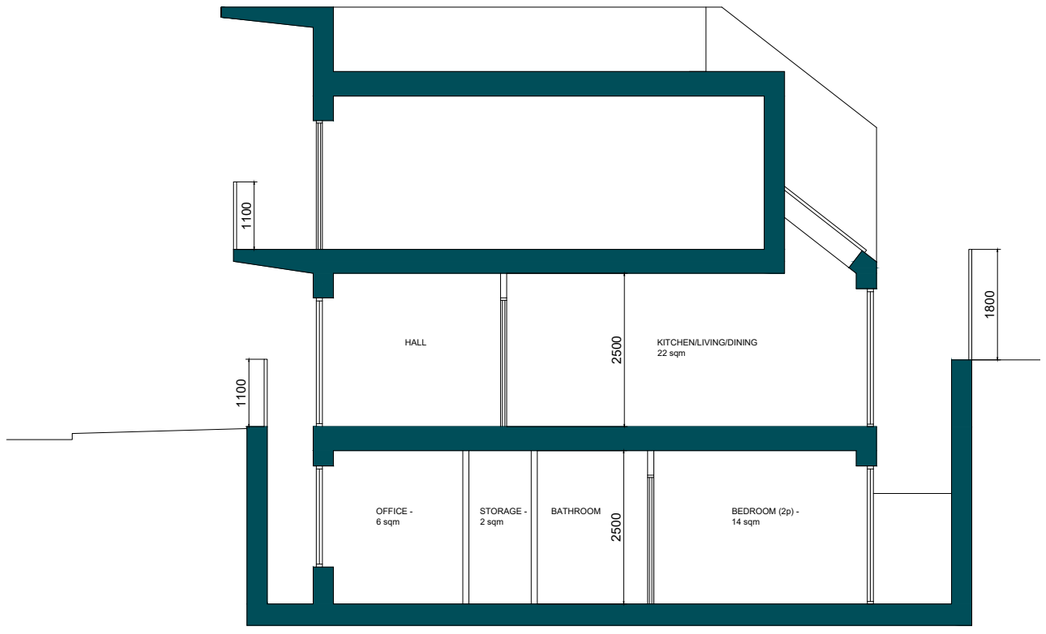
Date: JUN 22

Scale: 1:100 @ A3

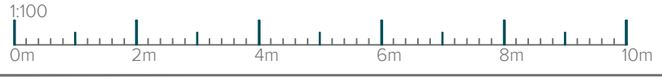
Dwg No.: 2022-026-03 Rev: -



SECTION A-A
1:50 @ A3



SECTION B-B
1:50 @ A3



GBS ARCHITECTURAL

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Revisions

Rev	Date	Notes	Initial

Project

Client: Ernle Estates

Address: Land Between 60 & 66
Alwyne Road
London
SW19 7AE

Stage: Planning

Drawing

Title: SECTIONS

Drawn By:

Date: JUN 22

Scale: 1:100 @ A3

Dwg No.: 2022-026-04 Rev: A

FRONT ELEVATION WITH STREET SCENE
1:50 @ A3

1:50
0m 1m 2m 3m 4m 5m

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Revisions

Rev	Date	Notes	Initial

Project

Client: Ernle Estates

Address: Land Between 60 & 66
Alwyne Road
London
SW19 7AE

Stage: Planning

Drawing

Title: ELEVATIONS

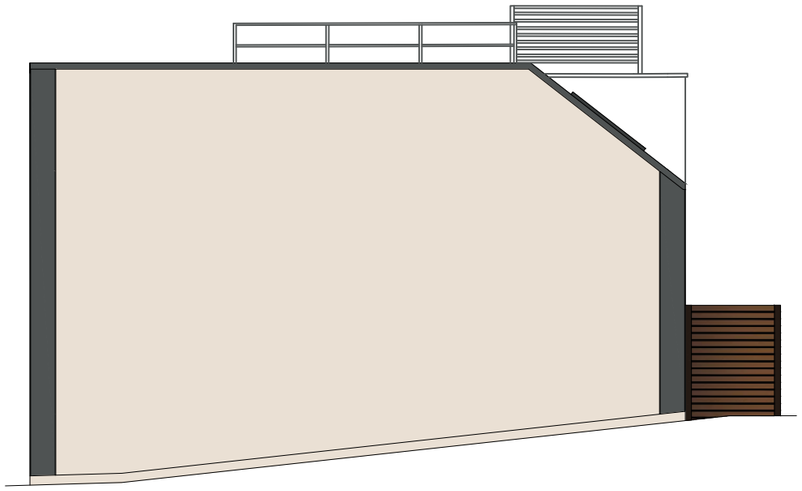
Drawn By:

Date: JUN 22

Scale: 1:100 @ A3

Dwg No.: 2022-026-05 Rev: -

FRONT ELEVATION
1:100 @ A3



SIDE ELEVATION
1:100 @ A3

REAR ELEVATION
1:100 @ A3

GBS ARCHITECTURAL

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1:50
0m 1m 2m 3m 4m 5m

Important Note

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Revisions

Rev	Date	Notes	Initial

Project

Client: Ernle Estates

Address: Land Between 60 & 66
Alwyne Road
London
SW19 7AE

Stage: Planning

Drawing

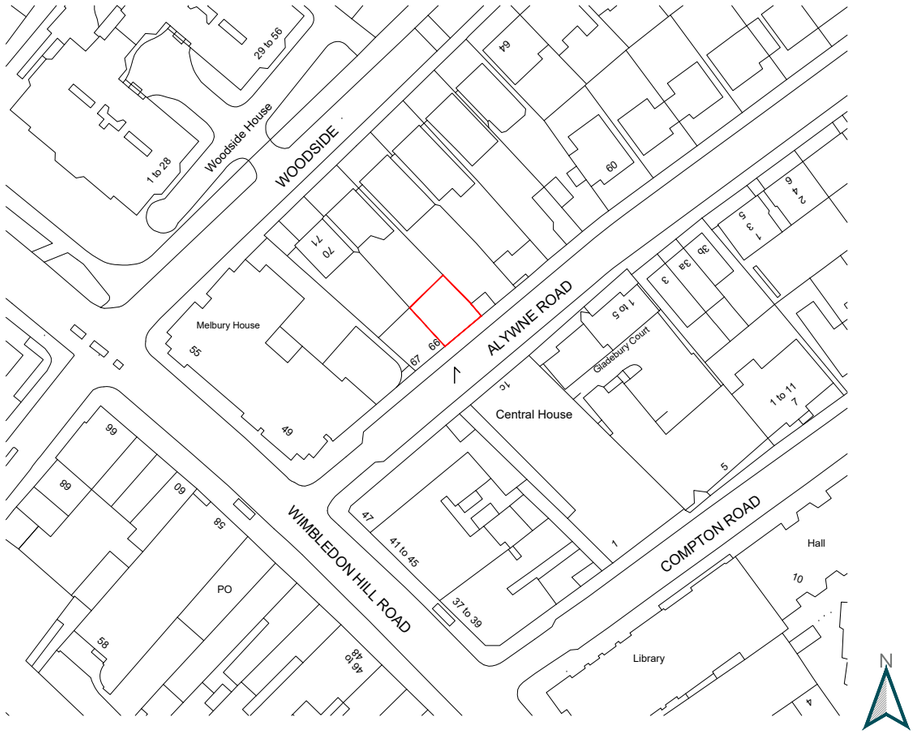
Title: ELEVATIONS

Drawn By:

Date: JUN 22

Scale: 1:100 @ A3

Dwg No.: 2022-026-06 Rev: -



LOCATION PLAN
1:1250 @ A3

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Important Note

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Revisions

Rev	Date	Notes	Initial

Project

Client: Ernle Estates

Address: Land Between 60 & 66
Alwyne Road
London
SW19 7AE

Stage: Planning

Drawing

Title: LOCATION PLAN

Drawn By:

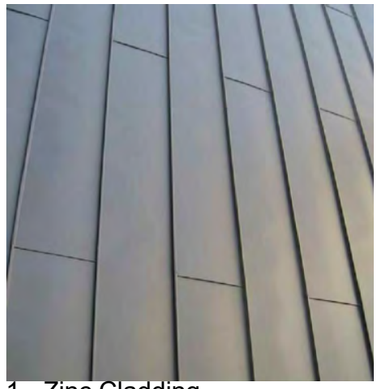
Date: JUN 22

Scale: 1:1250 @ A3

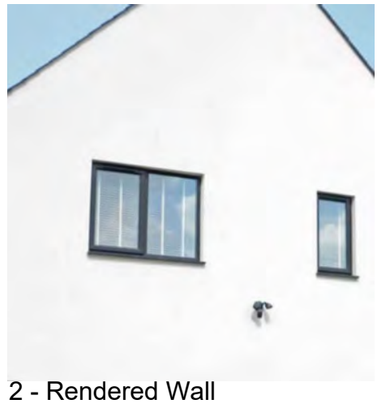
Dwg No.: 2022-026-LP Rev: -

FRONT ELEVATION - MATERIAL STUDY
NOT TO SCALE

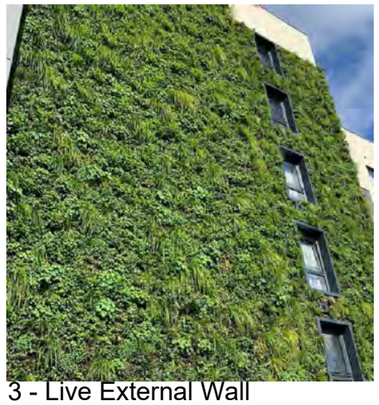
REAR ELEVATION - MATERIAL STUDY
NOT TO SCALE



1 - Zinc Cladding
Anthracite Grey or Similar

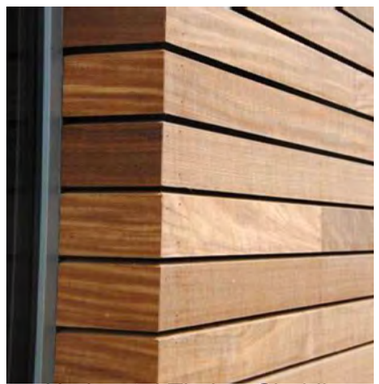


2 - Rendered Wall
White or Similar



3 - Live External Wall
Live Planting

4 - Powder Coated Aluminium Windows & Doors
Anthracite Grey or Similar



5 - Horizontal Timber Cladding
Western Red Cedar or Similar

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Revisions

Rev	Date	Notes	Initial

Project

Client: Ernle Estates

Address: Land Between 60 & 66
Alwyne Road
London
SW19 7AE

Stage: Planning

Drawing

Title: ELEVATIONS

Drawn By:

Date: JUN 22

Scale: NTS @ A3

Dwg No.: 2022-026-07 Rev: -

3D RENDER - Front Elevation
NOT TO SCALE

3D RENDER - Rear View
NOT TO SCALE

GBS ARCHITECTURAL

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Revisions

Rev	Date	Notes	Initial

Project

Client: Ernle Estates

Address: Land Between 60 & 66
Alwyne Road
London
SW19 7AE

Stage: Planning

Drawing

Title: 3D Renders

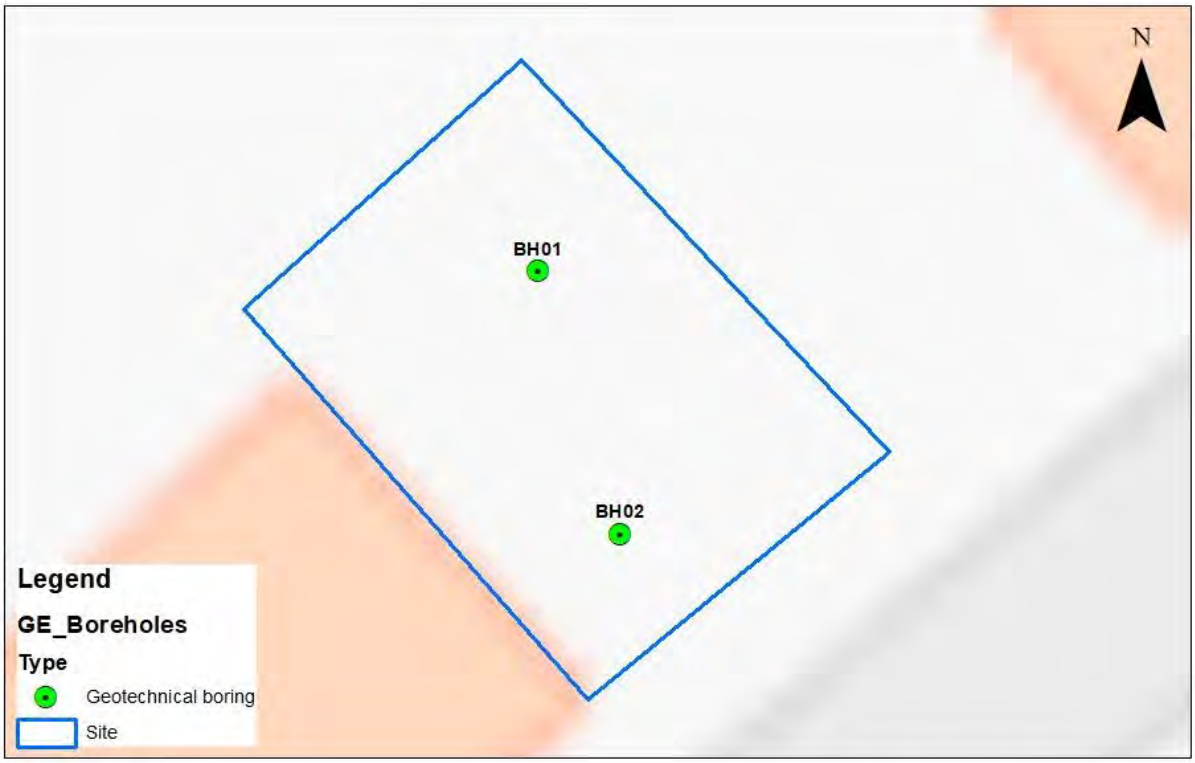
Drawn By:

Date: JUN 22

Scale: NTS @ A3

Dwg No.: 2022-026-08 Rev: -

12.2 Appendix 2 - Borehole Location Plan



0 2.25 4.5 9 Meters

Service Layer Credits: Contains OS data © Crown Copyright and database right 2020

12.3 Appendix 3 - Borehole Logs

Borehole Log

Borehole No. **BH01**

Sheet 1 of 2

Project Name:	Land between 60-66 Alwyne Road, Wimbledon, SW19 7AF	Project No. Land between 60-66 Alwyne Road, Wimbledon, SW19 7A	Co-ords: 0.00 - 0.00	Hole Type WLS
Location:	Land between 60-66 Alwyne Road, Wimbledon, SW19 7AF		Level:	Scale 1:50
Client:	GBS Architectural		Dates: 15/12/2022 - 15/12/2022	Logged By SM/MF/AA

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Made Ground - Dark grey and dark brown gravelly SILT. Abundant medium to large brick fragments. Abundant roots and rootlets (roots approximately 1-3mm in diameter).	
		1.00		N=16 (1,1/2,4,5,5)					1
					1.20			Mottled light brown, dark brown and dark yellow clayey, slightly sandy GRAVEL.	
					1.50			Mottled dark brown and light greenish grey CLAY.	
		2.00							
		2.00		N=5 (1,0/1,1,2,1)					2
		3.00							
		3.00		N=7 (1,1/1,1,2,3)					3
		4.00		N=16 (3,4/3,4,4,5)					4
		5.00							
		5.00		N=19 (3,4/4,5,5,5)					5
		6.00							
		6.00		N=22 (4,5/5,5,6,6)					6
		7.00		N=27 (5,5/7,6,7,7)	7.00			Dark grey CLAY.	7
		8.00							
		8.00		N=30 (5,6/7,7,8,8)					8
		9.00		N=36 (6,6/8,8,9,11)					9
		10.00			10.00				10
								Continued on next sheet	

Remarks

Borehole advanced to a maximum depth of 10mbgl. No water encountered. Elevation levels and borehole location grid references are approximated based on satellite imagery (not measured).

Borehole Log

Borehole No. **BH01**

Sheet 2 of 2

Project Name:	Land between 60-66 Alwyne Road, Wimbledon, SW19 7AF	Project No. Land between 60-66 Alwyne Road, Wimbledon, SW19 7A	Co-ords: 0.00 - 0.00	Hole Type WLS
Location:	Land between 60-66 Alwyne Road, Wimbledon, SW19 7AF		Level:	Scale 1:50
Client:	GBS Architectural		Dates: 15/12/2022 - 15/12/2022	Logged By SM/MF/AA

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.00		N=42 (8,8/8,11,11,12)				End of borehole at 10.00 m

11 12 13 14 15 16 17 18 19 20

Remarks

Borehole advanced to a maximum depth of 10mbgl. No water encountered. Elevation levels and borehole location grid references are approximated based on satellite imagery (not measured).

Borehole Log

Borehole No. **BH02**

Sheet 1 of 1

Project Name:	Land between 60-66 Alwyne Road, Wimbledon, SW19 7AF	Project No. Land between 60-66 Alwyne Road, Wimbledon, SW19 7A	Co-ords: 0.00 - 0.00	Hole Type WLS
Location:	Land between 60-66 Alwyne Road, Wimbledon, SW19 7AF		Level:	Scale 1:50
Client:	GBS Architectural		Dates: 15/12/2022 - 15/12/2022	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Made Ground - Mottled black dark grey and dark brown clayey sandy gravelly SILT. Abundant brick fragments and occasional small to medium sized concrete fragments.
					0.80			
		1.00 1.00		N=5 (1,1/1,1,2,1)				Light brown, dark brown and light greenish grey CLAY.
		2.00 2.00		N=5 (1,1/1,1,1,2)				
		3.00 3.00		N=10 (1,2/2,2,3,3)				
					3.50			Dark brown CLAY.
		4.00 4.00		N=19 (2,3/4,5,5,5)	4.00			End of borehole at 4.00 m

Remarks

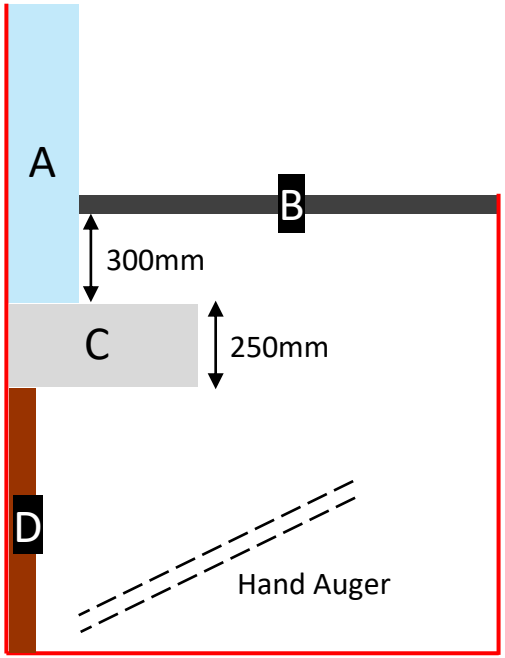
Borehole advanced to a maximum depth of 4mbgl. No water encountered. Elevation levels and borehole location grid references are approximated based on satellite imagery (not measured).

12.4 Appendix 4 – Trial Pit Log

TP01

Photographs

Cross section



Key

A. Brick wall

B. 30mm thick tiles

C. Concrete footing

D. Grey plastic shuttering

Notes

** Dimensions shown in mm.*
** Trial pit excavated to a maximum depth of 1500mm using hand tools.*
** Base of foundations still not encountered at base of trial pit (1.5mbgl).*
** Perched water in CLAY strata encountered at 1.4mbgl*

Red line = Boundary of trial pit

Land Between 60-66 Alwyne Road	
Trial pit record - TP01	15/12/2022
STM environmental	
NOT TO SCALE	

12.5 Appendix 5 – Laboratory Certification and Results

SOCOTEC UK Limited
Unit 11
Cowley Mill Trading Estate
Longbridge Way
Uxbridge
Middlesex
UB8 2YG
Telephone: +44(0) 1895 235235
Mohamed.Jaffer@socotec.com

SOCOTEC

UKAS TESTING
0001

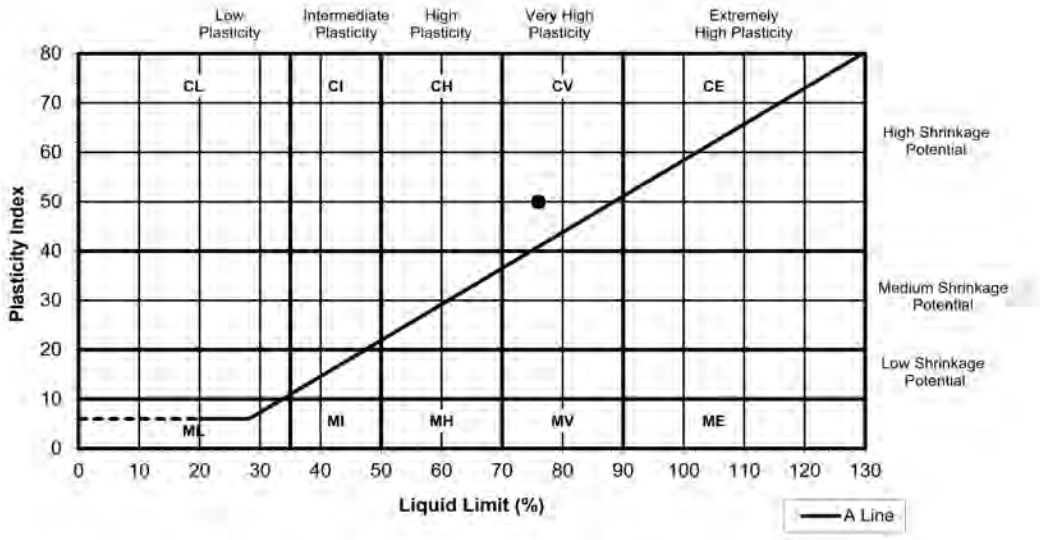
TEST REPORT

Liquid and Plastic Limit and Plasticity Index

Report No:	**UXB0564206/837/M2**	**Report Date:**	**11 January 2023**
		Our Contract Ref:	51072924
Client:	STM ENVIRONMENTAL LTD		
Address:	Unit 6 Crane Mews 32 Gould Road Twickenham TW2 6RS GB	Sample No.	26887837
		Client Sample Ref:	2
		Date Sampled:	15 Dec 2022
		Date Received:	16 Dec 2022
Client Contact:	Lab Info	Date Tested:	6 Jan 2023
Site:	**Land between 60-90 Alwyne Rd, Wimbledon**	Material Supplier:	Site
Location:	BH01/2	Material Source:	Site
Description:	Clay with Slight Gravel	Sampling Certificate:	Received
Material Specification:	Not given	Samples Submitted by:	SOCOTEC Uxbridge
Sample Type:	Bulk Bags	Sampled by:	Client
Depth (m):	2.00 - 3.00	Tested By:	SOCOTEC Uxbridge
Method of Preparation:	BS 1377-1:1990 7.4.3 & BS1377-2:1990 4.2.4		

Results :

As Received Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
40	76	26	50	80



Sample Preparation: **Washed over 425um BS test sieve**

Certified that the laboratory testing was carried out in accordance with BS1377-2:1990 Method 3.2, 4.4 and 5

Signed:

Mohamed Jaffer - Technical Manager
for and on behalf of SOCOTEC UK Limited

Form S1 v9 7/06

SOCOTEC UK Limited
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Longbridge Way
Uxbridge
Middlesex
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Mohamed.Jaffer@socotec.com

SOCOTEC

UKAS TESTING
0001

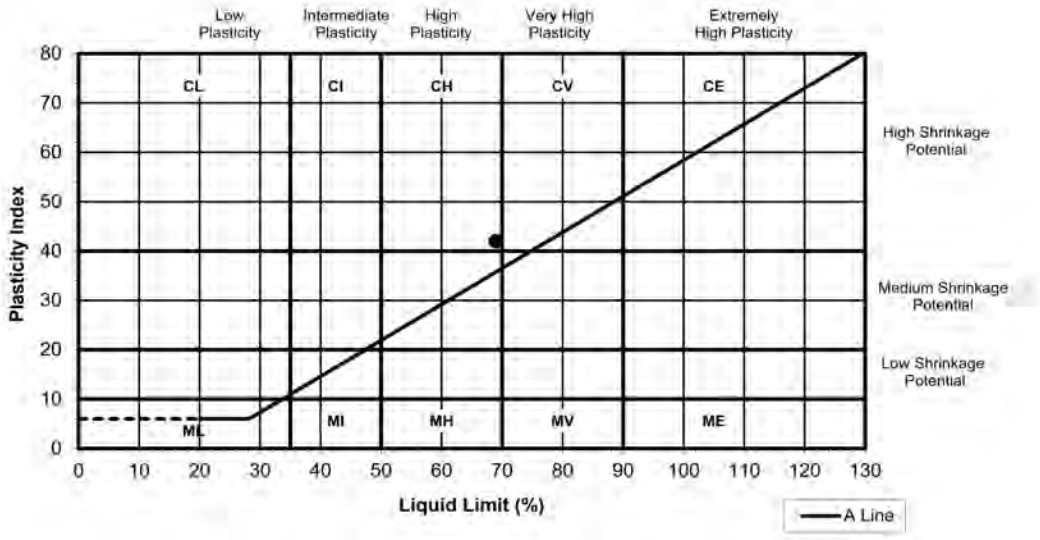
TEST REPORT

Liquid and Plastic Limit and Plasticity Index

Report No:	**UXB0564206/838/M2**	**Report Date:**	**11 January 2023**
		Our Contract Ref:	51072924
Client:	STM ENVIRONMENTAL LTD		
Address:	Unit 6 Crane Mews 32 Gould Road Twickenham TW2 6RS GB	Sample No.	26887838
		Client Sample Ref:	3
		Date Sampled:	15 Dec 2022
		Date Received:	16 Dec 2022
Client Contact:	Lab Info	Date Tested:	6 Jan 2023
Site:	**Land between 60-90 Alwyne Rd, Wimbledon**	Material Supplier:	Site
Location:	BH01/3	Material Source:	Site
Description:	Clay with Slight Gravel	Sampling Certificate:	Received
Material Specification:	Not given	Samples Submitted by:	SOCOTEC Uxbridge
Sample Type:	Bulk Bags	Sampled by:	Client
Depth (m):	3.00 - 5.00	Tested By:	SOCOTEC Uxbridge
Method of Preparation:	BS 1377-1:1990 7.4.3 & BS1377-2:1990 4.2.4		

Results :

As Received Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
30	69	27	42	92



Sample Preparation: **Washed over 425um BS test sieve**

Form S1 v9 7/06

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Mohamed.Jaffer@socotec.com

SOCOTEC

UKAS TESTING
0001

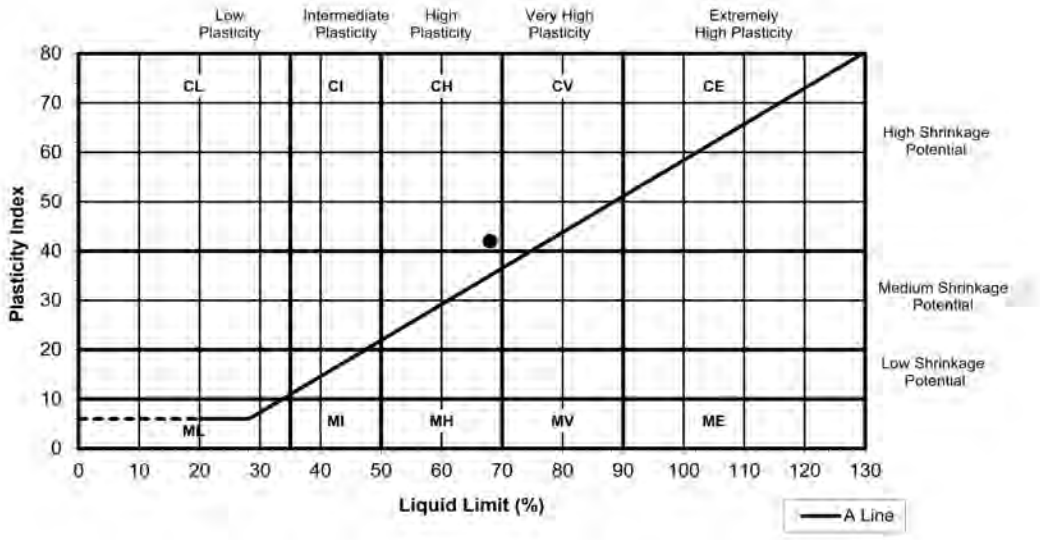
TEST REPORT

Liquid and Plastic Limit and Plasticity Index

Report No:	**UXB0564206/840/M2**	**Report Date:**	**11 January 2023**
		Our Contract Ref:	51072924
Client:	STM ENVIRONMENTAL LTD		
Address:	Unit 6 Crane Mews 32 Gould Road Twickenham TW2 6RS GB	Sample No.	26887840
		Client Sample Ref:	5
		Date Sampled:	15 Dec 2022
		Date Received:	16 Dec 2022
Client Contact:	Lab Info	Date Tested:	6 Jan 2023
Site:	**Land between 60-90 Alwyne Rd, Wimbledon**	Material Supplier:	Site
Location:	BH01/5	Material Source:	Site
Description:	Clay with Slight Gravel	Sampling Certificate:	Received
Material Specification:	Not given	Samples Submitted by:	SOCOTEC Uxbridge
Sample Type:	Bulk Bags	Sampled by:	Client
Depth (m):	6.00 - 8.00	Tested By:	SOCOTEC Uxbridge
Method of Preparation:	BS 1377-1:1990 7.4.3 & BS1377-2:1990 4.2.4		

Results :

As Received Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
28	68	26	42	91



Sample Preparation: **Washed over 425um BS test sieve**

Form S1 v9 7/06

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SOCOTEC

UKAS TESTING
0001

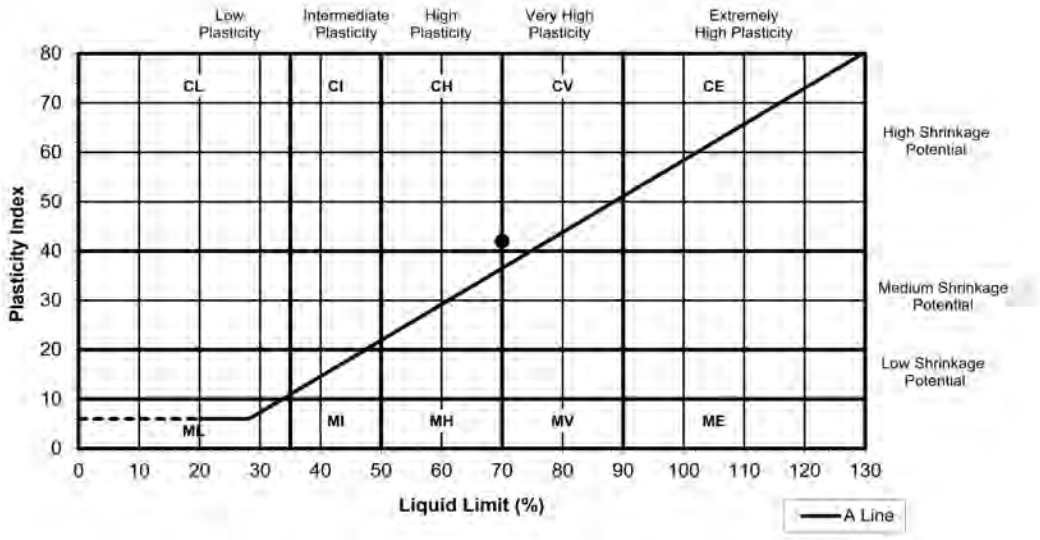
TEST REPORT

Liquid and Plastic Limit and Plasticity Index

Report No:	**UXB0564206/843/M2**	**Report Date:**	**11 January 2023**
		Our Contract Ref:	51072924
Client:	STM ENVIRONMENTAL LTD		
Address:	Unit 6 Crane Mews 32 Gould Road Twickenham TW2 6RS GB	Sample No.	26887843
		Client Sample Ref:	8
		Date Sampled:	15 Dec 2022
		Date Received:	16 Dec 2022
Client Contact:	Lab Info	Date Tested:	6 Jan 2023
Site:	**Land between 60-90 Alwyne Rd, Wimbledon**	Material Supplier:	Site
Location:	BH02/2	Material Source:	Site
Description:	Clay with Slight Gravel	Sampling Certificate:	Received
Material Specification:	Not given	Samples Submitted by:	SOCOTEC Uxbridge
Sample Type:	Bulk Bags	Sampled by:	Client
Depth (m):	1.00 - 2.00	Tested By:	SOCOTEC Uxbridge
Method of Preparation:	BS 1377-1:1990 7.4.3 & BS1377-2:1990 4.2.4		

Results :

As Received Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
38	70	28	42	92



Sample Preparation: **Washed over 425um BS test sieve**

Form S1 v9 7/06

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SOCOTEC

UKAS TESTING
0001

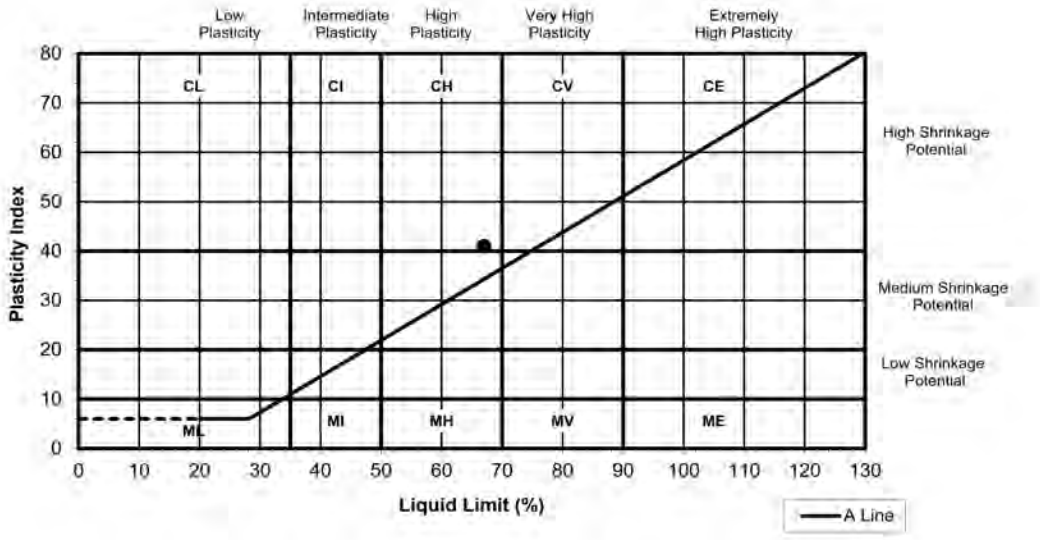
TEST REPORT

Liquid and Plastic Limit and Plasticity Index

Report No:	**UXB0564206/845/M2**	**Report Date:**	**11 January 2023**
		Our Contract Ref:	51072924
Client:	STM ENVIRONMENTAL LTD		
Address:	Unit 6 Crane Mews 32 Gould Road Twickenham TW2 6RS GB	Sample No.	26887845
		Client Sample Ref:	10
		Date Sampled:	15 Dec 2022
		Date Received:	16 Dec 2022
Client Contact:	Lab Info	Date Tested:	6 Jan 2023
Site:	**Land between 60-90 Alwyne Rd, Wimbledon**	Material Supplier:	Site
Location:	BH02/4	Material Source:	Site
Description:	Clay with Slight Gravel	Sampling Certificate:	Received
Material Specification:	Not given	Samples Submitted by:	SOCOTEC Uxbridge
Sample Type:	Bulk Bags	Sampled by:	Client
Depth (m):	2.00 - 3.00	Tested By:	SOCOTEC Uxbridge
Method of Preparation:	BS 1377-1:1990 7.4.3 & BS1377-2:1990 4.2.4		

Results :

As Received Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
29	67	26	41	94



Sample Preparation: **Washed over 425um BS test sieve**

Form S1 v9 7/06

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SOCOTEC

UKAS TESTING
0001

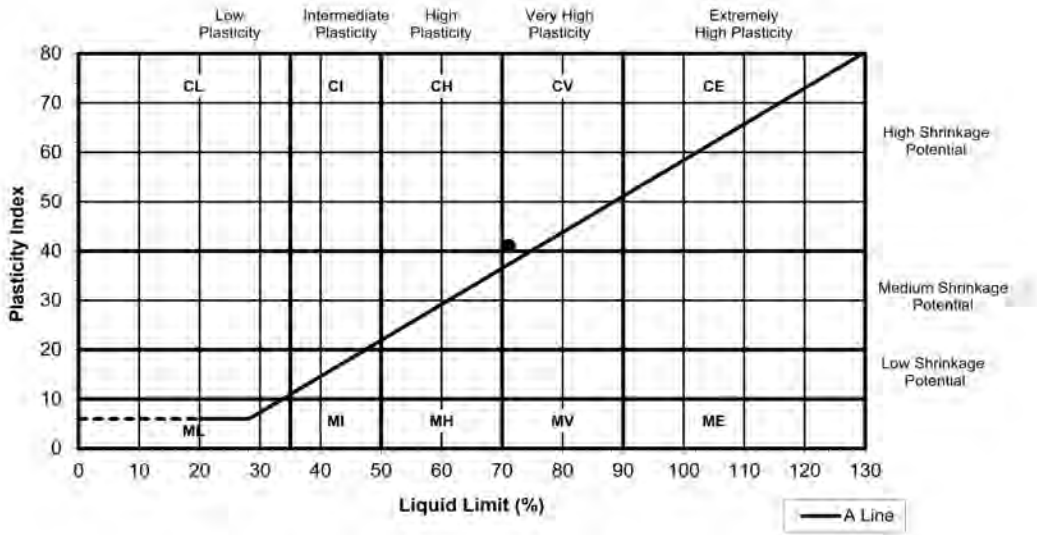
TEST REPORT

Liquid and Plastic Limit and Plasticity Index

Report No:	**UXB0564206/848/M2**	**Report Date:**	**11 January 2023**
		Our Contract Ref:	51072924
Client:	STM ENVIRONMENTAL LTD		
Address:	Unit 6 Crane Mews 32 Gould Road Twickenham TW2 6RS GB	Sample No.	26887848
		Client Sample Ref:	13
		Date Sampled:	15 Dec 2022
		Date Received:	16 Dec 2022
Client Contact:	Lab Info	Date Tested:	6 Jan 2023
Site:	**Land between 60-90 Alwyne Rd, Wimbledon**	Material Supplier:	Site
Location:	BH02/7	Material Source:	Site
Description:	Clay with Slight Gravel	Sampling Certificate:	Received
Material Specification:	Not given	Samples Submitted by:	SOCOTEC Uxbridge
Sample Type:	Bulk Bags	Sampled by:	Client
Depth (m):	4.00 - 4.00	Tested By:	SOCOTEC Uxbridge
Method of Preparation:	BS 1377-1:1990 7.4.3 & BS1377-2:1990 4.2.4		

Results :

As Received Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
29	71	30	41	92



Sample Preparation: **Washed over 425um BS test sieve**

Form S1 v9 7/06

SOCOTEC

Environmental Chemistry

Certificate of Analysis

Client: SOCOTEC Materials Testing

Project: 23010134

Quote: BEC221127710 V1.1

Project Ref: STM Environmental Ltd

Site: UXB0564206 Land Between 60-90 Alwyne Rd, Wimbledon

Contact: Cameo Searle

Address: Unit 11
Cowley Mill Trading Estate
Longbridge Way
Uxbridge
UB8 2YG

E-Mail: Cameo.Searle@socotec.com

Phone: 01895 235 235

No. Samples Received: 7

Date Received: 05/01/2023

Analysis Date: 10/01/2023

Date Issued: 10/01/2023

Report Type: Final Version 01

This report supersedes any versions previously issued by the laboratory

A. M. Kirby

Reported by Customer Service Co-Ordinator
Angela Kirby

Client: SOCOTEC Materials Testing
Project Name: STM Environmental Ltd-UXB0564206 Land Between 60-90 Alwyne R
Project No: 23010134
Date Issued: 10/01/2023

Samples Analysed

Text ID	Sample Reference	Sampling Date	Sample Type	Sample Description
23010134-001	26887836-BH01/1-1-ES-0-0	15/12/2022 00:00:00	SOLID	Soil Sample
23010134-002	26887839-BH01/4-2-ES-0-0	15/12/2022 00:00:00	SOLID	Soil Sample
23010134-003	26887841-BH01/6-3-ES-0-0	15/12/2022 00:00:00	SOLID	Soil Sample
23010134-004	26887842-BH02/1-4-ES-0-0	15/12/2022 00:00:00	SOLID	Soil Sample
23010134-005	26887842-BH02/3-5-ES-0-0	15/12/2022 00:00:00	SOLID	Soil Sample
23010134-006	26887846-BH02/5-6-ES-0-0	15/12/2022 00:00:00	SOLID	Soil Sample
23010134-007	26887847-BH02/6-7-ES-0-0	15/12/2022 00:00:00	SOLID	Soil Sample

Client: SOCOTEC Materials Testing
Project Name: STM Environmental Ltd-UXB0564206 Land Between 60-90 Alwyne Rd, Wimbledon
Project No: 23010134
Date Issued: 10/01/2023

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Analysis Results

					Sample ID	001	002	003	004	005	006	007
					Customer ID	26887836-BH01/1-1-ES-0-0	26887839-BH01/4-2-ES-0-0	26887841-BH01/6-3-ES-0-0	26887842-BH02/1-4-ES-0-0	26887842-BH02/3-5-ES-0-0	26887846-BH02/5-6-ES-0-0	26887847-BH02/6-7-ES-0-0
					Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
					Sampling Date	15/12/2022	15/12/2022	15/12/2022	15/12/2022	15/12/2022	15/12/2022	15/12/2022
Analysis	**Method Code**	**MDL**	**Units**	**Accred.**								
pH (2.5:1 extraction)	PHSOIL	1	pH units	U		7.7	7.3	7.4	7.3	7.4	7.1	6.8
Water Soluble Sulphate as SO4 2:1 Ext	ICPWSS	10	mg/l	U		68	2760	738	44	186	2410	2660
Total Moisture at 105°C	TMSS	0.1	%	U		25.6	22.8	29.8	21.5	25.4	23.8	22.9
Total Moisture at 35°C	CLANDPREP	0.1	%	N		23.5	21.1	20.9	19.0	24.4	20.4	21.5
Description of Solid Material	CLANDPREP		-	N		CLAY	CLAY	CLAY	CLAY	CLAY	CLAY	CLAY

Client: SOCOTEC Materials Testing
Project Name: STM Environmental Ltd-UXB0564206 Land Between 60-90 Alwyne Rd, Wimbledon
Project No: 23010134
Date Issued: 10/01/2023

Deviating Sample Report

Sample Reference	Text ID	Method Code	Incorrect Container	Incorrect Label	Headspace	Incorrect/No Preservative	No Sampling Date	Holding Time
26887836-BH01/1-1-ES-0-0	23010134-001	**PHSOIL**						✓
26887839-BH01/4-2-ES-0-0	23010134-002	**PHSOIL**						✓
26887841-BH01/6-3-ES-0-0	23010134-003	**PHSOIL**						✓
26887842-BH02/1-4-ES-0-0	23010134-004	**PHSOIL**						✓
26887842-BH02/3-5-ES-0-0	23010134-005	**PHSOIL**						✓
26887846-BH02/5-6-ES-0-0	23010134-006	**PHSOIL**						✓
26887847-BH02/6-7-ES-0-0	23010134-007	**PHSOIL**						✓

Analysis Method

Method Code	Method Description	Analysis Method
CLANDPREP	Basic Solid Description	As Received
CLANDPREP	CLand Prep Dry Weight Content @ 35°C	As Received
ICPWSS	Sulphate as SO4 (Water Soluble 2:1 Extract)	Air Dried & Ground
PHSOIL	pH (2.5:1)	As Received
TMSS	Total Moisture @ 105°C	As Received

Result Report Notes

Letters alongside results signify that the result has associated report notes.
The report notes are as follows:

Letter	Note
A	Due to the matrix of the sample the laboratory has had to deviate from our standard protocols to be able to process the sample and provide a result. Where applicable the accreditation has been removed and this should be taken into consideration when utilising the data.
B	The QC associated with this result has not wholly met the QMS requirements, the accreditation has therefore been removed. However, the Laboratory has confidence in the performance of the method as a whole and that the integrity of the data has not been significantly compromised.
C	Due to matrix interference, the internal standard and/or surrogate has not met the QMS requirements. This should be taken into consideration when utilising the data.
D	A non-standard volume or mass has been used for this test which has resulted in a raised detection limit.
E	Due to the parameter value being beyond our calibration range (and following the maximum size of dilution allowed, where applicable), the result cannot be quantified and as such the result will appear as a greater than symbol (>) with the accreditation removed. This data should be used for indicative purposes only.

F Based on the sample history, appearance and smell a dilution was applied prior to testing . Unfortunately, the result is either above (>) or below (<) our calibration range. Results above our calibration range have accreditation removed. The data should be used for indicative purposes only.

G The day 5 oxygen reading was below the capability of the instrument to detect, and therefore the calculated BOD has been reported unaccredited for guidance purposes only.

HWOL Acronym Key

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e everything extracted by the solvent(s)
CU	Clean up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
+	Operator to indicate cumulative e.g. EH_CU+HS_1D_Total

Additional Information

This report refers to samples as received. SOCOTEC UK Ltd takes no responsibility for accuracy or competence of sampling by others.

Results within this report relate only to the samples tested.

The accreditation codes are as follows:

U = UKAS accredited analysis
M = MCERT accredited analysis
N = Unaccredited analysis

Any units marked with ^ signify results are reported on a dry weight basis of 105° C.

All Air Dried and Ground Samples (ADG) are oven dried at less than 35° C.

This report shall not be reproduced except in full, without written approval of the laboratory.

Opinions and interpretations given are outside the scope of our UKAS accreditation.

Any samples marked with * are not covered by our scope of UKAS accreditation. If applicable, further report notes have been added.

Any solid samples where the Major Constituents are not one of the following (Sand, Silt, Clay, Made Ground) are not one of our accredited matrix types.

Any samples marked with ‡ have had MCERTS accreditation removed for this result

Any samples marked with a tick in the deviant table is deviant for the specific reason.

Any samples reported as IS, NA, ND mean the following:

IS = Insufficient Sample to complete analysis
NA = Sample is not amenable for the required analysis
ND = Results cannot be determined

Items listed with a 'SUB' method code prefix have been carried out by an external subcontracted laboratory.

Our deviating sample report does not include deviancy information for Subcontracted analysis. Please see the report from the subcontracted lab for information regarding any deviancies for this analysis.

Summaries of analysis methods are available upon request.

End of Certificate of Analysis

12.6 Appendix 6 – Site Photographs

Rig in operation at location BH01

10m of core samples (left to right) retrieved from sampling location BH01

Location of BH02

4m of core samples (left to right) retrieved from sampling location BH02

Cross section of samples retrieved at sampling location BH02



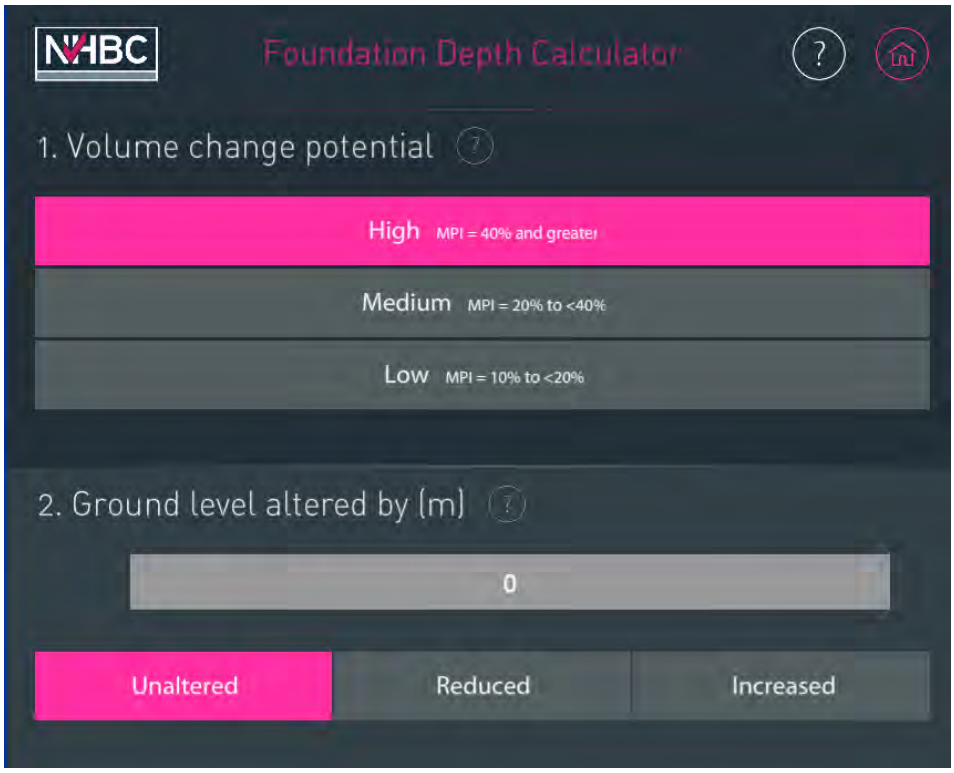
Images taken at Trial Pit location TP01

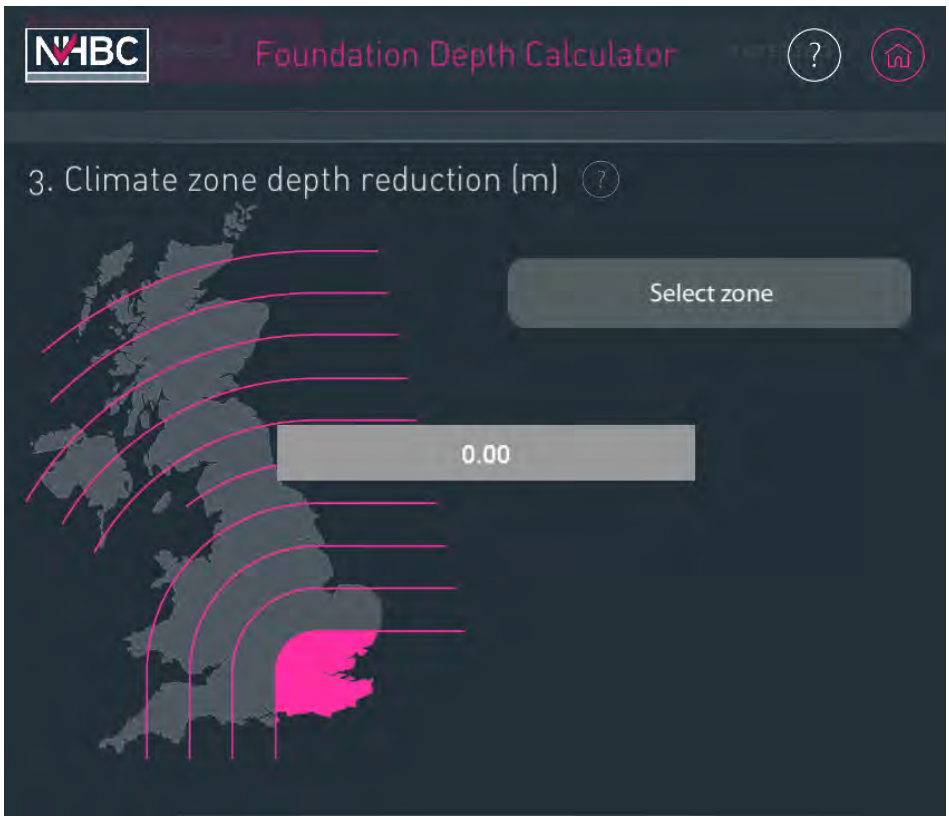
Images showing trees within site boundary

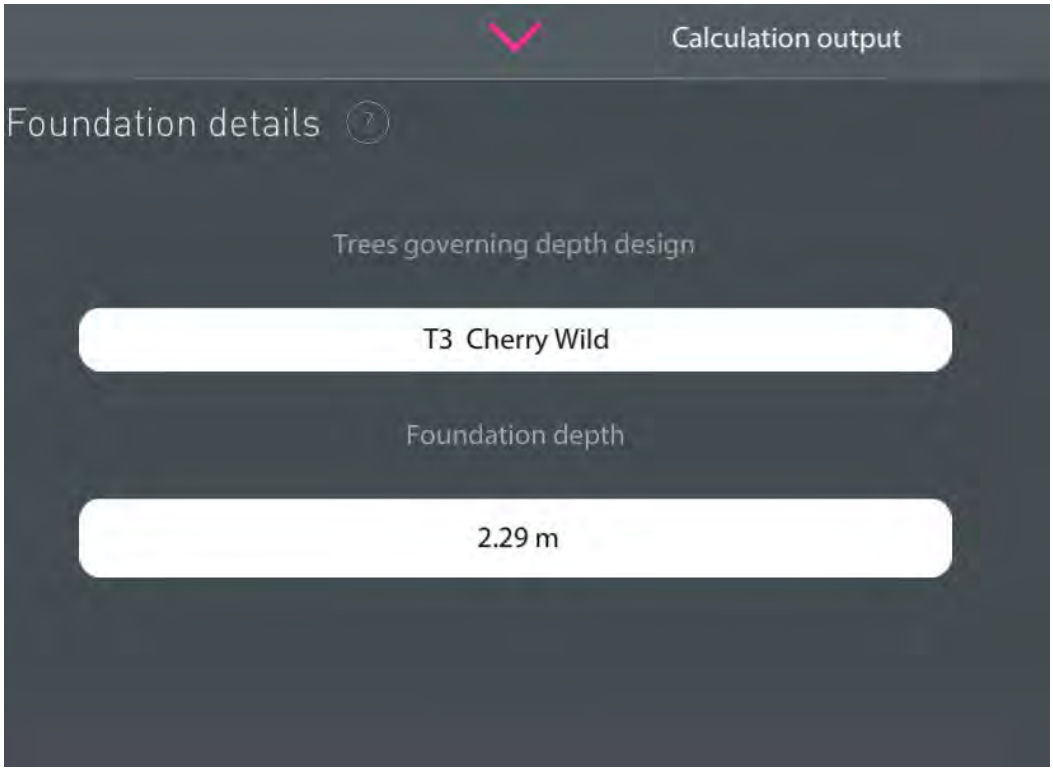
12.7 Appendix 7 – Results of Standard Penetration Testing

Location ID	Depth Top (m)	Blows Seating 1	Blows Seating 2	Blows Main 1	Blows Main 2	Blows Main 3	N Value
BH01	1	1	1	2	4	5	**16**
	2	1	0	1	1	2	**5**
	3	1	1	1	1	2	**7**
	4	3	4	3	4	4	**16**
	5	3	4	4	5	5	**19**
	6	4	5	5	5	6	**22**
	7	5	5	7	6	7	**27**
	8	5	6	7	7	8	**30**
	9	6	6	8	8	9	**36**
	10	8	8	8	11	11	**42**
BH02	1	1	1	1	1	2	**5**
	2	1	1	1	1	1	**5**
	3	1	2	2	2	3	**10**
	4	2	3	4	5	5	**19**

12.8 Appendix 8 – Foundation Depth Calculator Results






Calculation output
Foundation details
Trees governing depth design
T3 Cherry Wild
Foundation depth
2.29 m