

Appendix E

Appendix E – Geotechnical Testing



**Land adjacent to Mayberry Garden Centre
Old Shoreham Road
Portslade**

In Situ Infiltration Test Report

Report Beneficiary:

Tates Bros.
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Avis Road
Newhaven
BN9 0DH

Project Reference: P14741

Report Reference: R14368

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1. INTRODUCTION

Ashdown Site Investigation Ltd was requested to undertake in situ infiltration testing at land adjacent to of Mayberry Garden Centre, Old Shoreham Road, Portslade to assist with the drainage strategy for the proposed development. A copy of the proposed development plan is included in the Appendices to this report.

The specific objectives of the works were to:

- a) Establish the expected geology and hydrogeology at the site;
- b) Investigate the shallow ground and groundwater conditions at the test locations; and
- c) Provide calculated soil infiltration rates to assist others in undertaking design of SUDS.

The scope of the works covered by this report, and the terms and conditions under which they were undertaken, were set out within the offer letter Q9848, dated 23rd June 2020. The instruction to proceed was received on behalf of the client, Tates Bros.

2. SITE CONTEXT

2.1 Site Details

The site comprises an irregular shaped plot of land located to the south of Old Shoreham Road, Portslade and is centred on the approximate Ordnance Survey national grid reference TQ 2521 0583. A site location plan and site plan are presented as Figure 1 and Figure 2, respectively.

2.2 Geological and Hydrogeological Information

2.2.1 Expected Geology and Aquifer Designation

The stratigraphic succession that may be expected to underlie the site is presented in the following table.

Table 1. Expected Strata and Aquifer Designation

Type	Stratum	Aquifer Designation
Superficial	Head	Secondary Undifferentiated Aquifer
	River Terrace Deposits	Secondary B Aquifer
Bedrock	Tarrant Chalk Member	Principal Aquifer

The superficial Head is a polymict deposit generally comprising clay and sandy clay with variable amounts of gravel and cobbles. The lithology of the Head reflects the nature of the parent solid strata; the gravel and cobble fraction comprising chalk and flint. The material is likely to have been disturbed by intense frost action in a periglacial environment. It is usually poorly sorted but may be stratified where it has been subject to solifluction and/or hillwash and soil creep. It may form infill to solution features within the chalk.

The River Terrace Deposits generally comprise well graded sandy fine to coarse gravel. Locally sand or gravel strata may predominate. Lenses of clay, silt and localised peat may be present.

The White Chalk Subgroup comprises a weak, white chalk locally with flint bands together with scattered nodular flints. It may be expected to have a deeply convoluted upper surface as a result of solution weathering. The presence of natural cavities in the chalk is very rare and solution features, if present, can be expected to be infilled with Quaternary deposits such as the Head or River Terrace Deposits.

The infill material may be significantly weaker than the surrounding chalk. Solution features can comprise pipes extending to several metres deep into the chalk or conical depressions and basin shaped structures.

2.2.2 Groundwater Source Protection Zones

The site does not lie within an Environment Agency Source Protection Zone with regard to the protection of the quality of groundwater that is abstracted for potable supply.

3. SITE WORKS

The ground investigation comprised the excavation of four trial pits, designated TP01 to TP04, to depths of between 0.60m and 1.00m using a small mechanical excavator. It is noted that the depth of the trial pits was limited due to the very stiff/dense and gravelly nature of the soils encountered. The fieldwork was carried out on 17th August 2020. The exploratory hole locations are shown on Figure 2.

Falling head soakage testing was carried out within the trial pits in general accordance with BRE guidance¹, other than the pits were filled only once or twice rather than the three times suggested by the digest due to the site work being limited to one day, and the slow draining soils encountered.

Descriptions of the strata encountered and comments on groundwater conditions are shown in the exploratory hole records given in the appendices, together with notes to assist in their interpretation.

¹ Section 3.2.3 of Building Research Establishment (BRE) Digest 365, 2016.

4. GROUND CONDITIONS

4.1 Stratigraphy

4.1.1 Surface Covering

Each of the exploratory holes was excavated through a surface cover of topsoil some 150mm to 300mm in thickness.

4.1.2 Made Ground

Made ground, generally comprising gravelly sandy clay, was recorded to depths of between 0.30m and 0.60m below ground level at three of the four pit locations. The gravel fraction comprised variable quantities of flint, brick, plastic, concrete and charcoal-like material.

4.1.3 Head

Underlying the surfacing/made ground, the investigation progressed into undisturbed gravelly sandy clay deposits which continued to the full depth of investigation.

These soils are considered to represent the Head deposits indicated on the published geological map.

4.2 Groundwater Conditions and Stability

Each of the exploratory holes was recorded to remain dry and stable during the course of excavation, although it is noted that the works were undertaken during a dry summer period.

5. STORMWATER INFILTRATION SYSTEMS

In-situ infiltration testing² was carried out in each of the four trial pits.

To calculate the soil infiltration rate in accordance with the BRE digest the water needs to fall to 25% of the initial test depth. The volume of water between 75% and 25% of the initial test depth is then divided by the sum of the average surface area of the sides of the trial pit in contact with the water during the test monitoring period, and its base area. This figure is then divided by the test duration (time taken for the water level to fall between 75% and 25% of the initial test depth) to give the soil infiltration rate in metres per second.

However during a majority of the tests performed, the water level within the test pits did not fall below 25% of the initial test depth due to the slow draining soils encountered and/or time constraints. For the tests that did not achieve a fall in water level between 75% and 25% of the initial test depth, the soil infiltration rate has been calculated by dividing the volume of water lost during the test by the product of the average surface area of the trial pit in contact with water during the test period and the test duration in seconds.

The infiltration rates derived from the tests are summarised in the following table. The head of water that each infiltration calculation is based on is also summarised in the following table.

Table 2. Calculated Infiltration Rates

Exploratory Hole	Test Response Zone Depth (m)		Stratum	Infiltration Rate (f) (m/sec)	Head of Water (% of Ho)
	Top	Bottom			
TP01	0.43	0.75	Made Ground and Head	4.5×10^{-6}	100-56
TP02	0.50	0.80	Made Ground and Head	6.8×10^{-6}	100-47
TP03 Test 1	0.33	0.60	Head	2.1×10^{-5}	75-25
TP03 Test 2	0.30	0.60	Head	1.1×10^{-5}	100-73
TP04	0.45	1.00	Head	6.1×10^{-6}	100-67

The value 'f' is equivalent to the soil infiltration coefficient 'q' quoted in the Construction Industry Research and Information Association (CIRIA) Report 156.

The results from the infiltration tests indicate that the Head soils possess poor to moderate infiltration characteristics. The results from the infiltration tests should be provided to engineers responsible for the design of the drainage system.

To comply with building regulations³, point discharging infiltration systems (conventional ring or trench soakaways) are required to be constructed a minimum of 5.0m away from proposed or existing buildings.

Ashdown Site Investigation Ltd.

² Conducted in general accordance with the requirements of BRE 365, Soakaway Design.

³ The Building Regulations 2010; Part H; Drainage and Waste Disposal

FIGURES AND APPENDICES

Figure 1 Site Location Plan

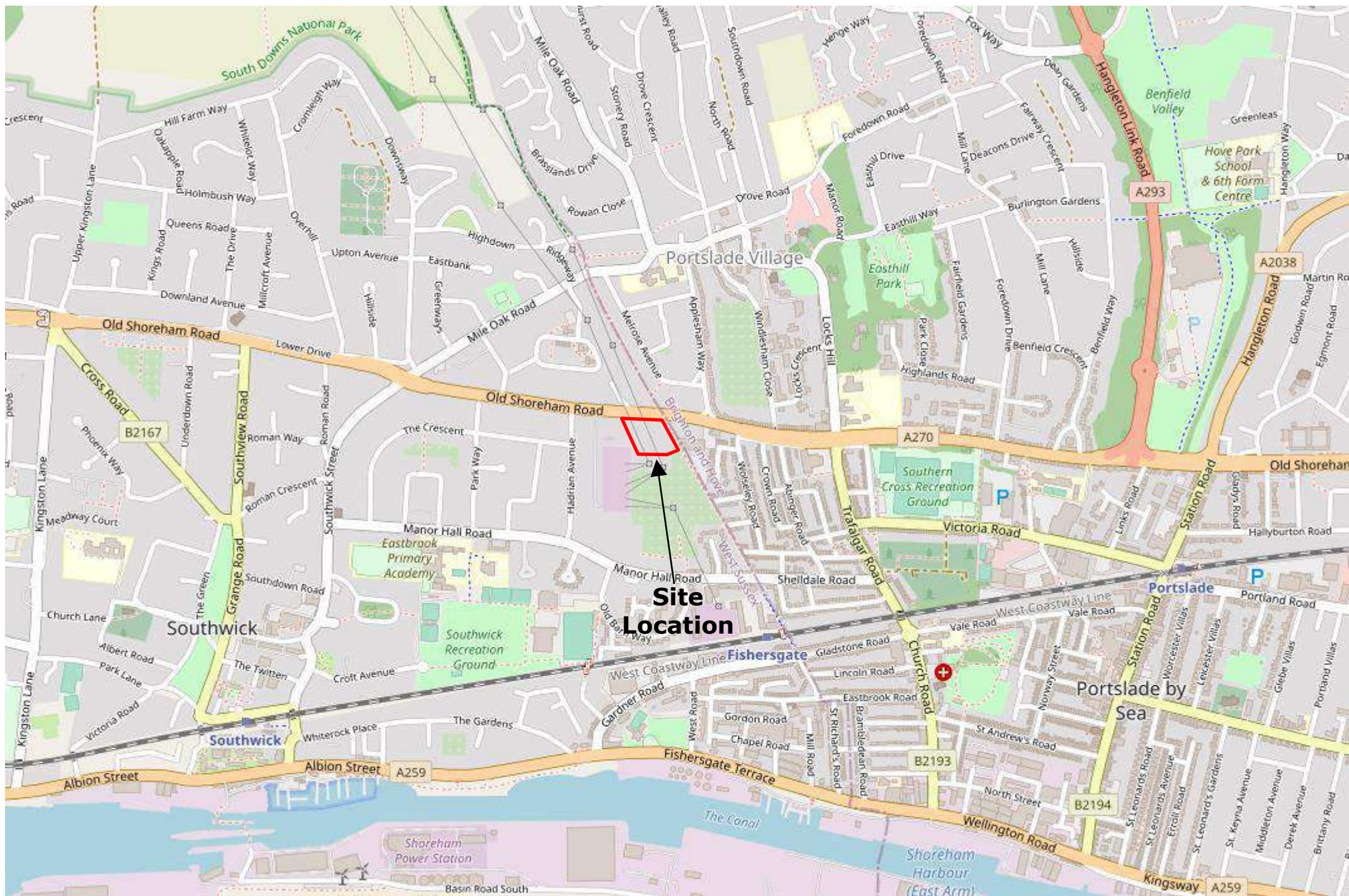
Figure 2 Site Plan

Proposed Development Layout

Exploratory Hole Notes

Exploratory Hole Records

Summary of Trial Pit Falling Head Soakage Test Results



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Site:

Land adjacent to Mayberry Garden Centre
Old Shoreham Road
Portslade

Report Ref:

P14741

Figure No.

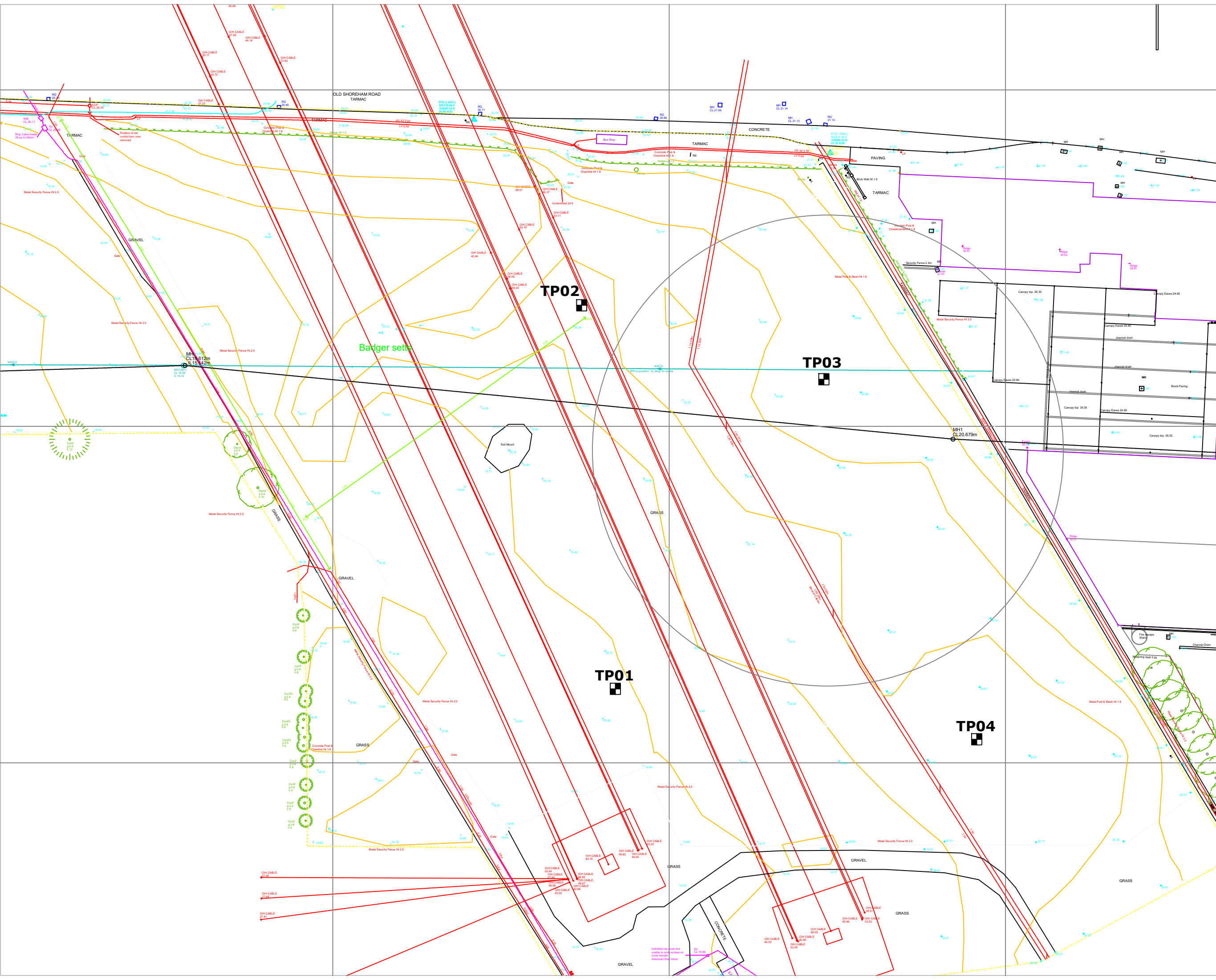
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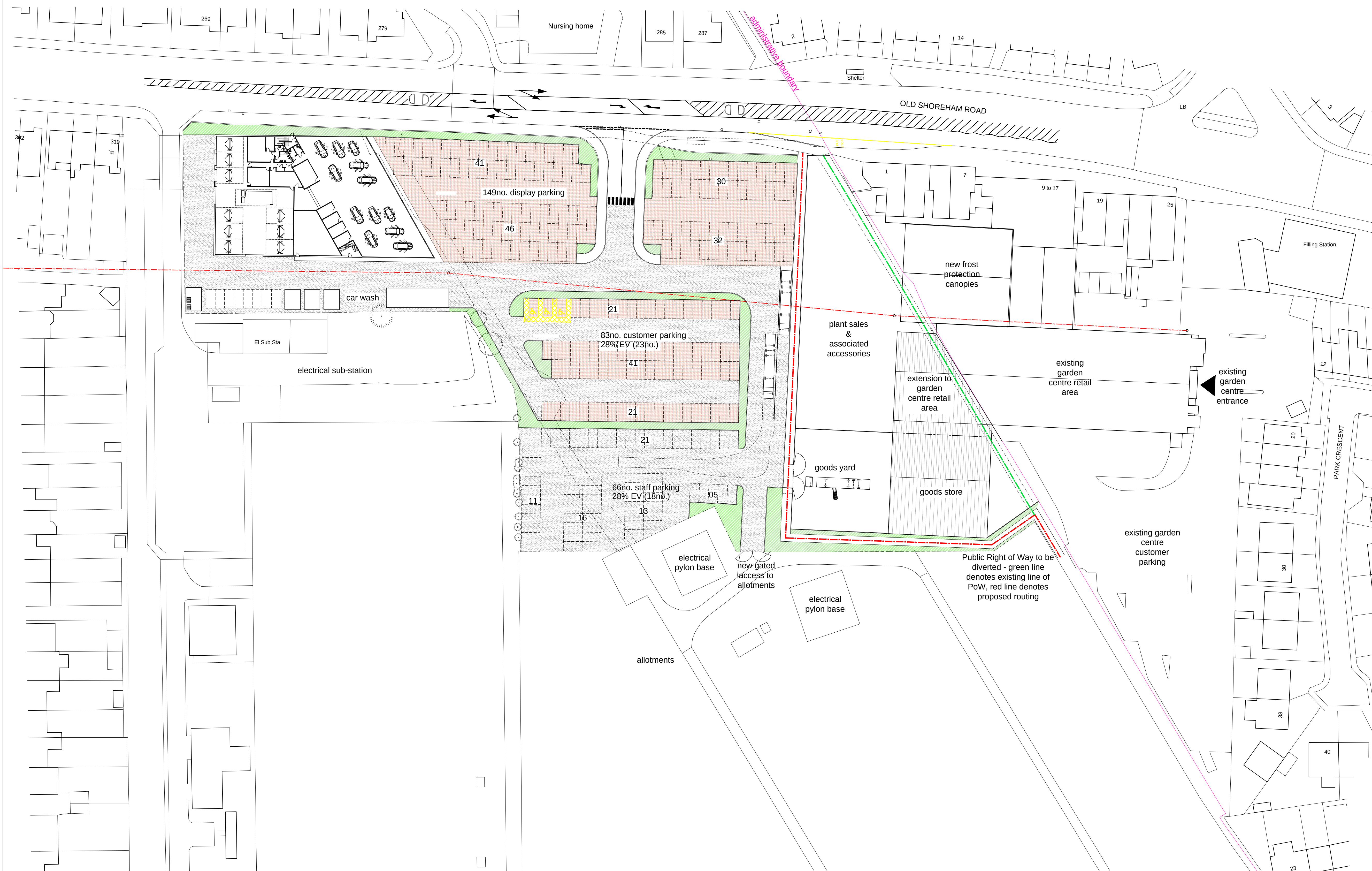
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Site Plan

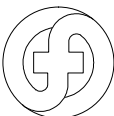
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CLIENT Tates Bro.					
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NOTES FOR THE INTERPRETATION OF EXPLORATORY HOLE RECORDS

1 Symbols and abbreviations

Samples

U	'Undisturbed' Sample: - 100mm diameter by 450mm long. The number of blows to drive in the sampling tube is shown after the test index letter in the SPT column.
U _o	Sample not obtained
U*	Full penetration of sample not obtained
Pi	Piston Sample: 'Undisturbed' sample 100mm diameter by 600mm long.
D	Disturbed Sample
R	Root Sample
B	Bulk Disturbed Sample
W	Water Sample
J	Jar Sample (sample taken in amber glass jar fitted with gas tight lid)
T	Tub Sample
Vi	Vial Sample

In situ Testing

S	Standard penetration test (SPT): Using the split spoon sampler.
C	Standard Penetration Test (SPT): using a solid cone instead of the sampler - conducted usually in coarse grained soils or weak rocks.
V	Shear Vane Test: Undrained shear strength (cohesion) (kN/m ²) shown within the Vane/Pen Test and N Value column.
H	Hand penetrometer Test: Undrained shear strength (cohesion) (kN/m ²) shown within the Vane/Pen Test and N Value column.
P	Perth Penetrometer Test: Number of blows for 300mm penetration shown under Vane/Pen Test and N Value column.

Excavation Method

CP	Cable Percussion Borehole
WLS	Dynamic Sampler Borehole using windowless sampler tubes
WS	Dynamic Sampler Borehole using window sampler tubes
TP	Trial Pit excavated using mechanic excavator
HDP	Trial Pit excavated using hand tools

2 Soil Description

Description and classification of soils has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of soil, Part 1 Identification and description (BS EN ISO 14688-1) and Part 2 Principles of classification (BS EN 14688-2) as well as the BS5930 code of Practice for Ground Investigations.

3 Rock Description

Description and classification of rocks has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of rock, Part 1 Identification and classification (BS EN ISO 14689-1) as well as the BS5930 code of Practice for Ground Investigations. TCR – Total Core Recovery, SCR – Solid Core Recovery, RQD – Rock Quality Designation, NI – Non Intact, If – indicative fracture spacing (min/ave/max), FI – Fracture Index.

4 Chalk Description

Chalk description is based on BS EN ISO 14688, BS EN ISO 14689 and BS5930. The classification of chalk generally follows the guidance offered by the Construction Industry Research and Information Association (CIRIA) C574, 'Engineering in Chalk'. This is based on assessment of chalk density, discontinuity and aperture spacing, and the proportion of intact chalk to silt of chalk.

Site Name: Land adjacent to Mayberry Garden Centre, Old Shoreham Road, Portslade

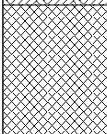
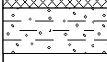
Job Number: P14741

Start Date: 17/08/2020

End Date: 17/08/2020

Trial Pit Number: TP01

Sheet 1 of 1

Samples and In Situ Testing				Stratum Description	
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Legend	Depth/ Reduced Level
D	0.60				0.00
					0.15
					0.60
					0.75
					Topsoil.
					MADE GROUND: Dark brown slightly gravelly slightly sandy clay. Gravel is subangular to subrounded fine to coarse brick, charcoal-like material and flint.
					Brown gravelly slightly sandy CLAY. Gravel is subangular to rounded fine to coarse flint. (Head)
					End of trial pit at 0.75m

Remarks

Groundwater: Trial pit dry on completion.

Stability: Trial pit stable on completion.

Notes: No further progress below 0.75m depth - too hard/ dense.

Excavation Method: TP

Pit Length: 1.00m

Pit Width: 0.40m

Made By: BA

Site Name: Land adjacent to Mayberry Garden Centre, Old Shoreham Road, Portslade

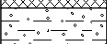
Job Number: P14741

Start Date: 17/08/2020

End Date: 17/08/2020

Trial Pit Number: **TP02**

Sheet 1 of 1

Samples and In Situ Testing				Stratum Description	
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Legend	Depth/ Reduced Level
D	0.70				0.00
					0.15
					0.35
					0.60
					0.80
					Topsoil.
					MADE GROUND: Silty sandy gravel of concrete and flint.
					MADE GROUND: Dark brown slightly gravelly slightly sandy clay. Gravel is subangular to subrounded fine to coarse brick, charcoal-like material and flint.
					Brown gravelly slightly sandy CLAY. Gravel is subangular to rounded fine to coarse flint. (Head)
					End of trial pit at 0.80m

Remarks	
---------	--

Groundwater: Trial pit dry on completion.

Stability: Trial pit stable on completion.

Notes: No further progress below 0.80m depth - too hard/ dense.

Excavation Method: TP

Pit Length: 1.10m

Pit Width: 0.40m

Made By: BA

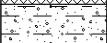
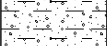
Site Name: Land adjacent to Mayberry Garden Centre, Old Shoreham Road, Portslade

Job Number: P14741**Start Date:** 17/08/2020

End Date: 17/08/2020

Trial Pit Number: **TP03**

Sheet 1 of 1

Samples and In Situ Testing				Stratum Description	
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Legend	Depth/ Reduced Level
D	0.50				0.00
					0.15
					0.30
					0.60
					Topsoil.
					MADE GROUND: Dark brown slightly gravelly slightly sandy clay. Gravel is subangular to subrounded fine to coarse flint, brick and plastic.
					Brown gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse flint. (Head)
					End of trial pit at 0.60m

Remarks	
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Groundwater: Trial pit dry on completion.

Stability: Trial pit stable on completion.

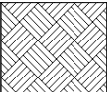
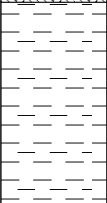
Notes: No further progress below 0.60m depth - too hard/ dense.

Excavation Method: TP

Pit Length: 1.00m

Pit Width: 0.40m

Made By: BA

ASHDOWN SITE INVESTIGATION L · I · M · I · T · E · D E-mail: contact@ashdownsi.co.uk Web: www.ashdownsi.co.uk Tel: 01273 483119 Site Name: Land adjacent to Mayberry Garden Centre, Old Shoreham Road, Portslade Job Number: P14741 Start Date: 17/08/2020 End Date: 17/08/2020		Trial Pit Number: TP04		Sheet 1 of 1		
Samples and In Situ Testing						
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Legend	Depth/ Reduced Level	Stratum Description
D	0.80				0.00	Topsoil.
					0.30	Brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse flint. (Head)
					1.00	End of trial pit at 1.00m
Remarks Groundwater: Trial pit dry on completion. Stability: Trial pit stable on completion. Notes: No further progress below 1.00m depth - too hard/ dense.						Excavation Method: TP Pit Length: 1.20m Pit Width: 0.40m Made By: BA

ASHDOWN SITE INVESTIGATION LIMITED

Site: Land adjacent to Mayberry Garden Centre, Old
Shoreham Road, Portslade

Project No: P14741
Sheet No.: 1 of 2

SUMMARY OF TRIAL PIT FALLING HEAD SOAKAGE TEST RESULTS

TP01		TP02	
Time (mins)	Depth to water (m bgl)	Time (mins)	Depth to water (m bgl)
0	0.43	0	0.50
1	0.43	1	0.50
2	0.44	2	0.50
3	0.44	3	0.50
4	0.44	4	0.50
5	0.45	5	0.51
8	0.45	8	0.51
10	0.45	10	0.52
12	0.45	20	0.56
14	0.46	38	0.59
18	0.46	72	0.62
20	0.46	98	0.64
26	0.46	124	0.65
47	0.48	158	0.66
68	0.50		
102	0.52		
134	0.54		
188	0.57		
Pit Length - 1.00m Pit Width - 0.40m Pit Depth - 0.75m bgl		Pit Length - 1.10m Pit Width - 0.40m Pit Depth - 0.80m bgl	

Remarks: bgl - below ground level.

ASHDOWN SITE INVESTIGATION LIMITED

Site: Land adjacent to Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No: P14741 Sheet No.: 2 of 2
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SUMMARY OF TRIAL PIT FALLING HEAD SOAKAGE TEST RESULTS

TP03 (Test 1)		TP03 (Test 2)		TP04	
Time (mins)	Depth to water (m bgl)	Time (mins)	Depth to water (m bgl)	Time (mins)	Depth to water (m bgl)
0	0.33	0	0.30	0	0.45
2	0.36	2	0.31	1	0.45
3	0.37	3	0.31	2	0.45
4	0.38	4	0.31	3	0.46
5	0.39	5	0.31	4	0.46
7	0.40	6	0.31	5	0.46
10	0.41	7	0.31	7	0.47
15	0.43	8	0.33	8	0.47
19	0.43	15	0.34	9	0.48
25	0.45	22	0.36	10	0.48
45	0.49	30	0.37	15	0.50
66	0.54	45	0.38	21	0.51
Pit Length - 1.00m Pit Width - 0.40m Pit Depth - 0.60m bgl		Pit Length - 1.00m Pit Width - 0.40m Pit Depth - 0.60m bgl		Pit Length - 1.20m Pit Width - 0.40m Pit Depth - 1.00m bgl	

Remarks: bgl - below ground level.



**Proposed Development at
Mayberry Garden Centre
Old Shoreham Road
Portslade**

**Combined Geotechnical and
Quantitative Ground Contamination Risk Assessment**

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Project Reference: P14899

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EXECUTIVE SUMMARY

The following presents a summary of the main findings of the report. It is emphasised that no reliance should be placed on any individual point until the whole of the report has been read as other sections of the report may put into context the information contained herein.

The development proposals are understood to comprise the construction of a detached car showroom/service centre in the west, a large area of external car parking in the centre, and the extension and alteration of the existing garden centre in the east.

Reference to geological datasets indicates that the site is expected to be underlain by Head and river Terrace Deposits overlying the White Chalk Subgroup. The ground investigation confirmed the underlying soils to comprise a shallow thickness of made ground, overlying Head deposits.

The Head and River Terrace Deposits are classed as a Secondary Undifferentiated Strata and a Secondary B Aquifer, respectively. The White Chalk Subgroup is classed as a Principal Aquifer. The site does not lie within an Environment Agency Source Protection Zone with regard to the protection of the quality of groundwater that is abstracted for potable supply. Groundwater was not encountered during the intrusive works or during the subsequent stand-pipe monitoring that has been undertaken to date.

Precautions against shrinkage and heave for any new foundation system should assume a medium volume change potential for the fine-grained Head soils. The undisturbed gravel soils of the Head may be considered to be non-plastic and hence non-shrinkable.

A net allowable bearing capacity of 150kN/m² may be assumed for spread (pad or strip) foundations up to 1.5m across bearing within the Head soils of at least stiff consistency or medium dense relative density, typically encountered below 1.00m below ground level.

A DS-1 Design Sulfate Class and an AC-1s ACEC classification may be assumed for the design of concrete in contact with the ground.

Ground bearing floor slabs may be considered provided made ground soils are appropriately compacted and the depth of foundations required to protect against seasonal soil volume changes close to trees is less than 1.5m.

Design equilibrium California bearing ratios and moduli of subgrade reaction are presented in the report. The subgrade is likely to be susceptible to frost heave.

The results from the infiltration tests indicate that the Head soils possess poor to moderate infiltration characteristics.

The ground investigation did not identify any concentrations of the identified potential contaminants that would be considered to pose an unacceptable risk to end users of the site or to controlled waters beneath the site.



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FIGURES AND APPENDICES

FIGURES

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- Figure 2 Site Plan

APPENDIX A

- Proposed Development Layout

APPENDIX B

- Exploratory Hole Notes
- Exploratory Hole Records
- DPSH-B Dynamic Probe Records
- Summary of In-situ TRL Cone Penetrometer (CBR) Test Results
- Summary of Trial Pit Falling Head Soakage Test Results
- Gas Concentration and Groundwater Monitoring Results
- Previous Exploratory hole Records and Test Results (P14741)

APPENDIX C

- Geotechnical Test Results
- Contamination Test Results

APPENDIX D

- Classification of Probability, Consequence and Risk

APPENDIX E

- Preliminary Conceptual Model

APPENDIX F

- Quantitative Conceptual Model



1. INTRODUCTION

The currently vacant land to the west of Mayberry Garden Centre, located at Old Shoreham Road, Portslade is to be redeveloped. The development proposals are understood to comprise the construction of a detached car showroom/service centre in the west, a large area of external car parking in the centre, and the extension and alteration of the existing garden centre in the east. Copies of the extent of the development site and the proposed layout are presented in Appendix A.

Ashdown Site Investigation Ltd was requested to undertake a ground investigation and to provide advice to assist with the structural design and support a planning application.

The specific objectives of the works were to:

- a) Establish the expected geology, hydrogeology and hydrology at the site;
- b) Investigate the shallow ground and groundwater conditions in the area of the proposed development;
- c) Provide advice to assist others in undertaking design of spread foundations, ground floors, road pavement and soakaways;
- d) Test for the presence of contaminants identified by the preliminary conceptual model; and
- e) Develop a quantitative conceptual model of the site, refining the preliminary model to identify any remaining pollutant linkages that may be present.

The scope of the works covered by this report, and the terms and conditions under which they were undertaken, were set out within the offer letters Q10287 and Q10288, both dated 17th November 2020. The instruction to proceed was received on behalf of the client.

This report should be read in conjunction with the Preliminary Ground Contamination Risk Assessment Report prepared by Ashdown Site Investigation Ltd¹. A previous In Situ Infiltration Test Report² has also been produced for the site by Ashdown Site Investigation Ltd.

The results of the in situ infiltration testing, together with the logs, have been included within this report and the appendices for completeness.

¹ Ashdown Site Investigation Project No. P14740 Report No. R14367, dated 4th September 2020.

² Ashdown Site Investigation Project No. P14741 Report No. R14368, dated 4th September 2020.



2. SITE CONTEXT

2.1 Site Description

The site comprises an irregular shaped plot of land located to the south of Old Shoreham Road, Portslade and is centred on the approximate Ordnance Survey national grid reference TQ 2521 0583. A site location plan and site plan are presented as Figure 1 and Figure 2, respectively.

The area under investigation lies to the west of Mayberry Garden Centre and comprises open land overgrown with tall grass, with areas of brambles in some places. There are three areas within the site, separated by steel palisade fencing. The two western areas are separated from the larger eastern area by a crushed stone surfaced access way which provides access from Old Shoreham Road in the north to allotment gardens located to the south of the central part of the site. Two large electricity pylons are located immediately beyond the southern site boundary.

To the south of the western part of the site is a large electricity substation, with cables feeding into the pylons. A brick structure, housing electrical equipment bounds the western part of the site immediately to the south. The remainder of the site is bounded by housing.

2.2 Geological and Hydrogeological Information

2.2.1 Expected Geology and Aquifer Designation

The stratigraphic succession that may be expected to underlie the site is presented in the following table.

Table 1. Expected Strata and Aquifer Designation

Type	Stratum	Aquifer Designation
Superficial	Head	Secondary Undifferentiated Aquifer
	River Terrace Deposits	Secondary B Aquifer
Bedrock	Tarrant Chalk Member	Principal Aquifer

The superficial Head is a polymict deposit generally comprising clay and sandy clay with variable amounts of gravel and cobbles. The lithology of the Head reflects the nature of the parent solid strata; the gravel and cobble fraction comprising chalk and flint. The material is likely to have been disturbed by intense frost action in a periglacial environment. It is usually poorly sorted but may be stratified where it has been subject to solifluction and/or hillwash and soil creep. It may form infill to solution features within the chalk.

The River Terrace Deposits generally comprise well graded sandy fine to coarse gravel. Locally sand or gravel strata may predominate. Lenses of clay, silt and localised peat may be present.

The White Chalk Subgroup comprises a weak, white chalk locally with flint bands together with scattered nodular flints. It may be expected to have a deeply convoluted upper surface as a result of solution weathering.



2.2.2 Mining and Natural Ground Hazards

The presence of natural cavities in the chalk is very rare and solution features, if present, can be expected to be infilled with Quaternary deposits such as the Head or River Terrace Deposits. The infill material may be significantly weaker than the surrounding chalk. Solution features can comprise pipes extending to several metres deep into the chalk or conical depressions and basin shaped structures.

Whilst chalk deposits were also often mined locally, the geo-environmental data sets and review of historical mapping discussed within the Preliminary Ground Contamination Risk Assessment Report³ did not indicate any significant risk of mines being present beneath the site.

However there still remains the possibility that localised, small scale, unrecorded mines could be present and it is therefore recommended that all stripped formation levels should be inspected for evidence of historical backfilled shafts as a precaution.

2.2.3 Groundwater Source Protection Zones

The site does not lie within an Environment Agency Source Protection Zone with regard to the protection of the quality of groundwater that is abstracted for potable supply.

2.2.4 Groundwater and Surface Water Abstraction Licences

The closest groundwater abstraction licence is recorded to lie 807m to the west of the site. The abstraction is for process water.

No surface water abstraction licences are indicated within 1km of the Site.

2.2.5 Surface Water Features

No significant surface water features are recorded within 250m of the site.

³ Ashdown Site Investigation Project No. P14740 Report No. R14367, dated 4th September 2020.
Mayberry Garden Centre, Old Shoreham Road, Portslade



3. GROUND INVESTIGATION

3.1 Introduction

The ground investigation comprised the excavation of a series of dynamic sampler boreholes, hand dug pits and mechanically dug trial pits together with accompanying in-situ geotechnical testing. Gas and groundwater monitoring standpipes were installed in selected exploratory holes and monitored on subsequent site visits. The fieldwork was carried out between 24th November and 2nd December 2020. The exploratory hole locations are shown on Figure 2.

Descriptions of the strata encountered and comments on groundwater conditions are shown in the exploratory hole records given in Appendix B, together with notes to assist in their interpretation.

3.2 Exploratory Holes

3.2.1 Dynamic Sampler Boreholes

Ten boreholes, designated BH01 to BH05 and WS01 to WS05, were drilled to depths of between 2.00m and 3.80m below ground level.

The boreholes were formed by a series of 1.0m long, open ended, hollow steel tubes of up to 100mm diameter, each containing a removable plastic liner. The tubes, progressively reducing in diameter, were driven into the ground by means of a track-mounted drop weight. Each tube was extracted from the ground using a hydraulically operated jack and the enclosed sample was recovered in its plastic liner.

The system enables sub-samples to be taken for detailed examination and laboratory testing.

3.2.2 Trial Pits

Four trial pits, designated SA101 to SA104, were dug by mechanical excavator to depths of between 2.40m and 2.50m below ground level to enable in situ infiltration testing to be carried out. The pits were unsupported and were logged from the surface.

In addition, six trial pits, designated CBR01 to CBR06 were dug using hand tools to depths of between 0.50m and 0.60m below ground level to enable in-situ CBR testing to be carried out.

3.3 Sampling

Disturbed samples of soil were taken at the depths shown in the exploratory hole records and were collected in plastic bags, plastic tubs or amber jars fitted with gas tight lids.

On collection the amber jars were stored in cool boxes with cooling blocks to maintain temperatures below 4°C until transferred to refrigerators upon return to the office and subsequently forwarded to the external accredited chemical testing laboratory.



3.4 In-situ Testing

The depths of in-situ testing, together with the test results, are either given on the exploratory hole records or are summarised separately in Appendix B.

3.4.1 DPSH Dynamic Probe (Super Heavy) Testing

Continuous dynamic probe tests were undertaken adjacent to boreholes BH01 to BH05, WS02 and WS05. The tests were conducted to depths of between 3.30m and 5.00m below ground level using a super heavy DPSH-B⁴ probing geometry.

The DPSH-B configuration is similar to that of the standard penetration test (SPT); the main differences being that the tip comprises a 90° cone, the driving rods are lighter than those used for SPT testing and the blow counts are recorded over 100mm increments rather than 300mm, as is the case for the SPT.

The blow counts recorded and the calculated dynamic point resistances, which account for inertia of the anvil and driving rods, are presented on the borehole records and separately in Appendix B.

3.4.2 Undrained Shear Strength

Undrained shear strength determinations were made in-situ within the fine-grained soils using a Geonor hand shear vane.

Additionally, undrained shear strength determinations were made within samples of the fine-grained soils held in the dynamic sampler liners using a hand penetrometer.

3.4.3 California Bearing Ratio Tests

Testing to determine the in-situ California Bearing Ratio (CBR) of soils was conducted at shallow depths within trial pits CBR01 to CBR06 and adjacent to boreholes BH01, BH02, BH03, WS01, WS03 and WS05 using a Transport Research Laboratory (TRL) cone penetrometer.

3.4.4 Soakage Testing

Falling head soakage tests were undertaken in trial pits SA101 to SA104. The tests were carried out in general accordance with BRE guidance⁵. The pits were backfilled with a free draining material to maintain hole stability and the fall in water level was recorded using dataloggers installed in standpipes. The pits were filled on three separate occasions.

During a previous phase of works (project No P14741), falling head soakage testing was carried out within trial pits TP01 to TP04 in general accordance with BRE guidance, other than the pits were filled only once or twice rather than the three times suggested by the digest due to the site work being limited to one day, and the slow draining nature of the soils encountered. The exploratory hole records and test results are included in Appendix B for completeness and the positions of the test holes are included on the site plan, Figure 2.

⁴ As defined by BS EN ISO 22476-2:2005.

⁵ Section 3.2.3 of Building Research Establishment (BRE) Digest 365, 2016.

3.5 Installations

Gas and groundwater monitoring standpipes were installed to depths of between 2.00m and 3.80m in boreholes BH01, BH03, BH05, and WS01 to WS05. Descriptions of the installations are shown on the exploratory hole records in Appendix B.

The concentrations of gases and depths to groundwater were recorded within the standpipes installed in boreholes WS01 to WS05 on three occasions between the 1st and 14th December 2020. The readings are presented in Appendix B.

Groundwater data loggers were installed within the standpipes constructed within boreholes BH01, BH03 and BH05. The groundwater monitoring within these positions is still ongoing and the results will be issued separately.

3.6 Laboratory Testing

Laboratory testing was scheduled by Ashdown Site Investigation Ltd. Results from the laboratory tests are provided in Appendix C.

3.6.1 Geotechnical Testing

Geotechnical testing was undertaken by an external UKAS accredited laboratory in accordance with the methods given in BS1377⁶. Chemical testing to enable classification of the chemical environment of soils in accordance with BRE SD1⁷ was also undertaken by an external laboratory.

3.6.2 Chemical Testing

Chemical (contamination) testing of selected samples was undertaken by a laboratory with recognised (UKAS and MCERTS) accreditation for quality control.

⁶ BS1377:1990 Parts 1 to 8, Methods of test for soils for civil engineering purposes.

⁷ BRE Special Digest 1:2005 Concrete in Aggressive Ground.

4. GROUND CONDITIONS

4.1 Stratigraphy

4.1.1 Surface Covering

Each of the exploratory holes was excavated through a surface cover of topsoil some 50mm to 300mm in thickness.

4.1.2 Made Ground/Reworked Soils

Made ground/Reworked soils, generally comprising gravelly sandy clay, was recorded to depths of between 0.20m and 0.60m below ground level. The gravel fraction comprised variable quantities of flint, brick, chalk, carbonaceous materials and charcoal-like material.

Within trial pit CBR02, sandy gravel of crystalline rock was recorded to a depth of 0.18m below ground level.

No made ground soils were recorded in exploratory holes BH02, BH04, WS02, WS04, CBR02, SA104 or TP04.

4.1.3 Head

Underlying the topsoil/made ground/reworked soils, the investigation progressed into undisturbed generally firm varying to stiff, slightly gravelly, slightly sandy, clay deposits which continued to the full depth of exploratory holes CBR01 to CBR06, WS01 and TP01 to TP04, and to depths of between 0.90m and 1.80m in the remaining exploratory holes.

Beneath the clay deposits, the exploratory holes encountered typically medium dense to dense and very dense, sandy, silty, clayey gravel soils. These soils continued to the full depth of the investigation.

Borehole BH03, located centrally along the northern boundary, recorded interbedded clay and gravel deposits to the full depth of 3.00m.

These soils are considered to represent the Head deposits indicated on the published geological map.

4.2 Stability

Instability was recorded locally within the coarse-grained soils encountered during drilling/excavation.

4.3 Groundwater Conditions

Each of the exploratory holes were recorded as being dry during the period of the intrusive works. During the three-week monitoring period the standpipes installed to a depth of 2.00m within boreholes WS01 to WS05 were also recorded to remain dry.



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It should be noted that groundwater levels should be expected to fluctuate seasonally. The results of the longer-term monitoring being undertaken within boreholes BH01, BH03 and BH05 will be provided separately on completion of the five month monitoring period.



5. GEOTECHNICAL ASSESSMENT

The geotechnical assessment has been prepared in connection with the development proposals shown on the drawings included in Appendix A.

In summary the proposed development is understood to comprise the construction of a detached car showroom/service centre in the western area of the site, a large area of external car parking in its centre, and the extension and alteration of the existing garden centre in the east.

At the time of writing, no details were available concerning the specific loads likely to be applied to the foundations.

5.1 Foundations

5.1.1 Soil Shrinkage/Heave Potential

The fine-grained soils of the Head have been classified as clays and with modified plasticity indices in the range of 10% to 23%, the soils may be expected to exhibit a low to medium volume change potential.

It is recommended that the design of precautions against shrinkage and heave for any new foundation system (spread footings and ground beams etc.) should assume a medium volume change potential for the fine-grained Head soils and take into account current guidance such as that given by the Building Research Establishment (BRE)⁸ or the National House Builders Council (NHBC)⁹.

The undisturbed gravel soils of the Head may be considered to be non-plastic and hence non-shrinkable.

Whilst this report has been prepared to provide advice to assist designers in undertaking detailed design, the report itself does not represent a detailed design statement. It is recommended that an arboricultural survey of the site should be conducted to establish the species and maturity of any existing trees and shrubbery in the areas of the proposed new buildings. The survey should be extended to include a review of historical photographs and detailed site plans (if available) to establish the species and location of any felled trees that may affect foundation design. The information obtained from the arboricultural survey, information on proposed planting schemes and the findings of this report should be provided to the structural engineer responsible for the detailed design of foundation systems, including assessment of minimum founding depths for spread foundations, and requirements for placement of void formers et cetera.

5.1.2 Spread Foundations

5.1.2.1 Foundation Depths for Spread Foundations

Foundations should be constructed so as to bear below soils that are likely to be affected by significant soil volume changes caused by seasonal changes in moisture content in order to avoid damage to foundations that could otherwise arise. In addition, all made ground and any soils disturbed by the construction or removal of any previously existing foundations or services should be regarded as being variable in nature and state of compaction and, as such, unsuitable

⁸ www.bre.co.uk : BRE Digests 240, 241 and 242, Low rise buildings on shrinkable clay soils, parts 1, 2 and 3; and BRE Digest 298, The influence of trees on house foundations in clay soils and BRE Digest 412, Desiccation in clay soils.

⁹ <http://www.nhbc.co.uk/> : NHBC Standards, Chapter 4.2.



as a founding medium for shallow footings. New footings should be constructed so as to bear below made ground/disturbed natural soils and soil subject to seasonal soil volume changes, whichever is the deeper, and onto undisturbed, competent, natural deposits.

Summary guidance on suitable minimum foundation depths to protect against the effects of seasonal soil volume changes is presented in the table below but designers undertaking detailed design of foundations should follow the detailed guidance such as that provided within Chapter 4.2 of the NHBC Standards.

Table 2. Indicative Minimum Foundation Depths

Tree Type	Water Demand of Tree	Tree Distance to Tree Height Ratio (D/H)									
		0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.80	1.00	1.25
		Minimum Foundation Depth Required in Medium Volume Change Potential Soils (m)									
Broad Leaf	High	†			2.50	2.35	2.20	2.00	1.70	1.35	0.90*
	Moderate	2.00	1.85	1.70	1.60	1.45	1.30	1.15	0.90*	0.90*	0.90*
	Low	1.50	1.40	1.30	1.15	1.05	0.90*	0.90*	0.90*	0.90*	0.90*
Coniferous	High	†			2.30	1.95	1.60	1.25	0.90*	0.90*	0.90*
	Moderate	2.00	1.70	1.40	1.10	0.90*	0.90*	0.90	0.90*	0.90*	0.90*

* Minimum foundation depth required to protect against soil volume changes.

† Foundations deeper than 2.50m require specialist design to protect against soil volume changes.

Details on the water demand and mature height of common trees is given within Table 3 of Chapter 4.2 of the NHBC standards which should be referred to when assessing minimum foundation depths required for the proposed development. A summary is provided in the table below.

Table 3. Indicative Summary of Water Demand and Mature Height of Common Trees

Tree Type	High Water Demand		Moderate Water Demand		Low Water Demand	
	Tree	Height (m)	Tree	Height (m)	Tree	Height (m)
Broad Leaf	Elm	18 – 24*	Acacia	18	Birch	14
	Oak	16 – 24*	Alder	18	Elder	10
	Poplar	15 – 28*	Apple	10	Fig	8
	Willow	16 – 24*	Ash	11 – 23*	Hazel	8
	Eucalyptus	18	Laurel	10	Holly	12
	Hawthorn	10	Beech	20	Honey Locust	14
			Blackthorn	8	Hornbeam	17
			Cherry	8 – 17*	Laburnum	12
			Chestnut	20 – 24*	Magnolia	9
			Lime	22	Mulberry	9
			Maple	8 – 18*	Tulip Tree	20
			Pear	12		
			Plane	26		
			Plum	10		
			Sycamore	22		



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Tree Type	High Water Demand		Moderate Water Demand		Low Water Demand	
	Tree	Height (m)	Tree	Height (m)	Tree	Height (m)
Coniferous			Tree of Heaven	20		
			Walnut	18		
			Whitebeam	12		
	Cypress	18 – 20*	Cedar	20		
			Douglas Fir	20		
			Larch	20		
			Monkey Puzzle	18		
			Pine	20		
			Spruce	18		
			Wellingtonia	30		
			Yew	12		

* Dependent on particular species.

5.1.2.2 Bearing Capacity for Spread Foundations

For design purposes, a net allowable bearing capacity of 150kN/m² may be assumed for spread (pad or strip) foundations up to 1.5m across bearing within the Head soils of at least stiff consistency or medium dense relative density, typically encountered below 1.00m below ground level. The quoted bearing capacity is expected to limit settlement to less than 25mm.

Attention is drawn to the presence of interbedded fine-grained soils and coarse-grained soils beneath the site. As there is the potential for mixed soil conditions to be present beneath footings, designers should consider the need for foundations to be reinforced due to the potential for differential cracking to develop as a result of coarse-grained and fine-grained soils settling at different rates under loading.

5.2 Groundwater

Groundwater was not encountered during the intrusive works or three-week monitoring period that followed, though it is noted that groundwater levels are subject to seasonal change and the results of long-term groundwater monitoring are still pending.

It is possible that heavy precipitation during construction could lead to the ingress of perched groundwater or surface water run-off into excavations. In such circumstances it would be expected that water entering excavations would be adequately managed by either pumping from sumps or natural drainage, or a combination of the two.

5.3 Stability of Excavations

All made ground or coarse-grained natural soils exposed in excavations should be assumed to be unstable, even in the short term. Whilst the fine-grained natural soils may remain stable for a short period of time if not subjected to surcharge loads (such as may be imposed by existing foundations, traffic or storage of materials), the stability of these deposits if left unsupported should be assumed to have the potential to deteriorate. Where stable excavations are required,



excavations should either be suitably supported or, where space permits, side slopes could be battered back to a safe angle of repose.

All excavations requiring human entry must be shored or battered as necessary to conform to current best practice, as accepted by the Health and Safety Executive (HSE)¹⁰. Current legislation requires that where personnel access is required into any excavation a competent person must inspect excavation supports or battering of slopes at the start of the working shift and at other specified times. No work should take place until the excavation is safe. Excavations should also be inspected after any event that may have affected their stability, such as a significant weather event, changes in surcharge loadings imposed by temporary storage of materials or changes in site traffic plans or alteration of support systems. Inspections should be formally recorded and any faults that are found should be corrected immediately.

Particular attention must be paid to ensuring the stability of nearby structures, services and neighbouring sites.

5.4 Aggressivity to Concrete

The aggressivity of the soils to concrete has been assessed in accordance with guidance published by the BRE¹¹.

In consideration of the soils encountered beneath the site it is considered that 'natural ground conditions' may be assumed for the purpose of assessing the aggressivity of the chemical environment for concrete classification (ACEC class). Given that groundwater has not been recorded to date, but pending confirmation by longer term monitoring, 'static groundwater' conditions may be assumed.

The following table summarises the characteristic values indicated from the chemical analysis of the soils present beneath the site.

Table 4. Assessment of the Chemical Analysis of the Soil

	Characteristic Value	Design Sulfate Class	ACEC Classification
pH	7.9	-	-
Water Soluble Sulphate (mg/l as SO₄) *	0	DS-1	AC-1s

Notes:

* Characteristic value rounded to nearest 100.

In accordance with the guidance, a DS-1 Design Sulfate Class and an AC-1s ACEC classification may be assumed for the design of concrete in contact with the ground, pending confirmation by longer term groundwater monitoring.

¹⁰ Relevant guidance is given on the HSE website, www.hse.gov.uk

¹¹ BRE Special Digest 1:2005 Concrete in Aggressive Ground.



5.5 Ground Floors

Ground bearing floor slabs may be considered, provided made ground soils are appropriately compacted and the depth of foundations required to protect against seasonal soil volume changes close to trees is less than 1.5m. In such circumstances further works should be undertaken to demonstrate, that close to the time of construction, no significant soil desiccation is present. If ground bearing floors are adopted it is recommended that the potential for differential movement, both between the floor slab and walls and across the floor slab itself, should be anticipated. Such floors should be fully debonded from walls. Formations should be adequately proof rolled and any excessively soft materials excavated and replaced with a suitable, well graded granular fill. The depth of any fill should be limited to a maximum of 600mm unless placed to an engineering specification designed to limit internal settlement of the fill materials to a tolerance to be advised by the designer. The detailing of services through, or under, ground-bearing floors should incorporate flexible connections and, where appropriate, enhanced falls.

Details of the CBR values and modulus of subgrade reaction that may be assumed for the floor design are included in Section 5.6.

5.6 Pavement Design

Current guidance¹² suggests that pavement design should be based on the design subgrade surface modulus, determined as being equal to the lower of the short-term subgrade modulus and the long-term subgrade modulus. The subgrade surface modulus can be related to California bearing ratio using the formula, $E = 176(\text{CBR})^{0.64}$, where E is the subgrade modulus expressed in MPa.

Cone penetrometer tests undertaken to establish the California bearing ratio (CBR) of the in-situ soils indicated CBR values ranging between 2% and >50% but typically in the range 2% to 6% in the underlying Head and derived made ground at the time of the investigation. It is noted that CBR values are, in part, dependent on the moisture content of the tested soils and are consequently subject to seasonal variation.

Equilibrium CBR values can be derived from knowledge of soil classification data (plasticity index for soils exhibiting cohesion (clay type) and particle size distribution for granular soils) and pavement thickness. Historical guidance¹³ suggests the following design equilibrium CBR values would be applicable to the Head soils and derived made ground for the construction of pavement. The subgrade moduli calculated from these design equilibrium CBR values can be reasonably considered to be representative of long-term subgrade modulus using the formula given above.

Table 5. Long-term CBR Values

Stratum	Design Equilibrium CBR Value (%)				Modulus of Subgrade Reaction E (MPa)
		Footpath and Cyclepath	Thin Road* Pavement	Thick Road Pavement	
Fine grained Head and Derived Made Ground	Minimum	2.2	3.2	4.6	37.1
	Average	2.7	3.6	5.2	42.0
	Maximum	3.0	3.8	5.8	48.0

¹² Highways England Design Manual for Roads and Bridges Interim Advice Note 73/06CD 225 Design for new pavement foundations.

¹³ Highways England Design Manual for Roads and Bridges Interim Advice Note 73/06; now withdrawn.



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* Thin pavement being 300mm sub-base; for chalk deposits a minimum total pavement thickness of 450mm is required to protect against frost heave.

Designers will need to select an appropriate design equilibrium CBR value / modulus of subgrade reaction taking account of proposed pavement thickness, expected winter groundwater conditions, the standard to which pavement is to be designed and any local authority or other regulatory/warrantor requirements together with construction conditions likely to prevail at the time of construction.

The subgrade should be assumed to be susceptible to frost heave.

5.7 Stormwater Infiltration Systems

In-situ infiltration testing¹⁴ was carried out in trial pits SA101 to SA104 as part of the current works and TP01 to TP04 as part of a previous phase of works.

To calculate the soil infiltration rate in accordance with the BRE digest the water needs to fall to 25% of the initial test depth. The volume of water between 75% and 25% of the initial test depth is then divided by the sum of the average surface area of the sides of the trial pit in contact with the water during the test monitoring period, and its base area. This figure is then divided by the test duration (time taken for the water level to fall between 75% and 25% of the initial test depth) to give the soil infiltration rate in metres per second.

However, during a majority of the tests performed as part of the previous phase of works, the water level within the test pits did not fall below 25% of the initial test depth due to the slow draining soils encountered and/or time constraints. For the tests that did not achieve a fall in water level between 75% and 25% of the initial test depth, the soil infiltration rate has been calculated by dividing the volume of water lost during the test by the product of the average surface area of the trial pit in contact with water during the test period and the test duration in seconds.

The infiltration rates derived from the tests are summarised in the following table. The head of water that each infiltration calculation is based on is also summarised in the following table.

Table 6. Calculated Infiltration Rates

Exploratory Hole	Test Response Zone Depth (m)		Stratum	Infiltration Rate (f) (m/sec)	Head of Water (% of Ho)
	Top	Bottom			
SA101 Test 1	1.81	2.50	Head (Gravel)	2.9×10^{-5}	75-25
SA101 Test 2	1.69	2.50	Head (Gravel)	3.0×10^{-5}	75-25
SA101 Test 3	1.76	2.50	Head (Gravel)	3.2×10^{-5}	75-25
SA102 Test 1	1.55	2.50	Head (Gravel)	1.8×10^{-5}	75-25
SA102 Test 2	1.59	2.50	Head (Gravel)	2.0×10^{-5}	75-25
SA102 Test 3	1.64	2.50	Head (Gravel)	2.0×10^{-5}	75-25
SA103 Test 1	1.91	2.40	Head (Gravel)	1.0×10^{-5}	75-25
SA103 Test 2	1.90	2.40	Head (Gravel)	9.1×10^{-6}	75-25
SA103 Test 3	1.87	2.40	Head (Gravel)	1.0×10^{-5}	75-25

¹⁴ Conducted in general accordance with the requirements of BRE 365, Soakaway Design.



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Exploratory Hole	Test Response Zone Depth (m)		Stratum	Infiltration Rate (f) (m/sec)	Head of Water (% of Ho)
	Top	Bottom			
SA104 Test 1	1.84	2.50	Head (Gravel)	5.0×10^{-6}	75-25
SA104 Test 2	1.69	2.50	Head (Gravel)	5.4×10^{-6}	75-25
SA104 Test 3	1.73	2.50	Head (Gravel)	5.2×10^{-6}	75-25
TP01	0.43	0.75	Made Ground and Head (Clay)	4.5×10^{-6}	100-56
TP02	0.50	0.80	Made Ground and Head (Clay)	6.8×10^{-6}	100-47
TP03 Test 1	0.33	0.60	Head (Clay)	2.1×10^{-5}	75-25
TP03 Test 2	0.30	0.60	Head (Clay)	1.1×10^{-5}	100-73
TP04	0.45	1.00	Head (Clay)	6.1×10^{-6}	100-67

The value 'f' is equivalent to the soil infiltration coefficient 'q' quoted in the Construction Industry Research and Information Association (CIRIA) Report 156.

The results from the infiltration tests indicate that the Head soils possess poor to moderate infiltration characteristics with generally faster infiltration rates being recorded in the deeper tests. The results from the infiltration tests should be provided to engineers responsible for the design of the drainage system.

To comply with building regulations¹⁵, point discharging infiltration systems (conventional ring or trench soakaways) are required to be constructed a minimum of 5.0m away from proposed or existing buildings.

¹⁵ The Building Regulations 2010; Part H; Drainage and Waste Disposal



6. QUANTITATIVE CONTAMINATION ASSESSMENT

6.1 Introduction

The risk assessment for the site considers the sources of contamination identified, the receptors that may be present in view of the development proposals and the contaminant pathways by which these may be linked.

A complete pollutant linkage is only deemed to exist where all three are present and a site is considered suitable for use where no complete pollutant linkages are identified.

Where a complete pollutant linkage is considered to be present, an assessment of the level of risk associated with the pollutant linkage has been carried out in line with published guidance¹⁶.

The level of risk is determined using the risk matrix presented in the following table. Classifications of probability, consequence and risk are presented in Appendix D.

Table 7. Risk Assessment Matrix

		Probability			
		Very Low	Low	Moderate	High
Consequence	Very Minor	Negligible	Very Low	Low	Low/Moderate
	Minor	Very Low	Low	Low/Moderate	Moderate
	Moderate	Low	Low/Moderate	Moderate	High
	Severe	Low/Moderate	Moderate	High	Very High

6.2 Preliminary Conceptual Model

The preliminary conceptual model for the proposed development, generated as part of the Preliminary Ground Contamination Risk Assessment is presented in Appendix E.

6.3 Assessment Strategy

The Preliminary Ground Contamination Risk Assessment concluded that complete pollutant linkages were present and that a ground investigation was required to assess the level of risk posed.

The assessment noted that the eastern part of the site had only recently (circa 2010) been redeveloped as a garden centre from its previous use as a garage. As no structural alterations, bar the provision of new frost canopies, are proposed for this area, and as the maximum level of risk in this part of the site was considered to be "very low", investigation in this area was not considered to be warranted.

It concluded that investigation works should be targeted at the central and western parts of the site, specifically those proposed areas of decorative planting around the car parking lots.

¹⁶ Contaminated Land Risk Assessment: A guide to good practice, CIRIA C552, 2001.



Sample of made ground from exploratory holes in these areas were tested for concentrations of heavy metals, polycyclic aromatic hydrocarbon (PAH) compounds, petroleum hydrocarbons and volatile organic compounds (VOCs). The samples were also screened for asbestos.

Shallow and deeper samples from boreholes located adjacent to the substation were also tested for concentrations of PCB compounds.

6.4 Analysis of Contamination Test Results

Comparison of the results of the laboratory testing has been made against the 'Suitable For Use Levels' (S4UL)¹⁷ or, in lieu of an S4UL being developed for lead, the Category 4 Screening Level (C4SL)¹⁸. These are collectively referred to as soil screening values (SSV).

In view of the development proposal, the SSV utilised in this assessment are those calculated for the generic "Commercial" land use¹⁹ with the amendments discussed within the LQM/CIEH report. The critical receptor for this land use is considered to be a full time female staff member working at the site between the ages of 17 and 65. Exposure routes that are considered include the potential for direct ingestion of the soil, the outdoor and indoor ingestion of dust and the potential inhalation of dust and vapours.

For other contaminants where S4UL do not exist, reference has been made to other generic screening values where appropriate.

For the assessment of risk to controlled waters a qualitative assessment has been undertaken based upon the concentrations of contaminants recorded within the soil samples and the information obtained about the sensitivity of the underlying strata or nearby surface water receptors.

6.4.1 Heavy Metals

The following table summarises the SSV along with the maximum and minimum concentrations of the heavy metals tested for.

Table 8. Summary of Test Results and Statistical Analysis for Heavy Metals

Contaminant	SSV (mg/kg)	No. of Samples	Minimum Concentration (mg/kg)	Maximum concentration (mg/kg)	Limit of Detection (mg/kg)	No of exceedances
Arsenic	640	5	7	13	< 2	0
Water Soluble Boron	240000	5	<LOD	4.7	< 1	0
Cadmium	190	5	<LOD	0.8	< 0.2	0

¹⁷ Nathanail, C.P, et al., The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015, Land Quality Press, Nottingham. Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3071.

¹⁸ SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report, published by DEFRA, 2014.

¹⁹ As defined within Science Report SC050021/SR3, January 2009, with the amendments discussed in the LQM/CIEH report.

Contaminant	SSV (mg/kg)	No. of Samples	Minimum Concentration (mg/kg)	Maximum concentration (mg/kg)	Limit of Detection (mg/kg)	No of exceedances
Chromium	8600	5	8	24	< 2	0
Hexavalent Chromium	33	5	<LOD	<LOD	< 2	0
Copper	68000	5	11	54	< 4	0
Lead	2330	5	17	248	< 3	0
Mercury	1100	5	<LOD	<LOD	< 1	0
Nickel	980	5	8	17	< 3	0
Selenium	12000	5	<LOD	<LOD	< 3	0
Zinc	730000	5	46	255	< 3	0

None of the samples tested recorded concentrations of heavy metals above their respective SSV. The concentrations of heavy metals present within the shallow soils are not considered to pose an unacceptable risk to end users of the site.

At the low concentrations recorded, none of the heavy metals would be expected to exhibit any significant mobility and they are not considered to pose an unacceptable risk to controlled waters beneath the site.

6.4.2 Asbestos

Five samples of the made ground were screened for the presence of asbestos. None of the samples recorded the presence of any asbestos materials.

No suspected asbestos materials were noted within any of the exploratory holes undertaken at the site.

Based on the findings of this investigation, no significant risk to end users is considered to be posed by asbestos materials within soils. However, due to the heterogeneity of made ground, there will always remain the potential for localised asbestos materials to be encountered during construction works, though the likelihood of this is considered to be very low. All workers at the site should be made aware of what actions to take in the event that suspected asbestos materials are identified at any time during the development works.

An asbestos survey of existing structures and infrastructure²⁰ was beyond the scope of this investigation. The potential for asbestos containing materials to be present within the fabric of buildings or infrastructure located on the site cannot be dismissed by reference to the soil test results contained within this report. It is recommended that relevant asbestos registers be inspected prior to commencing any demolition works at the site. Where asbestos is identified to be present within buildings or infrastructure, these materials should be appropriately removed by licensed contractors and asbestos materials disposed of in accordance with legal requirements prior to demolition to avoid contaminating soils at the site.

²⁰ As defined under Section 5(a) of the Control of Asbestos Regulations, 2012.

6.4.3 Polycyclic Aromatic Hydrocarbon (PAH) Compounds

The following table summarises the soil screening values, maximum and minimum concentrations for the PAH compounds tested for.

Table 9. Summary of Test Results and Statistical Analysis for PAH Compounds

Contaminant	SSV (mg/kg)	No. of Samples	Minimum Concentration (mg/kg)	Maximum concentration (mg/kg)	Limit of Detection (mg/kg)	No of exceedances
Naphthalene	190	5	<LOD	<LOD	< 0.1	0
Acenaphthylene	83000	5	<LOD	<LOD	< 0.1	0
Acenaphthene	84000	5	<LOD	<LOD	< 0.1	0
Fluorene	63000	5	<LOD	0.31	< 0.1	0
Phenanthrene	22000	5	<LOD	8.23	< 0.1	0
Anthracene	520000	5	<LOD	1.59	< 0.1	0
Fluoranthene	23000	5	<LOD	10.4	< 0.1	0
Pyrene	54000	5	<LOD	8.66	< 0.1	0
Benzo(a)anthracene	170	5	<LOD	2.82	< 0.1	0
Chrysene	350	5	<LOD	3.32	< 0.1	0
Benzo(b)fluoranthene	44	5	<LOD	2.35	< 0.1	0
Benzo(k)fluoranthene	1200	5	<LOD	1.1	< 0.1	0
Benzo(a)pyrene	35	5	<LOD	1.84	< 0.1	0
Indeno(123-cd)pyrene	500	5	<LOD	0.98	< 0.1	0
Dibenz(ah)anthracene	3.5	5	<LOD	0.26	< 0.1	0
Benzo(ghi)perylene	3900	5	<LOD	0.76	< 0.1	0

None of the samples tested recorded concentrations of individual PAH compounds above their respective SSV. The concentrations of PAH compounds present within the shallow soils are not considered to pose an unacceptable risk to end users of the site.

At the relatively low concentrations recorded, PAH compounds would not be expected to exhibit significant mobility and are not considered to pose an unacceptable risk to controlled waters beneath the site.

6.4.4 Petroleum Hydrocarbons

The following table lists the SSV for petroleum hydrocarbon equivalent carbon weight fractions calculated for 1% organic content.

Table 10. SSV for petroleum hydrocarbon equivalent carbon weight fractions

Petroleum Hydrocarbon Fraction	SSV (mg/kg)	Petroleum Hydrocarbon Fraction	SSV (mg/kg)
Aliphatic EC 5-6	3200	Aromatic EC 5-7	26000
Aliphatic EC >6-8	7800	Aromatic EC >7-8	56000
Aliphatic EC >8-10	2000	Aromatic EC >8-10	3500
Aliphatic EC >10-12	9700	Aromatic EC >10-12	16000
Aliphatic EC >12-16	59000	Aromatic EC >12-16	36000
Aliphatic EC >16-35	1600000	Aromatic EC >16-21	28000
Aliphatic EC >35-44	1600000	Aromatic EC >21-35	28000
		Aromatic EC >35-44	28000

Whilst full speciation of the concentrations of petroleum hydrocarbons by aromatic and aliphatic fractions was not undertaken, the results of the testing undertaken can still be compared with the more stringent of the screening values for the respective equivalent carbon weight fraction and, where the concentration recorded is found to be lower, it can be reasonably concluded that no significant risk is present.

No visual or olfactory evidence of petroleum hydrocarbon contamination was identified within any of the exploratory holes across the site. Where detectable concentrations of petroleum hydrocarbons were recorded within the samples tested, these were all significantly lower than the more conservative SSV for each equivalent carbon weight fraction.

The concentrations of petroleum hydrocarbons within the shallow soils are not considered to pose an unacceptable risk to end users or controlled waters beneath the site.

6.4.5 Volatile Organic Compounds (VOC)

With the exception of the samples of made ground from BH01 and SA103 which recorded concentrations of tetrachloroethene (PCE) slightly above the limit of detection for the test, none of the samples recorded concentrations of any VOC.

The samples from BH01 and SA103 recorded PCE concentrations of 6µg/kg and 22µg/kg, respectively, both of which are significantly lower than the SSV²¹ of 19mg/kg (19,000µg/kg).

The concentrations of VOC within the shallow soils are not considered to pose an unacceptable risk to end users or controlled waters beneath the site.

6.4.6 Polychlorinated Biphenyl (PCB) Compounds

None of the samples recorded any detectable concentrations of any PCB compound. No unacceptable risk to end users or controlled waters from PCB compounds are considered to be present.

²¹ S4UL for 1% organic content



6.5 Analysis of Ground Gas Monitoring Results

Monitoring of the gas concentrations within the standpipes in the five boreholes was carried out on three occasions.

Peak concentrations of carbon dioxide of up to 0.9% by volume. No detectable concentrations of methane and no detectable gas flow was recorded from any standpipe during any monitoring visit.

Atmospheric pressures varied between 998 and 1023 during the monitoring period. Monitoring was carried out during periods of both rising and falling atmospheric pressure.

Assessment of the results of the monitoring has been carried out in general accordance with the current guidance²².

The guidance provides a methodology for assessing the risk from ground gases by the calculation of site-specific gas screening values (GSV) for each key asphyxiating or explosive gas (carbon dioxide and methane). These are calculated by multiplying the concentration (percentage/volume) of a gas by a gas flow rate (l/hr).

Initial screening has been carried out by calculating the GSV using the highest consistent flow rate recorded multiplied by the highest gas concentration recorded. This is considered to represent a highly conservative assessment of the risk posed by ground gases.

Where no detectable gas concentrations or flow rates are recorded, the GSV are calculated assuming values equal to the limit of detection of the instrument are present.

The following table summarises the calculated GSV:

Table 11. Calculated GSV for Carbon Dioxide and Methane

Gas	GSV
Carbon Dioxide	$0.007 \times 0.1 = 0.0007$
Methane	$0.001 \times 0.1 = 0.0001$

For sites that do not fall within the definition of "typical" 2 storey housing, Table 8.5 of the CIRIA document sets out a series of "Characteristic Situations" for different GSV, with Table 8.6 providing guidance on the degree of protection required for each situation.

The calculated GSV place the site within Characteristic Situation 1. No specific gas protection measures are considered to be necessary.

6.6 Quantitative Contamination Risk Assessment

6.6.1 Basis of Assessment

The development is to comprise a new commercial/light industrial building in the north west, car parking across the central parts of the site and additional buildings to the north and south of the

²² CIRIA document C665, *Assessing risks posed by hazardous ground gases to buildings*, 2007.



main garden centre in the eastern parts of the site. Some decorative planting borders are indicated around the outside of the car parking lots though, given the context of the development, end users would be considered very unlikely to come into regular or prolonged contact with soils in these areas.

A copy of the proposed development layout is presented in Appendix A. Should the proposed development plans be altered, a revised risk assessment may be required.

6.6.2 Contamination Sources Identified

No sources of contamination have been identified by the quantitative contamination risk assessment.

6.6.3 Quantitative Conceptual Model

The quantitative conceptual model for the proposed development, confirming no pollutant linkages, is presented in Appendix F.

In the absence of any identified pollutant linkages, no further investigation or assessment is considered to be necessary.

6.7 Risks to Other Potential Receptors

All construction workers must undertake their own risk assessment, based upon the works to be carried out and the proposed method by which this will be achieved, in accordance with current health and safety legislation. Their assessment should take account of all available information about the site, including that presented within this report.

Appropriate working procedures and PPE should be adopted to ensure the health and safety of the site operatives. Instruction should be given in the recognition of potentially hazardous materials. All site personnel should be appropriately briefed on the discovery strategy, presented below, and what actions they must take in the event that further evidence of contamination is identified or suspected.

6.8 Discovery Strategy

If, during the course of the site clearance and development works, any materials not previously identified by the investigation that are suspected of being 'contaminants' are encountered, then the following procedure should apply:

- All works in that area should cease and the site manager should be informed.
- Advice should be sought from suitably qualified and experienced personnel as to whether any further site inspection, sampling, testing and/or assessment is deemed necessary.
- If required, the conclusions of any assessment and any proposed remedial works (if required) should be agreed by the local authority.
- If necessary, full details of any remedial works should be included in a verification report for the site.

Suspected 'contamination' may take the following form, though it is noted that this list is not exhaustive and site operatives should ask if they are at all unsure of any findings:

- Soil or water looks oily and/or has an oily odour
- Soil or water has a solvent type of odour
- Significant quantities of man-made materials within fill such as paint cans, car parts, glass fragments
- Suspected asbestos containing materials (insulating boards, cement, loose fibres etc.)
- Significant volumes of clinker like or ashy material
- Sand bags, and/or subsurface concrete structures
- Animal carcasses or evidence of animal burial pits

Ashdown Site Investigation Ltd.

FIGURES

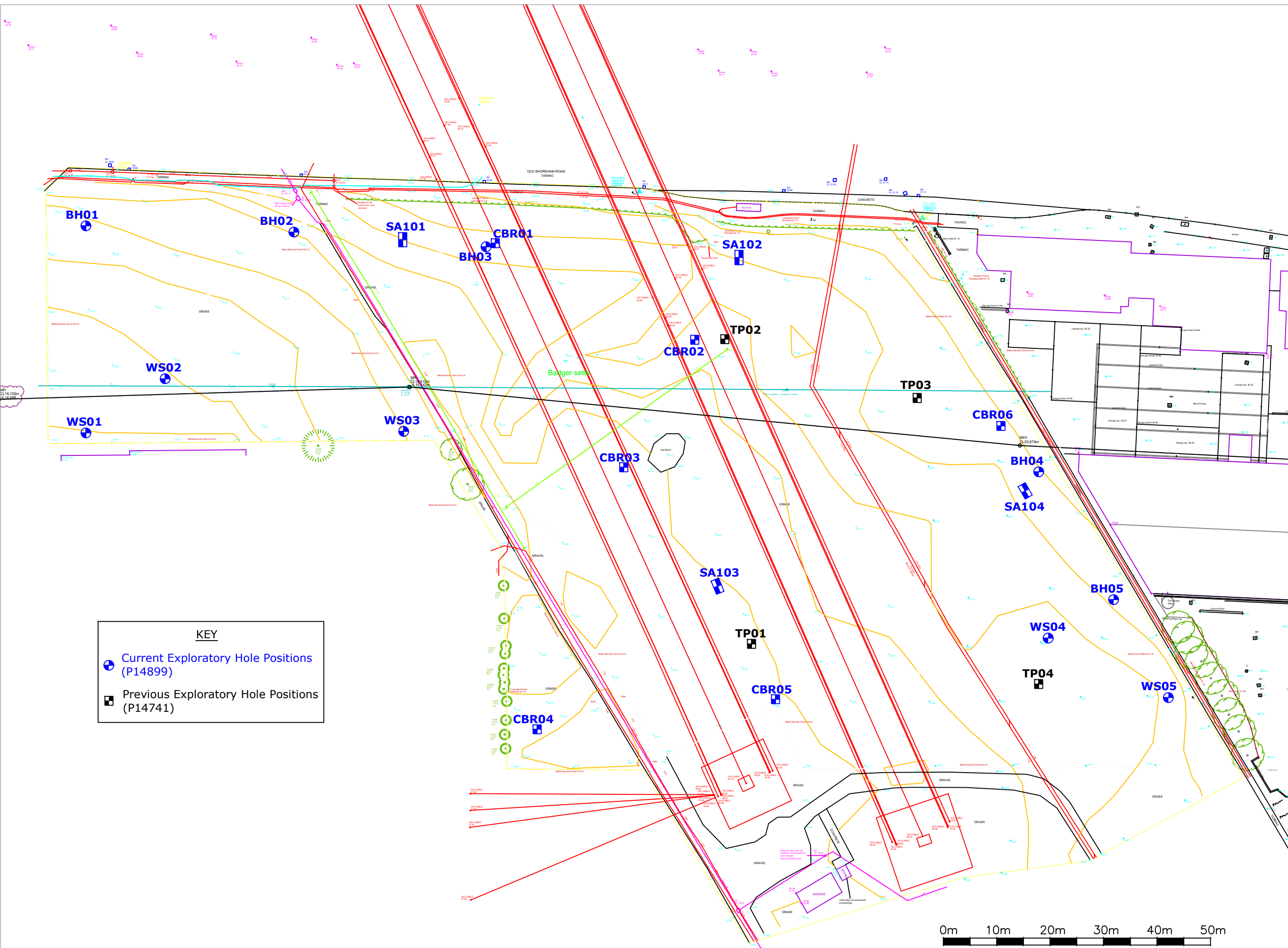
Figure 1 Site Location Plan

Figure 2 Site Plan



© OpenStreetMap contributors, CC BY-SA

Site Location Plan	Site Name	Figure No.	Project Reference
	Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	1	P14899



KEY

Current Exploratory Hole Positions
(P14899)

Previous Exploratory Hole Positions
(P14741)

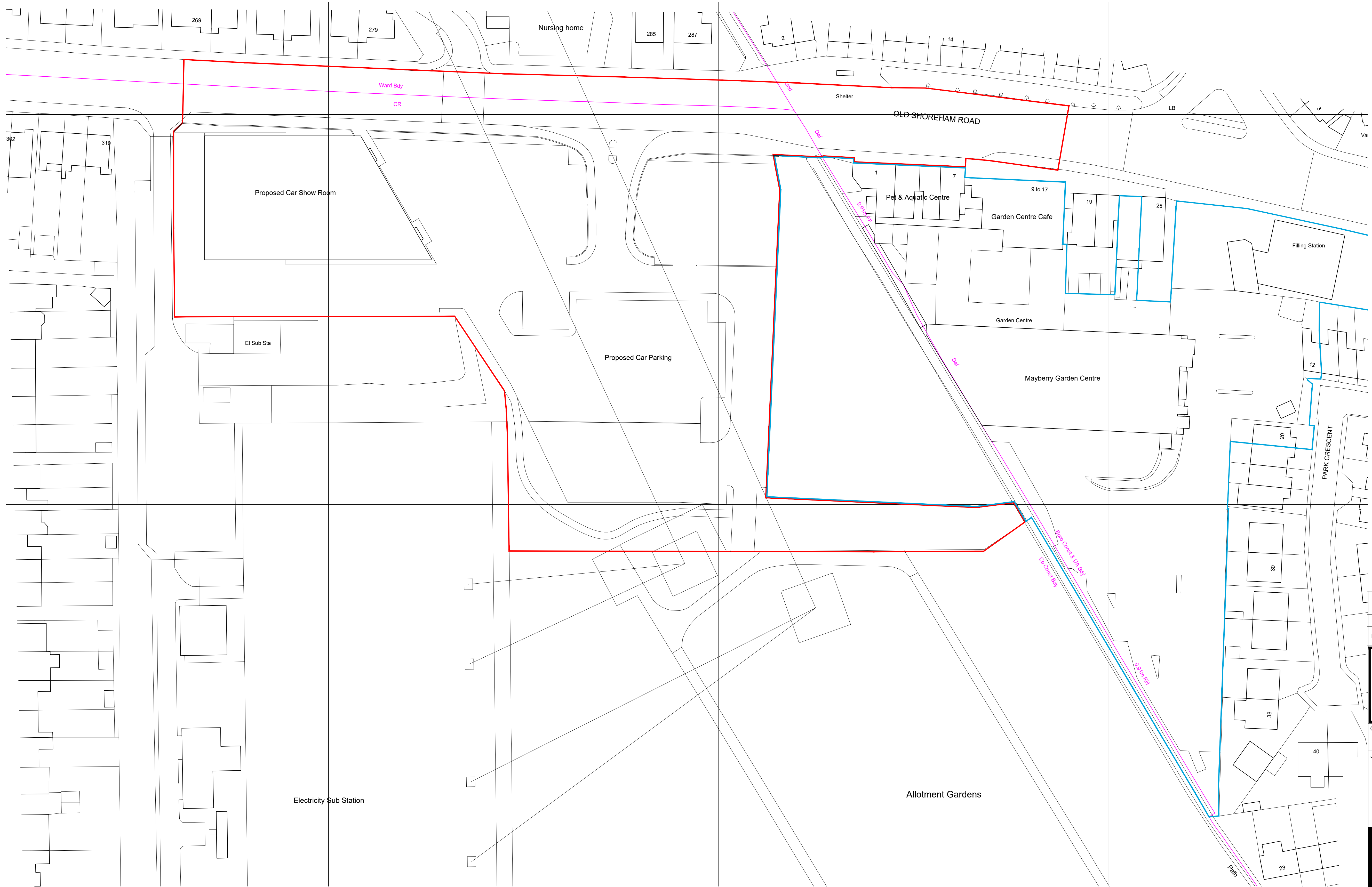
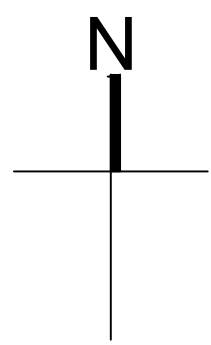
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Site:	Land adjacent to Mayberry Garden Centre Old Shoreham Road Portslade
Report Ref:	P14899
Figure No.	2
Drawing Title	Site Plan
Scale	NTS

APPENDIX A

Proposed Development Layout

NOTES

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JOB TITLE
Proposed Development at
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BN41 1SP

DRAWING TITLE
Proposed Car Showroom
Proposed Block Plan

PRELIMINARY ISSUE

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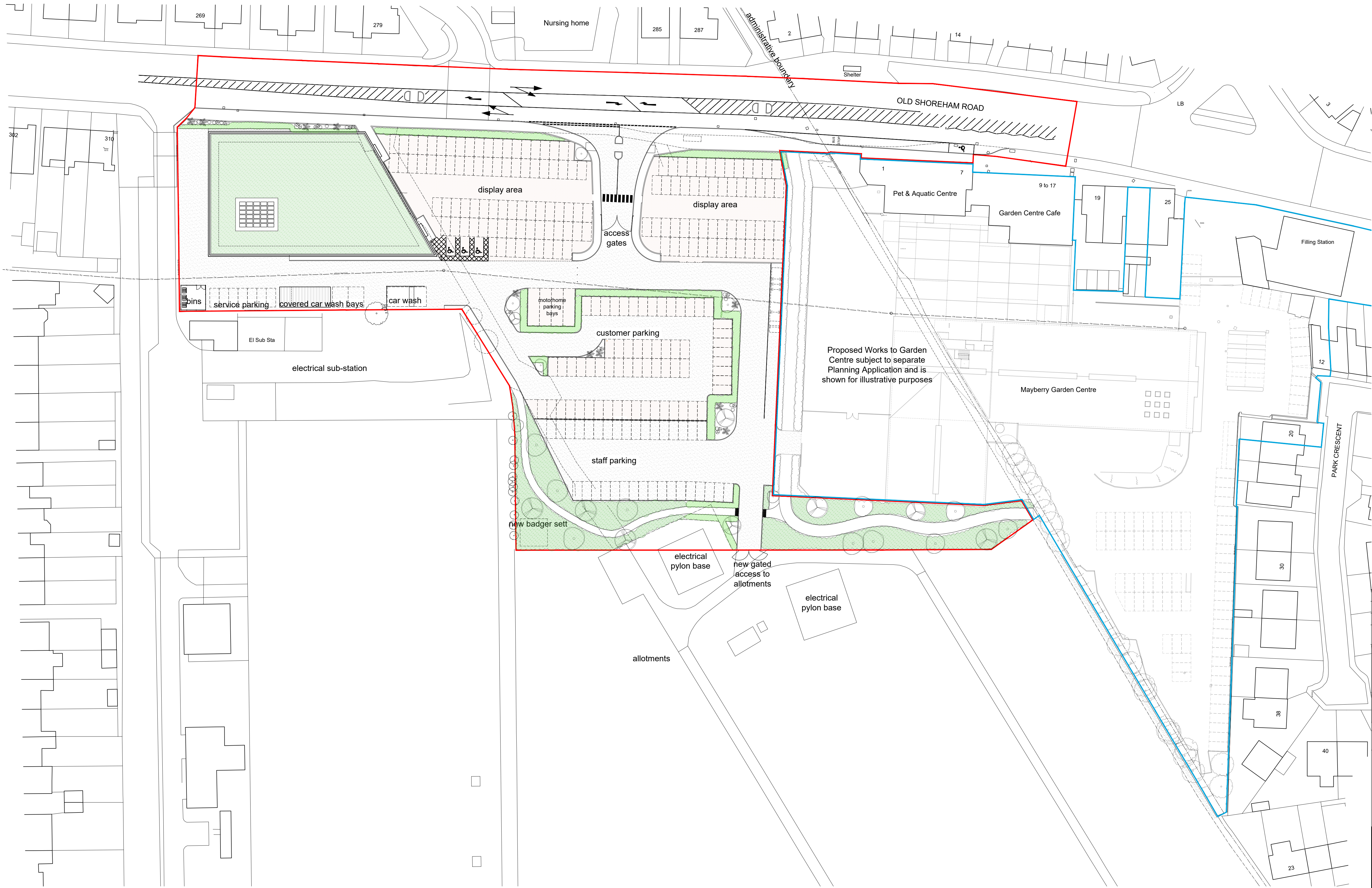
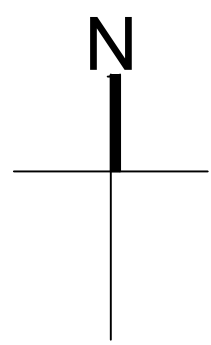
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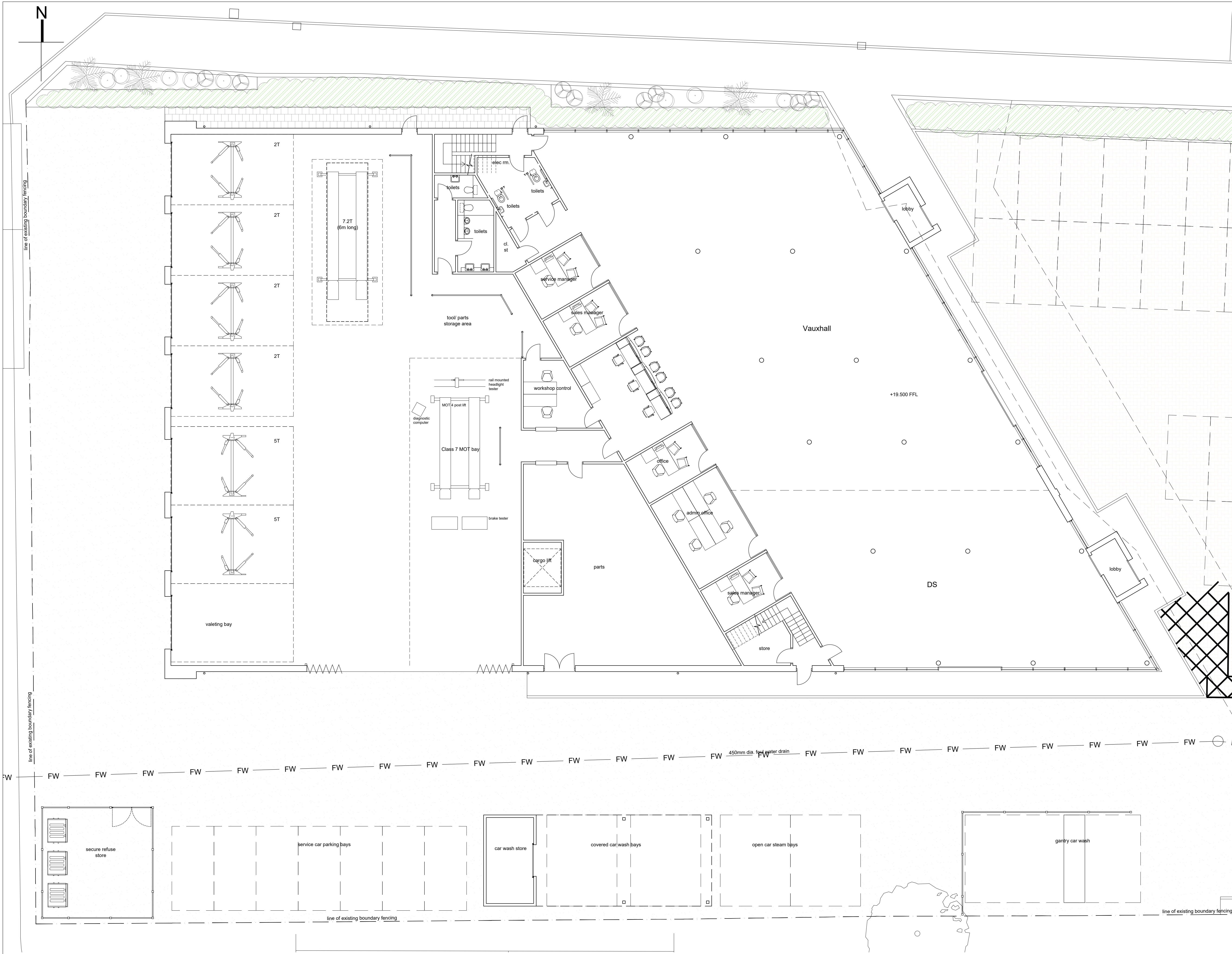
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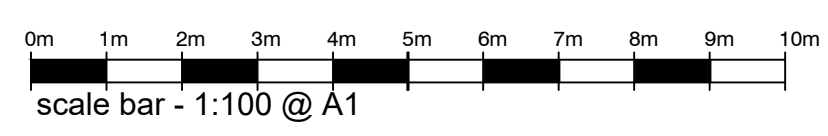
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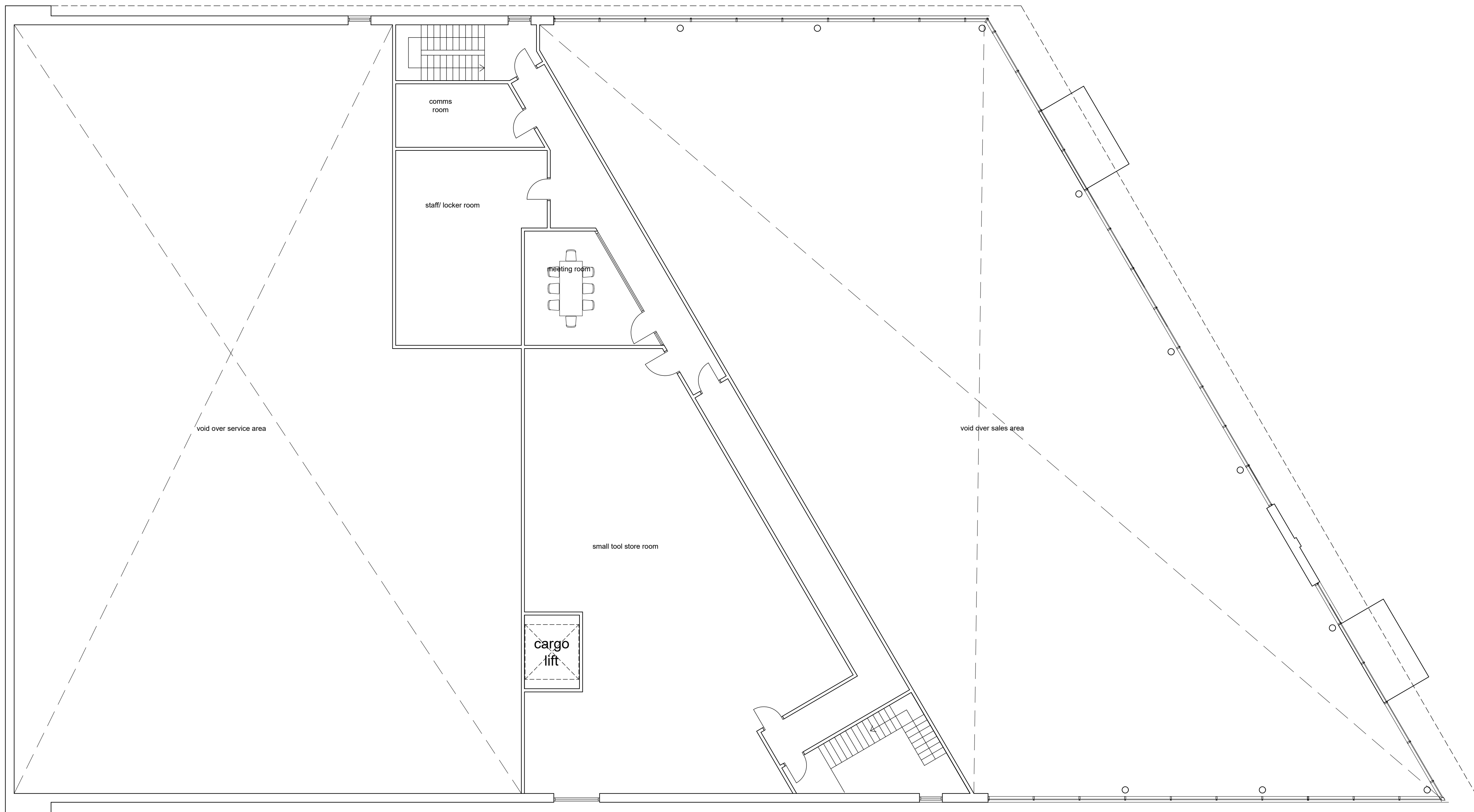
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DRAWING TITLE
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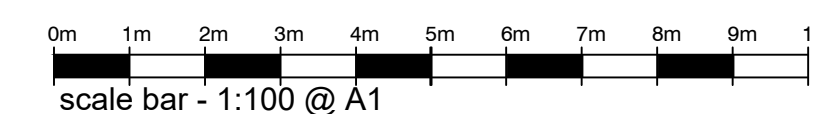
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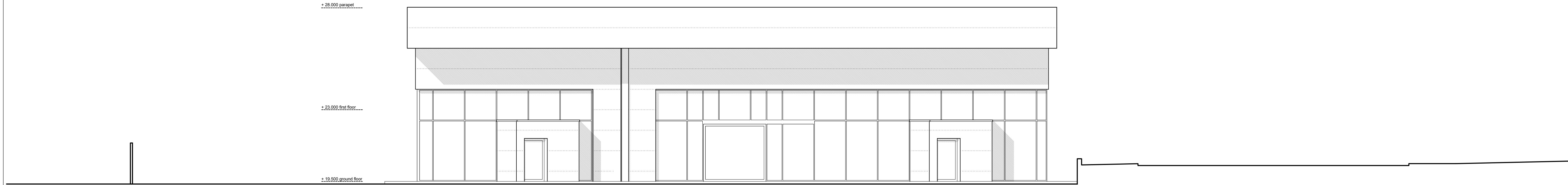
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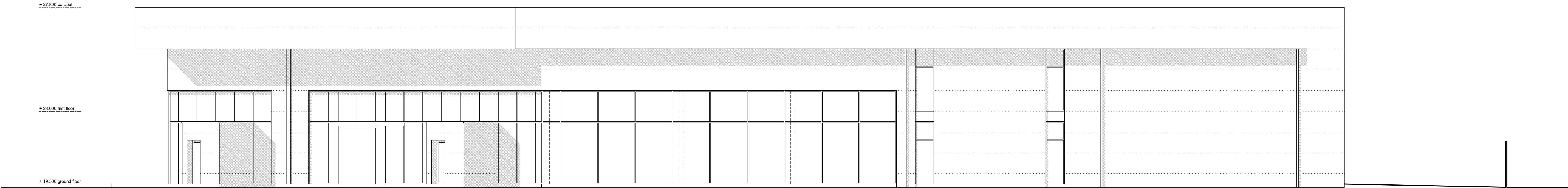


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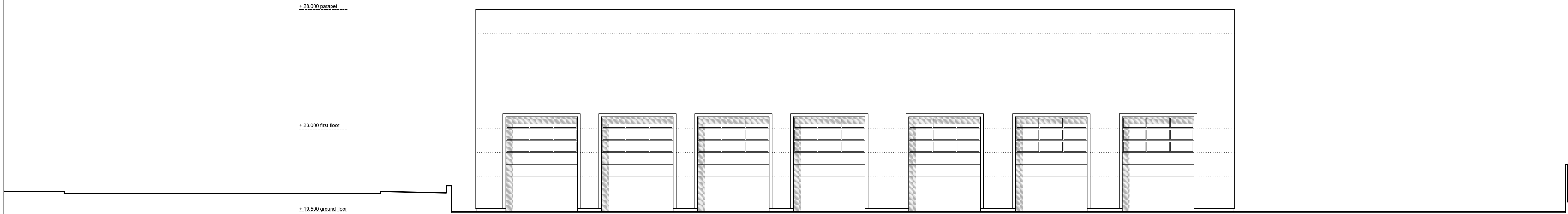
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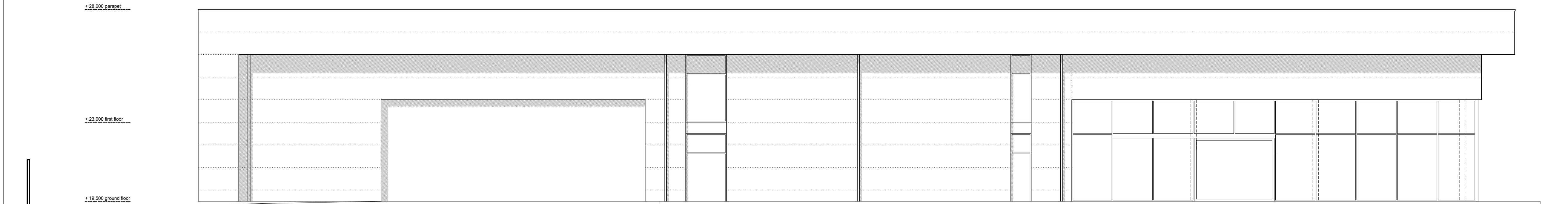
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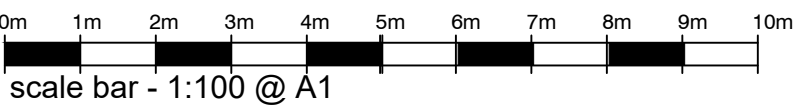
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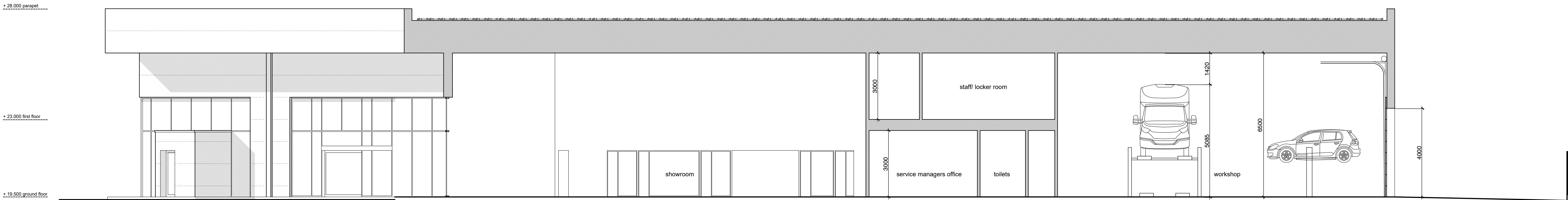


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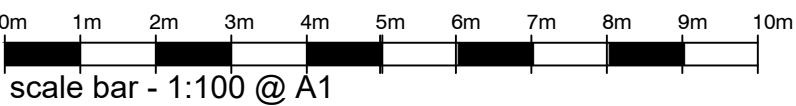
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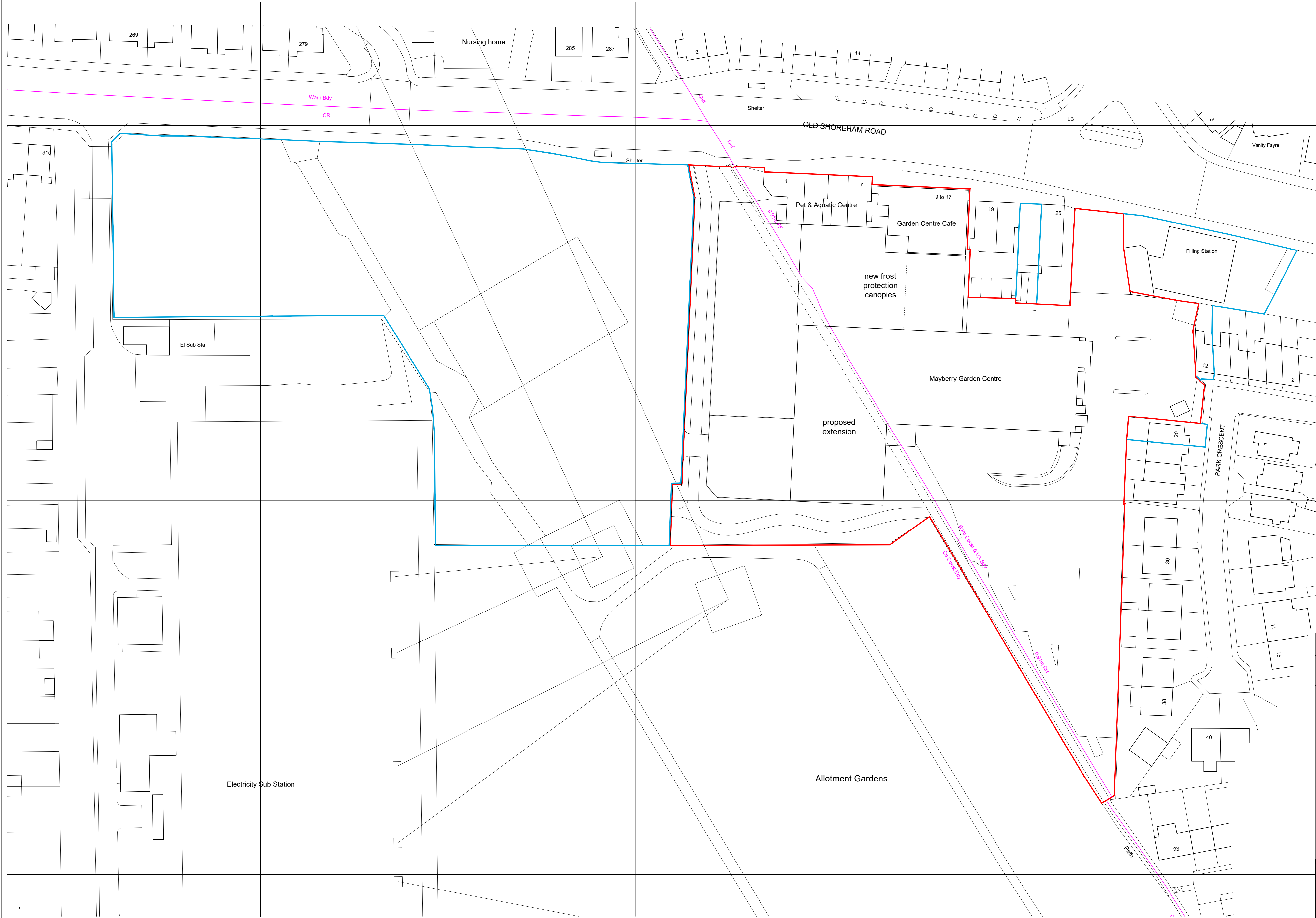
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Proposed Car Showroom -
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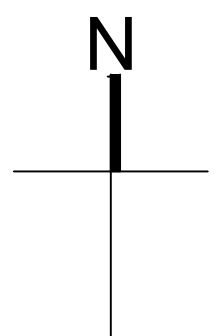
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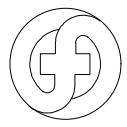


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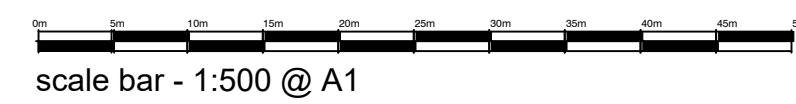
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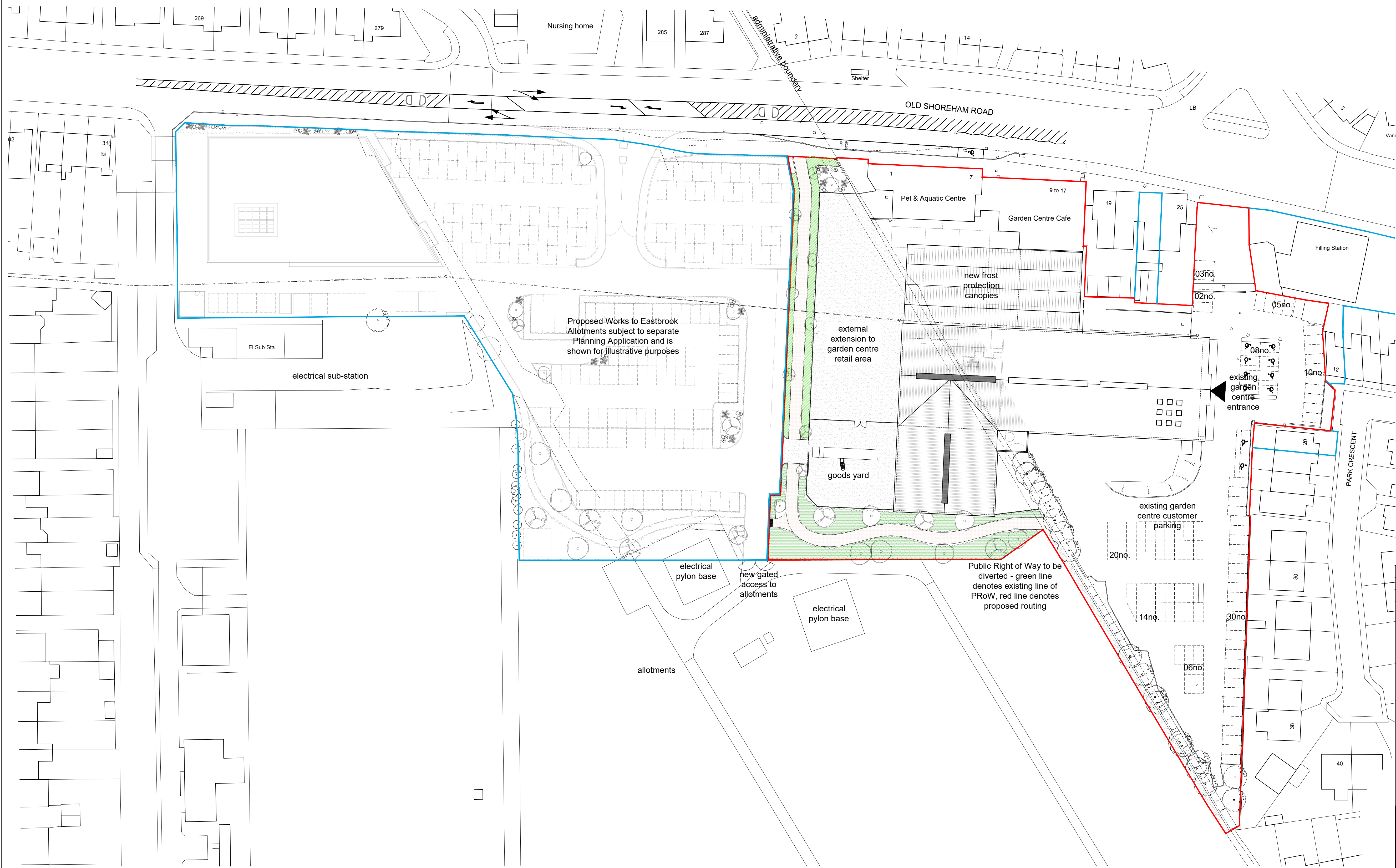
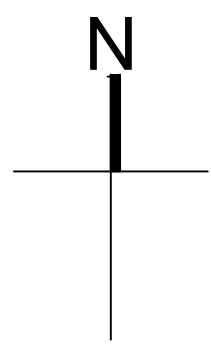
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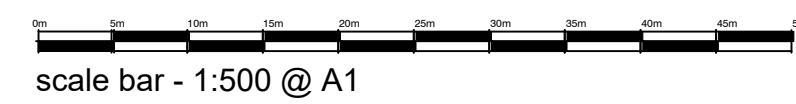
JOB TITLE
Proposed Development at
Mayberry Garden Centre
Old Shoreham Road
Portslade
BN41 1SP

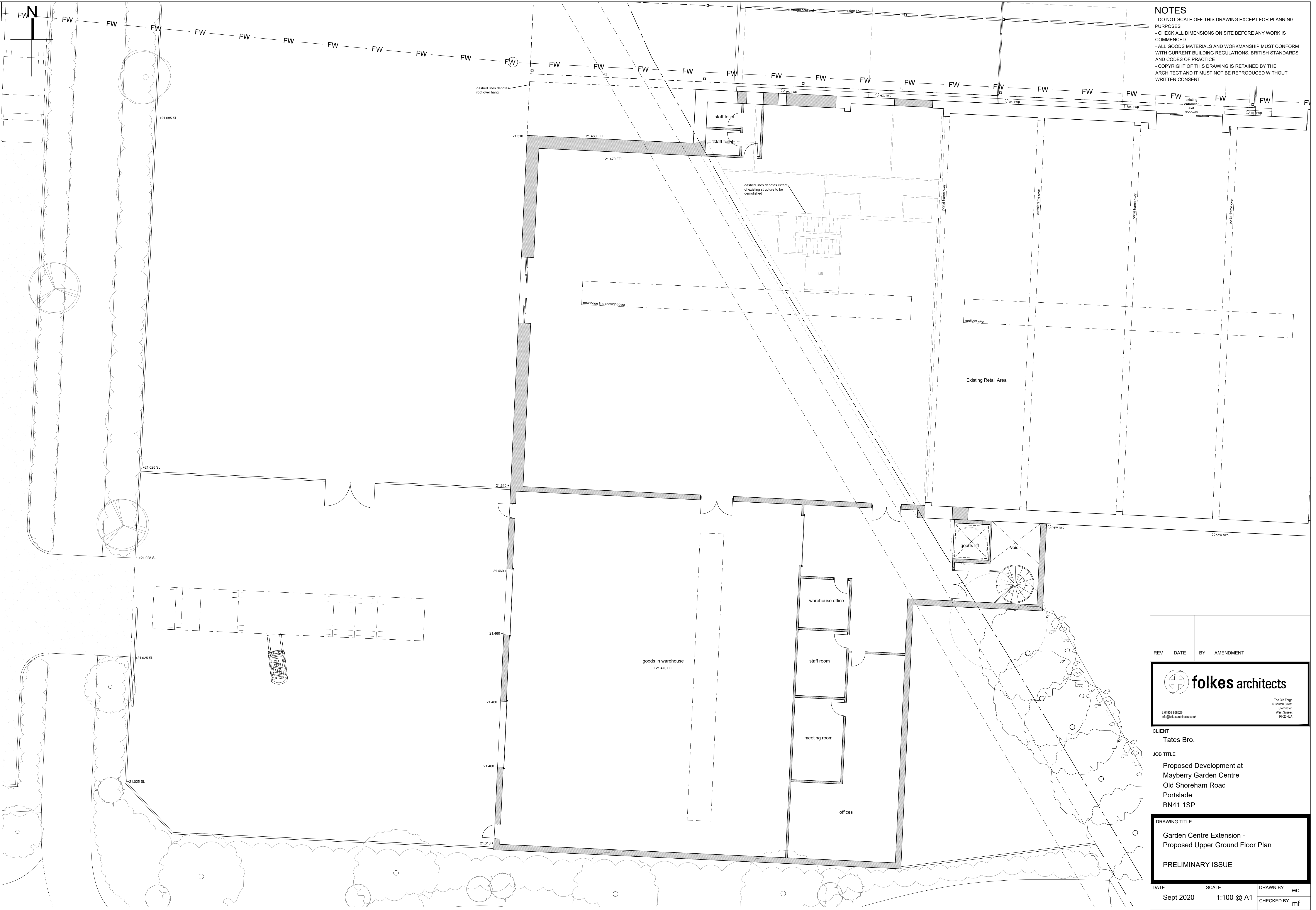
DRAWING TITLE
Garden Centre Extension -
Proposed Site Plan

PRELIMINARY ISSUE

DATE Sept 2020	SCALE 1:500 @ A1	DRAWN BY ec
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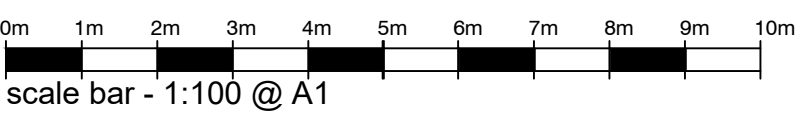
JOB NO. 20034	DRAWING NO. 2.12	REVISION





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Proposed Ground Floor & Site Plan - 1:200 @ A1



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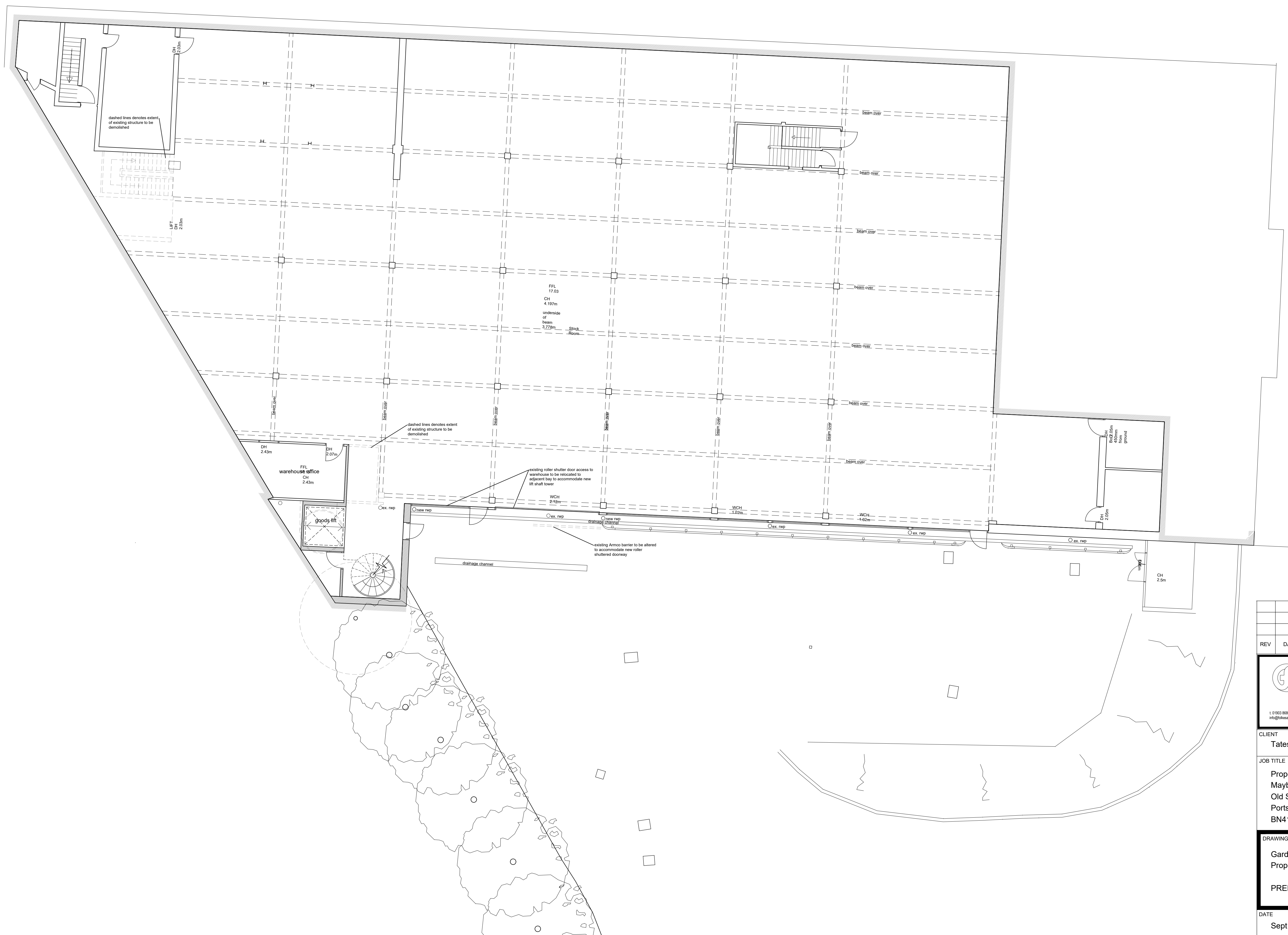
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JOB TITLE
Proposed Development at
Mayberry Garden Centre
Old Shoreham Road
Portslade
BN41 1SP

DRAWING TITLE
Garden Centre Extension -
Proposed Upper Ground Floor Plan

PRELIMINARY ISSUE

DATE Sept 2020	SCALE 1:100 @ A1	DRAWN BY ec
JOB NO. 20034		CHECKED BY mf
DRAWING NO. 2.13		REVISION



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JOB TITLE

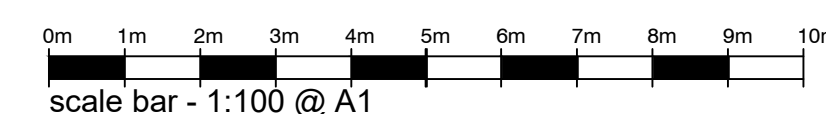
Proposed Development at
Mayberry Garden Centre
Old Shoreham Road
Portslade
BN41 1SP

DRAWING TITLE

Garden Centre Extension -
Proposed Lower Ground Floor

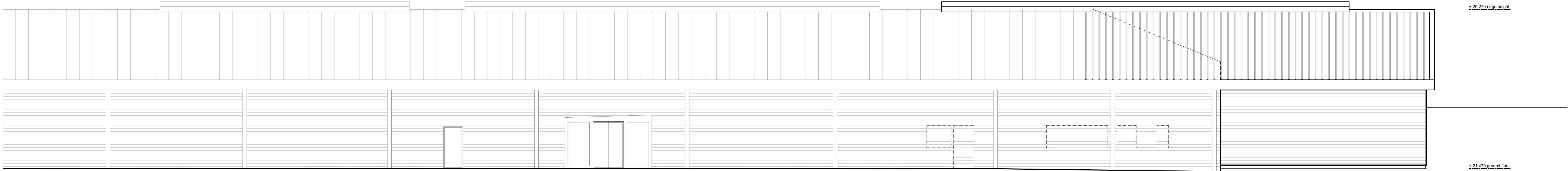
PRELIMINARY ISSUE

JOB NO.	DRAWING NO.	REVISION
20034	2.14	



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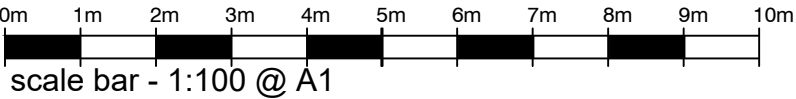
proposed northern elevation - 1:100 @ A1



proposed western elevation - 1:100 @ A1



proposed eastern elevation - 1:100 @ A1



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JOB TITLE
Proposed Development at
Mayberry Garden Centre
Old Shoreham Road
Portslade
BN41 1SP

DRAWING TITLE
Garden Centre Extension -
Proposed Elevations - sheet 1

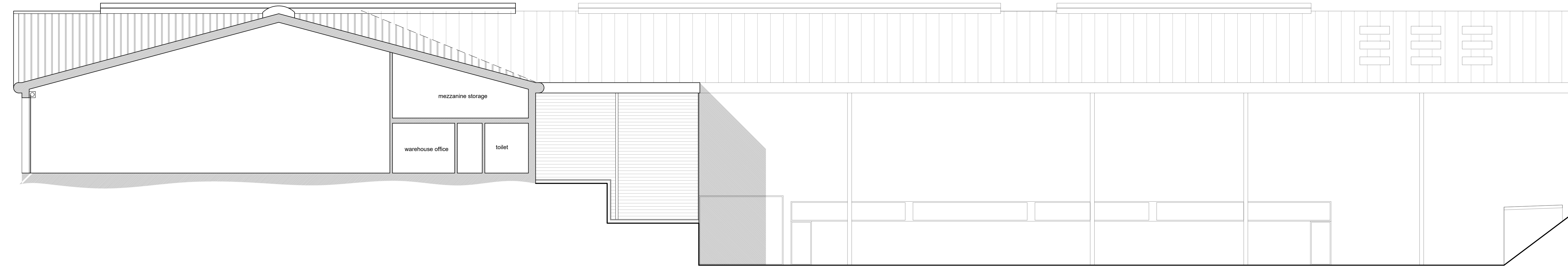
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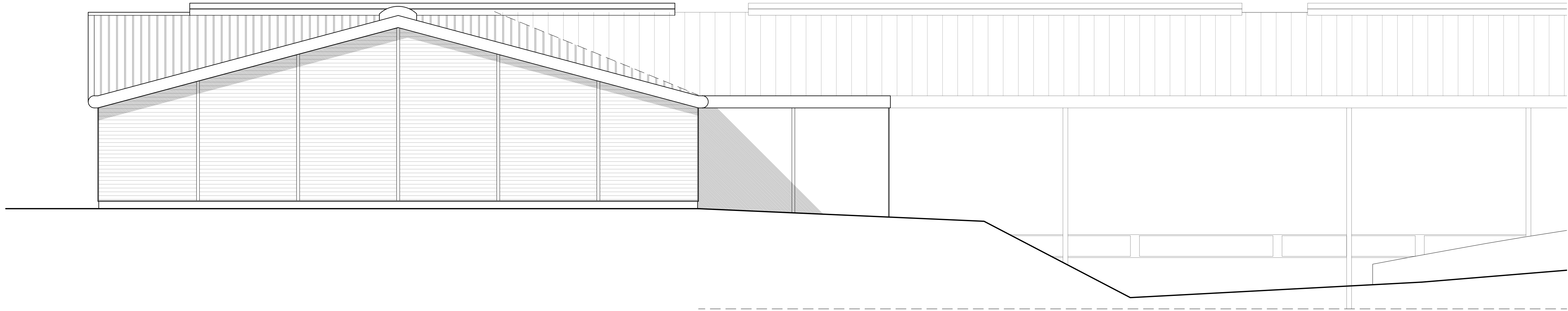
JOB NO.	DRAWING NO.	REVISION
20034	2.15	

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proposed section - 1:100 @ A1



proposed southern elevation - 1:100 @ A1

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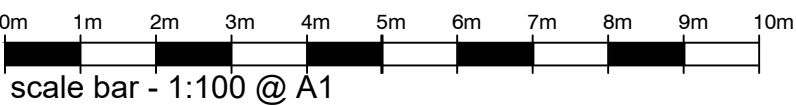
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JOB TITLE
Proposed Development at
Mayberry Garden Centre
Old Shoreham Road
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DRAWING TITLE
Garden Centre Extension -
Proposed Elevations - sheet 2

PRELIMINARY ISSUE

DATE Sept 2020	SCALE 1:100 @ A1	DRAWN BY ec
JOB NO. 20034		CHECKED BY mf
DRAWING NO. 2.16		REVISION



APPENDIX B

Exploratory Hole Notes
Exploratory Hole Records
DPSH-B Dynamic Probe Records
Summary of In-situ TRL Cone Penetrometer (CBR) Test Results
Summary of Trial Pit Falling Head Soakage Test Results
Gas Concentration and Groundwater Monitoring Results
Previous Exploratory hole Records and Test Results (P14741)

NOTES FOR THE INTERPRETATION OF EXPLORATORY HOLE RECORDS

1 Symbols and abbreviations

Samples

U	'Undisturbed' Sample: - 100mm diameter by 450mm long. The number of blows to drive in the sampling tube is shown after the test index letter in the SPT column.
U _o	Sample not obtained
U*	Full penetration of sample not obtained
Pi	Piston Sample: 'Undisturbed' sample 100mm diameter by 600mm long.
D	Disturbed Sample
R	Root Sample
B	Bulk Disturbed Sample
W	Water Sample
J	Jar Sample (sample taken in amber glass jar fitted with gas tight lid)
T	Tub Sample
Vi	Vial Sample

In situ Testing

S	Standard penetration test (SPT): Using the split spoon sampler.
C	Standard Penetration Test (SPT): using a solid cone instead of the sampler - conducted usually in coarse grained soils or weak rocks.
V	Shear Vane Test: Undrained shear strength (cohesion) (kN/m ²) shown within the Vane/Pen Test and N Value column.
H	Hand penetrometer Test: Undrained shear strength (cohesion) (kN/m ²) shown within the Vane/Pen Test and N Value column.
P	Perth Penetrometer Test: Number of blows for 300mm penetration shown under Vane/Pen Test and N Value column.

Excavation Method

CP	Cable Percussion Borehole
WLS	Dynamic Sampler Borehole using windowless sampler tubes
WS	Dynamic Sampler Borehole using window sampler tubes
TP	Trial Pit excavated using mechanic excavator
HDP	Trial Pit excavated using hand tools

2 Soil Description

Description and classification of soils has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of soil, Part 1 Identification and description (BS EN ISO 14688-1) and Part 2 Principles of classification (BS EN 14688-2) as well as the BS5930 code of Practice for Ground Investigations.

3 Rock Description

Description and classification of rocks has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of rock, Part 1 Identification and classification (BS EN ISO 14689-1) as well as the BS5930 code of Practice for Ground Investigations. TCR – Total Core Recovery, SCR – Solid Core Recovery, RQD – Rock Quality Designation, NI – Non Intact, If – indicative fracture spacing (min/ave/max), FI – Fracture Index.

4 Chalk Description

Chalk description is based on BS EN ISO 14688, BS EN ISO 14689 and BS5930. The classification of chalk generally follows the guidance offered by the Construction Industry Research and Information Association (CIRIA) C574, 'Engineering in Chalk'. This is based on assessment of chalk density, discontinuity and aperture spacing, and the proportion of intact chalk to silt of chalk.

ASHDOWN SITE INVESTIGATION

LIMITED

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Site Name: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

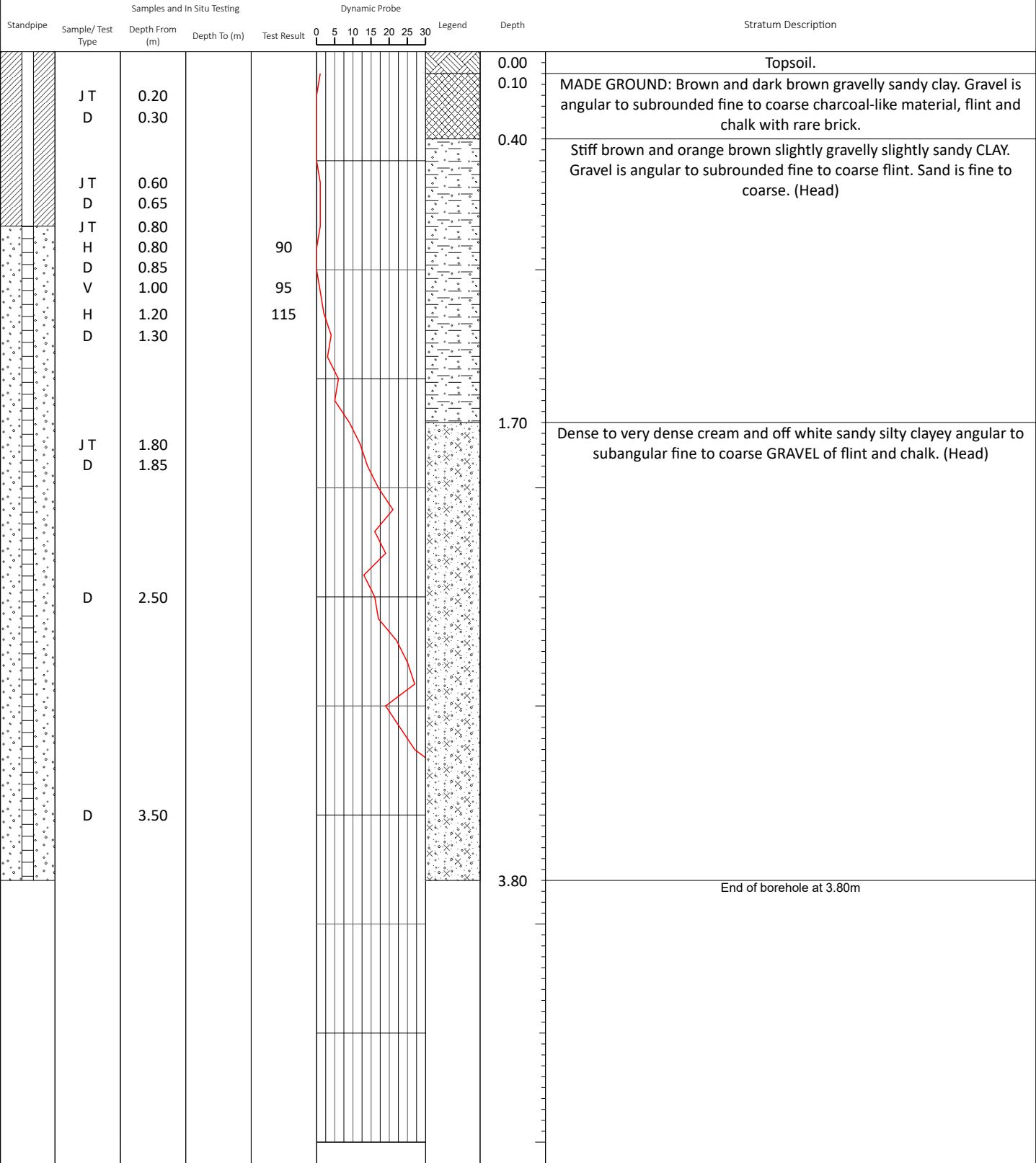
Job Number: P14899

Start Date: 24/11/2020

End Date: 24/11/2020

Borehole Number: **BH01**

Sheet 1 of 1



Remarks

Groundwater: Borehole dry on completion.
Stability: Borehole stable on completion.
Notes: No further progress below 3.80m depth - too dense. Standpipe installed to 3.80m depth; 3.80m to 0.80m slotted pipe with gravel surround; 0.80m to ground level plain pipe with bentonite seal; completed with end cap and security cover concreted flush with ground surface.

Excavation Method: WLS

Borehole Diameter: Various

Made By: RJ

Site Name: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

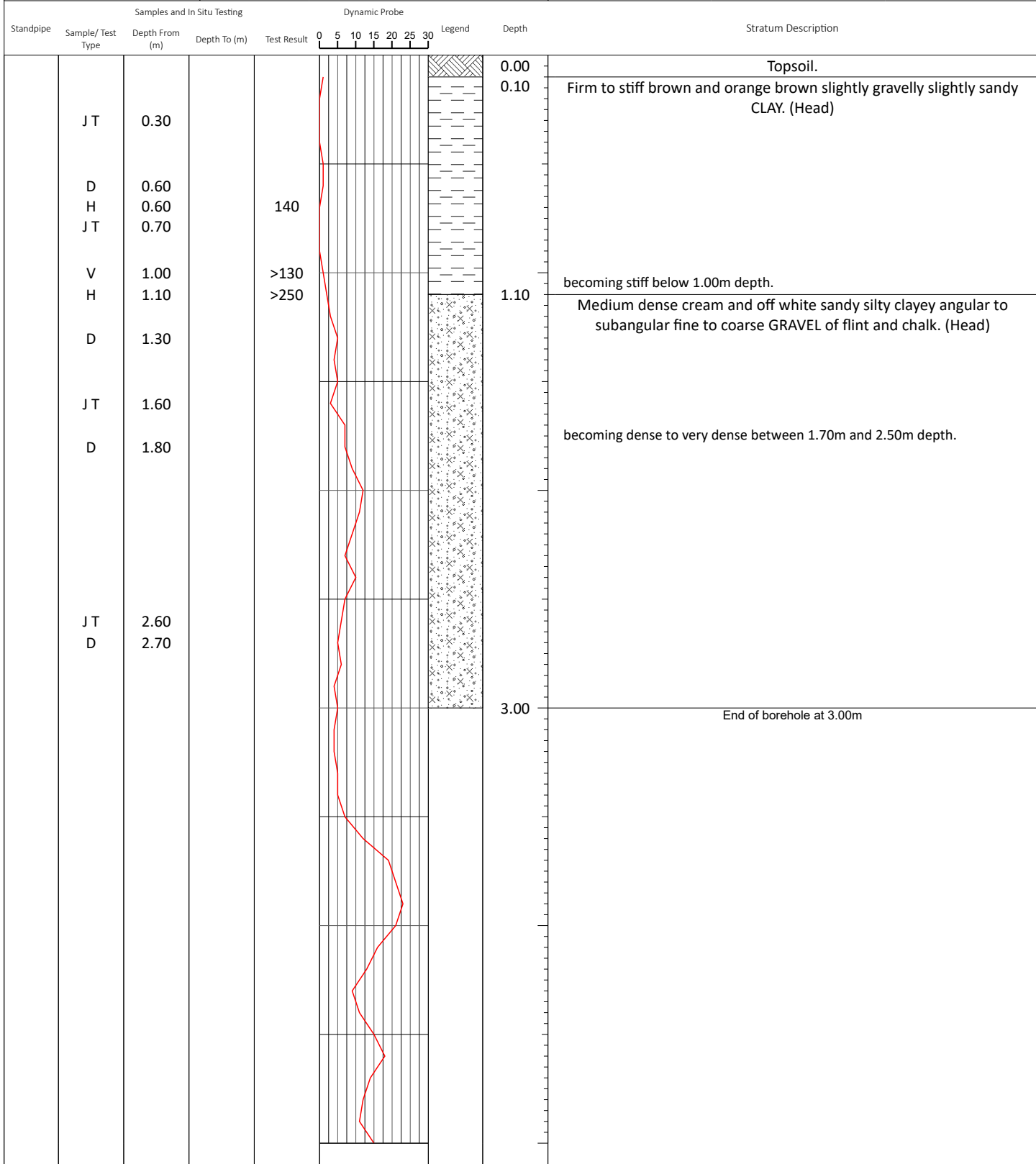
Job Number: P14899

Start Date: 24/11/2020

End Date: 24/11/2020

Borehole Number: **BH02**

Sheet 1 of 1



Remarks

Groundwater: Borehole dry on completion.

Stability: Borehole collapsed to 2.50m depth on completion.

Notes: n/a

Excavation Method: WLS

Borehole Diameter: Various

Made By: RJ

ASHDOWN SITE INVESTIGATION L I M I T E D E-mail: contact@ashdownsi.co.uk Web: www.ashdownsi.co.uk Tel: 01273 483119		Site Name: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade												
		Job Number: P14899												
		Start Date: 25/11/2020					Borehole Number: BH03							
		End Date: 25/11/2020												
Sheet 1 of 1														
Samples and In Situ Testing Dynamic Probe														
Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	0	5	10	15	20	25	30	Legend	Depth	Stratum Description
	J T	0.25											0.00	Topsoil.
													0.10	MADE GROUND/ REWORKED: Dark brown and brown gravelly sandy clay. Gravel is angular to subrounded fine to coarse flint and occasional carbonaceous material. Sand is fine to coarse.
	D	0.60											0.40	Firm to stiff brown and orange brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse flint. (Head)
	H	0.60		115										
	J T	0.80												
	V	1.00		>130									1.00	Stiff to very stiff cream and light brown very gravelly silty CLAY. Gravel is angular to subrounded fine to coarse chalk and flint. (Head)
	D	1.40												
	H	1.40		>250										
	J T	1.50												
	V	2.00		>130									2.00	Stiff to very stiff brown and light brown gravelly CLAY. Gravel is angular to subrounded fine to coarse flint. (Head)
	D	2.50											2.40	Medium dense to dense cream, off white and light brown sandy silty clayey angular to subrounded fine to coarse GRAVEL of flint and chalk. (Head)
	D	2.80												
	V	3.00		>130									3.00	Stiff to very stiff brown mottled light brown gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse flint. (Head)
	D	3.20											3.40	End of borehole at 3.40m

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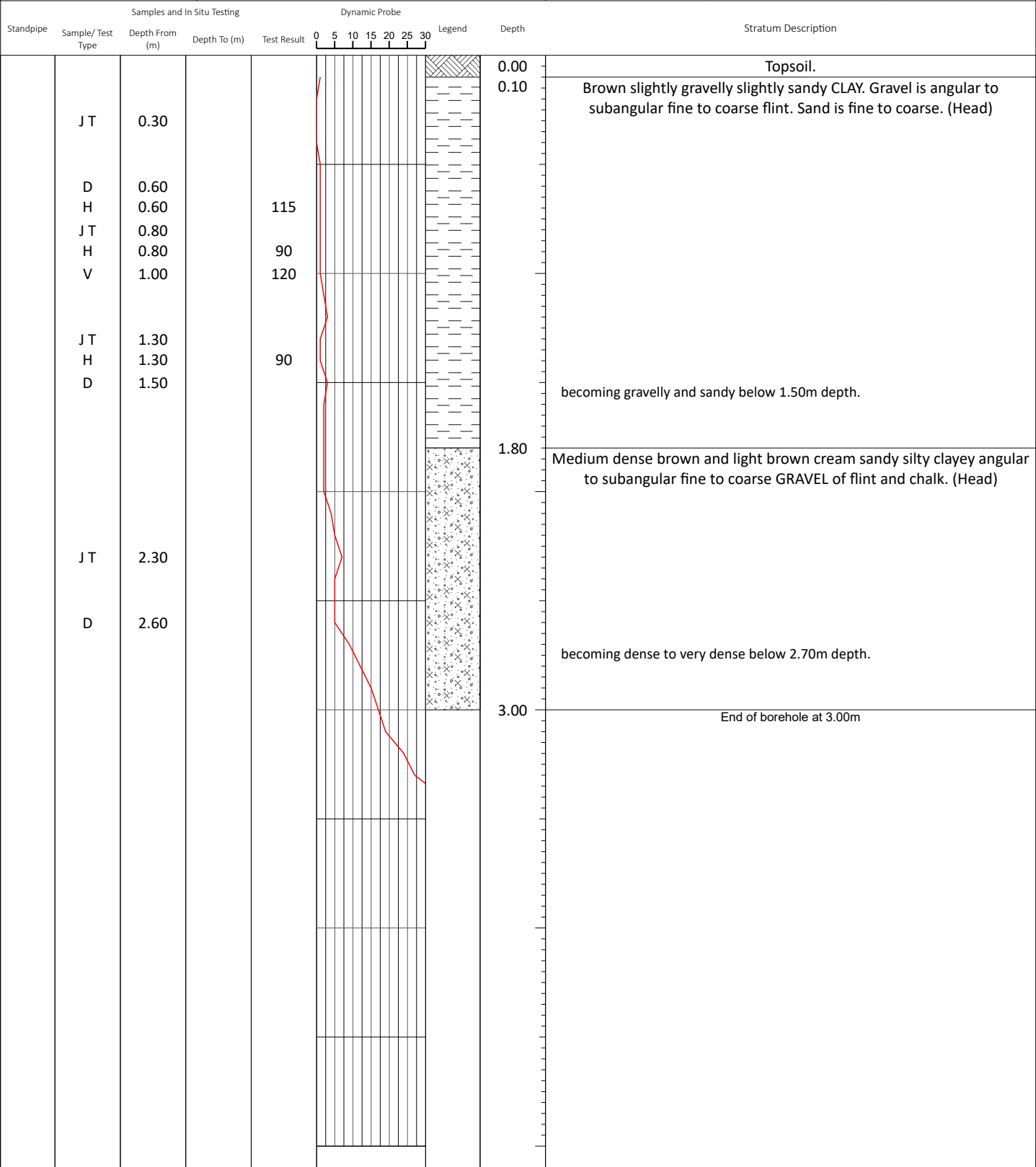
Job Number: P14899

Start Date: 24/11/2020

End Date: 24/11/2020

Borehole Number: **BH04**

Sheet 1 of 1



Remarks Groundwater: Borehole dry on completion. Stability: Borehole stable on completion. Notes: n/a	Excavation Method: WLS
	Borehole Diameter: Various
	Made By: RJ

Site Name: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

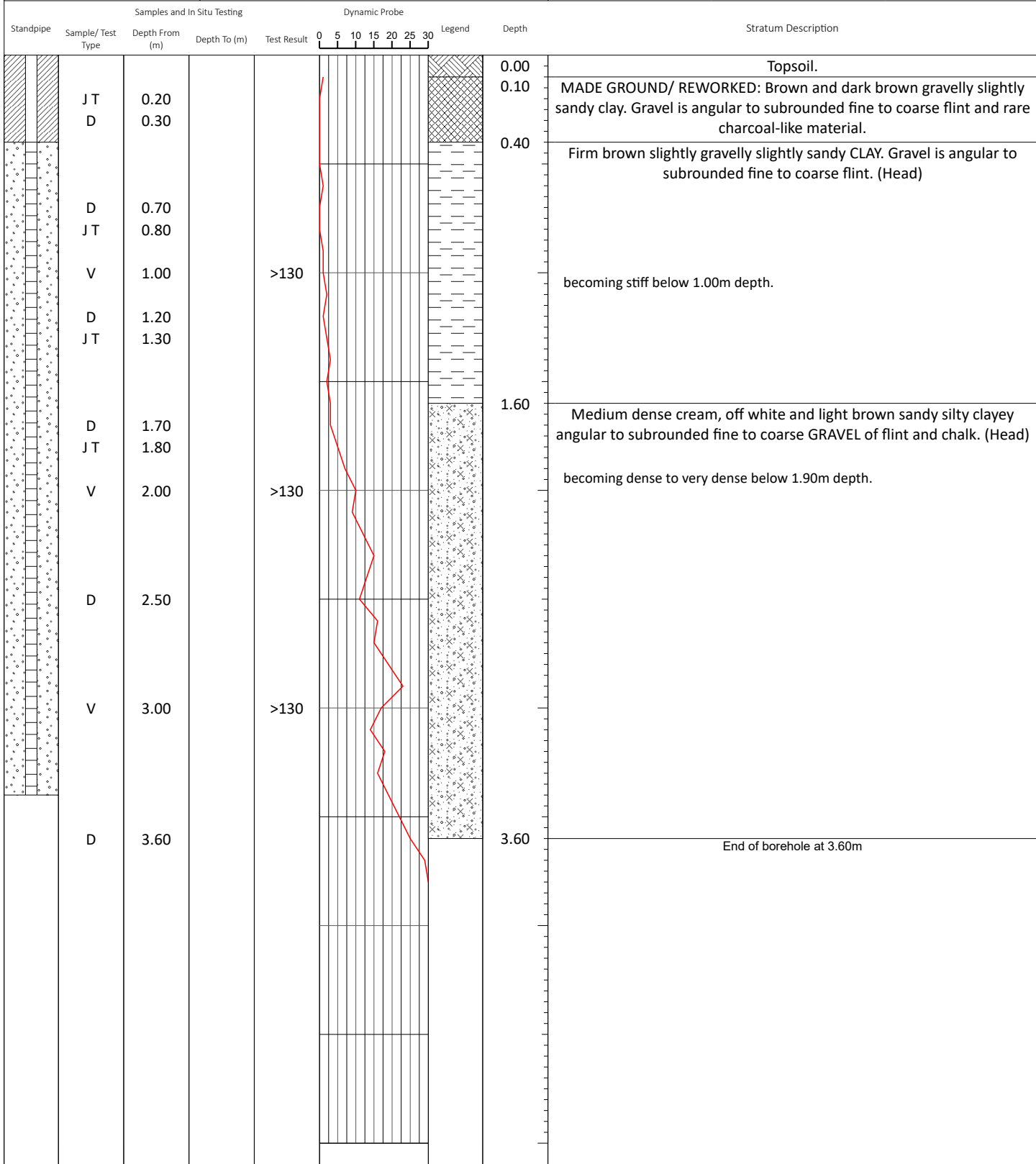
Job Number: P14899

Start Date: 24/11/2020

End Date: 24/11/2020

Borehole Number: **BH05**

Sheet 1 of 1



Remarks

Groundwater: Borehole dry on completion.

Stability: Borehole stable on completion.

Notes: No further progress below 3.60m depth - too dense.
 Standpipe installed to 3.40m depth; 3.40m to 0.40m slotted pipe with gravel surround; 0.40m to ground level plain pipe with bentonite seal; completed with end cap and security cover concreted flush with ground surface.

Excavation Method: WLS

Borehole Diameter: Various

Made By: RJ



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Tel: 01273 483119

Site Name: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

Job Number: P14899

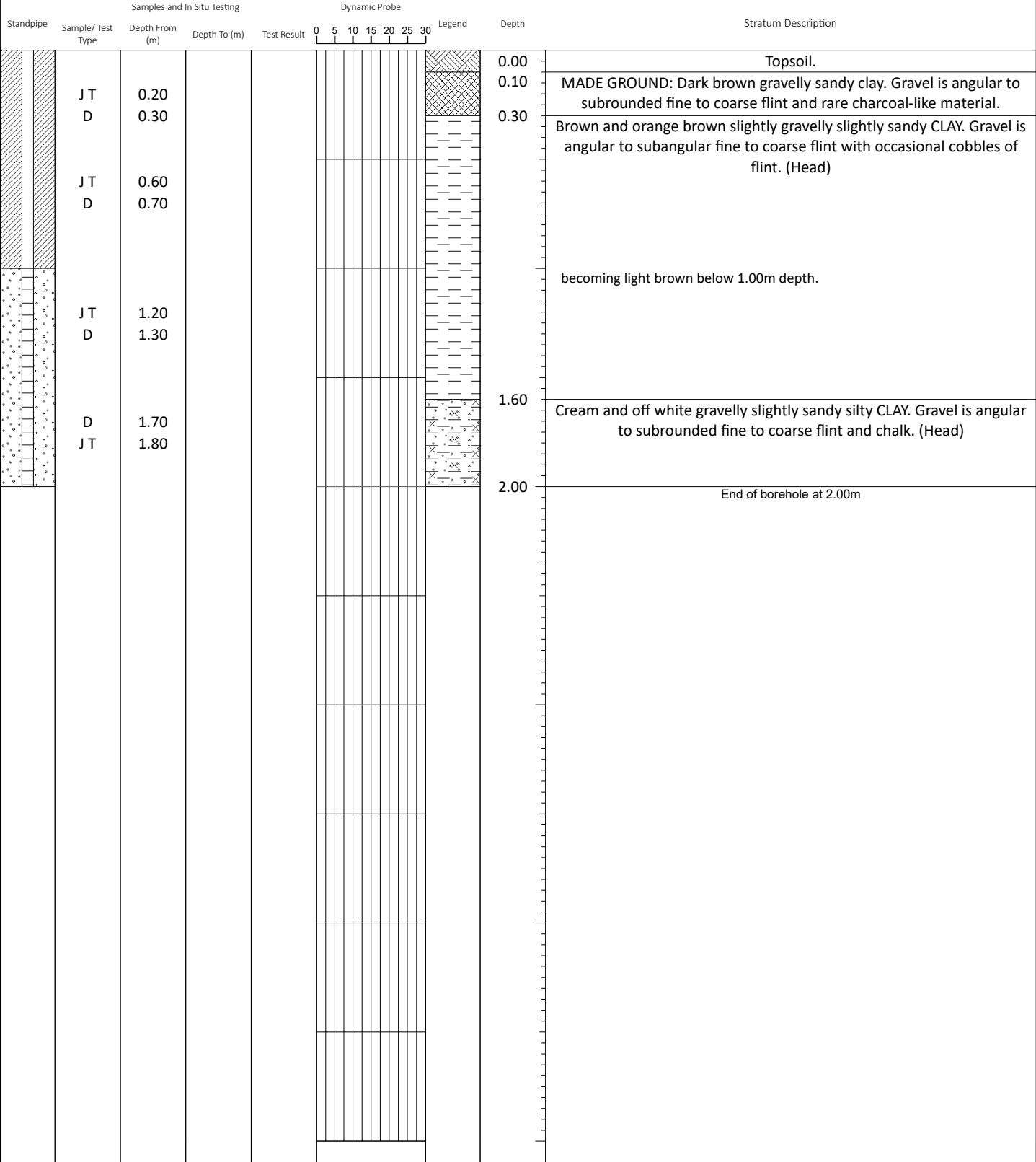
Start Date: 24/11/2020

End Date: 24/11/2020

Borehole Number:

WS01

Sheet 1 of 1



Remarks

Groundwater: Borehole dry on completion.

Stability: Borehole stable on completion.

Notes: Standpipe installed to 2.00m depth; 2.00m to 1.00m slotted pipe with gravel surround; 1.00m to ground level plain pipe with bentonite seal; completed with gas tap and security cover concreted flush with ground surface.

Excavation Method:

WLS

Borehole Diameter:

Various

Made By:

RJ

Site Name: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

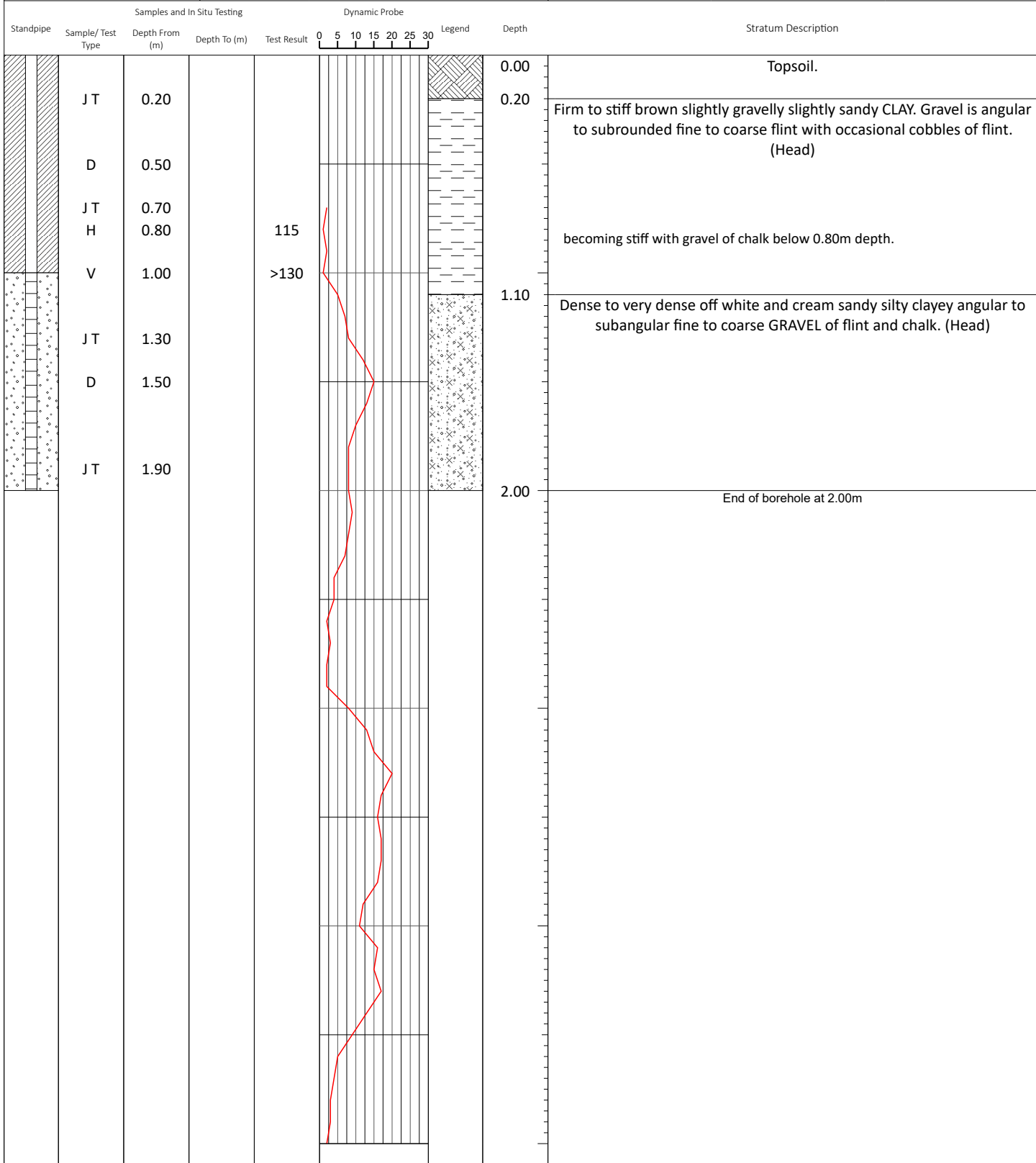
Job Number: P14899

Start Date: 24/11/2020

End Date: 24/11/2020

Borehole Number: **WS02**

Sheet 1 of 1



Remarks

Groundwater: Borehole dry on completion.

Stability: Borehole stable on completion.

Notes: Standpipe installed to 2.00m depth; 2.00m to 1.00m slotted pipe with gravel surround; 1.00m to ground level plain pipe with bentonite seal; completed with gas tap and security cover concreted flush with ground surface.

Excavation Method: WLS

Borehole Diameter: Various

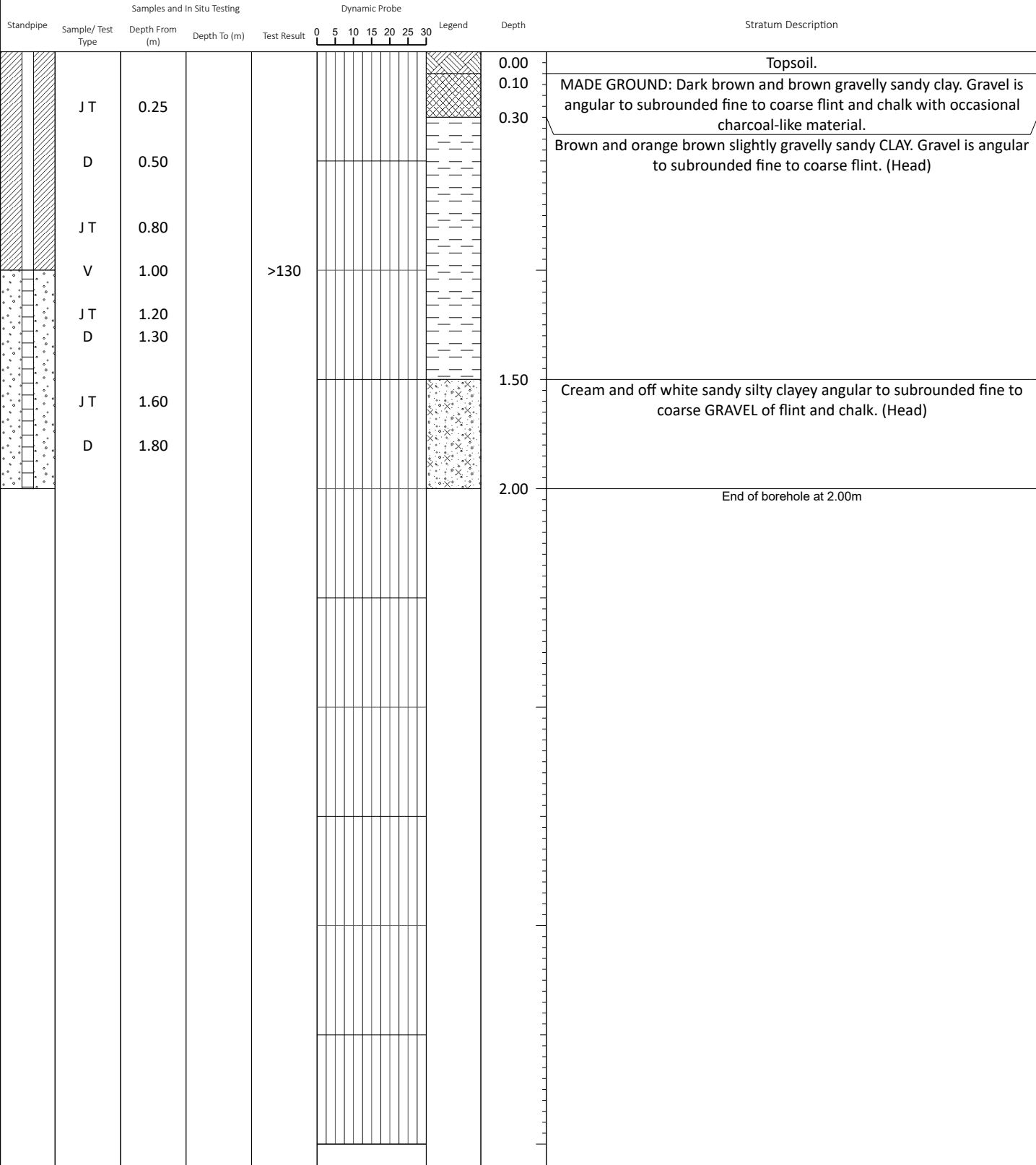
Made By: RJ

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Site Name: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade
Job Number: P14899
Start Date: 24/11/2020
End Date: 24/11/2020

Borehole Number: **WS03**

Sheet 1 of 1



Remarks
Groundwater: Borehole dry on completion.

Stability: Borehole stable on completion.

Notes: Standpipe installed to 2.00m depth; 2.00m to 1.00m slotted pipe with gravel surround; 1.00m to ground level plain pipe with bentonite seal; completed with gas tap and security cover concreted flush with ground surface.

Excavation Method: WLS

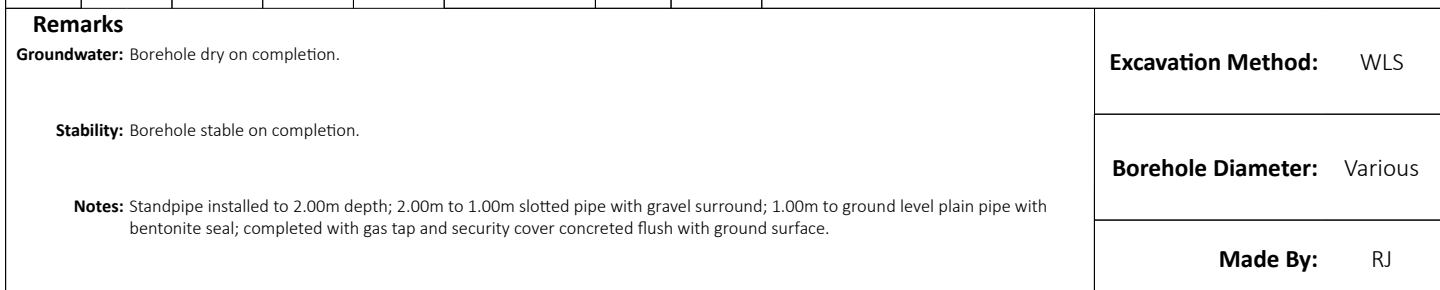
Borehole Diameter: Various

Made By: RJ

End Date: 24/11/2020

WS04

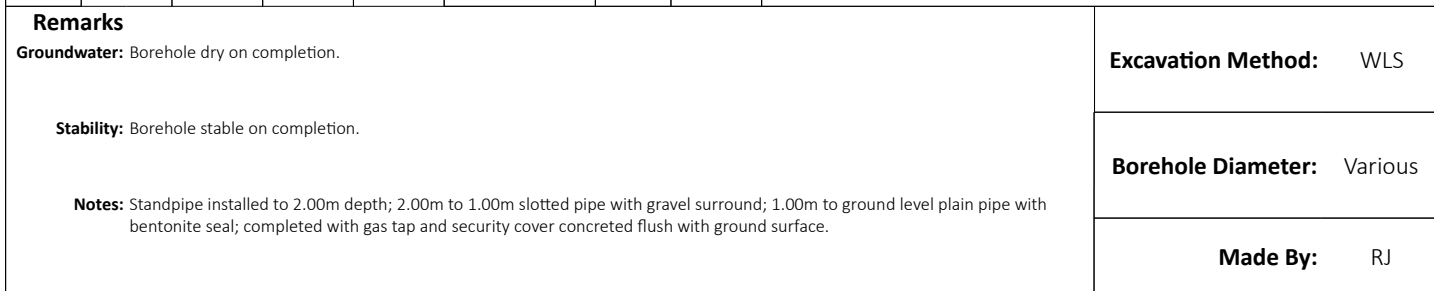
Sheet 1 of 1



End Date: 24/11/2020

WS05

Sheet 1 of 1





End Date: 25/11/2020

Sheet 1 of 1

Remarks Groundwater: Trial pit dry on completion. Stability: Trial pit stable on completion. Notes: n/a	Excavation Method: HDP
	Pit Length: n/a
	Pit Width: n/a
	Made By: RJ



End Date: 25/11/2020

Sheet 1 of 1

Remarks Groundwater: Trial pit dry on completion. Stability: Trial pit stable on completion. Notes: n/a	Excavation Method: HDP
	Pit Length: n/a
	Pit Width: n/a
	Made By: RJ



End Date: 25/11/2020

Sheet 1 of 1

Remarks Groundwater: Trial pit dry on completion. Stability: Trial pit stable on completion. Notes: n/a	Excavation Method: HDP
	Pit Length: n/a
	Pit Width: n/a
	Made By: RJ



End Date: 25/11/2020

Sheet 1 of 1

Remarks Groundwater: Trial pit dry on completion. Stability: Trial pit stable on completion. Notes: n/a	Excavation Method: HDP
	Pit Length: n/a
	Pit Width: n/a
	Made By: RJ



End Date: 25/11/2020

Sheet 1 of 1

Remarks Groundwater: Trial pit dry on completion. Stability: Trial pit stable on completion. Notes: n/a	Excavation Method: HDP
	Pit Length: n/a
	Pit Width: n/a
	Made By: RJ



End Date: 24/11/2020

Sheet 1 of 1

Remarks Groundwater: Trial pit dry on completion. Stability: Trial pit stable on completion. Notes: n/a	Excavation Method: HDP
	Pit Length: n/a
	Pit Width: n/a
	Made By: RJ



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Site Name: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

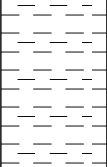
Job Number: P14899

Start Date: 27/11/2020

End Date: 27/11/2020

Trial Pit Number: SA101

Sheet 1 of 1

Samples and In Situ Testing				Legend	Depth/ Reduced Level	Stratum Description
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result			
J T D D J T D	0.25	0.35			0.00	Topsoil.
	0.28				0.25 0.35	MADE GROUND: Dark brown and brown gravelly sandy clay. Gravel is angular to subrounded fine to coarse flint, brick, carbonaceous material and plastic. Orange brown and brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse flint with cobbles of flint. (Head)
	0.60					
	0.70					
					1.00	Off white, cream and light brown sandy silty clayey angular to subangular fine to coarse GRAVEL of flint and chalk. (Head)
	2.00				2.50	End of trial pit at 2.50m

Remarks

Groundwater: Trial pit dry on completion.

Stability: Trial pit stable on completion.

Notes: n/a

Excavation Method: TP

Pit Length: 1.80m

Pit Width: 0.45m

Made By: RJ

End Date: 27/11/2020

Sheet 1 of 1

Remarks Groundwater: Trial pit dry on completion. Stability: Trial pit stable on completion. Notes: n/a	Excavation Method:	TP
	Pit Length:	1.70m
	Pit Width:	0.45m
	Made By:	RJ

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Site Name:

Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

Job Number:

P14899

Start Date:

27/11/2020

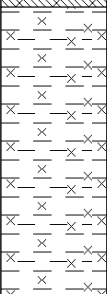
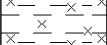
End Date:

27/11/2020

Trial Pit Number:

SA104

Sheet 1 of 1

Samples and In Situ Testing				Legend	Depth/ Reduced Level	Stratum Description
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result			
J T D	0.40				0.00	Topsoil.
	0.50				0.20	Orange brown and brown slightly gravelly slightly sandy silty CLAY. Gravel is angular to subrounded fine to coarse flint. (Head)
J T	1.20					becoming very gravelly below 1.00m depth.
D	1.50				1.30	Off white and cream mottled light brown sandy silty clayey angular to subrounded fine to coarse GRAVEL of flint and chalk. (Head)
D	2.30				2.50	End of trial pit at 2.50m

Remarks

Groundwater:

Trial pit dry on completion.

Stability:

Trial pit stable on completion.

Notes:

n/a

Excavation Method:

TP

Pit Length:

1.60m

Pit Width:

0.45m

Made By:

RJ

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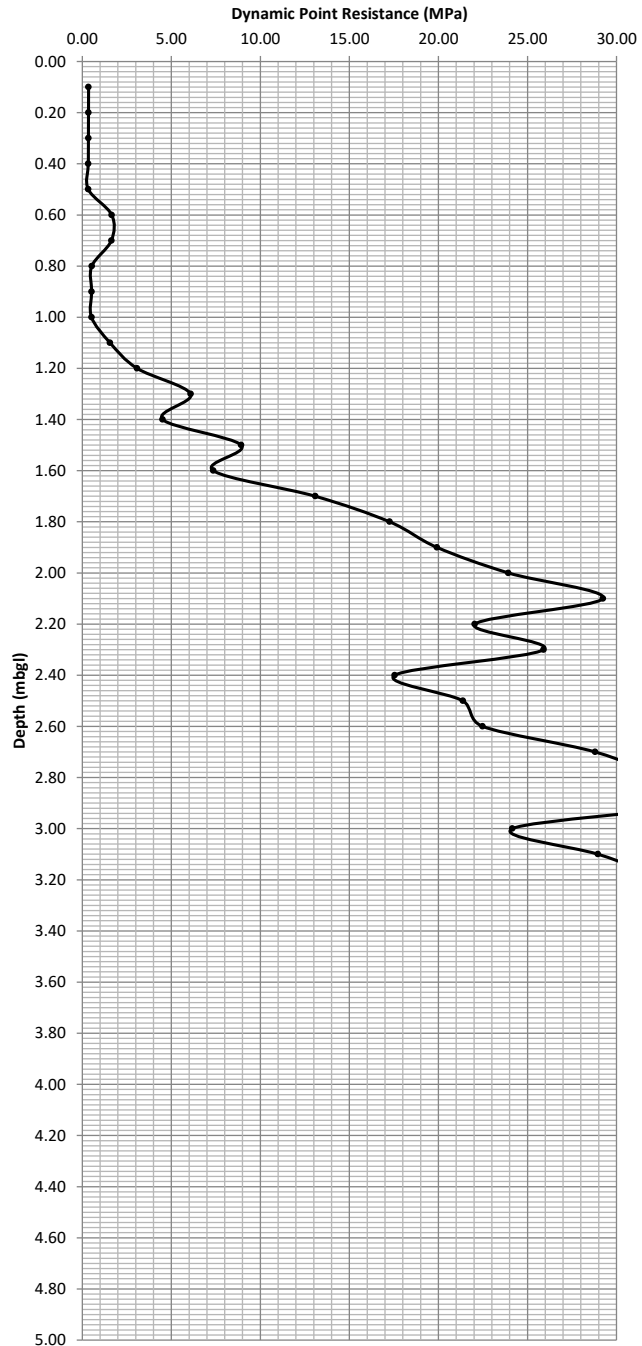
Dynamic Probe Record

SITE Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

Report Ref.

P14899

Test Location Reference		BH01		
Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10	0.2	0.50	0.36	0.35
0.20	0.2	0.50	0.36	0.35
0.30	0.2	0.50	0.36	0.34
0.40	0.2	0.50	0.36	0.34
0.50	0.2	0.50	0.36	0.34
0.60	1	0.10	1.82	1.66
0.70	1	0.10	1.82	1.63
0.80	0.33	0.30	0.60	0.53
0.90	0.33	0.30	0.60	0.53
1.00	0.33	0.30	0.60	0.52
1.10	1	0.10	1.82	1.56
1.20	2	0.05	3.64	3.08
1.30	4	0.03	7.28	6.09
1.40	3	0.03	5.46	4.51
1.50	6	0.02	10.91	8.92
1.60	5	0.02	9.09	7.35
1.70	9	0.01	16.37	13.09
1.80	12	0.01	21.83	17.26
1.90	14	0.01	25.47	19.92
2.00	17	0.01	30.92	23.93
2.10	21	0.00	38.20	29.24
2.20	16	0.01	29.10	22.05
2.30	19	0.01	34.56	25.91
2.40	13	0.01	23.65	17.54
2.50	16	0.01	29.10	21.37
2.60	17	0.01	30.92	22.48
2.70	22	0.00	40.02	28.80
2.80	25	0.00	45.47	32.41
2.90	27	0.00	49.11	34.66
3.00	19	0.01	34.56	24.15
3.10	23	0.00	41.84	28.96
3.20	27	0.00	49.11	33.67
3.30	35	0.00	63.66	43.24
3.40				
3.50				
3.60				
3.70				
3.80				
3.90				
4.00				
4.10				
4.20				
4.30				
4.40				
4.50				
4.60				
4.70				
4.80				
4.90				
5.00				



Notes:

No further progress below 3.30m depth - hammer bouncing.

Hammer Mass	63.5 kg
Fall Height	0.76 m
Cone Area	0.0019 m ²
E _{theor}	473 J
Energy Ratio	0.73
Anvil Mass	1 kg
Rod Mass	8.79 kg/m

ASHDOWN SITE INVESTIGATION LTD

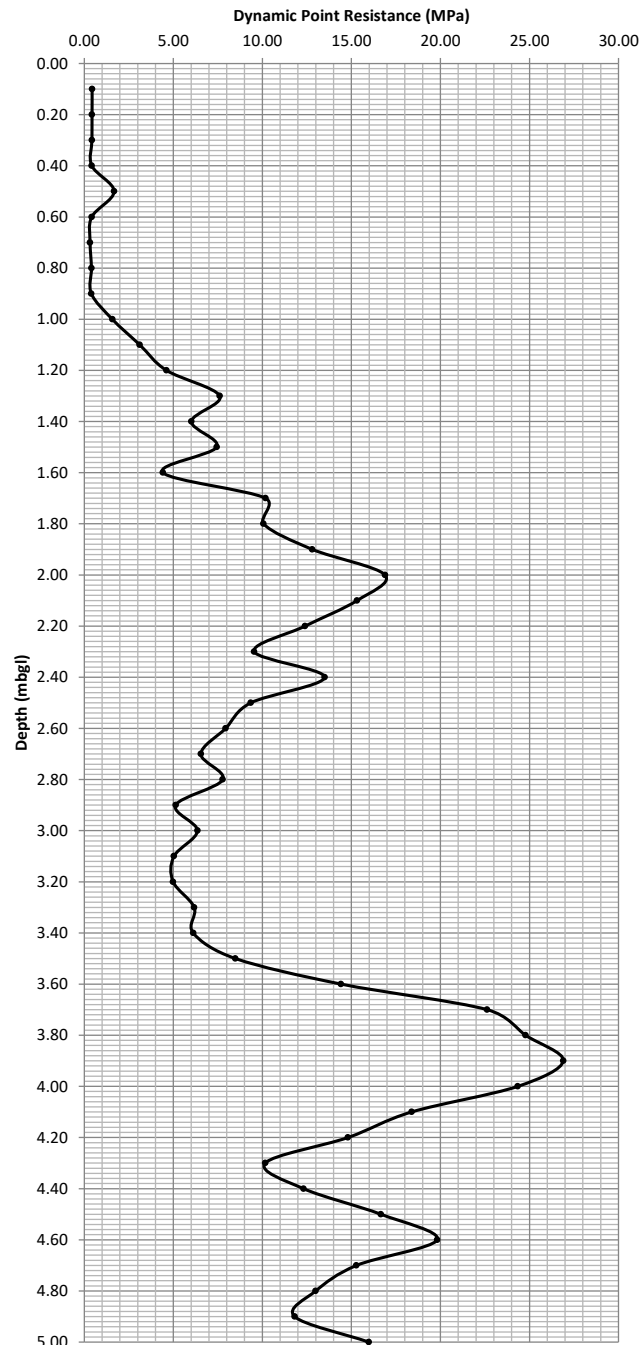
Dynamic Probe Record

SITE Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

Report Ref.

P14899

Test Location Reference		BH02		
Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10	0.25	0.40	0.45	0.44
0.20	0.25	0.40	0.45	0.44
0.30	0.25	0.40	0.45	0.43
0.40	0.25	0.40	0.45	0.42
0.50	1	0.10	1.82	1.68
0.60	0.25	0.40	0.45	0.41
0.70	0.2	0.50	0.36	0.33
0.80	0.25	0.40	0.45	0.40
0.90	0.25	0.40	0.45	0.40
1.00	1	0.10	1.82	1.58
1.10	2	0.05	3.64	3.11
1.20	3	0.03	5.46	4.62
1.30	5	0.02	9.09	7.61
1.40	4	0.03	7.28	6.02
1.50	5	0.02	9.09	7.43
1.60	3	0.03	5.46	4.41
1.70	7	0.01	12.73	10.18
1.80	7	0.01	12.73	10.07
1.90	9	0.01	16.37	12.80
2.00	12	0.01	21.83	16.89
2.10	11	0.01	20.01	15.32
2.20	9	0.01	16.37	12.40
2.30	7	0.01	12.73	9.55
2.40	10	0.01	18.19	13.50
2.50	7	0.01	12.73	9.35
2.60	6	0.02	10.91	7.93
2.70	5	0.02	9.09	6.55
2.80	6	0.02	10.91	7.78
2.90	4	0.03	7.28	5.13
3.00	5	0.02	9.09	6.36
3.10	4	0.03	7.28	5.04
3.20	4	0.03	7.28	4.99
3.30	5	0.02	9.09	6.18
3.40	5	0.02	9.09	6.12
3.50	7	0.01	12.73	8.49
3.60	12	0.01	21.83	14.42
3.70	19	0.01	34.56	22.62
3.80	21	0.00	38.20	24.78
3.90	23	0.00	41.84	26.90
4.00	21	0.00	38.20	24.34
4.10	16	0.01	29.10	18.39
4.20	13	0.01	23.65	14.81
4.30	9	0.01	16.37	10.16
4.40	11	0.01	20.01	12.32
4.50	15	0.01	27.28	16.65
4.60	18	0.01	32.74	19.82
4.70	14	0.01	25.47	15.29
4.80	12	0.01	21.83	12.99
4.90	11	0.01	20.01	11.81
5.00	15	0.01	27.28	15.98



Notes:

Hammer Mass	63.5 kg
Fall Height	0.76 m
Cone Area	0.0019 m ²
E _{theor}	473 J
Energy Ratio	0.73
Anvil Mass	1 kg
Rod Mass	8.79 kg/m

ASHDOWN SITE INVESTIGATION LTD

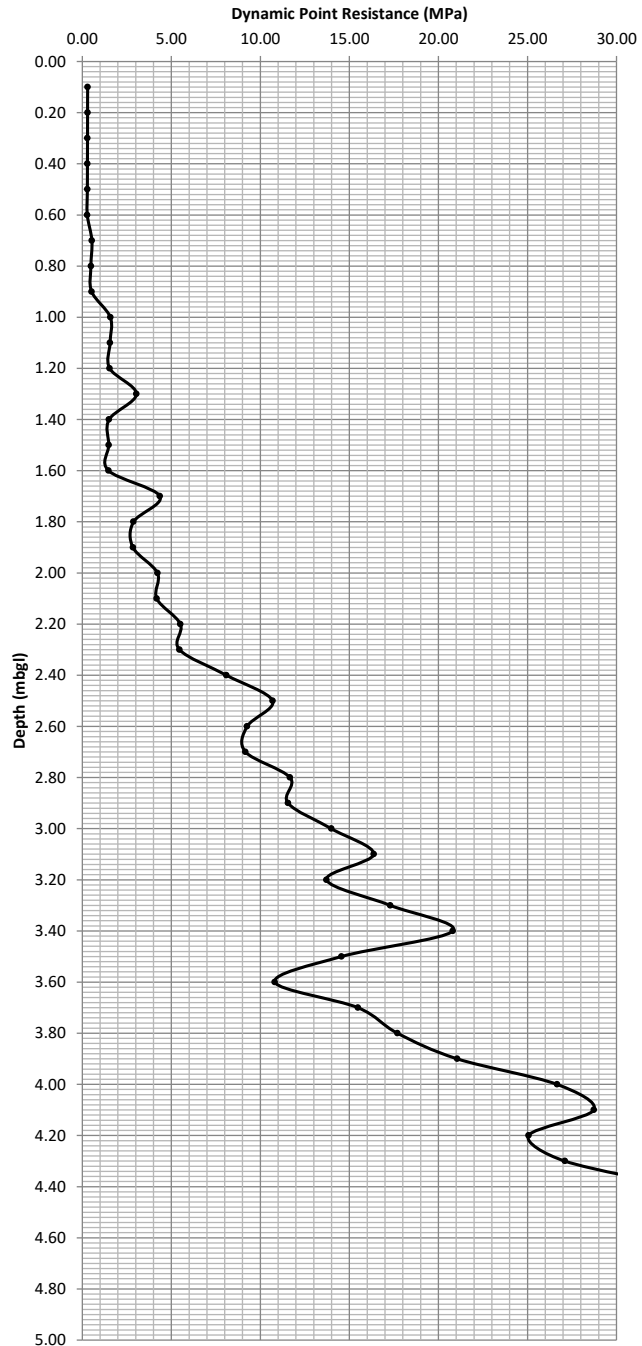
Dynamic Probe Record

SITE Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

Report Ref.

P14899

Test Location Reference		BH03		
Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10	0.17	0.59	0.31	0.30
0.20	0.17	0.59	0.31	0.30
0.30	0.17	0.59	0.31	0.29
0.40	0.17	0.59	0.31	0.29
0.50	0.17	0.59	0.31	0.29
0.60	0.17	0.59	0.31	0.28
0.70	0.33	0.30	0.60	0.54
0.80	0.3	0.33	0.55	0.48
0.90	0.33	0.30	0.60	0.53
1.00	1	0.10	1.82	1.58
1.10	1	0.10	1.82	1.56
1.20	1	0.10	1.82	1.54
1.30	2	0.05	3.64	3.04
1.40	1	0.10	1.82	1.50
1.50	1	0.10	1.82	1.49
1.60	1	0.10	1.82	1.47
1.70	3	0.03	5.46	4.36
1.80	2	0.05	3.64	2.88
1.90	2	0.05	3.64	2.85
2.00	3	0.03	5.46	4.22
2.10	3	0.03	5.46	4.18
2.20	4	0.03	7.28	5.51
2.30	4	0.03	7.28	5.45
2.40	6	0.02	10.91	8.10
2.50	8	0.01	14.55	10.69
2.60	7	0.01	12.73	9.26
2.70	7	0.01	12.73	9.17
2.80	9	0.01	16.37	11.67
2.90	9	0.01	16.37	11.55
3.00	11	0.01	20.01	13.98
3.10	13	0.01	23.65	16.37
3.20	11	0.01	20.01	13.72
3.30	14	0.01	25.47	17.30
3.40	17	0.01	30.92	20.81
3.50	12	0.01	21.83	14.55
3.60	9	0.01	16.37	10.81
3.70	13	0.01	23.65	15.48
3.80	15	0.01	27.28	17.70
3.90	18	0.01	32.74	21.05
4.00	23	0.00	41.84	26.66
4.10	25	0.00	45.47	28.73
4.20	22	0.00	40.02	25.06
4.30	24	0.00	43.66	27.10
4.40	30	0.00	54.57	33.59
4.50				
4.60				
4.70				
4.80				
4.90				
5.00				



Notes:

No further progress below 4.40m depth - hammer bouncing.

Hammer Mass	63.5 kg
Fall Height	0.76 m
Cone Area	0.0019 m ²
E _{theor}	473 J
Energy Ratio	0.73
Anvil Mass	1 kg
Rod Mass	8.79 kg/m

ASHDOWN SITE INVESTIGATION LTD

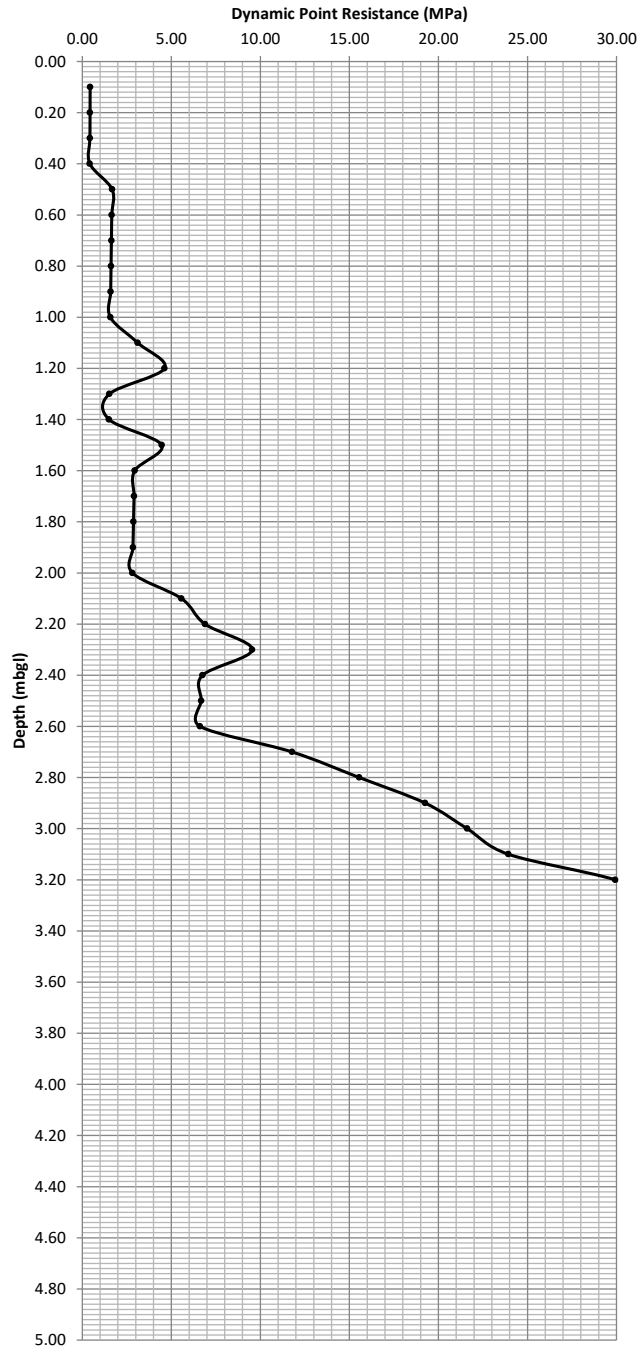
Dynamic Probe Record

SITE Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

Report Ref.

P14899

Test Location Reference		BH04		
Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10	0.25	0.40	0.45	0.44
0.20	0.25	0.40	0.45	0.44
0.30	0.25	0.40	0.45	0.43
0.40	0.25	0.40	0.45	0.42
0.50	1	0.10	1.82	1.68
0.60	1	0.10	1.82	1.66
0.70	1	0.10	1.82	1.63
0.80	1	0.10	1.82	1.61
0.90	1	0.10	1.82	1.60
1.00	1	0.10	1.82	1.58
1.10	2	0.05	3.64	3.11
1.20	3	0.03	5.46	4.62
1.30	1	0.10	1.82	1.52
1.40	1	0.10	1.82	1.50
1.50	3	0.03	5.46	4.46
1.60	2	0.05	3.64	2.94
1.70	2	0.05	3.64	2.91
1.80	2	0.05	3.64	2.88
1.90	2	0.05	3.64	2.85
2.00	2	0.05	3.64	2.81
2.10	4	0.03	7.28	5.57
2.20	5	0.02	9.09	6.89
2.30	7	0.01	12.73	9.55
2.40	5	0.02	9.09	6.75
2.50	5	0.02	9.09	6.68
2.60	5	0.02	9.09	6.61
2.70	9	0.01	16.37	11.78
2.80	12	0.01	21.83	15.56
2.90	15	0.01	27.28	19.26
3.00	17	0.01	30.92	21.61
3.10	19	0.01	34.56	23.92
3.20	24	0.00	43.66	29.93
3.30	27	0.00	49.11	33.36
3.40	35	0.00	63.66	42.84
3.50				
3.60				
3.70				
3.80				
3.90				
4.00				
4.10				
4.20				
4.30				
4.40				
4.50				
4.60				
4.70				
4.80				
4.90				
5.00				



Notes:

No further progress below 3.40m depth - hammer bouncing.

Hammer Mass	63.5 kg
Fall Height	0.76 m
Cone Area	0.0019 m ²
E _{theor}	473 J
Energy Ratio	0.73
Anvil Mass	1 kg
Rod Mass	8.79 kg/m

ASHDOWN SITE INVESTIGATION LTD

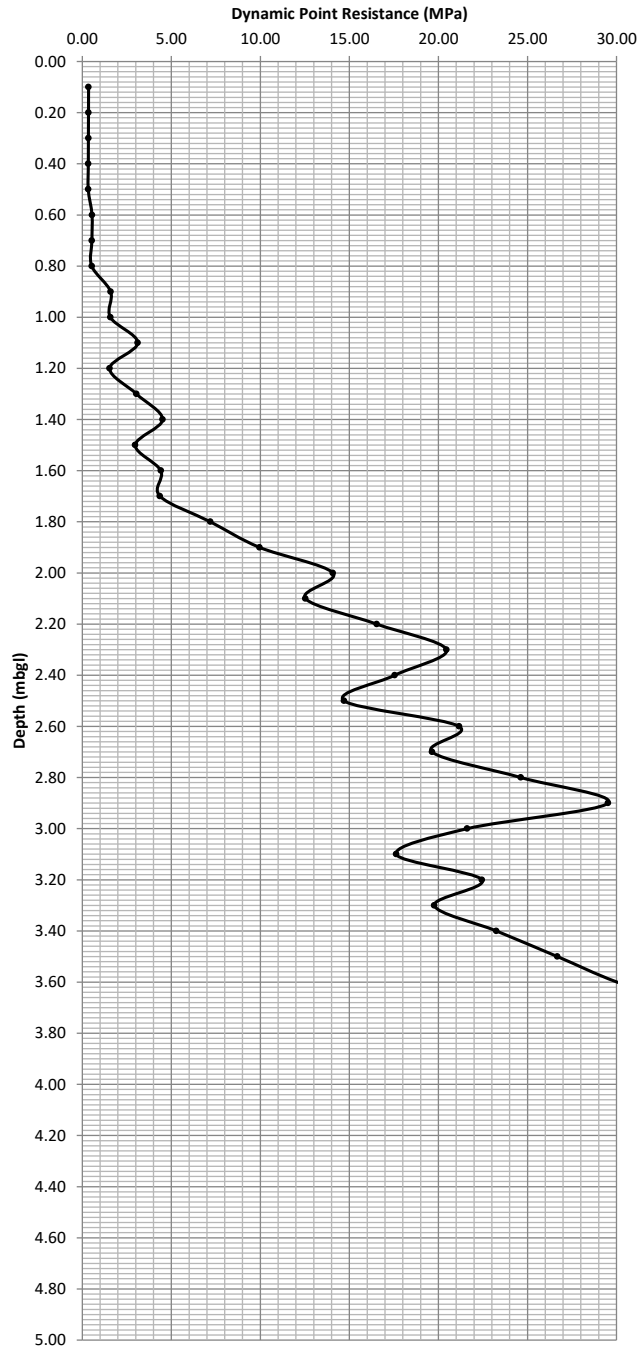
Dynamic Probe Record

SITE Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

Report Ref.

P14899

Test Location Reference		BH05		
Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10	0.2	0.50	0.36	0.35
0.20	0.2	0.50	0.36	0.35
0.30	0.2	0.50	0.36	0.34
0.40	0.2	0.50	0.36	0.34
0.50	0.2	0.50	0.36	0.34
0.60	0.33	0.30	0.60	0.55
0.70	0.33	0.30	0.60	0.54
0.80	0.33	0.30	0.60	0.53
0.90	1	0.10	1.82	1.60
1.00	1	0.10	1.82	1.58
1.10	2	0.05	3.64	3.11
1.20	1	0.10	1.82	1.54
1.30	2	0.05	3.64	3.04
1.40	3	0.03	5.46	4.51
1.50	2	0.05	3.64	2.97
1.60	3	0.03	5.46	4.41
1.70	3	0.03	5.46	4.36
1.80	5	0.02	9.09	7.19
1.90	7	0.01	12.73	9.96
2.00	10	0.01	18.19	14.07
2.10	9	0.01	16.37	12.53
2.20	12	0.01	21.83	16.53
2.30	15	0.01	27.28	20.45
2.40	13	0.01	23.65	17.54
2.50	11	0.01	20.01	14.69
2.60	16	0.01	29.10	21.16
2.70	15	0.01	27.28	19.64
2.80	19	0.01	34.56	24.63
2.90	23	0.00	41.84	29.53
3.00	17	0.01	30.92	21.61
3.10	14	0.01	25.47	17.63
3.20	18	0.01	32.74	22.45
3.30	16	0.01	29.10	19.77
3.40	19	0.01	34.56	23.26
3.50	22	0.00	40.02	26.68
3.60	25	0.00	45.47	30.04
3.70	29	0.00	52.75	34.53
3.80	30	0.00	54.57	35.40
3.90	35	0.00	63.66	40.93
4.00				
4.10				
4.20				
4.30				
4.40				
4.50				
4.60				
4.70				
4.80				
4.90				
5.00				



Notes:

No further progress below 3.90m depth - hammer bouncing.

Hammer Mass	63.5 kg
Fall Height	0.76 m
Cone Area	0.0019 m ²
E _{theor}	473 J
Energy Ratio	0.73
Anvil Mass	1 kg
Rod Mass	8.79 kg/m

ASHDOWN SITE INVESTIGATION LTD

Dynamic Probe Record

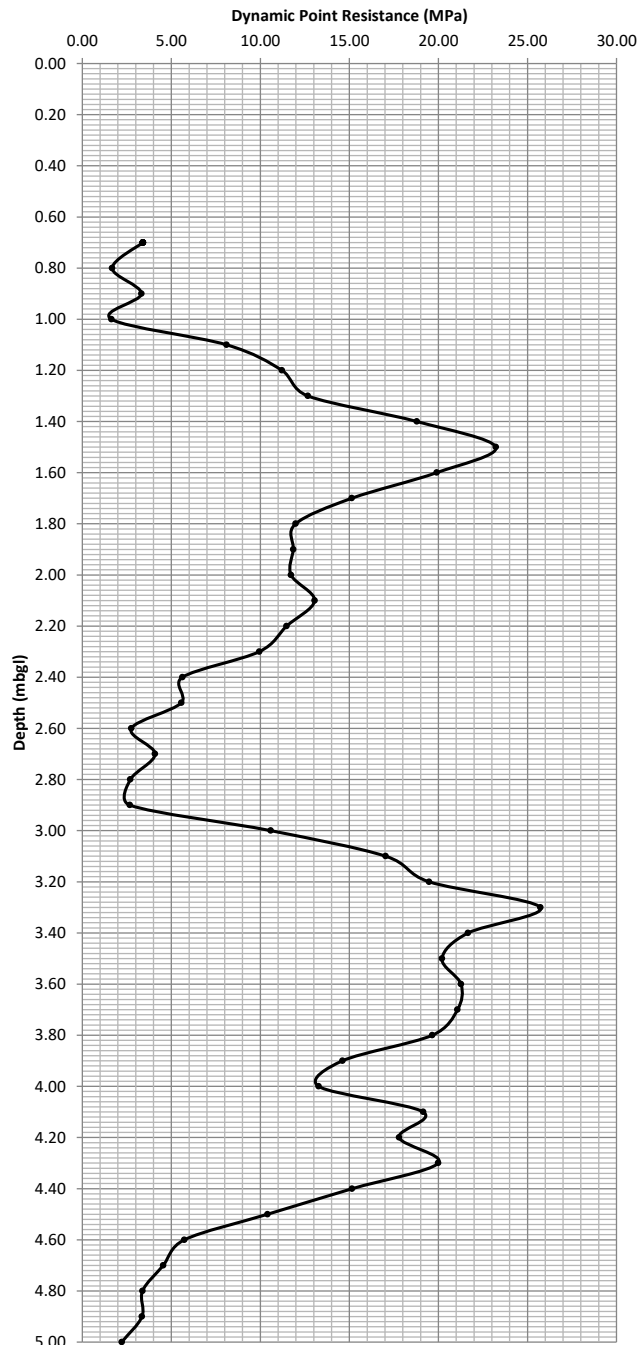
SITE Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

Report Ref.

P14899

Test Location Reference WS02

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50				
0.60				
0.70	2	0.05	3.79	3.40
0.80	1	0.10	1.89	1.68
0.90	2	0.05	3.79	3.32
1.00	1	0.10	1.89	1.64
1.10	5	0.02	9.47	8.11
1.20	7	0.01	13.26	11.22
1.30	8	0.01	15.15	12.67
1.40	12	0.01	22.72	18.79
1.50	15	0.01	28.41	23.22
1.60	13	0.01	24.62	19.90
1.70	10	0.01	18.94	15.14
1.80	8	0.01	15.15	11.98
1.90	8	0.01	15.15	11.85
2.00	8	0.01	15.15	11.72
2.10	9	0.01	17.04	13.05
2.20	8	0.01	15.15	11.48
2.30	7	0.01	13.26	9.94
2.40	4	0.03	7.57	5.62
2.50	4	0.03	7.57	5.56
2.60	2	0.05	3.79	2.75
2.70	3	0.03	5.68	4.09
2.80	2	0.05	3.79	2.70
2.90	2	0.05	3.79	2.67
3.00	8	0.01	15.15	10.59
3.10	13	0.01	24.62	17.04
3.20	15	0.01	28.41	19.48
3.30	20	0.01	37.87	25.72
3.40	17	0.01	32.19	21.66
3.50	16	0.01	30.30	20.20
3.60	17	0.01	32.19	21.27
3.70	17	0.01	32.19	21.07
3.80	16	0.01	30.30	19.66
3.90	12	0.01	22.72	14.61
4.00	11	0.01	20.83	13.28
4.10	16	0.01	30.30	19.14
4.20	15	0.01	28.41	17.79
4.30	17	0.01	32.19	19.99
4.40	13	0.01	24.62	15.15
4.50	9	0.01	17.04	10.40
4.60	5	0.02	9.47	5.73
4.70	4	0.03	7.57	4.55
4.80	3	0.03	5.68	3.38
4.90	3	0.03	5.68	3.35
5.00	2	0.05	3.79	2.22



Notes:

Hammer Mass 63.5 kg
 Fall Height 0.76 m
 Cone Area 0.0019 m²
 E_{theor} 473 J
 Energy Ratio 0.76
 Anvil Mass 1 kg
 Rod Mass 8.79 kg/m

ASHDOWN SITE INVESTIGATION LTD

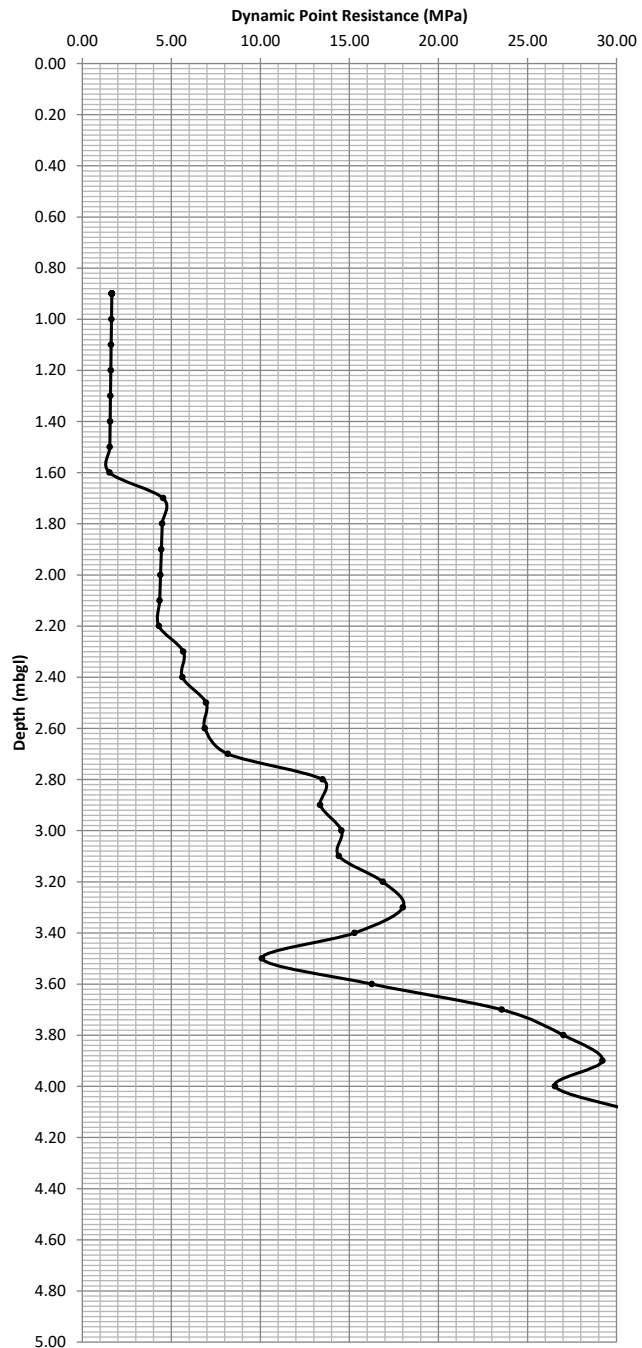
Dynamic Probe Record

SITE Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

Report Ref.

P14899

Test Location Reference		WS05		
Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50				
0.60				
0.70				
0.80				
0.90	1	0.10	1.89	1.66
1.00	1	0.10	1.89	1.64
1.10	1	0.10	1.89	1.62
1.20	1	0.10	1.89	1.60
1.30	1	0.10	1.89	1.58
1.40	1	0.10	1.89	1.57
1.50	1	0.10	1.89	1.55
1.60	1	0.10	1.89	1.53
1.70	3	0.03	5.68	4.54
1.80	3	0.03	5.68	4.49
1.90	3	0.03	5.68	4.44
2.00	3	0.03	5.68	4.40
2.10	3	0.03	5.68	4.35
2.20	3	0.03	5.68	4.30
2.30	4	0.03	7.57	5.68
2.40	4	0.03	7.57	5.62
2.50	5	0.02	9.47	6.95
2.60	5	0.02	9.47	6.88
2.70	6	0.02	11.36	8.18
2.80	10	0.01	18.94	13.50
2.90	10	0.01	18.94	13.36
3.00	11	0.01	20.83	14.56
3.10	11	0.01	20.83	14.42
3.20	13	0.01	24.62	16.88
3.30	14	0.01	26.51	18.01
3.40	12	0.01	22.72	15.29
3.50	8	0.01	15.15	10.10
3.60	13	0.01	24.62	16.26
3.70	19	0.01	35.98	23.55
3.80	22	0.00	41.66	27.03
3.90	24	0.00	45.45	29.22
4.00	22	0.00	41.66	26.55
4.10	26	0.00	49.24	31.10
4.20	30	0.00	56.81	35.58
4.30	32	0.00	60.60	37.62
4.40				
4.50				
4.60				
4.70				
4.80				
4.90				
5.00				



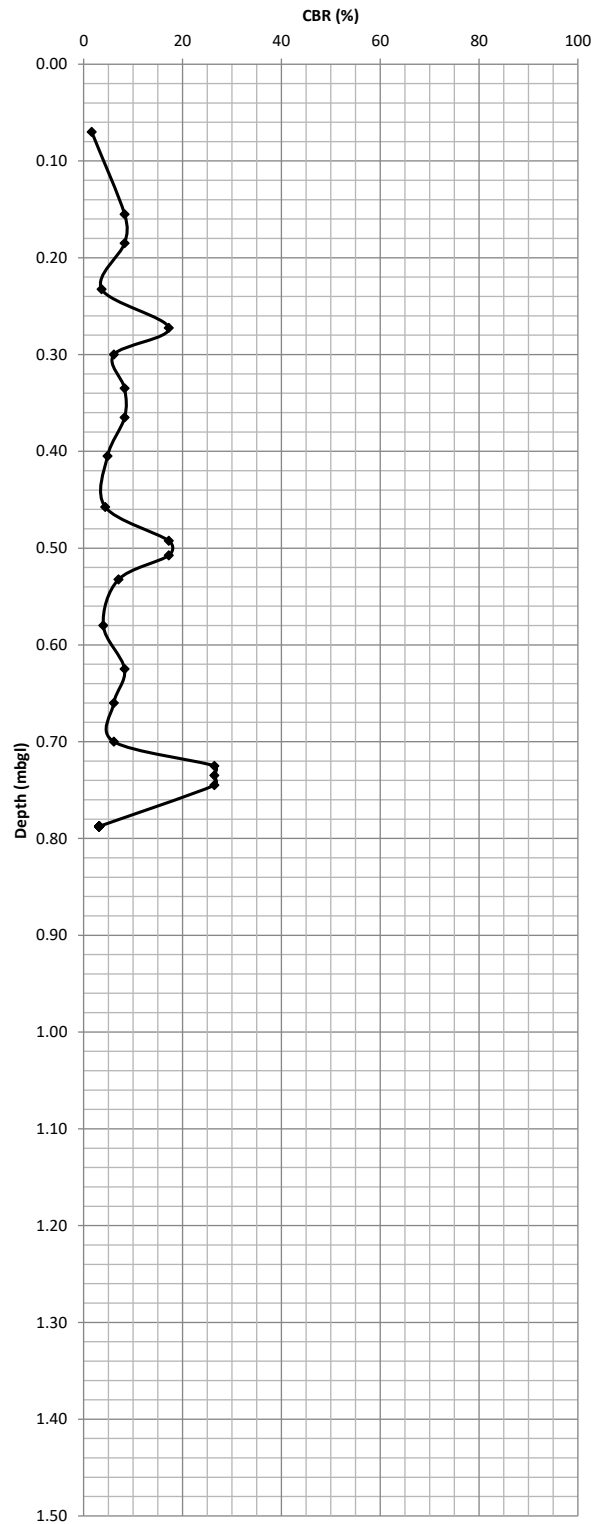
Notes:

No further progress below 4.30m depth - hammer bouncing.

Hammer Mass	63.5 kg
Fall Height	0.76 m
Cone Area	0.0019 m ²
E _{theor}	473 J
Energy Ratio	0.76
Anvil Mass	1 kg
Rod Mass	8.79 kg/m

TRL Dynamic Cone Penetrometer Record

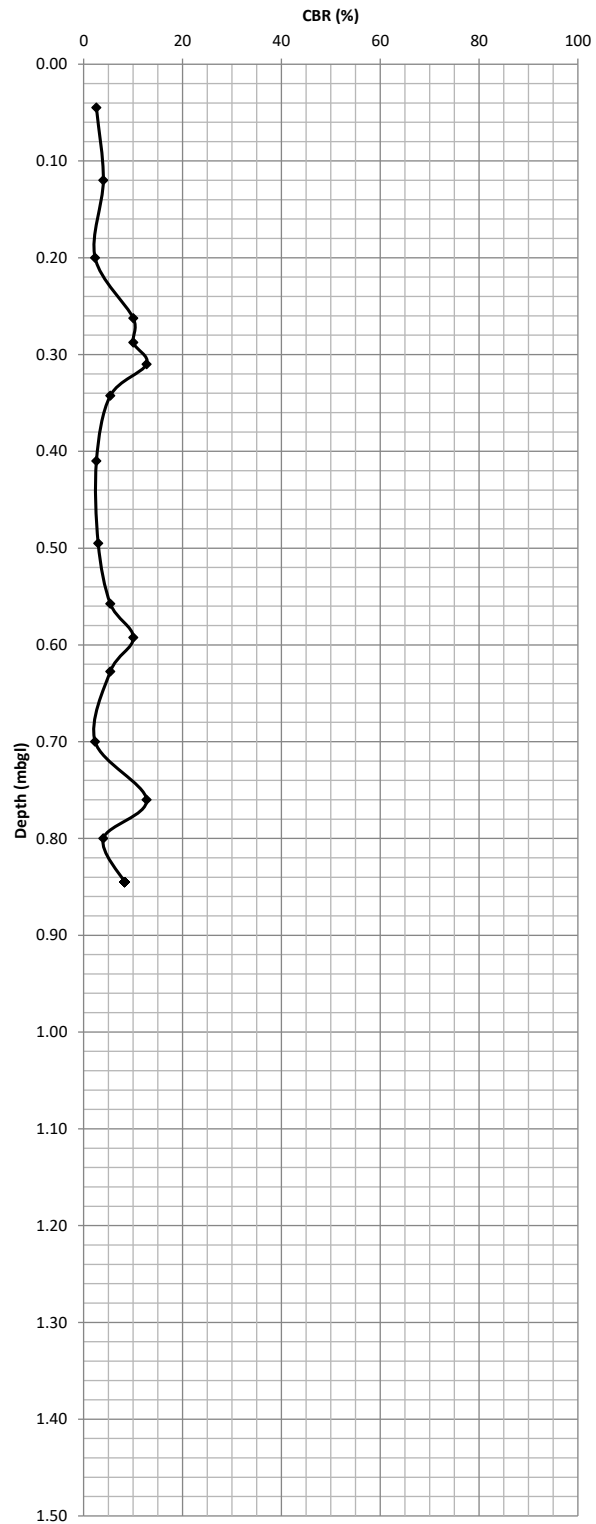
P14899



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

TRL Dynamic Cone Penetrometer Record

P14899

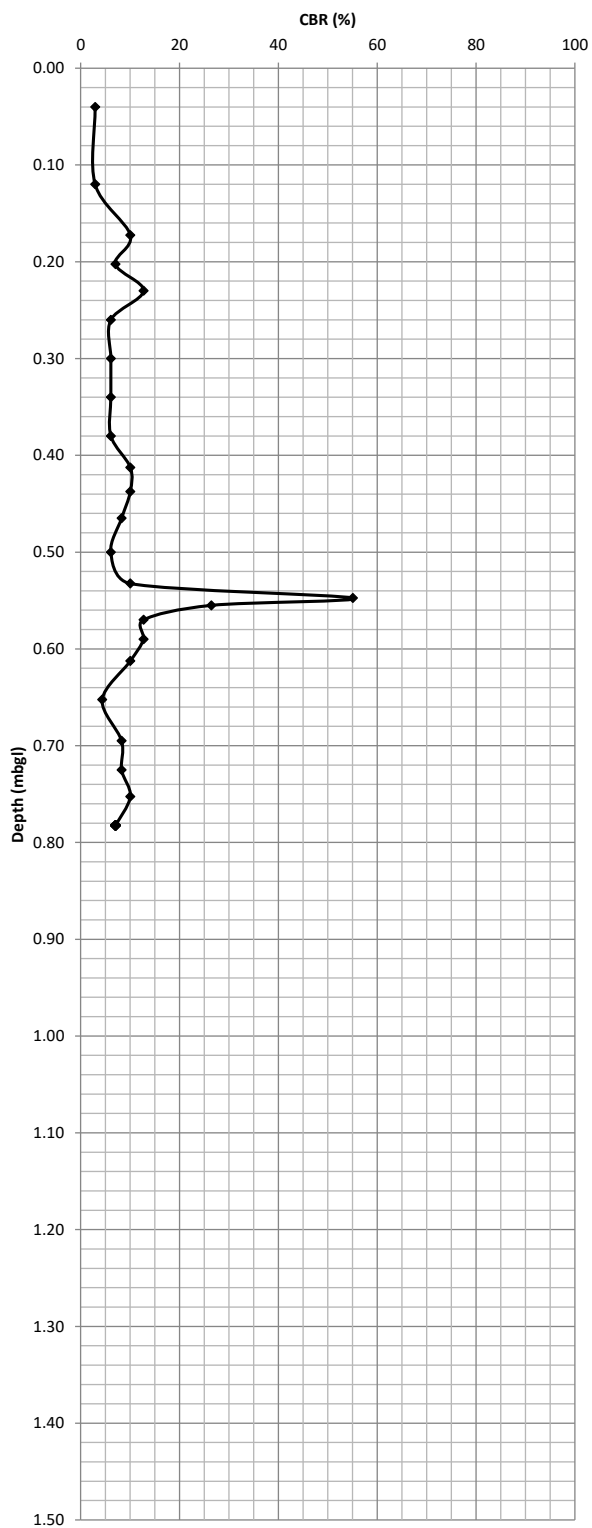


Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

TRL Dynamic Cone Penetrometer Record

Project Ref.

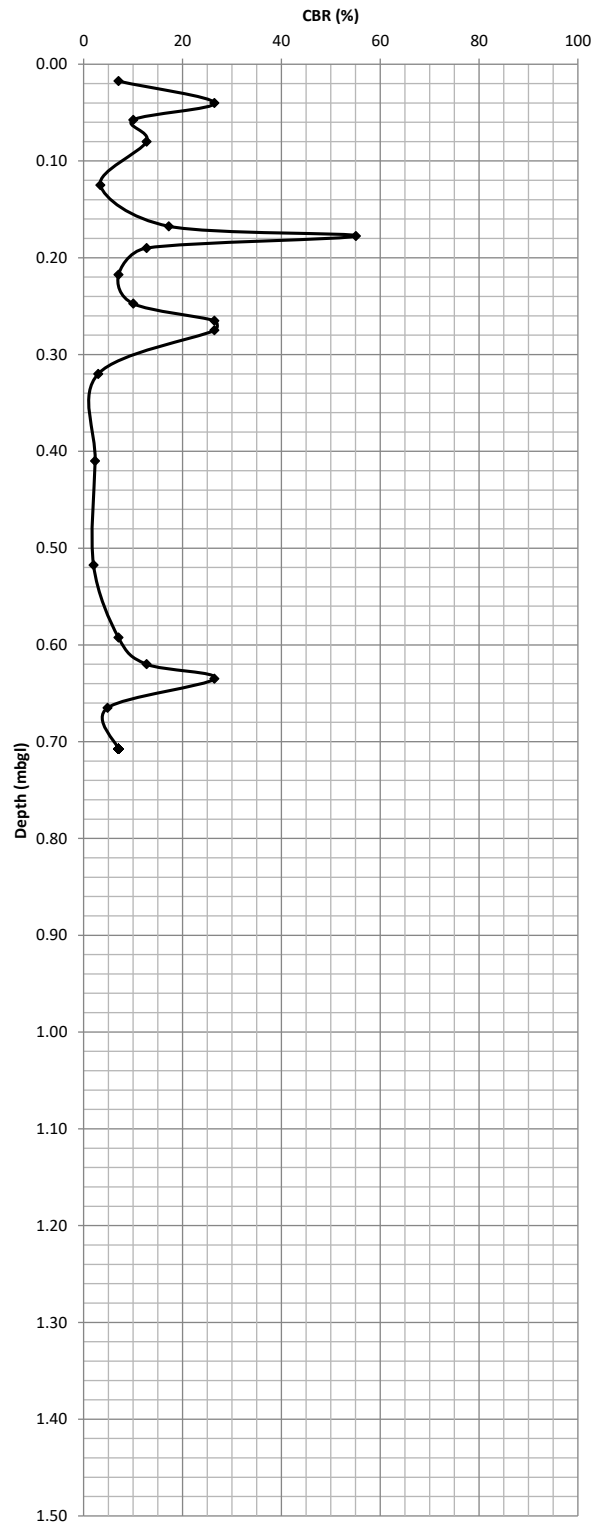
P14899

[illegible]

Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

TRL Dynamic Cone Penetrometer Record

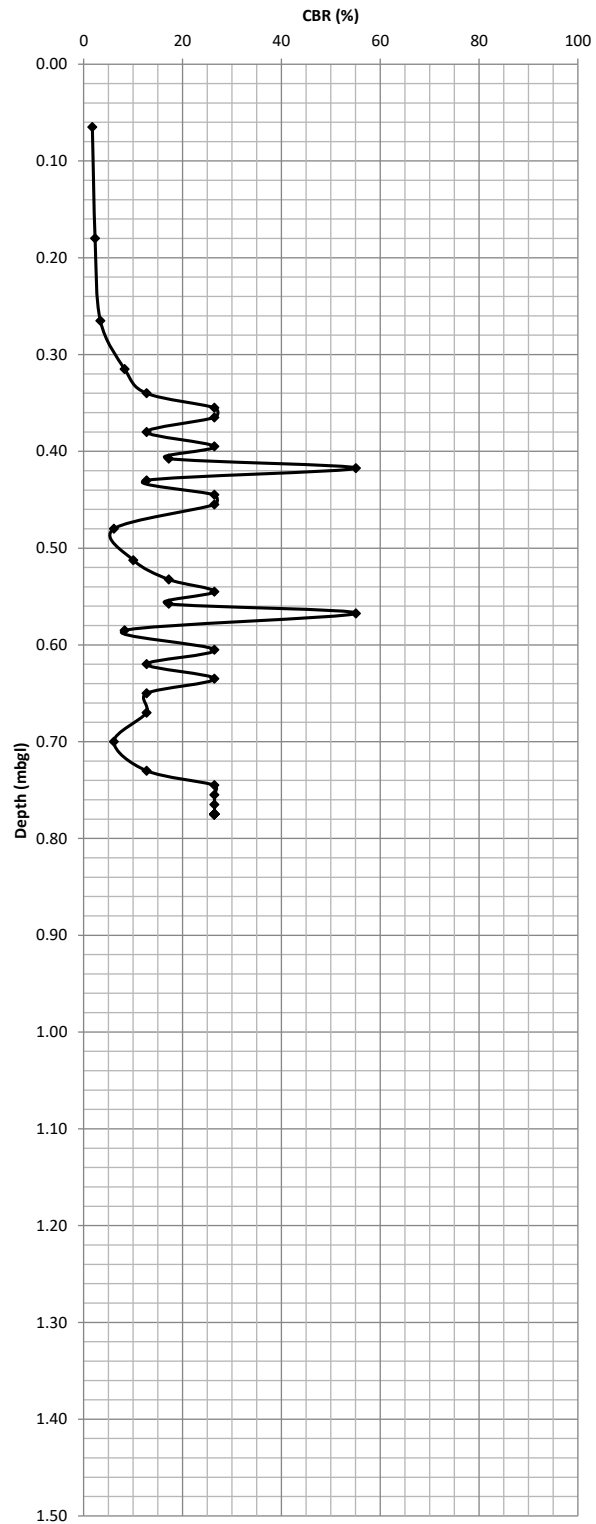
P14899



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

TRL Dynamic Cone Penetrometer Record

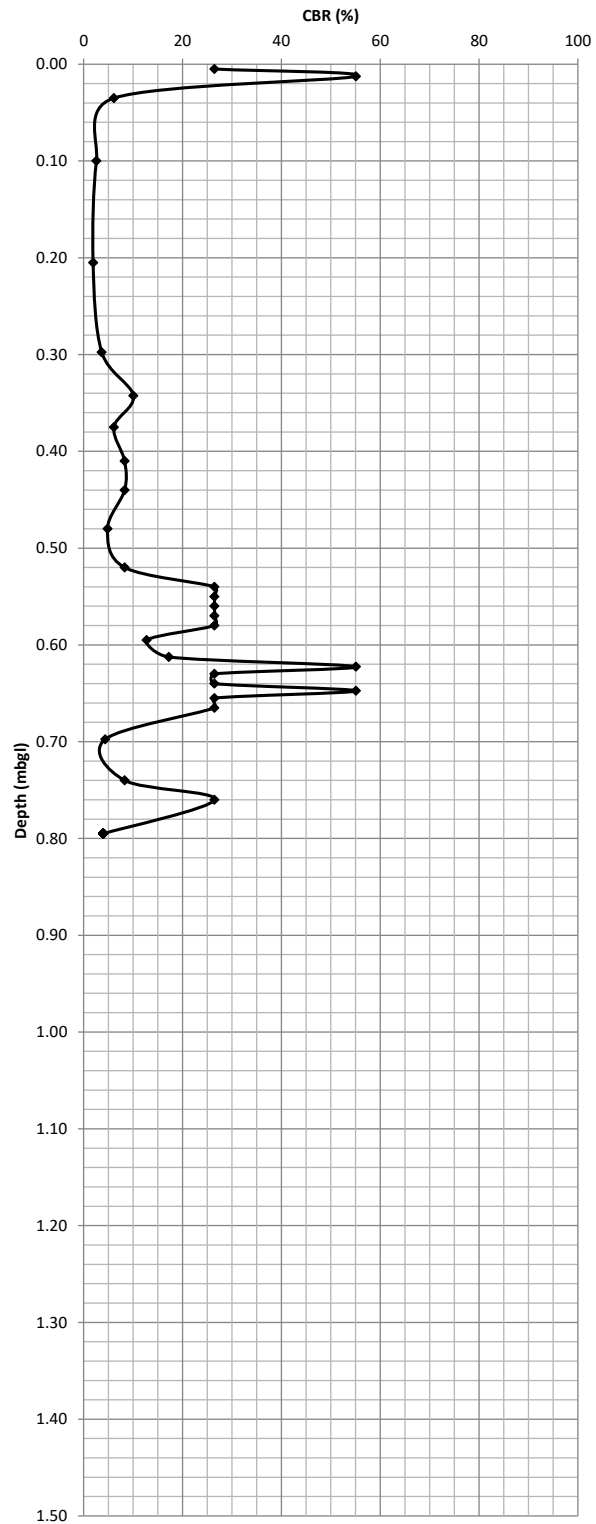
P14899



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

TRL Dynamic Cone Penetrometer Record

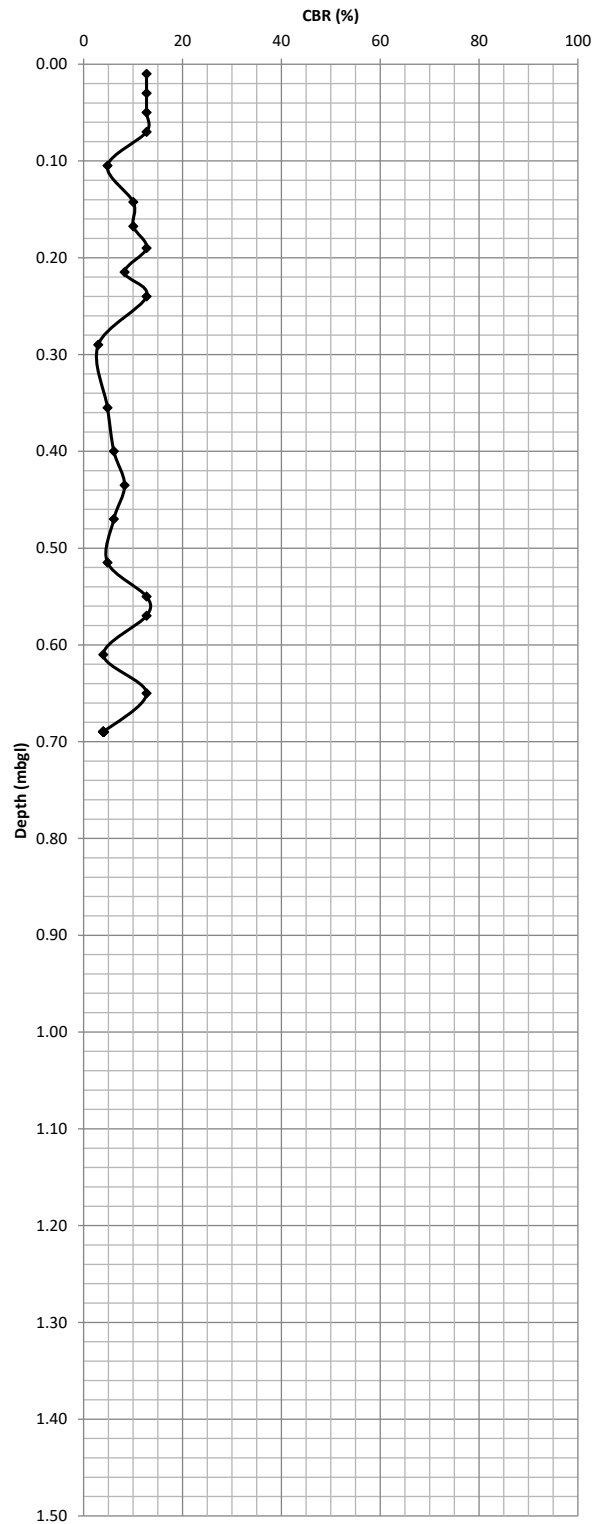
P14899



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

TRL Dynamic Cone Penetrometer Record

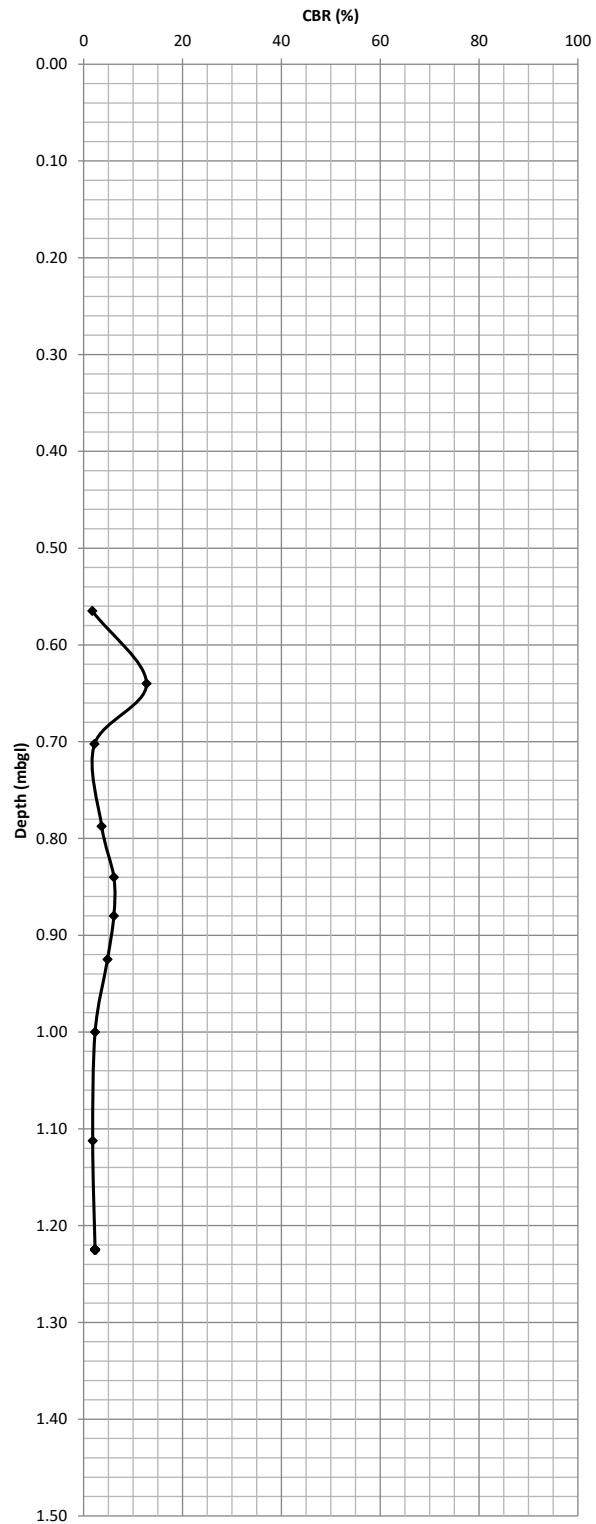
P14899



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

TRL Dynamic Cone Penetrometer Record

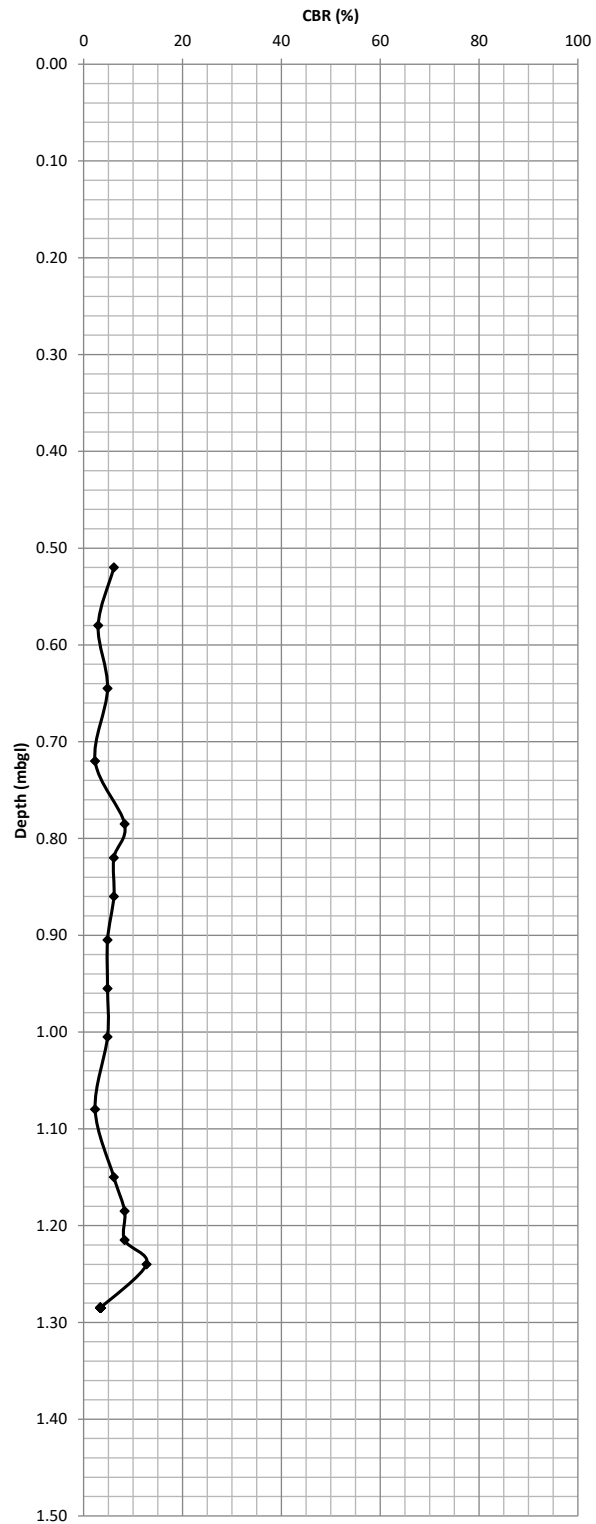
P14899



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

TRL Dynamic Cone Penetrometer Record

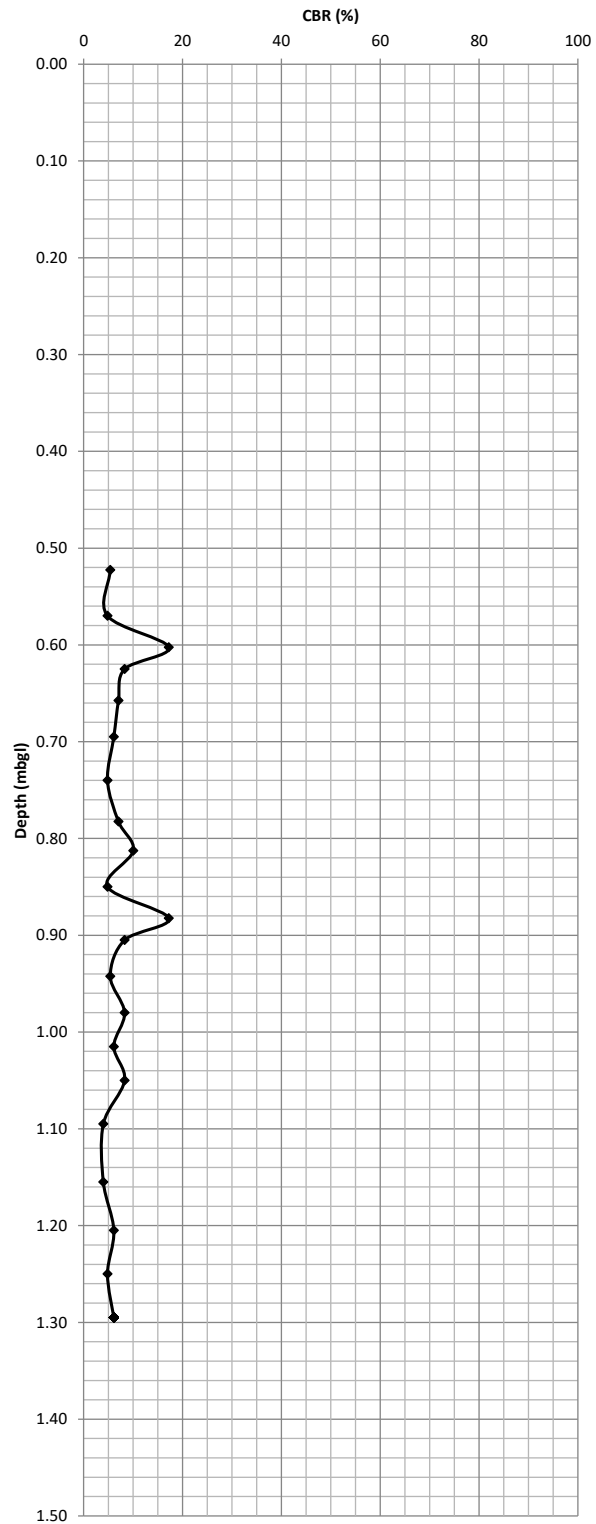
P14899



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

TRL Dynamic Cone Penetrometer Record

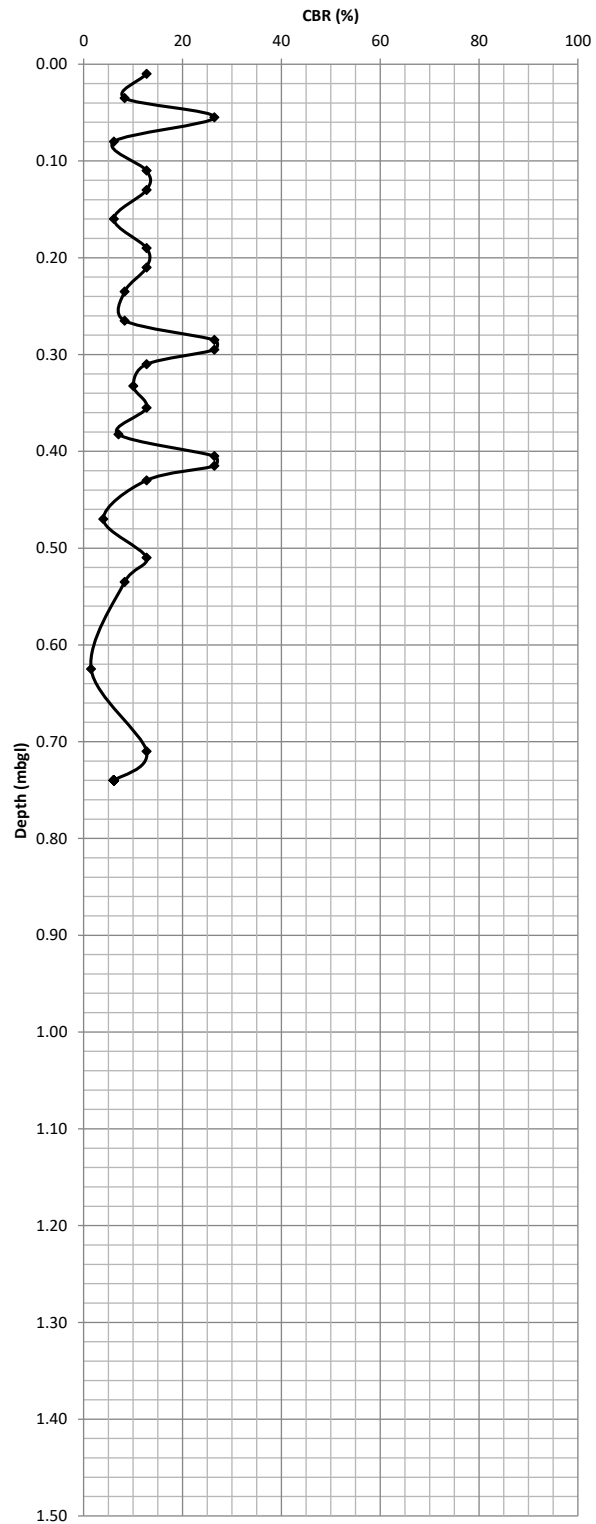
P14899



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

TRL Dynamic Cone Penetrometer Record

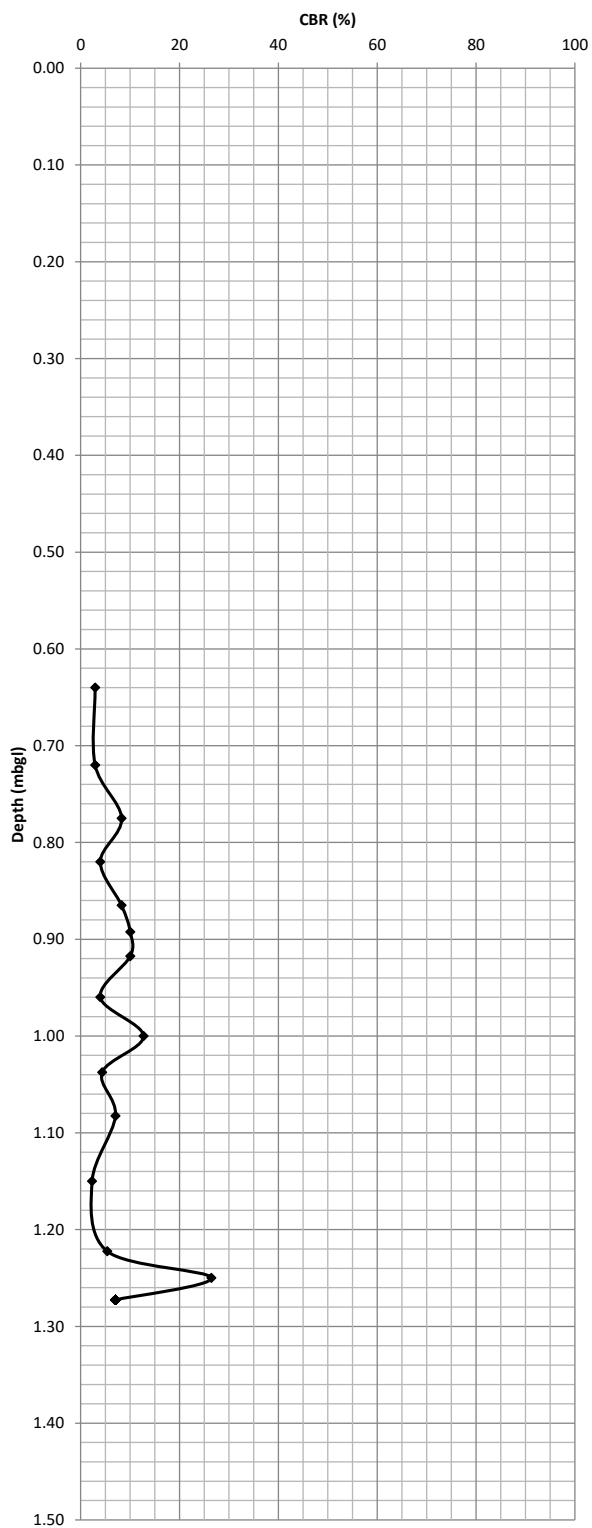
P14899



Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

TRL Dynamic Cone Penetrometer Record

P14899

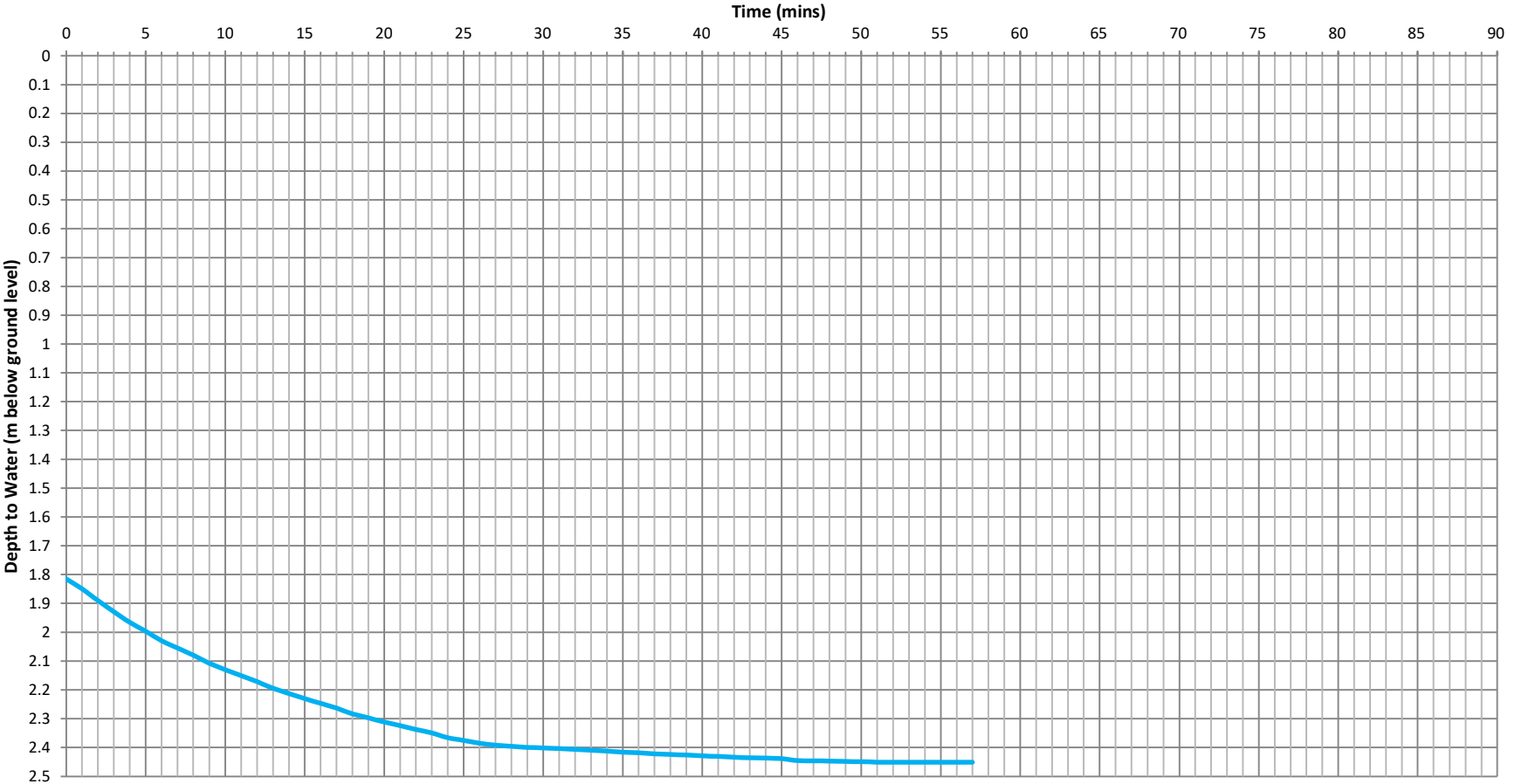


Notes: CBR Value calculated in accordance with the TRRL equation given in TRL Road Note 8.

Ashdown Site Investigation Limited

Site: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No. P14899
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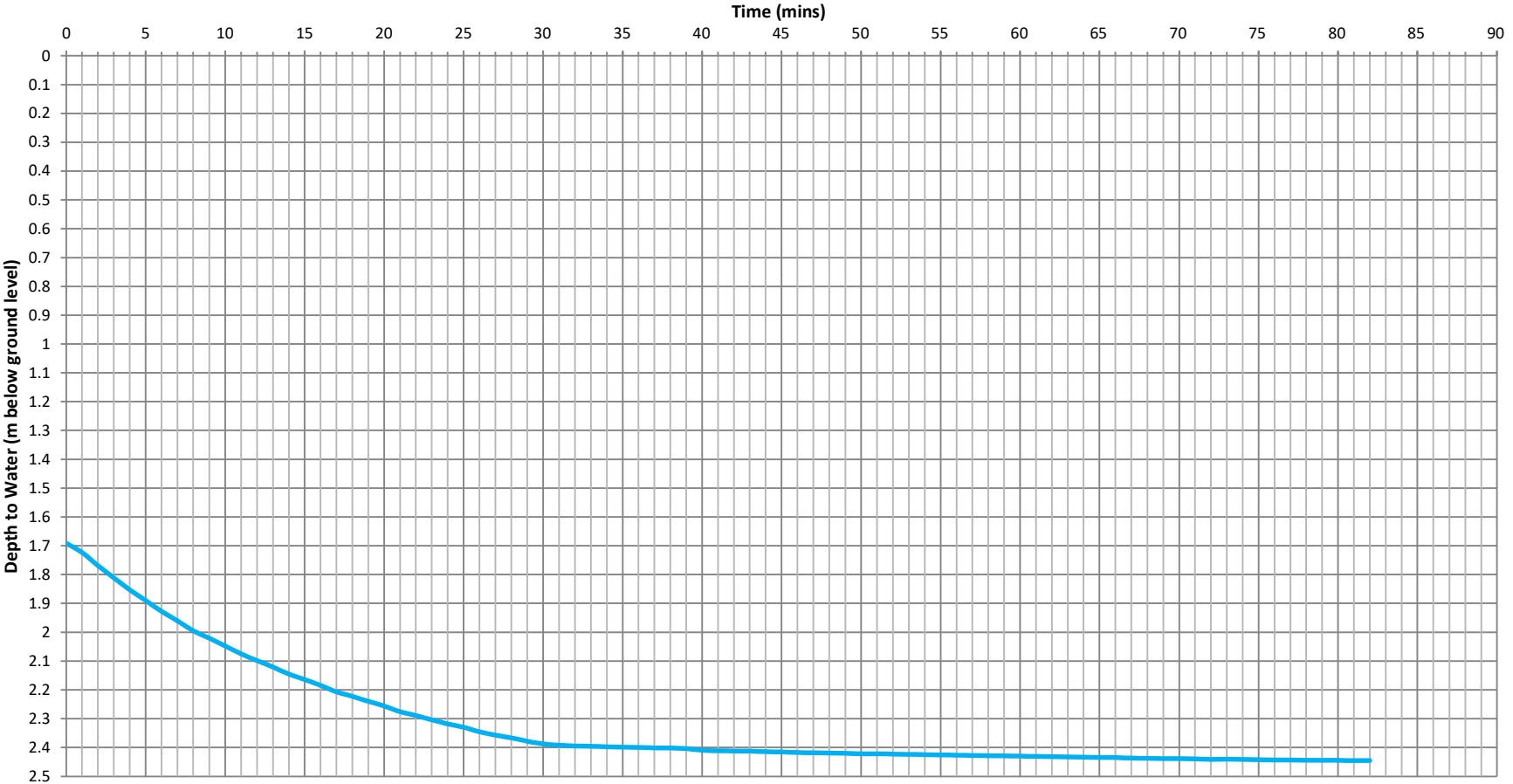
Trial Pit Soakage Test Results - SA101 Test 1



Ashdown Site Investigation Limited

Site: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No. P14899
--	--------------------

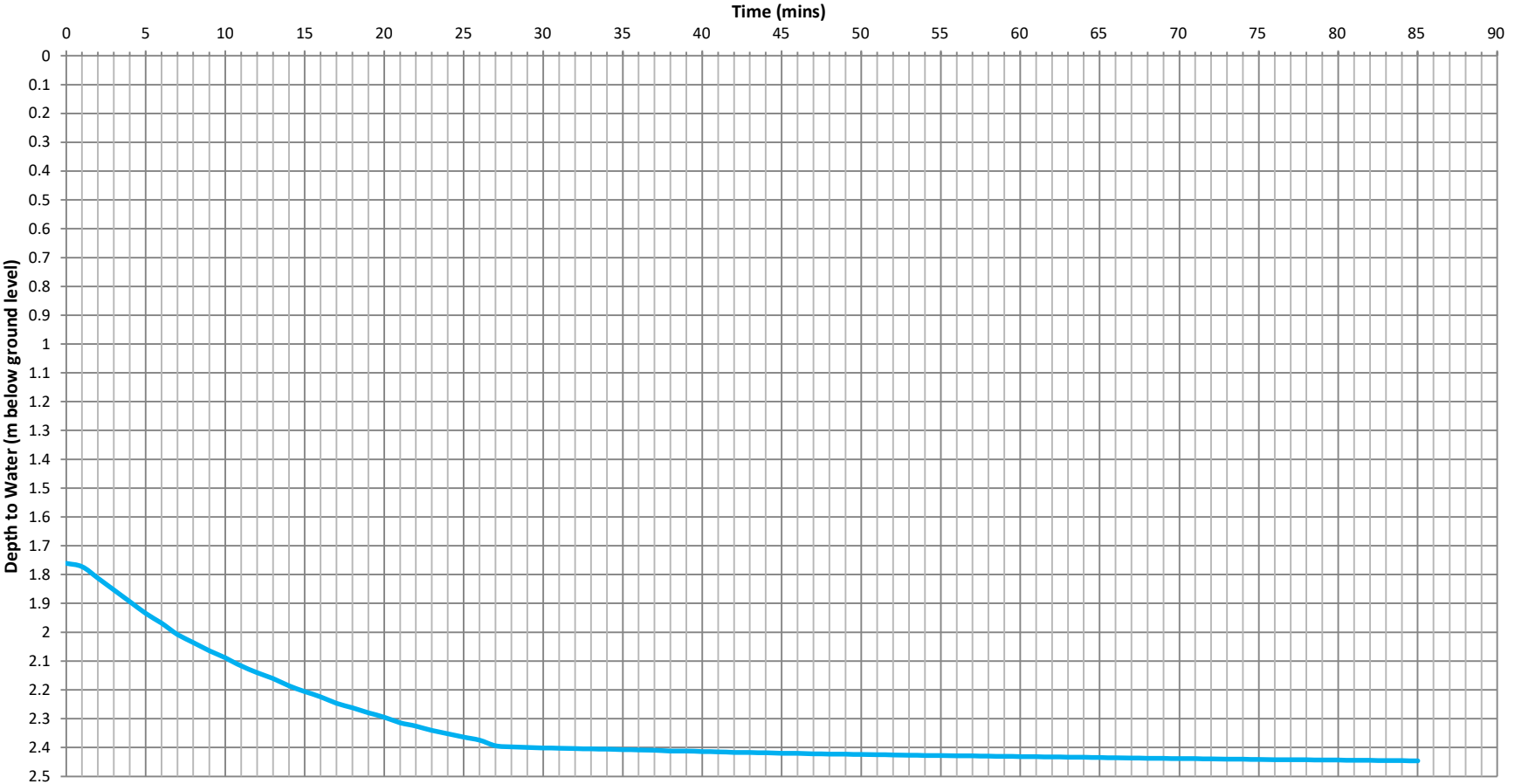
Trial Pit Soakage Test Results - SA101 Test 2



Ashdown Site Investigation Limited

Site: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No. P14899
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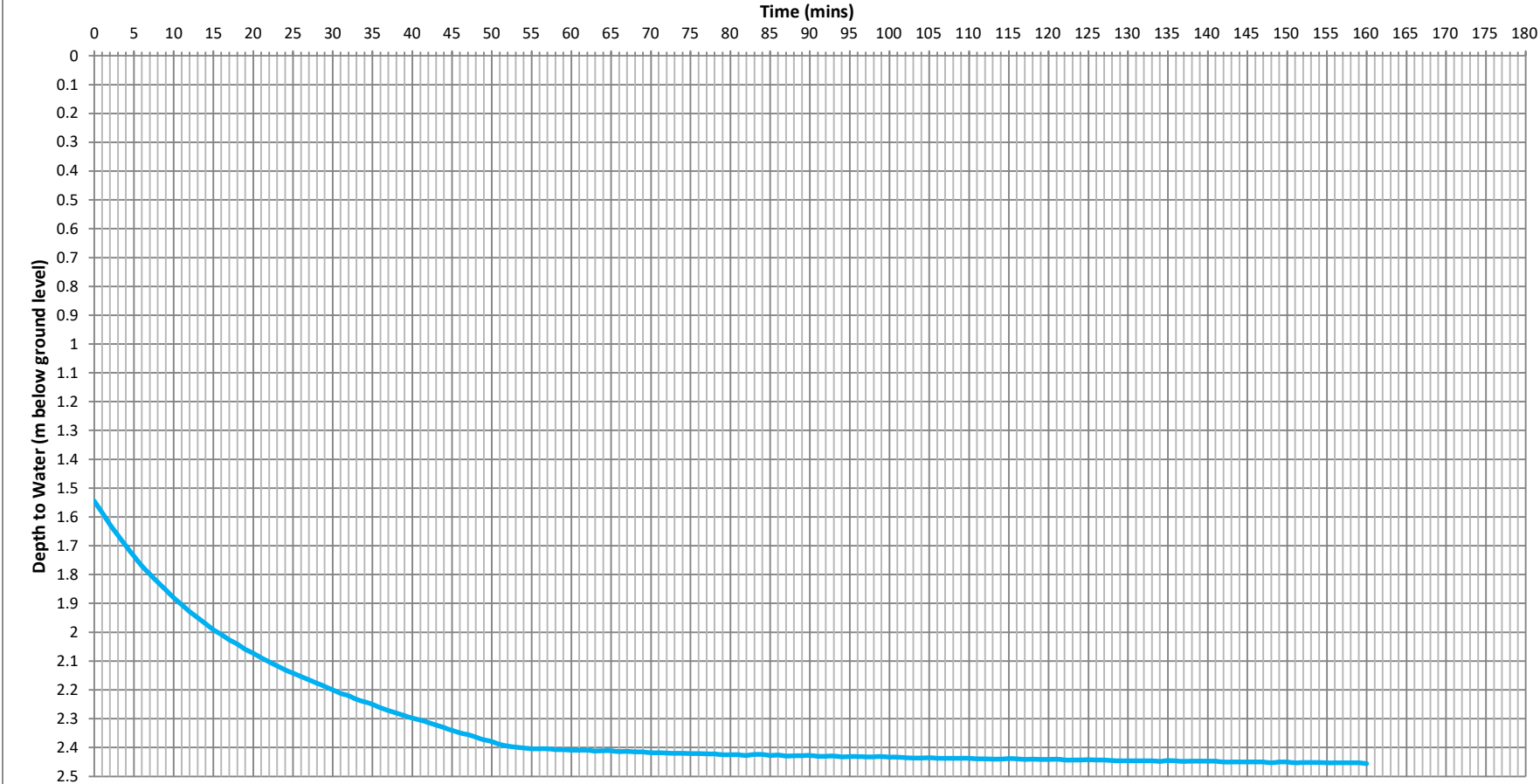
Trial Pit Soakage Test Results - SA101 Test 3



Ashdown Site Investigation Limited

Site: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No. P14899
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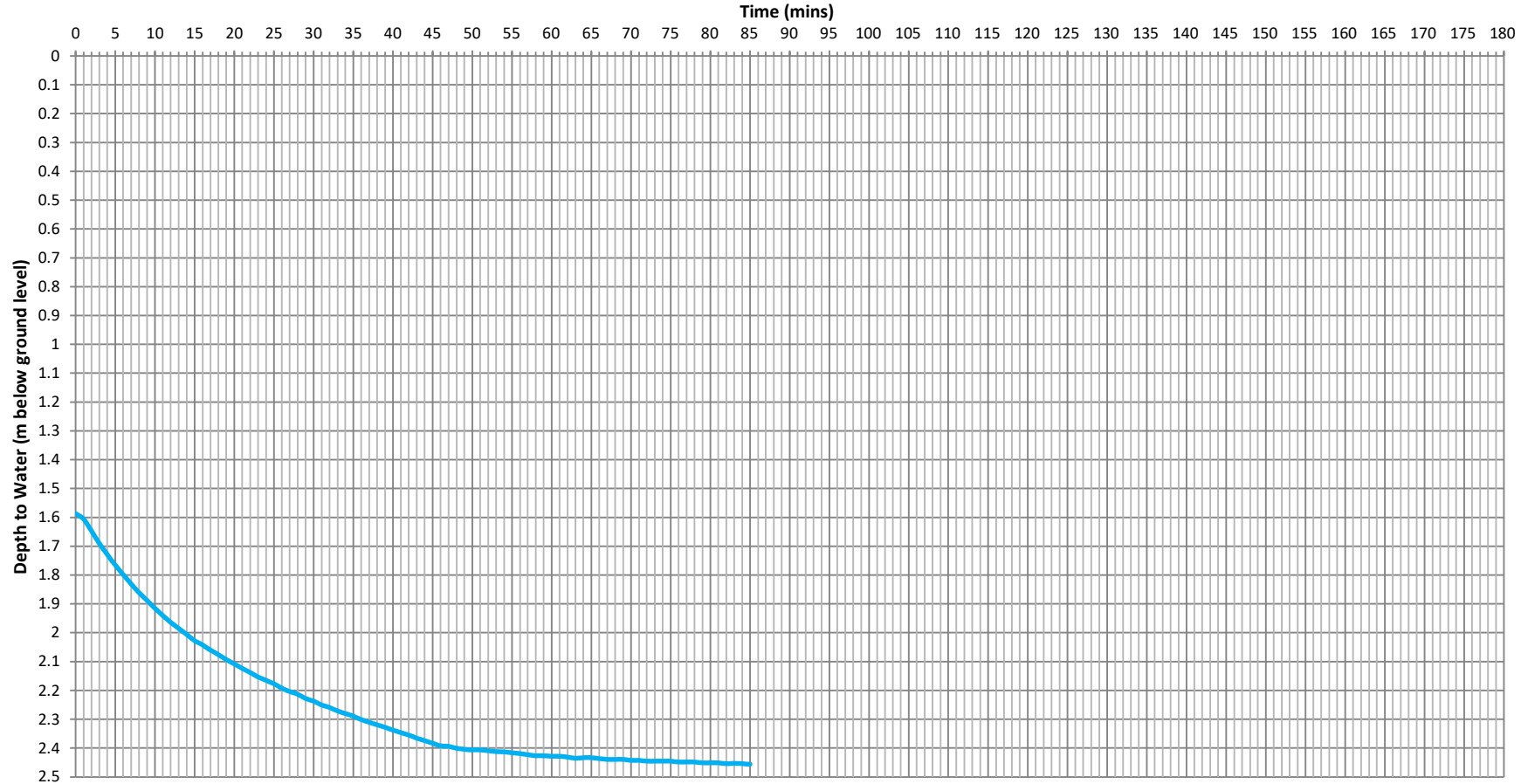
Trial Pit Soakage Test Results - SA102 Test 1



Ashdown Site Investigation Limited

Site: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No. P14899
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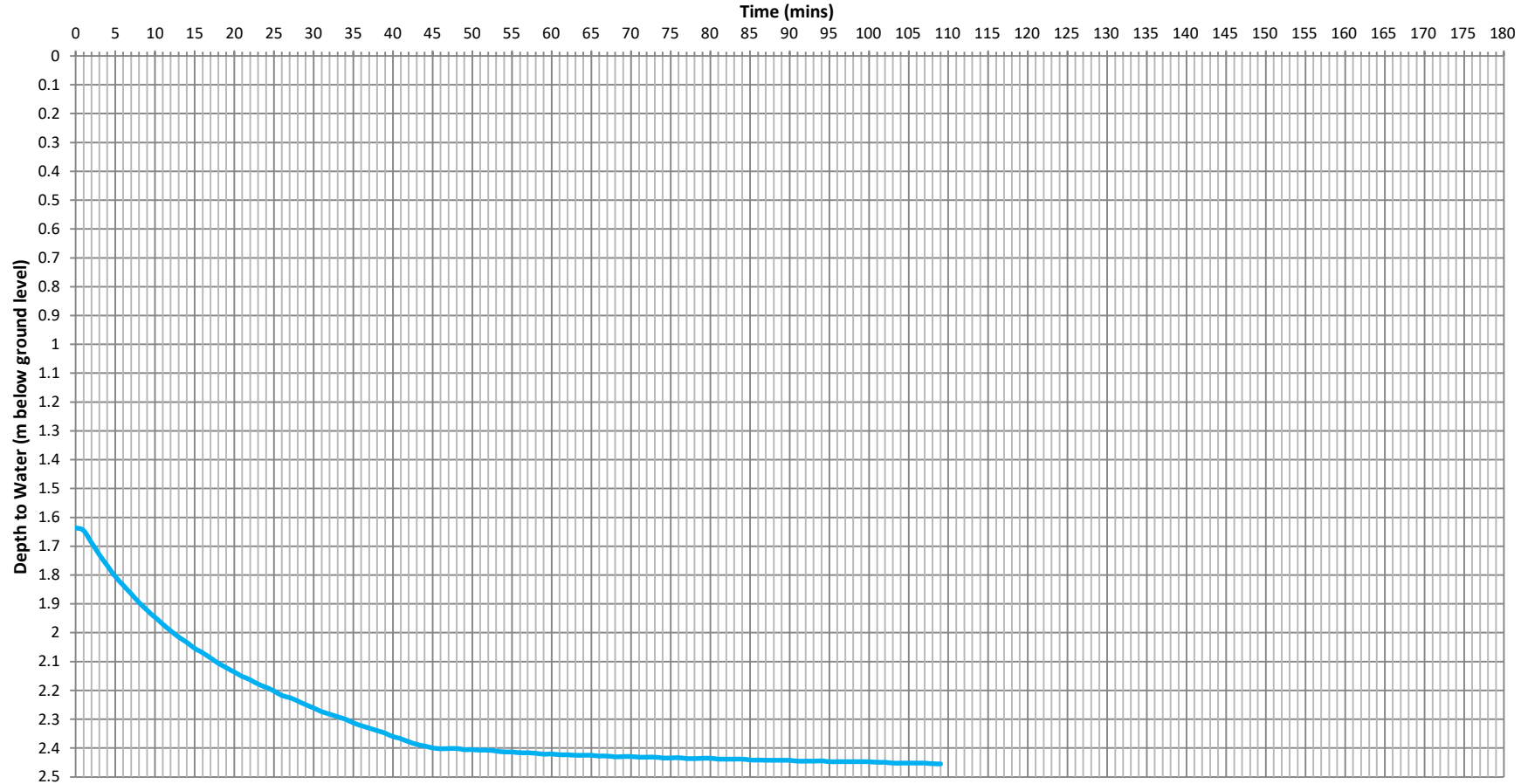
Trial Pit Soakage Test Results - SA102 Test 2



Ashdown Site Investigation Limited

Site: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No. P14899
--	--------------------

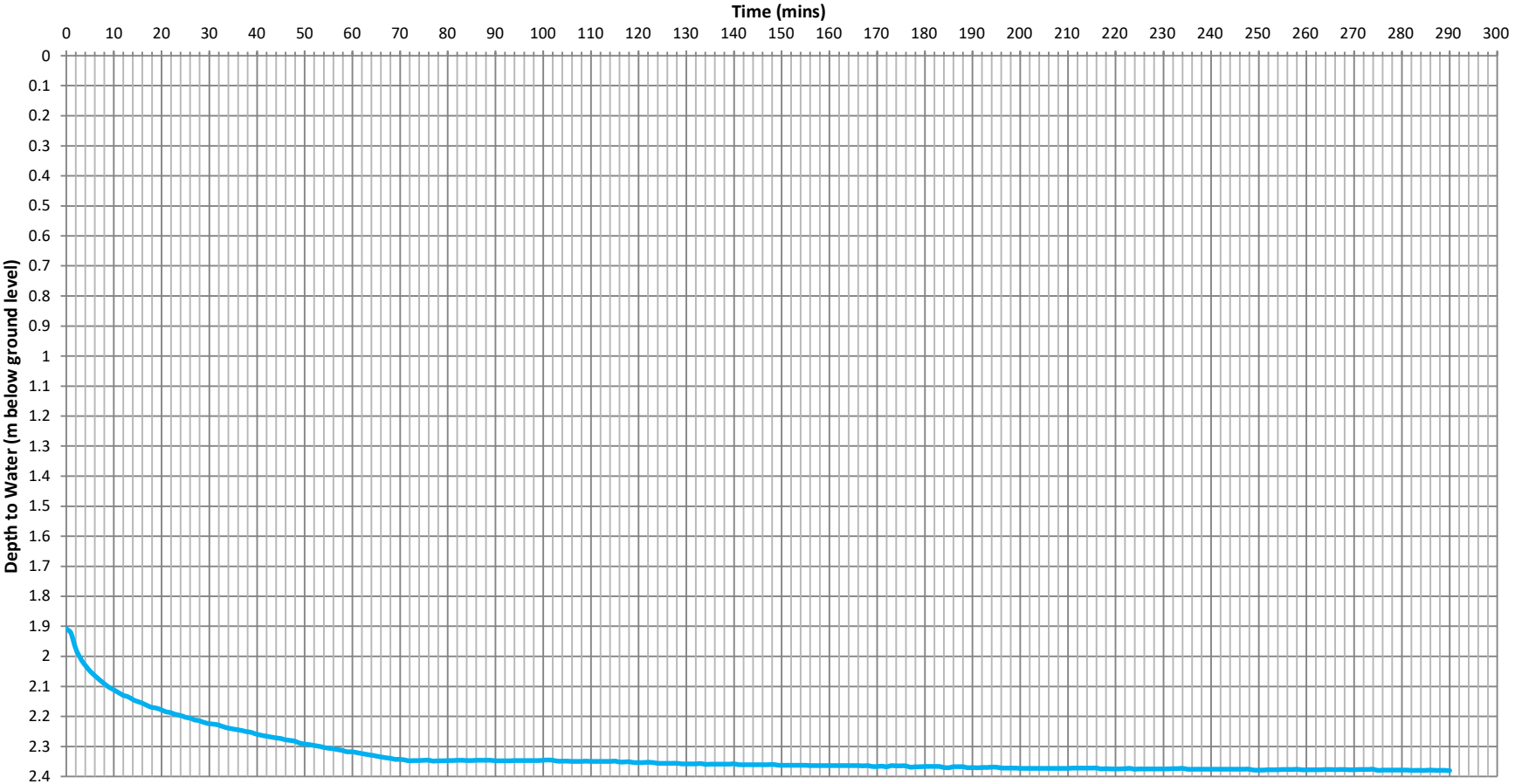
Trial Pit Soakage Test Results - SA102 Test 3



Ashdown Site Investigation Limited

Site: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No. P14899
--	--------------------

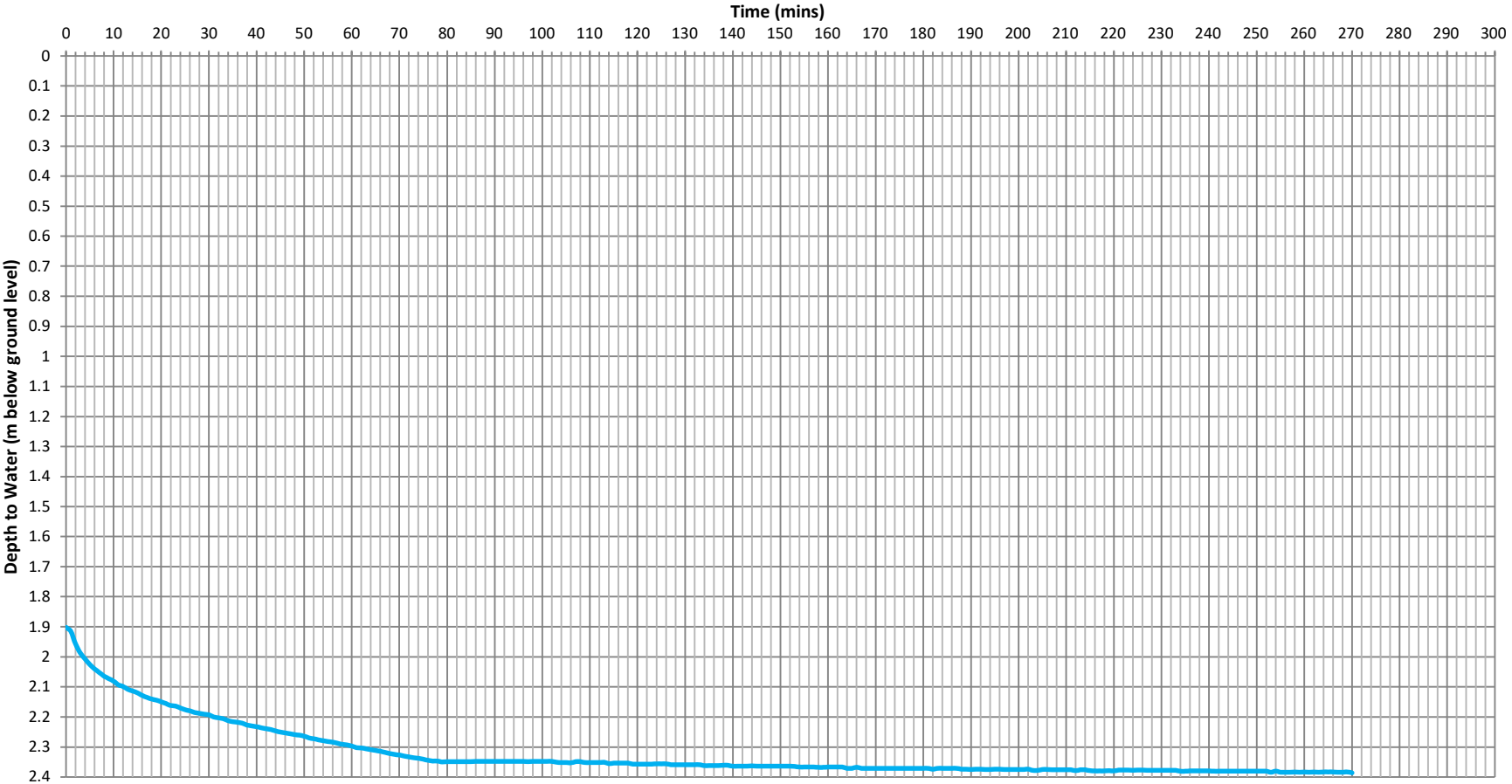
Trial Pit Soakage Test Results - SA103 Test 1



Ashdown Site Investigation Limited

Site: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No. P14899
--	--------------------

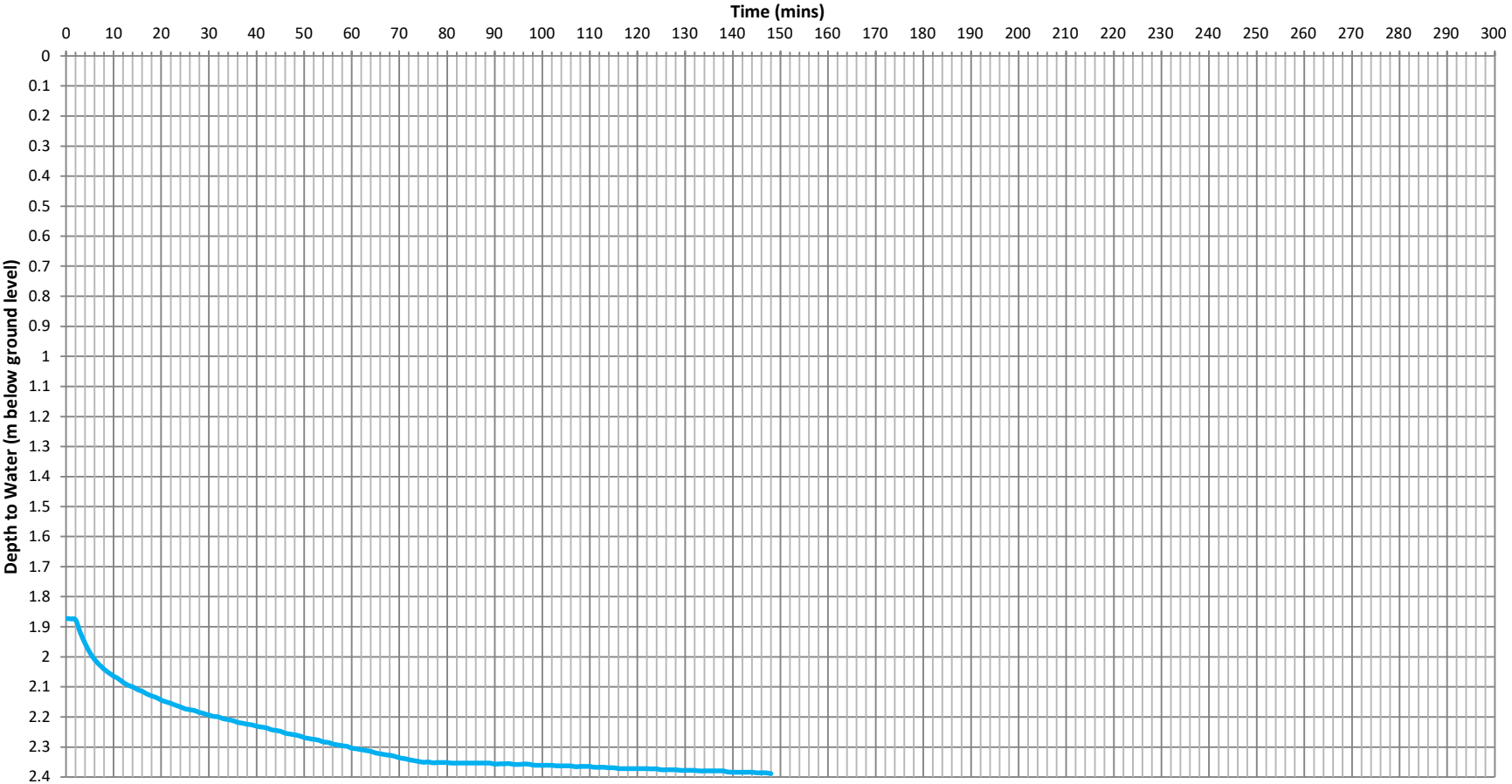
Trial Pit Soakage Test Results - SA103 Test 2



Ashdown Site Investigation Limited

Site: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No. P14899
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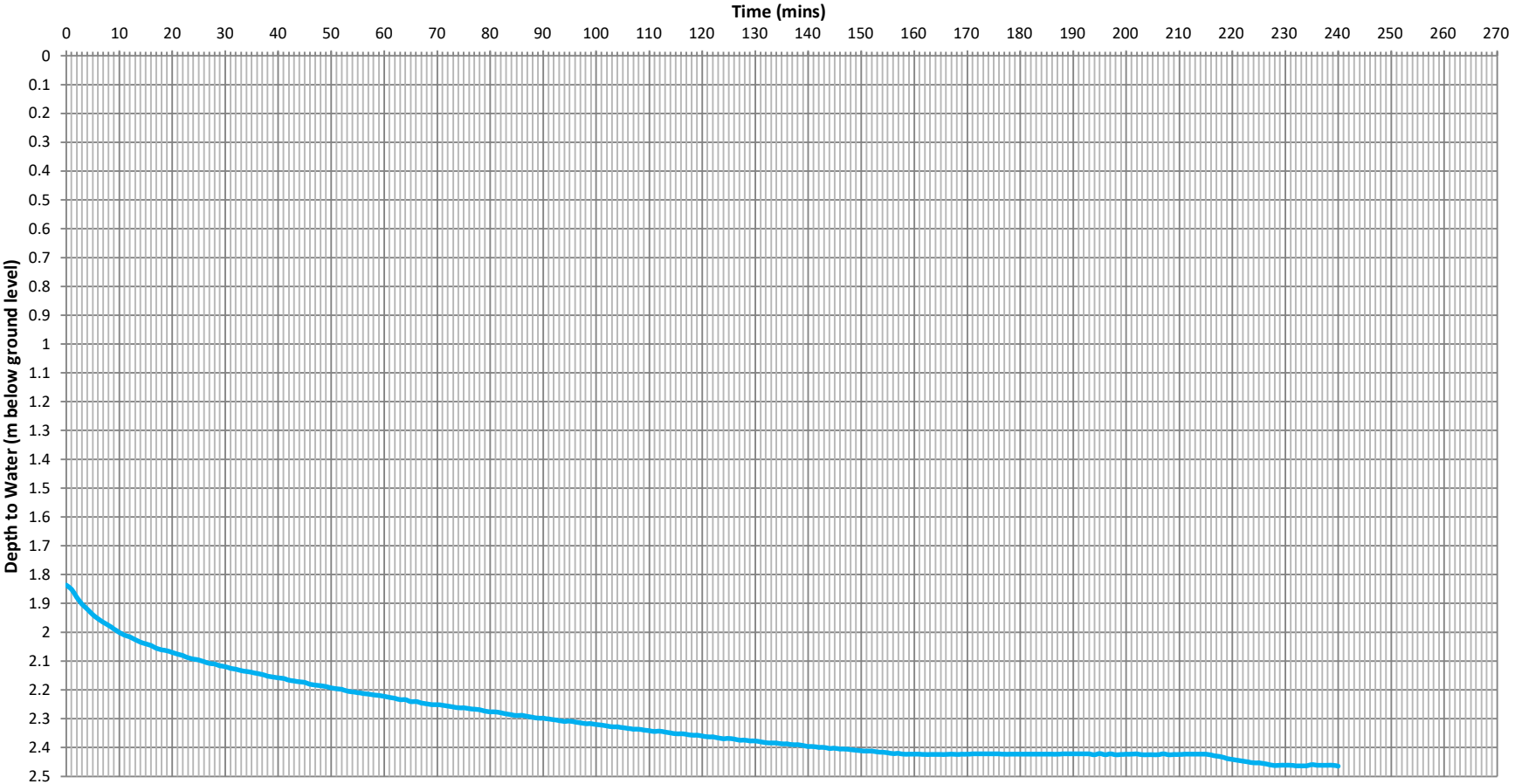
Trial Pit Soakage Test Results - SA103 Test 3



Ashdown Site Investigation Limited

Site: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No. P14899
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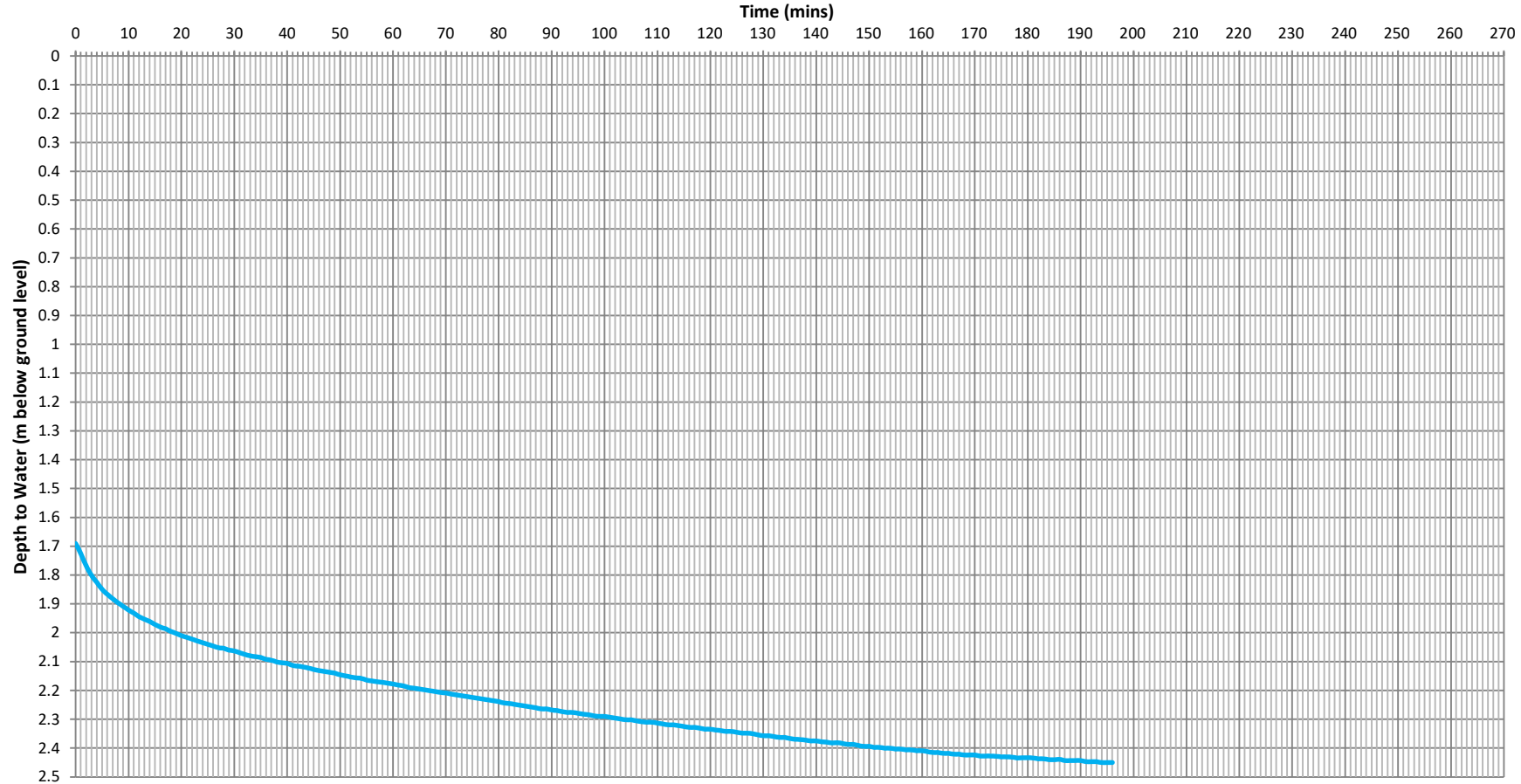
Trial Pit Soakage Test Results - SA104 Test 1



Ashdown Site Investigation Limited

Site: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No. P14899
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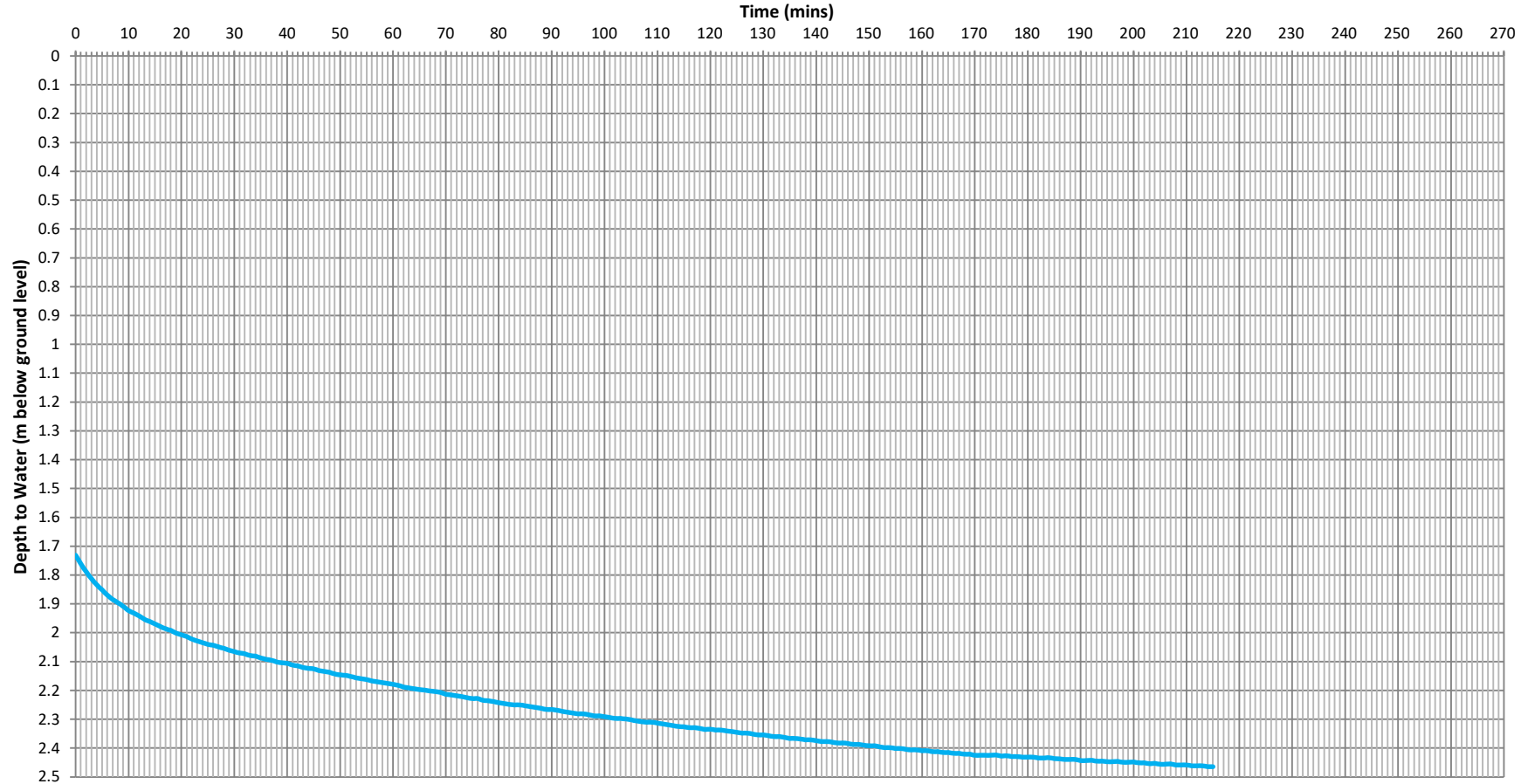
Trial Pit Soakage Test Results - SA104 Test 2



Ashdown Site Investigation Limited

Site: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	Project No. P14899
--	--------------------

Trial Pit Soakage Test Results - SA104 Test 3



Gas Concentrations and Groundwater Monitoring Results

Site Name:				Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade																									
Project Ref:				P14899																									
Position	Date	Time	Dynamic Pressure (pa)	Atmospheric Pressure (mbar)	Atmospheric Trend	Standing Water Depth (m bgl)	Flow Rate (l/hr)				Methane (%)				Carbon Dioxide (%)				Oxygen (%)				CO (ppm)	H2S (ppm)	PID (ppm)				
							Seconds				Seconds				Seconds				Seconds						Seconds				
							15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60			15	30	45	60	15
WS01	01/12/2020	09:44	0	1023	Rising	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.9	20.5	20.4	20.3	0	0	0.0	0.0	0.0	0.0	
WS02	01/12/2020	09:52	0	1023	Rising	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	21.2	21.7	20.5	0	0	0.0	0.0	0.0	0.0	
WS03	01/12/2020	09:55	0	1023	Rising	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.1	21.4	20.7	20.4	0	0	0.0	0.0	0.0	0.0	
WS04	01/12/2020	09:25	0	1022	Rising	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.5	20.5	20.5	20.3	0	0	0.0	0.0	0.0	0.0	
WS05	01/12/2020	09:30	0	1022	Rising	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.1	20.6	20.4	20.4	0	0	0.0	0.0	0.0	0.0	
WS01	07/12/2020	09:10	0	998	Falling	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.6	0.9	21.6	20.9	19.7	19.7	0	0	0.0	0.0	0.0	0.0	
WS02	07/12/2020	09:14	0	998	Falling	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.7	0.7	19.8	19.7	19.7	19.5	0	0	0.0	0.0	0.0	0.0	
WS03	07/12/2020	09:20	0	998	Falling	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.8	0.5	0.5	21.0	20.8	20.6	20.6	0	0	0.0	0.0	0.0	0.0	
WS04	07/12/2020	08:55	0	998	Falling	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.9	0.8	20.5	20.1	19.8	19.8	0	0	0.0	0.0	0.0	0.0	
WS05	07/12/2020	09:02	0	998	Falling	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.6	0.7	19.8	20.1	20.2	20.2	0	0	0.0	0.0	0.0	0.0	
WS01	14/12/2020	08:17	0	999	Rising	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.4	22.6	21.5	20.9	20.1	0	0	0.0	0.0	0.0	0.0
WS02	14/12/2020	08:13	0	999	Rising	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.4	20.5	20.3	20.2	20.0	0	0	0.0	0.0	0.0	0.0	
WS03	14/12/2020	08:08	0	999	Rising	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	21.9	20.5	20.2	19.9	0	0	0.0	0.0	0.0	0.0	
WS04	14/12/2020	08:27	0	999	Rising	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	23.6	22.2	21.5	20.6	0	0	0.0	0.0	0.0	0.0	
WS05	14/12/2020	08:36	0	999	Rising	Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	23.4	23.2	23.0	22.4	0	0	0.0	0.0	0.0	0.0	



End Date: 17/08/2020

Sheet 1 of 1

Remarks Groundwater: Trial pit dry on completion. Stability: Trial pit stable on completion. Notes: No further progress below 0.75m depth - too hard/ dense.	Excavation Method: TP
	Pit Length: 1.00m
	Pit Width: 0.40m
	Made By: BA



End Date: 17/08/2020

Sheet 1 of 1

Remarks Groundwater: Trial pit dry on completion. Stability: Trial pit stable on completion. Notes: No further progress below 0.80m depth - too hard/ dense.	Excavation Method: TP
	Pit Length: 1.10m
	Pit Width: 0.40m
	Made By: BA

E-mail: contact@ashdownsi.co.uk
Web: www.ashdownsi.co.uk
Tel: 01273 483119

End Date: 17/08/2020

Sheet 1 of 1

Made By: BA



End Date: 17/08/2020

Sheet 1 of 1

Remarks Groundwater: Trial pit dry on completion. Stability: Trial pit stable on completion. Notes: No further progress below 1.00m depth - too hard/ dense.	Excavation Method: TP
	Pit Length: 1.20m
	Pit Width: 0.40m
	Made By: BA

ASHDOWN SITE INVESTIGATION LIMITED

Site: Land adjacent to Mayberry Garden Centre, Old
Shoreham Road, Portslade

Project No: P14741
Sheet No.: 1 of 2

SUMMARY OF TRIAL PIT FALLING HEAD SOAKAGE TEST RESULTS

TP01		TP02	
Time (mins)	Depth to water (m bgl)	Time (mins)	Depth to water (m bgl)
0	0.43	0	0.50
1	0.43	1	0.50
2	0.44	2	0.50
3	0.44	3	0.50
4	0.44	4	0.50
5	0.45	5	0.51
8	0.45	8	0.51
10	0.45	10	0.52
12	0.45	20	0.56
14	0.46	38	0.59
18	0.46	72	0.62
20	0.46	98	0.64
26	0.46	124	0.65
47	0.48	158	0.66
68	0.50		
102	0.52		
134	0.54		
188	0.57		
Pit Length - 1.00m Pit Width - 0.40m Pit Depth - 0.75m bgl		Pit Length - 1.10m Pit Width - 0.40m Pit Depth - 0.80m bgl	

Remarks: bgl - below ground level.

ASHDOWN SITE INVESTIGATION LIMITED

Site: Land adjacent to Mayberry Garden Centre, Old
Shoreham Road, Portslade

Project No: P14741
Sheet No.: 2 of 2

SUMMARY OF TRIAL PIT FALLING HEAD SOAKAGE TEST RESULTS

TP03 (Test 1)		TP03 (Test 2)		TP04	
Time (mins)	Depth to water (m bgl)	Time (mins)	Depth to water (m bgl)	Time (mins)	Depth to water (m bgl)
0	0.33	0	0.30	0	0.45
2	0.36	2	0.31	1	0.45
3	0.37	3	0.31	2	0.45
4	0.38	4	0.31	3	0.46
5	0.39	5	0.31	4	0.46
7	0.40	6	0.31	5	0.46
10	0.41	7	0.31	7	0.47
15	0.43	8	0.33	8	0.47
19	0.43	15	0.34	9	0.48
25	0.45	22	0.36	10	0.48
45	0.49	30	0.37	15	0.50
66	0.54	45	0.38	21	0.51
Pit Length - 1.00m Pit Width - 0.40m Pit Depth - 0.60m bgl		Pit Length - 1.00m Pit Width - 0.40m Pit Depth - 0.60m bgl		Pit Length - 1.20m Pit Width - 0.40m Pit Depth - 1.00m bgl	

Remarks: bgl - below ground level.

APPENDIX C

Geotechnical Test Results
Contamination Test Results



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Ashdown Site Investigations Ltd
Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park, Ditchling,
West Sussex, BN6 8SG
Contact: Ashdown Site Investigations
Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 24/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

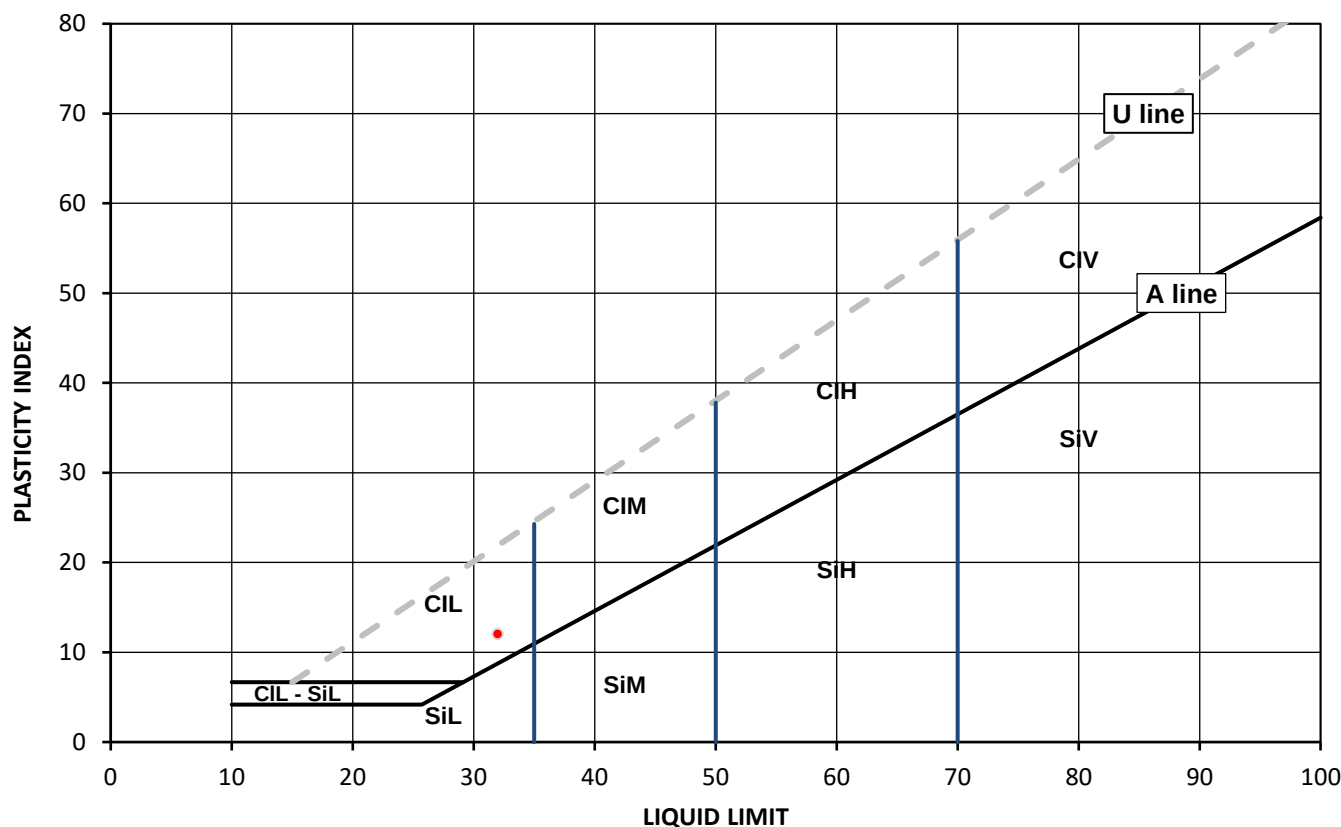
Test Results:

Laboratory Reference: 1705979
Hole No.: BH01
Sample Reference: Not Given
Soil Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 0.65
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
17	32	20	12	91



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity	Liquid Limit
Cl	Clay	L Low	below 35
Si	Silt	M Medium	35 to 50
		H High	50 to 70
		V Very high	exceeding 70
		O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Ashdown Site Investigations Ltd
Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park, Ditchling,
West Sussex, BN6 8SG
Contact: Ashdown Site Investigations
Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 25/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

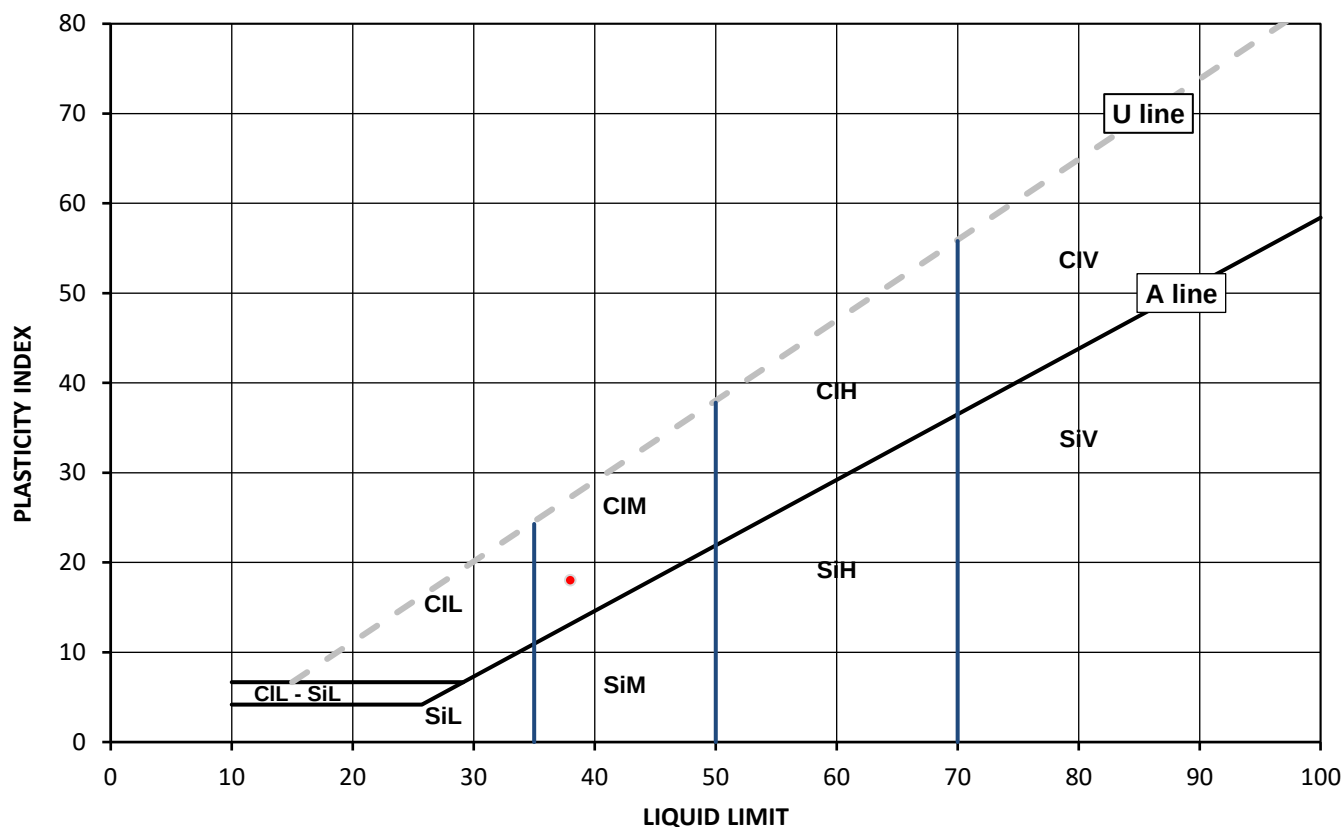
Test Results:

Laboratory Reference: 1705981
Hole No.: BH04
Sample Reference: Not Given
Soil Description: Brown gravelly sandy CLAY with fragments of flintstone

Depth Top [m]: 1.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
14	38	20	18	58



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Ashdown Site Investigations Ltd
Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park, Ditchling,
West Sussex, BN6 8SG
Contact: Ashdown Site Investigations
Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 24/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

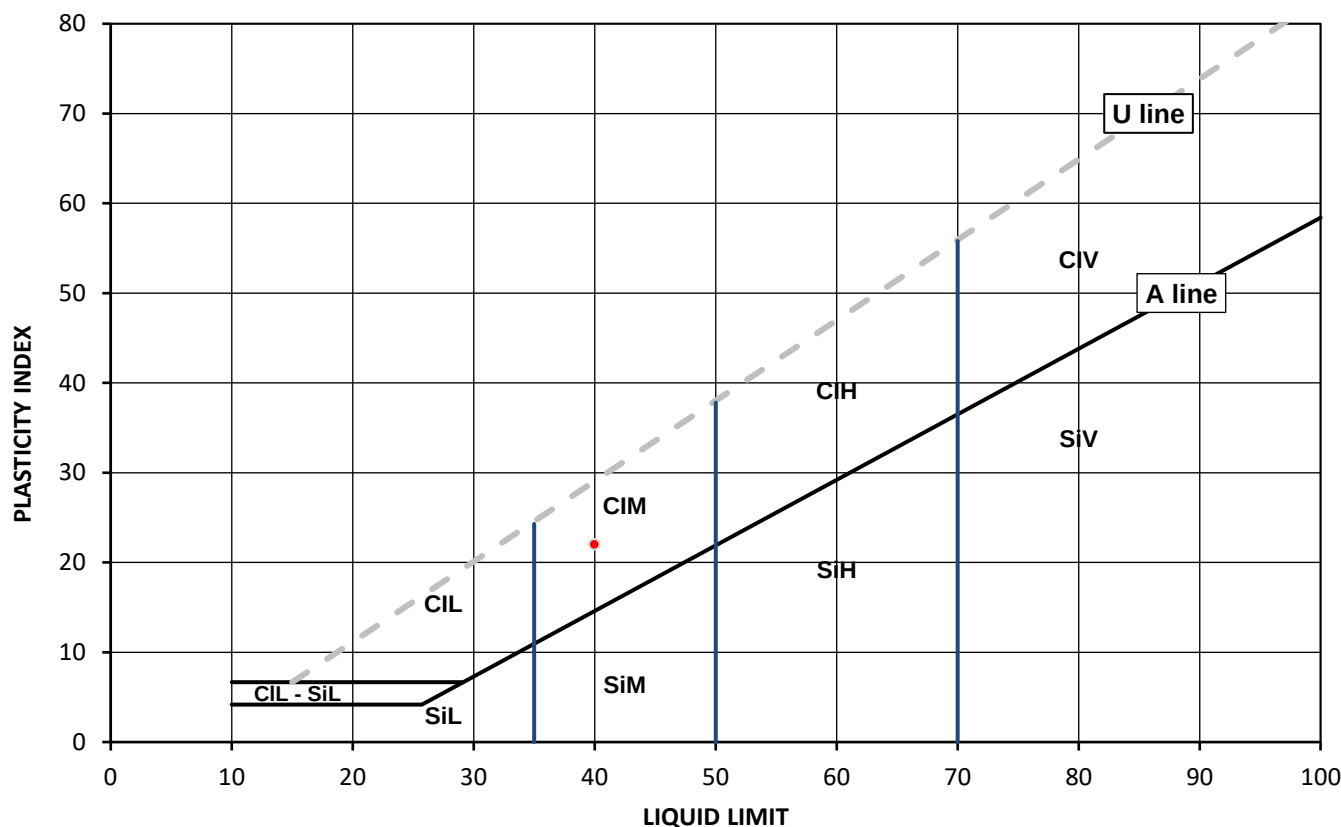
Test Results:

Laboratory Reference: 1705983
Hole No.: WS05
Sample Reference: Not Given
Soil Description: Mottled brown slightly gravelly sandy CLAY

Depth Top [m]: 1.30
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
24	40	18	22	97



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Ashdown Site Investigations Ltd
Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park, Ditchling,
West Sussex, BN6 8SG
Contact: Ashdown Site Investigations
Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 25/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

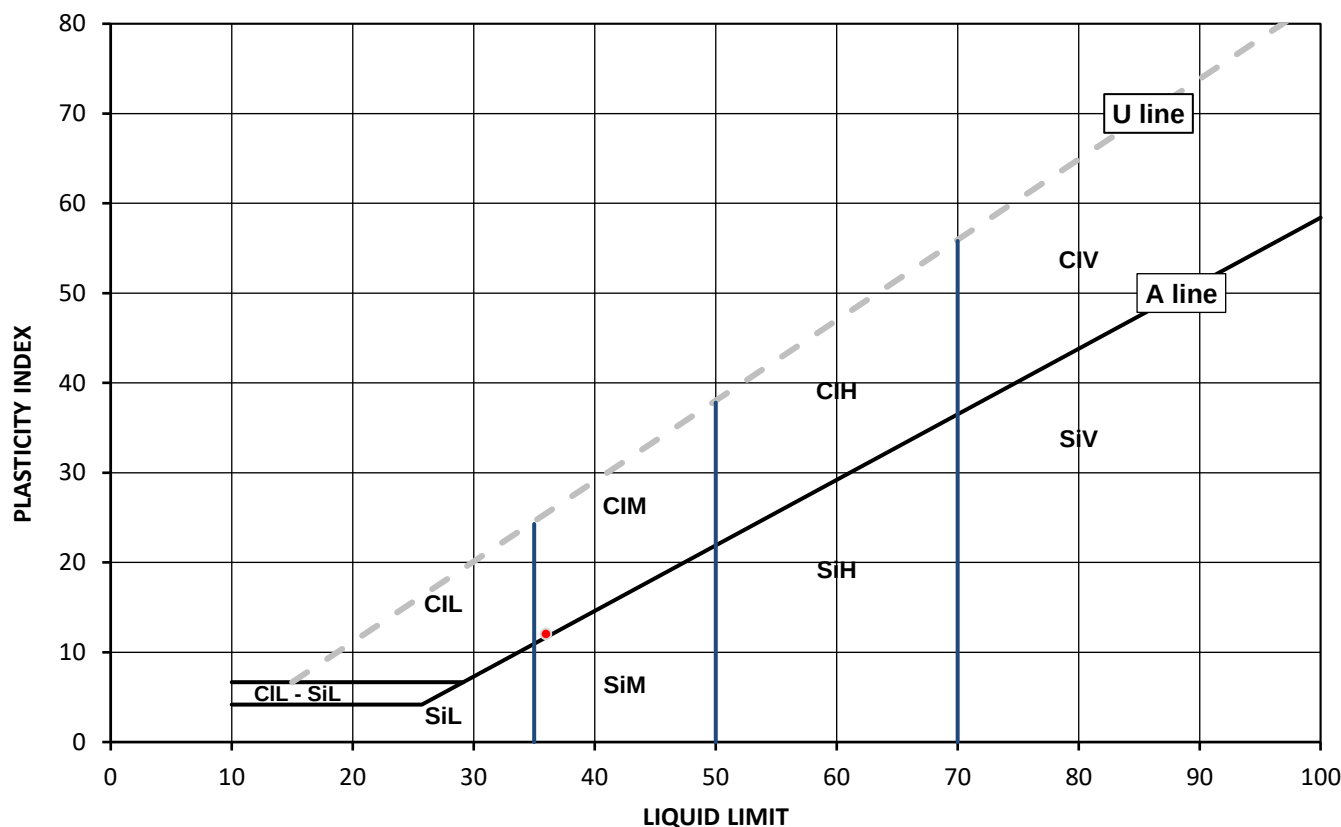
Test Results:

Laboratory Reference: 1705984
Hole No.: CBR01
Sample Reference: Not Given
Soil Description: Dark brown slightly gravelly sandy CLAY with fragments of rootlet

Depth Top [m]: 0.40
Depth Base [m]: 0.60
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
21	36	24	12	86



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity	Liquid Limit
Cl	Clay	L Low	below 35
Si	Silt	M Medium	35 to 50
		H High	50 to 70
		V Very high	exceeding 70
		O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Liquid and Plastic Limits

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Ashdown Site Investigations Ltd

Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park, Ditchling,
West Sussex, BN6 8SG

Contact: Ashdown Site Investigations

Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 25/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1705985
Hole No.: CBR02
Sample Reference: Not Given
Soil Description: Dark brown slightly gravelly very sandy CLAY with fragments of rootlet

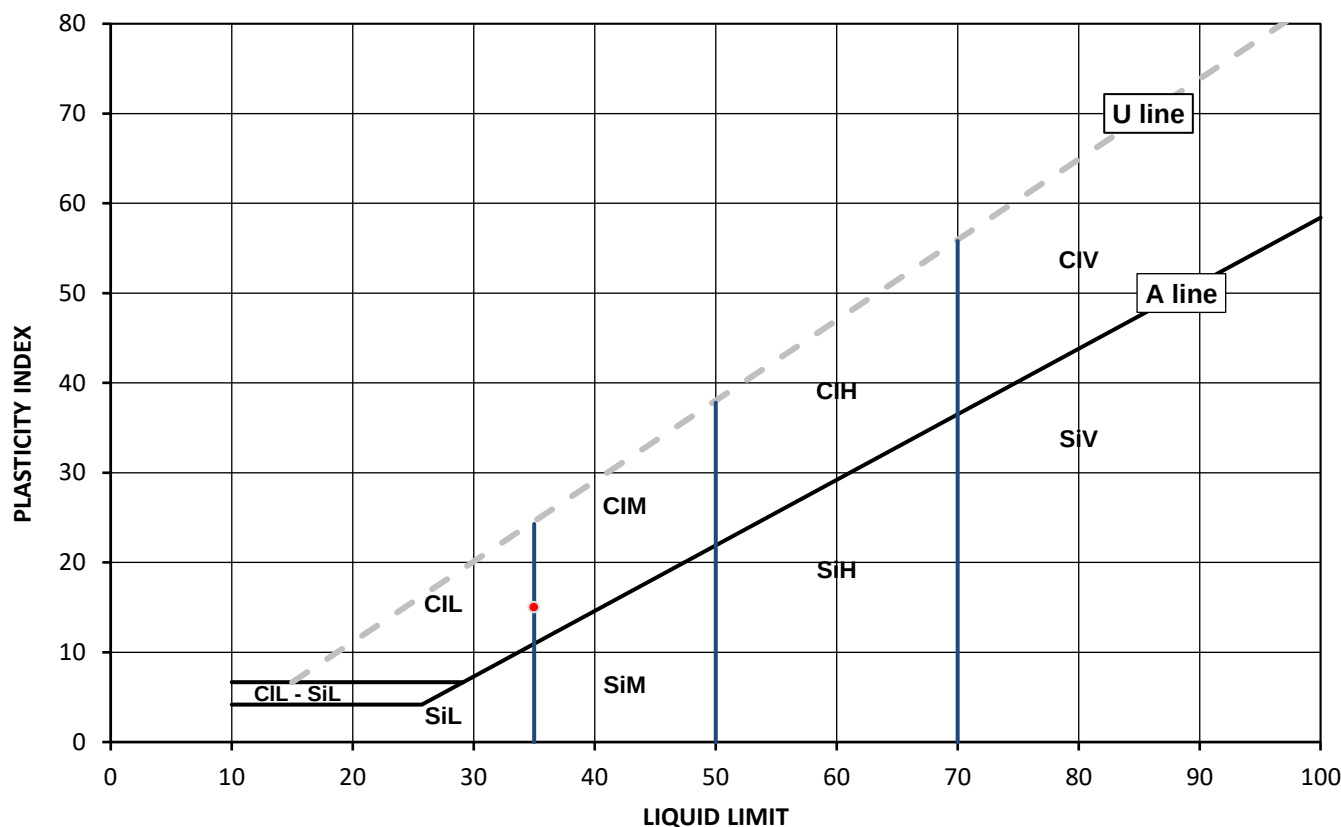
Depth Top [m]: 0.20

Depth Base [m]: 0.40

Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
16	35	20	15	88



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Ashdown Site Investigations Ltd
Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park, Ditchling,
West Sussex, BN6 8SG
Contact: Ashdown Site Investigations
Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 25/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

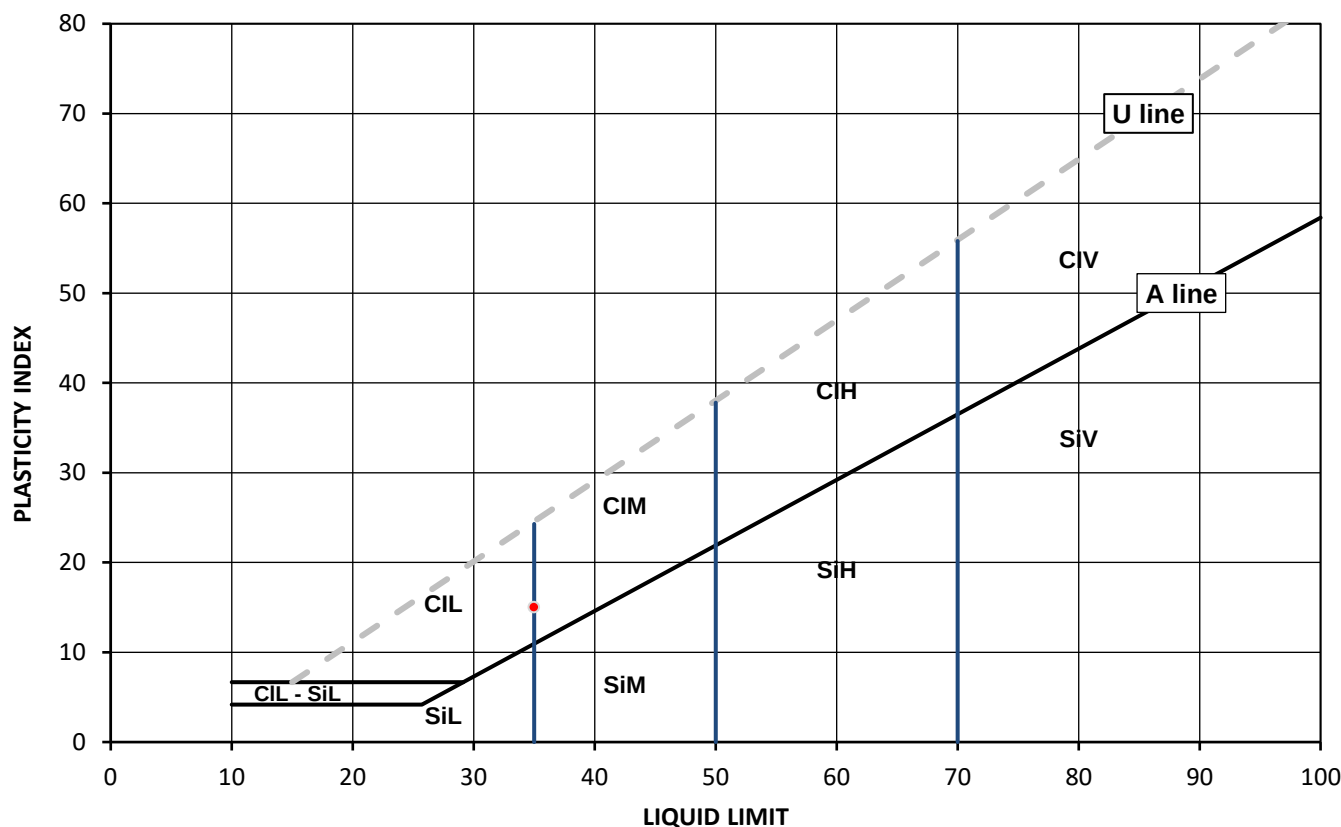
Test Results:

Laboratory Reference: 1705986
Hole No.: CBR03
Sample Reference: Not Given
Soil Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 0.20
Depth Base [m]: 0.50
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
21	35	20	15	90



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Clay	Silt	Plasticity	Liquid Limit
Cl	Clay		L Low	below 35
Si		Silt	M Medium	35 to 50
			H High	50 to 70
			V Very high	exceeding 70
			O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Ashdown Site Investigations Ltd
Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park, Ditchling,
West Sussex, BN6 8SG
Contact: Ashdown Site Investigations
Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 25/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

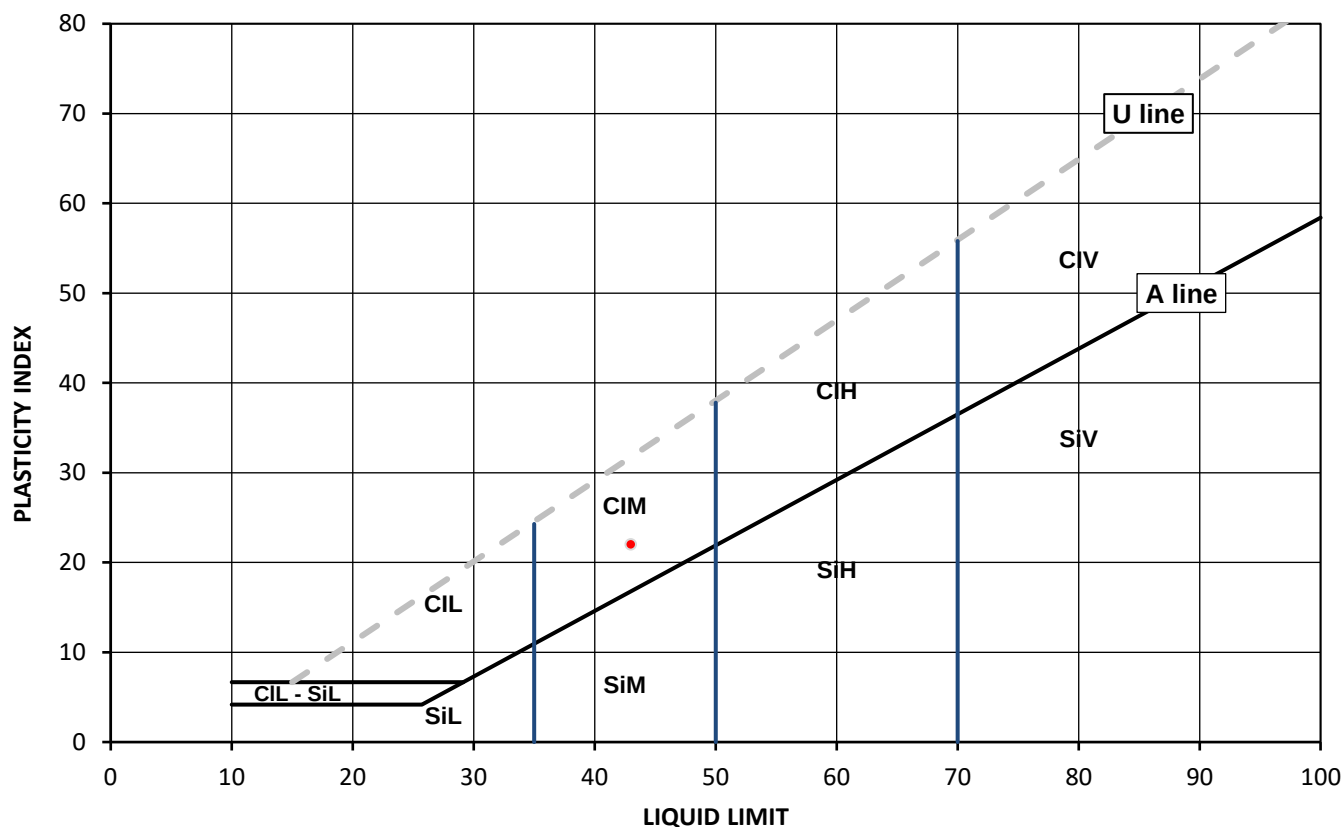
Test Results:

Laboratory Reference: 1705987
Hole No.: CBR04
Sample Reference: Not Given
Soil Description: Brown slightly gravelly sandy CLAY with fragments of rootlet

Depth Top [m]: 0.20
Depth Base [m]: 0.50
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
25	43	21	22	95



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

Plasticity		Liquid Limit	
Cl	Clay	L	Low
Si	Silt	M	Medium
		H	High
		V	Very high
		O	Organic
			append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Liquid and Plastic Limits

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Ashdown Site Investigations Ltd

Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park, Ditchling,
West Sussex, BN6 8SG

Contact: Ashdown Site Investigations

Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 25/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1705988
Hole No.: CBR05
Sample Reference: Not Given
Soil Description: Mottled brown slightly gravelly sandy CLAY with fragments of rootlet

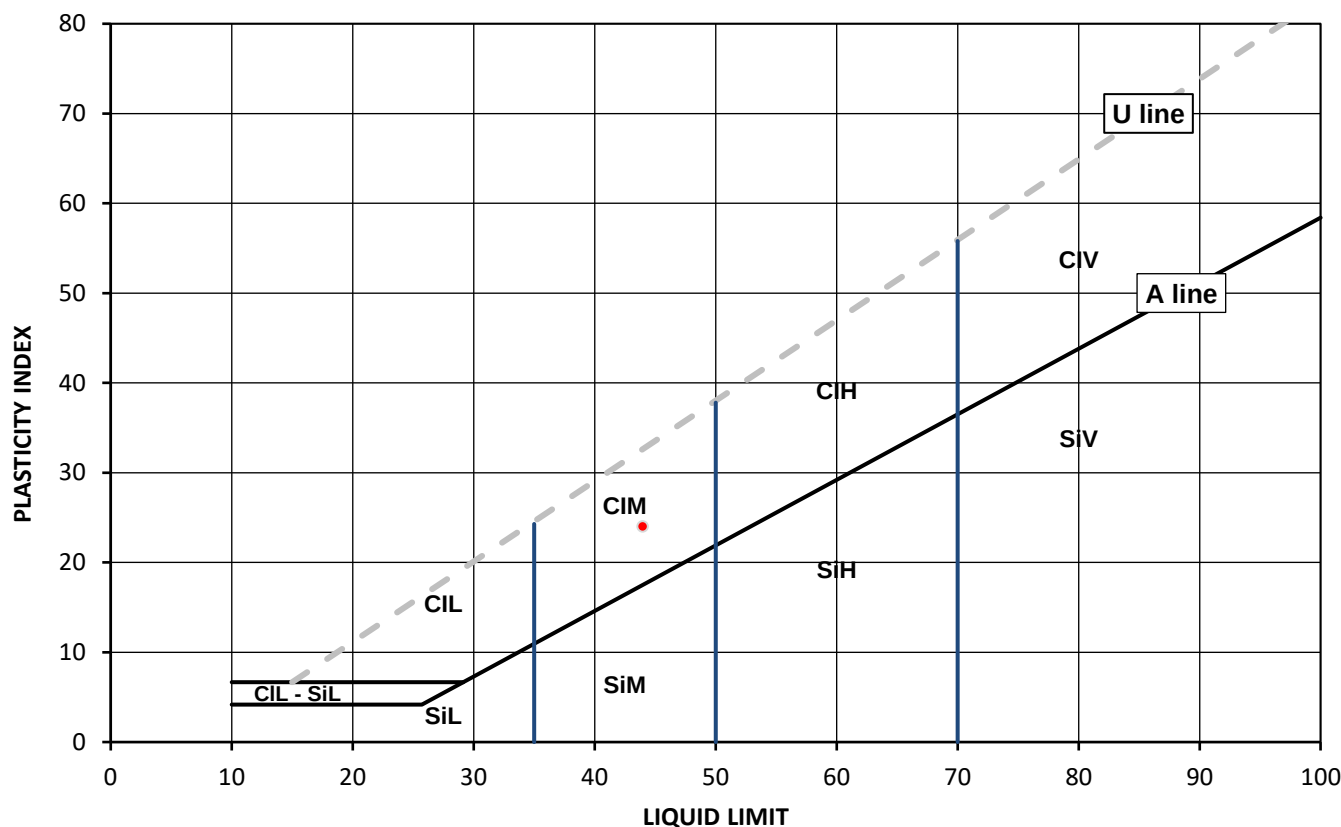
Depth Top [m]: 0.30

Depth Base [m]: 0.60

Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
28	44	20	24	96



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client: Ashdown Site Investigations Ltd
Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park, Ditchling,
West Sussex, BN6 8SG
Contact: Ashdown Site Investigations
Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 24/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

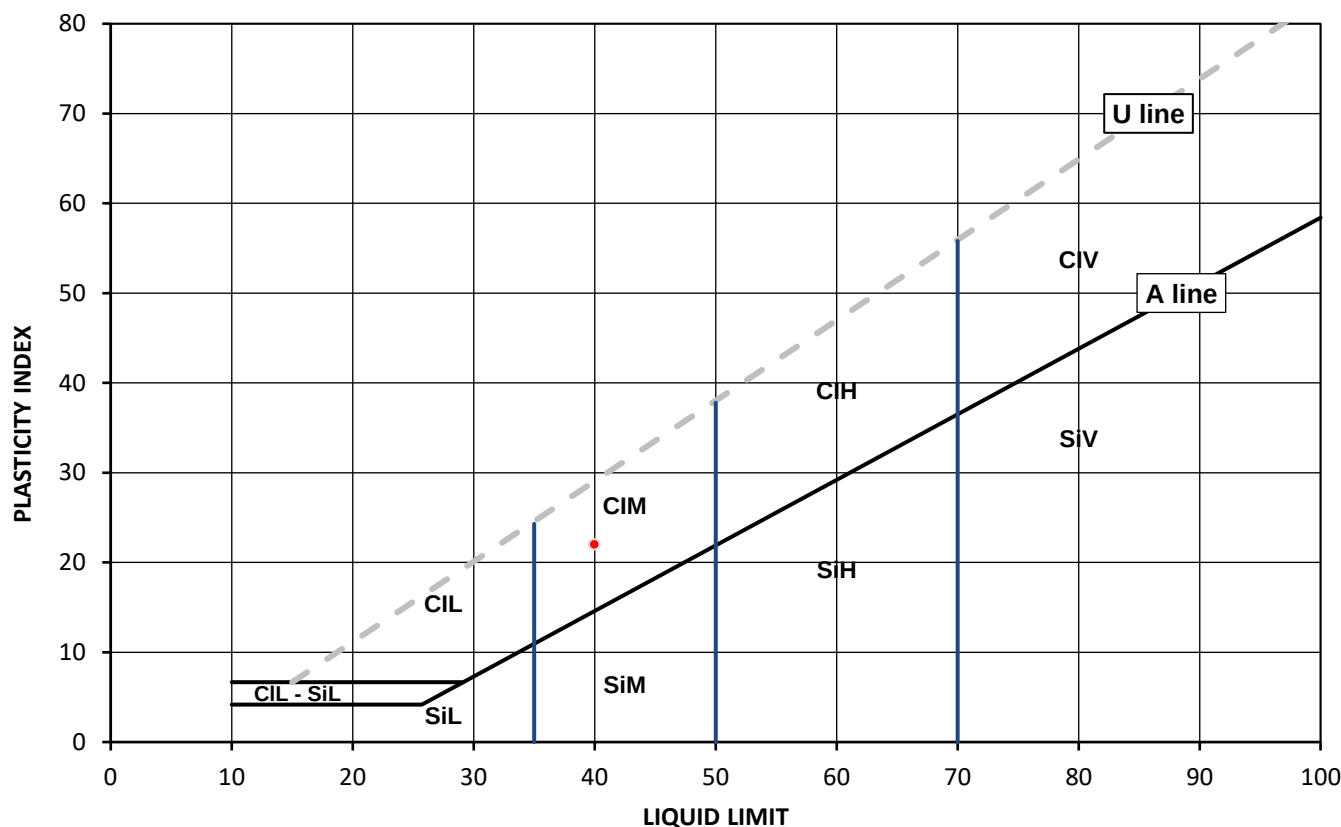
Test Results:

Laboratory Reference: 1705989
Hole No.: CBR06
Sample Reference: Not Given
Soil Description: Mottled brown slightly gravelly sandy CLAY with fragments of rootlet

Depth Top [m]: 0.25
Depth Base [m]: 0.50
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
19	40	18	22	89



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

Summary of Classification Test Results

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with:

Client: Ashdown Site Investigations Ltd
Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park,
Ditchling,
West Sussex, BN6 8SG
Contact: Ashdown Site Investigations

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN
17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test),
Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 24/11 - 25/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Moisture Content [W]	Water Content [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top m	Depth Base m	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
								%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
1705979	BH01	Not Given	0.65	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	17		91	32	20	12						
1705980	BH02	Not Given	1.80	Not Given	D	Light brown clayey CHALK with fragments of flintstone		12											
1705981	BH04	Not Given	1.50	Not Given	D	Brown gravelly sandy CLAY with fragments of flintstone	Atterberg 1 Point	14		58	38	20	18						
1705982	BH05	Not Given	2.50	Not Given	D	Brown clayey sandy GRAVEL with fragments of flintstone and chalk		8.8											
1705984	CBR01	Not Given	0.40	0.60	D	Dark brown slightly gravelly sandy CLAY with fragments of rootlet	Atterberg 1 Point	21		86	36	24	12						
1705985	CBR02	Not Given	0.20	0.40	D	Dark brown slightly gravelly very sandy CLAY with fragments of rootlet	Atterberg 1 Point	16		88	35	20	15						
1705986	CBR03	Not Given	0.20	0.50	D	Brown slightly gravelly sandy CLAY	Atterberg 1 Point	21		90	35	20	15						
1705987	CBR04	Not Given	0.20	0.50	D	Brown slightly gravelly sandy CLAY with fragments of rootlet	Atterberg 1 Point	25		95	43	21	22						
1705988	CBR05	Not Given	0.30	0.60	D	Mottled brown slightly gravelly sandy CLAY with fragments of rootlet	Atterberg 1 Point	28		96	44	20	24						
1705989	CBR06	Not Given	0.25	0.50	D	Mottled brown slightly gravelly sandy CLAY with fragments of rootlet	Atterberg 1 Point	19		89	40	18	22						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

Summary of Classification Test Results

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with:

Client: Ashdown Site Investigations Ltd
Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park,
Ditchling,
West Sussex, BN6 8SG
Contact: Ashdown Site Investigations

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN
17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test),
Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 24/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Moisture Content [W]	Water Content [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
1705983	WS05	Not Given	1.30	Not Given	D	Mottled brown slightly gravelly sandy CLAY	Atterberg 1 Point	24		97	40	18	22						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



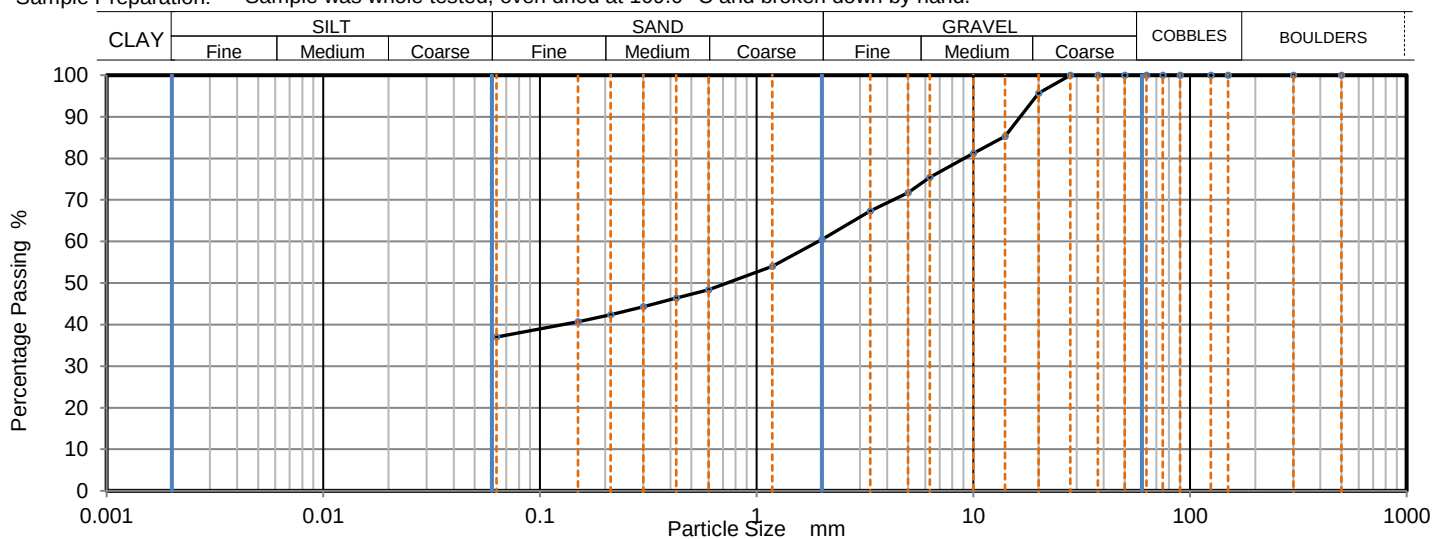
Client: Ashdown Site Investigations Ltd
Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park, Ditchling,
West Sussex, BN6 8SG
Contact: Ashdown Site Investigations
Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 24/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Test Results:

Laboratory Reference: 1705980
Hole No.: BH02
Sample Reference: Not Given
Sample Description: Light brown clayey CHALK with fragments of flintstone
Sample Preparation: Sample was whole tested, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 1.80
Depth Base [m]: Not Given
Sample Type: D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	96		
14	85		
10	81		
6.3	75		
5	72		
3.35	67		
2	61		
1.18	54		
0.6	48		
0.425	46		
0.3	44		
0.212	42		
0.15	41		
0.063	38		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	39.50
Sand	22.90
Fines <0.063mm	37.60

Grading Analysis	
D100	mm 28
D60	mm 1.92
D30	mm
D10	mm
Uniformity Coefficient	> 30
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



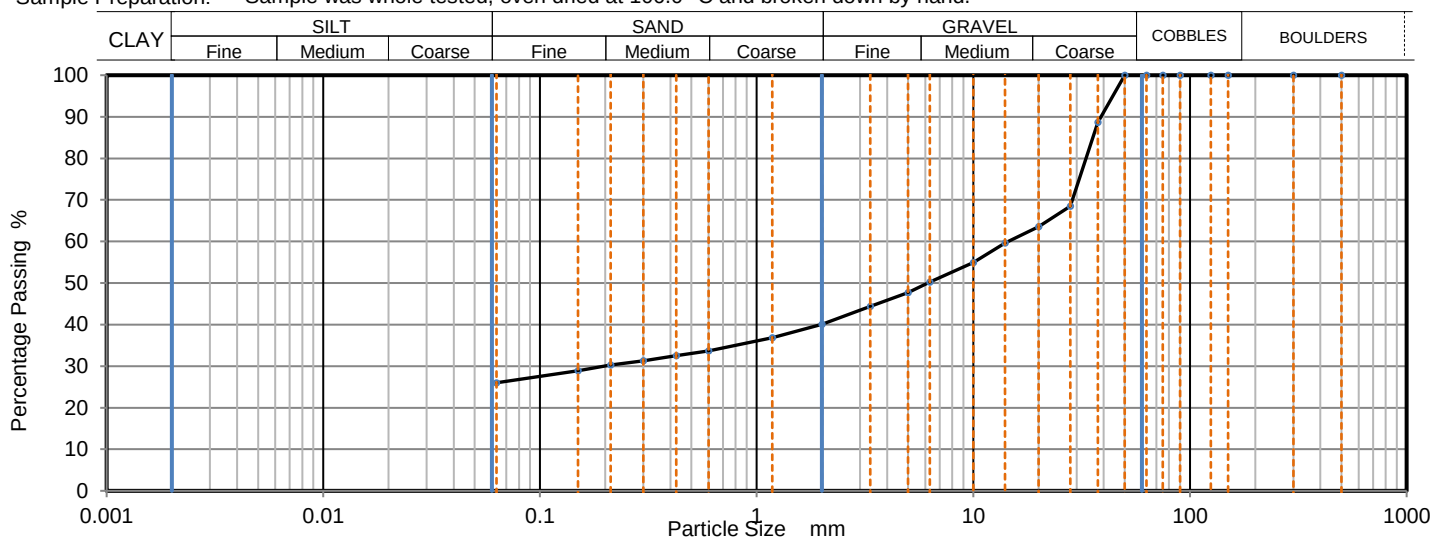
Client: Ashdown Site Investigations Ltd
Client Address: Unit 3, The Old Grain Store,
Ditchling Common Business Park, Ditchling,
West Sussex, BN6 8SG
Contact: Ashdown Site Investigations
Site Address: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslad
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: P14899
Job Number: 20-45317
Date Sampled: 24/11/2020
Date Received: 02/12/2020
Date Tested: 09/12/2020
Sampled By: Client

Test Results:

Laboratory Reference: 1705982
Hole No.: BH05
Sample Reference: Not Given
Sample Description: Brown clayey sandy GRAVEL with fragments of flintstone and chalk
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 2.50
Depth Base [m]: Not Given
Sample Type: D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	89		
28	69		
20	64		
14	60		
10	55		
6.3	50		
5	48		
3.35	44		
2	40		
1.18	37		
0.6	34		
0.425	33		
0.3	31		
0.212	30		
0.15	29		
0.063	27		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	59.90
Sand	13.30
Fines <0.063mm	26.80

Grading Analysis		
D100	mm	50
D60	mm	14.5
D30	mm	0.198
D10	mm	
Uniformity Coefficient		> 230
Curvature Coefficient		

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

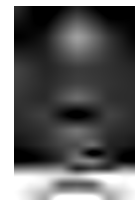
Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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Alex Bewick
Ashdown Site Investigations Ltd
Unit 3 The Grain Store
Ditchling Common Business Park
Ditchling Common
West Sussex
BN6 8SG

DETS Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 20-14330

Site Reference: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

Project / Job Ref: P14899

Order No: 9065

Sample Receipt Date: 03/12/2020

Sample Scheduled Date: 03/12/2020

Report Issue Number: 1

Reporting Date: 10/12/2020

Authorised by:



Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

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



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate						
DETS Report No: 20-14330	Date Sampled	24/11/20	24/11/20	25/11/20	24/11/20	24/11/20
Ashdown Site Investigations Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	TP / BH No	BH01	BH02	BH04	BH05	WS02
Project / Job Ref: P14899	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 9065	Depth (m)	2.50	1.30	2.60	1.20	0.50
Reporting Date: 10/12/2020	DETS Sample No	514551	514552	514553	514554	514555

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	7.8	8.0	8.1	7.9	7.9
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	14	< 10	< 10	16	14
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.01	< 0.01	< 0.01	0.02	0.01

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 20-14330	
Ashdown Site Investigations Ltd	
Site Reference: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade	
Project / Job Ref: P14899	
Order No: 9065	
Reporting Date: 10/12/2020	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
514551	BH01	None Supplied	2.50	9.4	Beige sandy clay with chalk
514552	BH02	None Supplied	1.30	12.8	Beige sandy clay with chalk
514553	BH04	None Supplied	2.60	10.5	Beige sandy clay with chalk
514554	BH05	None Supplied	1.20	11.7	Brown sandy clay with chalk
514555	WS02	None Supplied	0.50	5.9	Brown sandy clay with stones

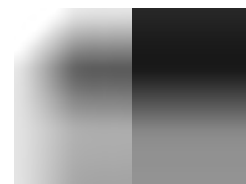
Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{u/s}

Unsuitable Sample ^{u/s}



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 20-14330

Ashdown Site Investigations Ltd

Site Reference: Proposed Development at Mayberry Garden Centre, Old Shoreham Road, Portslade

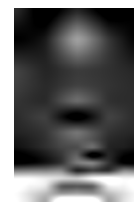
Project / Job Ref: P14899

Order No: 9065

Reporting Date: 10/12/2020

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 dphenylcarbazine followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



Alex Bewick
Ashdown Site Investigations Ltd
Unit 3 The Grain Store
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DETS Report No: 20-14331

Site Reference: Mayberry Garden Centre, Old Shoreham Road, Portslade

Project / Job Ref: P14899

Order No: 9068

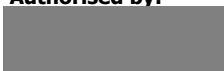
Sample Receipt Date: 03/12/2020

Sample Scheduled Date: 03/12/2020

Report Issue Number: 1

Reporting Date: 10/12/2020

Authorised by:



Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

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Soil Analysis Certificate						
DETS Report No: 20-14331	Date Sampled	24/11/20	24/11/20	25/11/20	27/11/20	27/11/20
Ashdown Site Investigations Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Mayberry Garden Centre, Old Shoreham Road, Portslade	TP / BH No	WS05	BH01	CBR05	SA101	SA103
Project / Job Ref: P14899	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 9068	Depth (m)	0.20	0.20	0.20	0.25	0.20
Reporting Date: 10/12/2020	DETS Sample No	514561	514562	514563	514564	514565

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	7.9	7.1	7.2	7.3	7.8
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	298	571	443	1956	398
Total Sulphate as SO ₄	%	< 0.02	MCERTS	0.03	0.06	0.04	0.20	0.04
Organic Matter	%	< 0.1	MCERTS	0.8	3.4	2.9	37.9	2
Arsenic (As)	mg/kg	< 2	MCERTS	7	13	12	8	12
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	4.7	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	0.8	0.4	0.3	0.4
Chromium (Cr)	mg/kg	< 2	MCERTS	19	24	20	8	17
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	11	54	36	33	25
Lead (Pb)	mg/kg	< 3	MCERTS	17	248	95	144	99
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	13	17	17	8	15
Selenium (Se)	mg/kg	< 2	MCERTS	< 3	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	46	255	212	158	146

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 20-14331	Date Sampled	24/11/20	24/11/20	25/11/20	27/11/20	27/11/20
Ashdown Site Investigations Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Mayberry Garden Centre, Old Shoreham Road, Portslade	TP / BH No	WS05	BH01	CBR05	SA101	SA103
Project / Job Ref: P14899	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 9068	Depth (m)	0.20	0.20	0.20	0.25	0.20
Reporting Date: 10/12/2020	DETS Sample No	514561	514562	514563	514564	514565

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.31	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	0.69	< 0.1	8.23	0.36
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.17	< 0.1	1.59	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	2.07	0.13	10.40	0.84
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	1.84	< 0.1	8.66	0.76
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.71	< 0.1	2.82	0.38
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.99	< 0.1	3.32	0.49
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.86	< 0.1	2.35	0.55
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.43	< 0.1	1.10	0.26
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.71	< 0.1	1.84	0.42
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.48	< 0.1	0.98	0.29
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.26	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	0.40	< 0.1	0.76	0.26
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	9.3	< 1.6	42.6	4.6



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Soil Analysis Certificate - EPH Banded (Type F)						
DETS Report No: 20-14331	Date Sampled	24/11/20	24/11/20	25/11/20	27/11/20	27/11/20
Ashdown Site Investigations Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Mayberry Garden Centre, Old Shoreham Road, Portslade	TP / BH No	WS05	BH01	CBR05	SA101	SA103
Project / Job Ref: P14899	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 9068	Depth (m)	0.20	0.20	0.20	0.25	0.20
Reporting Date: 10/12/2020	DETS Sample No	514561	514562	514563	514564	514565

Determinand	Unit	RL	Accreditation					
EPH (>C8 - C10)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
EPH (>C10 - C12)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
EPH (>C12 - C16)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	3	< 1
EPH (>C16 - C21)	mg/kg	< 1	MCERTS	< 1	11	< 1	61	10
EPH (>C21 - C40)	mg/kg	< 6	MCERTS	< 6	30	8	81	37
EPH (C8 - C40)	mg/kg	< 6	MCERTS	< 6	41	8	144	46



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Soil Analysis Certificate - Volatile Organic Compounds (VOC)						
DETS Report No: 20-14331	Date Sampled	24/11/20	24/11/20	25/11/20	27/11/20	27/11/20
Ashdown Site Investigations Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Mayberry Garden Centre, Old Shoreham Road, Portslade	TP / BH No	WS05	BH01	CBR05	SA101	SA103
Project / Job Ref: P14899	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 9068	Depth (m)	0.20	0.20	0.20	0.25	0.20
Reporting Date: 10/12/2020	DETS Sample No	514561	514562	514563	514564	514565

Determinand	Unit	RL	Accreditation					
Dichlorodifluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chloromethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Chloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromomethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Trichlorofluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
cis-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
2,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chloroform	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,1-Trichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1-Dichloropropene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Carbon Tetrachloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
1,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Trichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromodichloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Dibromomethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
TAME	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
1,3-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	ug/kg	< 5	MCERTS	< 5	6	< 5	< 5	22
Dibromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dibromoethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,1,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethyl Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
m,p-Xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-Xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Styrene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromoform	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Isopropylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2,3-Trichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
n-Propylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Bromobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
2-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,3,5-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
4-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
tert-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2,4-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
sec-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
p-Isopropyltoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,3-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,4-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
n-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
1,2-Dibromo-3-chloropropane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5



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Soil Analysis Certificate - PCB (7 Congeners)						
DETS Report No: 20-14331	Date Sampled	24/11/20	24/11/20	24/11/20	24/11/20	24/11/20
Ashdown Site Investigations Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Mayberry Garden Centre, Old Shoreham Road, Portslade	TP / BH No	WS01	WS01	WS02	WS03	WS03
Project / Job Ref: P14899	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 9068	Depth (m)	0.60	1.80	0.70	0.80	1.20
Reporting Date: 10/12/2020	DETS Sample No	514556	514557	514558	514559	514560

Determinand	Unit	RL	Accreditation					
PCB Congener 28	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 52	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 101	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 118	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 138	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 153	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
PCB Congener 180	mg/kg	0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008
Total PCB (7 Congeners)	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1



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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 20-14331	
Ashdown Site Investigations Ltd	
Site Reference: Mayberry Garden Centre, Old Shoreham Road, Portslade	
Project / Job Ref: P14899	
Order No: 9068	
Reporting Date: 10/12/2020	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
514556	WS01	None Supplied	0.60	8.8	Light brown sandy clay with stones
514557	WS01	None Supplied	1.80	5.8	Light brown sandy clay with stones and chalk
514558	WS02	None Supplied	0.70	16.3	Brown sandy clay with chalk
514559	WS03	None Supplied	0.80	14.6	Brown sandy clay with stones
514560	WS03	None Supplied	1.20	13.7	Brown sandy clay with stones and chalk
514561	WS05	None Supplied	0.20	16.2	Brown sandy clay with stones and chalk
514562	BH01	None Supplied	0.20	15.4	Brown loamy sand with vegetation
514563	CBR05	None Supplied	0.20	17.9	Brown loamy sand with stones and vegetation
514564	SA101	None Supplied	0.25	37.9	Black loamy sand with stones and vegetation
514565	SA103	None Supplied	0.20	16.3	Brown loamy sand with stones and vegetation

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 20-14331

Ashdown Site Investigations Ltd

Site Reference: Mayberry Garden Centre, Old Shoreham Road, Portslade

Project / Job Ref: P14899

Order No: 9068

Reporting Date: 10/12/2020

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

APPENDIX D

Classification of Probability, Consequence and Risk

Probability of risk being realised	
Classification	Definition
High	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Moderate	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter term.
Very Low	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

Consequence of risk being realised		
Classification	Category	Definition
Severe	Human Health	Short term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA.
	Controlled Waters	Short term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource.
	Property	Catastrophic damage to buildings/property.
	Ecological Systems	A short term risk to a particular ecosystem or organisation forming part of such ecosystem.
Moderate	Human Health	Chronic damage to Human Health.
	Controlled Waters	Pollution of sensitive water resources (note: Water Resources Act contains no scope for considering significance of pollution).
	Ecological System	A significant change in a particular ecosystem or organism forming part of such ecosystem.
Minor	Controlled Waters	Pollution of non-sensitive water resources.
	Property	Significant damage to crops, buildings, structures and services.
	Ecological Systems	Damage to sensitive buildings/structures/services or the environment.
Very Minor	Human Health	Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc).
	Property	Easily repairable effects of damage to buildings, structures and services.
	Project	Harm, although not necessarily significant harm, which may result in a financial loss or expenditure to resolve.

Risk classification definitions	
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the long term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from an identified hazard, but there is a low likelihood of this hazard occurring and if realised, harm would at worst normally be mild.
Very Low	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

APPENDIX E

Preliminary Conceptual Model

Site Name				Preliminary Conceptual Model		P14740	
Potential Source	Potential Receptor	Potential Contaminants	Potential Pathway	Complete Linkage Present?	Probability	Consequence	Risk
• Historical landfill/backfilled pits to the east and within the eastern part of the site.	End Users	Heavy Metals, PAH Compounds, Asbestos and Land Gases	Dermal contact with soil and dust (indoor & outdoor)	Yes	P1: Very Low	C3: Moderate	Low
			Ingestion of soil and indoor dust	Yes	P1: Very Low	C3: Moderate	Low
			Consumption of home-grown produce and attached soil	No private gardens proposed			N/A
			Inhalation of soil dust (indoor and outdoor)	Yes	P1: Very Low	C3: Moderate	Low
			Inhalation of soil vapours	Identified contaminant(s) do not pose a risk via this pathway			N/A
			Inhalation of soil gases/ Risk of explosion	Yes	P3: Moderate	C3: Moderate	Moderate
	End Users (via Water Supply Pipework)		Contamination of incoming services	Identified contaminant(s) do not pose a risk via this pathway			N/A
	Groundwater	Heavy Metals and PAH Compounds	Migration to groundwater	Yes	P1: Very Low	C1: Very Minor	Negligible
• Historical use of the eastern part of the site as a garage and laundry.	End Users	Heavy Metals, PAH Compounds, Petroleum Hydrocarbons and VOC Compounds	Dermal contact with soil and dust (indoor & outdoor)	Yes	P1: Very Low	C2: Minor	Very Low
			Ingestion of soil and indoor dust	Yes	P1: Very Low	C2: Minor	Very Low
			Consumption of home-grown produce and attached soil	No private gardens proposed			N/A
			Inhalation of soil dust (indoor and outdoor)	Yes	P1: Very Low	C2: Minor	Very Low
			Inhalation of soil vapours	Yes	P1: Very Low	C2: Minor	Very Low
			Inhalation of soil gases/ Risk of explosion	No potential gas source identified			N/A
	End Users (via Water Supply Pipework)	Petroleum Hydrocarbons and VOC Compounds	Contamination of incoming services	Yes	P1: Very Low	C2: Minor	Very Low
	Groundwater	Heavy Metals, PAH Compounds, Petroleum Hydrocarbons and VOC Compounds	Migration to groundwater	Yes	P1: Very Low	C2: Minor	Very Low

Site Name				Preliminary Conceptual Model		P14740	
Potential Source	Potential Receptor	Potential Contaminants	Potential Pathway	Complete Linkage Present?	Probability	Consequence	Risk
• Filling station to the east of the site.	End Users	Petroleum Hydrocarbons and VOC Compounds	Dermal contact with soil and dust (indoor & outdoor)	No proposed landscaping areas in the eastern part of the site			N/A
			Ingestion of soil and indoor dust	No proposed landscaping areas in the eastern part of the site			N/A
			Consumption of home-grown produce and attached soil	No private gardens proposed			N/A
			Inhalation of soil dust (indoor and outdoor)	No proposed landscaping areas in the eastern part of the site			N/A
			Inhalation of soil vapours	Yes	P1: Very Low	C2: Minor	Very Low
			Inhalation of soil gases/ Risk of explosion	No potential gas source identified			N/A
	End Users (via Water Supply Pipework)	Petroleum Hydrocarbons and VOC Compounds	Contamination of incoming services	Yes	P1: Very Low	C2: Minor	Very Low
	Groundwater	Petroleum Hydrocarbons and VOC Compounds	Migration to groundwater	Yes	P1: Very Low	C2: Minor	Very Low
• Electricity substation to the south west.	End Users	Petroleum Hydrocarbons and PCB Compounds	Dermal contact with soil and dust (indoor & outdoor)	Yes	P1: Very Low	C2: Minor	Very Low
			Ingestion of soil and indoor dust	Yes	P1: Very Low	C2: Minor	Very Low
			Consumption of home-grown produce and attached soil	No private gardens proposed			N/A
			Inhalation of soil dust (indoor and outdoor)	Yes	P1: Very Low	C2: Minor	Very Low
			Inhalation of soil vapours	Yes	P1: Very Low	C2: Minor	Very Low
			Inhalation of soil gases/ Risk of explosion	No potential gas source identified			N/A
	End Users (via Water Supply Pipework)	Petroleum Hydrocarbons and PCB Compounds	Contamination of incoming services	Yes	P2: Low	C3: Moderate	Low/Moderate
	Groundwater	Petroleum Hydrocarbons and PCB Compounds	Migration to groundwater	Yes	P1: Very Low	C2: Minor	Very Low

APPENDIX F

Quantitative Conceptual Model

Mayberry Garden Centre, Old Shoreham Road, Portslade				Quantitative Conceptual Model		P14899	
Source	Receptor	Contaminants	Pathway	Complete Linkage Present?	Probability	Consequence	Risk
None Identified	End Users		Dermal contact with soil and dust (indoor & outdoor)	No contaminants present above SSVs			N/A
			Ingestion of soil and indoor dust	No contaminants present above SSVs			N/A
			Consumption of home-grown produce and attached soil	No private gardens proposed			N/A
			Inhalation of soil dust (indoor and outdoor)	No contaminants present above SSVs			N/A
			Inhalation of soil vapours	No contaminants present above SSVs			N/A
			Inhalation of soil gases/ Risk of explosion	No gases present above GSVs			N/A
	End Users (via Water Supply Pipework)		Contamination of incoming services	No contaminants present above screening criteria			N/A
	Groundwater		Migration to groundwater	No contaminants present at concentrations posing risk to groundwater			N/A



Appendix F

Appendix F – Building Control Inspections

Site Inspection Report

**Project Name:**

66105426 - Mayberry Garden Centre Car showroom

Client Name:

Tate Bros Limited

Description

Plan Based Inspection 22.06.2023 at 14:47

Prepared By

Robert Scott

Inspection Date

22.06.2023

Inspection Number

003

Weather Conditions

Fine and dry

Printed

26.09.2025 15:10

Findings

10 images / issues

Present During Inspection

Amon - Benridge
Rob Scott - Sweco

Peer Review**Comments**

I attended site and met Amon, We walked the site and noted the following;

Many of the drainage runs have been back filled, due to site pressure, i.e. site traffic needing to move across site.

The run to and from I.C. 27 had been backfilled but not covered with soil, I noted that the pipework was bedded on pea shingle and covered with pea shingle, Then a layer of concrete has been poured to protect the run.

The majority of the drainage runs had been backfilled leaving only the inspection chamber precast concrete ring cover slabs visible.

Inspection chamber S16 requires a further ring to be installed prior to the precast concrete ring cover slab being installed.

Issues Identified

To update the status of any of the issues identified in this report please click the link below, scan the QR code or visit : bc.sweco.co.uk and enter site number 696-588

[Click here to view these issues in the contractor portal](#)



Pursuant to Regulation 19 of the Building (Registered Building Control Approvers etc) Regulations 2024, Sweco Building Control has a legal obligation to issue a final certificate within four weeks (eight weeks for works to a single dwelling) following occupation of the building or within eight weeks of the works being substantially complete. It is important that the person carrying out the work and/or the client ensure Sweco Building Control are notified without delay in order for us to undertake our final inspection within these timeframes.

Any contraventions highlighted by us at any stage during construction or at completion of work (including outstanding information/documentation) may be subject to a notice under Regulation 21 of the Building (Registered Building Control Approvers etc) Regulations 2024, which will give the person carrying out the work and/or the client 3 months from the date of issue for these matters to be resolved. Where any outstanding matters are not resolved with the 3 month period, Sweco Building Control may issue a notice of cancellation and control of the project would move to the Local Authority who may consider formal enforcement action. Evidence of contraventions being rectified can be submitted via our contractor portal and therefore we would encourage that any outstanding items issued as part of our inspection regime are resolved within this time period.

Note: This inspection report is restricted to requirements covered by the building regulations current as of the date of inspection. Any contraventions raised will be listed within this and previously issued reports. As required by Regulation 21 of the Building (Registered Building Control Approvers etc) Regulations 2024, the reports identify any contraventions reported and their location. This report does not constitute evidence that the Building Regulations have been satisfied until a Completion / Final Certificate has been issued for the project. It remains the responsibility of the person carrying out the work to ensure that the work complies with the Building Regulations.

Reg. Office Address: Sweco Building Control Limited, Grove House, Mansion Gate Drive, Leeds, LS7 4DN

Sweco Building Control Limited, a company incorporated in England & Wales (Reg. No.: 02891295)

003 / 001



50.96242676906096 -0.07537337580118733



Comment

Inspection chamber - S29

Current Status

Work In Progress

Location / Plan

Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area

003 / 002

Comment



Inspection chamber - S27

Current Status

Work In Progress

Location / Plan

Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area

50.96242676906096 -0.07537337580118733



003 / 003



50.96242676906096 -0.07537337580118733



Comment

Towards Inspection chamber - S29

Current Status

Work In Progress

Location / Plan

Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area

003 / 004

Comment



Inspection chamber - S28

Current Status

Work In Progress

Location / Plan

Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area

50.96242676906096 -0.07537337580118733



003 / 005



50.96242676906096 -0.07537337580118733



Comment

Between Inspection chambers -S27/S28

Current Status

Work In Progress

Location / Plan

Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area

003 / 006



50.96242676906096 -0.07537337580118733



Comment

Inspection chamber - S27

Current Status

Work In Progress

Location / Plan

Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

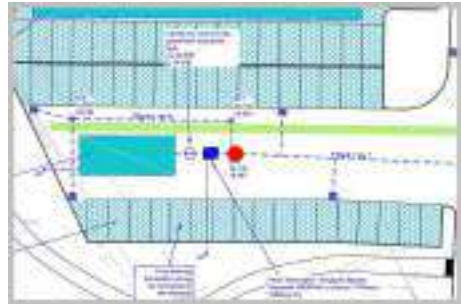
Inspection Plan Element

Building Regs Area

003 / 007



50.96242676906096 -0.07537337580118733



Comment

Inspection chamber - S13

Current Status

Work In Progress

Location / Plan

Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area

003 / 008



50.96242676906096 -0.07537337580118733



Inspection chamber - S14

Current Status
Work In Progress

Location / Plan
Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area

003 / 009



50.96242676906096 -0.07537337580118733



Comment

Inspection chamber - S16 - Further rings to be installed.

Current Status

Work In Progress

Location / Plan

Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area

003 / 010



50.96242676906096 -0.07537337580118733



Comment

Inspection chamber - S30

Current Status

Work In Progress

Location / Plan

Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area

Site Inspection Report

**Project Name:**

66105426 - Mayberry Garden Centre Car showroom

Client Name:

Tate Bros Limited

Description

Gallery Upload

Prepared By

Graham Winstanley

Inspection Date

13.07.2023

Inspection Number

004

Weather Conditions

sunny 18c

Printed

26.09.2025 15:10

Findings

8 images / issues

Present During Inspection

Richard - Jurial Construction
Jason - Jurial Construction

Peer Review**Comments**

Site inspection to see progress of grey water landscaping works and drainage plots for new build showroom.

Ground level now formed for slab of showroom. Drainage level backfilled with I/C's and manhole chambers identified. Connection to soakaway and mains foul not yet made due to access road. On adjacent parking landscaping plot connection to main foul evident with connection to be made. Graywater curb drainage being installed and mains grey water drainage manholes being formed. Soakaway now backfilled, teram evident on site. Photos of installation of crates and teram seen on site and contractor to submit.

Issues Identified

To update the status of any of the issues identified in this report please click the link below, scan the QR code or visit : bc.sweco.co.uk and enter site number 696-588

[Click here to view these issues in the contractor portal](#)



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Sweco Building Control Limited, a company incorporated in England & Wales (Reg. No.: 02891295)

004 / 001



Comment
Beginning of foul drainage to curtilage of proposed plot

Current Status
No issue

Location / Plan
Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area

004 / 002



Comment
Manhole to curtilage

Current Status
No issue

Location / Plan
Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area

004 / 003

Comment



Current Status

No issue

Location / Plan

Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area



004 / 004

Comment



Current Status
No issue

Location / Plan
Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area



004 / 005

Comment



Current Status
No issue

Location / Plan
Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area



004 / 006

Comment



Current Status
No issue

Location / Plan
Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area



004 / 007

Comment



Current Status
No issue

Location / Plan
Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area



004 / 008

Comment



Current Status
No issue

Location / Plan
Drawing : D2099-103C Engineering Layout - Below
Ground Drainage Page 1 of 2[ATP414469].pdf

Inspection Plan Element

Building Regs Area

