

INTERPRETATIVE SITE INVESTIGATION REPORT

At

Sefter Road, Pagham

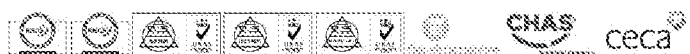
On behalf of

Hamilton Homes and Developments Ltd

PROJECT REFERENCE: 21.1146

August 2021

constructiveevaluation
site investigation • building pathology

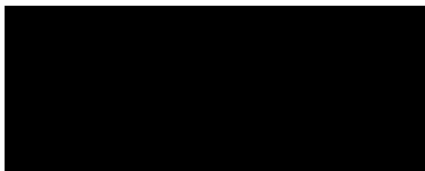


Interpretative Site Investigation Report

by

Constructive Evaluation Ltd

Units 15-16 Ford Lane Business Park, Ford, Arundel BN18 0UZ



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	Version 1	Version 2	Version 3
History			
Issued to			
Date			

Foreword

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CONTENTS

1.0	Introduction	6
1.1	SITE PROPOSAL	6
1.2	SUMMARY OF SITE INVESTIGATION	6
2.0	Site Background	7
2.1	PUBLISHED GEOLOGY	7
2.2	PHYSICAL SITE SETTING	7
3.0	Field Work	8
3.1	SOIL SAMPLE COLLECTION	8
4.0	Ground Conditions	9
4.1	OBSERVED STRATIGRAPHICAL UNITS	9
4.2	GROUNDWATER	9
4.3	FIELD EVIDENCE OF CONTAMINATION	9
5.0	In situ Testing	10
5.1	STANDARD PENETRATION TESTING	10
5.2	DYNAMIC PROBE TESTING	11
6.0	Geotechnical Laboratory Testing	12
6.1	NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS	12
6.2	PARTICLE SIZE DISTRIBUTION (PSD) TESTING	12
6.3	SULPHATE AND PH ANALYSIS	12
7.0	Geotechnical Discussion	13
7.1	SOIL ENGINEERING PROPERTIES	13
7.2	SHALLOW FOUNDATIONS	13
7.3	DEEP FOUNDATIONS	13
7.4	FLOOR SLAB	14
7.5	EXCAVATIONS AND GROUNDWATER	14
7.6	CONCRETE IN AGGRESSIVE GROUND	14
7.7	FURTHER INVESTIGATION	14

FIGURES

Figure 1 – Site Location Plan

Figure 2 – Site Investigation Plan

APPENDICES

Appendix A – Site Investigation Photographs

Appendix B – Stratigraphic Logs

Appendix C - Geotechnical Laboratory Testing

Appendix D – Report Terms and Conditions

1.0 Introduction

In July 2021 Constructive Evaluation (CE) Limited was commissioned by Hamilton Homes and Developments Ltd to carry out a Site Investigation at Sefter Road, Pagham, PO21 3EE hereafter referred to as the “site”.

The purposes of this investigation and report are to identify the geotechnical properties of the ground to determine outline design parameters for foundation design.

Attention is drawn to the fact that whilst every effort has been made to ensure the accuracy of the data supplied and any analysis derived from it, there is a potential for variations in ground and groundwater conditions between and beyond the specific locations investigated. No liability can be accepted for any such variations. Furthermore, any recommendations are specific to the client’s requirements as detailed herein and no liability will be accepted should these be used by third parties without prior consultation with Constructive Evaluation Ltd.

A desk study as outlined in BS5930 “Code of practice for site investigations” was not requested and therefore has not been carried out.

1.1 Site Proposal

It is understood that the proposed development is the construction of a number of new residential buildings.

1.2 Summary of Site Investigation

An outline of the intrusive works instructed are summarised below:

- Up to five (5no) windowless sampler boreholes to 6mbgl or refusal

2.0 Site Background

2.1 Published Geology

Reference to the publications of the British Geological Survey (BGS), indicate the site is underlain by bedrock of the London Clay Formation. Superficial deposits of Raised Beach Deposits are recorded on site.

Raised Beach Deposits: Sand and Gravel. Superficial deposits formed up to 3 million years ago in the Quaternary Period. These sedimentary deposits are shallow-marine in origin, detrital and generally coarse grained forming beaches and bars in a coastal setting.

London Clay Formation: Clay, Silt and Sand. Sedimentary bedrock formed approximately 48 to 56 million years ago in the Palaeogene Period. These sedimentary rocks are marine in origin, detrital and range from coarse to fine grained slurries of debris from the continental shelf flowing into a deep-sea environment, forming distinctively graded beds.

2.2 Physical Site Setting

The site comprises a triangular shaped plot of land at approximate National Grid Reference SZ 89526 99488. At the time of the site investigation the site comprised a disused field with minor construction work including a stepped trench (10mx3m) and hardstanding cover area in the north section of the site.

The majority of the site contains a cover of backfilled construction materials with some soft standing patches. The site is accessed from the north via Sefter Road and topography on site is relatively flat. The site is bound by mature and semi-mature trees of various species to the south.

The site surroundings are as follows:

- North: Sefter Road and agricultural fields,
- East: A stream trending NE-SW and agricultural fields,
- South: Residential properties and agricultural fields,
- West: Rear gardens of residential properties and agricultural fields.

A Site Location Plan is provided in **Figure 1**, with Site Investigation Photographs provided in **Appendix A**.

3.0 Field Work

The following intrusive works were carried out on 09th August 2021, supervised by an Engineering Geologist from CE:

- Four (4no) windowless sampler boreholes to a maximum of 6mbgl,
- Two (2no) super heavy dynamic probe to a maximum of 6mbgl.

A Site Investigation Plan can be found in **Figure 2**.

The ground investigation was undertaken in accordance with the scope of works agreed with our Client and in relation to statutory guidance including BS5930: 1999 Code of Practice for Site Investigations (Amendment 3: 2015) and BS10175: 2011+A1: 2013 Investigation of Potentially Contaminated Sites: Code of Practice.

3.1 Soil Sample Collection

All intrusive locations were logged, visual and/or olfactory evidence of contamination noted, and representative soil sample removed in accordance with current protocol for geotechnical parameters.

4.0 Ground Conditions

4.1 Observed Stratigraphical Units

The following anthropogenic (made ground) strata were encountered during the intrusive works:

The surface cover identified across all locations considered to be resultant from recent profiling works at the site extending to depths of 1mbgl to 1.1mbgl. The material is somewhat variable in composition; however, it is largely comprised of slightly sandy slightly gravelly CLAY. The gravels are noted to be of red brick, concrete, tile, flint, glass, metal, and inclusions of plastic.

Beneath the made ground material, the natural stratigraphic sequence is as follows:

Slightly sandy slightly gravelly Clay: greyish brown slightly sandy slightly gravelly CLAY. Gravel was noted to be of flint. This is inferred to possibly represent either a superficial deposit or the top of the weathered London Clay or a reworked fill material derived from the latter. This material was encountered in all intrusive locations to a maximum depth of 2.4mbgl in WLS3.

Raised Beach Deposits: yellowish brown gravelly SAND. This was encountered to a maximum depth of 2.7mbgl within WLS1 and WLS4.

London Clay Formation: firm to stiff fissured dark grey CLAY. The London Clay Formation is encountered below the natural soils.

Bognor Sand Member: Very dense dark grey clayey SAND. The Bognor Sand Member is encountered below the London Clay Formation.

Reference should be made to the engineer's logs contained within **Appendix A** for a more detailed description.

4.2 Groundwater

Groundwater was encountered within WLS3 and WLS4 recorded at 5.2mbgl and 5.4mbgl respectively. Shallow groundwater was encountered at 1.0mbgl within all inspection pits considered to represent a perched water table between the Made Ground and relatively impermeable clays beneath. Furthermore, groundwater levels may vary both seasonally and in the long term.

4.3 Field Evidence of Contamination

A suspected fragment of asbestos was noted in proximity to the inspection pit of WLS5/DP5.

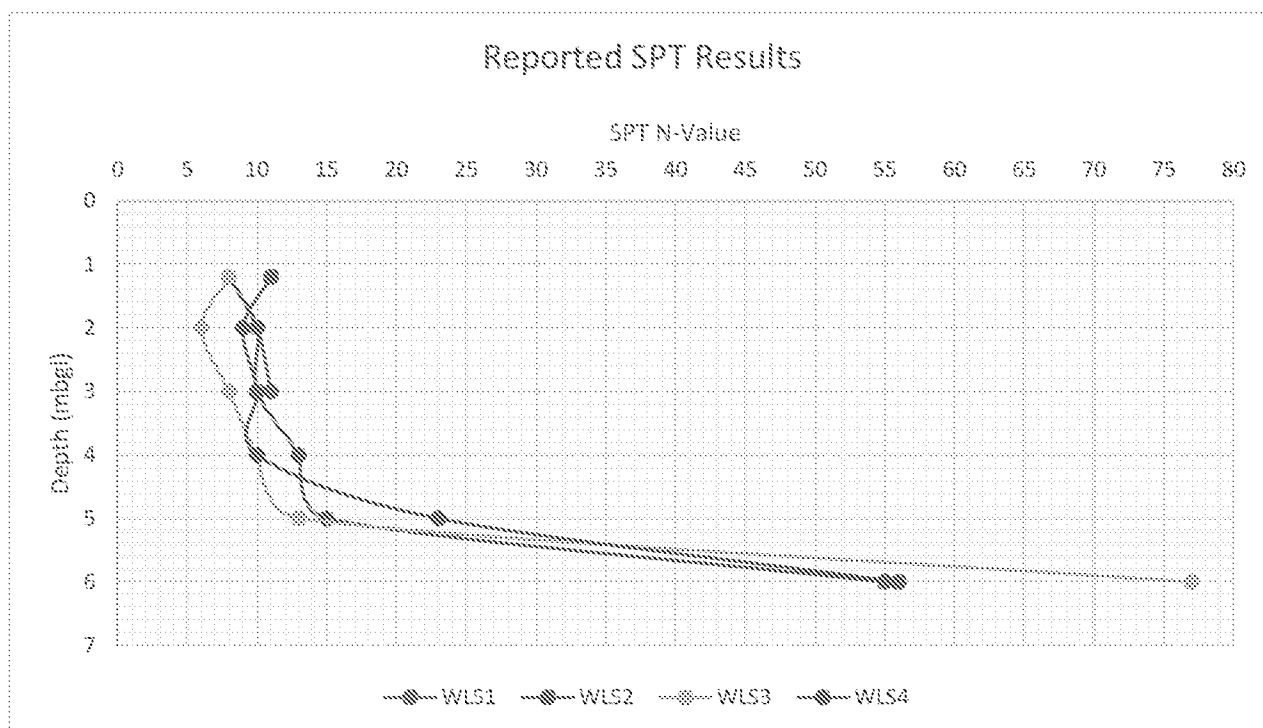
5.0 In situ Testing

5.1 Standard Penetration Testing

Standard penetration testing (SPT) was completed throughout the drilling of WLS1 to WLS4 at 1m centres.

This form of testing is completed using a 63.5kg drop hammer weight, over a 750mm drop, measuring the blow counts for six, 75mm increments. The first two values are recorded as seating blows, with the remaining four values, added together to provide an 'N-value'.

The results of the SPT testing are presented in the graph below:



Four (4no) tests were carried out within the slightly sandy slightly gravelly Clay soils returning a range of N-values of N=6 to N=11.

Within the underlying Raised Beach Deposits, SPT N-values show a range between N=9 and N=10.

Within the London Clay Formation, SPT N-values show initial values in the order of N=8-11 with a gradual increase in N-value between 2mbgl and 5mbgl to N-values between N=13 and N=23. Using the relationship described by Stroud & Butler and a moderately conservative F1 value of 4.5 these values correspond to a range of undrained shear strength of between 36kN/m² to 103.5kN/m².

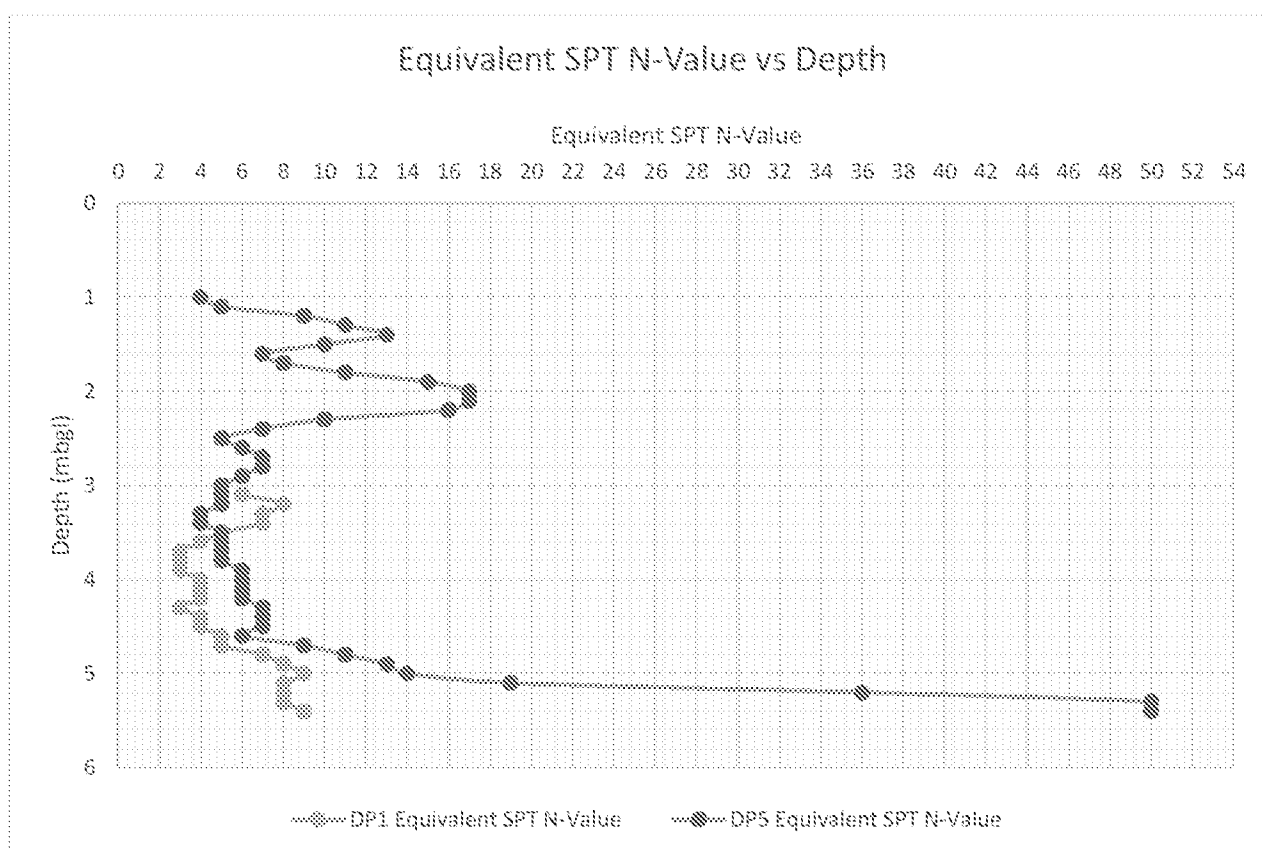
Within the underlying Bognor Sand Member, SPT N-values show a sharp increase to refusal at 6mbgl. The SPT tests carried out at 6.0mbgl in WLS2 & WLS3 returned extrapolated SPT-N values of N=55 and N=77 respectively both of which are regarded as refusals.

5.2 Dynamic Probe Testing

Two super heavy dynamic probe tests (DPSH-B) were complete during the field works. The first test was complete through the base of WLS1 from 3mbgl to 6mbgl. The second test was complete in replace of WLS5 from 1mbgl to 6mbgl.

This form of testing is completed using a 63.5kg drop hammer weight, over a 760mm drop, measuring the blow counts across 100mm increments. Due to the same parameters as an SPT the values are recorded and can be added together over 300mm to provide an equivalent 'N-value'.

The graphs below summarise the equivalent SPT N-value results:



DP1 complete through the base of WLS1 from 3mbgl shows a generally increasing equivalent N-value with depth. DP5 complete through the base of the inspection pit shows a consistent weak equivalent SPT N-values to approximately 4.5mbgl then shows a sharp increase toward 6mbgl.

For the uncorrected DPSH-B data and stratigraphic logs, see Appendix B.

6.0 Geotechnical Laboratory Testing

6.1 Natural Moisture Content and Atterberg Limits

Ten (10no) samples of material were submitted for determination of their natural moisture content (NMC) of which eight (8no) samples were further submitted for determination of their plasticity index (PI). These were selected from possible reworked and undisturbed London Clay Fm from WLS1 – WLS4 at depths ranging from 1.3mbgl to 4.8mbgl.

NMC values were found to range between 17.0-30.9%. Atterberg limits testing indicates liquid limit values of 27-63% and plastic limits of 12-23%. Considering the portion of the sample retained upon the 425µm sieve (0%-40%) the modified plasticity index results are 9-42%.

The materials tested indicate a low to high plasticity classification, with a worst case, high volume change potential at WLS3; 3.5 – 3.7mbgl, and WLS2; 4.6 – 4.8mbgl in accordance with NHBC guidance, Chapter 4.2 'Building near Trees'.

For full laboratory test results please see **Appendix C**.

6.2 Particle Size Distribution (PSD) Testing

Two (2no) samples of material were submitted for PSD testing using the wet sieve method.

Results are summarised in the table below and can be found in full in **Appendix E**.

Sample Location	Depth (mbgl)	Cobbles (%)	Gravels (%)	Sands (%)	Fines (%)
WLS1	2.4-2.6	0.0	27.8	32.4	39.8
WLS4	2.4-2.6	0.0	4.9	87.4	7.7

For full laboratory test results please see **Appendix C**.

6.3 Sulphate And pH Analysis

Five (5no) samples were submitted for a determination of pH and water-soluble sulphate concentration.

Water soluble sulphate concentrations within the natural soils were found to range between 13mg/l to 155mg/l, with pH values of between 7.8 and 8.1.

For full laboratory test results can be found in full in **Appendix C**.

7.0 Geotechnical Discussion

7.1 Soil Engineering Properties

It is understood that the proposed development is the construction of a series of new two-storey residential properties. The exact proposed loadings of the new buildings are not known; however, they are expected to be low to moderate on the basis of the anticipated nature of the development.

Two tests were carried out within the Raised Beach Deposits returning a range of SPT N values of N=9 and N=10.

Ten tests were carried out within the London Clay Formation returning a range of SPT N values between N=8 to N=23.

Two tests were carried out within the Bognor Sand Member returning refusals with extrapolated SPT N-values of N=55 and N=77 suggesting very dense materials.

The two dynamic probe (DPSH-B) tests (DP1 & DP5) correlate well with the SPT results above proving a significantly more resistant soil from approximately 5.5mbgl.

Laboratory testing has indicated that the cohesive soils are of worst case High volume change potential.

7.2 Shallow Foundations

Any foundations formed within Made Ground soils would be expected to be subject to total and differential settlement beyond tolerable limits. These soils are frequently present in a variable and inconsistent nature such that would render them unsuitable as a founding strata.

The soils of the Raised Beach Deposits are noted to be both laterally and vertically variable across the site, which in conjunction to the low SPT-N results suggest that any foundations formed upon these materials would be expected to be subject to total and differential settlement beyond tolerable limits, and as such CE would regard these materials as unsuitable as a founding stratum.

7.3 Deep Foundations

Deep foundation methods may prove more suitable to mitigate settlement beyond tolerable limits. Utilising a bored piling technique into the clayey Sand of the Bognor Sand Member to at least 6.0mbgl, an ultimate bearing capacity of up to 150kN is likely achievable.

It should be noted that the thickness of the Bognor Sand Formation remains unproven and as such it is advised that if a deep foundation option is chosen that further investigation works would be recommended to at least 1.5 times the proposed founding level of the piles and a specialist piling contractor is consulted prior to any further works.

A specialist structural engineer should be consulted for final foundation designs.

7.4 Floor Slab

The floor slab design will depend on the final foundation designs and is dependent on the underlying materials, including bearing capacity and the presence of any cohesive or Made Ground Soils.

Owing to the presence of worst case High shrinkage potential soils it is recommended that a fully suspended floor slab is adopted for the new development.

7.5 Excavations and Groundwater

Due to the potentially granular nature of the Raised Beach Deposits encountered during the site investigation, it is recommended that adequate trench support is provided in order to satisfy statutory safety regulations during any excavation works on site.

Groundwater was encountered within the upper soil profile during the site investigation and therefore dewatering is likely to be required in any excavations. Groundwater levels are dependent upon seasonal variations and levels may change after periods of heavy rainfall or prolonged drought. Where groundwater or surface water is encountered within any excavations during the construction phase it should be dealt with appropriately and removed using good engineering practices.

7.6 Concrete in Aggressive Ground

The results of laboratory testing have indicated that a design class of DS-1 and subclass of AC-1s will be suitable for buried concrete on this site. This is in response to a maximum water-soluble sulphate concentration of 155mg/l and a minimum pH value of 7.9.

7.7 Further Investigation

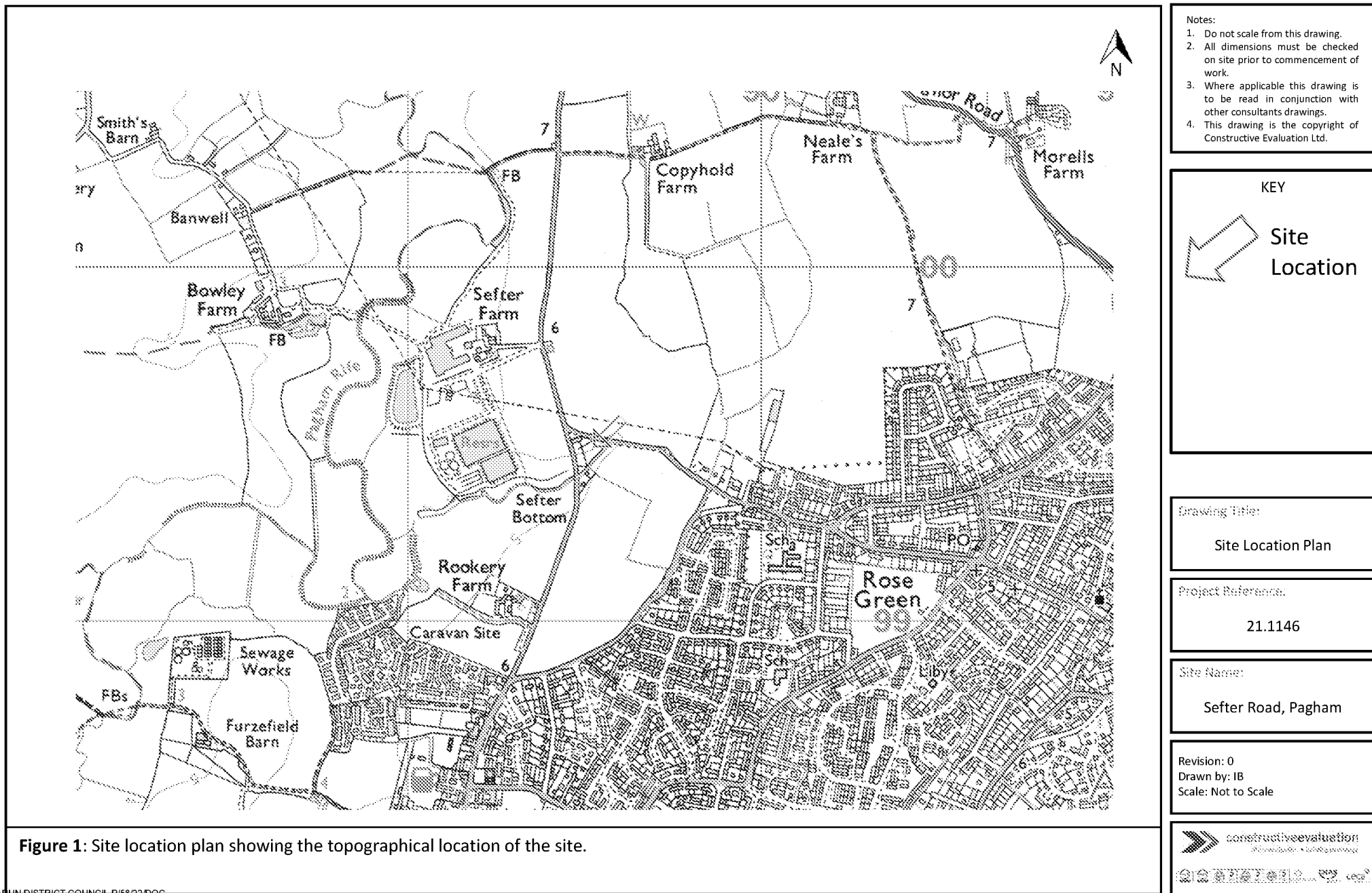
The low strength and variable nature of the shallow raised beach deposits suggests that a shallow foundation may not be suitable at this site. CE would suggest that a deep piled foundation design be considered and that some further investigation works may be required.

CE would recommend that at least one 10-12mbgl borehole be carried out using cable percussive or rotary techniques with the aim of providing additional soil parameters for pile design and proving the thickness and extent of the Bognor Sand Formation.

CE would also recommend that this borehole be installed with a groundwater and gas monitoring standpipe, with water levels monitored over the winter period to understand peak / high groundwater levels at the site.

Figure 1 – Site Location Plan

Figure 2 – Site Investigation Plan





- Notes:
1. Do not scale from this drawing.
 2. All dimensions must be checked on site prior to commencement of work.
 3. Where applicable this drawing is to be read in conjunction with other consultants drawings.
 4. This drawing is the copyright of Constructive Evaluation Ltd.

KEY

 **WLS**

 **DP**

Drawing Title:

Site Investigation Plan

Project Reference:

21.1146

Site Name:

Sefter Road, Pagham

Revision: 0
 Drawn by: IB
 Scale: Not to Scale

 **constructiveevaluation**
Drainage • Surveying • Landscaping



Figure 2: Site investigation plan showing the final positions of the intrusive works completed.

APPENDICES

Appendix A – Site Investigation Photographs

Appendix B – Stratigraphic Logs

Appendix C – Geotechnical Laboratory Testing

Appendix D – Report Terms and Conditions

APPENDIX A

Site Investigation Photographs

Investigation Photographs

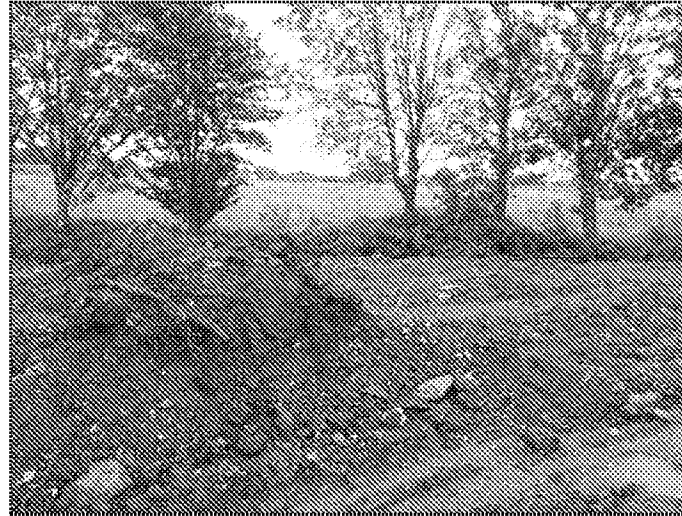
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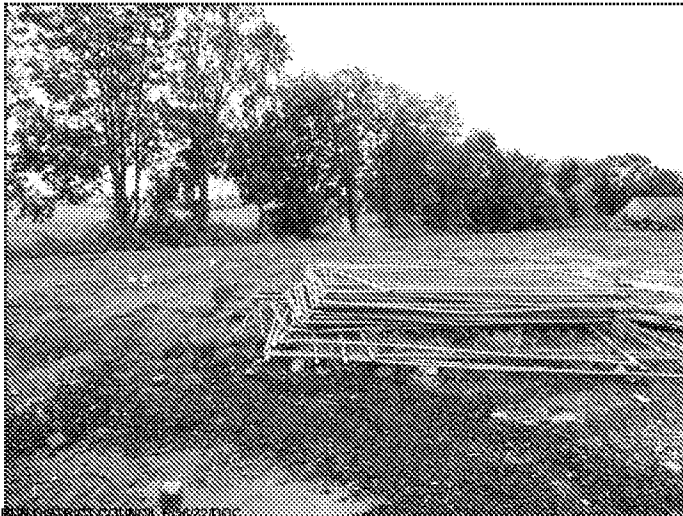
1.



2.



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- 1) Northeast section of site,
- 2) Southeast section of site,
- 3) Site extent, facing south,
- 4) Site extent, facing southwest.

Investigation Photographs

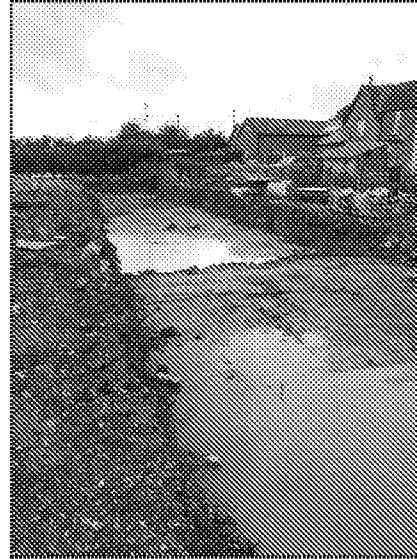
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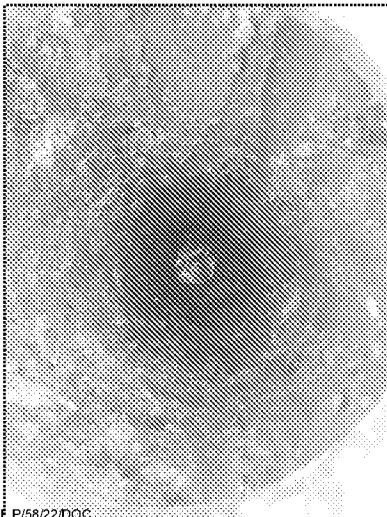
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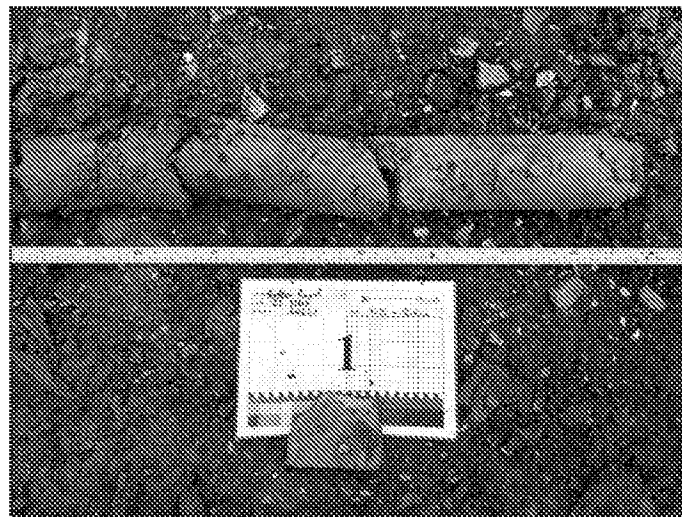
6.



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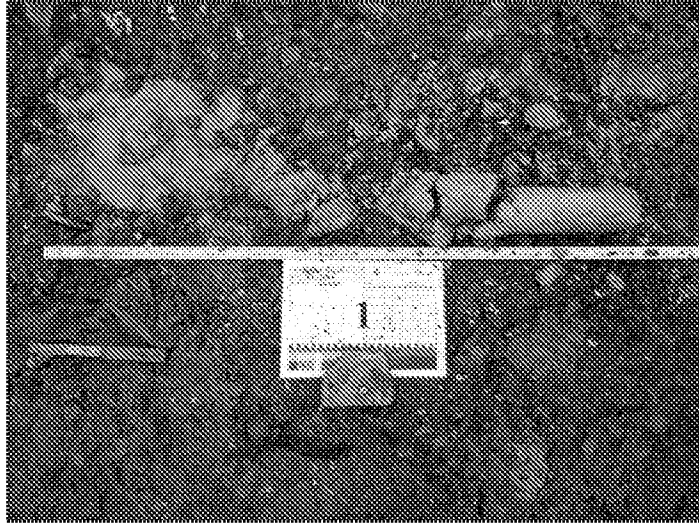
- 5) Northwest extent of site,
- 6) Large stepped excavation trench, facing west,
- 7) WLS1 Pit 0.0-1.2mbgl,
- 8) WLS1 1.2-2.0mbgl.

Investigation Photographs

Project Ref: 21.1146

Site Name: Sefter Road, Pagham

9.



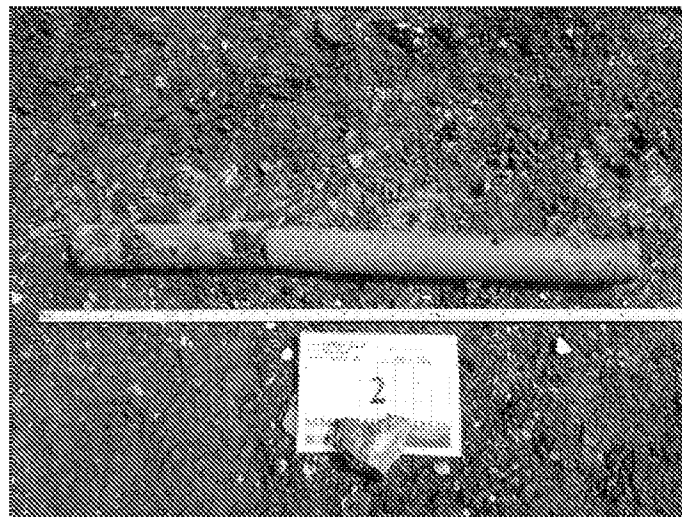
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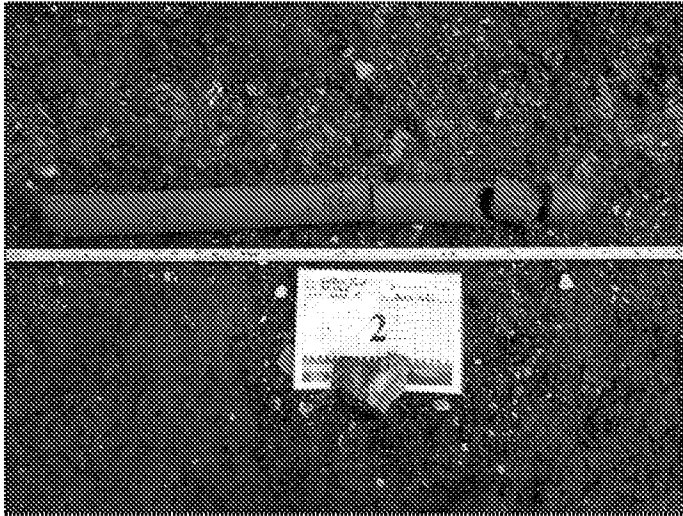
- 9) WLS1 2.0-3.0mbgl,
- 10) WLS2 Pit 0.0-1.2mbgl,
- 11) WLS2 1.2-2.0mbgl,
- 12) WLS2 2.0-3.0mbgl.

Investigation Photographs

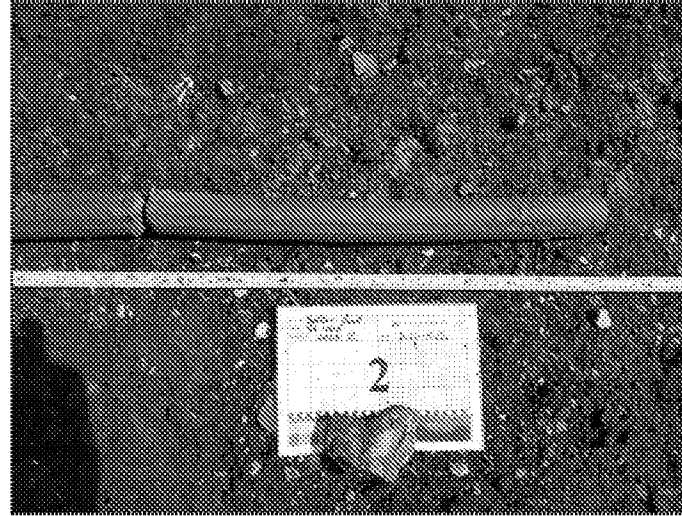
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Site Name: Sefter Road, Pagham

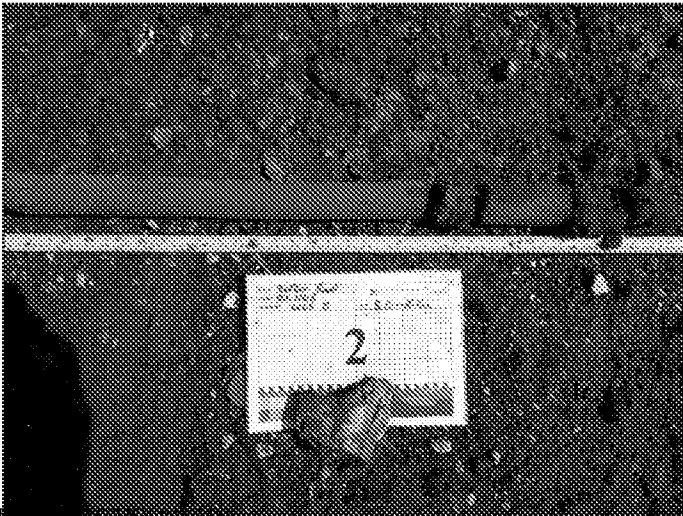
13.



14.



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- 13) WLS2 3.0-4.0mbgl,
- 14) WLS2 4.0-5.0mbgl,
- 15) WLS2 5.0-6.0mbgl,
- 16) WLS3 1.2-2.0mbgl,

Investigation Photographs

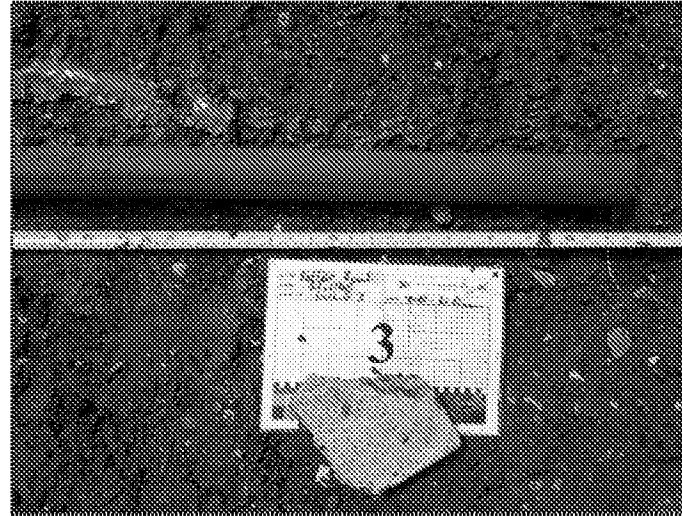
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Site Name: Sefter Road, Pagham

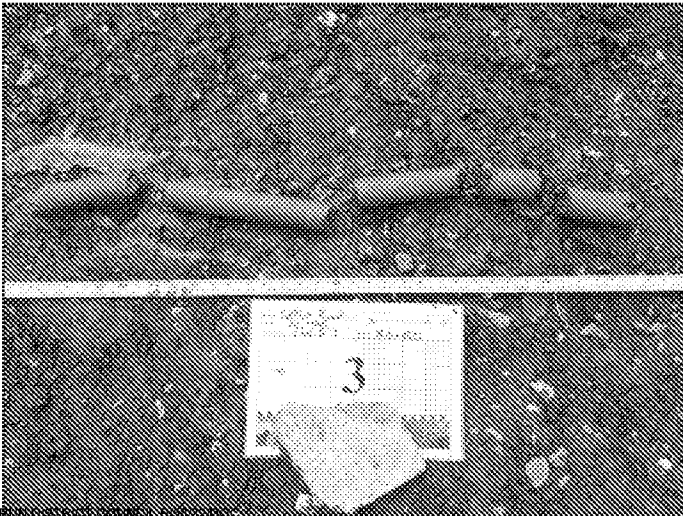
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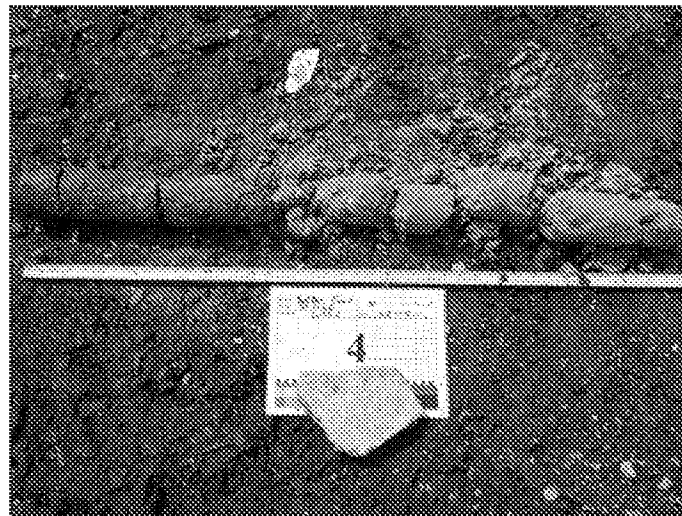
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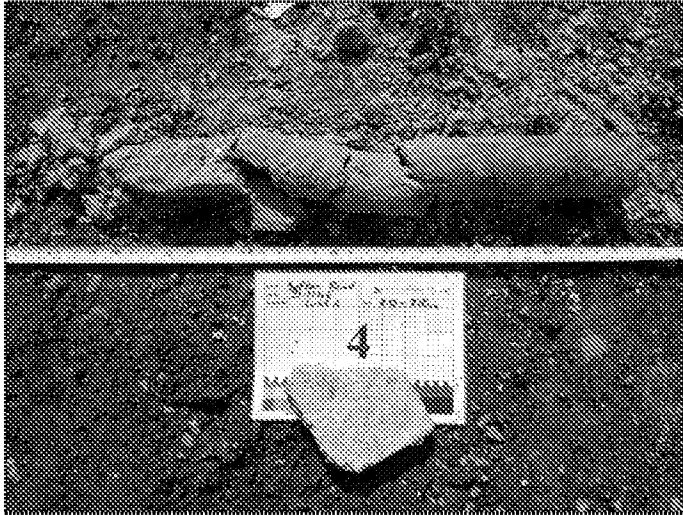
- 17) WLS3 2.0-3.0mbgl,
- 18) WLS3 3.0-4.0mbgl,
- 19) WLS3 5.0-6.0mbgl,
- 20) WLS4 1.2-2.0mbgl.

Investigation Photographs

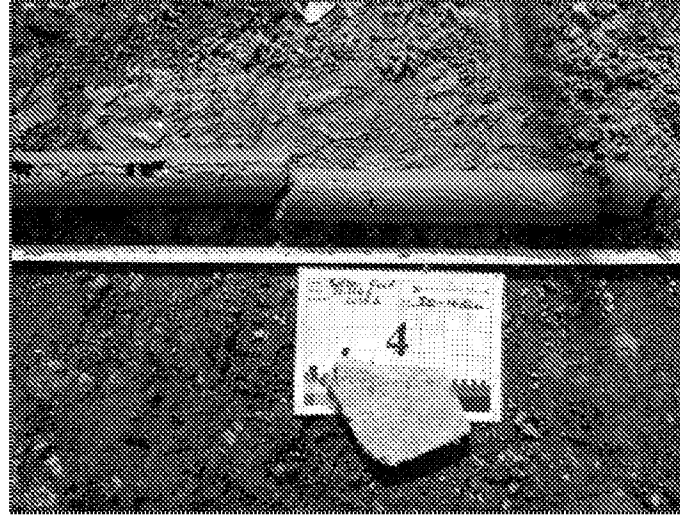
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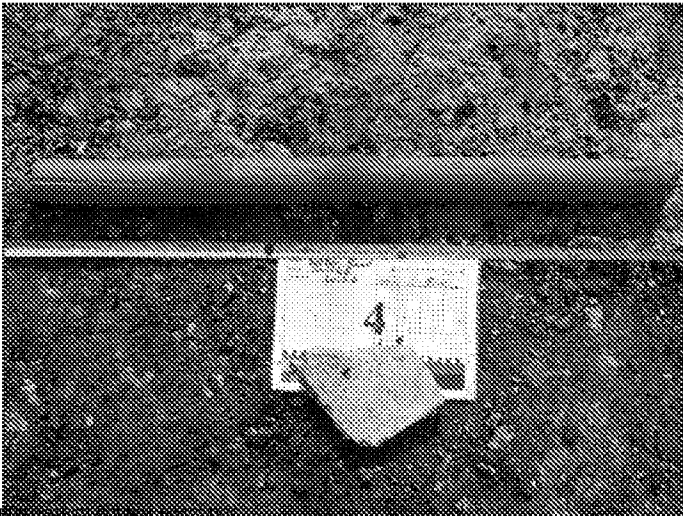
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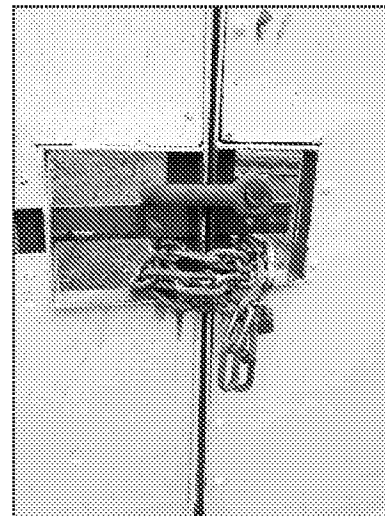
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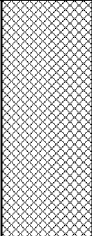
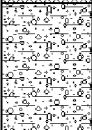
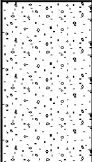
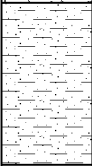


- 21) WLS4 2.0-3.0mbgl,
- 22) WLS4 3.0-4.0mbgl,
- 23) WLS4 4.0-5.0mbgl,
- 24) Site gate post works.

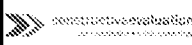
APPENDIX B

Stratigraphic Logs

 constructiveevaluation site investigation • building pathology				Borehole Log				Borehole No. WLS1 Sheet 1 of 1	
Project Name: Sefter Road				Project No. 21.1146		Co-ords: 489516E - 99462N		Hole Type WLS	
Location: Pagham						Level:		Scale 1:36	
Client: David Stone						Dates: 09/08/2021		Logged By IB	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		1.20	SPT	N=8 (1,2/2,2,2,2)	1.10		 Greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular and sub-angular fine to coarse of red brick concrete glass flint tile and plastic. Low cobble content of angular red brick and concrete. (MADE GROUND)	1	
		1.30 - 1.50							
		1.80 - 1.90	D		1.70		 Firm brown mottled grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of flint.	2	
		2.00	SPT	N=10 (1,3/2,3,2,3)	1.95		 Firm brown mottled grey CLAY.		
		2.40 - 2.60	D		2.70		 Loose brown gravelly SAND. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of flint. (RAISED BEACH DEPOSITS)		
		2.70 - 2.90	D				<i>Becoming progressively more silty/clayey with depth.</i>		
		3.00	SPT	N=11 (1,3/2,3,3,3)			 Stiff dark grey mottled brown slightly sandy CLAY. Sand is fine to coarse. (LONDON CLAY FORMATION)		3
				3.45		End of Borehole at 3.450m	4		
							5		
							6		
							7		

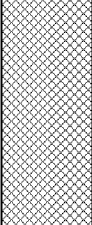
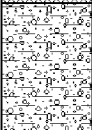
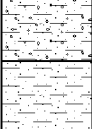
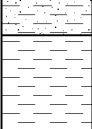
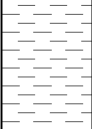
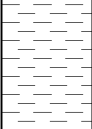
Remarks 1. Location scanned using CAT and Genny prior to breaking ground and every 0.3m to 1.2mbgl. 2. Position ceased after 3m due to collapse of borehole. 3. DPSH-B testing was complete through the base of the borehole from 3mbgl to 6mbgl.		
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		Probe Log		Borehole No. DP1 Sheet 1 of 1	
Project Name: Sefter Road		Project No. 21.1146	Co-ords: 489516.00 - 99462.00		Hole Type DP
Location: Pagham			Level:		Scale 1:30
Client: David Stone			Dates: 09/08/2021 -		Logged By

Depth (m)	Blows/100mm					Torque (Nm)
	10	20	30	40		
1						
2						
3						
4						
5						
6						

Remarks 1. Location scanned using CAT and Genny prior to breaking ground and every 0.3m to 1.2mbgl. 2. Testing was complete through the base of WLS1 starting from 3mbgl to 6mbgl.	Fall Height 760 Hammer Wt 64 Probe Type DPSH-B	Cone Base Diameter 55 Final Depth 6.00 Log Scale 1:30	
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 constructiveevaluation site investigation • building pathology				Borehole Log				Borehole No. WLS2 Sheet 1 of 1	
Project Name: Sefter Road				Project No. 21.1146		Co-ords: 489521E - 99476N		Hole Type WLS	
Location: Pagham						Level:		Scale 1:36	
Client: David Stone						Dates: 09/08/2021		Logged By IB	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		1.20	SPT	N=8 (1,2/2,2,2,2)	1.10			Dark greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of red brick concrete metal plastic glass and flint. Low cobble content of angular red brick and concrete. (MADE GROUND)	1		
		1.30 - 1.50			D						
		1.80 - 2.00	D		1.70				Soft greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of flint.		
		2.00	SPT	N=10 (1,1/2,2,3,3)	2.00						
		2.20 - 2.40	D						Firm red mottled brown and grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded fine and medium of flint.	2	
					2.50				Stiff grey mottled brown slightly sandy CLAY. Sand is fine to coarse. (LONDON CLAY FORMATION)		
		2.70 - 2.90	D								
		3.00	SPT	N=10 (1,1/2,2,3,3)					Stiff fissured dark grey CLAY. Fissures are randomly orientated extremely closely spaced planar smooth with low polish. (LONDON CLAY FORMATION)	3	
		3.60 - 3.70	D							Stiff dark grey sandy CLAY. Sand is fine to coarse. (BOGNOR SAND MEMBER)	4
		4.00	SPT	N=13 (1,4/3,3,4,3)							
4.60 - 4.80	D										
5.00	SPT	N=15 (1,4/4,4,3,4)						5			
5.60 - 5.90	D										
6.00	SPT	55 (8,10/55 for 225mm)						6			
					6.45						
							End of Borehole at 6.450m		7		

Remarks 1. Location scanned using CAT and Genny prior to breaking ground and every 0.3m to 1.2mbgl. 2. Borehole was cased from ground level to 2mbgl.		
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 constructiveevaluation site investigation • building pathology				Borehole Log				Borehole No. WLS3 Sheet 1 of 1	
Project Name: Sefter Road				Project No. 21.1146		Co-ords: 489534E - 99480N		Hole Type WLS	
Location: Pagham						Level:		Scale 1:36	
Client: David Stone						Dates: 09/08/2021		Logged By IB	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
							Dark greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of red brick concrete metal plastic glass and flint. Low cobble content of angular red brick and concrete. (MADE GROUND)		
	1.20	SPT	N=8 (2,3/2,2,2,2)	1.00			NO RECOVERY	1	
	1.80 - 2.00	D		1.80					
	2.00	SPT	N=6 (1,2/1,1,2,2)				Soft greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of flint.	2	
	2.30 - 2.50	D		2.40					
	2.70 - 2.90	D		2.80			Firm brown mottled grey CLAY. (LONDON CLAY FORMATION)		
	3.00	SPT	N=8 (1,2/2,2,2,2)				Stiff fissured dark grey CLAY. Fissures are randomly orientated extremely closely spaced planar smooth with low polish. (LONDON CLAY FORMATION)	3	
	3.50 - 3.70	D							
	4.00	SPT	N=10 (1,2/2,2,3,3)					4	
	4.60 - 4.70	D							
	5.00	SPT	N=13 (1,3/4,3,3,3)	5.20				5	
	5.60 - 5.80	D					Stiff dark grey sandy CLAY. Sand is fine to coarse. (BOGNOR SAND MEMBER)		
6.00	SPT	77 (2,5/77 for 260mm)	6.45				6		
						End of Borehole at 6.450m	7		

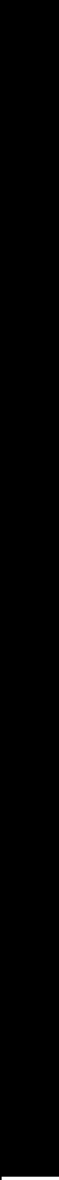
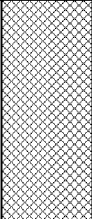
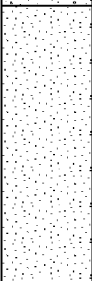
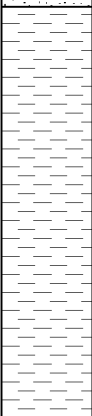
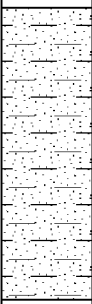
Remarks

1. Location scanned using CAT and Genny prior to breaking ground and every 0.3m to 1.2mbgl.

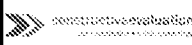
2. Borehole was cased from ground level to 2mbgl.

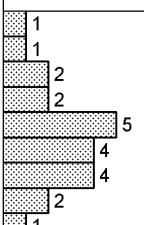
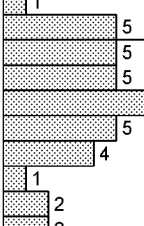
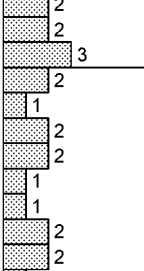
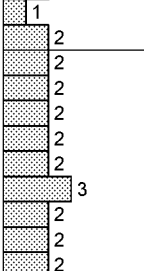
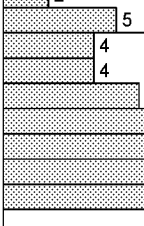


 constructiveevaluation site investigation • building pathology				Borehole Log				Borehole No. WLS4 Sheet 1 of 1	
Project Name: Sefter Road				Project No. 21.1146		Co-ords: 489538E - 99494N		Hole Type WLS	
Location: Pagham				Level:		Scale 1:36			
Client: David Stone				Dates: 09/08/2021		Logged By IB			

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
 							 Greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of red brick concrete metal plastic glass and flint. Low cobble content of angular red brick and concrete. (MADE GROUND)	1	
		1.20	SPT	N=11 (2,3/3,2,3,3)	1.05		 Soft greenish grey mottled brown slightly sandy slightly gravelly glauconitic CLAY. Sand is fine to coarse. Gravel is sub-angular and sub-rounded fine to coarse of flint.		
		1.60 - 1.80	D		1.40		 Loose yellowish brown gravelly SAND. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of flint. (RAISED BEACH DEPOSITS)	2	
		2.00	SPT	N=9 (1,3/2,2,2,3)					
		2.40 - 2.60	D		2.70		 Stiff fissured dark grey CLAY. Fissures are randomly orientated extremely closely spaced planar smooth with low polish. (LONDON CLAY FORMATION)	3	
		3.00	SPT	N=10 (1,2/2,2,3,3)					
		3.60 - 3.70	D						
		4.00	SPT	N=10 (1,1/2,2,3,3)					
		4.50 - 4.70	D				<u>Partitions of dark grey Sand.</u>		
		5.00	SPT	N=23 (1,3/4,5,6,8)	5.10		 Very dense dark grey clayey SAND. Sand is fine to coarse. (BOGNOR SAND MEMBER)	5	
	6.00	SPT	56 (1,5/56 for 225mm)					6	
				6.45			End of Borehole at 6.450m	7	

Remarks 1. Location scanned using CAT and Genny prior to breaking ground and every 0.3m to 1.2mbgl. 2. Borehole was cased from ground level to 3mbgl.		
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		Probe Log		Borehole No. DP5 Sheet 1 of 1	
Project Name: Sefter Road		Project No. 21.1146	Co-ords: 489550.00 - 99497.00		Hole Type DP
Location: Pagham			Level:		Scale 1:30
Client: David Stone			Dates: 09/08/2021 -		Logged By IB

Depth (m)	Blows/100mm					Torque (Nm)	
	10	20	30	40			
1							
2							
3							
4							
5							
6							

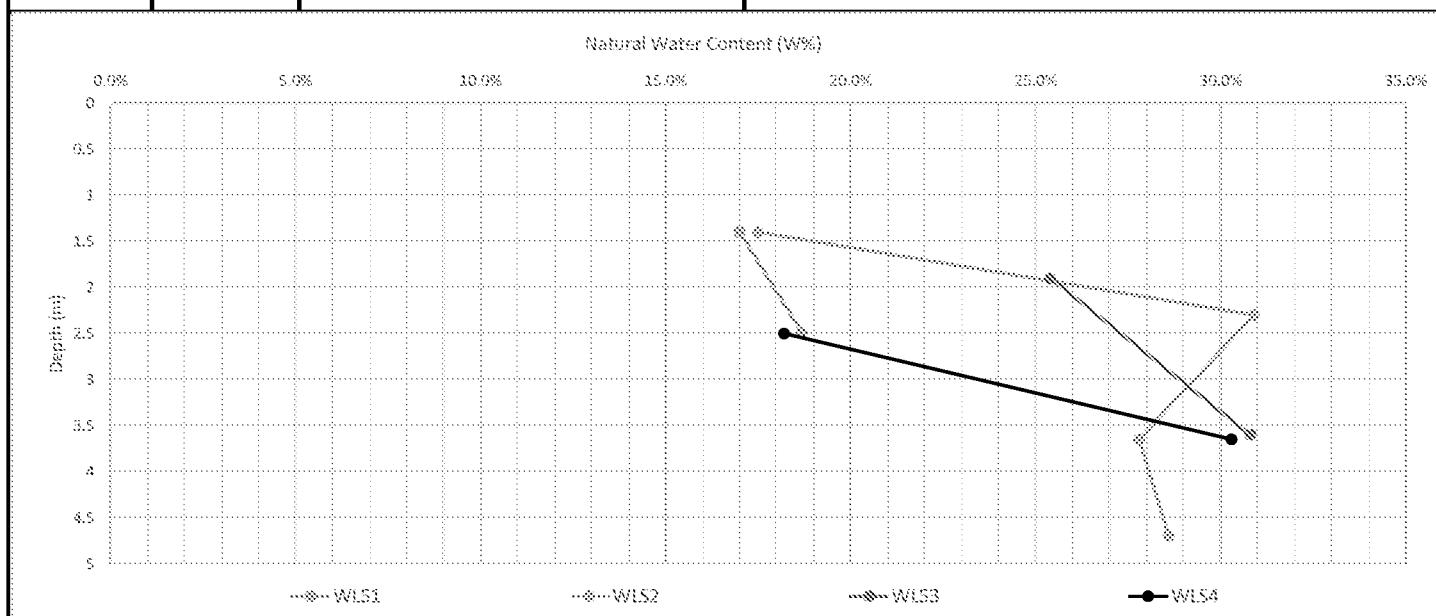
Remarks 1. Location scanned using CAT and Genny prior to breaking ground and every 0.3m to 1mbgl. 2. Position complete through the base of a 1m inspection pit to 5.7mbgl. 3. Position ceased at 5.7mbgl due to refusal.		Fall Height 760 Hammer Wt 64 Probe Type DPSH-B	Cone Base Diameter 55 Final Depth 5.70 Log Scale 1:30
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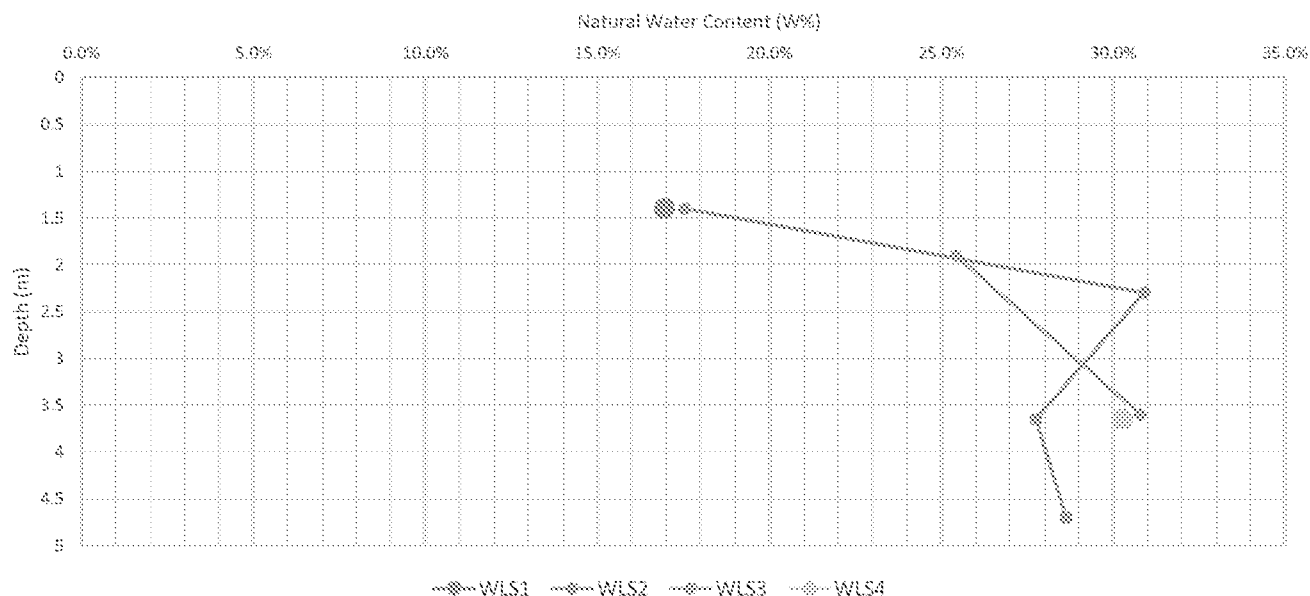
APPENDIX C

Geotechnical Laboratory Testing

Project No	21.1146
Project Name	Sefter Road, Pagham
Client	David Stone

[illegible]

Project No	21.1146
Project Name	Sefter Road, Paghman
Client	David Stone

[illegible]

Constructive Evaluation Ltd
Units 15 & 16 Ford Lane Business Park, Ford
Lane, Arundel,
West Sussex BN18 0UZ
TEL: 01243 533499
E: info@theconstructivegroup.com

Test Procedure(s):

BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method

B.R. (Lab Mngr)

Checked and Approved:

18/08/2021

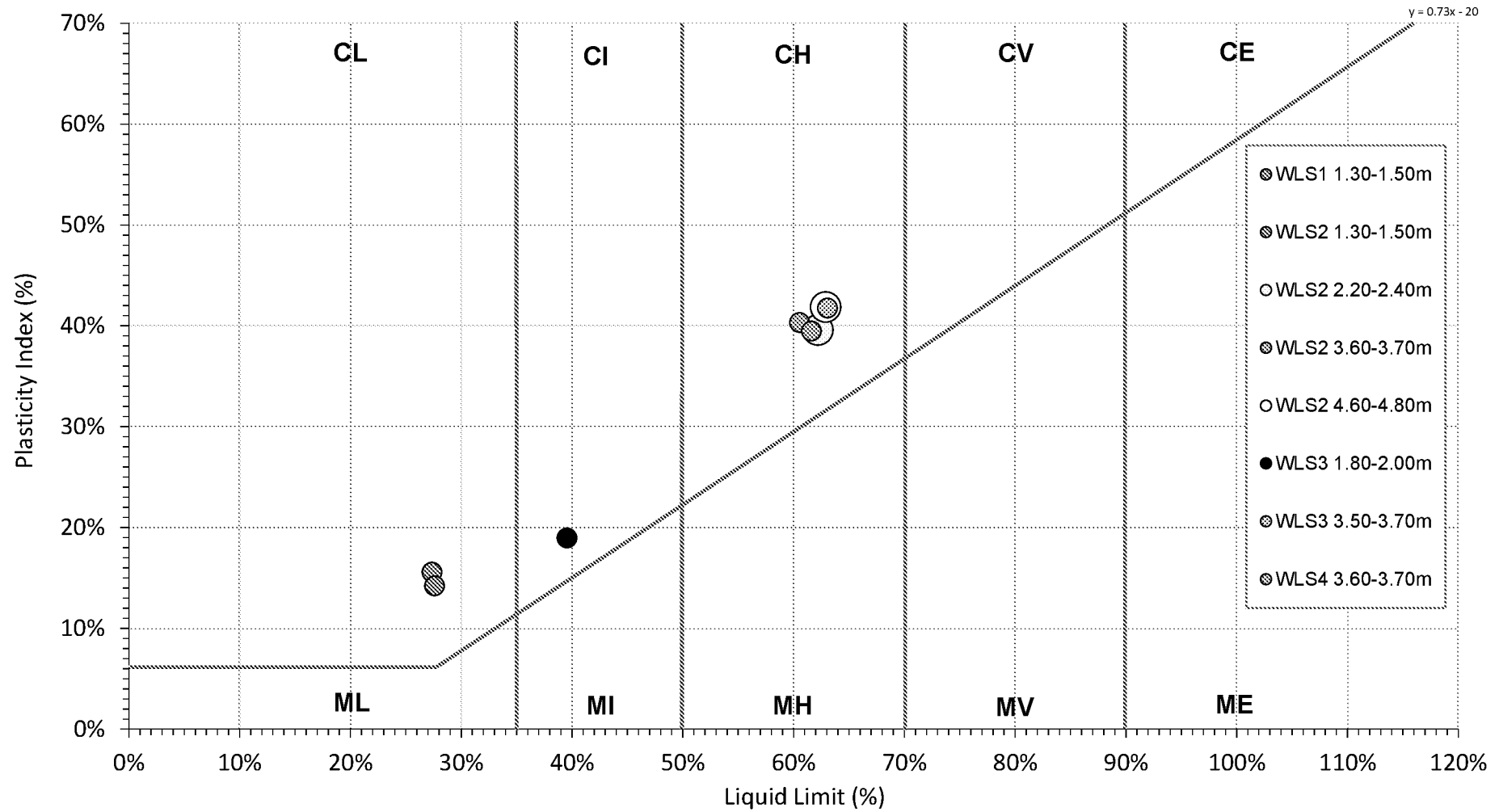


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PLASTICITY CHART FOR SOIL CLASSIFICATION:

21.1146 Sefter Road, Pagham

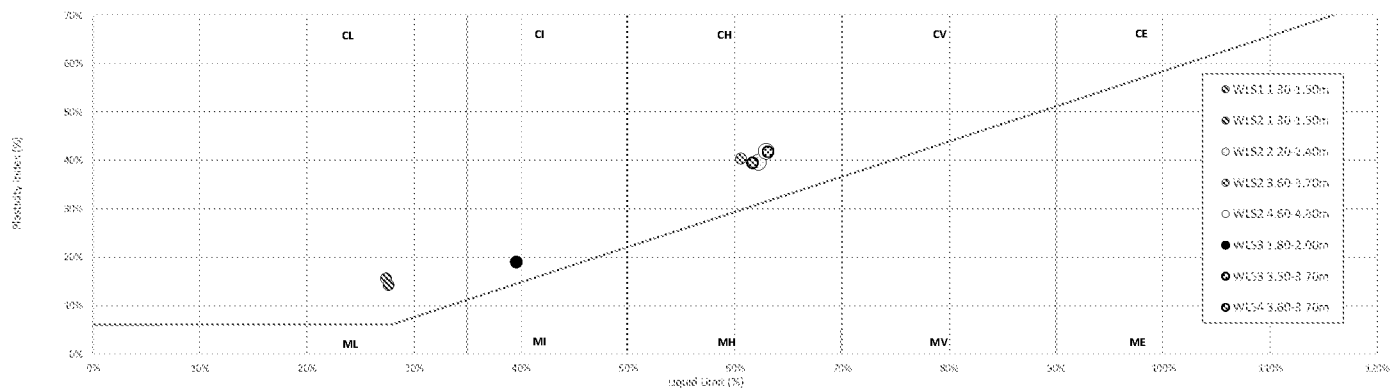


SUMMARY OF RESULTS

21.1146

Sefter Road, Pagham

David Stone

[illegible]

18/08/2021



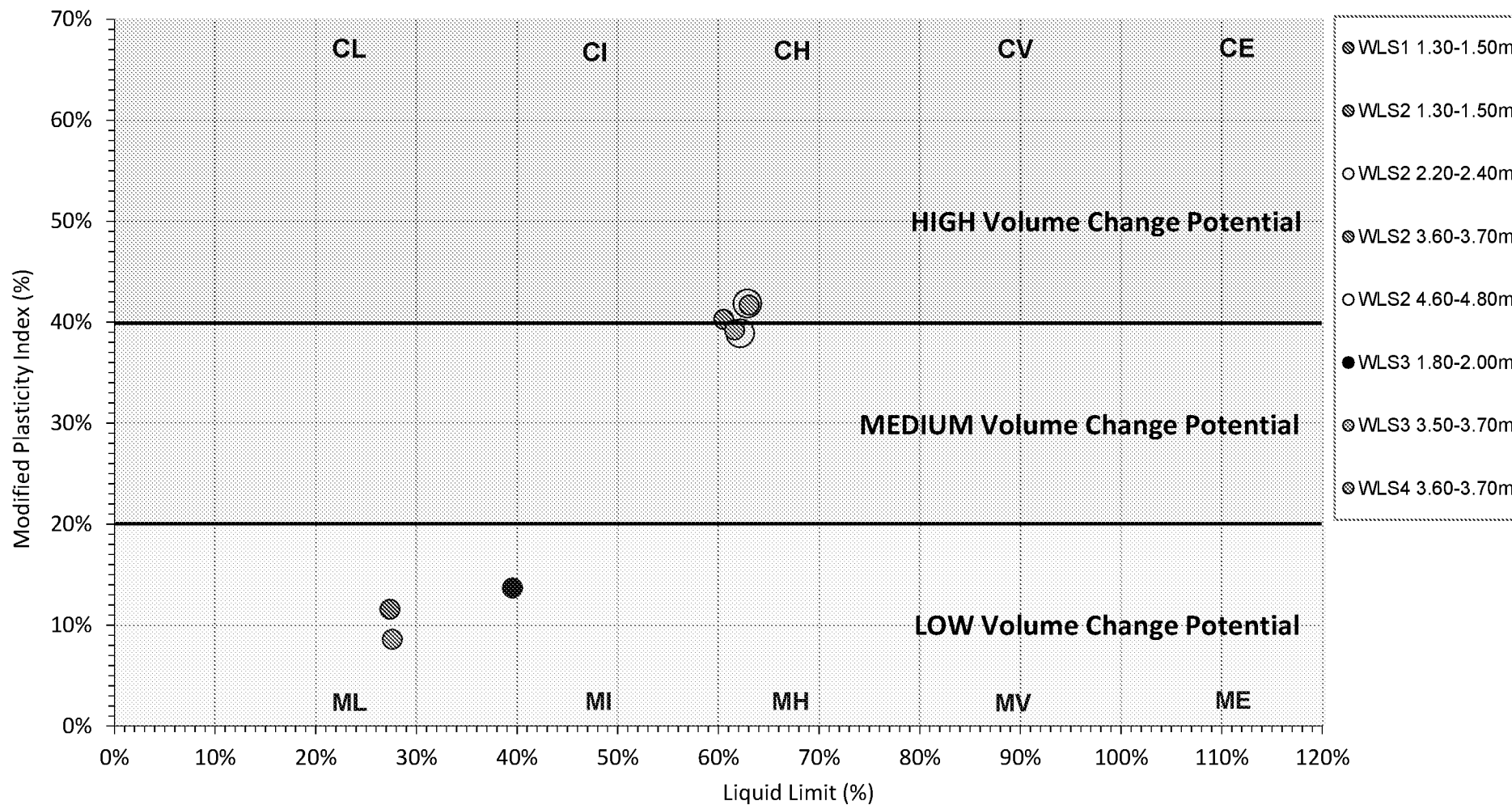
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NHBC Volume Change Potential:

21.1146 Sefter Road, Pagham

$y = 0.73x - 20$





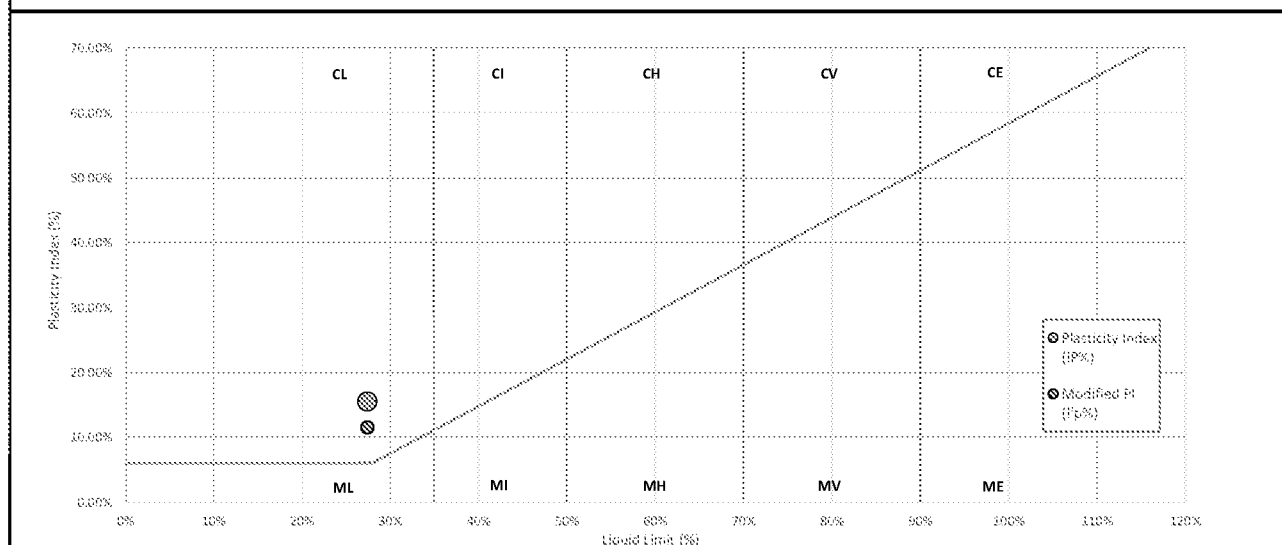
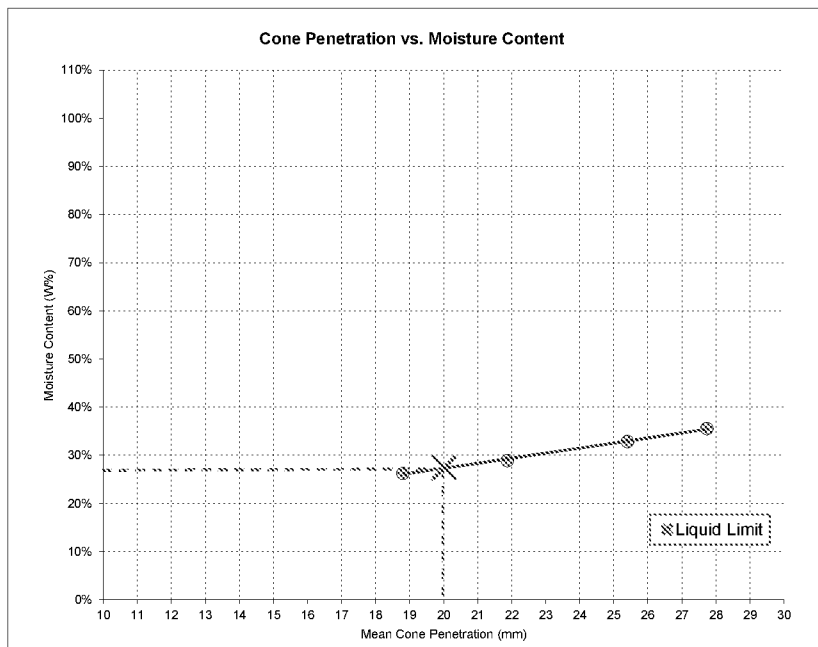
LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

Testing performed in accordance with BS 17892-12: 2018: Clauses 5.3, 5.5, 6.5

Project No	21.1146
Project Name	Sefter Road, Pagham
Client	David Stone

Sample Position & Depth:	WLS1	1.30-1.50m	Test Date:	18/08/2021
Sample Description:	Brown mottled grey slightly sandy slightly gravelly CLAY		Original Dried Mass (g):	1016.60

Natural Moisture Content (W%)	17%
Liquid Limit (WL%)	27%
Plastic Limit (WP%)	12%
Plasticity Index (IP%)	16%
Classification	CL
Portion Retained on 425µm Sieve (%)	26%
Modified Plasticity Index (factoring in the above) (I _p %)	12%
Consistency Index (I _{pc})	0.67
Fall Cone Used:	30°-80 g cone
Remarks	



Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 533499 E: info@theconstructivegroup.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method		
		BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method		
		BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index		
	Checked and Approved:	B.R. (Lab Mngr)		18/08/2021

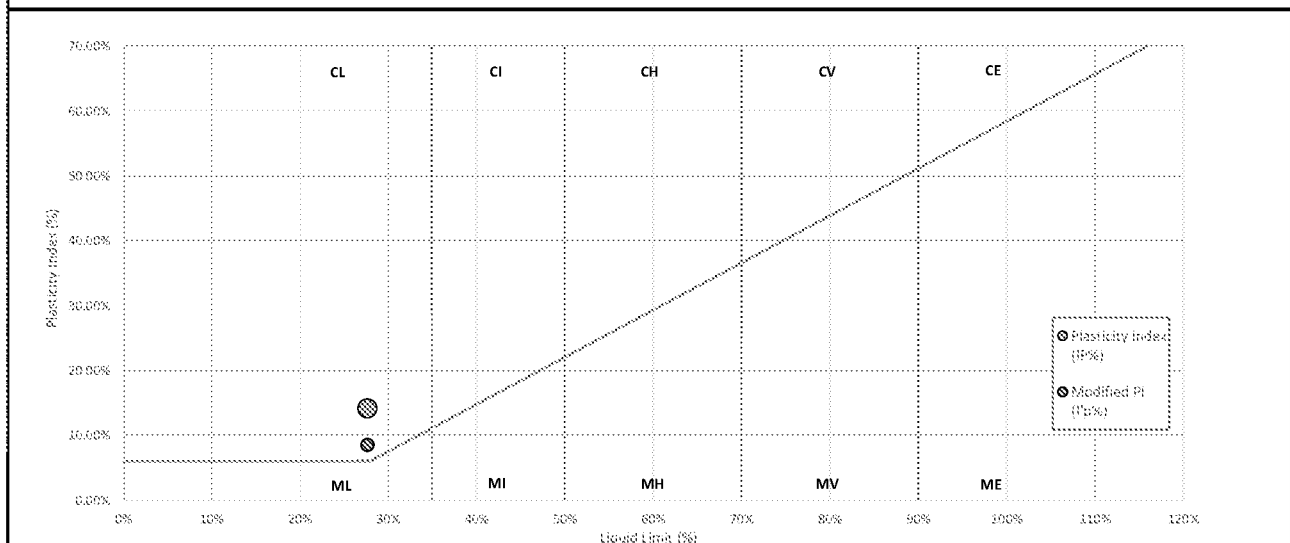
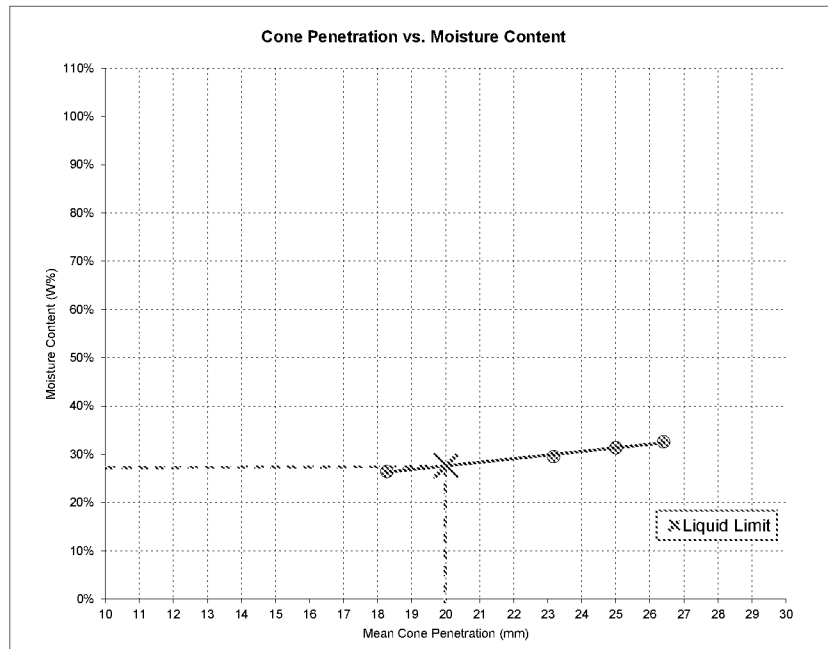


Project No	21.1146
Project Name	Sefter Road, Pagham
Client	David Stone

Sample Position & Depth:	WLS2	1.30-1.50m	Test Date:	18/08/2021
Sample Description:	Greyish brown slightly sandy slightly gravelly CLAY		Original Dried Mass (g):	985.45

Natural Moisture Content (W%)	13%
Liquid Limit (WL%)	28%
Plastic Limit (WP%)	13%
Plasticity Index (IP%)	14%
Classification	CL
Portion Retained on 425µm Sieve (%)	40%
Modified Plasticity Index (factoring in the above) (I _p %)	9%
Consistency Index (I _{pc})	0.71
Fall Cone Used:	30°-80 g cone

Remarks	
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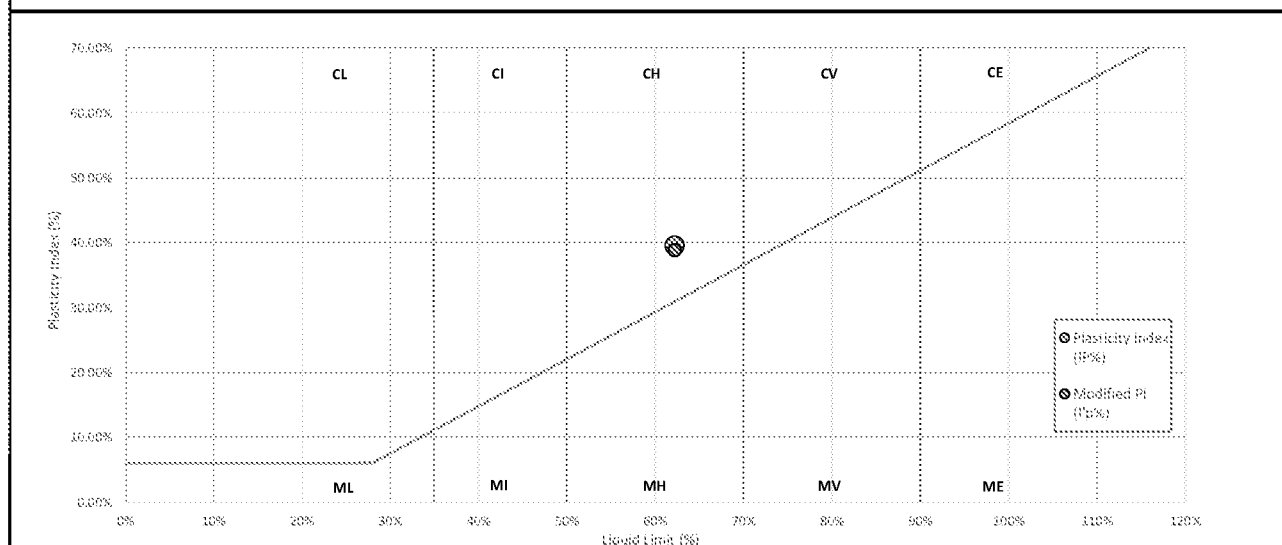
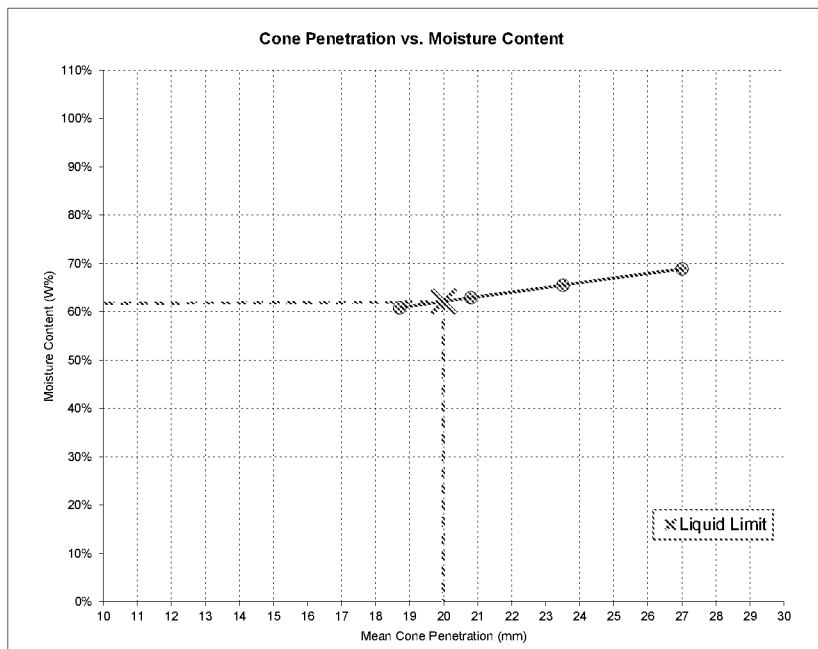
Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 533499 E: info@theconstructivegroup.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method		
		BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method		
		BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index		
	Checked and Approved:	B.R. (Lab Mgr)		18/08/2021



Project No	21.1146
Project Name	Sefter Road, Pagham
Client	David Stone

Sample Position & Depth:	WLS2	2.20-2.40m	Test Date:	18/08/2021
Sample Description:	Grey mottled brown slightly sandy CLAY		Original Dried Mass (g):	638.20

Natural Moisture Content (W%)	31%
Liquid Limit (WL%)	62%
Plastic Limit (WP%)	23%
Plasticity Index (IP%)	40%
Classification	CH
Portion Retained on 425µm Sieve (%)	2%
Modified Plasticity Index (factoring in the above) (I _p %)	39%
Consistency Index (I _{pc})	0.79
Fall Cone Used:	30°-80 g cone
Remarks	



Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 533499 E: info@theconstructivegroup.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method		
		BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method		
		BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index		
Checked and Approved:	B.R. (Lab Mgr)			18/08/2021



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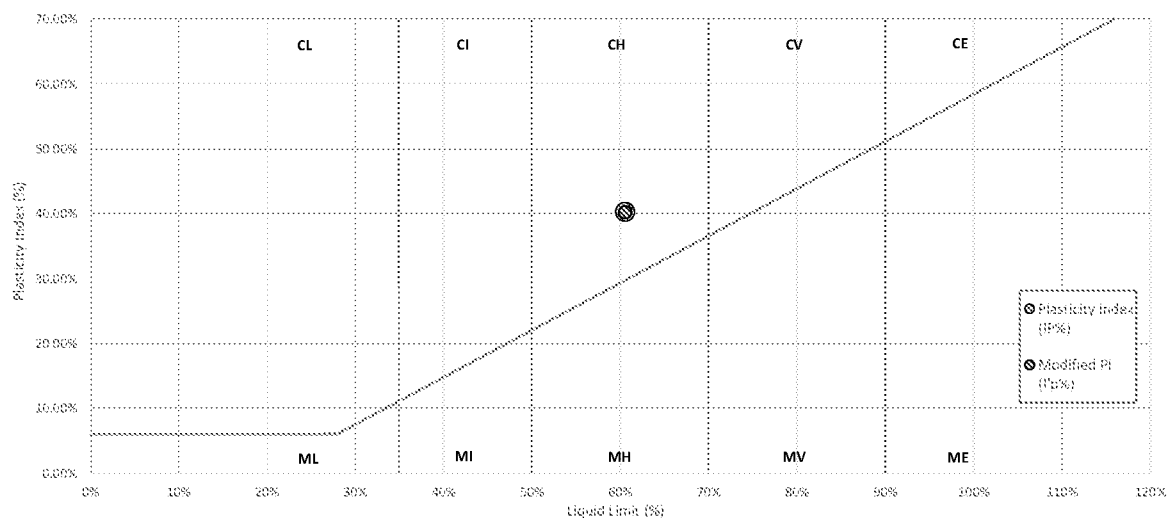
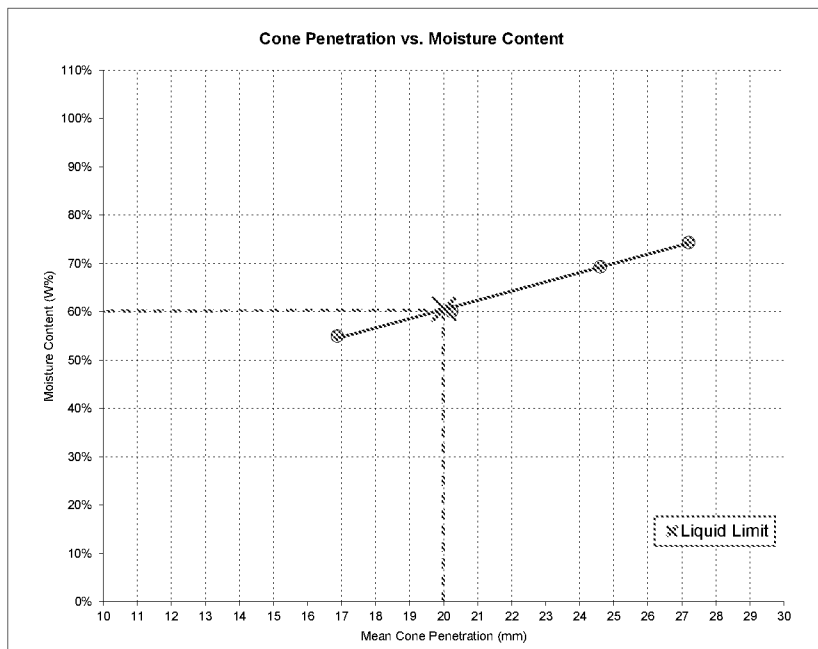
LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

Testing performed in accordance with BS 17892-12: 2018: Clauses 5.3, 5.5, 6.5

Project No	21.1146
Project Name	Sefter Road, Pagham
Client	David Stone

Sample Position & Depth:	WLS2	3.60-3.70m	Test Date:	18/08/2021
Sample Description:	Dark grey CLAY		Original Dried Mass (g):	714.40

Natural Moisture Content (W%)	38%
Liquid Limit (WL%)	61%
Plastic Limit (WP%)	20%
Plasticity Index (IP%)	40%
Classification	CH
Portion Retained on 425µm Sieve (%)	0%
Modified Plasticity Index (factoring in the above) (I _p %)	40%
Consistency Index (I _{pc})	0.81
Fall Cone Used:	30°-80 g cone
Remarks	



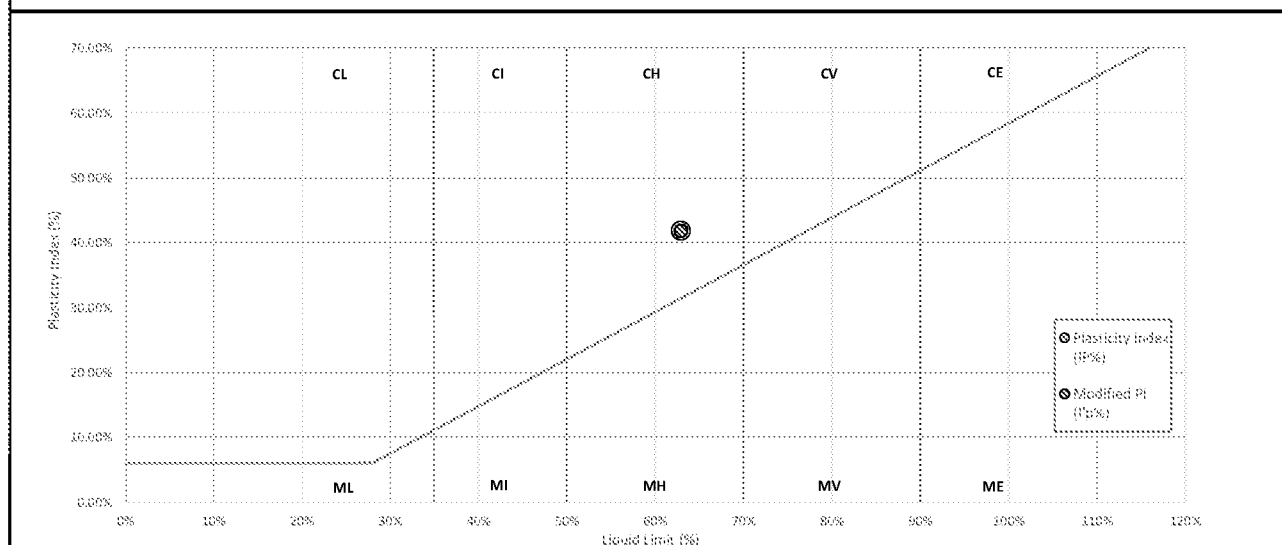
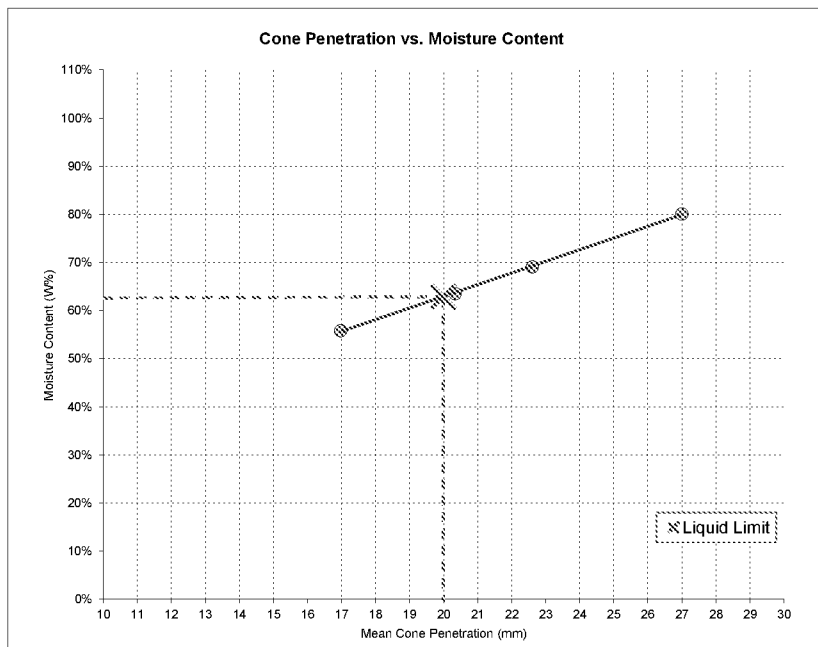
Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 533499 E: info@theconstructivegroup.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method
		BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method
		BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index
Checked and Approved:	B.R. (Lab Mgr)	18/08/2021



Project No	21.1146
Project Name	Sefter Road, Pagham
Client	David Stone

Sample Position & Depth:	WLS2	4.60-4.80m	Test Date:	18/08/2021
Sample Description:	Dark grey CLAY		Original Dried Mass (g):	647.60

Natural Moisture Content (W%)	39%
Liquid Limit (WL%)	63%
Plastic Limit (WP%)	21%
Plasticity Index (IP%)	42%
Classification	CH
Portion Retained on 425µm Sieve (%)	0%
Modified Plasticity Index (factoring in the above) (I _p %)	42%
Consistency Index (I _{pc})	0.82
Fall Cone Used:	30°-80 g cone
Remarks	



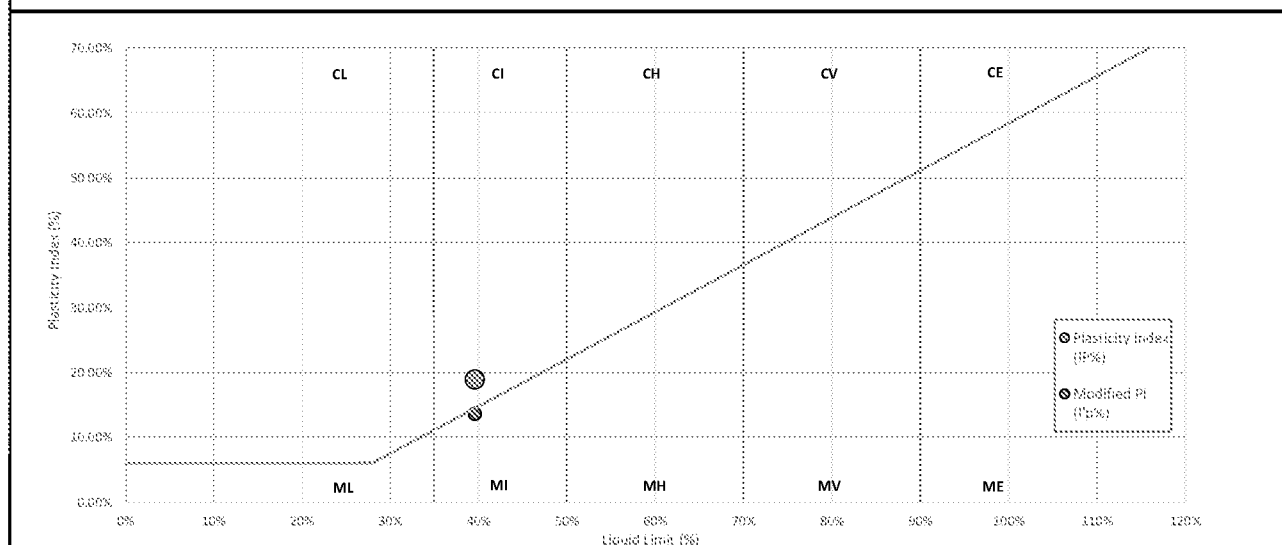
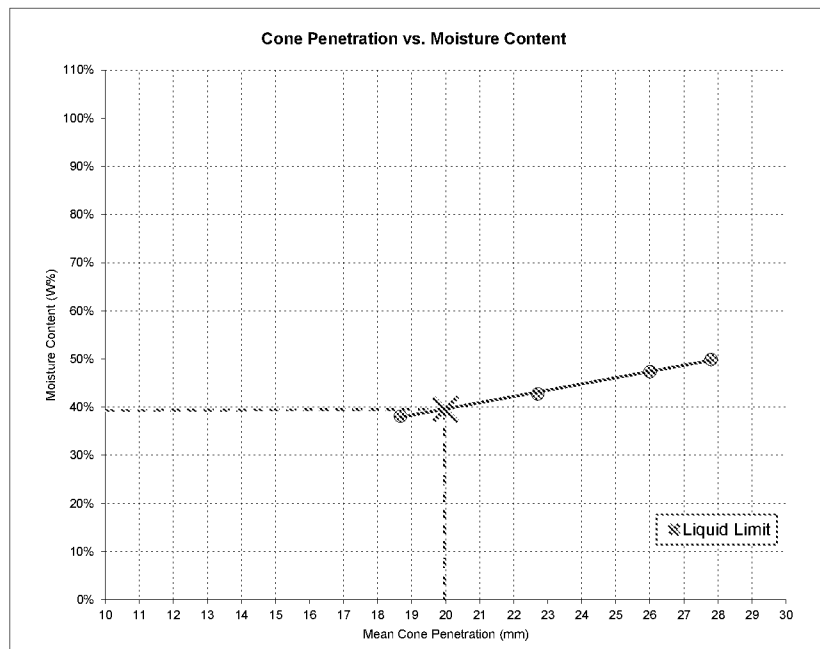
Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 533499 E: info@theconstructivegroup.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method		
		BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method		
		BS17892: Part 12: Clauses 5.5, 5.6 : 2018: Determination of the plastic limit and plasticity index		
	Checked and Approved:	B.R. (Lab Mngr)		18/08/2021



Project No	21.1146
Project Name	Sefter Road, Pagham
Client	David Stone

Sample Position & Depth:	WLS3	1.80-2.00m	Test Date:	18/08/2021
Sample Description:	Greyish brown slightly sandy slightly gravelly CLAY		Original Dried Mass (g):	1002.10

Natural Moisture Content (W%)	35%
Liquid Limit (WL%)	40%
Plastic Limit (WP%)	21%
Plasticity Index (IP%)	19%
Classification	CI/MI
Portion Retained on 425µm Sieve (%)	28%
Modified Plasticity Index (factoring in the above) (I _p %)	14%
Consistency Index (I _{pc})	0.75
Fall Cone Used:	30°-80 g cone
Remarks	



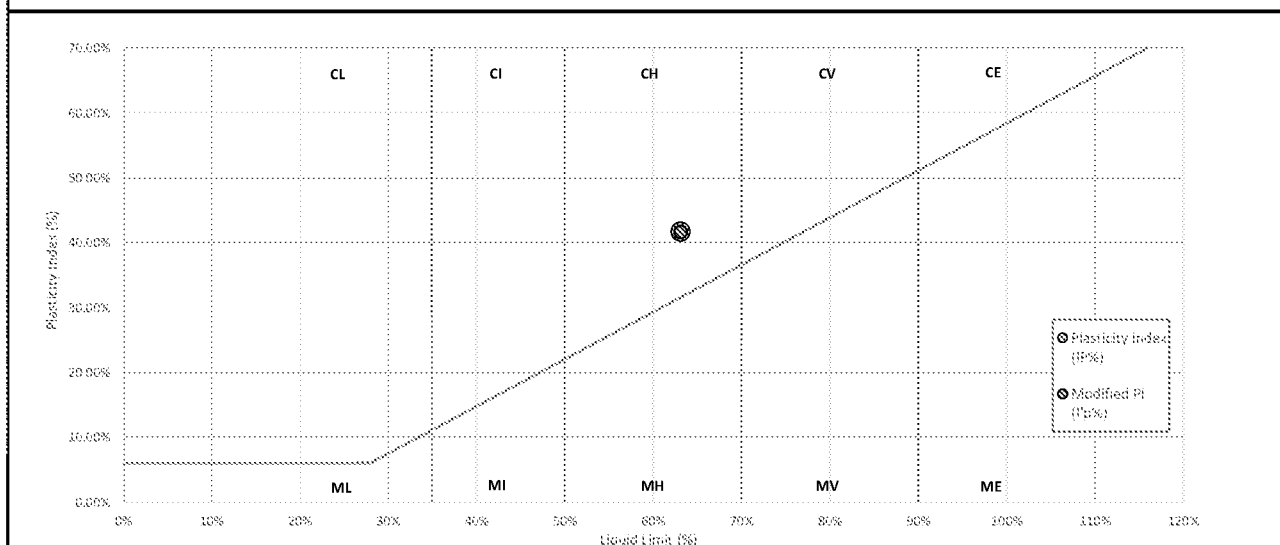
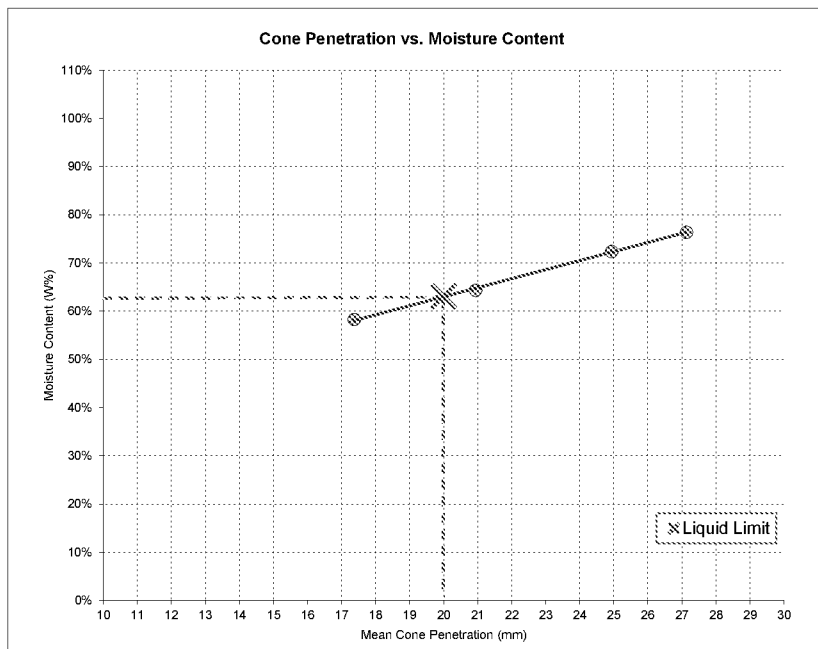
Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 533499 E: info@theconstructivegroup.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method			
		BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method			
		BS17892: Part 12: Clauses 5.5 & 5.8 : 2018: Determination of the plastic limit and plasticity index			
	Checked and Approved:	B.R. (Lab Mgr)			18/08/2021



Project No	21.1146
Project Name	Sefter Road, Pagham
Client	David Stone

Sample Position & Depth:	WLS3	3.50-3.70m	Test Date:	18/08/2021
Sample Description:	Dark grey CLAY		Original Dried Mass (g):	676.60

Natural Moisture Content (W%)	31%
Liquid Limit (WL%)	63%
Plastic Limit (WP%)	21%
Plasticity Index (IP%)	42%
Classification	CH
Portion Retained on 425µm Sieve (%)	0%
Modified Plasticity Index (factoring in the above) (I _p %)	42%
Consistency Index (I _{pc})	0.77
Fall Cone Used:	30°-80 g cone
Remarks	



Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 533499 E: info@theconstructivegroup.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method		
		BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method		
		BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index		
	Checked and Approved:	B.R. (Lab Mgr)		18/08/2021



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LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX

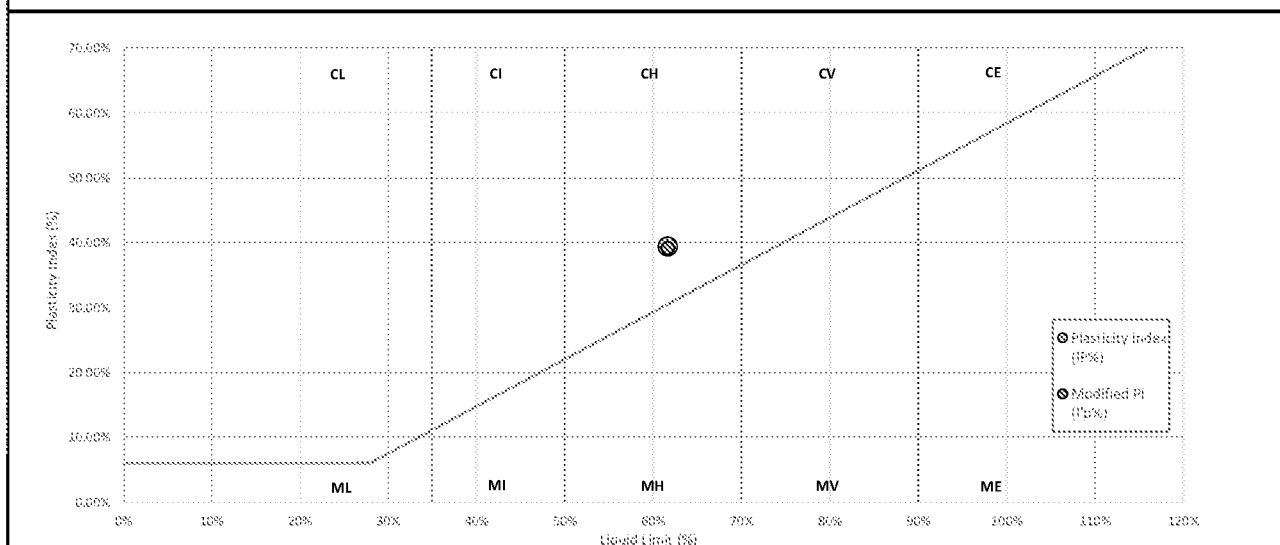
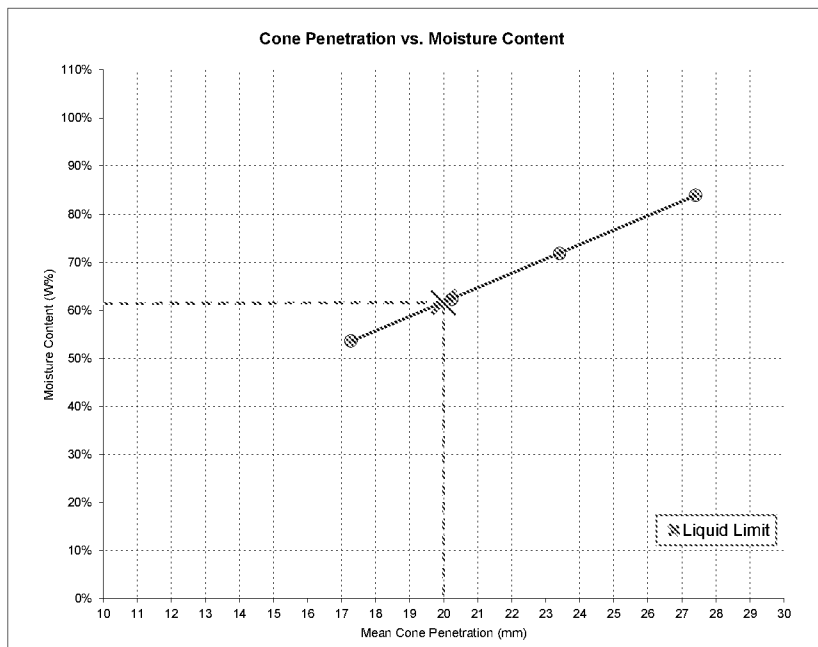
Testing performed in accordance with BS 17892-12: 2018: Clauses 5.3, 5.5, 6.5

Project No	21.1146
Project Name	Sefter Road, Pagham
Client	David Stone

Sample Position & Depth:	WLS4	3.60-3.70m	Test Date:	18/08/2021
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Sample Description:	Dark grey CLAY	Original Dried Mass (g):	711.70
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Natural Moisture Content (W%)	38%
Liquid Limit (WL%)	62%
Plastic Limit (WP%)	22%
Plasticity Index (IP%)	39%
Classification	CH
Portion Retained on 425µm Sieve (%)	1%
Modified Plasticity Index (factoring in the above) (I _p %)	39%
Consistency Index (I _{pc})	0.79
Fall Cone Used:	30°-80 g cone
Remarks	



Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 533499 E: info@theconstructivegroup.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method
		BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method
		BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index
Checked and Approved:	B.R. (Lab Mngr)	18/08/2021



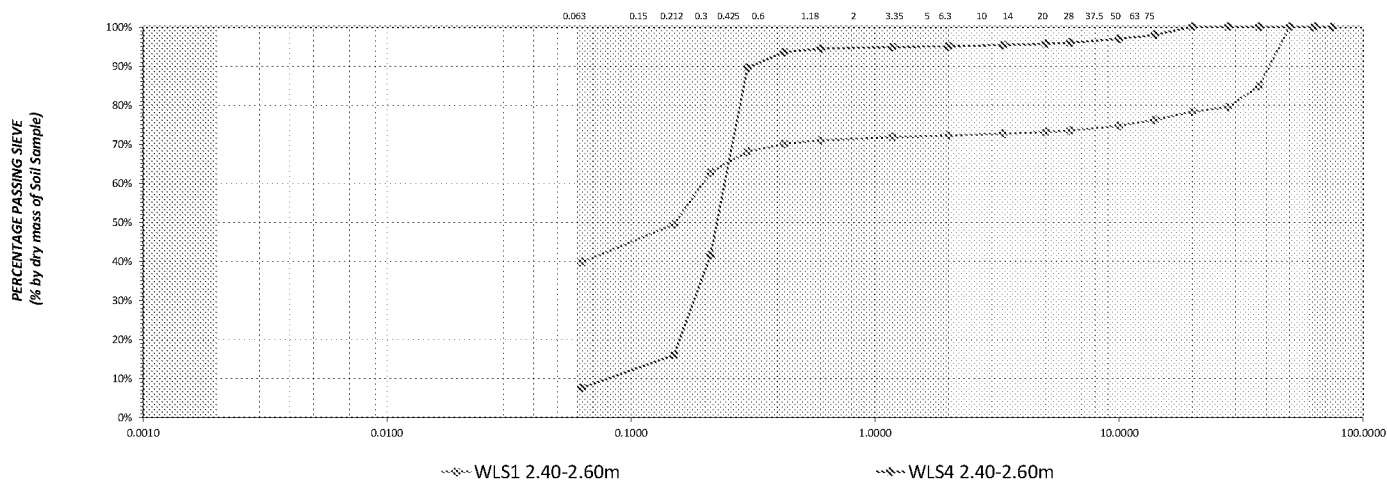
PARTICLE SIZE DISTRIBUTION

SUMMARY OF RESULTS

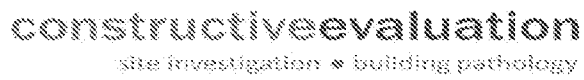
Project No	21.1146
Project Name	Sefter Road, Pagham
Client	David Stone

Particle Size (mm)	% Passing								
	WLS1	WLS4							
	2.40-2.60m	2.40-2.60m							
	Very gravelly very sandy CLAY	Moderately well graded slightly gravelly clayey silty SAND							
75	100.0%	100.0%							
63	100.0%	100.0%							
50	100.0%	100.0%							
37.5	84.9%	100.0%							
28	79.4%	100.0%							
20	78.3%	100.0%							
14	76.2%	98.0%							
10	74.7%	96.9%							
6.3	73.5%	96.0%							
5	73.1%	95.7%							
3.35	72.6%	95.4%							
2	72.2%	95.1%							
1.18	71.8%	94.9%							
0.6	71.0%	94.4%							
0.425	70.1%	93.6%							
0.3	68.1%	89.6%							
0.212	62.9%	41.6%							
0.15	49.5%	16.0%							
0.063	39.8%	7.7%							
0	0.0%	0.0%							
NMC (W%)	18.7%	18.2%							
Cobbles	0.0%	0.0%							
Gravels	27.8%	4.9%							
Sands	32.4%	87.4%							
Fines <0.063mm	39.8%	7.7%							

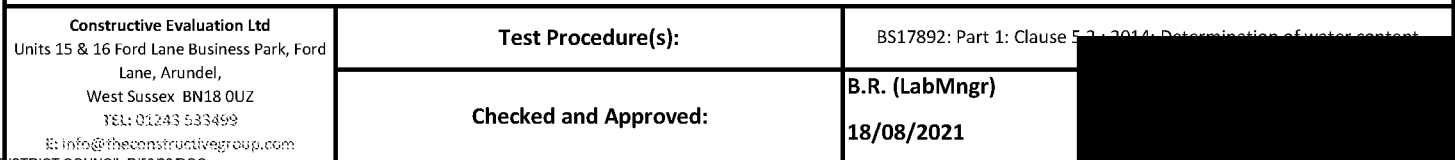
PARTICLE SIZE DISTRIBUTION CURVE FOR SOIL SAMPLES



Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ Tel: 01243 533498 E: info@theconstructivegroup.com	Test Procedure(s):		BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method	
			BS17892: Part 4: Clause 5.2.3 : 2016: Determination of particle size distribution by the wet sieving method	
			BS17892: Part 4: Clause 5.3 : 2016 Determination of particle size distribution by Sedimentation; Hydrometer method	
	Checked and Approved:	B.R. (Lab Mngr)		18/08/2021



SUMMARY OF RESULTS FROM PSD & SEDS

[illegible]



PARTICLE SIZE DISTRIBUTION

Testing performed in accordance with BS 17892-4: 2016: Clauses 5.2.2 & 5.2.3

Project No	21.1146
Project Name	Sefter Road, Pagham
Client	David Stone

Sample Position & Depth	WLS1	2.40-2.60m
Natural Moisture Content (W%)	18.7%	
Original Dried Mass (g)	1043.50	

Date Tested:	18/08/2021
Particle Density (assumed)	2.65 Mg/m ³

WET SIEVING			HYDROMETER SEDIMENTATION	
Particle Size (mm)	% Passing	Remarks	Particle Size (mm)	% Passing
75	100.0%			
63	100.0%			
50	100.0%			
37.5	84.9%			
28	79.4%			
20	78.3%			
14	76.2%			
10	74.7%			
6.3	73.5%			
5	73.1%			
3.35	72.6%			
2	72.2%			
1.18	71.8%			
0.6	71.0%			
0.425	70.1%			
0.3	68.1%			
0.212	62.9%			
0.15	49.5%			
0.063	39.8%			

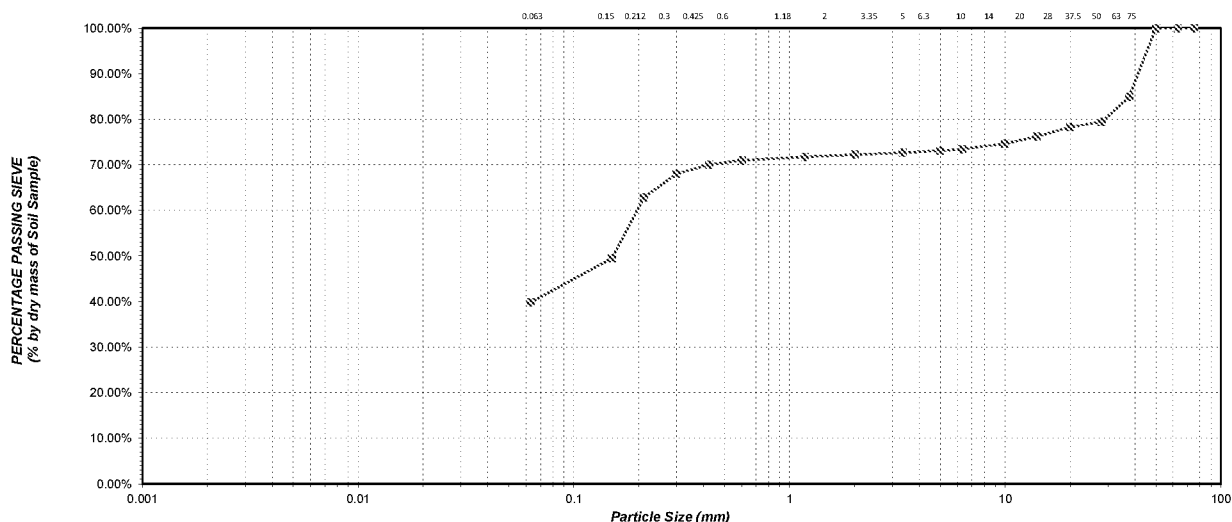
Soil Fraction	% Dry Mass
Cobbles	0.0%
Gravel	27.8%
Sand	32.4%
Fines <0.063mm	39.8%

Grading	
D100	50.0000
D60	0.2000
D30	
D10	
Uniformity Coefficient (Cu)	
Gradation Coefficient (Cc)	

Grading Classification:	Very gravely very sandy CLAY
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PARTICLE SIZE DISTRIBUTION CURVE FOR SOIL SAMPLE

BS Sieve Aperture Sizes, mm:



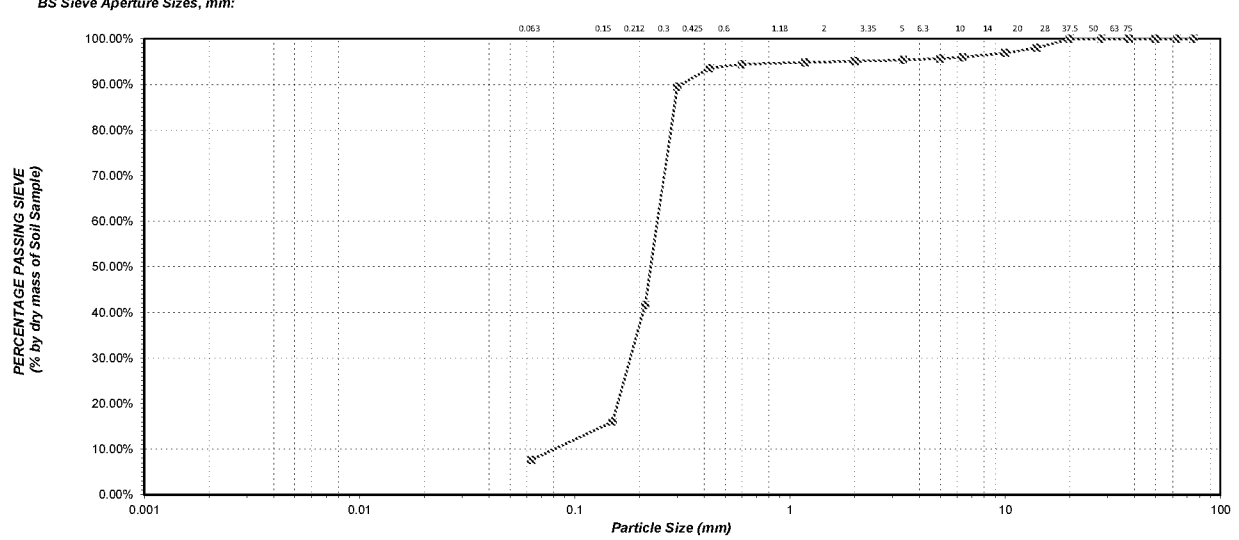
Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 533499 E: info@theconstructivegroup.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method		
		BS17892: Part 4: Clause 5.2.3 : 2016: Determination of particle size distribution by the wet sieving method		
		BS17892: Part 4: Clause 5.3 : 2016 Determination of particle size distribution by Sedimentation; Hydrometer method		
Checked and Approved:	B.R. (LabMngr)			18/08/2021

 constructiveevaluation site investigation • building pathology			PARTICLE SIZE DISTRIBUTION Testing performed in accordance with BS 17892-4: 2016: Clauses 5.2.2 & 5.2.3		
Project No		21.1146			
Project Name		Sefter Road, Pagham			
Client		David Stone			
Sample Position & Depth		WLS4		2.40-2.60m	
Natural Moisture Content (W%)		18.2%			
Original Dried Mass (g)		1006.95			
WET SIEVING			HYDROMETER SEDIMENTATION		
Particle Size (mm)	% Passing	Remarks	Particle Size (mm)	% Passing	
75	100.0%				
63	100.0%				
50	100.0%				
37.5	100.0%				
28	100.0%				
20	100.0%				
14	98.0%				
10	96.9%				
6.3	96.0%				
5	95.7%				
3.35	95.4%				
2	95.1%				
1.18	94.9%				
0.6	94.4%				
0.425	93.6%				
0.3	89.6%				
0.212	41.6%				
0.15	16.0%				
0.063	7.7%				

Date Tested:	18/08/2021
Particle Density (assumed)	2.65 Mg/m³
Soil Fraction	% Dry Mass
Cobbles	0.0%
Gravel	4.9%
Sand	87.4%
Fines <0.063mm	7.7%

Grading	
D100	20.0000
D60	0.2400
D30	0.1800
D10	0.0800
Uniformity Coefficient (Cu)	3.0000
Gradation Coefficient (Cc)	1.6875
Grading Classification:	Moderately well graded slightly gravelly clayey silty SAND

PARTICLE SIZE DISTRIBUTION CURVE FOR SOIL SAMPLE



BS Sieve Aperture Sizes, mm:

0.063	0.15	0.212	0.3	0.425	0.6	1.18	2	3.35	5	6.3	10	14	20	28	37.5	50	63	75
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Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 533489 E: info@theconstructivegroup.com		Test Procedure(s): BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method BS17892: Part 4: Clause 5.2.3 : 2016: Determination of particle size distribution by the wet sieving method BS17892 : Part 4: Clause 5.3 : 2016 Determination of particle size distribution by Sedimentation; Hydrometer method	Checked and Approved: B.R. (LabMngr)	18/08/2021
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Isaac Betts
Constructive Evaluation Ltd
Unit 15 & 16
Ford Lane Business
Ford Lane
Ford
Arundel
BN18 0UZ

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN

DETS Report No: 21-10085

Site Reference: Sefter Road, Paqham

Project / Job Ref: 21.1146

Order No: 21.1146/IB

Sample Receipt Date: 13/08/2021

Sample Scheduled Date: 13/08/2021

Report Issue Number: 1

Reporting Date: 19/08/2021

Authorised by:

[Redacted]
Derwentside Environmental
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



Soil Analysis Certificate						
DETS Report No: 21-10085	Date Sampled	09/08/21	09/08/21	09/08/21	09/08/21	09/08/21
Constructive Evaluation Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Sefter Road, Pagham	TP / BH No	WLS1	WLS2	WLS2	WLS3	WLS4
Project / Job Ref: 21.1146	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 21.1146/IB	Depth (m)	1.20	3.00	6.00	4.00	1.60 - 1.80
Reporting Date: 19/08/2021	DETS Sample No	559759	559760	559761	559762	559763

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	7.8	8.0	8.0	8.0	8.1
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	67	155	148	116	13
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.07	0.16	0.15	0.12	0.01

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description 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



Soil Analysis Certificate - Sample Descriptions

DETS Report No: 21-10085
Constructive Evaluation Ltd
Site Reference: Sefter Road, Pagham
Project / Job Ref: 21.1146
Order No: 21.1146/IB
Reporting Date: 19/08/2021



DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
559759	WLS1	None Supplied	1.20	15.3	Brown sandy clay with stones
559760	WLS2	None Supplied	3.00	18.9	Brown clay
559761	WLS2	None Supplied	6.00	16.8	Brown clay
559762	WLS3	None Supplied	4.00	20.2	Brown clay
559763	WLS4	None Supplied	1.60 - 1.80	18	Brown sandy clay

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

Insufficient Sample ^{1/5}

Unsuitable Sample ^{1/5}



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



Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 21-10085

Constructive Evaluation Ltd

Site Reference: Sefter Road, Pagham

Project / Job Ref: 21.1146

Order No: 21.1146/IB

Reporting Date: 19/08/2021

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 diphénylcarbazide 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

Report Terms and Conditions

Trading Terms

Unless specifically stated within the tender/quotation or unless identified within the introduction to this report it is confirmed that this report has been compiled wholly in accord with Constructive Evaluation Limited's terms of engagement. This report is provided for sole use by the Client and is confidential to them. No responsibility whatsoever for the contents of the report will be accepted to anyone other than the Client.

Copyright

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Context

This report is written in the context of an agreed scope of work between Constructive Evaluation Limited and the Client and should not be used in a different context. In light of additional information becoming available, improved practices and changes in legislation amendment or re-interpretation of the report in whole or part may be necessary after its original submission.

Professional Interpretation

The recommendations made and opinions expressed in the report are based on the conditions revealed by the site works together with an assessment of the data from the insitu and laboratory testing or in respect of the desktop reports. No responsibility can be accepted for conditions that have not been revealed by the research, site works and testing.

The Client is advised that the conditions observed on site by Constructive Evaluation Limited at the time of any site survey may be subject to change. Certain indicators of the presence of hazardous substances may have been latent at the time of the most recent site reconnaissance and they may subsequently have become evident. It is not possible to assess areas which are inaccessible or where access is not granted and CE accept no liability for risks subsequently identified therein.

The conceptual model, Risk assessment and sampling regime has been formulated in accordance with current UK guidance at time of production based upon the relevant information gained from Phase 1 and Phase 2 investigations. While the model and assessment offer opinions and interpretations of these guidelines, the comments made are for guidance only and no liability can be accepted for their accuracy. It is possible that aspects of desktop study may need to be altered to conform to the requirements of the statutory regulatory bodies.

Intrusive Field Operations

The data collected through direct operations in the production of this report has been so obtained, unless directly otherwise stated, in accordance with current UK guidance, law or accepted industry practice, including but not limited to: BS.5930: 1990 Code of Practice for Site Investigations (Amendment 2: 2010), BS 10175:2011+A1:2013 Investigations into Potentially Contaminated Sites, and BS.8576:2013 Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds. Exact exploratory locations will depend upon access conditions, site use and plant capability, CE do not accept liability for issues arising from material identified between or outside of the area of exploratory locations.

Laboratory Testing

Unless stated otherwise within the text, all geotechnical and material laboratory tests have been performed in accordance with the relevant British Standard Documents. Laboratory testing for contaminated land assessment is completed under the UKAS / MCERTS accreditation schemes, unless identified as otherwise in the report.

Human Health Risk Assessment Criteria

The Environment Agency has recently undertaken revision of the Soil Guideline Values (SGVs) which are partially complete. Where standards are available using the "new" approach, these have been utilised for correlative purposes. Where standards have not yet been revised, guidance following the "old" approach has been utilised. Please note that upon release of the remaining guidelines, the standards contained within this report may be subject to change. In addition, the second edition of the LQM CIEH guidance has now been released and will be utilised in favour of previously published guideline values.

Third Parties

The findings and opinions conveyed in this report are based on information obtained from a variety of sources, including that from previous Site investigations and chemical testing laboratories. Constructive Evaluation Limited has assumed that such information is correct. Constructive Evaluation Limited cannot and does not guarantee the authenticity or reliability of the information it has relied upon and can accept no responsibility for inaccuracies with the data supplied by other parties.

The accuracy of the historical map extracts supplied cannot be guaranteed and it should be noted that different conditions may have existed between mapping sheet editions. Therefore, there can be no certainty that all areas of contamination have been identified during the Phase 1 investigation.

Definitions

Reference to the word "contamination" in this report does not relate to the statutory definition of contaminated land under 1990 Environmental Protection Act unless otherwise stated. The definition used in this report is: "Land that contains substances that, when present in sufficient quantities or concentrations, are likely to cause harm, directly or indirectly, to man, to the environment, or on occasion to other targets" (NATO CCMS, 1985).

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