

Appendix C Factual Report



Langstone Flood & Coastal Erosion Management Scheme

Factual Report on Ground Investigation

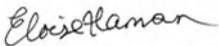
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1 INTRODUCTION

This investigation was carried out by Structural Soils Ltd (SSL) on the instructions of AECOM (the Engineer) on behalf of Havant Borough Council (the Client) at Langstone, Havant. The purpose of the work was to obtain geotechnical and geoenvironmental information for the proposed various flood defence schemes.

The intrusive works included machine excavated and hand dug trial pits, dynamic sample and cable percussive boreholes, laboratory testing, and the preparation of this report. The report contains a description of the site and the works carried out, the exploratory hole logs, in-situ and laboratory testing results.

The ground investigation has been carried out in accordance with the contract specification, and the general requirements of BS 5930:2015, BS 10175:2011+A2:2017, BS EN 1997-2 (2007), BS EN ISO 22475-1 (2006) and other relevant standards as identified below.

This report presents the factual records of the fieldwork carried out and laboratory testing. Whilst every attempt is made to record full details of the strata encountered in the exploratory holes, techniques of hole formation and sampling will inevitably lead to disturbance, mixing or loss of material in some soils and rocks. All information given in this report is based on the ground conditions encountered during the site work, and on the results of laboratory and field tests performed during the investigation. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata, contaminant concentrations, and water conditions between or below exploratory holes.

This report was prepared by SSL for the sole and exclusive use of Havant Borough Council in response to particular instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded. No liability will be accepted after a period of 6 years from the date of the report.

2 SITE DESCRIPTION

2.1 Location and Topography

The site is located along the coastline of Langstone, within the borough of Havant, Hampshire (see Site Location Map in Appendix A). The site is centred around British National Grid Reference SU 718047, between SU 715048 in the west to SU 719049 in the east, and SU 718044 in the south.

The site comprises approximately 1.2 km of the coastline, extending inland by up to 200 m (see Exploratory Hole Location Plan in Appendix A). The site is bisected by Langstone Road running NNW-SSE through the site, across to Hayling Island to the south. The western half of the site is bounded to the west by an inlet and Mill Lane to the north, and it mostly comprises residential houses and gardens. The foreshore of the western half of site extends southwards into a 300 m long spit, which is parallel to Langstone Road. Salt marsh land is present along the spit. Access to the western foreshore is gained via a cycle lane and across a bund, which was temporarily flattened to gain access for the ground investigation.

The eastern half of the site comprises the foreshore from The Ship Inn in the south and extends to Langstone Mill Pond in the east. The foreshore comprises vegetated shingle, marsh areas, mud flats and shingle beaches, which are only accessible at low tide. It can be accessed via two slipways: one in The Ship Inn car park and the other at the end of Langstone High Street. The eastern half of site also includes agricultural fields in the north-east. Langstone Sailing Club is present on the protruding land south of The Ship Inn.

The site is set at an elevation ranging between 1.8 m above Ordnance Datum (AOD) on the spit, in the south, and 3.2 m AOD inland, at the north of the site.

2.2 Geology

Information on the geology of the site was obtained from the following sources published by the British Geological Survey (BGS):

- BGS map (sheet 316, scale 1:50,000, published 1998).
- The BGS digital geology map, which utilises the most up to date names for geological units (www.bgs.ac.uk/data).
- The BGS Lexicon of Named Rock Units, which provides typical descriptions for most geological units (www.bgs.ac.uk/lexicon).

The site is shown to be underlain by the following descending sequence of strata:

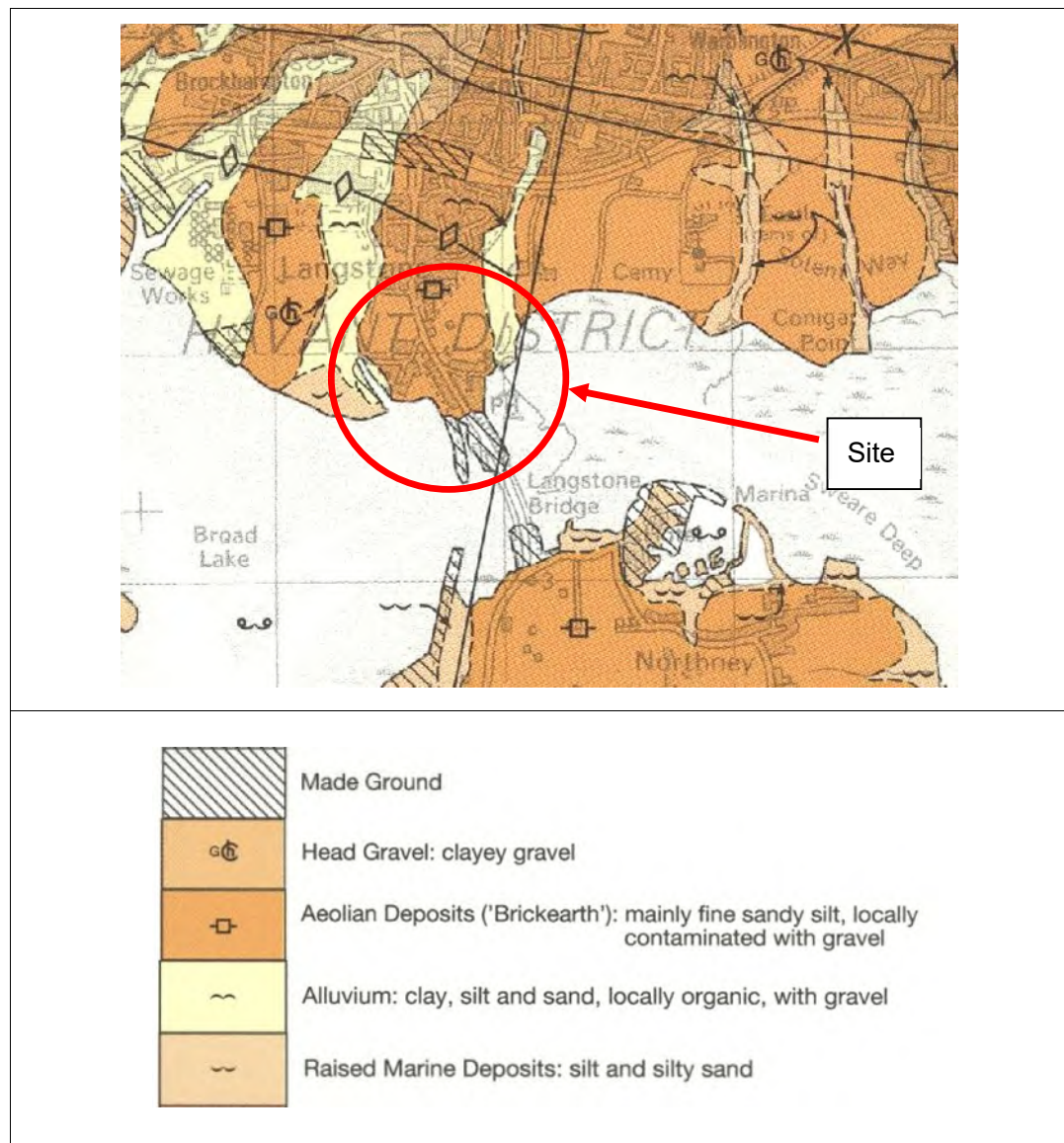
TABLE 1 : SUMMARY OF EXPECTED SITE GEOLOGY	
Geological Unit Name	Description
ANTHROPOGENIC GROUND	
Made ground	
DRIFT DEPOSITS	
River Terrace Deposits	Sand and gravel, locally with lenses of silt, clay or peat.
Alluvium	Clay, silt, sand and gravel.
Beach and Tidal Flat Deposits (undifferentiated)	Composite of 'Beach deposits': Shingle, sand, silt and clay; may be bedded or chaotic; beach deposits may be in the form of dunes, sheets or banks, and 'Tidal Flat Deposits': commonly silt and clay with sand and gravel layers; possible peat layers; from the tidal zone.
SOLID GEOLOGY	
Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated)	Chalk with flints. With discrete marl seams, nodular chalk, sponge-rich and flint seams throughout.

Note: Information obtained from BGS digital records © NERC.

The site is shown to be underlain by a mixture of superficial deposits over chalk of the White Chalk Subgroup. The majority of the inland areas of site are mapped as being underlain by superficial deposits comprising River Terrace Deposits (previously mapped as Aeolian Deposits, as shown on the map excerpt below) with Alluvium present along the inlet in the west of site and at Langstone Mill Pond in the east. The foreshore is shown to be underlain by Beach and Tidal Flat Deposits.

The 1998 mapping shows made ground to be present along the spit and protruding land south of the site at Langstone Sailing Club.

The BGS online maps portal provides access to scans of almost all maps produced by the BGS since 1932. An extract of the most recent available scanned map for the site is included below:



Note: Above images contain British Geological Survey materials ©NERC [2021].

3 FIELDWORK

3.1 General

The ground investigation was carried out by SSL between 13 September and 4 October 2021. A return visit for remediation works was carried out on 29 September 2021. The investigation was supervised by an engineer from SSL. The scope of works and positions were selected by AECOM, set out by SSL and adjusted where necessary to take account of buried or overhead services, or other restrictions. The exploratory hole and in-situ test locations are shown on the Exploratory Hole Location Plan presented in Appendix A.

3.2 Exploratory Holes

The exploratory holes are listed in the following table.

TABLE 2 :SCOPE OF INTRUSIVE WORKS			
Quantity	Exploratory Hole Type	Maximum depth (m)	Hole / Test Numbers
6	Cable Percussion Boreholes	15.45	BH101 to BH106
10	Hand Dug Trial Pits (HDTP106 extended by hand auger)	1.20 (1.40)	HDTP102 to HDTP111
3	Machine Dug Trial Pits	3.50	MDTP101 to MDTP103
9	Window Sample Boreholes	6.45	DS101-DS107, DS109 and DS110

Access to HDTP101 was restricted by the landowner and this position was cancelled. Access to DS108 was deemed unsuitable for the window sample rig and was therefore changed to a hand dug trial pit and renamed HDTP111. DS110 was added to the scope of works in an attempt to reach the proposed investigation depth, following the instability of the machine dug trial pits on the spit.

Hand augers were planned at the base of each hand dug trial pit, but it was only undertaken in HDTP106 from 1.20 m to 1.40 m before refusal. Hand augers were not possible due to the high gravel content of the soils.

The exploratory hole logs are presented in Appendix B. These provide information including the equipment and methods used, samples taken, tests carried out, water observations and descriptions of the strata encountered. Explanation of the terms and abbreviations used on the logs is given in the Key to Exploratory Hole Records in Appendix B, together with other explanatory information.

The holes were logged by an engineer in general accordance with the recommendations of BS 5930:2015 (which incorporates the requirements of BS EN ISO 14688-1, 14688-2

and 14689-1), and CIRIA Report C574 *Engineering in Chalk*. Detailed descriptions, together with relevant comments, are given in the logs included in Appendix B.

Photographs of the trial pits and window samples are presented in Appendix B, alongside the exploratory hole logs.

Prior to the commencement of any exploratory hole or intrusive test, all positions were checked for buried services by a specialist utility surveyor using a cable avoidance tool (CAT), signal generator ('genny'), and ground penetrating radar (GPR). The survey was carried out by RSK SafeGround. No checks using GPR were undertaken at the location of HDTP106.

Inspection pits were hand dug at exploratory locations as noted on the relevant exploratory hole logs.

Prior to commencement of intrusive works, the hole locations and the immediate vicinity were scanned by a specialist UXO (Unexploded Ordnance) officer using a magnetometer to check for buried ferrous objects that could possibly be UXO. A down hole UXO survey was also undertaken during drilling with the magnetometer being lowered to the base of the holes at regular intervals until past the maximum probable penetration depth of air dropped ordnance.

On completion of the works, a survey of the exploratory hole locations was undertaken using specialist Global Positioning System (GPS) equipment. The coordinates of each exploratory hole were measured relative to British National Grid, and the level relative to Ordnance Datum. These are shown on the exploratory hole logs contained in Appendix B, which have been printed with a reduced level column.

3.3 In-Situ Testing

The in-situ tests are listed in the following table. The test methods used are detailed on the test result sheets included in Appendix C, unless otherwise noted.

TABLE 3 :SCOPE OF IN-SITU TESTING		
Quantity	In-situ Test	Remarks
98	Standard Penetration Tests (SPT).	Carried out in boreholes; test results included on exploratory hole logs presented in Appendix B. SPT calibration certificates included in Appendix G.
24	Hand Vane (HV).	Test results included on exploratory hole logs presented in Appendix B. HV calibration certificates included in Appendix G.
10	Hand Penetrometer (HP).	Test results included on exploratory hole logs presented in Appendix B.
8	Mackintosh Probe tests.	Test results included in Appendix B. Undertaken in the base of

TABLE 3 :SCOPE OF IN-SITU TESTING

		hand dug trial pits, or adjacent to, as indicated on the results. No test was completed at HDTP102 due to the proximity to a listed wall.
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3.4 Backfill and Instrumentation

On completion 19 mm, 35 mm and 50 mm internal diameter gas/groundwater monitoring wells were installed in selected exploratory holes, the design having been decided by AECOM. The installation details are shown on the exploratory hole logs and on a summary table presented within Appendix B. The remaining cable percussion boreholes were backfilled with bentonite pellets, and window sample boreholes by a variety of backfilled arisings, gravel, and concrete, as indicated on the logs.

The machine dug trial pits were backfilled with arisings which were compacted in layers by the excavator bucket.

The hand dug trial pits were backfilled with bentonite pellets and arisings.

3.5 Monitoring and Post Fieldwork Environmental Sampling

Groundwater levels were recorded in the monitoring wells during the siteworks between 23 September and 4 October 2021. Three post-fieldwork visits were undertaken between 8 and 25 October 2021 by SSL engineers. The results together with the temporal (weather) conditions are tabulated in Appendix F.

Ground gas monitoring was carried out over three monitoring rounds between 8 and 25 October 2021. An infrared gas meter was used to measure concentrations of carbon dioxide (CO₂), methane (CH₄) and oxygen (O₂) in percentage by volume, whilst hydrogen sulphide (H₂S) and carbon monoxide (CO) were recorded in parts per million. Initial and steady state concentrations were recorded. An integral flow meter was used to measure borehole flow rates (initial and steady state) in litres per hour (l/hr). In addition the atmospheric pressure before and during monitoring. Holes were screened with a Photo-ionisation Detector (PID) to establish if there are any interferences and cross-sensitivity of other hydrocarbons with the infrared gas meter. The results are recorded as ppm (isobutylene equivalent).

A historic borehole (BH03) was also monitored as part for the works and results are presented alongside the records for the current investigation boreholes.

The calibration certificate for the gas analyser used is contained in Appendix G.

It should be noted that groundwater levels, gas concentrations and gas flows usually vary due to seasonal, atmospheric and/or other effects and may at times differ to those measured during the investigation.

The wells were purged of three well volumes of groundwater (unless indicated otherwise on the monitoring results) on the first monitoring visit.

Groundwater samples were retrieved using a United States Environment Protection Agency (USEPA) approved Low-Flow Purging and Sampling Methodology. The Low-Flow Purging and Sampling method relies on moving groundwater through the well screen at approximately the same rate as it flows through the geological formation. This results in a significant reduction in the volume of water extracted before sampling and significantly reduces the amount of disturbance of the water in the monitoring well during purging and sampling.

Groundwater levels in the monitoring well and water quality indicator parameters (pH, temperature, electrical conductivity, redox potential and dissolved oxygen) are monitored during low-flow purging, with parameter stabilisation indicating that purging is complete and sampling can begin. As the flow rate used for purging is (in most cases) the same as or only slightly higher than the flow rate used for sampling, purging and sampling are conducted as one continuous operation in the field.

In situ water quality measurements (pH, temperature, electrical conductivity, redox potential and dissolved oxygen) undertaken during the purging or sampling process and are provided in Appendix F.

4 LABORATORY TESTING

Samples for potential geotechnical testing were returned to one of the Company's UKAS accredited laboratories, and those for potential geoenvironmental testing were sent to a sister company Envirolab Limited, a MCERTS and UKAS accredited testing laboratory. Laboratory tests were scheduled by AECOM. Tests carried out in accordance with MCERTS/UKAS standards where noted on the results sheets.

4.1 Geotechnical Laboratory Testing

Geotechnical laboratory testing was generally carried out in accordance with the relevant part of BS1377: 1990, *Methods of Test for Soils for Civil Engineering Purposes*, or, where superseded, by the relevant part of BS EN ISO 17892:2014+ *Geotechnical investigation and testing – Laboratory Testing of Soil*.

The number of tests completed and the test methods used are summarised below. Where non-standard procedures have been undertaken, this is recorded on the report sheet. The results are reported in tabular and/or graphical form and included as Appendix D of this report.

The following values in brackets are the number of test results available in this draft report.

TABLE 4 :SUMMARY OF GEOTECHNICAL TESTING		
Number of tests	Test	Remarks
Classification Tests		
89	Water content.	
52	Liquid and plastic (Atterberg) limits.	
2	Dry density and saturation moisture content of chalk.	
59	Particle size distribution by sieving.	
40	Particle size distribution by sedimentation.	
Compressibility, Permeability and Durability Tests		
7	One-dimensional consolidation test.	
Shear Strength - Total Stress		
10	Single stage unconsolidated undrained triaxial compression tests without the measurement of pore pressure.	
Chemical Tests: Soil*		
32	Water soluble sulphate content and pH value.	
1	Water soluble sulphate, total (acid soluble) sulphate and total sulphur contents and pH value.	
10	Organic Matter	

Note:* Test(s) carried out to method approved in BRE Special Digest 1.

4.2 Geoenvironmental Laboratory Testing

The geoenvironmental testing carried out is summarised in the following table. The results are included as Appendix E of this report, and include details of the test method.

TABLE 5 : SUMMARY OF GEOENVIRONMENTAL LABORATORY TESTING		
Number of tests	Description	Notes
SOIL		
37	AECOM Suite E.	Comprises CLEA metals (arsenic, barium, beryllium, boron (water soluble), cadmium, chromium (total and hexavalent), lead, mercury, selenium, copper, nickel, zinc, vanadium), pH, Total Organic Carbon, CWG total petroleum hydrocarbons, BTEX, MTBE, speciated polycyclic aromatic hydrocarbons (USEPA 16).
5	Organo-tin Compounds	
23	Hexavalent chromium (CrVI).	
11	Volatile organic compounds (VOC).	
9	Semi volatile organic compounds (SVOC) and tentatively identified compounds (TICs)	
2	Polychlorinated biphenyls (PCBS).	Total PCB 7 congeners.
20	Asbestos presence screen.	Identification was undertaken if/where asbestos fibres were detected.
10	Ammoniacal nitrogen as N	
11	Cyanide (free)	
11	Cyanide (total)	
10	Phenols – Total by HPLC	
3	PCS-EC7 & WHO12	
WATER		
10	AECOM Suite F	Comprises antimony, arsenic, barium, beryllium, boron, cadmium, chromium (total and VI), lead, magnesium, mercury, molybdenum, selenium, copper, nickel, zinc, chloride, potassium, sulphate, hardness, pH, total suspended solids, cyanide (total and free), phenol, CWG total petroleum hydrocarbons, speciated polyaromatic hydrocarbons (USEPA 16), nitrate, nitrite, ammoniacal nitrogen as N, dissolved organic carbon.
4	VOC, SVOC and TICs	
1	VOC suite	
2	BTEX	
4	BRE suite D1	
3	PCBs (7) PCB WHO12	
LEACHATE (simulated leachates derived from soil samples)		

TABLE 5 : SUMMARY OF GEOENVIRONMENTAL LABORATORY TESTING

13	AECOM Suite G 2:1 leachate prep	
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The results for dissolved metals, cyanides, sulphides, phenols, ammonia, dissolved organic carbon and chemical oxygen demand for the water sample from DS106, taken on 18 October, are deviating due to a lack of preservation bottles at the time of sampling (Envirolab Report No. 21-11436-1).

Due to an issue with quality control, the water sample taken from DS105 on the 25 October had to be re-prepped, which was completed beyond the nominal 14 day holding for polycyclic aromatic hydrocarbons (PAH). Therefore, the results for PAH will be deviating (Envirolab Report No. 21-11840-1).

Results for total petroleum hydrocarbons, PAH, chromium hexavalent and total suspended solids for the water sample from BH03, taken on the 14 October, are also deviating (Envirolab Report No. 21-11687-1). Since a car was parked over BH03 on 18 October a new water sample could not be taken following the failed visit. The sample taken on 14 October was then scheduled instead, resulting in an increased timeframe between sampling and scheduling causing the deviation.

5 REFERENCES

- 5.1 BS 5930:2015 *Code of practice for ground investigations*
- 5.2 BS EN 1997-1:2004 *Eurocode 7 — Geotechnical Design Part 1 - General Rules* incorporating corrigendum Feb 2009 and Amendment A1 2013
- 5.3 BS EN 1997-2:2007 *Eurocode 7 — Geotechnical design Part 2: Ground Investigation and testing*
- 5.4 BS 10175:2011 *Investigation of potentially contaminated sites: Code of practice*, including amendment A2 2017
- 5.5 British Geological Survey sheet 316 scale 1:50,000, published 1998
- 5.6 British Geological Survey online digital geological map, www.bgs.ac.uk/data
- 5.7 British Geological Survey Lexicon of Named Rock Units, www.bgs.ac.uk/lexicon
- 5.8 BS EN ISO 14688-1:2018 *Geotechnical investigation and testing – Identification and classification of soil: Part 1: Identification and description*
- 5.9 BS EN ISO 14688-2:2018 *Geotechnical investigation and testing – Identification and classification of soil: Part 2: Principles for a classification*
- 5.10 BS EN ISO 14689-1:2018 *Geotechnical investigation and testing – Identification and classification of rock: Part 1: Identification and description*
- 5.11 BS EN ISO 22475-1:2006 *Geotechnical Investigation and Testing – Sampling methods and groundwater measurements, Part 1 Technical principals for execution*
- 5.12 BS EN ISO 22476-3:2005 (updated February 2007) *Geotechnical Investigation and Testing – Field Testing Part 3: Standard Penetration Test*, including Amendment A1 (2011)
- 5.13 CIRIA Report R143 (1995) *The Standard Penetration Test (SPT) - Methods and Use*
- 5.14 BS 1377:1990 *Method of Test for Soils for Civil Engineering Purposes*

- 5.15** BS EN ISO 17892:2014 *Geotechnical investigation and testing – Laboratory Testing of Soil*
- 5.16** CIRIA Report C574 (2002) *Engineering In Chalk*
- 5.17** BRE Special Digest 1 (SD1) (2005) *Concrete in Aggressive Ground Part 1: Assessing the aggressive chemical environment*. Third Edition

APPENDIX A - PLANS AND DRAWINGS

- (i) Site Location Plan
- (ii) Exploratory Hole Location Plan



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CLIENT

Havant Borough Council

PROJECT

Langstone Flood & Coastal Erosion Management Scheme

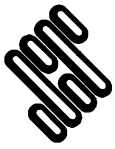
TITLE

SITE LOCATION MAP

REV.	DATE	DESCRIPTION	BY	CHD.	APR.	JOB NO	GRID REF	SCALE BAR	ORIGIN SIZE	FIGURE
00	21.10.2021	-	NP	EH	-	736036	SU 714 049	0 250 500 750 1,000m	A4	1
DIMENSION		SCALE	DRAWING STATUS							
m		1:25,000	-							

APPENDIX B - EXPLORATORY HOLE RECORDS

- (i) Key to Exploratory Hole Logs
- (ii) Borehole Logs
- (iii) Trial Pit Logs
- (iv) Window Sample Logs
- (v) Macintosh Probe Logs
- (vi) Standpipe Summary Table



KEY TO EXPLORATORY HOLE LOGS - SUMMARY OF ABBREVIATIONS

SAMPLING

Sample type codes

B	=	Bulk disturbed sample.
D	=	Small disturbed sample.
DSPT	=	Small disturbed sample originating from SPT test.
ES	=	Soil sample for environmental testing.
EW	=	Water sample for environmental testing.
LB	=	Large bulk disturbed sample.
U	=	Undisturbed driven tube sample - Number of blows indicated. % recovery reported.
U70	=	
UT	=	Undisturbed thin wall sample.
UT100	=	Undisturbed sample UT100.
W	=	Water sample.

Undisturbed sample detail codes

U _(UT100)	=	Undisturbed sample UT100.
----------------------	---	---------------------------

IN-SITU TESTING

SPT _(c)	=	Standard Penetration Test using a solid 60 degree cone.
SPT	=	Standard Penetration Test using split spoon sampler. _(NR) indicates 'No Sample Recovery'.
	=	* denotes extrapolated N value. NP denotes 'No Penetration'.
HP	=	Hand Penetrometer Test. Value given as shear strength c_u , in kPa.
V	=	Field Vane Test. Peak value (c_u) & Residual value (c_r), given as shear strength in kPa.
PID	=	Photo Ionisation Detector Results, in ppm.

ADDITIONAL NOTES

1. All soil and rock descriptions and legends in general accordance with BS EN ISO 14688-1, 14688-2, 14689-1, and BS5930:2015.
2. Material types divided by a broken line (- - -) indicates an unclear boundary.
3. Fracture spacings (lf) quoted in the Description of Strata for specific strata or specific fracture sets are also quoted in mm, e.g. (25/80/230) referring to (Min/Avg/Max).
4. The data on any sheet within the report showing the AGS icon is available in the AGS format.



KEY TO EXPLORATORY HOLE LOGS - SUMMARY OF GRAPHIC SYMBOLS

WATER COLUMN SYMBOLS

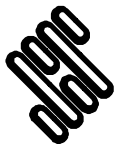
	First water strike, second water strike etc.
	Standing water level following first strike, standing water level following second strike etc.
	Seepage.
	Standing water level recorded at documented date.

MATERIAL GRAPHIC LEGENDS

	CLAY		Gravelly clayey SAND with COBBLES		Chalk		Clayey sandy GRAVEL
	Sandy clayey GRAVEL		Gravelly CLAY		Gravelly CLAY with COBBLES		Gravelly SAND
	Gravelly SILT		MADE GROUND		Possible MADE GROUND		Sandy GRAVEL
	Gravelly sandy CLAY		Sandy gravelly CLAY		Sandy gravelly CLAY with COBBLES		Topsoil
	Silty sandy GRAVEL		Assumed Zone of No Recovery				

INSTRUMENTATION SYMBOLS

	Backfill		Bentonite seal		Concrete		Gravel filter
	Flush cover		Upstanding cover				
	Plain pipe		Slotted pipe				



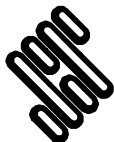
STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Borehole: BH101
Contract Ref: 736036	Start: 24.09.21 End: 27.09.21	Ground Level (m AOD): 3.10	National Grid Co-ordinate: E:471941.7 N:105011.0	Sheet: 1 of 4

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10	101	ES	1xT+1xJ+1xV			MADE GROUND: Grass over firm dark brown slightly sandy SILT with occasional roots and rootlets. Sand is fine to coarse.	2.90	0.20	
0.10		PID	0.0ppm						
0.20-0.40	1	B							
0.20-0.40	102	ES	1xT+2xJ+1xV			MADE GROUND: Very stiff brown slightly sandy slightly gravelly SILT with occasional rootlets. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint and rare brick fragments.	2.60	0.50	
0.20		HP	$c_u=150/100 > 225$						
0.20		PID	0.1ppm						
0.40-0.80	103	ES	1xT+2xJ+1xV			Firm brown locally mottled grey and light brown slightly sandy slightly gravelly CLAY with a low cobble content and rare rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint. Cobbles are subrounded flint up to 110mm long.			
0.40		V	$c_u=60/80/90$						
0.40		PID	0.1ppm						
0.50-0.80	2	B				(HEAD)			
0.70		V	$c_u=56/40/36$						
1.20-1.65	3	UT100	28 blows 89% recovery					(2.15)	
1.65-1.75	4	D							
1.65		HP	$c_u=88$						
1.75-2.20	5	SPT	N=8			... From 1.75m depth no cobbles present.			
1.75		DSPT							
1.80-2.20	7	B							
2.20	8	D							
2.20-2.65	9	UT100	40 blows 100% recovery			... UT100 sample description: 2.20m-2.55m: Soft brown mottled grey and orange slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to medium of flint and chalk. 2.55m-2.65m: Soft grey spotted orange slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of flint and chalk.	0.45	2.65	
2.65-3.10	10	SPT	N=10						
2.65		DSPT							
2.70-3.10	12	B				Structureless CHALK composed of grey slightly gravelly SILT. Gravel is very weak medium density off-white subangular to subrounded fine to coarse with frequent fine to coarse gravel sized fragments of black flint, locally rind.			
2.70-3.10	104	ES	1xT+2xJ+1xV			(WHITE CHALK SUBGROUP Grade Dm)		(1.05)	
2.70		PID	0.1ppm						
3.10-3.50	13	UT100							
3.10-3.50	14	B							
3.10-3.40	105	ES	1xT+2xJ+1xV						
3.10		PID	0.1ppm						
3.60-4.05	15	SPT(c)	N=12				-0.60	3.70	
3.70-4.10	16	B				Grey slightly sandy angular to subrounded fine to coarse GRAVEL of flint and occasional chalk with pockets of grey structureless silty chalk (up to 45 x 20 x 20mm). (POSSIBLE DISSOLUTION FEATURE INFILL)	-1.00	4.10	
						Structureless CHALK composed of grey gravelly SILT. Gravel is very weak medium density off-white subangular to subrounded fine to coarse with frequent fine to coarse gravel sized fragments of black flint.		(0.40)	
						(WHITE CHALK SUBGROUP Grade Dm)	-1.40	4.50	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
24/09/21	12:11	3.50	3.50	200	3.50				1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated pit from ground level to 1.20m depth. 4. Cable percussive boring from 1.20m to 9.50m depth in 200mm diameter, environmental seal installed from 8.50 to 9.50 m depth, 9.50m to 15.45m depth in 150mm
24/09/21	12:31	3.50	3.50	200	3.50				
24/09/21	13:43	7.50	7.50	200	7.30				
27/09/21	09:30	7.40	7.50	200	5.00				
27/09/21	13:00	9.50	9.50	200	-				
27/09/21	16:42	15.45	15.00	150	-				
Method Used: Inspection pit + Cable percussion						Drilled By: Martin Reeves			All dimensions in metres
Plant Used: Dando 2000 Mark 2						Logged By: KDalton			Scale: 1:25
						Checked By: SS			AGS



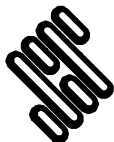
STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Borehole: BH101
Contract Ref: 736036	Start: 24.09.21 End: 27.09.21	Ground Level (m AOD): 3.10	National Grid Co-ordinate: E:471941.7 N:105011.0	Sheet: 2 of 4

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
4.50-4.95 4.50 4.50-5.00	18 19 20	SPT DSPT B	N=16			Structureless CHALK composed of light grey gravelly slightly sandy SILT. Gravel is very weak to weak medium density off-white subangular to subrounded fine to coarse with occasional fine to coarse gravel sized fragments of black flint. (WHITE CHALK SUBGROUP Grade Dm)			
5.00	106	EW							
5.50	21	D				... From 5.50m depth frequent to numerous fine to coarse gravel sized fragments of flint.			
6.00-6.38 6.00 6.00-6.45	22 23 24	SPT DSPT B	N=17			... From 6.00m depth grey with abundant fine to coarse gravel sized fragments of flint.		(3.00)	
6.70	25	D							
7.50-7.88 7.50-8.00	26 27	SPT(c) B	N=15			Grey slightly sandy slightly silty angular to subangular fine to coarse GRAVEL of flint and occasional chalk. Sand is fine to coarse. (POSSIBLE DISSOLUTION FEATURE INFILL)	-4.40	7.50	
								(1.50)	
							-5.90	9.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
										diameter. 5. Groundwater seepage at 3.50m depth. 6. 35mm and 50mm diameter gas/groundwater monitoring wells installed to 5.50m depth; response zone 2.50m to 5.50m, and 14.00m depth; response zone 11.00m to 14.00m, respectively. Completed with flush protective cover. 7. SPT hammer AR3508-2021 ($E_r = 68.00\%$) used.
										All dimensions in metres
Method Used: Inspection pit + Cable percussion		Plant Used: Dando 2000 Mark 2		Drilled By: Martin Reeves		Logged By: KDalton		Checked By: SS	Scale: 1:25	AGS



STRUCTURAL SOILS

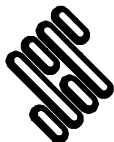
BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Borehole: BH101
Contract Ref: 736036	Start: 24.09.21 End: 27.09.21	Ground Level (m AOD): 3.10	National Grid Co-ordinate: E:471941.7 N:105011.0	Sheet: 3 of 4

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
9.00 9.00-9.45 9.00 9.00-9.50 9.00	28 29 30 31 32	D SPT DSPT B D	N=16			Possibly structured CHALK recovered as structureless CHALK composed of light grey to off-white sandy gravelly SILT. Gravel is very weak medium density off-white subangular to subrounded fine to coarse. (Unable to apply CIRIA Grade) (WHITE CHALK SUBGROUP) ... From 9.00m depth matrix has local yellow staining. ... From 10.00m depth chalk has occasional black specks.			
10.50-10.95	33	UT100	38 blows 0% recovery					(3.00)	
11.00-11.45 11.00 11.00-11.50	34 35 36	SPT DSPT B	N=17						
12.00	37	D					-8.90	12.00	
12.50-12.95 12.50 12.50-13.00	38 39 40	SPT DSPT B	N=16			Probably structured recovered as structureless CHALK composed of slightly silty subangular to subrounded fine to coarse GRAVEL and subangular to subrounded COBBLES. Clasts are weak to moderately weak medium to high density off-white locally yellowish orange with rare black specks and rare fine to coarse sized fragments of flint. Matrix is off-white to yellow. (Unable to apply CIRIA Grade) (WHITE CHALK SUBGROUP)			
13.30	41	D							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:25
Plant Used: Dando 2000 Mark 2			Drilled By: Martin Reeves			Logged By: KDalton		Checked By: SS	





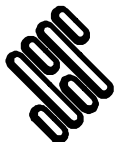
STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Borehole: BH101
Contract Ref: 736036	Start: 24.09.21 End: 27.09.21	Ground Level (m AOD): 3.10	National Grid Co-ordinate: E:471941.7 N:105011.0	Sheet: 4 of 4

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
14.00-14.45 14.00-14.50	42 43	SPT(c) B	N=9			Probably structured recovered as structureless CHALK composed of slightly silty subangular to subrounded fine to coarse GRAVEL and subangular to subrounded COBBLES. Clasts are weak to moderately weak medium to high density off-white locally yellowish orange with rare black specks and rare fine to coarse sized fragments of flint. Matrix is off-white to yellow. (Unable to apply CIRIA Grade) (WHITE CHALK SUBGROUP) (stratum copied from 12.00m from previous sheet) ... From 14.00m depth clasts are off-white with rare black specks.		(3.45)	
14.80	44	D							
15.00-15.45 15.00	45 46	SPT DSPT	N=25						
							-12.35	15.45	
Borehole terminated at 15.45m depth.									

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



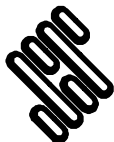
STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme	Client: Havant Borough Council	Borehole: BH102
Contract Ref: 736036	Start: 29.09.21 End: 29.09.21	Ground Level (m AOD): 1.77 National Grid Co-ordinate: E:471968.1 N:104941.3
		Sheet: 1 of 3

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20-0.50 0.20 0.20	1 101	B ES PID	1xT+2xJ+1xV 0.2ppm			MADE GROUND: Dark brown sandy silty angular to subrounded fine to coarse GRAVEL of flint and brick fragments with a low cobble content. Sand is fine to coarse. Cobbles are subangular of flint and brick (up to 100 x 60 x 60mm).	1.27	(0.50)	
0.50-1.00 0.50 0.50 0.60	2 102	B ES PID V	1xT+2xJ+1xV 0.0ppm c _u =38/30/32			MADE GROUND: Soft brown mottled grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint and chalk. ... 0.50-1.00m bulk sample description (from lab results) brown mottled white and dark grey slightly gravelly slightly sandy clayey SILT.		(0.70)	
1.00-1.20 1.00	103	ES PID	1xT+2xJ+1xV 0.0ppm			... From 1.10m depth: grey mottled brown.	0.57	1.20	
1.20-1.65	3	UT100	10 blows 100% recovery			UT100 sample description: 1.20m-1.28m: MADE GROUND: Very soft brown mottled dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint, brick and terracotta tile.	0.49	1.28	
1.65-1.75 1.75-2.20 1.80-2.20 1.80-2.20 1.80	4 5 6 104	D SPT(c) B ES PID	N=8 1xT+2xJ+1xV 0.2ppm			Structureless CHALK composed of grey slightly gravelly SILT with occasional orange staining and occasional rootlets. Gravel is very weak medium density off-white subangular to subrounded fine to coarse with occasional fine to medium gravel sized fragments of flint. (WHITE CHALK SUBGROUP Grade Dm) ... UT100 sample description: 1.28m-1.65m: Structureless CHALK composed of light grey locally mottled orange slightly sandy slightly gravelly SILT. Gravel is weak medium density off-white with rare black specks, subrounded to rounded fine to medium. Frequent to numerous fine to coarse gravel sized fragments of brown and black flint.		(1.42)	
2.20 2.20-2.65	7 8	D UT100	25 blows 67% recovery			... UT100 sample description: 2.20m-2.50m: Structureless CHALK composed of light grey slightly sandy slightly gravelly SILT. Gravel is weak medium density off-white with rare black specks subrounded fine to medium. Occasional fine to medium gravel sized fragments of black brown flints with thin cortexes (Grade Dm). 2.50m-2.65m: AZNR.	-0.94	2.70	
2.70-3.15 2.70 2.70 2.70-3.20	9 10 105 11	SPT DSPT EW B	N=10			Structureless CHALK composed of off-white gravelly SILT with rare orange staining. Gravel is very weak medium density off-white subangular to subrounded fine to coarse with occasional fine to coarse gravel and cobble sized fragments of flint. (WHITE CHALK SUBGROUP Grade Dm)			
3.20 3.20-3.65 3.20 3.20-3.70	13 14 15 16	D SPT DSPT B	N=18						
3.70 3.80-4.25 3.80 3.80-4.20	17 18 19 20	D SPT DSPT B	N=15						
4.30	21	D							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
29/09/21	09:32	2.00	2.00	200	-						
29/09/21	13:30	2.50	2.50	150	2.50						
29/09/21	13:50	2.50	2.50	150	2.50						
29/09/21	15:37	9.95	9.00	150	-						
									1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated pit from ground level to 1.20m depth. 4. Cable percussive boring from 1.20m to 2.00m depth in 200mm diameter, environmental seal installed from 1.00m to 2.00m depth, 2.00m to 9.95m depth in		
						All dimensions in metres			Scale: 1:25		
Method Used:	Inspection pit + Cable percussion		Plant Used:	Dando 2000 Mark 2		Drilled By:	Martin Reeves		Logged By: KDalton	Checked By: 	



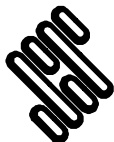
STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Borehole: BH102
Contract Ref: 736036	Start: 29.09.21 End: 29.09.21	Ground Level (m AOD): 1.77	National Grid Co-ordinate: E:471968.1 N:104941.3	Sheet: 2 of 3

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
4.50-4.95	22	UT100	36 blows 78% recovery			Structureless CHALK composed of off-white gravelly SILT with rare orange staining. Gravel is very weak medium density off-white subangular to subrounded fine to coarse with occasional fine to coarse gravel and cobble sized fragments of flint. (WHITE CHALK SUBGROUP Grade Dm) <i>(stratum copied from 2.70m from previous sheet)</i> ... UT100 sample description: 4.50m-4.95m: Structureless CHALK composed of off-white locally mottled orange slightly sandy slightly gravelly SILT with a low cobble content. Gravel is weak medium density off-white with rare black specks subangular to subrounded fine to coarse. Cobbles are off-white weak medium density subrounded locally moderately stained orange on relict discontinuities. Local green glauconite staining. (Grade Dm). ... UT100 sample description: 5.50m-5.95m: Structureless CHALK composed of orangish brown slightly sandy slightly gravelly SILT. Gravel is weak medium density off-white with rare black specks subangular to subrounded fine to coarse locally lightly to heavily stained orange on relict discontinuity surfaces. Local traces of brown clay. (Grade Dm)			
4.95-5.40	23	SPT	N=11						
4.95	24	DSPT							
5.30-5.50	25	B							
5.50	26	D							
5.50-5.95	27	UT100	38 blows 100% recovery						
5.95-6.05	28	D							
6.05-6.50	29	SPT	N=12						
6.05	30	DSPT							
6.10-6.50	31	B							
6.80	32	D							
6.80-7.25	33	UT100	32 blows 0% recovery						
7.25-7.70	34	SPT	N=11						
7.25	35	DSPT							
7.30-7.80	36	B							
8.00	37	D							
8.30-8.75	38	SPT	N=17						
8.30	39	DSPT							
8.30-8.70	40	B							
							-7.24	9.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)						
									150mm diameter. 5. Groundwater seepage at 2.50m depth.. 6. Borehole backfilled with bentonite on completion. 7. SPT hammer AR3508-2021 (E_r = 68.00%) used.					
									All dimensions in metres	Scale: 1:25				
Method Used:	Inspection pit + Cable percussion			Plant Used:	Dando 2000 Mark 2		Drilled By:	Martin Reeves		Logged By:	KDalton	Checked By:		



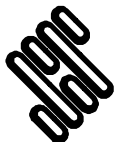
STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Borehole: BH102
Contract Ref: 736036	Start: 29.09.21 End: 29.09.21	Ground Level (m AOD): 1.77	National Grid Co-ordinate: E:471968.1 N:104941.3	Sheet: 3 of 3

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
9.00-9.45	41	UT100	37 blows 67% recovery			Probably structured CHALK recovered as structureless CHALK composed of off-white gravelly SILT. Gravel is very weak medium density off-white subangular to subrounded fine to coarse with occasional fine to coarse gravel and cobble sized fragments of flint. (Unable to apply CIRIA Grade) (WHITE CHALK SUBGROUP) ... UT100 sample description: 9.00m-9.35m: Possibly structured CHALK recovered as structureless CHALK composed of off-white slightly sandy slightly gravelly SILT. Gravel is weak medium density off-white with rare black specks subangular to subrounded fine to coarse with occasional liesegang banding. Locally lightly stained yellow to moderately stained orange with rare to frequent black specks on discontinuity surfaces. (Grade DM). 9.35m-9.45m: AZNR. Borehole terminated at 9.95m depth.			
9.50-9.95	42	SPT	N=23					(0.95)	
9.50	43	DSPT					-8.19	9.95	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



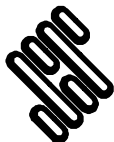
STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme			Client: Havant Borough Council		Borehole: BH103
Contract Ref: 736036	Start: 30.09.21 End: 30.09.21	Ground Level (m AOD): 1.69	National Grid Co-ordinate: E:471908.2 N:104795.3		Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10-0.20 0.10-0.20 0.20 0.30-0.60	1 101 2	B ES PID B	0.0ppm			MADE GROUND: Dark greyish brown sandy slightly clayey angular to subrounded fine to coarse GRAVEL of flint and rare brick fragments. Sand is fine to coarse.	1.39	(0.30) 0.30	
0.50 0.50 0.60-1.20 0.70-1.00 0.70 0.70	102 3 103	ES PID B ES V PID	0.0ppm 1xT+2xJ+1xV c _v =16/18/14 0.1ppm			Brownish grey very sandy clayey angular to subangular fine to coarse GRAVEL of flint with a low cobble content and abundant shell fragments up to 10mm long. Sand is fine to coarse. Cobbles are subangular of flint (up to 90 x 60 x 60mm). (BEACH DEPOSIT)	1.09	(0.30) 0.60	
1.20-1.65 1.20-1.65 1.20-1.65 1.20-1.70 1.20	4 104 5 6	SPT ES DSPT B PID	N=4 1xT+2xJ+1xV 0.0ppm			Soft brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED))	0.49	(0.60) 1.20	
1.90 2.00-2.45	7 8	D UT _(UT100)	15 blows 78% recovery			Soft brown mottled grey slightly gravelly slightly sandy SILT. Gravel is subangular to subrounded fine to coarse of flint and chalk. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED))	-0.81	(1.30) 2.50	
2.45-2.55 2.55-3.00 2.55-3.00 2.60-3.00 2.60	9 10 11 12 105	D SPT DSPT B ES PID	N=7 0.0ppm			Structureless CHALK composed of grey slightly sandy slightly gravelly SILT with occasional orange staining. Gravel is very weak medium density off-white subangular to subrounded fine to medium with rare flint up to 100mm long. (WHITE CHALK SUBGROUP Grade Dm)		(2.10)	
3.00 3.00-3.45	13 14	D UT _(UT100)	25 blows 67% recovery			... UT100 sample description: 2.00m-2.38m: Very stiff light brown mottled grey and orange slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to medium of chalk (90%) and black and brown flint. 2.38m-2.45m: AZNR.			
3.45-3.55 3.55-4.00 3.60-4.00	15 16 17	D SPT(c) B	N=16			... UT100 sample description: 3.00m-3.19m: Structureless CHALK composed of grey slightly gravelly sandy SILT. Gravel is very weak medium density off-white with rare black specks subangular to subrounded fine to medium with occasional fine to coarse gravel sized nodular flint, locally rounded. 3.19m-3.37m: Structureless CHALK composed of soft grey SILT. 3.37m-3.45m: AZNR.			
4.00 4.00-4.45	18 19	D UT _(UT100)	35 blows 67% recovery			... From 3.60m depth gravelly.			
						... UT100 sample description: 4.00m-4.29m: Structureless CHALK composed of grey slightly sandy slightly gravelly SILT. Gravel is very weak medium density off-white with rare black specks subangular to rounded fine to medium with occasional fine to medium gravel sized nodular flints locally rinded. (Grade Dm) 4.29m-4.45m: AZNR.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
30/09/21 30/09/21	11:17 16:23	3.00 8.00	3.00 8.00	200 150					
Method Used: Cable percussion						Drilled By: Martin Reeves			1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Inspection pit hand dug to 1.2 m depth. 4. Cable percussive boring from 1.20m to 3.00m depth in 200mm diameter, environmental seal installed from 2.00m to 3.00m depth, 3.00m to 8.05m depth in
Plant Used: Dando 2000 Mark 2						Logged By: KDalton			All dimensions in metres Scale: 1:25
						Checked By:			



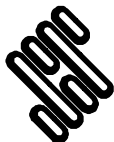
STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme			Client: Havant Borough Council		Borehole: BH103
Contract Ref: 736036	Start: 30.09.21 End: 30.09.21	Ground Level (m AOD): 1.69	National Grid Co-ordinate: E:471908.2 N:104795.3		Sheet: 2 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend	
Depth	No	Type	Results							
4.45-4.55 4.55-5.00 4.60-5.00	20 21 22	D SPT(c) B	N=10				-2.91	4.60		
						Grey slightly sandy slightly clayey subangular to subrounded fine to coarse GRAVEL of flint and chalk. Sand is fine to coarse. (POSSIBLE DISSOLUTION FEATURE INFILL)		(0.40)		
							-3.31	5.00		
5.00 5.00-5.45 5.00 5.00-5.45 5.00-5.50	23 24 106 25 26	D SPT EW DSPT B	N=11			Structureless CHALK composed of grey slightly sandy slightly gravelly SILT. Gravel is very weak medium density light grey to off-white subangular to subrounded fine to coarse with occasional fine to coarse gravel sized fragments of flint. (WHITE CHALK SUBGROUP Grade Dm)				
5.70	27	D								
6.00-6.45	28	UT _(UT100)	39 blows 44% recovery			... UT100 sample description: 6.00m-6.24m: Structureless CHALK composed of slightly sandy slightly gravelly SILT. Gravel is weak medium density off-white with rare black specks subangular to rounded fine to coarse. Locally stained orange. (Grade Dm) 2.24m-2.45M: AZNR.		(2.00)		
6.45-6.55 6.55-7.00 6.55-7.00 6.60-7.00	29 30 31 32	D SPT DSPT B	N=12							
								-5.31	7.00	
7.00 7.00-7.45 7.00-7.60	33 34 35	D UT _(UT100) B	40 blows 0% recovery				Structureless CHALK composed of off-white slightly sandy slightly gravelly SILT. Gravel is very weak medium density off-white subangular to subrounded fine to coarse with rare fine to coarse gravel sized fragments of flint. (WHITE CHALK SUBGROUP Grade Dm)		(1.05)	
7.60-8.05 7.60-8.05	36 37	SPT DSPT	N=12							
							-6.36	8.05		
Borehole terminated at 8.05m depth.										

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
									150mm diameter. 5. Groundwater seepage at 0.30m depth. 6. Location backfilled with bentonite on completion. 7. SPT hammer AR3508-2021 (E _r = 68.00%) used.
									All dimensions in metres
Method Used: Cable percussion			Plant Used: Dando 2000 Mark 2			Drilled By: Martin Reeves		Logged By: KDalton	Scale: 1:25
								Checked By:	



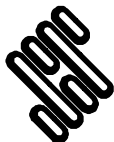
STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme	Client: Havant Borough Council	Borehole: BH104
Contract Ref: 736036	Start: 22.09.21 End: 23.09.21	Ground Level (m AOD): 2.68 National Grid Co-ordinate: E:471889.2 N:104682.1
Sheet: 1 of 4		

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.05-0.20	101	ES	1xT+2xJ+1xV			MADE GROUND: Black ASPHALT.	2.66	0.02	
0.05		PID	0.3ppm			MADE GROUND: Brown becoming dark brown slightly clayey gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse flint, brick fragments and tile.	2.48	0.20	
0.20-0.40	1	B						(0.30)	
0.20-0.40	102	ES	1xT+2xJ+1xV			MADE GROUND: Brown slightly sandy clayey angular to subangular fine to coarse GRAVEL of flint and rare brick fragments. Sand is fine to coarse.	2.18	0.50	
0.20		PID	0.9ppm						
0.50-1.00	2	B						(0.50)	
0.50-0.80	103	ES	1xT+2xJ+1xV			MADE GROUND: Soft to firm brown locally mottled brownish grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint, rare brick fragments and chalk.			
0.50		HP	c _u =38						
0.50		PID	0.5ppm				1.68	1.00	
1.00-1.30	3	B				MADE GROUND: Soft to firm brownish grey locally mottled dark grey slightly sandy very gravelly CLAY with a medium cobble content and occasional wood fragments up to 90mm x 40mm x 30mm. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint and rare brick fragments. Cobbles are angular to subangular flint and concrete up to 100mm long.		(1.00)	
1.00-1.30	104	ES	1xT+2xJ+1xV			... 1.00-1.30m bulk sample particle size distribution test result: very sandy silty fine to coarse GRAVEL. Sand is fine to coarse.			
1.00		HP	c _u =25			... At 1.30m depth concrete cobble 180mm x 140mm x 130mm.			
1.00		PID	13.6ppm			... 1.30-1.50m bulk sample particle size distribution test result: sandy very silty fine to coarse GRAVEL. Sand is fine to coarse.			
1.30-1.45	4	SPT(c)	8/50 for 75mm			... From 1.50m depth no concrete present.	0.68	2.00	
1.30	5	D				MADE GROUND: Soft to firm greyish brown mottled grey and light brown slightly sandy gravelly SILT with rare metal nails and slightly sulphurous odour. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint and rare brick fragments.		(0.70)	
1.30-1.50	6	B							
1.70	7	D					-0.03	2.70	
2.00-2.45	8	SPT	N=7			Firm to stiff brown mottled grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium flint and chalk.			
2.00-2.50	10	B				(BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED))			
2.00-2.45	105	ES	1xT+2xJ+1xV						
2.00		DSPT							
2.00	9	PID	1.3ppm						
2.70	11	D							
2.80	106	ES	1xT+2xJ+1xV						
2.80		PID	1.4ppm						
3.00-3.45	12	UT100	20 blows 89% recovery						
3.50-3.95	13	SPT	N=12					(2.20)	
3.50	14	DSPT							
3.50-3.95	15	B							
4.00	16	D							
4.00-4.45	17	UT100	25 blows 89% recovery			... At 4.00m: UT100 sample is soft. Particle size distribution test result: slight sandy silty CLAY.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
22/09/21	16:10	6.00	3.20	200	6.00	1.30	1.70	00:45	1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated pit from ground level to 1.20m depth. 4. Cable percussive boring from 1.20m to 6.00m depth in 200mm diameter, environmental seal installed from 5.00m to 6.00m depth, 6.00m to 15.45m depth in
22/09/21	17:14	6.00	6.00	200	4.70				
23/09/21	08:35	6.00	6.00	200	3.30				
23/09/21	12:45	6.00	6.00	200					
23/09/21	17:19	15.45	7.50	150	5.00				
Method Used: Inspection pit + Cable percussion						Drilled By: Martin Reeves			All dimensions in metres Scale: 1:25
Plant Used: Dando 2000 Mark 2						Logged By: EHarman			Checked By: SS AGS



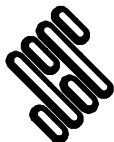
STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Borehole: BH104
Contract Ref: 736036	Start: 22.09.21 End: 23.09.21	Ground Level (m AOD): 2.68	National Grid Co-ordinate: E:471889.2 N:104682.1	Sheet: 2 of 4

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
4.45-4.55	18	D				... From 4.45m depth greyish brown.			
4.50	19	HP	$c_u=75$ $N=10$						
4.55-5.00	20	SPT							
4.55	21	DSPT							
4.55-4.90	21	B					-2.23	4.90	
4.90	22	D				Firm light brown gravelly CLAY. Gravel is subangular to subrounded fine to coarse flint and chalk.			
4.90-5.00	107	ES	$1xT+2xJ+1xV$ 2.4ppm			(BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED))		(0.55)	
4.90	23	PID	28 blows			... UT100 sample description: 5.00m-5.23m: Soft light grey gravelly CLAY. Gravel is subangular to subrounded fine to medium of chalk and flint.			
5.00-5.45	23	UT100	67% recovery				-2.78	5.45	
5.45-5.55	24	D				Structureless CHALK composed of grey gravelly SILT. Gravel is very weak to weak medium density off-white subangular to subrounded fine to coarse with occasional fine to coarse gravel sized fragments of black flint.			
5.55-6.00	25	SPT	$N=14$			(WHITE CHALK SUBGROUP Grade Dm)			
5.55	26	DSPT							
5.60-6.00	27	B				... UT100 sample description: 6.00m-6.08m: Structureless CHALK composed very soft light grey SILT. 6.08m-6.22m: Structureless CHALK composed of light grey slightly sandy slightly gravelly SILT. Gravel is weak medium density off-white with rare black specks subangular to rounded fine to medium occasional fragments of flint with thin cortexes fine to medium gravel sized. (Grade Dm) 6.22m-6.45m: AZNR.			
5.60-6.00	108	ES	$1xT+2xJ+1xV$ 0.1ppm						
5.60	28	PID							
6.00	29	D							
6.00-6.45	29	UT100	30 blows 44% recovery						
6.45-6.55	30	D						(2.05)	
6.55-7.00	31	SPT	$N=14$						
6.55	32	DSPT							
6.55-7.00	33	B							
7.00	34	D							
7.50-7.95	35	UT100	71% recovery			Structureless CHALK composed of off-white slightly sandy slightly gravelly SILT. Gravel is weak medium density off-white with rare black specks subangular to subrounded fine to coarse with rare fine to coarse gravel sized fragments of black flint. (WHITE CHALK SUBGROUP Grade Dm)			
7.95-8.05	36	D				... UT100 sample description: 7.50m-7.78m: Structureless CHALK composed of off-white mottled light grey slightly sandy slightly gravelly SILT. Gravel is weak medium density off-white with occasional black specks subangular to subrounded fine to medium. (Grade Dm). 7.78m-7.87m: Structureless CHALK composed of sandy very silty subangular to subrounded fine to coarse GRAVEL. Gravel is weak medium density off-white with rare black specks. Matrix is light grey. (Grade Dc) 7.87m-7.95m: AZNR.			
8.05-8.50	37	SPT	$N=14$						
8.05	38	DSPT							
8.10-8.50	39	B							
8.70	40	D							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks				
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)					
									150mm diameter. 5. Groundwater strike at 6.00m depth, rising to 4.70m after 20 minutes. 6. 19mm and 50mm diameter gas/groundwater monitoring wells installed 2.50m depth; response zone 1.00m to 2.50m, and to 10.00m depth; response zone 7.00m to 10.00m respectively. Completed with flush protective cover. 7. SPT hammer AR3508-2021 (E_r = 68.00%) used.				
						All dimensions in metres			Scale: 1:25				
Method Used:	Inspection pit + Cable percussion			Plant Used:	Dando 2000 Mark 2		Drilled By:	Martin Reeves	Logged By:	EHarman	Checked By:		



STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Borehole: BH104
Contract Ref: 736036	Start: 22.09.21 End: 23.09.21	Ground Level (m AOD): 2.68	National Grid Co-ordinate: E:471889.2 N:104682.1	Sheet: 3 of 4

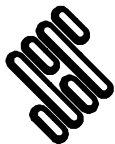
Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
9.00-9.45	41	UT100	27 blows 56% recovery			Structureless CHALK composed of off-white slightly sandy slightly gravelly SILT. Gravel is weak medium density off-white with rare black specks subangular to subrounded fine to coarse with rare fine to coarse gravel sized fragments of black flint. (WHITE CHALK SUBGROUP Grade Dm) ... UT100 sample description: 7.50m-7.78m: Structureless CHALK composed of off-white mottled light grey slightly sandy slightly gravelly SILT. Gravel is weak medium density off-white with occasional black specks subangular to subrounded fine to medium. (Grade Dm). 7.78m-7.87m: Structureless CHALK composed of sandy very silty subangular to subrounded fine to coarse GRAVEL. Gravel is weak medium density off-white with rare black specks. Matrix is light grey. (Grade Dc) 7.87m-7.95m: AZNR. (stratum copied from 7.50m from previous sheet) ... UT100 sample description: 9.00m-9.35m: Possibly structured CHALK recovered as structureless CHALK composed of off-white slightly sandy slightly gravelly SILT. Gravel is weak medium density off-white with rare black specks subangular to subrounded fine to coarse with occasional liesegang banding. Locally lightly stained yellow to moderately stained orange with rare to frequent black specks on discontinuity surfaces. 9.35m-9.45m: AZNR. ... UT100 sample description: 10.50m-10.80m: Structureless CHALK composed of slightly sandy very silty subangular to subrounded fine to coarse GRAVEL. Gravel is weak medium density off-white with rare black specks. Matrix is off-white locally yellow. (Grade Dc). 10.80m - 10.95m: AZNR.		(3.50)	
9.50-9.95 9.50 9.50-10.00	42 43 44	SPT DSPT B	N=13						
10.30	45	D							
10.50-10.95	46	UT100	20 blows 67% recovery						
10.95-11.40 10.95 11.00-11.40 11.00	47 48 49 109	SPT DSPT B EW	N=13				-8.33	11.00	
11.80	50	D				Structureless CHALK composed of silty subangular to subrounded fine to coarse GRAVEL and subangular to subrounded COBBLES. Clasts are weak, medium density, off-white. Matrix is off-white. (WHITE CHALK SUBGROUP Grade Dc)		(1.00)	
12.00-12.45 12.00 12.00-12.50	51 52 53	SPT DSPT B	N=20				-9.33	12.00	
12.80	54	D				Probably structured recovered as structureless CHALK composed of slightly silty subangular to subrounded fine to coarse GRAVEL and subangular to subrounded COBBLES. Clasts are weak to moderately weak medium to high density off-white. Matrix is off-white. (Unable to apply CIRIA Grade) (WHITE CHALK SUBGROUP)			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
13.50-13.95 13.50 13.50-14.00	55 56 57	SPT DSPT B	N=13			Probably structured recovered as structureless CHALK composed of slightly silty subangular to subrounded fine to coarse GRAVEL and subangular to subrounded COBBLES. Clasts are weak to moderately weak medium to high density off-white. Matrix is off-white. (Unable to apply CIRIA Grade) (WHITE CHALK SUBGROUP) <i>(stratum copied from 12.00m from previous sheet)</i> ... At 13.50m to 14.50m depth matrix has occasional orange staining. Locally frequent black specks and moderately stained orange on discontinuities.		(3.45)	
14.50	58	D							
15.00-15.45 15.00	59 60	SPT DSPT	N=34						
							-12.78	15.45	
						Borehole terminated at 15.45m depth.			

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Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB Tel: 0117-947-1004 Web: www.soils.co.uk, Email: ask@soils.co.uk | 11/01/22 - 08:49 | SS5 |



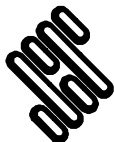
STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme	Client: Havant Borough Council	Borehole: BH105
Contract Ref: 736036	Start: 20.09.21 End: 21.09.21	Ground Level (m AOD): 2.44 National Grid Co-ordinate: E:471477.2 N:104859.4
Sheet: 1 of 3		

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20	101	ES	1xT+2xJ+1xV			MADE GROUND: Grass over stiff dark brown slightly sandy SILT with occasional rootlets and rare metal pipe fragments, charcoal, brick and ceramic fragments. Sand is fine to coarse.	2.14	(0.30)	
0.20		V	c _u =115/112/115					0.30	
0.20		PID	0.1ppm						
0.30-0.50	1	B				MADE GROUND: Firm to stiff brown slightly sandy slightly gravelly CLAY with rare rootlets. Sand is fine to coarse. Gravel is angular to subangular fine to coarse charcoal.	1.94	0.50	
0.30	3	D							
0.40-0.50	102	ES				Firm to stiff brown mottled grey slightly sandy slightly gravelly CLAY with rare rootlets. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint.			
0.40		PID	0.0ppm			(HEAD)			
0.45		V	c _u =100/90/120						
0.50-1.00	2	B							
0.80	4	D							
0.80		V	c _u =50/60/60						
1.00	5	EW							
1.00	103	ES						(1.20)	
1.00		PID	0.0ppm						
1.20-1.65	6	UT100	38 blows 78% recovery			... At 1.45m: becoming soft. (UT100 sample)			
1.65-2.10	7	SPT	N=4				0.74	1.70	
1.65-2.10	8	DSPT				Firm brown mottled grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse flint and rare chalk.			
1.70-2.10	9	B				(HEAD)			
1.70-2.10	104	ES							
1.70		PID	0.5ppm						
2.20	10	D							
2.20-2.65	11	UT100	20 blows 0% recovery					(1.40)	
2.65-3.10	12	SPT(c)	N=9			... From 2.70m depth gravel is subangular.			
2.70-3.10	13	B							
3.10	14	D				... From 3.00m depth grey and very gravelly.	-0.66	3.10	
3.10-3.55	15	SPT	N=16			Grey slightly sandy slightly clayey angular to subangular fine to coarse GRAVEL of flint and chalk. Sand is fine to coarse.			
3.10-3.55	105	ES				(RIVER TERRACE DEPOSITS)			
3.10-3.55	15	B							
3.10-3.55	16	DSPT							
3.10-3.55	17	D							
3.10		PID	0.1ppm						
3.50	16	D							
4.10-4.55	17	SPT	N=21						
4.10-4.55	18	DSPT						(2.40)	
4.10-4.55	19	B							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
20/09/21	12:24	1.20	0.00	200	1.00				1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated from ground level to 1.20m depth. 4. Cable percussive boring from 1.20m to 5.50m depth in 200mm diameter, environmental seal installed from 4.50m to 5.50m depth, 5.50m to 10.15m depth in
20/09/21	17:04	1.20	-	200	1.00				
21/09/21	08:39	1.20	-	200	0.70				
21/09/21	14:18	5.50	5.50	150	-				
21/09/21	17:59	10.15	10.00	150	8.00				
Method Used: Inspection pit + Cable percussion						Drilled By: Martin Reeves			All dimensions in metres Scale: 1:25
Plant Used: Dando 2000 Mark 2						Logged By: KDalton			Checked By: SS
									AGS



STRUCTURAL SOILS

BOREHOLE LOG

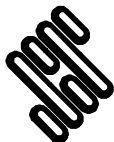
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Borehole: BH105
Contract Ref: 736036	Start: 20.09.21 End: 21.09.21	Ground Level (m AOD): 2.44	National Grid Co-ordinate: E:471477.2 N:104859.4	Sheet: 2 of 3

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
4.50	20	D				Grey slightly sandy slightly clayey angular to subangular fine to coarse GRAVEL of flint and chalk. Sand is fine to coarse. (RIVER TERRACE DEPOSITS) (stratum copied from 3.10m from previous sheet)			
5.20-5.65	21	UT100	50 blows 67% recovery			... UT100 sample description: 5.20: Soft to firm grey mottled white slightly sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of chalk and flint.	-3.06	5.50	
5.20	25	D				Structureless CHALK composed of grey gravelly SILT. Gravel is very weak to weak medium density off-white subangular fine to coarse with occasional fine to coarse gravel sized fragments of black flint. (WHITE CHALK SUBGROUP Grade Dm)			
5.65-5.75	22	D							
5.65		HP	$c_u=150$						
5.75-6.20	23	SPT	N=18						
5.75	24	DSPT							
6.20-6.50	26	B							
6.20-6.50	106	ES							
6.20		PID	0.3ppm						
6.50-6.95	27	UT100	50 blows 4% recovery			... From 6.50m depth light grey and very gravelly.			
6.95-7.05	28	D							
7.00-7.50	31	B				... From 7.00m depth locally frequent flints.		(3.00)	
7.05-7.50	29	SPT	N=31						
7.05-7.55	30	DSPT							
7.50	32	D							
8.00-8.45	33	SPT	N=37						
8.00-8.45	34	DSPT							
8.50-9.00	35	B				Structureless CHALK composed of off-white very gravelly slightly sandy SILT. Gravel is weak medium density off-white subangular fine to coarse with numerous fine to coarse gravel and cobble sized fragments of flint. (WHITE CHALK SUBGROUP Grade Dm)	-6.06	8.50	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
									150mm diameter. 5. Groundwater seepage at 1.00m depth. 6. 19mm and 50mm diameter gas/groundwater monitoring wells to 3.00m depth; response zone 1.00m to 3.00m, and to 9.00m depth; response zone 6.00m to 9.00m respectively. Completed with flush protective cover. 7. SPT hammer AR3508-2021 ($E_s = 68.00\%$) used.
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:25
Plant Used: Dando 2000 Mark 2		Drilled By: Martin Reeves		Logged By: KDalton		Checked By: SS			



Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
9.30 9.30	35 36	D D	N=21			Structureless CHALK composed of off-white very gravelly slightly sandy SILT. Gravel is weak medium density off-white subangular fine to coarse with numerous fine to coarse gravel and cobble sized fragments of flint. (WHITE CHALK SUBGROUP Grade Dm) <i>(stratum copied from 8.50m from previous sheet)</i>		(1.65)	
9.70-10.15 9.70-10.15	37 38	SPT DSPT							
						Borehole terminated at 10.15m depth.	-7.71	10.15	



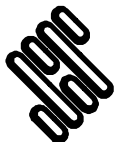
STRUCTURAL SOILS

BOREHOLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme	Client: Havant Borough Council		Borehole: BH106
Contract Ref: 736036	Start: 28.09.21 End: 28.09.21	Ground Level (m AOD): 1.15	National Grid Co-ordinate: E:471658.3 N:104798.2
		Sheet: 1 of 3	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10-0.30 0.20 0.20	1 101	B ES PID	1xT+2xJ+1xV 0.0ppm			Dark brown slightly sandy slightly clayey subangular to subrounded fine to coarse GRAVEL of flint, rare chalk and shells. (BEACH DEPOSIT)	0.55	(0.60)	
0.60-1.00 0.60 0.60	2 102	B ES PID	1xT+2xJ+1xV 0.2ppm			Very soft to soft brownish grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED)) ... 0.60-1.00m bulk sample particle size distribution test results: sandy silty fine to coarse GRAVEL. Sand is fine to coarse.		(0.90)	
1.20-1.65 1.20 1.20-1.70	3 4 5	SPT DSPT B	N=10				-0.35	1.50	
1.50-1.70 1.50	103	ES PID	1xT+2xJ+1xV 0.2ppm			Structureless CHALK composed of brown to grey gravelly SILT. Gravel is very weak to weak medium density off-white subangular fine to coarse with occasional fine to coarse gravel sized fragments of black flint. (WHITE CHALK SUBGROUP Grade Dm)		(1.50)	
1.80	6	D							
2.00-2.45 2.00-2.45	7 8	SPT(c) B	N=9						
2.80	9	D					-1.85	3.00	
3.00-3.45 3.00-3.50 3.00 3.00-3.50 3.00	10 104 11 12	SPT ES DSPT B PID	N=8 0.0ppm			Structureless CHALK composed of off-white gravelly SILT. Gravel is weak medium density off-white subangular fine to coarse with rare fine to medium sized fragments of flint. Rare Liesegang banding visible within clasts. (WHITE CHALK SUBGROUP Grade Dm)			
3.80	13	D				... From 3.80m depth: matrix is light brown with occasional yellow staining.			
4.00-4.45 4.00 4.00-4.50	14 15 16	SPT DSPT B	N=12			... From 4.00m depth: matrix has occasional orange staining.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
28/09/21	08:55	2.00	2.00	200	-						
28/09/21	09:15	3.00	3.00	150	3.00						
28/09/21	16:00	9.95	9.00	150	9.00						
									1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated from ground level to 1.20m depth. 4. Cable percussive boring from 1.20m to 2.00m depth in 200mm diameter, environmental seal installed from 1.00m to 2.00m depth, 2.00m to 9.95m depth in		
									All dimensions in metres	Scale: 1:25	
Method Used:	Inspection pit + Cable percussion		Plant Used:	Dando 2000 Mark 2		Drilled By:	Martin Reeves		Logged By: KDalton	Checked By: 	



STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Langstone Flood & Coastal Erosion Management Scheme		Client:	Havant Borough Council		Borehole:	BH106	
Contract Ref:	736036		Start: 28.09.21	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:	2 of 3	
			End: 28.09.21	1.15	E:471658.3 N:104798.2			

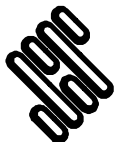
Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
4.80	17	D	29 blows 100% recovery			Structureless CHALK composed of off-white gravelly SILT. Gravel is weak medium density off-white subangular fine to coarse with rare fine to medium sized fragments of flint. Rare Liesegang banding visible within clasts. (WHITE CHALK SUBGROUP Grade Dm) (stratum copied from 3.00m from previous sheet) ... UT100 sample description: 5.00m-5.36m: Structureless CHALK composed of off-white locally spotted orange slightly gravelly SILT with a low cobble content. Gravel is off-white with rare black specks weak medium density subangular to rounded fine to coarse. Cobbles are off-white with rare black specks subrounded. Rare fine to medium gravel sized flint fragments. (Grade Dm) 5.36m-5.45m: AZNR. ... From 4.55m depth: matrix is light grey. ... From 5.55m depth: matrix is off-white with rare yellow staining.			
5.00-5.45	18	UT100							
5.00	105	EW							
5.45-5.55	19	D	N=13						
5.50-6.00	22	B							
5.55-6.00	20	SPT							
5.55	21	DSPT							
6.00	23	D	N=10						
6.00-6.45	24	SPT							
6.00	25	DSPT							
6.00-6.50	26	B							
6.80	27	D	N=12						
7.00-7.45	28	SPT							
7.00	29	DSPT							
7.00-7.50	30	B							
7.80	31	D	N=12						
8.00-8.45	32	SPT							
8.00	33	DSPT							
8.00-8.50	34	B							
8.80	35	D							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
									150mm diameter. 5. Groundwater strike at 3.00m depth, rising to 2.70m after 20 minutes. 6. Location backfilled with bentonite on completion. 7. SPT hammer AR3508-2021 ($E_s = 68.00\%$) used.
Method Used: Inspection pit + Cable percussion						Drilled By: Martin Reeves			Scale: 1:25
Plant Used: Dando 2000 Mark 2						Logged By: KDalton			Checked By: SS
									AGS



Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
9.50-9.95	36	UT100	35 blows 78% recovery			Structureless CHALK composed of off-white gravelly SILT. Gravel is weak medium density off-white subangular fine to coarse with rare fine to medium sized fragments of flint. Rare Liesegang banding visible within clasts. (WHITE CHALK SUBGROUP Grade Dm) <i>(stratum copied from 3.00m from previous sheet)</i> ... UT100 sample description: 9.50m-9.95m: Structureless CHALK composed of off-white gravelly SILT. Gravel is off-white with rare black specks weak medium density subrounded to rounded fine to coarse. Orange stained sponge bed visible on gravel fragments at 9.80m-9.85m. (Grade Dm)	-8.80	9.95	
						Borehole terminated at 9.95m depth.			

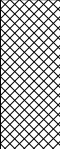
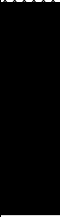
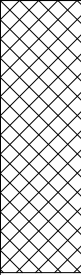
Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									All dimensions in metres	Scale: 1:25
Method Used:	Inspection pit + Cable percussion			Plant Used:	Dando 2000 Mark 2			Drilled By:	Martin Reeves	
								Logged By:	KDalton	
								Checked By:	 	



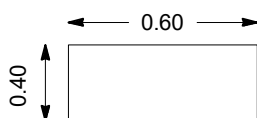
STRUCTURAL SOILS

TRIAL PIT LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme	Client: Havant Borough Council		Trial Pit: HDTP102
Contract Ref: 736036	Start: 23.09.21 End: 23.09.21	Ground Level (m AOD): 3.05	National Grid Co-ordinate: E:471908.4 N:104831.7
Sheet: 1 of 3			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend	
Depth	No	Type	Results							
0.20-0.30	1	D	1xT+2xJ+1xV 0.0ppm			MADE GROUND: PAVING SLAB.	3.01	0.04		
0.20	101	ES				MADE GROUND: Yellowish brown mottled dark brown slightly gravelly slightly clayey fine to coarse SAND with occasional roots (up to 15mm diameter). Gravel is angular fine to coarse mortar, brick and flint.	2.75	0.30		
0.20		PID								
0.30-0.50	2	B	1xT+2xJ+1xV c _u =20/25/20 0.1ppm			MADE GROUND: Very soft to soft/friable brown mottled light brown slightly sandy gravelly CLAY with occasional to frequent fragments of oyster shells. Sand is fine to coarse. Gravel is angular to subangular fine to coarse chalk, brick and flint. ... At 0.80m-1.10m: abundant oyster shells.		(0.90)		
0.50	102	ES								
0.50		HP								
0.50		PID								
0.70-0.80	3	D								
0.80-1.00	4	B								
1.00	103	ES	1xT+2xJ+1xV 0.0ppm				Trial pit terminated at 1.20m depth.	1.85	1.20	
1.00		PID								

Plan (Not to Scale)



General Remarks

1. Location GPR, CAT & Genny scanned prior to commencement.
2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer.
3. Hand excavated from ground level to 1.20m depth.
4. No groundwater encountered.
5. Trial pit stable.
6. Hand auger and Mackintosh Probe not completed due to neighbours concern over digging close to listed wall.
7. Location backfilled with bentonite and arisings on completion.

All dimensions in metres

Scale: **1:25**

Method Used:

Hand dug

Plant Used:

Hand tools

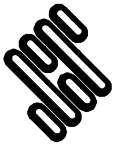
Logged By:

KDodd

Checked By:

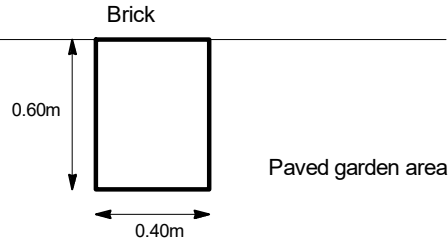
SS



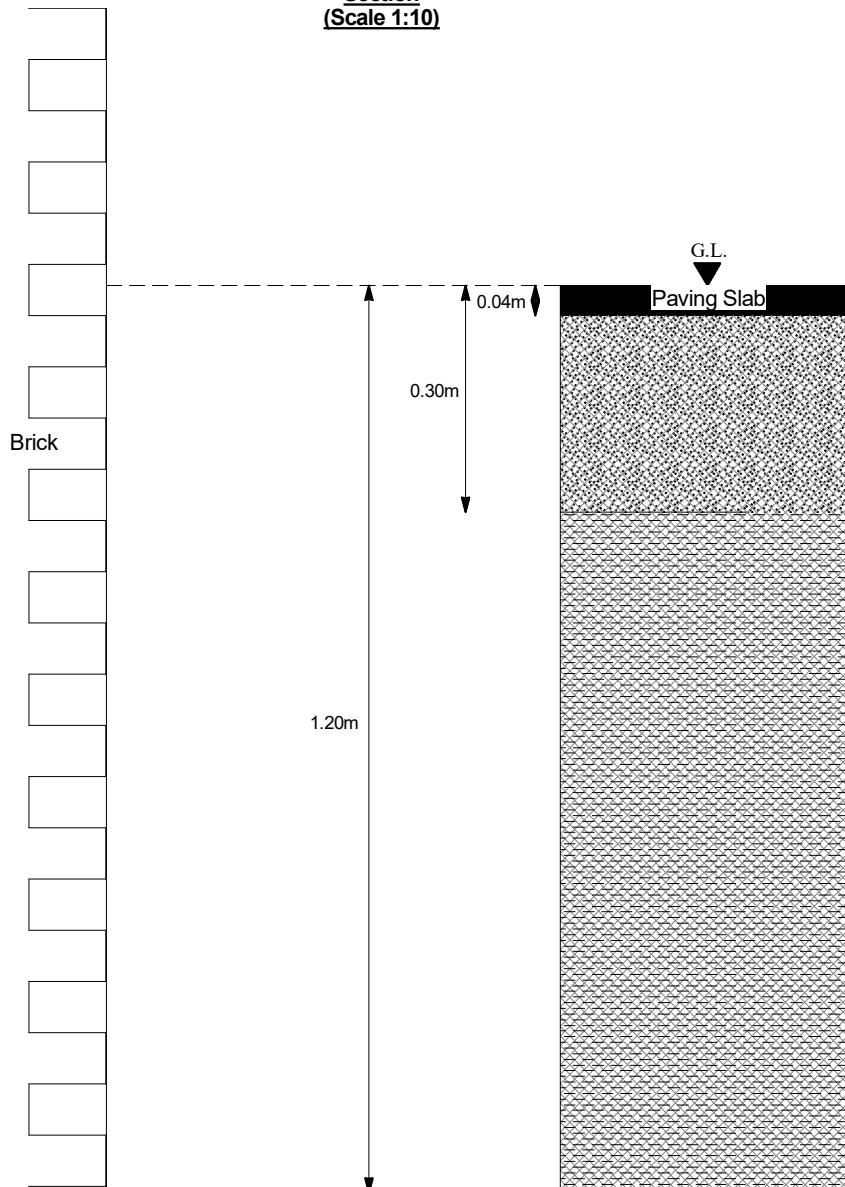


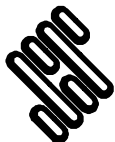
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP102
Contract Ref: 736036	Start: 23.09.21 End: 23.09.21	Ground Level (m AOD): 3.05	National Grid Co-ordinate: E:471908.4 N:104831.7	Sheet: 2 of 3

Plan
(Not to Scale)



Section
(Scale 1:10)

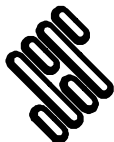




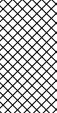
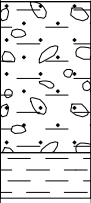
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HOTP102
Contract Ref: 736036	Start: 23.09.21 End: 23.09.21	Ground Level (m AOD): 3.05	National Grid Co-ordinate: E:471908.4 N:104831.7	Sheet: 3 of 3

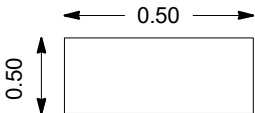


Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By: SS	AGS
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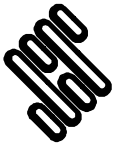


Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HOTP103
Contract Ref: 736036	Start: 16.09.21 End: 16.09.21	Ground Level (m AOD): 0.83	National Grid Co-ordinate: E:471653.1 N:104789.8	Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20-0.30	1	D	1xT+2xJ+1xV 0.4ppm			Multicoloured (brown, dark grey, black and off-white) sandy slightly clayey angular to subrounded fine to coarse GRAVEL of flint and chalk with frequent to abundant shell fragments. Sand is fine to coarse. (BEACH DEPOSIT)	0.33	0.50	
0.20	101	ES							
0.20-0.40	2	B							
0.20	PID								
0.50-0.60	3	D				Soft bluish grey mottled grey and yellowish brown slightly gravelly slightly sandy CLAY. Gravel is subangular fine to medium of flint. Sand is fine to coarse. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED)) Trial pit terminated at 0.65m depth.	0.18	0.65	

Plan (Not to Scale)		General Remarks		
		1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated from ground level to 0.65m depth. 4. Groundwater encountered at 0.12m; fast inflow. 5. Trial pit stable. 6. Hand augering attempted at base of pit; refusal due to water ingress and instability. 7. Mackintosh Probe test undertaken at base of pit; results presented separately. 8. Location backfilled with bentonite and arisings on completion.		
Method Used: Hand dug		Plant Used: Hand tools	Logged By: KDodd	Checked By:  AGS

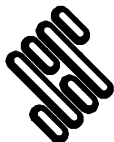
GINT LIBRARY V10.01.GLB LibVersion: v8.07 | Log TRIAL PIT LOG - A4P | 736036 LANGSTONE FLOOD & COASTAL EROSION MANAGEMENT SCHEME GPJ - v10.01.
Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel: 0117-947-1000, Web: www.sols.co.uk, Email: ask@sols.co.uk | 11/01/22 - 08:34 | SS5



Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP103
Contract Ref: 736036	Start: 16.09.21 End: 16.09.21	Ground Level (m AOD): 0.83	National Grid Co-ordinate: E:471653.1 N:104789.8	Sheet: 2 of 2



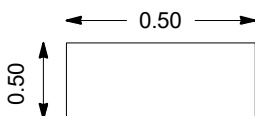
Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By: SS	AGS
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Contract:	Langstone Flood & Coastal Erosion Management Scheme		Client:	Havant Borough Council		Trial Pit:	HDTP104	
Contract Ref:	736036		Start: 16.09.21	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:	1 of 2	
			End: 16.09.21	0.49	E:471608.8 N:104773.5			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20	101	ES	1xT+2xJ+1xV			Multicoloured (black, brown and off-white) slightly sandy very clayey angular to subrounded fine to coarse GRAVEL of flint and chalk with frequent to abundant shell fragments. Sand is fine to coarse. (BEACH DEPOSIT) Soft bluish grey and yellowish brown slightly gravelly slightly sandy SILT with occasional shell fragments. Gravel is subrounded to rounded fine to coarse chalk. Sand is fine to coarse. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED)) Soft greyish brown slightly sandy slightly gravelly CLAY with a low cobble content. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse flint and chalk. Cobbles are subrounded flint up to 150mm x 100mm. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED)) Trial pit terminated at 1.00m depth.	0.34	0.15	
0.20		PID	0.8ppm						
0.40-0.50	1	D						(0.65)	
0.40-0.60	2	B							
0.40		V	$c_u=20/24/24$						
0.40		V	$c_c=9/4/8$						
0.50	102	ES	1xT+2xJ+1xV				-0.31	0.80	
0.50		PID	0.2ppm						
0.80-1.00	3	B					-0.51	1.00	
1.00	103	ES	1xT+2xJ+1xV						

Plan (Not to Scale)



General Remarks

1. Location GPR, CAT & Genny scanned prior to commencement.
2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer.
3. Hand excavated from ground level to 1.00m depth.
4. Groundwater encountered at 0.70m; slow inflow.
5. Trial pit unstable.
6. Hand augering attempted at base of pit; refusal due to gravel.
7. Mackintosh Probe test undertaken at base of pit; results presented separately.
8. Location backfilled with bentonite and arisings on completion.

All dimensions in metres

Scale: **1:25**

Method Used:

Hand dug

Plant Used:

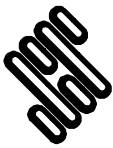
Hand tools

Logged By:

KDodd

Checked By:





Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP104
Contract Ref: 736036	Start: 16.09.21 End: 16.09.21	Ground Level (m AOD): 0.49	National Grid Co-ordinate: E:471608.8 N:104773.5	Sheet: 2 of 2

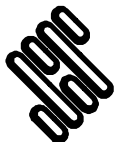


Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By: SS	AGS
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Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20 0.20 0.30-0.50 0.40-0.50	101 1 2	ES PID LB D	1xT+2xJ+1xV 0.1ppm		 	Multicoloured (brown, black, white, orange and yellow) slightly sandy slightly silty angular to subrounded fine to coarse GRAVEL of flint and chalk. Sand is fine to coarse. (BEACH DEPOSIT)	1.03	(0.50)	
						Trial pit terminated at 1.00m depth due to colapse.			

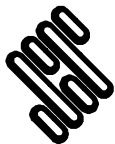
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Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB Tel: 0117-947-1000, Fax: 0117-947-1004 Web: www.solis.co.uk | 11/01/22 - 08:35 | S55 |



Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP105
Contract Ref: 736036	Start: 16.09.21 End: 16.09.21	Ground Level (m AOD): 1.53	National Grid Co-ordinate: E:471569.5 N:104776.9	Sheet: 2 of 2



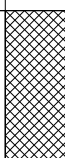
Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By: SS	AGS
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STRUCTURAL SOILS

COMPOSITE AUGER LOG

Contract:	Langstone Flood & Coastal Erosion Management Scheme		Client:	Havant Borough Council		Position:	HDTP106	
Contract Ref:	736036		Date:	28.09.21		Ground Level (m AOD):	2.34	
						National Grid Co-ordinate:	E:471978.6 N:105006.5	
						Sheet:	1 of 2	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20-0.30	1	D	0.0ppm			Brown clayey fine to coarse SAND with frequent roots and wood fragments. (TOPSOIL)	2.19	0.15	
0.20	101	ES			Very soft brown slightly gravelly slightly sandy CLAY with frequent pockets of dark brown and black organic matter (up to 30 x 10mm). Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. (ALLUVIUM)		(1.25)		
0.20		PID							
0.30-0.50	2	B							
0.50	102	ES							
0.50		V							
0.50		V							
0.50		PID							
0.70-0.80	3	D	c _u =16/18/16 c _c =6/7/7 0.0ppm						
0.80-1.00	4	B							
1.00	103	ES							
1.00		PID							
1.20-1.40	5	D	0.0ppm			... at 1.20m: becomes gravelly.	0.94	1.40	
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									
									

General Remarks

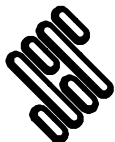
1. Location CAT & Genny scanned prior to commencement.
2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer.
3. Hand excavated from ground level to 1.20m depth.
4. Groundwater encountered at 0.60m; seepage.
5. Trial pit unstable.
6. Hand augered from 1.20m to 1.40m depth; refusal due to gravel.
7. Mackintosh Probe test undertaken at base of pit; results presented separately.
8. Location backfilled with bentonite and arisings on completion.

All dimensions in metres

Scale:

1:25

Method Used:	Trial Pit/trench + Hand Auger	Plant Used:	Hand tools + Hand auger	Drilled By:	Michael O'Shea	Logged By:	KDodd	Checked By:		
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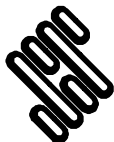


Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Position: HDTP106
Contract Ref: 736036	Date: 28.09.21	Ground Level (m AOD): 2.34	National Grid Co-ordinate: E:471978.6 N:105006.5	Sheet: 2 of 2



General Remarks

All dimensions in metres				Scale: 1:25
Method Used: Trial Pit/trench + Hand Auger	Plant Used: Hand tools + Hand auger	Drilled By: Michael O'Shea	Logged By: KDodd	Checked By: SS 

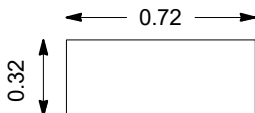


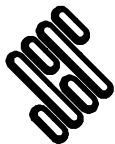
STRUCTURAL SOILS

TRIAL PIT LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme	Client: Havant Borough Council			Trial Pit: HOTP107
Contract Ref: 736036	Start: 17.09.21 End: 17.09.21	Ground Level (m AOD): 2.88	National Grid Co-ordinate: E:471915.3 N:104820.6	Sheet: 1 of 3

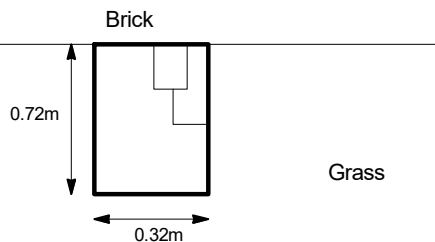
Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20-0.30	1	D	1xT+2xJ+1xV			MADE GROUND: Grass over brown very sandy very clayey angular to rounded fine to coarse GRAVEL of flint, tile and brick with occasional roots and rare oyster shells noted. Sand is fine to coarse. ... 0.15m to 0.30m: subrounded cobble of limestone (250 x 150 x 150mm). ... from 0.30m: becoming clayey.	2.38	(0.50)	
0.20	101	ES	0.2ppm						
0.30-0.50	2	B						0.50	
0.50	102	ES	1xT+2xJ+1xV			MADE GROUND: Brown gravelly very clayey fine to coarse SAND with a low cobble content. Gravel is angular to subangular brick up to 100 x 80 x 100mm. ... at 0.50m to 0.60m: angular cobble of concrete paving slab (400 x 280 x 50mm). ... 0.50-0.70m: bulk sample description (from lab results) dark brown mottled red slightly gravelly slightly sandy CLAY with brick fragments. Trial pit terminated at 0.70m depth.	2.18		
0.50-0.70	4	B						0.70	
0.60-0.70	3	D	0.0ppm						

Plan (Not to Scale)		General Remarks		
		1. Location GPR, CAT and Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated from ground level to 0.70m depth. 4. No groundwater encountered. 5. Trial pit unstable. 6. Unable to hand auger due to cobbles. 7. Mackintosh Probe test undertaken from ground level next to the pit; results presented separately. 8. Location backfilled with bentonite and arisings on completion.		
Method Used: Hand dug		Plant Used: Hand tools	Logged By: KDodd	Checked By: SS 

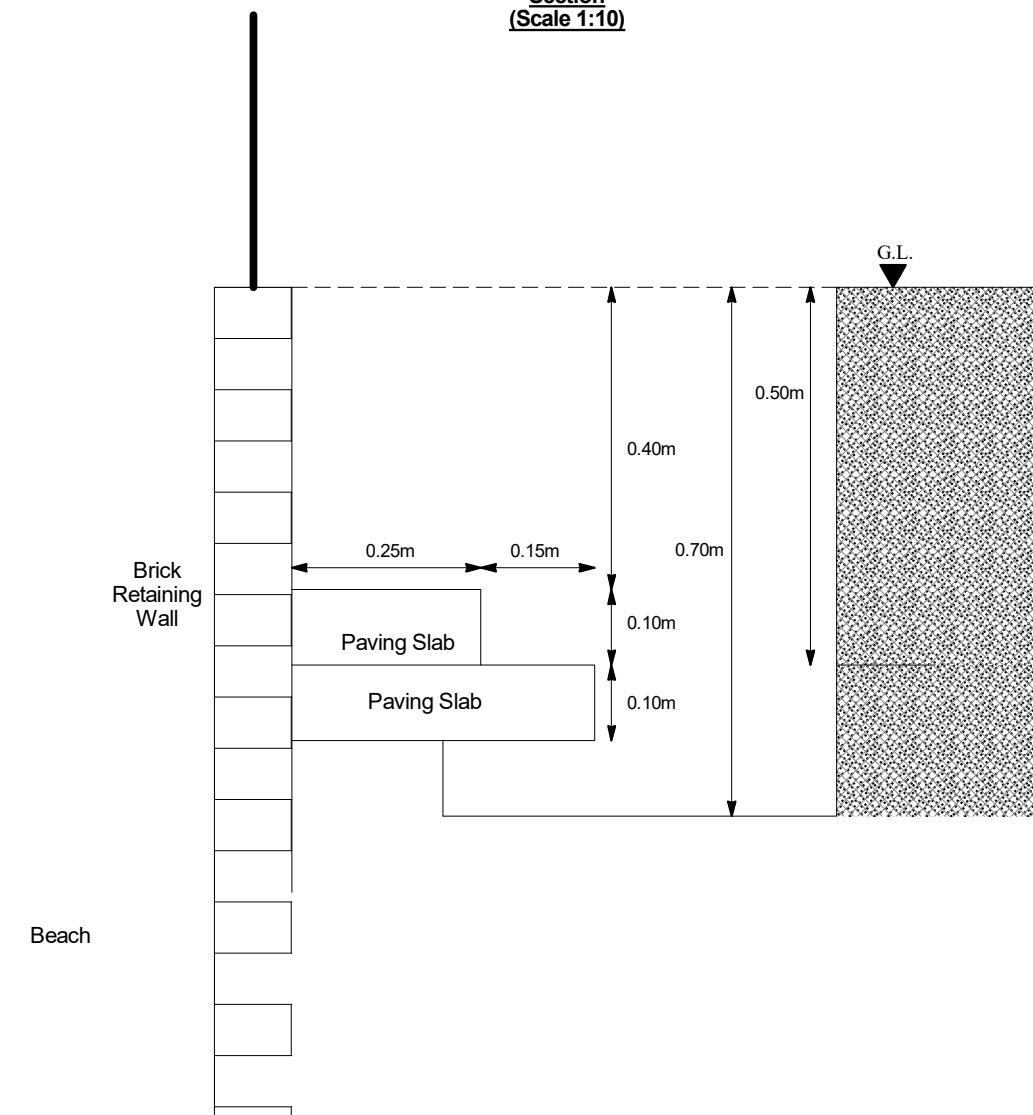


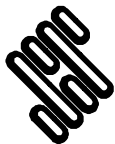
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HOTP107
Contract Ref: 736036	Start: 17.09.21 End: 17.09.21	Ground Level (m AOD): 2.88	National Grid Co-ordinate: E:471915.3 N:104820.6	Sheet: 2 of 3

Plan
(Not to Scale)



Section
(Scale 1:10)

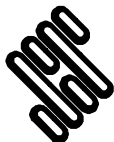




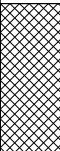
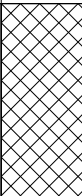
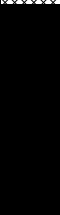
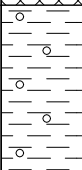
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP107
Contract Ref: 736036	Start: 17.09.21 End: 17.09.21	Ground Level (m AOD): 2.88	National Grid Co-ordinate: E:471915.3 N:104820.6	Sheet: 3 of 3



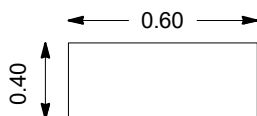
Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By: SS	AGS
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Contract:	Langstone Flood & Coastal Erosion Management Scheme		Client:	Havant Borough Council		Trial Pit:	HDTP108	
Contract Ref:	736036		Start: 17.09.21	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:	1 of 3	
			End: 17.09.21	2.95	E:471904.5 N:104780.9			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20-0.40	1	B	1xT+2xJ+1xV 0.1ppm			MADE GROUND: Grass over brown very gravelly very silty fine to coarse SAND with frequent roots. Gravel is subangular to rounded fine to medium flint and brick. ... at 0.25m: becoming clayey.	2.30	0.65	
0.20	101	ES							
0.20		PID							
0.30-0.40	2	D	0.2ppm			Firm brown and orangish brown slightly gravelly slightly sandy CLAY. Gravel is subangular to rounded fine to coarse flint. Sand is fine to coarse. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED)) ... from 0.80m: occasional oyster shell fragments.	1.75	1.20	
0.50	102	ES							
0.50		PID							
0.70-0.90	3	B	1xT+2xJ+1xV			(BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED)) ... from 0.80m: occasional oyster shell fragments.	1.75	1.20	
0.80-0.90	4	D							
1.00	103	ES	0.0ppm			Trial pit terminated at 1.20m depth.			
1.00-1.20	5	B							
1.00		PID							

Plan (Not to Scale)



General Remarks

1. Location GPR, CAT and Genny scanned prior to commencement.
2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer.
3. Hand excavated from ground level to 1.20m depth.
4. No groundwater encountered.
5. Trial pit stable
6. Mackintosh Probe test undertaken from ground level next to the pit; results presented separately.
7. Location backfilled with bentonite and arisings on completion.

All dimensions in metres

Scale: **1:25**

Method Used:

Hand dug

Plant Used:

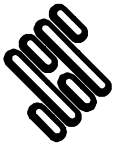
Hand tools

Logged By:

KDodd

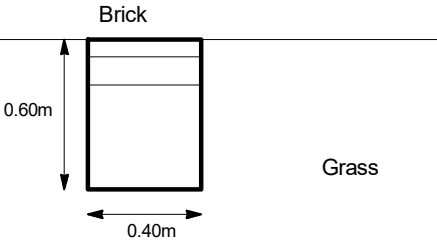
Checked By:



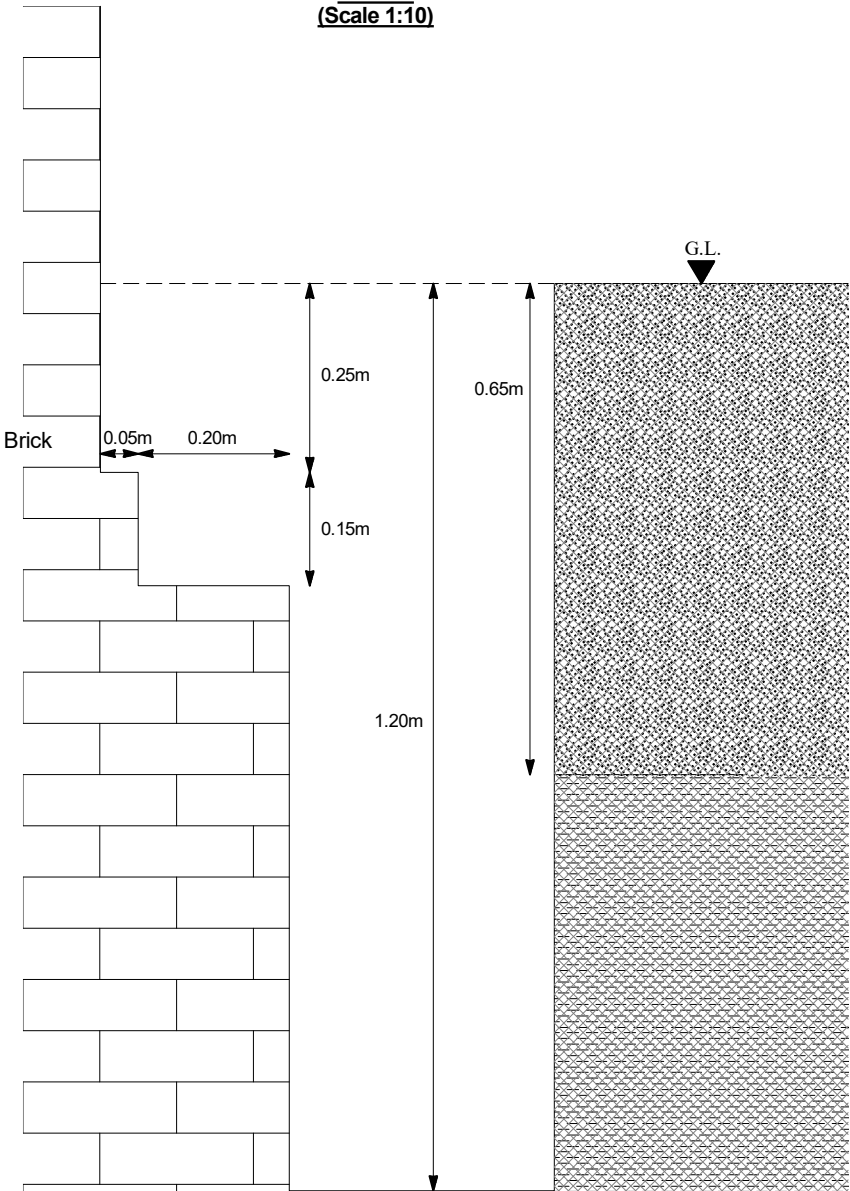


Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP108
Contract Ref: 736036	Start: 17.09.21 End: 17.09.21	Ground Level (m AOD): 2.95	National Grid Co-ordinate: E:471904.5 N:104780.9	Sheet: 2 of 3

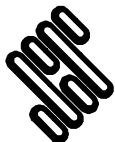
Plan
(Not to Scale)



Section
(Scale 1:10)



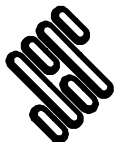
Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By: SS	AGS
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Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP108
Contract Ref: 736036	Start: 17.09.21 End: 17.09.21	Ground Level (m AOD): 2.95	National Grid Co-ordinate: E:471904.5 N:104780.9	Sheet: 3 of 3



Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By: SS	AGS
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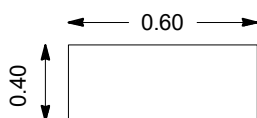
STRUCTURAL SOILS

TRIAL PIT LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme	Client: Havant Borough Council			Trial Pit: HDTP109
Contract Ref: 736036	Start: 17.09.21 End: 17.09.21	Ground Level (m AOD): 2.87	National Grid Co-ordinate: E:471908.1 N:104769.5	Sheet: 1 of 3

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend			
Depth	No	Type	Results									
0.20-0.30	1	D	1xT+2xJ+1xV 0.1ppm			MADE GROUND: Grass over brown gravelly slightly clayey fine to coarse SAND with a low cobble content and occasional roots. Gravel is angular to subrounded fine to coarse flint and brick. Cobbles are tabular, angular slate up to 100 x 120 x 10mm.	2.57	0.30				
0.20	101	ES										
0.20		PID										
0.30-0.50	2	B	1xT+2xJ+1xV 0.1ppm				MADE GROUND: Firm/friable brown slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse brick and flint. Sand is fine to coarse.	1.92	0.95			
0.50	102	ES										
0.50		PID										
0.70-0.80	3	D	1xT+2xJ+1xV					Firm to stiff orangish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse flint. Sand is fine to coarse.	1.62	1.25		
1.00	103	ES										
1.00-1.20	4	B										
1.00-1.10	5	D	0.2ppm						(BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED))	Trial pit terminated at 1.25m depth.		
1.00		PID										

Plan (Not to Scale)



General Remarks

1. Location GPR, CAT and Genny scanned prior to commencement.
2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer.
3. Hand excavated from ground level to 1.20m depth.
4. No groundwater encountered.
5. Trial pit stable.
6. Mackintosh Probe test undertaken from ground level next to the pit; results presented separately.
7. Location backfilled with bentonite and arisings on completion.

All dimensions in metres

Scale: **1:25**

Method Used:

Hand dug

Plant Used:

Hand tools

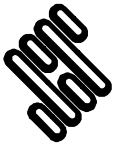
Logged By:

KDodd

Checked By:

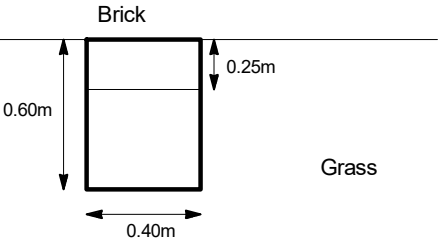
SS



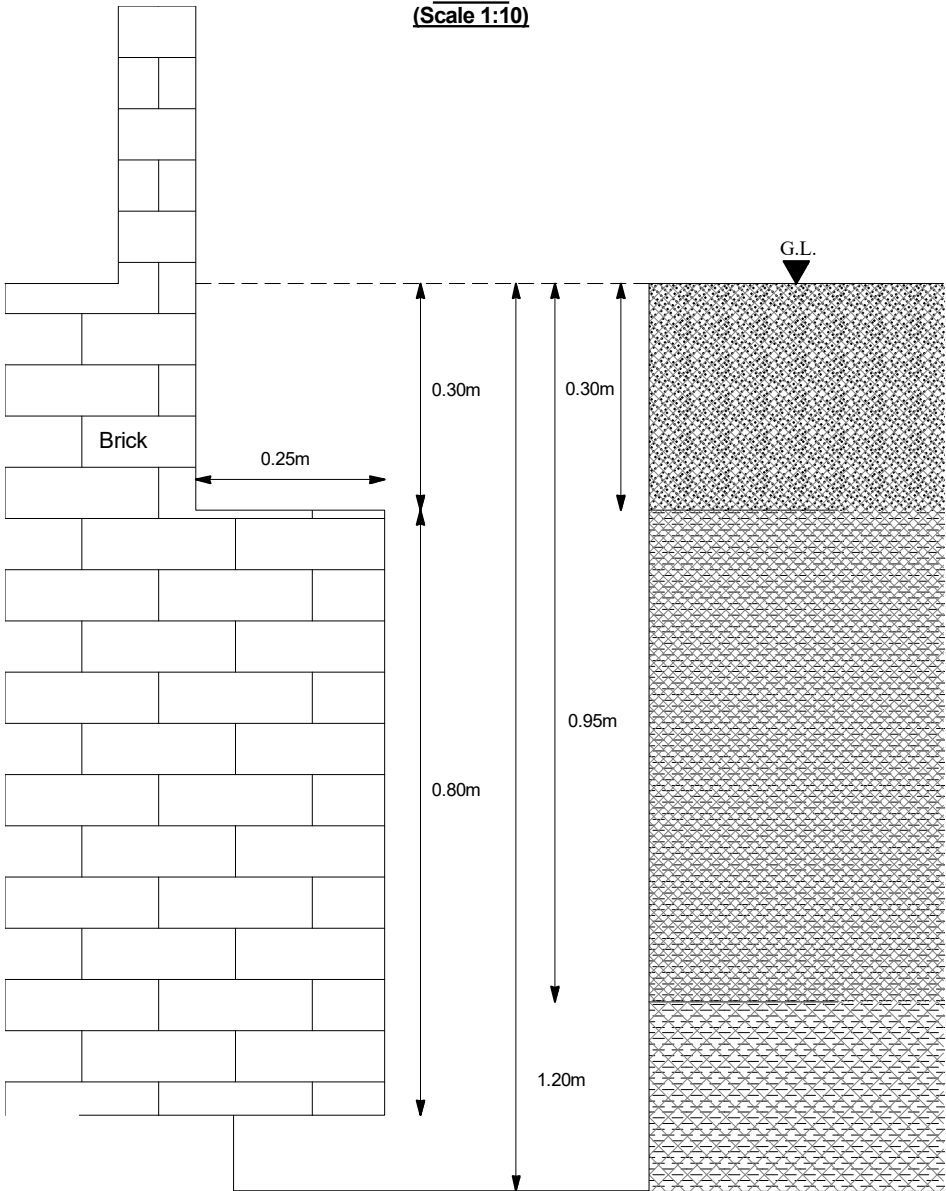


Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP109
Contract Ref: 736036	Start: 17.09.21 End: 17.09.21	Ground Level (m AOD): 2.87	National Grid Co-ordinate: E:471908.1 N:104769.5	Sheet: 2 of 3

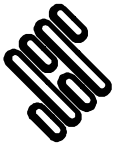
Plan
(Not to Scale)



Section
(Scale 1:10)



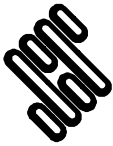
Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By: SS	AGS
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Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP109
Contract Ref: 736036	Start: 17.09.21 End: 17.09.21	Ground Level (m AOD): 2.87	National Grid Co-ordinate: E:471908.1 N:104769.5	Sheet: 3 of 3



Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By: SS	AGS
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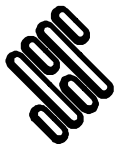


Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP110
Contract Ref: 736036	Start: 16.09.21 End: 16.09.21	Ground Level (m AOD): 2.84	National Grid Co-ordinate: E:471897.8 N:104759.3	Sheet: 1 of 3

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend	
Depth	No	Type	Results							
0.20	101	ES	1xT+2xJ+1xV 0.1ppm			MADE GROUND: Multicoloured (white, brown and black) slightly sandy angular to subrounded fine to coarse GRAVEL of flint, chalk, brick and red tile. Sand is fine to coarse.	2.74	0.10		
0.20		PID								
0.30-0.40	1	D	1xT+2xJ+1xV 0.1ppm			MADE GROUND: Brown mottled greyish yellow gravelly clayey fine to coarse SAND with a medium cobble content. Gravel is angular to subrounded fine to coarse predominantly brick, flint and brown tile fragments. Cobbles are angular to subrounded of flint. ... 0.50m: cobbles are subrounded brick fragments up to 170mm x 60mm x 100mm.		(1.10)		
0.30-0.50	2	B								
0.50	102	ES								
0.50		PID								
0.90-1.00	3	D	1xT+2xJ+1xV 0.0ppm			Trial pit terminated at 1.20m depth.	1.64	1.20		
0.90-1.20	4	B								
1.00	103	ES								
1.00		PID								

Plan (Not to Scale)		General Remarks		
		1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated from ground level to 1.20m depth. 4. Groundwater encountered at 0.90m; seepage. 5. Trial pit stable. 6. Mackintosh Probe not undertaken due to gravel and cobble content. 7. Location backfilled with bentonite and arisings on completion.		
All dimensions in metres		Scale: 1:25		
Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By:	

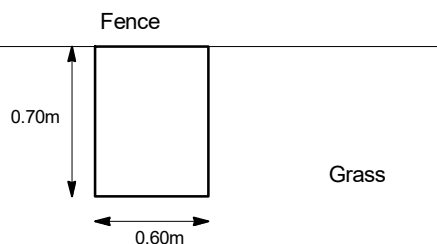
GINT LIBRARY_V10_01.GLB LibVersion: v8.07 | Log TRIAL PIT LOG - A4P | 736036 LANGSTONE FLOOD & COASTAL EROSION MANAGEMENT SCHEME GPJ - v10_01.
Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel: 0117-947-1000, Web: www.sols.co.uk, Email: ask@sols.co.uk | 11/01/22 - 08:39 | SS5



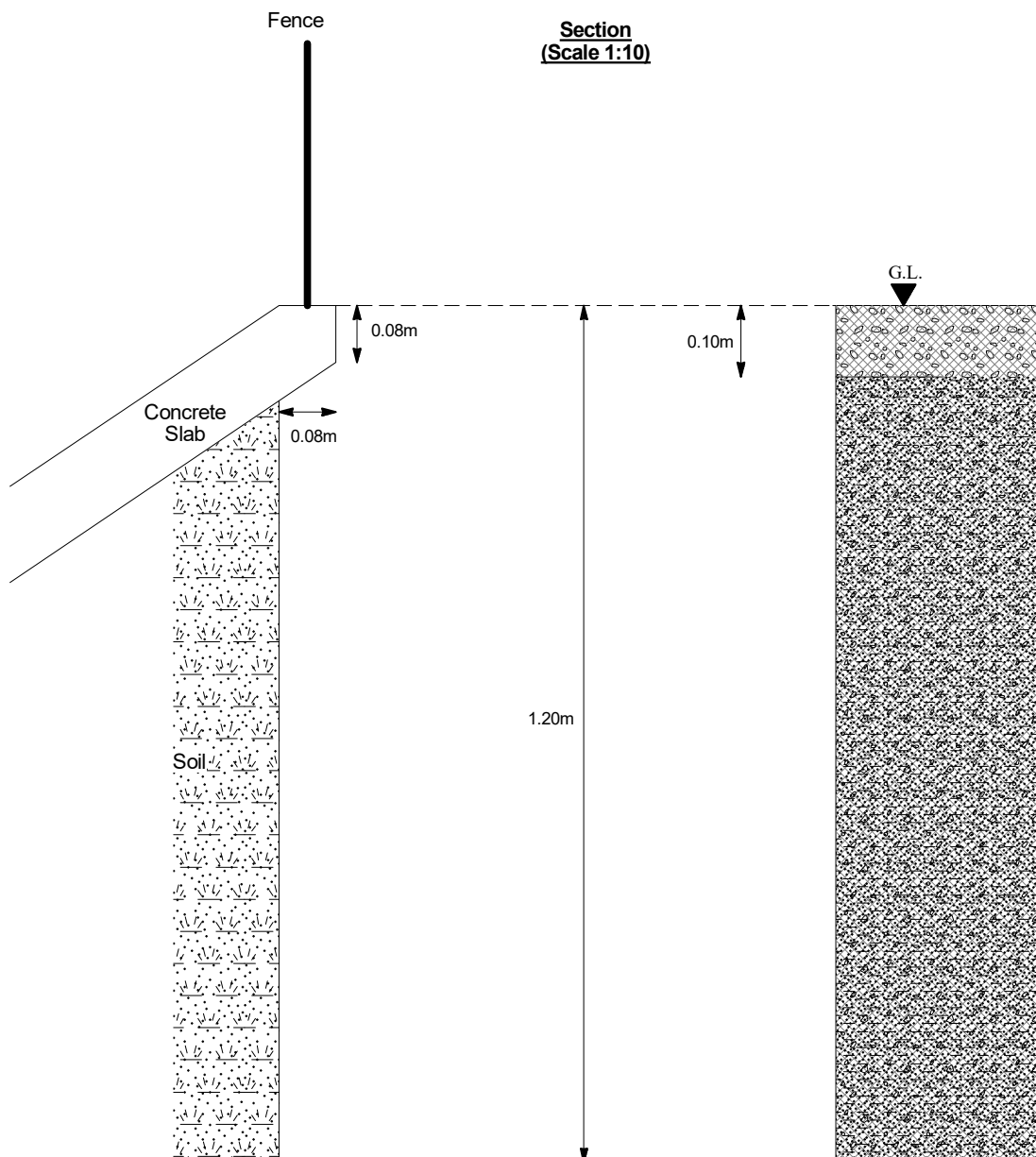
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP110
Contract Ref: 736036	Start: 16.09.21 End: 16.09.21	Ground Level (m AOD): 2.84	National Grid Co-ordinate: E:471897.8 N:104759.3	Sheet: 2 of 3

Foundation pit

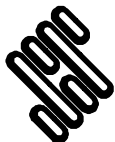
Plan
(Not to Scale)



Section
(Scale 1:10)



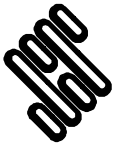
Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By: SS	AGS
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Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP110
Contract Ref: 736036	Start: 16.09.21 End: 16.09.21	Ground Level (m AOD): 2.84	National Grid Co-ordinate: E:471897.8 N:104759.3	Sheet: 3 of 3



Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By: SS	AGS
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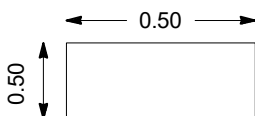
STRUCTURAL SOILS

TRIAL PIT LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme	Client: Havant Borough Council			Trial Pit: HOTP111
Contract Ref: 736036	Start: 23.09.21 End: 23.09.21	Ground Level (m AOD): 2.06	National Grid Co-ordinate: E:471794.0 N:104723.3	Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.15 0.15 0.20-0.30 0.20 0.20 0.30-0.50 0.50 0.50 0.50 0.70-1.00 0.90 0.90	1 101	V V D ES PID	$c_u=22/26/22$ $c_r=8/8/6$ 1xT+2xJ+1xV 0.0ppm			MADE GROUND: Salt marsh grass over soft brown slightly sandy slightly gravelly CLAY with occasional plastic fragments, labels and crisp packets. Gravel is angular to subrounded fine to coarse flint and chalk. Sand is fine to coarse.	1.46	(0.60) 0.60	
		B EW ES PID B	 1xT+2xJ+1xV 0.0ppm			Brownish grey sandy clayey angular to subangular fine to coarse GRAVEL of flint. Sand is fine to coarse. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED))	1.06	(0.40) 1.00	
		ES PID	1xT+12xJ+1xV 0.2ppm			Trial pit terminated at 1.00m depth due to groundwater ingress.			

Plan (Not to Scale)



General Remarks

1. Location GPR, CAT & Genny scanned prior to commencement.
2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer.
3. Hand excavated from ground level to 1.20m depth.
4. Groundwater encountered at 1.00m; fast seepage.
5. Trial pit stable.
6. Unable to progress pit beyond 1.00m depth due to water ingress and gravel; hand auger attempted but too gravelly.
7. Mackintosh Probe undertaken from 1.00m depth; results presented separately.
8. Location backfilled with bentonite and arisings on completion.

All dimensions in metres

Scale: **1:25**

Method Used:

Hand dug

Plant Used:

Hand tools

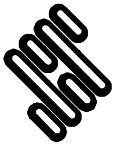
Logged By:

KDodd

Checked By:

SS

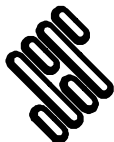




Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: HDTP111
Contract Ref: 736036	Start: 23.09.21 End: 23.09.21	Ground Level (m AOD): 2.06	National Grid Co-ordinate: E:471794.0 N:104723.3	Sheet: 2 of 2



Method Used: Hand dug	Plant Used: Hand tools	Logged By: KDodd	Checked By: SS	AGS
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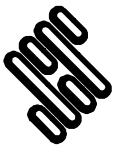
STRUCTURAL SOILS

TRIAL PIT LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme	Client: Havant Borough Council		Trial Pit: MDTP101
Contract Ref: 736036	Start: 15.09.21 End: 15.09.21	Ground Level (m AOD): 1.88	National Grid Co-ordinate: E:471822.1 N:104508.5
Sheet: 1 of 2			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20 0.20	101	ES PID	1xT+2xJ+1xV 0.4ppm			MADE GROUND: Multicoloured (black, brown, yellow, orange and red) sandy subangular to rounded fine to coarse GRAVEL of flint, brick and chalk. Sand is fine to coarse. MADE GROUND: Greyish yellow gravelly slightly clayey fine to coarse SAND. Gravel is subangular to rounded fine to coarse flint, brick and chalk.	1.83	0.05	
0.50 0.50 0.50-0.60 0.50	1 102 2	D ES LB PID	1xT+2xJ+1xV 0.9ppm					(1.15)	
1.00 1.00 1.00 1.10-1.20 1.20 1.20 1.40 1.40	103 3 4 4 104	ES D PID LB V V ES PID	1xT+2xJ+1xV 0.5ppm $c_u=30/32/42$ $c_u=10/14/19$ 1xT+2xJ+1xV 1.1ppm			Soft dark grey slightly sandy slightly gravelly CLAY with frequent fragments of decomposing wood and a strong sulphurous odour. Sand is fine to coarse. Gravel is fine. (TIDAL FLAT DEPOSITS)	0.68	1.20	
1.60 1.70-1.80	5 6	D LB				. . . 1.70-1.80m: large bulk sample description (from lab results) dark grey slightly gravelly slightly sandy SILT with organics.		(0.80)	
						Trial pit terminated at 2.00m depth due to collapse.	-0.12	2.00	

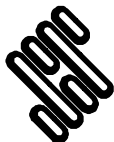
Plan (Not to Scale)		General Remarks	
		1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Machine excavated from ground level to 2.00m depth. 4. Groundwater encountered at 1.00m; medium inflow. 5. Trial pit unstable from ground level and complete collapse from 2.00m; unable to progress excavation. 6. Location backfilled with arisings on completion.	
All dimensions in metres		Scale: 1:25	
Method Used: Machine dug	Plant Used: 8 Ton Tracked Excavator	Logged By: KDodd	Checked By:



Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: MDTP101
Contract Ref: 736036	Start: 15.09.21 End: 15.09.21	Ground Level (m AOD): 1.88	National Grid Co-ordinate: E:471822.1 N:104508.5	Sheet: 2 of 2



Method Used: Machine dug	Plant Used: 8 Ton Tracked Excavator	Logged By: KDodd	Checked By: SS	AGS
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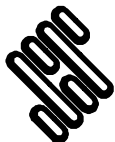
STRUCTURAL SOILS

TRIAL PIT LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: MDTP102
Contract Ref: 736036	Start: 15.09.21 End: 15.09.21	Ground Level (m AOD): 2.22	National Grid Co-ordinate: E:471831.7 N:104476.7	Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20 0.20 0.20-0.30 0.20 0.50 0.50	1 101 2 102	D ES LB PID ES PID	1xT+2xJ+1xV 0.2ppm 1xT+2xJ+1xV 0.3ppm			MADE GROUND: Multicoloured (white, black, brown, yellow, orange and red) slightly sandy subangular to rounded fine to coarse GRAVEL of flint, chalk and brick with a medium cobble content. Sand is fine to coarse. Cobbles are subangular to subrounded of flint. MADE GROUND: Greyish yellow very sandy slightly clayey subangular to rounded fine to coarse GRAVEL of flint, chalk and brick. Sand is fine to coarse.	2.17	0.05	
1.00 1.00	103	ES PID	1xT+2xJ+1xV 0.3ppm					(1.65)	
1.20 1.20-1.30	3 4	D LB							
1.60 1.60-1.70 1.70-1.80 1.70-1.80 1.70 1.70	5 6 7 8	D LB D B V V	 $c_u=28/20/32$ $c_r=4/2/9$			Soft black mottled brown slightly sandy CLAY. Sand is fine. (TIDAL FLAT DEPOSITS) Trial pit terminated at 1.80m depth due to collapse.	0.52 0.42	1.70 1.80	

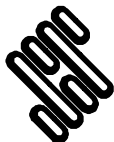
Plan (Not to Scale)		General Remarks		
		1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Machine excavated from ground level to 1.80m depth. 4. Groundwater encountered at 1.30m; fast inflow. 5. Trial pit unstable from 1.80m; unable to progress excavation. 6. Location backfilled with arisings on completion.		
Method Used: Machine dug		Plant Used: 8 Ton Tracked Excavator	Logged By: KDodd	Checked By:



Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: MDTP102
Contract Ref: 736036	Start: 15.09.21 End: 15.09.21	Ground Level (m AOD): 2.22	National Grid Co-ordinate: E:471831.7 N:104476.7	Sheet: 2 of 2



Method Used: Machine dug	Plant Used: 8 Ton Tracked Excavator	Logged By: KDodd	Checked By: SS	AGS
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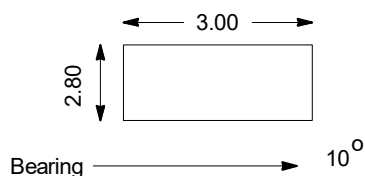
STRUCTURAL SOILS

TRIAL PIT LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: MDTP103
Contract Ref: 736036	Start: 15.09.21 End: 15.09.21	Ground Level (m AOD): 2.49	National Grid Co-ordinate: E:471837.0 N:104456.0	Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20-0.30	1	B				MADE GROUND: Multicoloured (white, black, brown, orange, yellow and red) slightly sandy subangular to rounded fine to coarse GRAVEL of flint, chalk and brick with a medium cobble content. Cobbles are subangular to subrounded of flint.	2.44	0.05	
0.20	101	ES	1xT+2xJ+1xV						
0.20		V	c _u =62/26/40			MADE GROUND: Soft to firm brown locally mottled bluish grey and red slightly sandy slightly gravelly CLAY with a medium cobble content and occasional to frequent shell fragments. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse flint, chalk and brick. Cobbles are subangular to subrounded flint, chalk and brick (up to 270 x 200 x 180mm). ... At 0.50m-3.00m: lenses of red clay (up to 45 x 30 x 30mm).			
0.20		V	c _u =18/8/15						
0.20		PID	0.2ppm						
0.50	102	ES	1xT+2xJ+1xV						
0.50	2	D							
0.50		PID	0.2ppm						
0.70		V	c _u =10/52/46						
0.70		V	c _u =2/30/20						
1.00	103	ES	1xT+2xJ+1xV						
1.00		PID	0.3ppm						
1.20		V	c _u =76/74/78			(3.45)			
1.20		V	c _u =26/20/19						
1.30-1.40	3	B							
1.50	4	D							
1.70		V	c _u =32/40/72						
1.70		V	c _u =15/12/18						
2.20		V	c _u =28/30/58						
2.20		V	c _u =10/8/15						
2.30-2.40	5	B							
2.50	6	D							
2.70		V	c _u =68/54/48			... At 3.30m particle size distribution test: sandy silty fine to coarse GRAVEL. Sand is fine to coarse.			
2.70		V	c _u =15/22/15						
2.90-3.00	7	B							
3.10-3.20	8	B							
3.30-3.50	9	B							
						Trial pit terminated at 3.50m depth.	-1.01	3.50	

Plan (Not to Scale)



General Remarks

1. Location GPR, CAT & Genny scanned prior to commencement.
2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer.
3. Machine excavated from ground level to 3.50m depth.
4. Groundwater encountered at 1.50m; fast inflow.
5. Trial pit unstable from 3.00m and collapse from 3.50m to 3.00m.
6. Location backfilled with arisings on completion.

All dimensions in metres

Scale: **1:25**

Method Used:

Machine dug

Plant Used:

8 Ton Tracked Excavator

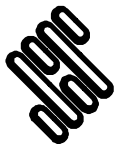
Logged By:

KDodd

Checked By:

SS

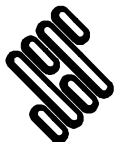




Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Trial Pit: MDTP103
Contract Ref: 736036	Start: 15.09.21 End: 15.09.21	Ground Level (m AOD): 2.49	National Grid Co-ordinate: E:471837.0 N:104456.0	Sheet: 2 of 2



Method Used: Machine dug	Plant Used: 8 Ton Tracked Excavator	Logged By: KDodd	Checked By: SS	AGS
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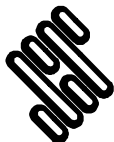
STRUCTURAL SOILS

WINDOW SAMPLE LOG

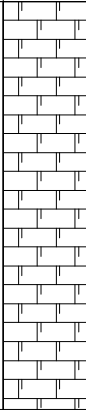
Contract: Langstone Flood & Coastal Erosion Management Scheme	Client: Havant Borough Council		Window Sample: DS101
Contract Ref: 736036	Start: 27.09.21 End: 27.09.21	Ground Level (m AOD): 1.97	National Grid Co-ordinate: E:471901.5 N:104745.9
Sheet: 1 of 4			

Progress	Samples / Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
	0.10-0.20	1	D				MADE GROUND: Beach shingle overlying brown, black and dark grey mottled gravelly clayey fine to coarse SAND with an organic odour. Gravel is angular to rounded fine to coarse flint.	1.72	0.25	
	0.20	101	ES	1xT+2xJ+1xV						
	0.20		PID	0.1ppm						
	0.30-0.50	2	B				MADE GROUND: Soft dark grey and black mottled slightly sandy gravelly CLAY with a low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint, brick and mortar. Cobbles are subangular brick (130 x 80 x 70mm).		(0.40)	
	0.40		V	c _u =22/24/27						
	0.40		V	c _u =8/10/11						
	0.50	102	ES	1xT+2xJ+1xV				1.32	0.65	
	0.50		PID	0.1ppm						
	0.70-0.80	3	D						(0.35)	
	0.70-0.90	4	B							
	0.90-1.35	5	SPT	N=17			Dark grey sandy clayey angular to rounded fine to coarse GRAVEL of flint. Sand is fine to coarse.	0.97	1.00	
	0.90	103	ES	1xT+2xJ+1xV			(BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED))		(0.40)	
	0.90-1.65	6	DSPT				Soft to firm dark grey, dark brown and black mottled slightly sandy slightly gravelly CLAY with rare shell fragments. Sand is fine to coarse.			
	0.90-1.40	7	D				(BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED))			
	0.90		PID	0.1ppm				0.57	1.40	
	1.40-1.90	8	D				Thinly bedded soft multicoloured (grey, yellowish brown, orangish brown and black) slightly gravelly slightly sandy CLAY. Gravel is subangular to rounded fine to coarse flint and chalk. Sand is fine to coarse.			
	1.70	104	ES	1xT+2xJ+1xV			(BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED))			
	1.70		PID	0.2ppm						
	1.75		HP	c _u =30/25/30						
	1.90-2.35	9	SPT	N=11						
	1.90-2.35	10	DSPT							
	2.40-2.90	11	D						(2.50)	
	2.90-3.35	12	SPT	N=6						
	2.90-3.35	13	DSPT							
	3.39-3.90	14	D							
	3.90-4.35		U	0% recovery			Zone of no recovery in U70 sample. ... 3.90-4.35m: no recovery from U70.	-1.93	3.90	
	3.90 - 4.90 (79mm dia) 40% rec								(0.50)	AZNR
	4.40-4.85	15	SPT	N=25			Description on next sheet	-2.43	4.40	

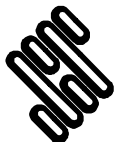
Drilling Progress and Water Observations						General Remarks							
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)								
27/09/21		0.75	-	400	0.75	1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated pit from ground level to 0.90m depth. 4. Dynamic windowless sampling from 0.90m to 5.85m depth. 5. Groundwater seepage noted at 0.75m depth. 6. Location backfilled with concrete from ground level to 0.50m and gravel from 0.50m to 5.85m. 7. SPT hammer DART227-2020 ($E_r = 73.80\%$) used.							
27/09/21		5.40	-	92	-								
						All dimensions in metres		Scale: 1:25					
Method Used:	Inspection pit + Tracked window sampling			Plant Used:	Supacat ATMP SS1105A		Drilled By:	Tom Saxton	Logged By:	KDodd	Checked By:	SS	AGS



Contract: Langstone Flood & Coastal Erosion Management Scheme			Client: Havant Borough Council		Window Sample: DS101
Contract Ref: 736036		Start: 27.09.21 End: 27.09.21	Ground Level (m AOD): 1.97	National Grid Co-ordinate: E:471901.5 N:104745.9	Sheet: 2 of 4

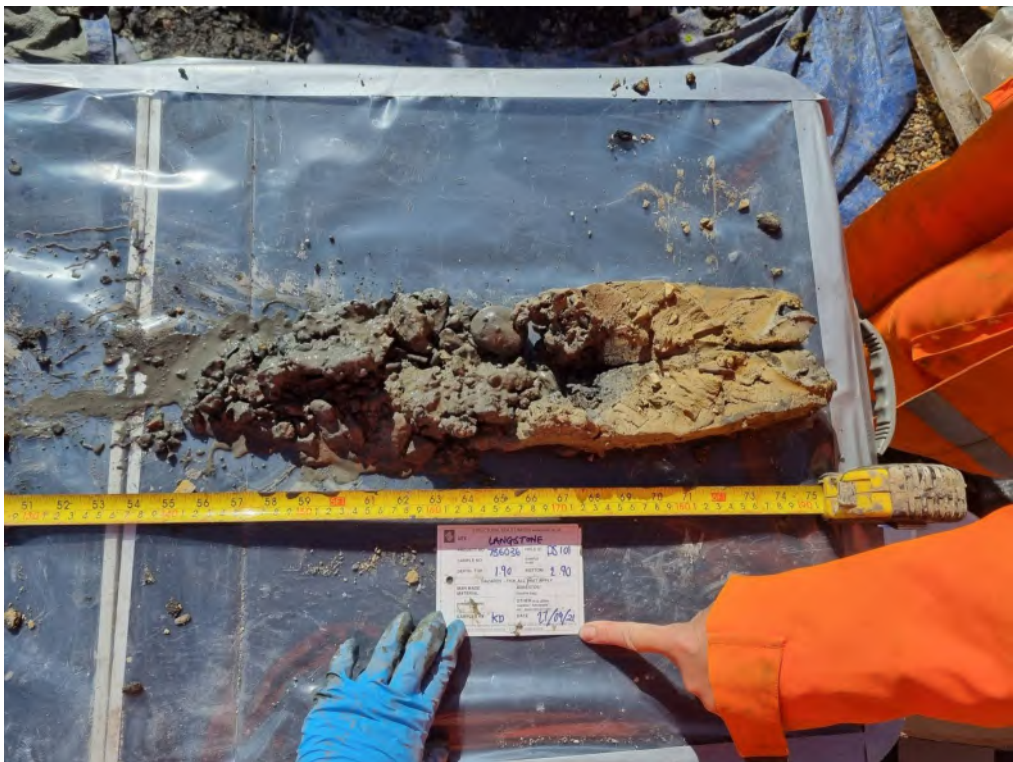
Progress		Samples / Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results							
3.90 - 4.90 (79mm dia) 40% rec	4.40-4.85	16	DSPT	0% recovery			Structureless CHALK composed of off-white mottled yellowish brown slightly gravelly SILT. Gravel is weak medium density angular to subangular fine to medium. Occasional fine to medium gravel sized fragments of nodular flint. (WHITE CHALK SUBGROUP Grade Dm) (stratum copied from 4.40m from previous sheet)		(1.45)		
	4.50-4.90	17	D								
	4.90-5.35	18	U								
	5.35-5.40	19	D								
	5.40-5.85	20	SPT								
	5.40-5.85	21	DSPT	N=12							
Windowless sample hole terminated at 5.85m depth.								-3.88	5.85		

Drilling Progress and Water Observations						General Remarks		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)			



Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS101
Contract Ref: 736036	Start: 27.09.21 End: 27.09.21	Ground Level (m AOD): 1.97	National Grid Co-ordinate: E:471901.5 N:104745.9	Sheet: 3 of 4

Run 1: 0.90 - 1.90 m.



Run 2: 1.90 -2.90 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	
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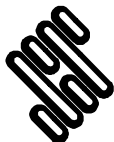
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS101
Contract Ref: 736036	Start: 27.09.21 End: 27.09.21	Ground Level (m AOD): 1.97	National Grid Co-ordinate: E:471901.5 N:104745.9	Sheet: 4 of 4

Run 3: 2.90 - 3.90 m.



Run 4: 3.90 - 4.90 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	
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STRUCTURAL SOILS

WINDOW SAMPLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS102
Contract Ref: 736036	Start: 24.09.21 End: 24.09.21	Ground Level (m AOD): 2.28	National Grid Co-ordinate: E:471889.1 N:104724.2	Sheet: 1 of 4

Progress	Samples / Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
<										

Drilling Progress and Water Observations						General Remarks							
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)								
24/09/21	08:30	0.60	-	400	0.60	1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated pit from ground level to 1.20m depth. 4. Dynamic windowless sampling from 1.20m to 5.45m depth. 5. Groundwater seepage noted at 0.60m depth. 6. Location backfilled with concrete from ground level to 0.50m and gravel from 0.50m to 5.45m. 7. SPT hammer DART227-2020 ($E_r = 73.80\%$) used.							
24/09/21		5.00	-	92	-								
						All dimensions in metres		Scale: 1:25					
Method Used:	Inspection pit + Tracked window sampling			Plant Used:	Supacat ATMP SS1105A		Drilled By:	Tom Saxton	Logged By:	KDodd	Checked By:	SS	AGS



Progress		Samples / Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results							
4.00 - 5.00 (79mm dia) ▼	4.45-4.76	18	D	N=12				-2.48	4.76		
	4.76-5.00	19	D				Structureless CHALK composed of light grey, off-white and yellowish brown mottled slightly sandy slightly gravelly SILT. Gravel is weak medium density angular to subangular fine to coarse. Sand is fine to coarse. Occasional fine to medium gravel sized fragments of nodular flint. (WHITE CHALK SUBGROUP Grade Dm)		(0.69)		
	5.00-5.45	20	SPT								
	5.00-5.45	21	DSPT								
							Windowless sample hole terminated at 5.45m depth.				

[illegible]

JSTOR LIBRARY V10_01 GLB LibVersion: v8.07.001 PrivVersion: v8.07 | Log WINDOW SAMPLE LOG - A4P | 736036 LANGSTONE FLOOD & COASTAL EROSION MANAGEMENT_SCHEME GPJ - v10.01
 Structural Soils Ltd, Head Office - Bristol, The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB, Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.soils.co.uk, Email: ask@soils.co.uk | 11/01/22 - 08:43 | S55



Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS102
Contract Ref: 736036	Start: 24.09.21 End: 24.09.21	Ground Level (m AOD): 2.28	National Grid Co-ordinate: E:471889.1 N:104724.2	Sheet: 3 of 4

Run 1: 1.20 - 2.00 m.



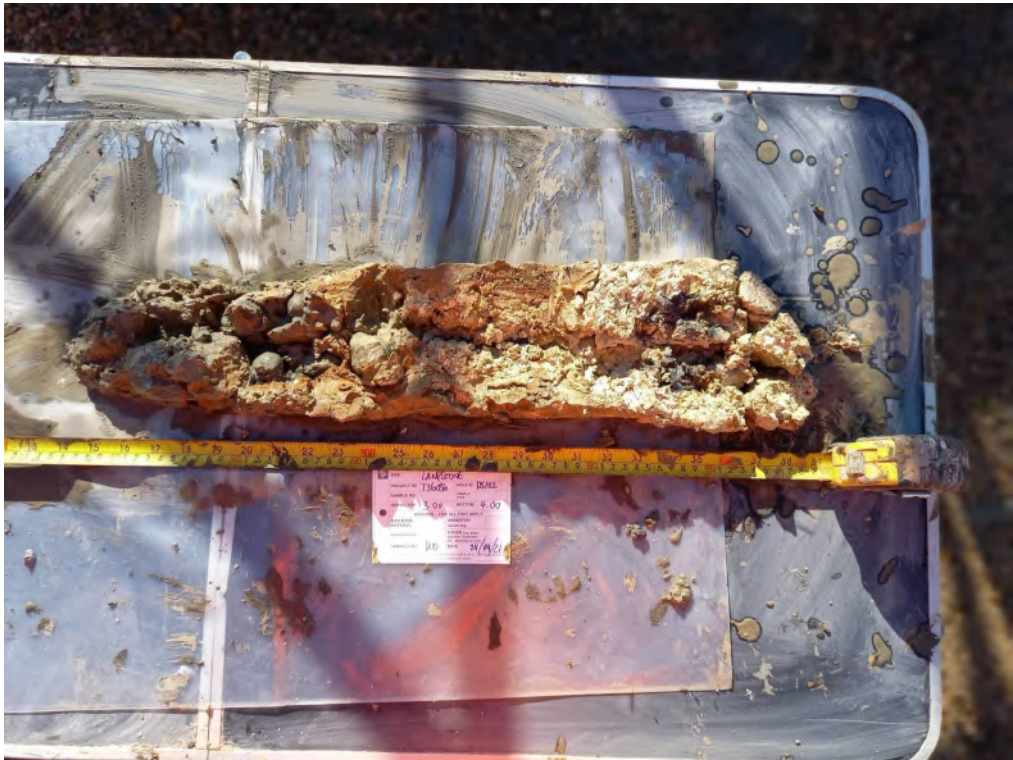
Run 2: 2.00 - 3.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	
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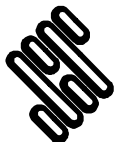
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS102
Contract Ref: 736036	Start: 24.09.21 End: 24.09.21	Ground Level (m AOD): 2.28	National Grid Co-ordinate: E:471889.1 N:104724.2	Sheet: 4 of 4

Run 3: 3.00 - 4.00 m.



Run 4: 4.00 - 5.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	
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STRUCTURAL SOILS

WINDOW SAMPLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS103
Contract Ref: 736036	Start: 23.09.21 End: 23.09.21	Ground Level (m AOD): 2.21	National Grid Co-ordinate: E:471820.2 N:104687.2	Sheet: 1 of 4

Progress	Samples / Tests				Water Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20-0.30	1	D	1xT+2xJ+1xV		POSSIBLE MADE GROUND: Grass over brown slightly sandy gravelly CLAY with a low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint and chalk. Cobbles are subrounded flint (up to 750 x 500 x 450 mm).	1.71	(0.50)	
	0.20	101	ES	0.0ppm		Firm light bluish grey, orangish brown and grey mottled slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint and chalk. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED)) ... from 1.00m: predominantly grey and dark grey.	0.66	1.55	
	0.20		PID						
	0.30-0.50	2	B						
	0.50		V	$c_u=42/50/44$					
	0.50		V	$c_c=10/6/8$					
	0.55	102	ES	1xT+2xJ+1xV					
	0.55		PID	0.0ppm					
	0.70-0.80	3	D						
	0.80-1.00	4	B						
	1.00	103	ES	1xT+2xJ+1xV					
	1.00		PID	0.0ppm					
	1.20-1.65	5	U70	89% recovery					
	1.40-2.00	8	D						
	1.70-2.15	6	SPT	N=0					
	1.70-2.15	7	DSPT						
	2.00-2.45	10	DSPT						
	2.00	104	ES	1xT+2xJ+1xV					
	2.00-2.66	11	D						
	2.00		PID	1.0ppm					
	2.15-2.60	9	SPT	N=1					
	2.66-3.00	12	D						
	2.80		HP	$c_u=13/18/10$					
	3.00	105	ES	1xT+2xJ+1xV					
	3.00-3.45	13	U70	89% recovery					
	3.00		PID	0.1ppm					
	3.42-3.77	16	D						
	3.50-3.95	15	DSPT						
	3.77-4.00	17	D						
	3.80		HP	$c_u=75/70/75$					
	4.00-4.45	14	SPT	N=9					
	4.00-4.45	19	DSPT						
	4.28-4.39	20	D						
	4.39-4.64	21	D						

Drilling Progress and Water Observations						General Remarks							
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)								
23/09/21		5.00	-	92	-	1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated pit from ground level to 1.20m depth. 4. Dynamic windowless sampling from 1.20m to 5.45m depth. 5. No groundwater encountered. 6. 50mm diameter gas/groundwater monitoring well installed to 3.00m depth on completion. Response zone 1.00m to 3.00m depth. Complete with riased protective cover. 7. SPT hammer DART227-2020 (E _r = 73.80%) used.							
All dimensions in metres						Scale:		1:25					
Method Used:	Inspection pit + Tracked window sampling			Plant Used:	Supacat ATMP SS1105A		Drilled By:	Tom Saxton	Logged By:	KDodd	Checked By:	SS	AGS



Progress		Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results							
4.00 - 5.00 (79mm dia) 100% rec ▼	4.50-4.95	18	SPT	N=20			Soft to firm grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subrounded fine to coarse of flint and chalk. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED))	-2.43	4.64		
	4.64-5.00	22	D				Very soft black slightly gravelly CLAY. Gravel is angular fine flint. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED))		(0.36)		
	5.00-5.45	23	SPT	N=15			Soft brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to medium chalk and flint. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED))	-2.79	5.00		
	5.00-5.45	24	DSPT				Soft brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to medium chalk and flint. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED)) (stratum copied from 4.39m from previous sheet) Firm to stiff grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded fine to coarse flint and chalk. (BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED)) Structureless CHALK composed of greyish white slightly gravelly SILT. Gravel is very weak medium density white subangular fine to medium (logged from SPT split spoon sample). (WHITE CHALK SUBGROUP Grade Dm) Windowless sample hole terminated at 5.45m depth.	-3.24	5.45		

GINT_LIBRARY_V10_01.GLB LibVersion: v8_07_001 ProjVersion: v8_07_001 WINDOW SAMPLE LOG - AP | 736036 LANGSTONE FLOOD & COASTAL EROSION_MANAGEMENT_SCHEME.GPJ - v10_01.
Head Office - Bristol: The Old School, Sillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.solls.co.uk, Email: ask@solls.co.uk, 11/01/22 - 08:43 | SS5 |



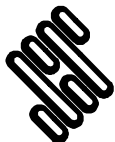
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS103
Contract Ref: 736036	Start: 23.09.21 End: 23.09.21	Ground Level (m AOD): 2.21	National Grid Co-ordinate: E:471820.2 N:104687.2	Sheet: 3 of 4

Run 1: 1.20 - 2.00 m.



Run 2: 2.00 - 3.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	
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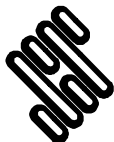
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS103
Contract Ref: 736036	Start: 23.09.21 End: 23.09.21	Ground Level (m AOD): 2.21	National Grid Co-ordinate: E:471820.2 N:104687.2	Sheet: 4 of 4

Run 3: 3.00 - 4.00 m.



Run 4: 4.00 - 5.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	
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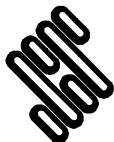
STRUCTURAL SOILS

WINDOW SAMPLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS104
Contract Ref: 736036	Start: 21.09.21 End: 22.09.21	Ground Level (m AOD): 3.19	National Grid Co-ordinate: E:471682.1 N:104863.5	Sheet: 1 of 4

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend	
Window Run	Depth	No	Type	Results							
	0.20-0.30	1	D	1xT+2xJ+1xV 0.0ppm			Vegetation over very sandy very clayey angular to rounded fine to coarse GRAVEL of flint and chalk with a low cobble content. Sand is fine to coarse. Cobbles are angular to subangular of chalk. (RIVER TERRACE DEPOSITS)	1.64	(1.55)		
	0.20	101	ES								
	0.30-0.50	2	B								1xT+2xJ+1xV 0.0ppm
	0.50	102	ES								
	0.50		PID								
	0.70-0.80	3	D								
	0.80-1.00	4	B	1xT+2xJ+1xV 0.0ppm							
	1.00	103	ES								
	1.00		PID								
	1.20-1.65	5	SPT								N=9
	1.20	6	DSPT								
	1.20-1.55	7	D								
	Soft to firm light brownish grey, orangish brown and dark brown mottled slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint. (HEAD)	... at 1.20m: loose. ... from 1.20m: very clayey.	... at 2.85-3.00m: gravelly.	... from 3.78m: gravel of flint and chalk.			Firm grey gravelly CLAY. Gravel is angular to subrounded fine to medium chalk and flint. (HEAD)				
								2.00-2.45	9	U70	100% recovery
								2.20-3.00	13	B	
								2.50-2.95	10	SPT	N=10
								2.50	11	DSPT	
								3.00-3.45	11	SPT	N=7
								3.00	12	DSPT	
								3.55-3.91	15	D	N=14
								3.91-4.00	16	D	
								4.00-4.45	17	SPT	

Drilling Progress and Water Observations						General Remarks											
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)												
22/09/21	12:00	3.00	-	116	2.60	1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated pit from ground level to 1.20m depth. 4. Dynamic windowless sampling from 1.20m to 5.45m depth. 5. Groundwater strike at 2.60m depth. 6. 50mm diameter gas/groundwater monitoring well installed to 3.00m depth on completion. Response zone 1.00m to 3.00m depth. Completed with flush protective cover. 7. SPT hammer DART227-2020 ($E_r = 73.80\%$) used.											
22/09/21		5.00	-	101	-												
All dimensions in metres						Scale:		1:25									
Method Used:	Inspection pit + Tracked window sampling			Plant Used:	Supacat ATMP SS1105A		Drilled By:	Tom Saxton		Logged By:	KDodd		Checked By:	SS		AGS	

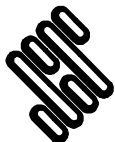


Contract: Langstone Flood & Coastal Erosion Management Scheme			Client: Havant Borough Council		Window Sample: DS104
Contract Ref: 736036		Start: 21.09.21 End: 22.09.21	Ground Level (m AOD): 3.19	National Grid Co-ordinate: E:471682.1 N:104863.5	Sheet: 2 of 4

Progress		Samples / Tests				Water	Backfill & Instru- ment- ation	Description of Strata	Reduced Level	Depth (Thick- ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results							
4.00 - 5.00 (89mm dia) 100% rec ▼	4.45-5.00	18	B	N=13			... at 4.45m-4.90m: gravelly; gravel is angular to subangular fine to coarse of flint. Firm grey gravelly CLAY. Gravel is angular to subrounded fine to medium chalk and flint. (HEAD) <i>(stratum copied from 3.91m from previous sheet)</i>		(1.54)		
	5.00-5.45 5.00	19 20	SPT DSPT								
							Windowless sample hole terminated at 5.45m depth.				

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
						All dimensions in metres	
						Scale:	1:25
Method Used:	Inspection pit + Tracked window sampling			Plant Used:	Supacat ATMP SS1105A	Drilled By:	Tom Saxton
						Logged By:	KDodd
						Checked By:	

GINT LIBRARY_V10_01.GLB LibVersion: v8.07 | Log WINDOW SAMPLE LOG - A4P | 736036 LANGSTONE FLOOD & COASTAL EROSION MANAGEMENT SCHEME.GPJ - v10.01.
Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.structuralsols.co.uk, Email: ask@structuralsols.co.uk | 11/01/22 - 08:44 | SS5 |



STRUCTURAL SOILS

WINDOW SAMPLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS104
Contract Ref: 736036	Start: 21.09.21 End: 22.09.21	Ground Level (m AOD): 3.19	National Grid Co-ordinate: E:471682.1 N:104863.5	Sheet: 3 of 4

Run 1: 1.20 - 2.00 m.



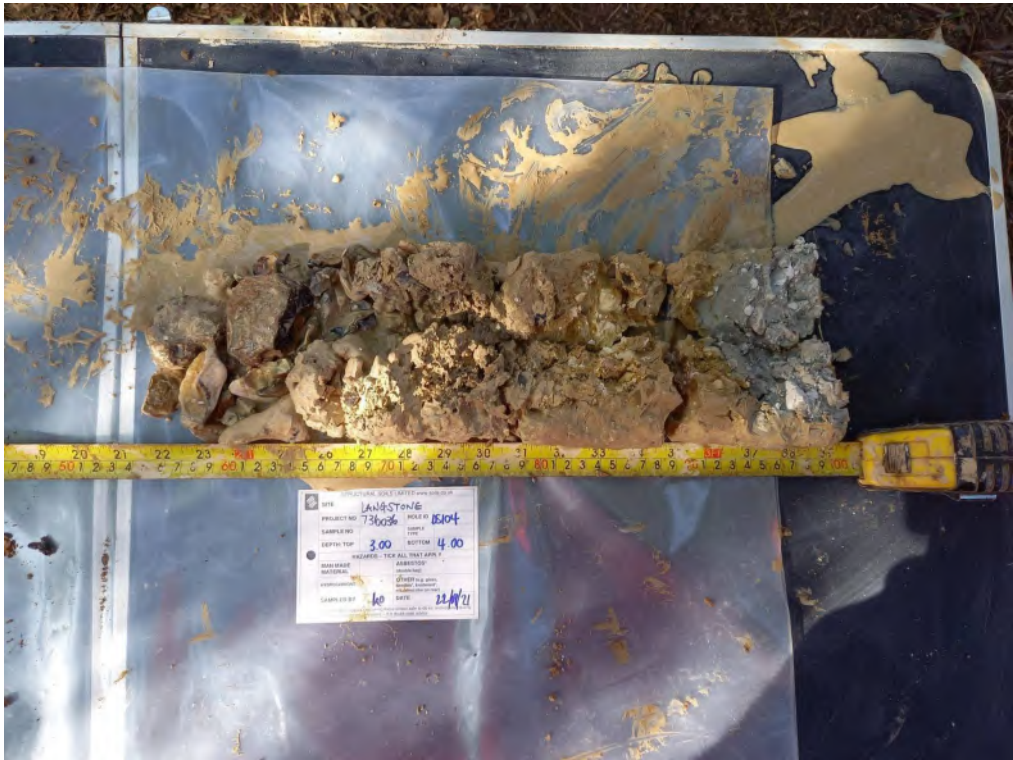
Run 2: 2.00 - 3.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	AGS
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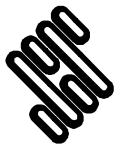
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS104
Contract Ref: 736036	Start: 21.09.21 End: 22.09.21	Ground Level (m AOD): 3.19	National Grid Co-ordinate: E:471682.1 N:104863.5	Sheet: 4 of 4

Run 3: 3.00 - 4.00 m.



Run 4: 4.00 - 5.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	AGS
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STRUCTURAL SOILS

WINDOW SAMPLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS105
Contract Ref: 736036	Start: 22.09.21 End: 22.09.21	Ground Level (m AOD): 3.19	National Grid Co-ordinate: E:471652.1 N:104932.3	Sheet: 1 of 4

Progress	Samples / Tests				Water Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20-0.30	1	D	1xT+2xJ+1xV		MADE GROUND: Vegetation over slightly sandy slightly gravelly CLAY with a low cobble content and frequent roots (up to 30mm diameter). Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint. Cobbles are angular to subangular concrete and flint (160 x 120 x 70mm). ... 0.30m: metal rod (220 x 30mm). ... 0.40m: angular fine to coarse gravel of chalk. POSSIBLE MADE GROUND: Orangish brown slightly gravelly slightly clayey fine to coarse SAND. Gravel is angular to subangular fine to coarse flint. ... 0.80-1.00m bulk sample particle size distribution test: slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse. Firm light greyish brown, orangish brown and dark brown slightly sandy slightly gravelly CLAY with a hydrocarbon odour. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint and chalk. (HEAD) ... At 1.20m U70 sample particle size distribution: slightly sandy SILT. Sand is fine to coarse. Structureless CHALK composed of light grey mottled light yellowish brown slightly sandy gravelly SILT. Gravel is very weak medium density off-white angular to subangular fine to coarse. Occasional fine to coarse gravel sized fragments of nodular flints. (WHITE CHALK SUBGROUP)	2.64	0.55	
	0.20	101	ES	0.0ppm					
	0.30-0.50	2	B	1xT+2xJ+1xV					
	0.50	102	ES	0.0ppm					
	0.70-0.80	3	D						
	0.80-1.00	4	B						
	1.00	103	ES	1xT+2xJ+1xV			1.99	1.20	
	1.00		PID	0.0ppm					
	1.20-1.65	5	U70	89% recovery					
	1.40	104	ES	1xT+2xJ+1xV			0.74	2.45	
	1.40-2.00	9	D	1.4ppm					
	1.40		PID						
	1.65-1.70	6	D	N=7					
	1.70-2.15	7	SPT						
	1.70	8	DSPT						
	2.00-2.45	10	U70	89% recovery					
	2.00-2.45	14	D						
	2.45-2.50	11	D				(3.00)		
	2.45-2.55	15	D						
	2.50-2.95	12	SPT	N=10					
	2.50	13	DSPT						
	3.00-3.45	16	SPT	N=9					
	3.00	17	DSPT						
	3.30	105	ES	1xT+1xJ+1xV					
	3.30-4.00	18	B	1.0ppm					
	3.30		PID						
	4.00-4.45	19	SPT	N=10					
	4.00	20	DSPT						
	4.00-5.00	21	B						

Drilling Progress and Water Observations						General Remarks							
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)								
22/09/21		5.00	-	101	Dry	1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated pit from ground level to 1.20m depth. 4. Dynamic windowless sampling from 1.20m to 5.45m depth. 5. No groundwater encountered. 6. 50mm diameter gas/groundwater monitoring well installed to 2.50m depth on completion. Response zone 1.50m to 2.50m depth. Completed with flush protective cover. 7. SPT hammer DART227-2020 ($E_r = 73.80\%$) used.							
All dimensions in metres						Scale:		1:25					
Method Used:	Inspection pit + Tracked window sampling			Plant Used:	Supacat ATMP SS1105A		Drilled By:	Tom Saxton	Logged By:	KDodd	Checked By:	SS	AGS



Contract: Langstone Flood & Coastal Erosion Management Scheme			Client: Havant Borough Council		Window Sample: DS105
Contract Ref: 736036		Start: 22.09.21 End: 22.09.21	Ground Level (m AOD): 3.19	National Grid Co-ordinate: E:471652.1 N:104932.3	Sheet: 2 of 4

Progress	Samples / Tests				Water	Backfill & Instru- mentation	Description of Strata	Reduced Level	Depth (Thick- ness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
4.00 - 5.00 (89mm dia) 100% rec ▼	5.00-5.45 5.00	22 23	SPT DSPT	N=12			Structureless CHALK composed of light grey mottled light yellowish brown slightly sandy gravelly SILT. Gravel is very weak medium density off-white angular to subangular fine to coarse. Occasional fine to coarse gravel sized fragments of nodular flints. (WHITE CHALK SUBGROUP) (stratum copied from 2.45m from previous sheet)	-2.27	5.45	
							Windowless sample hole terminated at 5.45m depth.			

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
						All dimensions in metres	Scale: 1:25
Method Used:	Inspection pit + Tracked window sampling		Plant Used:	Supacat ATMP SS1105A		Drilled By: Tom Saxton	Logged By: KDodd Checked By:

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Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.soils.co.uk, Email: ask@soils.co.uk | 11/01/22 - 08:44 | SS5 |





Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS105
Contract Ref: 736036	Start: 22.09.21 End: 22.09.21	Ground Level (m AOD): 3.19	National Grid Co-ordinate: E:471652.1 N:104932.3	Sheet: 3 of 4

Run 1: 1.20 - 2.00 m.



Run 2: 2.00 - 3.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	
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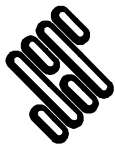
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS105
Contract Ref: 736036	Start: 22.09.21 End: 22.09.21	Ground Level (m AOD): 3.19	National Grid Co-ordinate: E:471652.1 N:104932.3	Sheet: 4 of 4

Run 3: 3.00 - 4.00 m.



Run 4: 4.00 - 5.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	
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STRUCTURAL SOILS

WINDOW SAMPLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS106
Contract Ref: 736036	Start: 20.09.21 End: 21.09.21	Ground Level (m AOD): 2.97	National Grid Co-ordinate: E:471471.4 N:104897.4	Sheet: 1 of 4

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend						
Window Run	Depth	No	Type	Results												
	0.20-0.30	1	D	1xT+2xJ+1xV			MADE GROUND: Grass over brown slightly gravelly clayey fine to coarse SAND with occasional to frequent roots. Gravel is angular to subrounded fine to coarse flint and brick. 0.20-0.40m bulk sample particle size distribution test: slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is fine to medium.	2.37	0.60							
	0.20	101	ES													
	0.20-0.40	2	B													
	0.20		PID	0.0ppm												
	0.50	102	ES	1xT+2xJ+1xV			MADE GROUND: Firm brown spotted black and light grey slightly sandy slightly gravelly CLAY. Gravel is angular fine to coarse limestone and flint. Sand is fine to coarse.									
	0.50		PID	0.0ppm												
	0.70-0.80	3	D	c _u =65/74/66 c _r =12/12/14												
	0.70-0.90	4	B													
	0.70		V													
	0.70		V	1xT+2xJ+1xV												
	1.00	103	ES	0.1ppm												
	1.00		PID													
	1.20-1.65	5	U70	N=8					(1.90)							
	1.20-2.20	9	B													
	1.65-1.70	6	D	N=7			Thinly laminated firm brown, orangish brown and grey slightly gravelly CLAY. Gravel is angular fine to medium flint. (HEAD)	0.47	2.50							
	1.70-2.15	7	SPT													
	1.70-2.15	8	DSPT													
	2.00-2.45	10	U70	N=13			Soft light grey mottled brown and white slightly sandy gravelly CLAY. Gravel is angular to subangular fine to coarse flint and chalk. (HEAD)	0.35	2.62							
	2.00-2.62	14	B													
	2.45-2.50	11	D	N=16			... from 3.76m: gravelly.	-1.03	4.00							
	2.50-2.95	12	SPT													
	2.50	13	DSPT													
	2.62-3.00	15	B	N=16			Soft light grey mottled brown CLAY (logged from SPT splitspoon sample). (HEAD)	-1.48	4.45							

Drilling Progress and Water Observations						General Remarks								
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)									
20/09/21		1.20	-	400	1.20									
21/09/21		1.20	-	400	1.20									
21/09/21		6.45	-	70	-									
						1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated pit from ground level to 1.20m depth. 4. Dynamic windowless sampling from 1.20m to 6.45m depth. 5. Groundwater seepage at 1.20m depth. 6. 50mm diameter gas/groundwater monitoring well installed to 3.60m depth on completion. Response zone 1.60m to 3.60m depth. Completed with flush protective cover. 7. SPT hammer DART227-2020 ($E_r = 73.80\%$) used.								
						All dimensions in metres		Scale:	1:25					
Method Used:	Inspection pit + Tracked window sampling			Plant Used:	Supacat ATMP SS1105A		Drilled By:	Tom Saxton		Logged By:	KDodd	Checked By:		



Contract: Langstone Flood & Coastal Erosion Management Scheme			Client: Havant Borough Council		Window Sample: DS106
Contract Ref: 736036		Start: 20.09.21 End: 21.09.21	Ground Level (m AOD): 2.97	National Grid Co-ordinate: E:471471.4 N:104897.4	Sheet: 2 of 4

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
							Assumed zone of no recovery. (stratum copied from 4.45m from previous sheet)	-1.81	(0.33) 4.78	AZNR
	4.78-5.00	21	D	N=8			Loose brown mottled black and off-white slightly sandy slightly clayey angular to subrounded fine to coarse GRAVEL of flint. Sand is fine to coarse. (HEAD)		(1.01)	
	5.00-5.45	22	SPT							
	5.60-5.79	23	D	N=17			Structureless CHALK composed of greyish white slightly sandy gravelly SILT. Gravel is very weak medium density white angular to subangular fine to coarse. Occasional fragments of fine to medium gravel sized fragments of locally carious nodular flint. (WHITE CHALK SUBGROUP Grade Dm)	-2.82	5.79	
	5.79-6.00	24	D							
	6.00-6.45	25	SPT						(0.66)	
6.00	26	DSPT			-3.48	6.45				
							Windowless sample hole terminated at 6.45m depth.			

Drilling Progress and Water Observations						General Remarks							
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)								
						All dimensions in metres	Scale:	1:25					
Method Used:	Inspection pit + Tracked window sampling			Plant Used:	Supacat ATMP SS1105A		Drilled By:	Tom Saxton	Logged By:	KDodd	Checked By:	SS	AGS



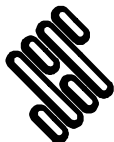
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS106
Contract Ref: 736036	Start: 20.09.21 End: 21.09.21	Ground Level (m AOD): 2.97	National Grid Co-ordinate: E:471471.4 N:104897.4	Sheet: 3 of 4

2.00 - 3.00 m.



3.00 - 4.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	AGS
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STRUCTURAL SOILS

WINDOW SAMPLE LOG

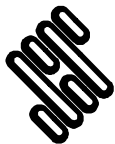
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS106
Contract Ref: 736036	Start: 20.09.21 End: 21.09.21	Ground Level (m AOD): 2.97	National Grid Co-ordinate: E:471471.4 N:104897.4	Sheet: 4 of 4

4.00 - 5.00 m.



5.00 - 6.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	AGS
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STRUCTURAL SOILS

WINDOW SAMPLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS107
Contract Ref: 736036	Start: 21.09.21 End: 21.09.21	Ground Level (m AOD): 2.53	National Grid Co-ordinate: E:471471.9 N:104933.1	Sheet: 1 of 5

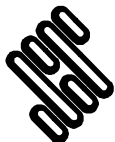
Progress	Samples / Tests				Water Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20-0.30 0.20 0.20 0.30-0.50 0.50 0.50	1 101 2 102	D ES PID B ES PID	1xT+2xJ+1xV 0.0ppm 1xT+2xJ+1xV 0.0ppm		MADE GROUND: Grass over brown slightly gravelly clayey fine to coarse SAND. Gravel is angular fine to medium flint. ... 0.30-0.50m bulk sample particle size distribution test: slightly gravelly slightly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse.	1.93	0.60	
	0.70-0.80 0.70 0.70 0.80-1.00 1.00 1.00	3 4 103	D V V B ES PID	$c_u=72/72/54$ $c_r=9/8/10$ 1xT+2xJ+1xV 0.0ppm		Firm to stiff brown mottled orangish brown slightly gravelly CLAY with a low cobble content. Gravel is angular to subrounded fine to coarse flint. Cobbles are subangular to subrounded flint. (HEAD)		(1.10)	
	1.20-1.65 1.20 - 2.00 (101mm dia) 100% rec	5	U70	100% recovery					
	1.60-2.00 1.70-2.15 1.70	8 6 7	D SPT DSPT	N=11		Thinly laminated firm orangish brown, dark brown and grey slightly gravelly CLAY. Gravel is angular to subangular fine to coarse flint. (HEAD)	0.83	1.70	
	2.00-2.45 2.00	9 10	SPT DSPT	N=11		... from 1.78m: gravelly.		(0.94)	
	2.00 - 3.00 (101mm dia) 100% rec	11	B				-0.11	2.64	
	3.00-3.45 3.00	12 13	SPT DSPT	N=9		Firm light grey, light brown and orangish brown mottled slightly sandy gravelly CLAY. Gravel is angular to subangular fine to medium flint and chalk. Sand is fine to coarse. (HEAD)		(2.05)	
	3.00 - 4.00 (89mm dia) 100% rec	14	D						
	4.00-4.45 4.00	15 16	SPT DSPT	N=24					
	4.00 - 5.00 (89mm dia) 100% rec	17	D						
	4.30-4.69								

Drilling Progress and Water Observations						General Remarks											
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)												
21/09/21		1.30	-	116	1.30	1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated pit from ground level to 1.20m depth. 4. Dynamic windowless sampling from 1.20m to 6.00m depth. 5. Groundwater seepage at 1.30m depth. 6. 50mm diameter gas/groundwater monitoring well installed to 5.00m depth on completion. Response zone 1.50m to 5.00m depth. Completed with flush protective cover. 7. SPT hammer DART227-2020 ($E_r = 73.80\%$) used.											
21/09/21		6.00	-	92	-												
All dimensions in metres						Scale:		1:25									
Method Used:	Inspection pit + Tracked window sampling			Plant Used:	Supacat ATMP SS1105A		Drilled By:	Tom Saxton		Logged By:	KDodd		Checked By:	SS		AGS	



Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
4.00 - 5.00 (89mm dia) 100% rec ▼ 5.00 - 6.00 (79mm dia) 70% rec ▼	4.69-5.00	18	D	N=16			-2.16	4.69		
							Stiff light brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse chalk and flint. (HEAD)	-2.47	5.00	
	5.00-5.45 5.00	19 20	SPT DSPT				Assumed zone of no recovery.	-2.67	5.20	AZNR
	5.20-6.00	21	B			Structureless CHALK composed of greyish white slightly gravelly SILT. Gravel is very weak medium density white angular to subangular fine to coarse. Occasional fragments of fine to medium gravel sized fragments of locally carious nodular flint. (WHITE CHALK SUBGROUP Grade Dm)	-3.47	6.00		
						Windowless sample hole terminated at 6.00m depth.				

JSTOR LIBRARY V10_01 GLB LibVersion: v8.07.001 PrivVersion: v8.07 | Log WINDOW SAMPLE LOG - A4P | 736036 LANGSTONE FLOOD & COASTAL EROSION MANAGEMENT_SCHEME GPJ - v10.01
 Structural Soils Ltd, Head Office - Bristol, The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB, Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.soils.co.uk, Email: ask@soils.co.uk | 11/01/22 - 08:46 | \$\$\$



STRUCTURAL SOILS

WINDOW SAMPLE LOG

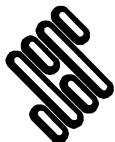
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS107
Contract Ref: 736036	Start: 21.09.21 End: 21.09.21	Ground Level (m AOD): 2.53	National Grid Co-ordinate: E:471471.9 N:104933.1	Sheet: 3 of 5

Run 1: 1.20 - 2.00 m.



Run 2: 2.00 - 3.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	AGS
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STRUCTURAL SOILS

WINDOW SAMPLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS107
Contract Ref: 736036	Start: 21.09.21 End: 21.09.21	Ground Level (m AOD): 2.53	National Grid Co-ordinate: E:471471.9 N:104933.1	Sheet: 4 of 5

Run 3: 3.00 - 4.00 m.



Run 4: 4.00 - 5.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	AGS
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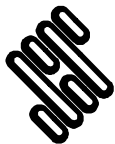


Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS107
Contract Ref: 736036	Start: 21.09.21 End: 21.09.21	Ground Level (m AOD): 2.53	National Grid Co-ordinate: E:471471.9 N:104933.1	Sheet: 5 of 5

Run 5: 5.00 - 6.00 m.



Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	
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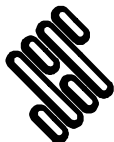
STRUCTURAL SOILS

WINDOW SAMPLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS109
Contract Ref: 736036	Start: 29.09.21 End: 29.09.21	Ground Level (m AOD): 1.65	National Grid Co-ordinate: E:471940.8 N:104898.9	Sheet: 1 of 4

Progress	Samples / Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
	0.20-0.30 0.20 0.20 0.30-0.50	1 101 2	D ES PID B	1xT+2xJ+1xV 0.1ppm			MADE GROUND: Multicoloured (brown, orange, white, black and yellow) sandy clayey subangular to rounded fine to coarse GRAVEL of flint. Sand is fine to coarse.	1.60	0.05 (0.50)	
	0.60 0.60 0.60 0.60 0.70-0.80 0.80-1.00 1.00	102 3 4 5 6 7	ES V V PID D B ES	1xT+2xJ+1xV c _u =52/40/38 c _u =14/10/8 0.0ppm			MADE GROUND: Greyish brown gravelly slightly clayey fine to coarse SAND with rare oyster shell fragments. Gravel is subangular to rounded fine to coarse flint and brick.	1.10	0.55 (0.55)	
	1.10-1.20 1.20-1.65 1.30-2.00	8 9 10	D B ES PID D U B	0.0ppm 100% recovery			MADE GROUND: Firm light grey mottled brown and dark brown slightly sandy slightly gravelly silty CLAY with a low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint and brick. Cobbles are angular flint (130 x 100 x 90mm).	0.55	1.10	
	1.20 - 2.00 (87mm dia) 100% rec						Soft to firm grey spotted orangish brown gravelly CLAY. Gravel is angular to rounded fine to coarse flint and chalk. (HEAD)			
	1.70-2.15 1.70	7 8	SPT DSPT	N=11						
	2.15-2.60 2.17-3.00	12	U B	0% recovery			... 2.15m-2.60m: no recovery from U70. ... 2.17-3.00m: bulk sample particle size distribution test: sandy very clayey fine to coarse GRAVEL. Sand is fine to coarse.			
	2.00 - 3.00 (87mm dia) 100% rec									
	2.50-2.95 2.50	10 11	SPT DSPT	N=8						
	3.00-3.45 3.00	13 14	SPT DSPT	N=11			... 2.90m-3.00m: very gravelly. Gravel is subrounded fine to coarse flint. ... 3.00m-3.45m: U70 not taken due to coarse gravel.			
	3.00 - 4.00 (79mm dia) 100% rec									
	3.30-4.00	15	D							
	3.80 3.80	104	ES PID	1xT+1xJ+1xV 0.6ppm						
	4.00-4.45	16	U	100% recovery						
	4.00 - 5.00 (79mm dia) 100% rec									
								-2.80	4.45	

Drilling Progress and Water Observations						General Remarks										
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)											
29/09/21	09:02	1.00	-	400	1.00											
29/09/21	11:45	5.00	-	92	-											
1. Location GPR, CAT & Genny scanned prior to commencement.																
2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer.																
3. Hand excavated pit from ground level to 1.20m depth.																
4. Dynamic windowless sampling from 1.20m to 5.45m depth.																
5. Groundwater seepage at 1.00m depth.																
6. Location backfilled with arisings, gravel and concrete on completion.																
7. SPT hammer DART227-2020 (E_r = 73.80%) used.																
All dimensions in metres					Scale:	1:25										
Method Used:	Inspection pit + Tracked window sampling		Plant Used:	Supacat ATMP SS1105A		Drilled By:	Tom Saxton		Logged By:	KDodd		Checked By:	SS		AGS	



Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS109	
Contract Ref: 736036		Start: 29.09.21 End: 29.09.21	Ground Level (m AOD): 1.65	National Grid Co-ordinate: E:471940.8 N:104898.9	Sheet: 2 of 4

Progress		Samples / Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results							
4.00 - 5.00 (79mm dia) 100% rec ▼	4.45-4.50	17	D	N=18			Structureless CHALK composed of light grey locally orange gravelly SILT. Gravel is weak medium density off-white angular to subangular fine to coarse. (WHITE CHALK SUBGROUP Grade Dm) (stratum copied from 4.45m from previous sheet) ... 4.55m-4.80m: very gravelly.		(1.00)		
	4.50-4.95	18	SPT								
	4.50-4.95	20	DSPT								
	4.55-5.00	21	D								
	5.00-5.45	22	SPT	N=18							
	5.00	23	DSPT								
Windowless sample hole terminated at 5.45m depth.											

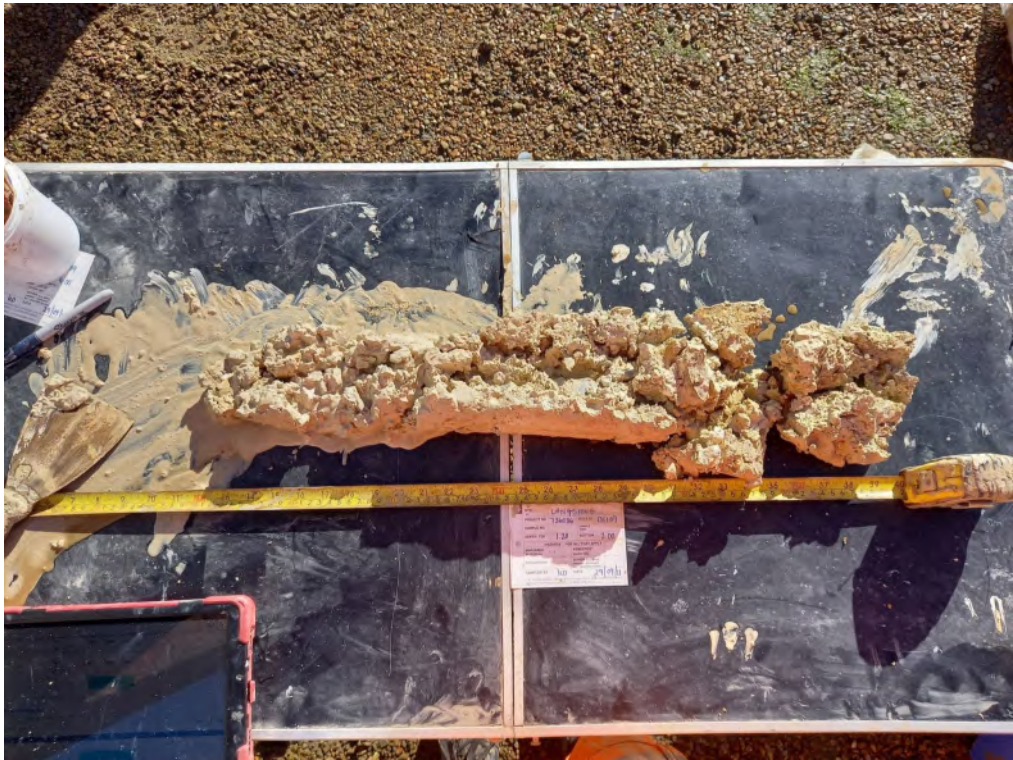
Drilling Progress and Water Observations						General Remarks								
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)									
						All dimensions in metres		Scale:	1:25					
Method Used:	Inspection pit + Tracked window sampling			Plant Used:	Supacat ATMP SS1105A		Drilled By:	Tom Saxton		Logged By:	KDodd			
								Checked By:						
														

GINT LIBRARY_V10_01.GLB LibVersion: v8.07 | Log WINDOW SAMPLE LOG - A4P | 736036 LANGSTONE FLOOD & COASTAL EROSION MANAGEMENT SCHEME.GPJ - v10_01: Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.sols.co.uk, Email: ask@sols.co.uk | 11/01/22 - 08:46 | SS5 |



Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS109
Contract Ref: 736036	Start: 29.09.21 End: 29.09.21	Ground Level (m AOD): 1.65	National Grid Co-ordinate: E:471940.8 N:104898.9	Sheet: 3 of 4

Run 1: 1.20 - 2.00 m.



Run 2: 2.00 - 3.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	
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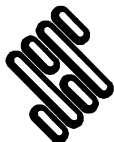
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Window Sample: DS109
Contract Ref: 736036	Start: 29.09.21 End: 29.09.21	Ground Level (m AOD): 1.65	National Grid Co-ordinate: E:471940.8 N:104898.9	Sheet: 4 of 4

Run 3: 3.00 - 4.00 m.



Run 4: 4.00 - 5.00 m.

Method Used: Inspection pit + Tracked window sampling	Plant Used: Supacat ATMP SS1105A	Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	AGS
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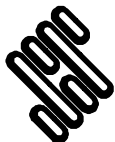
STRUCTURAL SOILS

WINDOW SAMPLE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme	Client: Havant Borough Council			Window Sample: DS110
Contract Ref: 736036	Start: 28.09.21 End: 28.09.21	Ground Level (m AOD): 1.97	National Grid Co-ordinate: E:471827.7 N:104482.0	Sheet: 1 of 1

Progress	Samples / Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
1.00 - 2.00 (87mm dia)	0.20-0.30	1	D	1xT+2xJ+1xV 0.1ppm			MADE GROUND: Multicoloured (white, orange, brown, yellow and black) gravelly slightly clayey fine to coarse SAND. Gravel is subangular to rounded fine to coarse of flint, brick, quartzite and chalk.	1.92	0.05	
	0.20	101	ES							
	0.30-0.50	2	B	1xT+2xJ+1xV 0.0ppm						
	0.50	102	ES							
	0.50		PID							
	0.70-0.80	3	D							
	1.00-1.45	4	SPT	N=9 1xT+2xJ+1xV 2.2ppm				(2.40)		
	1.00	103	ES							
	1.00		PID							
	2.00-2.45	5	SPT	N=2					... from 2.00m: very loose.	
								Windowless sample location terminated at 2.45m depth due to instability of hole.		

Drilling Progress and Water Observations						General Remarks				
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)					
28/09/21		2.00	-	101	-	1. Location GPR, CAT & Genny scanned prior to commencement. 2. Surface and downhole checks for buried ferrous objects carried out by a UXO specialist using a magnetometer. 3. Hand excavated pit from ground level to 1.20m depth. 4. Dynamic windowless sampling from 1.20m to 2.45m depth. 5. No groundwater encountered. 6. Location backfilled with arisings on completion. 7. SPT hammer DART227-2020 ($E_r = 73.80\%$) used.				
						All dimensions in metres	Scale: 1:25			
Method Used:	Inspection pit + Tracked window sampling			Plant Used:	Supacat ATMP SS1105A		Drilled By: Tom Saxton	Logged By: KDodd	Checked By: SS	



STRUCTURAL SOILS

MACKINTOSH PROBE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme			Client: Havant Borough Council		Probe ref: HOTP103 - Probe
Contract Ref: 736036		Date: 16.09.21	Ground Level (m AOD): 0.83	National Grid Co-ordinate: E:471653.1 N:104789.8	Sheet: 1 of 1

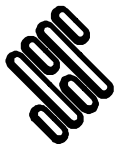
DEPTH (m)	READING (Blows/75mm)	DIAGRAM (N75 VALUES)	TORQUE ON RODS (Nm)	Reduced Level	REMARKS
0.5	8				
1.0	12				
1.5	15				
2.0	18				
2.5	34				
3.0	50				
3.5					
4.0					
4.5					
5.0					
5.5					

Mackintosh probe hole terminated at 1.80m depth.

General Remarks

Test carried out from 0.65m depth.
Test terminated due to refusal.

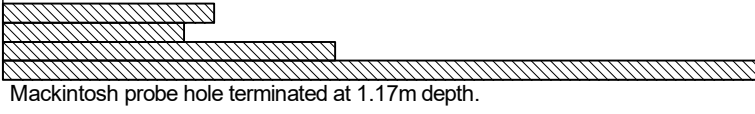
All dimensions in metres	Method:	Tested By:	Checked By:	
Scale 1:30	Mackintosh probe	KDodd	SS	AGS



STRUCTURAL SOILS

MACKINTOSH PROBE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme			Client: Havant Borough Council		Probe ref: HDTP104 - Probe
Contract Ref: 736036		Date: 16.09.21	Ground Level (m AOD): 0.49	National Grid Co-ordinate: E:471608.8 N:104773.5	Sheet: 1 of 1

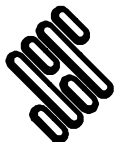
DEPTH (m)	READING (Blows/75mm)	DIAGRAM (N75 VALUES)	TORQUE ON RODS (Nm)	Reduced Level	REMARKS
0.5					
1.0	14 12 22 50	 Mackintosh probe hole terminated at 1.17m depth.			
1.5					
2.0					
2.5					
3.0					
3.5					
4.0					
4.5					
5.0					
5.5					

General Remarks

Test carried out from 0.87m depth due to partial collapse of pit.
Test terminated due to refusal.

All dimensions in metres	Method:	Tested By:	Checked By:
Scale 1:30	Mackintosh probe	KDodd	SS





STRUCTURAL SOILS

MACKINTOSH PROBE LOG

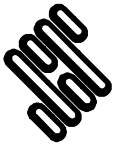
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Probe ref: HOTP105 - Probe
Contract Ref: 736036	Date: 16.09.21	Ground Level (m AOD): 1.53	National Grid Co-ordinate: E:471569.5 N:104776.9	Sheet: 1 of 1

DEPTH (m)	READING (Blows/75mm)	DIAGRAM (N75 VALUES)	TORQUE ON RODS (Nm)	Reduced Level	REMARKS
0.5	3				
	2				
	1				
1.0	2				
	1				
	3				
	6				
	4				
	12				
	26				
	29				
	25				
1.5	23				
	29				
	32				
		Mackintosh probe hole terminated at 1.73m depth.			
2.0					
2.5					
3.0					
3.5					
4.0					
4.5					
5.0					
5.5					

General Remarks

Test carried out from 0.50m depth.
Test terminated due to refusal.

All dimensions in metres	Method: Mackintosh probe	Tested By: KDodd	Checked By: SS	
Scale 1:30				



Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Probe ref: HOTP106 - Probe
Contract Ref: 736036	Date: 28.09.21	Ground Level (m AOD): 2.34	National Grid Co-ordinate: E:471978.6 N:105006.5	Sheet: 1 of 1

DEPTH (m)	READING (Blows/75mm)	DIAGRAM (N75 VALUES)		TORQUE ON RODS (Nm)	Reduced Level	REMARKS
		0	50			
0.5						
1.0						
1.5	51 22					
2.0						
2.5						
3.0						
3.5						
4.0						
4.5						
5.0						
5.5						

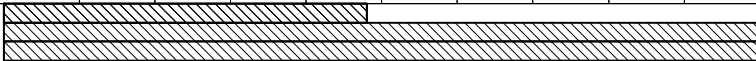
General Remarks

Test carried out from 1.40m depth.
Test terminated due to refusal.

All dimensions in metres Scale 1:30	Method: Mackintosh probe	Tested By: KDodd	Checked By: SS	AGS
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GINT LIBRARY_V10_01.GLB LibVersion: v8.07.001 ProjVersion: v8.07 | Log MACKINTOSH PROBE LOG - A4P | 736036 LANGSTONE FLOOD & COASTAL EROSION MANAGEMENT SCHEME GPJ - V10_01.
Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.soils.co.uk, Email: ask@soils.co.uk | 05/01/22 - 15:28 | SS5 |

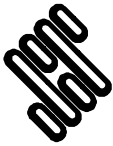


DEPTH (m)	READING (Blows/75mm)	DIAGRAM (N75 VALUES)	TORQUE ON RODS (Nm)	Reduced Level	REMARKS
	24 50 50	 Mackintosh probe hole terminated at 0.23m depth.			
0.5					
1.0					
1.5					
2.0					
2.5					
3.0					
3.5					
4.0					
4.5					
5.0					
5.5					

Test carried out from ground level.
Test terminated due to refusal.

Checked By:	SS
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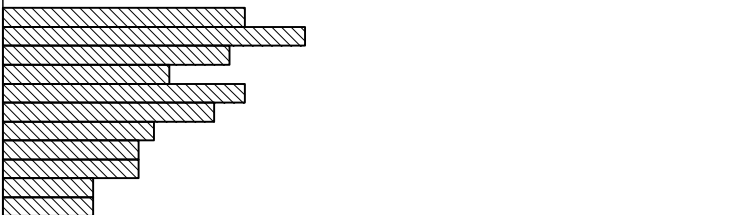




STRUCTURAL SOILS

MACKINTOSH PROBE LOG

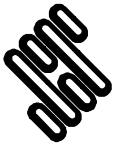
Contract: Langstone Flood & Coastal Erosion Management Scheme		Client: Havant Borough Council		Probe ref: HOTP108 - Probe
Contract Ref: 736036	Date: 17.09.21	Ground Level (m AOD): 2.95	National Grid Co-ordinate: E:471904.5 N:104780.9	Sheet: 1 of 1

DEPTH (m)	READING (Blows/75mm)	DIAGRAM (N75 VALUES)	TORQUE ON RODS (Nm)	Reduced Level	REMARKS
0.5					
1.0					
1.5	16 20 15 11				
2.0	6 6	Mackintosh probe hole terminated at 2.03m depth.			
2.5					
3.0					
3.5					
4.0					
4.5					
5.0					
5.5					

General Remarks

Test carried out from 1.20m depth.

All dimensions in metres Scale 1:30	Method: Mackintosh probe	Tested By: KDodd	Checked By: SS	
---	---------------------------------	-------------------------	-----------------------	---



STRUCTURAL SOILS

MACKINTOSH PROBE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme			Client: Havant Borough Council		Probe ref: HDTP109 - Probe	
Contract Ref: 736036		Date: 17.09.21	Ground Level (m AOD): 2.87	National Grid Co-ordinate: E:471908.1 N:104769.5		Sheet: 1 of 1

DEPTH (m)	READING (Blows/75mm)	DIAGRAM (N75 VALUES)	TORQUE ON RODS (Nm)	Reduced Level	REMARKS
0.5					
1.0					
1.5	10 12 19 24				
2.0	22 25 24 30 24 26				
2.5					
3.0					
3.5					
4.0					
4.5					
5.0					
5.5					

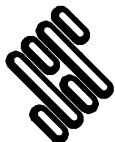
Mackintosh probe hole terminated at 1.95m depth.

General Remarks

Test carried out from 1.25m depth.

All dimensions in metres	Method:	Tested By:	Checked By:
Scale 1:30	Mackintosh probe	KDodd	SS





STRUCTURAL SOILS

MACKINTOSH PROBE LOG

Contract: Langstone Flood & Coastal Erosion Management Scheme			Client: Havant Borough Council		Probe ref: HOTP111 - Probe	
Contract Ref: 736036		Date: 23.09.21	Ground Level (m AOD): 2.06	National Grid Co-ordinate: E:471794.0 N:104723.3		Sheet: 1 of 1

DEPTH (m)	READING (Blows/75mm)	DIAGRAM (N75 VALUES)	TORQUE ON RODS (Nm)	Reduced Level	REMARKS
0.5					
1.0	11 8				
1.5	15 24 23 21 20				
2.0	11 15 12 18				
2.5					
3.0					
3.5					
4.0					
4.5					
5.0					
5.5					
		Mackintosh probe hole terminated at 1.83m depth.			

General Remarks

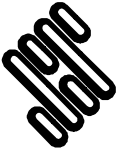
Test carried out from 1.00m depth.

All dimensions in metres	Method:	Tested By:	Checked By:
Scale 1:30	Mackintosh probe	KDodd	SS



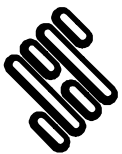
STANDPIPE SUMMARY TABLE

Exploratory Position ID	Pipe ref/ Caption	Ground Level	Length of Pipe (m)	Response Zone Top (m)	Response Zone Base (m)	Slotted Pipe Top (m)	Slotted Pipe Base (m)	Pipe Internal Diameter (mm)	Remarks
BH101	Deep	3.10	14.00	11.00	14.00	11.00	14.00	50	
BH101	Shallow	3.10	5.50	2.50	5.50	2.50	5.50	35	
BH104	Deep	2.68	10.00	7.00	10.00	7.00	10.00	50	
BH104	Shallow	2.68	2.50	1.00	2.50	1.00	2.50	19	
BH105	Deep	2.44	9.00	6.00	9.00	6.00	9.00	50	
BH105	Shallow	2.44	3.00	1.00	3.00	1.00	3.00	19	
DS103	Shallow	2.21	3.00	1.00	3.00	1.00	3.00	50	
DS104	Shallow	3.19	3.00	1.00	3.00	1.00	3.00	50	
DS105	Shallow	3.19	2.50	1.50	2.50	1.50	2.50	35	
DS106	Shallow	2.97	3.60	1.60	3.60	1.60	3.60	50	

	STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By		Date	Contract Ref:
			SSTANLEY	13.12.21	
		Contract: Langstone Flood & Coastal Erosion Management Scheme			



STANDPIPE SUMMARY TABLE

[illegible]

STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By

Date _____

Contract Ref:

736036

Contract:

Langstone Flood & Coastal Erosion Management Scheme

Page:

2 of 2



APPENDIX C - IN-SITU TESTING

- (i) Standard Penetration Test (SPT) Summary Sheet
- (ii) SPT N value versus Depth Plot

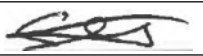
STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	N ₆₀	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result					
BH101	1.75	200		Dry	1,1	150	2,2,2,2		N=8	AR3508-2021	28/01/2021	68	9	
	2.65	200	1.70	Dry	1,3	150	2,3,2,3		N=10	AR3508-2021	28/01/2021	68	11	
	3.60	200	3.00	Dry	1,2	150	2,2,3,5		N=12	AR3508-2021	28/01/2021	68	14	SPT(c)
	4.50	200	4.50	4.20	3,3	150	4,4,4,4		N=16	AR3508-2021	28/01/2021	68	18	
	6.00	200	6.00	5.40	2	75	4,4,4,5		N=17	AR3508-2021	28/01/2021	68	19	
	7.50	200	7.50	7.30	3	75	3,4,3,5		N=15	AR3508-2021	28/01/2021	68	17	SPT(c)
	9.00	200	9.00	8.40	2,2	150	3,3,3,7		N=16	AR3508-2021	28/01/2021	68	18	
	11.00	150	10.50	10.00	2,3	150	3,4,4,6		N=17	AR3508-2021	28/01/2021	68	19	
	12.50	150	12.00	9.00	2,3	150	3,3,4,6		N=16	AR3508-2021	28/01/2021	68	18	
	14.00	150	14.00	10.00	2,2	150	2,2,2,3		N=9	AR3508-2021	28/01/2021	68	10	SPT(c)
	15.00	150	15.00	9.00	2,4	150	4,6,5,10		N=25	AR3508-2021	28/01/2021	68	28	
BH102	1.75	200		Dry	1,2	150	2,2,2,2		N=8	AR3508-2021	28/01/2021	68	9	SPT(c)
	2.70	150	1.70	2.50	1,2	150	3,2,2,3		N=10	AR3508-2021	28/01/2021	68	11	
	3.20	150	3.20	3.00	2,2	150	3,5,5,5		N=18	AR3508-2021	28/01/2021	68	20	
	3.80	150	4.00	Dry	2,2	150	2,3,5,5		N=15	AR3508-2021	28/01/2021	68	17	
	4.95	150	4.50	4.30	1,2	150	2,3,3,3		N=11	AR3508-2021	28/01/2021	68	12	
	6.05	150	5.50	5.50	2,2	150	3,3,3,3		N=12	AR3508-2021	28/01/2021	68	14	

Notes:

- Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
- Reported blows are for 75mm penetration unless indicated "+".
- Where full test drive was not achieved, actual penetration (R) and total test drive blows are reported.
- Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.
- Entries in the water depth column reflects the measured water depth at time of test.

$$N_{60} = (\text{Measured hammer energy ratio} / 60) \times N \text{ value}$$

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By		Date	Contract Ref: 736036
			13.12.21	
	Contract: Langstone Flood & Coastal Erosion Management Scheme			Page: 1 of 7 

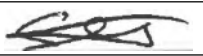
STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	N ₆₀	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result					
BH102	7.25	150	7.25	7.00	2,3	150	3,2,3,3		N=11	AR3508-2021	28/01/2021	68	12	
	8.30	150	8.30	8.00	2,3	150	2,5,5,5		N=17	AR3508-2021	28/01/2021	68	19	
	9.50	150	9.00	8.70	2,3	150	5,6,6,6		N=23	AR3508-2021	28/01/2021	68	26	
BH103	1.20	200	1.20	0.30	1,1	150	1,1,1,1		N=4	AR3508-2021	28/01/2021	68	5	
	2.55	200	1.70	0.90	1,1	150	1,2,2,2		N=7	AR3508-2021	28/01/2021	68	8	
	3.55	150	3.00	2.80	2,2	150	4,4,4,4		N=16	AR3508-2021	28/01/2021	68	18	SPT(c)
	4.55	150	3.80	3.80	2,2	150	2,2,3,3		N=10	AR3508-2021	28/01/2021	68	11	SPT(c)
	5.00	150	5.00	4.70	2,2	150	3,3,2,3		N=11	AR3508-2021	28/01/2021	68	12	
	6.55	150	6.00	5.00	2,23	150	3,2,3,4		N=12	AR3508-2021	28/01/2021	68	14	
	7.60	150	7.60	7.00	2,2	150	2,2,4,4		N=12	AR3508-2021	28/01/2021	68	14	
BH104	1.30	200		Dry	8	75	50	75	8/50	AR3508-2021	28/01/2021	68		SPT(c)
									for 75mm					
	2.00	200	1.70	Dry	1,11	150	1,1,2,3		N=7	AR3508-2021	28/01/2021	68	8	
	3.50	200	1.00	Dry	3,3	150	3,3,3,3		N=12	AR3508-2021	28/01/2021	68	14	
	4.55	200	3.20	Dry	2,2	150	2,2,3,3		N=10	AR3508-2021	28/01/2021	68	11	
	5.55	200	3.20	4.70	3,3	150	3,3,4,4		N=14	AR3508-2021	28/01/2021	68	16	

Notes:

1. Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
2. Reported blows are for 75mm penetration unless indicated "+".
3. Where full test drive was not achieved, actual penetration (R) and total test drive blows are reported.
4. Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.
5. Entries in the water depth column reflects the measured water depth at time of test.

$$N_{60} = (\text{Measured hammer energy ratio} / 60) \times N \text{ value}$$

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By		Date	Contract Ref: 736036
			13.12.21	
	Contract: Langstone Flood & Coastal Erosion Management Scheme			Page: 2 of 7 

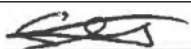
STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	N ₆₀	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result					
BH104	6.55	150	6.80	5.20	2,3	150	3,3,4,4		N=14	AR3508-2021	28/01/2021	68	16	
	8.05	150	7.50	7.00	2,2	150	3,3,4,4		N=14	AR3508-2021	28/01/2021	68	16	
	9.50	150	9.00	8.50	2,2	150	3,3,3,4		N=13	AR3508-2021	28/01/2021	68	15	
	10.95	150	10.50	10.00	2,2	150	3,3,3,4		N=13	AR3508-2021	28/01/2021	68	15	
	12.00	150	12.00	6.00	3,4	150	5,5,5,5		N=20	AR3508-2021	28/01/2021	68	23	
	13.50	150	13.50	5.70	2,3	150	3,5,2,3		N=13	AR3508-2021	28/01/2021	68	15	
	15.00	150	15.00	10.00	2,3	150	7,10,10,7		N=34	AR3508-2021	28/01/2021	68	39	
BH105	1.65	200	0.00	0.70	1,1	150	1,1,1,1		N=4	AR3508-2021	28/01/2021	68	5	
	2.65	200	2.65	NR	3,3	150	3,2,2,2		N=9	AR3508-2021	28/01/2021	68	10	SPT(c)
	3.10	200	3.00	1.50	2,3	150	4,4,4,4		N=16	AR3508-2021	28/01/2021	68	18	
	4.10	200	4.10	3.70	2,4	150	4,4,6,7		N=21	AR3508-2021	28/01/2021	68	24	
	5.75	150	5.20	5.00	3,4	150	3,4,5,6		N=18	AR3508-2021	28/01/2021	68	20	
	7.05	150	6.50	6.30	5,5	150	6,5,8,12		N=31	AR3508-2021	28/01/2021	68	35	
	8.00	150	8.00	Dry	4,4	150	7,8,9,13		N=37	AR3508-2021	28/01/2021	68	42	
	9.70	150	9.00	8.00	3,3	150	4,4,5,8		N=21	AR3508-2021	28/01/2021	68	24	
BH106	1.20	200		Dry	1,1	150	2,2,3,3		N=10	AR3508-2021	28/01/2021	68	11	

Notes:

1. Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
2. Reported blows are for 75mm penetration unless indicated "+".
3. Where full test drive was not achieved, actual penetration (R) and total test drive blows are reported.
4. Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.
5. Entries in the water depth column reflects the measured water depth at time of test.

$$N_{60} = (\text{Measured hammer energy ratio} / 60) \times N \text{ value}$$

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By		Date	Contract Ref: 736036
			13.12.21	
	Contract: Langstone Flood & Coastal Erosion Management Scheme			Page: 3 of 7 

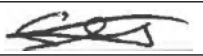
STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	N ₆₀	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result					
BH106	2.00	200	1.70	Dry	1,1	150	2,2,2,3		N=9	AR3508-2021	28/01/2021	68	10	SPT(c)
	3.00	150	3.00	2.00	2,2	150	2,2,2,2		N=8	AR3508-2021	28/01/2021	68	9	
	4.00	150	3.00	2.80	2,2	150	3,3,3,3		N=12	AR3508-2021	28/01/2021	68	14	
	5.55	150	4.70	4.70	2,2	150	3,3,3,4		N=13	AR3508-2021	28/01/2021	68	15	
	6.00	150	6.00	5.50	2,2	150	2,2,2,4		N=10	AR3508-2021	28/01/2021	68	11	
	7.00	150	7.00	6.80	2,2	150	2,2,4,4		N=12	AR3508-2021	28/01/2021	68	14	
	8.00	150	8.00	7.80	2,2	150	3,2,3,4		N=12	AR3508-2021	28/01/2021	68	14	
DS101	0.90	400		NR	3,2	150	2,4,6,5		N=17	DART227-2020	12/08/2020	73.8	21	
	1.90	101		NR	3,3	150	3,3,3,2		N=11	DART227-2020	12/08/2020	73.8	14	
	2.90	101		NR	2,2	150	1,2,1,2		N=6	DART227-2020	12/08/2020	73.8	7	
	4.40	92		NR	7,6	150	7,7,6,5		N=25	DART227-2020	12/08/2020	73.8	31	
	5.40	92		NR	3,3	150	3,3,3,3		N=12	DART227-2020	12/08/2020	73.8	15	
DS102	1.20	400		NR	17,8	150	7,4,4,4		N=19	DART227-2020	12/08/2020	73.8	23	
	2.50	116		NR	5,4	150	5,5,5,5		N=20	DART227-2020	12/08/2020	73.8	25	
	3.00	101		NR	2,3	150	3,3,5,6		N=17	DART227-2020	12/08/2020	73.8	21	
	4.00	92		NR	4,4	150	3,4,4,4		N=15	DART227-2020	12/08/2020	73.8	18	

Notes:

1. Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
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$$N_{60} = (\text{Measured hammer energy ratio} / 60) \times N \text{ value}$$

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By		Date	Contract Ref: 736036
			13.12.21	
	Contract: Langstone Flood & Coastal Erosion Management Scheme			Page: 4 of 7 

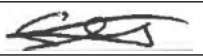
STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	N ₆₀	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result					
DS102	5.00	92		NR	2,2	150	3,3,3,3		N=12	DART227-2020	12/08/2020	73.8	15	
DS103	1.70	116		NR		0		0	N=0	DART227-2020	12/08/2020	73.8		Sunk under own weight
														Initial penetration after lowering of
														drive assembly to base of hole
														was recorded as > 450mm. In this
														situation N=0.
	2.15	116		NR	1,0	150	0,0,1,0		N=1	DART227-2020	12/08/2020	73.8	1	
	3.00	116		NR	2,2	150	2,3,2,2		N=9	DART227-2020	12/08/2020	73.8	11	
	4.50	92		NR	3,4	150	5,5,5,5		N=20	DART227-2020	12/08/2020	73.8	25	
	5.00	92		NR	4,4	150	4,3,4,4		N=15	DART227-2020	12/08/2020	73.8	18	
DS104	1.20	400		NR	3,3	150	2,2,2,3		N=9	DART227-2020	12/08/2020	73.8	11	
	2.50	116		NR	3,4	150	2,4,2,2		N=10	DART227-2020	12/08/2020	73.8	12	
	3.00	116		NR	3,2	150	2,2,1,2		N=7	DART227-2020	12/08/2020	73.8	9	
	4.00	101		NR	3,3	150	3,4,3,4		N=14	DART227-2020	12/08/2020	73.8	17	
	5.00	101		NR	4,3	150	4,4,2,3		N=13	DART227-2020	12/08/2020	73.8	16	

Notes:

1. Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
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$$N_{60} = (\text{Measured hammer energy ratio} / 60) \times N \text{ value}$$

 STRUCTURAL SOILS The Old School Stillhouse Lane Bedminster Bristol BS3 4EB	Compiled By		Date	Contract Ref: 736036
			13.12.21	
	Contract: Langstone Flood & Coastal Erosion Management Scheme			Page: 5 of 7 

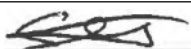
STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	N ₆₀	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result					
DS105	1.70	116		NR	1,2	150	2,1,2,2		N=7	DART227-2020	12/08/2020	73.8	9	
	2.50	116		NR	2,2	150	3,2,3,2		N=10	DART227-2020	12/08/2020	73.8	12	
	3.00	116		NR	1,1	150	2,3,2,2		N=9	DART227-2020	12/08/2020	73.8	11	
	4.00	101		NR	1,1	150	2,2,3,3		N=10	DART227-2020	12/08/2020	73.8	12	
	5.00	101		NR	2,3	150	3,3,3,3		N=12	DART227-2020	12/08/2020	73.8	15	
DS106	1.70	116		NR	2,1	150	2,2,2,2		N=8	DART227-2020	12/08/2020	73.8	10	
	2.50	116		NR	1,1	150	2,1,2,2		N=7	DART227-2020	12/08/2020	73.8	9	
	3.00	116		NR	4,3	150	2,4,3,4		N=13	DART227-2020	12/08/2020	73.8	16	
	4.00	101		NR	6,6	150	4,4,4,4		N=16	DART227-2020	12/08/2020	73.8	20	
	5.00	92		NR	2,2	150	2,2,2,2		N=8	DART227-2020	12/08/2020	73.8	10	
	6.00	70		NR	1,0	150	5,4,4,4		N=17	DART227-2020	12/08/2020	73.8	21	
DS107	1.70	116		NR	5,5	150	3,2,3,3		N=11	DART227-2020	12/08/2020	73.8	14	
	2.00	116		NR	3,3	150	3,3,2,3		N=11	DART227-2020	12/08/2020	73.8	14	
	3.00	116		NR	1,2	150	2,2,2,3		N=9	DART227-2020	12/08/2020	73.8	11	
	4.00	101		NR	4,6	150	5,6,6,7		N=24	DART227-2020	12/08/2020	73.8	30	
DS107	5.00	101		NR	4,5	150	4,4,4,4		N=16	DART227-2020	12/08/2020	73.8	20	

Notes:

1. Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
2. Reported blows are for 75mm penetration unless indicated "+".
3. Where full test drive was not achieved, actual penetration (R) and total test drive blows are reported.
4. Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.
5. Entries in the water depth column reflects the measured water depth at time of test.

$$N_{60} = (\text{Measured hammer energy ratio} / 60) \times N \text{ value}$$

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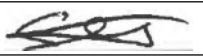
STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	N ₆₀	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result					
DS109	1.70	101		NR	2,2	150	3,3,2,3		N=11	DART227-2020	12/08/2020	73.8	14	
	2.50	101		NR	2,2	150	2,2,2,2		N=8	DART227-2020	12/08/2020	73.8	10	
	3.00	101		NR	2,2	150	3,2,3,3		N=11	DART227-2020	12/08/2020	73.8	14	
	4.50	92		NR	3,3	150	3,5,5,5		N=18	DART227-2020	12/08/2020	73.8	22	
	5.00	92		NR	3,5	150	5,5,4,4		N=18	DART227-2020	12/08/2020	73.8	22	
DS110	1.00	400		NR	2,1	150	2,3,2,2		N=9	DART227-2020	12/08/2020	73.8	11	
	2.00	101		NR	1,1	150	1,0,0,1		N=2	DART227-2020	12/08/2020	73.8	2	

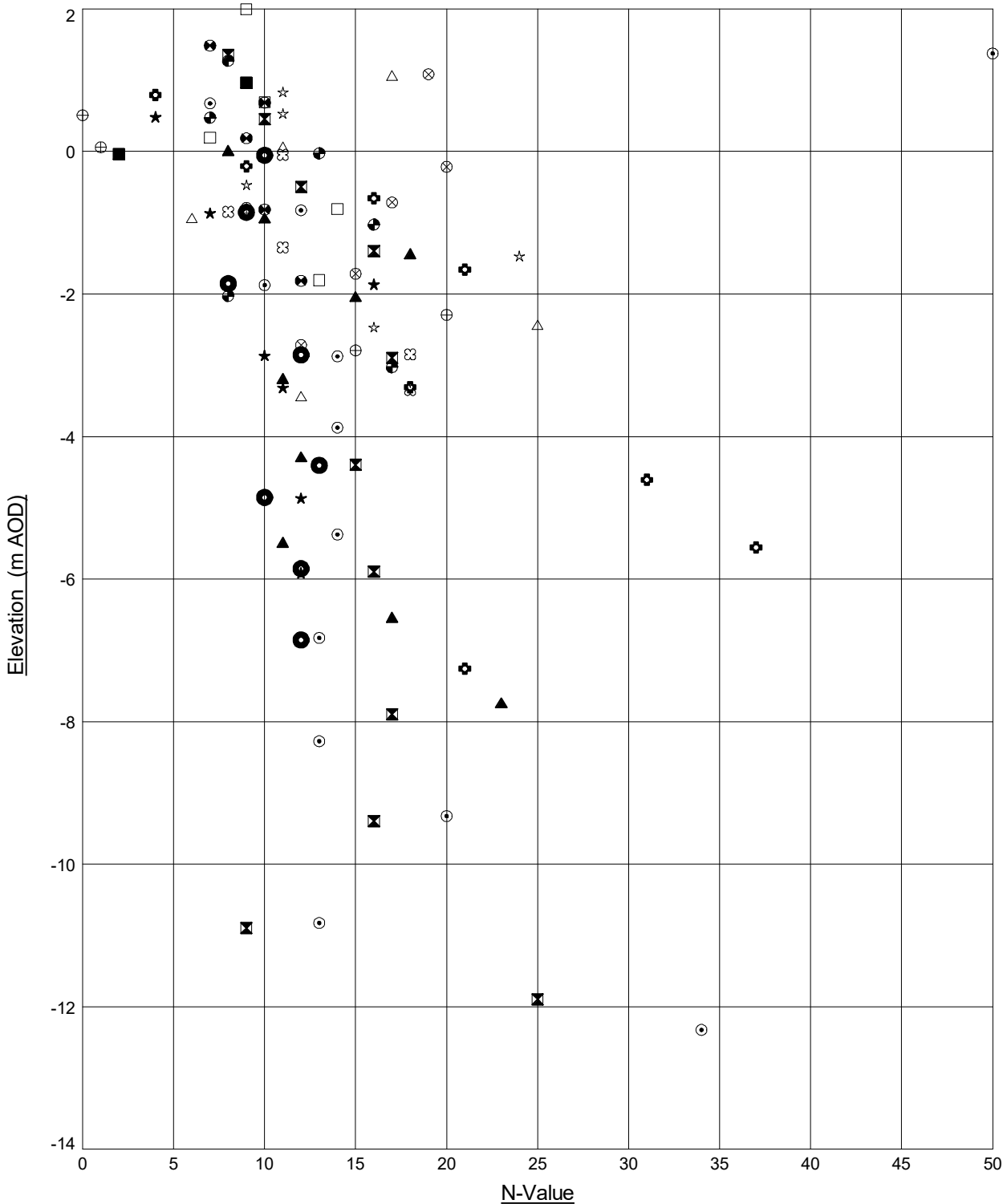
Notes:

- Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
- Reported blows are for 75mm penetration unless indicated "+".
- Where full test drive was not achieved, actual penetration (R) and total test drive blows are reported.
- Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.
- Entries in the water depth column reflects the measured water depth at time of test.

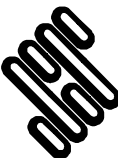
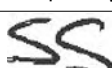
$$N_{60} = (\text{Measured hammer energy ratio} / 60) \times N \text{ value}$$

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STANDARD PENETRATION TEST (SPT N-Value) vs ELEVATION



Key: = BH101, = BH102, = BH103, = BH104, = BH105, = BH106, = DS101, = DS102, = DS103, = DS104, = DS105, = DS106, = DS107, = DS109, = DS110

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