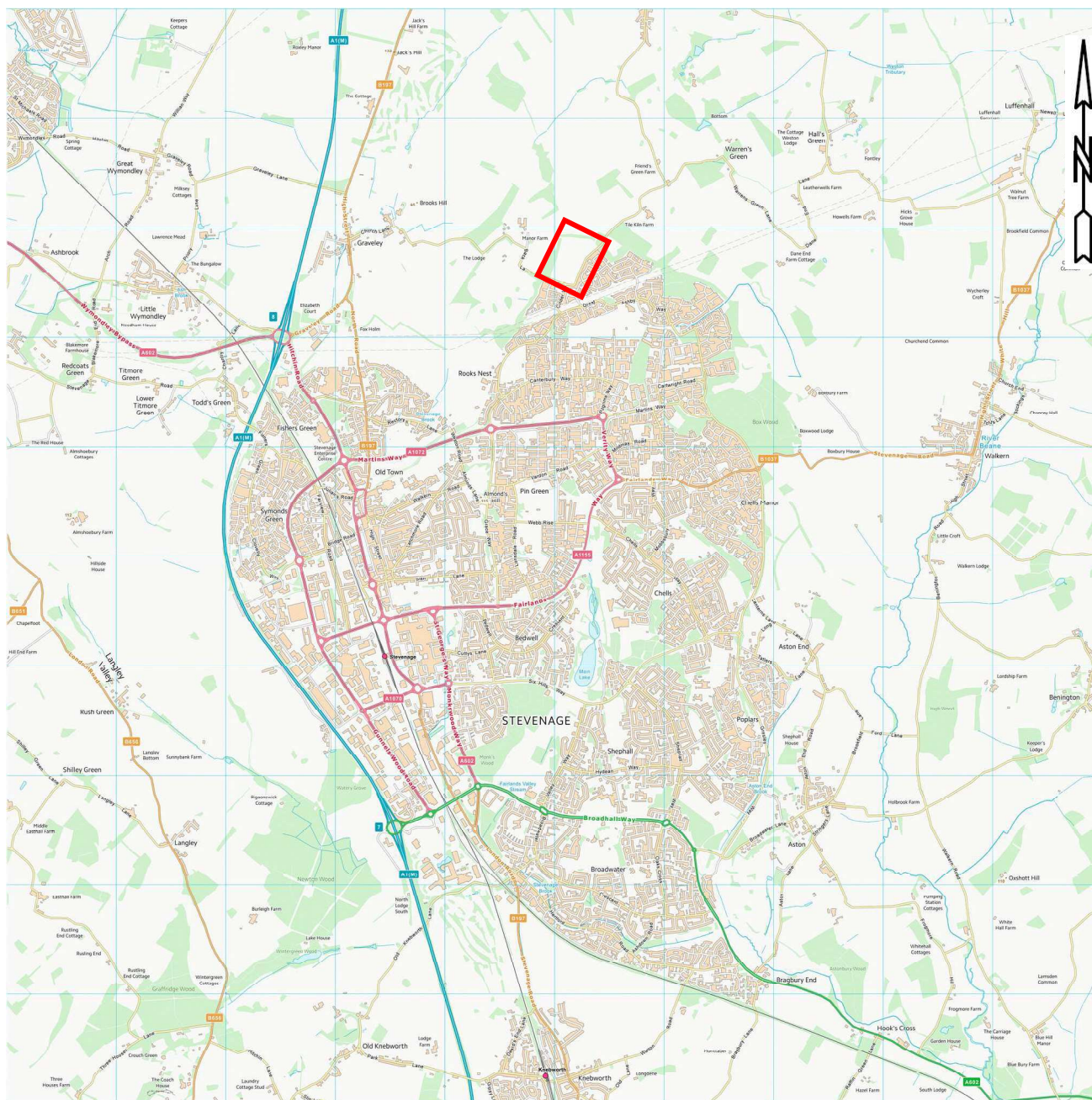


APPENDIX A

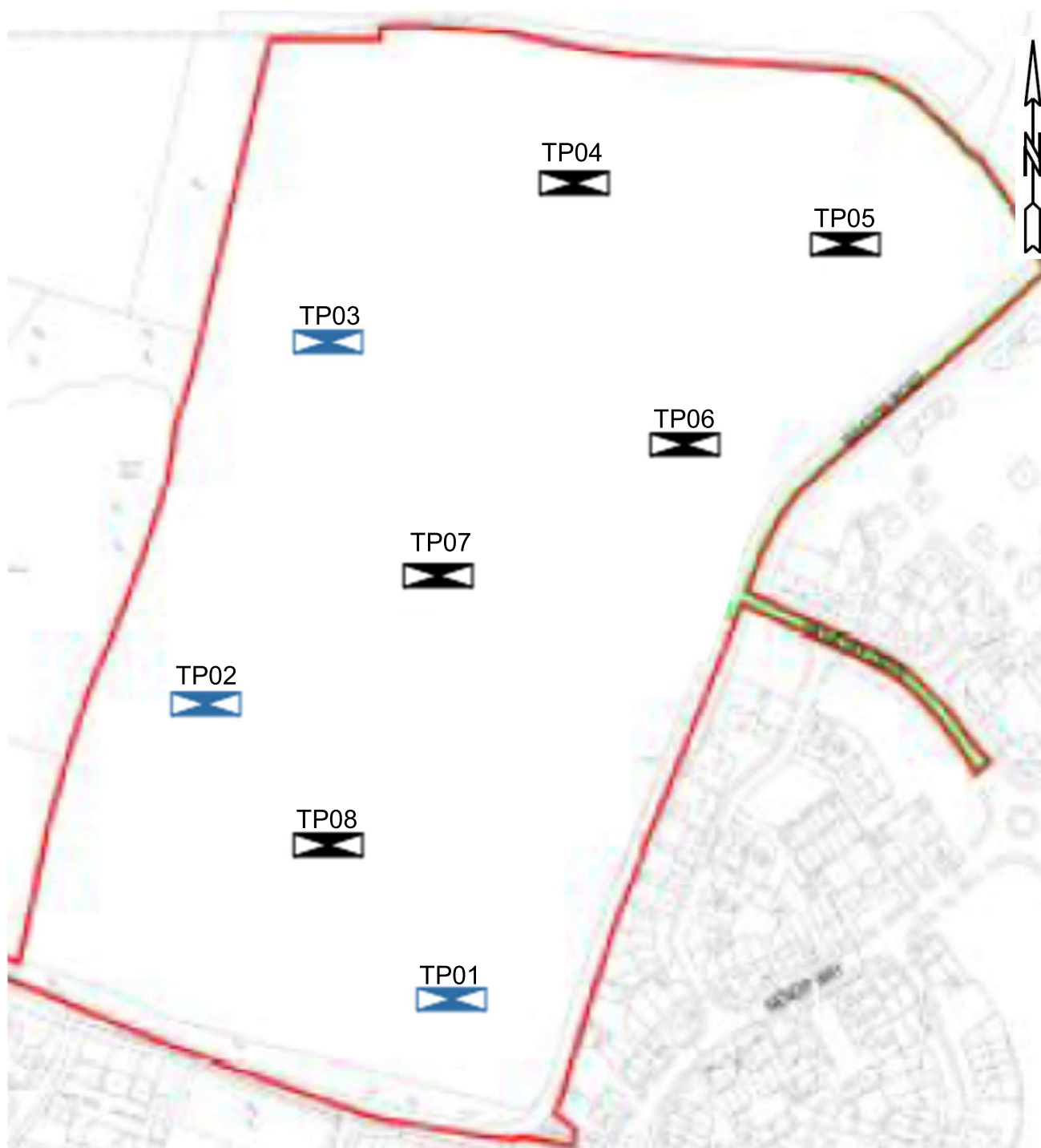
Site Plans and Exploratory Hole Logs





Contains Ordnance Survey Data © Crown Copyright and Database Right 2020

Site:	Roundwood, Great Ashby	Project ID	JN1631
Figure 1	Site Location Plan	Date:	26/11/2021



NB: Positions of exploratory holes / test positions are only indicative unless dimensioned.

Site:	Roundwood, Great Ashby	Project ID	JN1631
Figure 2	Site Investigation Layout Plan	Date:	26/11/2021

Key to Exploratory Hole Logs, Plans and Sections

Backfill Symbols		Pipe Symbols		Principal Soil Types		Principal Rock Types		Drilling Records	
Arisings		Plain Pipe		Topsoil		Mudstone		Water Strike	
Concrete		Slotted Pipe		Made Ground		Claystone		Depth Water Rose	
Blacktop		Piezometer		Clay		Siltstone		Total Core Recovery (%) [TCR]	
Bentonite		Piezometer Tip		Silt		Sandstone		Solid Core Recovery (%) [SCR]	
Gravel Filter		Filter Tip		Sand		Limestone		Rock Quality Index (%) RQD]	
Sand Filter		Extensometer		Gravel		Chalk		Fracture Index (fractures / m) [FI]	
		Inclinometers		Peat					

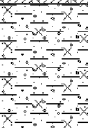
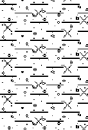
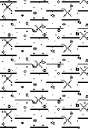
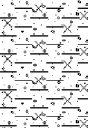
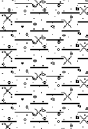
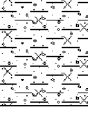
All soil and rock descriptions are in general accordance with BS5930 2015, BS EN ISO 14688-1:2002+A1:2013 and BS EN ISO 14689-1:2003. Chalk descriptions are also based on CIRIA C574 and "Logging the Chalk – R.N. Mortimer 2015". The Geology Code is only provided where a positive identification of the sample strata has been made.

Location / Method Identifiers		In-situ Test Location / Method	
BH	Borehole (undefined)	DP	Dynamic Probe
CP	Cable Percussive	CPT	Cone Penetration Test
RC	Rotary Core	CBR	In-situ CBR Test
RO	Rotary Open Hole	DCP	CBR using Dynamic Cone Penetrometer
ODC	Rotary Odex/Symmetrix drilling cased	CBRT	CBR using TRL Probe
CP+RC	Cable Percussive to Rotary Core	PB	Plate Bearing Test
SNC	Sonic	SPT (S)	Standard Penetration Test (Split Barrel Sampler)
CFA	Continuous Flight Auger	SPT (C)	Standard Penetration Test (Solid Cone)
FA	Flight Auger	N	SPT Result
VC	Vibro Core	-/-	Blows/Penetration (mm) after seating drive
WLS+RC	Windowless (Dynamic) Sampler to Rotary Core	-*/-	Total Blows / Penetration (mm)
WLS	Windowless Sampler	()	Extrapolated Value
WS	Window Sampler	PPT	Perth Penetration (In-House Method - Equivalent N Value)
HA	Hand Auger	HP / UCS	Strength from Hand Penetrometer (kN/m ²)
C	Road / Pavement Core	IVN	Strength from Hand Vane ((kN/m ²) P = peak, R = residual
IP	Inspection Pit (Hand Excavation)	PID	Photo Ionisation Detector (ppm)
TP	Trial Pit (Machine Excavated)	MEXE	Mexi-Cone CBR (%)
OP	Observation Pit (Supported Excavation Hand or Machine)		

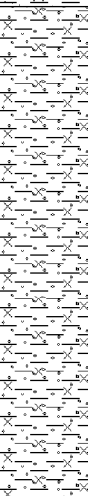
Samples / Test Type	
B	Bulk Sample
BLK	Block Sample
C	Core Sample
CBRS	CBR Mould Sample
D	Small Disturbed Sample
ES	Environmental Sample (Soil)
EW	Environmental Sample (Water)
GS	Environmental Sample (Gas)

Samples / Test Type	
SPTLS	Standard Penetration Test Split Barrel Sample
TW	Thin Wall Push In Sample (e.g. Shelby Sampler)
U	Undisturbed Open Drive Sample (blows to take)
UT	Thin Wall Undisturbed Open Drive Sample (blows to take)
W	Water Sample (Geotechnical)
SP	Sample from Stockpile
P	Piston Sample
AMAL	Amalgamated Sample

				Start - End Date: 25/11/2021		Project ID: JN1631		Machine Type: TERREX		TP01 Sheet 1 of 1	
Project Name: Roundwood				Remarks: Stable in the short term.		Co-ordinates:		Level (m AOD):		Logger: ODJ	
Location: Great Ashby											
Client: Croudace Homes											

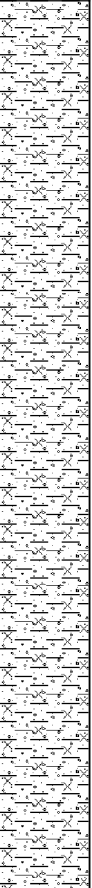
Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description	
Depth (m)	Type	Results						
0.15	ES			(0.40)		0.40	Brown clayey silty sandy gravelly TOPSOIL with rootlets. Gravels comprise fine to coarse sub-rounded to sub-angular flint.	
0.75	HP	UCS(kPa)=200.00					Stiff brown silty sandy gravelly CLAY. Gravels comprise fine to coarse sub-rounded to sub-angular flint.	
1.00	D							1
1.50	HP	UCS(kPa)=250.00		(2.30)			Becoming red-brown with hematite staining.	
2.00	D							2
2.50	HP	UCS(kPa)=280.00						
						2.70	Pit terminated at 2.70m.	3
								4

Pit Dimension (m)		Pit Stability:		Water Strikes:	
Width:	0.50	STABLE		DRY	
Length:	1.50				
Depth:	2.70				

				Start - End Date: 25/11/2021		Project ID: JN1631		Machine Type: TERREX		TP02 Sheet 1 of 1	
Project Name: Roundwood				Remarks:		Co-ordinates:		Level (m AOD):		Logger: ODJ	
Location: Great Ashby				Stable in the short term.							
Client: Croudace Homes											
Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description				
Depth (m)	Type	Results									
0.15	ES	UCS(kPa)=200.00		(0.30)		0.30	Brown clayey silty sandy gravelly TOPSOIL with rootlets. Gravels comprise fine to coarse sub-rounded to sub-angular flint.		1		
0.50	HP						Stiff yellow-brown silty slightly sandy CLAY.				
1.00	D					UCS(kPa)=200.00		(1.40)		1.70	Stiff red-brown slightly silty gravelly CLAY. Gravels comprise fine to coarse sub-rounded to sub-angular flint.
1.50	HP										
2.00	D	UCS(kPa)=350.00		(1.30)						3.00	Pit terminated at 3.00m.
2.50	HP										
3.00	D HP					UCS(kPa)=400.00					
Pit Dimension (m)			Pit Stability:				Water Strikes:				
Width:	0.50		STABLE				DRY				
Length:	1.80										
Depth:	3.00										

				Start - End Date: 25/11/2021		Project ID: JN1631		Machine Type: TERREX		TP03 Sheet 1 of 1	
Project Name: Roundwood				Remarks:		Co-ordinates:		Level (m AOD):		Logger: ODJ	
Location: Great Ashby				Stable in the short term.							
Client: Croudace Homes											
Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description				
Depth (m)	Type	Results									
0.15	ES		(2.45)	(0.35)		0.35	Grey-brown clayey silty sandy gravelly TOPSOIL with rootlets. Gravels comprise fine to coarse sub-rounded to sub-angular flint.		1		
0.50	ES			Stiff brown silty slightly sandy gravelly slightly cobbly CLAY. Gravels comprise fine to coarse sub-rounded to sub-angular flint.							
1.00	HP	UCS(kPa)=200.00						2			
1.50	D										
2.00	HP	UCS(kPa)=240.00				Becoming red-brown with hematite staining.		3			
2.50	D HP	UCS(kPa)=300.00									
2.80	HP	UCS(kPa)=450.00			Pit terminated at 2.80m.		4				
Pit Dimension (m)			Pit Stability:				Water Strikes:				
Width:		0.50	STABLE				DRY				
Length:		1.60									
Depth:		2.80									

				Start - End Date: 25/11/2021		Project ID: JN1631		Machine Type: TERREX		TP04 Sheet 1 of 1				
Project Name: Roundwood				Remarks:		Co-ordinates:		Level (m AOD):		Logger: ODJ				
Location: Great Ashby				Stable in the short term.										
Client: Croudace Homes														
Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description							
Depth (m)	Type	Results												
0.15	ES			(0.30)		0.30	Grey-brown clayey silty sandy gravelly TOPSOIL with rootlets. Gravels comprise fine to coarse sub-rounded to sub-angular flint.							
0.50	HP	UCS(kPa)=200.00		Stiff Grey/orange-brown mottled silty sandy gravelly CLAY. Gravels comprise fine to coarse sub-rounded to sub-angular flint and fine chalk.										
1.00	D			(2.20)					1					
1.50	HP	UCS(kPa)=400.00												
2.00	D						Becoming very gravelly.					2		
2.50	HP	UCS(kPa)=400.00					Chalk gravels becoming more common and coarse.							
2.85	HP	UCS(kPa)=420.00		(0.50)			2.50	Stiff red-brown slightly silty gravelly CLAY with prominent hematite staining. Gravels comprise fine to coarse sub-rounded to sub-angular flint and chalk.		3				
3.00	D						3.00	Pit terminated at 3.00m.						
									4					
Pit Dimension (m)			Pit Stability:				Water Strikes:							
Width:			STABLE				DRY							
Length:														
Depth:		3.00												

				Start - End Date: 25/11/2021		Project ID: JN1631		Machine Type: TERREX		TP05 Sheet 1 of 1	
Project Name: Roundwood				Remarks:		Co-ordinates:		Level (m AOD):		Logger: ODJ	
Location: Great Ashby				Stable in the short term.							
Client: Croudace Homes											
Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description				
Depth (m)	Type	Results									
0.15	ES			(0.45)		0.45	Grey-brown clayey silty sandy gravelly TOPSOIL with rootlets. Gravels comprise fine to coarse sub-rounded to sub-angular flint.				
0.75	HP	UCS(kPa)=220.00					Stiff grey/orange-brown mottled silty sandy gravelly CLAY. Gravels comprise fine to coarse sub-rounded to sub-angular flint.				
1.00	D										
1.50	HP	UCS(kPa)=350.00				(2.35)					
2.00	D							Becoming very gravelly and cobbly.			
2.50	HP	UCS(kPa)=480.00			2.80	Pit terminated at 2.80m.					
Pit Dimension (m)			Pit Stability:				Water Strikes:				
Width:			STABLE				DRY				
Length:											
Depth:		2.80									

				Start - End Date: 25/11/2021		Project ID: JN1631		Machine Type: TERREX		TP07 Sheet 1 of 1	
Project Name: Roundwood				Remarks:		Co-ordinates:		Level (m AOD):		Logger: ODJ	
Location: Great Ashby				Stable in the short term.							
Client: Croudace Homes											
Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description				
Depth (m)	Type	Results									
0.15	ES	UCS(kPa)=300.00		(0.35)		0.35	Brown clayey silty sandy gravelly TOPSOIL with rootlets. Gravels comprise fine to coarse sub-rounded to sub-angular flint.		1		
0.50	HP						Stiff brown silty sandy gravelly slightly cobbly CLAY. Gravels comprise fine to coarse sub-rounded to sub-angular flint.				
1.00	D	UCS(kPa)=290.00		(2.65)					2		
1.50	HP										
2.00	D	UCS(kPa)=300.00							3		
2.50	HP						Introduction of fine to coarse chalk gravels.				
3.00	D						Becoming very chalky.		4		
							Pit terminated at 3.20m.				
Pit Dimension (m)			Pit Stability:				Water Strikes:				
Width:			STABLE				DRY				
Length:											
Depth:		3.20									

Remarks:

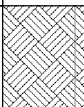
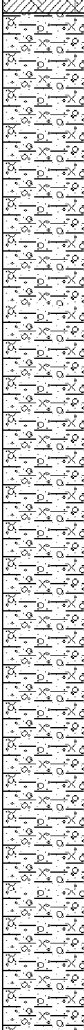
Level (m AOD):

Logger:

ODJ

Stable in the short term.

Client:	Croudace Homes
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Samples and Insitu Testing			Level (m AOD)	Thickness (m)	Legend	Depth (m bgl)	Stratum Description		
Depth (m)	Type	Results							
0.15	ES	UCS(kPa)=200.00		(0.30)		0.30	Brown clayey silty sandy gravelly TOPSOIL with rootlets. Gravels comprise fine to coarse sub-rounded to sub-angular flint.	1	
0.50	HP						Stiff brown silty sandy gravelly slightly cobbly CLAY. Gravels comprise fine to coarse sub-rounded to sub-angular flint.		
1.00	D								
1.50	HP	UCS(kPa)=300.00				(2.70)	3.00	Becoming red-brown with hematite staining.	2
2.00	D								
2.50	HP	UCS(kPa)=300.00							
3.00	D								
						Pit terminated at 3.00m.	3		
								4	

Pit Stability:

STABLE

	DRY
--	-----

Width:

Length:

Depth:

3.00

APPENDIX B

Field Sampling and In-Situ Test Methods and Results



B

Soil and Rock Descriptions

All soil and rock descriptions are in general accordance with BS5930 Ref [4].

Anthropogenic soils ('made ground' or 'fill') describe materials which have been placed by man and can be divided into those composed of reworked natural soils and those composed of or containing man-made materials. 'Fill' is used to describe material placed in a controlled manner and 'made ground' is used to describe materials placed without strict engineering control.

The classification of materials such as topsoil is based on visual description only and should not be interpreted to mean that the material complies with criteria used in BS 3882 Ref [26].

Chalk descriptions are based on CIRIA C574 Ref [27] and Mortimore Ref [28].

The geology code is only provided on logs where a positive identification of the sample strata has been made.

Trial Pits and Trenches

Trial pits and trenches are unsupported excavations, mechanically excavated by machine to the required depth to enable visual examination, in situ testing and sampling as required from outside the excavation.

Hand Penetrometer Test

The handheld soil penetrometer consists of a spring loaded and calibrated plunger which is forced into cohesive soil. A reading of unconfined compression strength (equal to twice cohesion) is given on a calibrated scale. The average of a set of three readings shall be recorded.

In common with other hand methods of strength assessment it does not give an accurate indication of bearing capacity in stiff or fissured soils, because of the small test area.

Disturbed Samples

Disturbed samples were taken from exploratory holes in general accordance with BS 5930 [4] and BS EN ISO 22475-1 Ref [29] as required and stored in appropriately labelled containers. Details of the type, size and depth of sample will be recorded within the exploratory hole record. Such samples can be regarded as being between Class 5 up to Class 3 quality depending upon their method of sampling.

Environmental Samples

Environmental samples were taken from the boreholes at regular intervals in the made ground and natural soils as indicated on the exploratory hole logs. The sampling strategy was in general accordance with BS10175 Ref [5] and BS ISO 18400 Refs [30], [31], [32], [33] & [34].

These samples were collected and stored in glass jars or plastic pots and transferred to the laboratory in cool boxes as appropriate to the proposed laboratory testing.

Soakage Tests (after BRE DG365 2016)

The BRE DG365 Ref [17] paper on soakaway design allows for the design of trench soakaways as well as traditional square and circular soakaways.

The test to measure the soil infiltration rate is carried out in pits which are excavated to the full depth of the proposed soakaway. The trial pits are filled and allowed to drain to empty or near empty, three times, on the same day or on consecutive days. Water levels are recorded against time. Where the sides are unstable the pit should be filled with granular material to provide stability during the test.

Calculated soakage rates are expressed as l/m²/minute, which is a convenient rate to use. The BRE use a unit of m/sec, which is the value in l/m²/minute divided by 60,000.

Soakage Test (after NHBC Standards Chapter 5.3)

The above test Ref [16] refers to small-scale soakage tests that can be performed in areas with restricted access e.g. occupied houses, or where disturbance is to be kept to a minimum. The aim is to measure the time it takes for a set quantity of water to drain from a standard sized excavation. The results from which are used to design a soakaway chamber. However, if the test results prove inconclusive, it may be advisable to retest the soils using the larger scale BRE DG365 test method Ref [17].

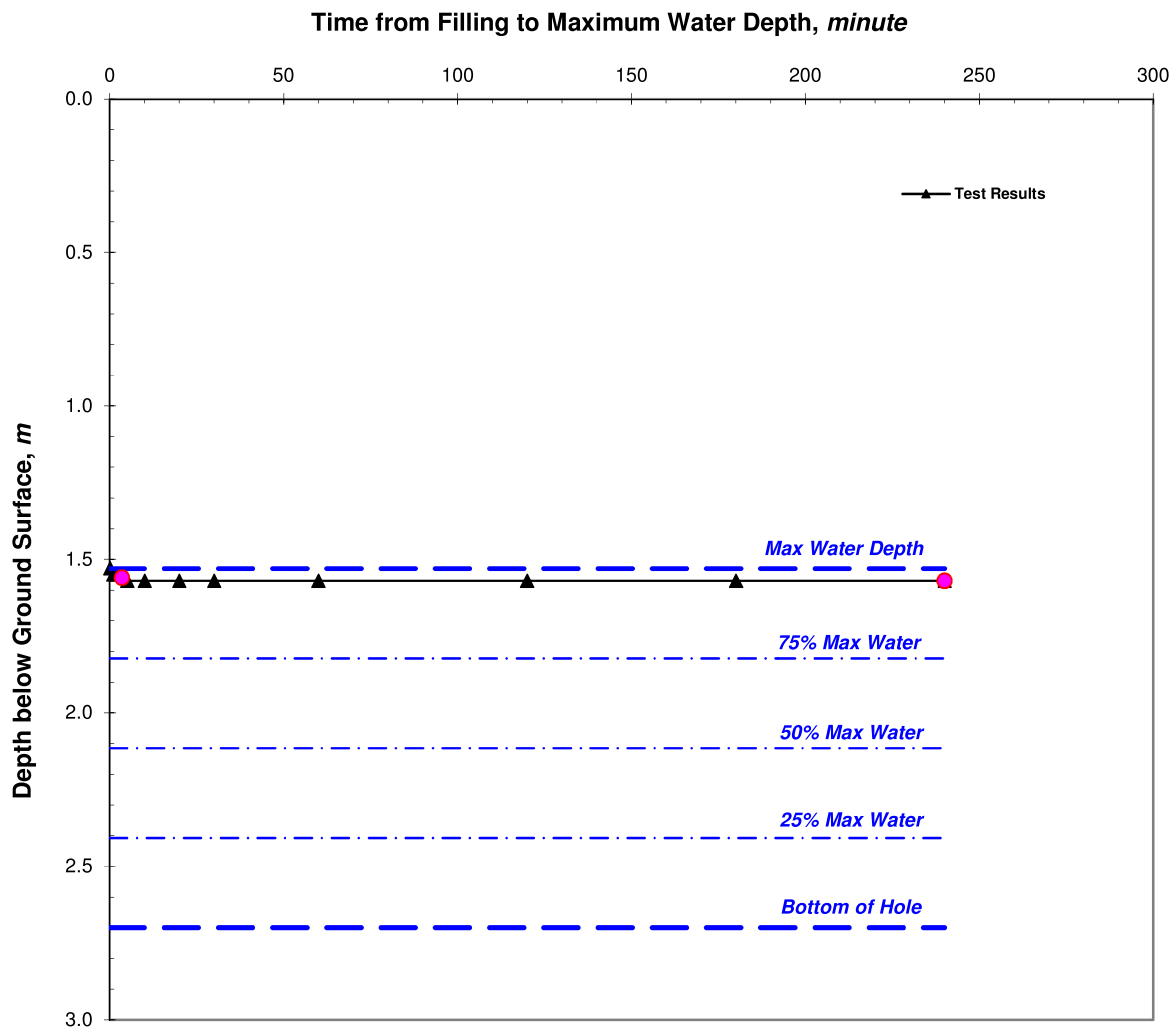
The procedure involves drilling a 150 mm diameter hole to a depth of 1.5m or more. Perforated casing is installed in the hole with a sand filter surround. Water is added to a depth of 300 mm, and a record kept of the falling water level.

The test result is expressed as the time in minutes for the water level to drop the full 300 mm, and required soakaway sizes and depths are obtained from graphs in NHBC 5.3. If the water does not completely soak away in the time available then a graphical plot of water level versus logarithm of time is prepared. The test time is then obtained by extrapolation.

BRE Digest DG365 Soakage Test

Test Hole No: TP01

Test No: Test No 1 (Initial)



Pit Length, m	1.500	Depth to Water at Start of Test, m	1.530
Pit Width, m	0.500	Max Water Dropdown during Test, m	0.040
Depth to Pit Base, m	2.700	Total Soakage Test Time, min	240.0
Depth to Top of Permeable Soils, m	0.400	Mean Internal Discharge Area, m ²	5.290
Depth to Groundwater Surface, m		Discharge Rate, litre/min	0.032
Depth to Top of Granular Fill, m		Soakage Rate, litre/m ² /min	0.0060
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, m/sec	9.99E-08

Comments:

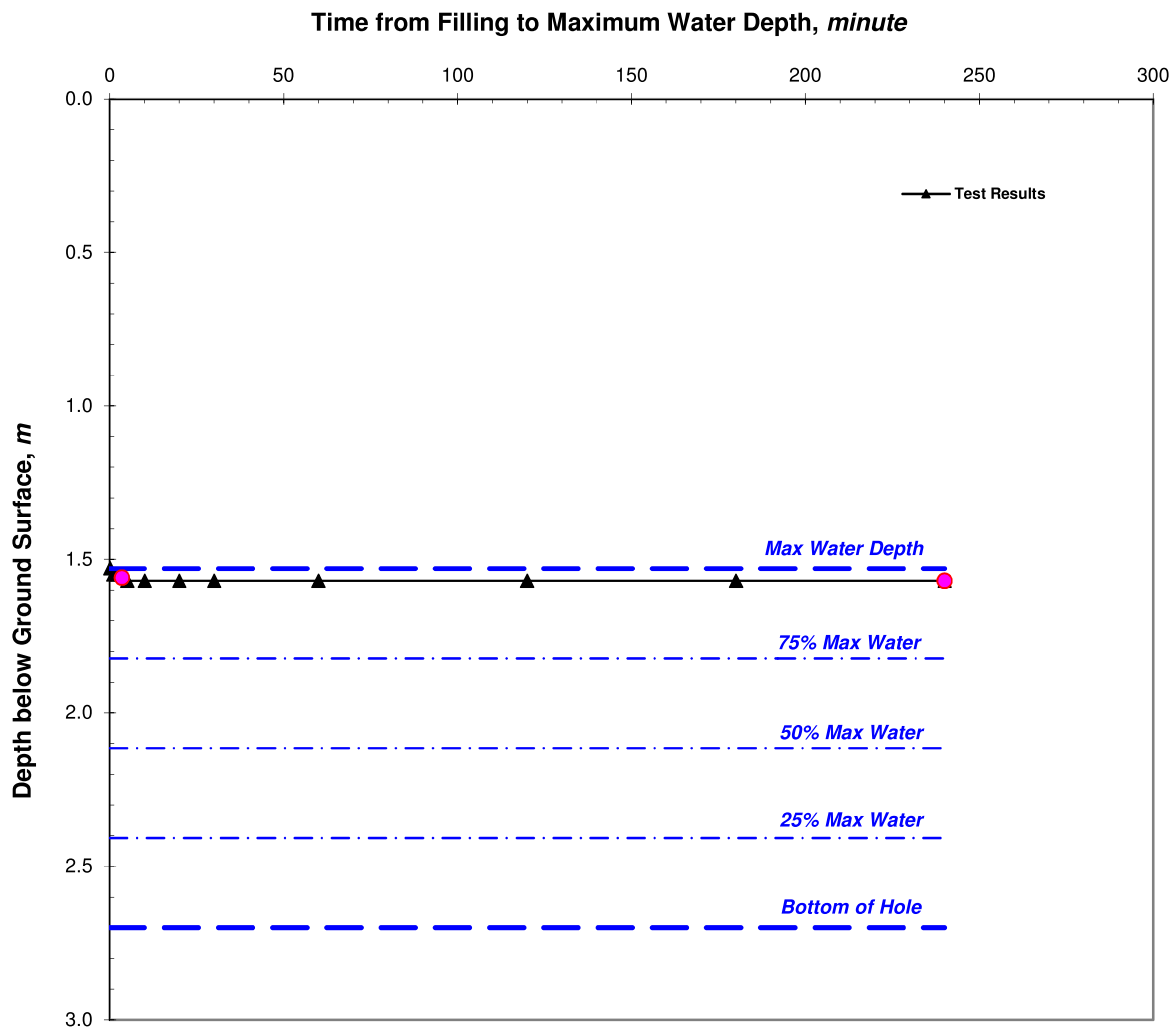
Water level did not fall to 75% max water depth, calculations were based on actual fall of water level achieved.
Result not compliant with BRE365 requirement since water did not fall to 25% max water depth.

Client: Croudace Homes Group & Warden Develop	Job No: JN1631	Test Date: 25/Nov/2021
Site: Back Lane, Stevenage	Tested By: DR	Engineer: ODJ Fig. S1

BRE Digest DG365 Soakage Test

Test Hole No: TP01

Test No: Test No 1 (Initial)



Pit Length, m	1.500	Depth to Water at Start of Test, m	1.530
Pit Width, m	0.500	Max Water Dropdown during Test, m	0.040
Depth to Pit Base, m	2.700	Total Soakage Test Time, min	240.0
Depth to Top of Permeable Soils, m	0.400	Mean Internal Discharge Area, m ²	5.290
Depth to Groundwater Surface, m		Discharge Rate, litre/min	0.032
Depth to Top of Granular Fill, m		Soakage Rate, litre/m ² /min	0.0060
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, m/sec	9.99E-08

Comments:

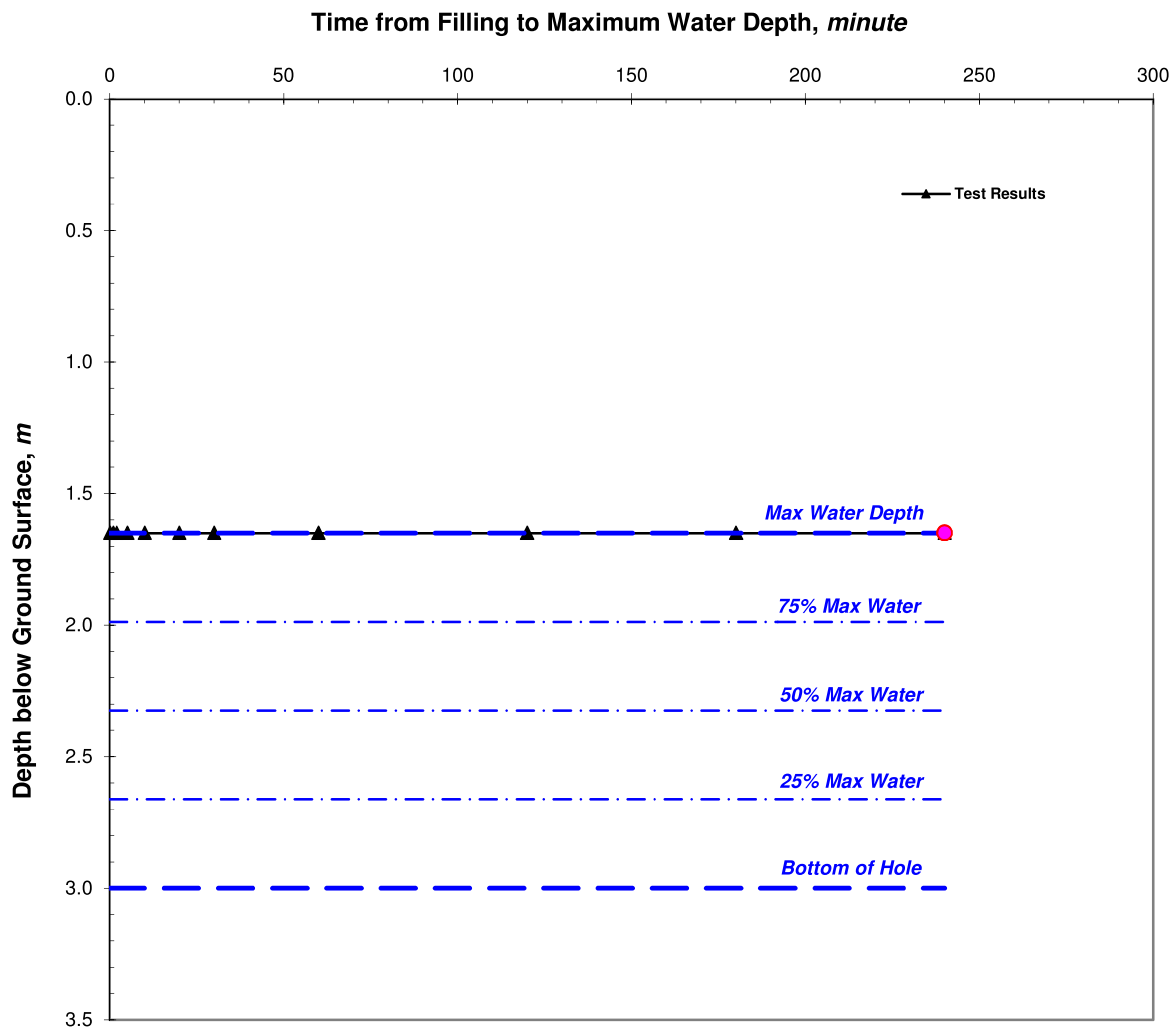
Water level did not fall to 75% max water depth, calculations were based on actual fall of water level achieved.
Result not compliant with BRE365 requirement since water did not fall to 25% max water depth.

Client: Croudace Homes Group & Warden Develop	Job No: JN1631	Test Date: 25/Nov/2021
Site: Back Lane, Stevenage	Tested By: DR	Engineer: ODJ Fig. S1

BRE Digest DG365 Soakage Test

Test Hole No: TP03

Test No: Test No 1 (Initial)



Pit Length, m	1.600	Depth to Water at Start of Test, m	1.650
Pit Width, m	0.500	Max Water Dropdown during Test, m	0.000
Depth to Pit Base, m	3.000	Total Soakage Test Time, min	240.0
Depth to Top of Permeable Soils, m	0.350	Mean Internal Discharge Area, m ²	6.470
Depth to Groundwater Surface, m		Discharge Rate, litre/min	0.000
Depth to Top of Granular Fill, m		Soakage Rate, litre/m ² /min	0.0000
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, m/sec	0.00E+00

Comments:

Water level did not fall to 75% max water depth, calculations were based on actual fall of water level achieved.
Result not compliant with BRE365 requirement since water did not fall to 25% max water depth.

Client: Croudace Homes Group & Warden Develop	Job No: JN1631	Test Date: 25/Nov/2021
Site: Back Lane, Stevenage	Tested By: DR	Engineer: ODJ Fig. S3

Summary Sheet							
Results of BRE Digest DG365 Soakage Tests							
Site : Back Lane, Stevenage					Job No : JN1631		
Client : Croudace Homes Group & Warden Development					O S Reference : TL 25150 27700		
Tested By : DR				Engineer: ODJ		Test Date : 25/11/2021	
Hole No	Test No	Hole Depth <i>m</i>	Soakage Rate for Each Test <i>litre/m²/min</i>	Soakage Rate for Each Hole <i>litre/m²/min m/sec</i>		Water Level at Finish of Test	Remarks
TP01	No 1	2.70	0.0060	0.0060	9.99E-8	Pit was not emptied; Non compliant value was calculated.	Depth to top of permeable soils was 0.4m.
TP02	No 1	3.00	0.0000	0.0000	0.00E+0	Water level did not fall during test.	Depth to top of permeable soils was 0.3m.
TP03	No 1	3.00	0.0000	0.0000	0.00E+0	Water level did not fall during test.	Depth to top of permeable soils was 0.35m.
Mean Value of All Calculated Soakage Rates :				0.0020 <i>litre/m²/min</i>	3.33E-8 <i>m/sec</i>		

APPENDIX C

Geotechnical Laboratory Test Methods and Results





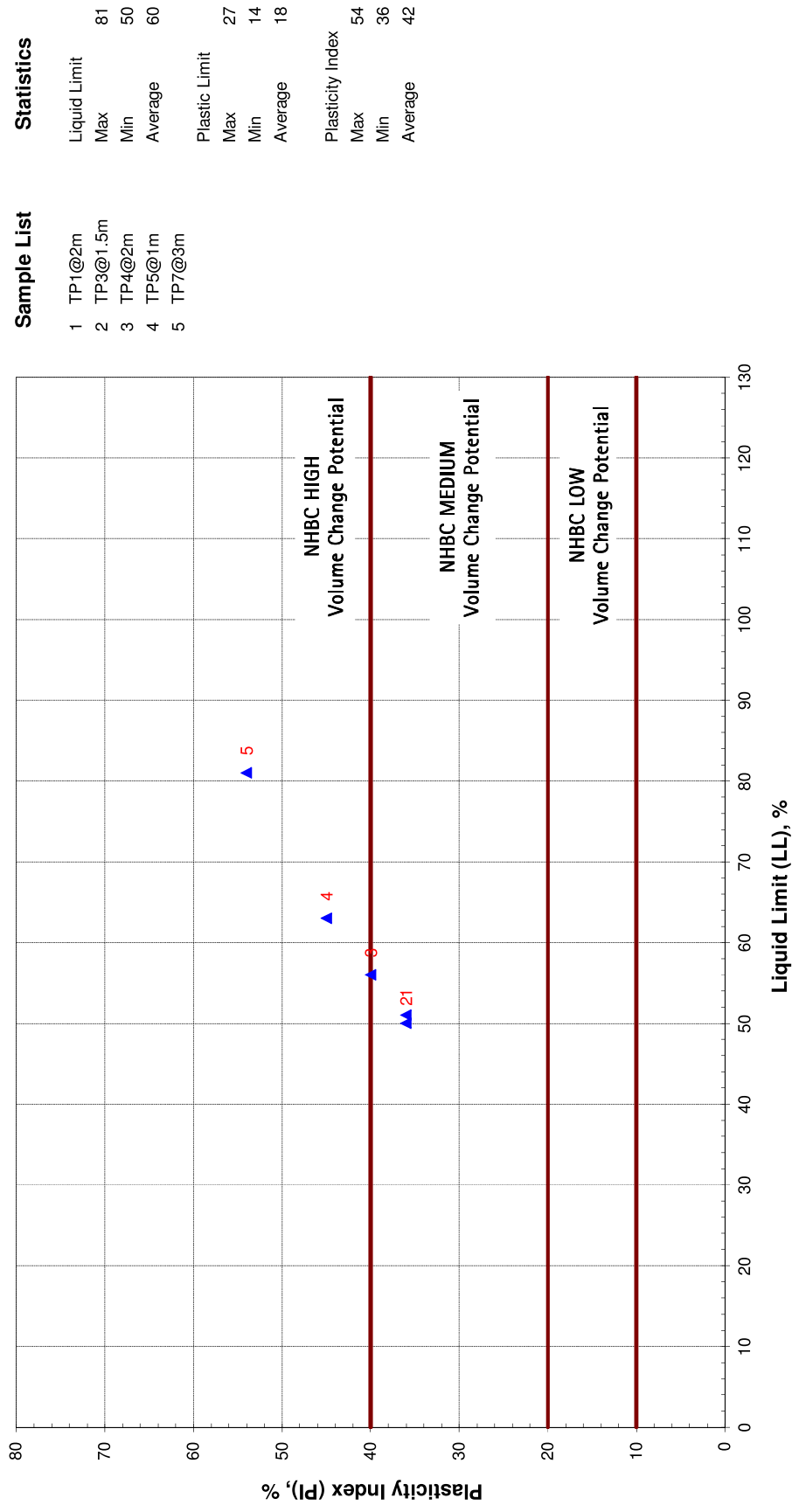
Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creton, Northampton NN6 8NN



ST Consult

Plot Relating Soil Plasticity to NHBC Classification for Volume Change Potential



Project Name:	Back Lane, Stevenage	Project No:	JN1631	Project Engineer:	OJ
Client:	Croudace Homes Group & Warden Developments Ltd	Date:	15/12/2021	Figure No. 3	



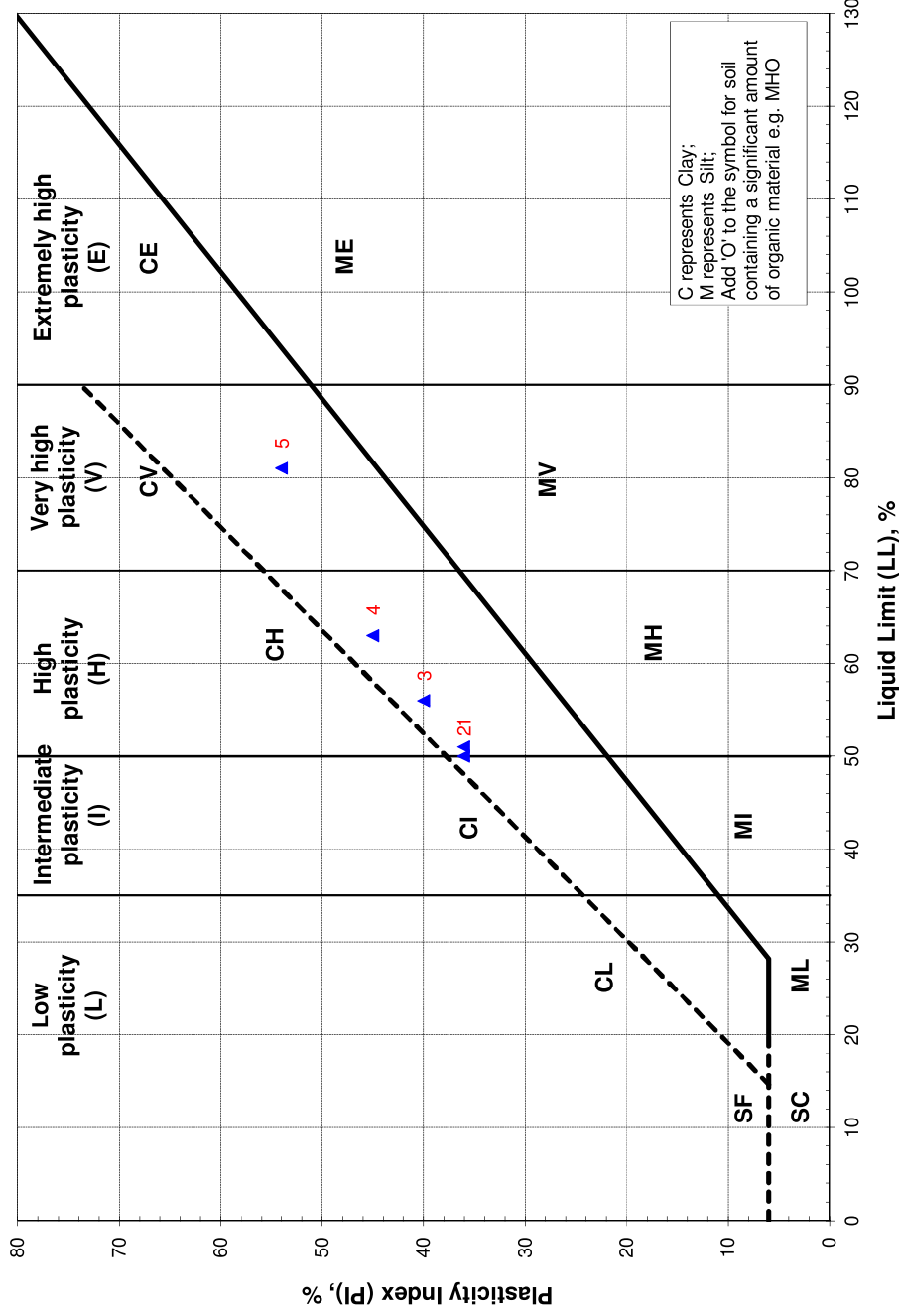
Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creton, Northampton NN6 8NN



ST Consult

Plasticity Chart for Atterberg Limit Test Results



Sample List		Statistics	
1	TP1@2m	Liquid Limit	81
2	TP3@1.5m	Max	
3	TP4@2m	Min	50
4	TP5@1m	Average	60
5	TP7@3m		
		Plastic Limit	
		Max	27
		Min	14
		Average	18
		Plasticity Index	
		Max	54
		Min	36
		Average	42

Project Name: Back Lane, Stevenage Project No: JN1631 Project Engineer: OJ

Client: Croudace Homes Group & Warden Developments Ltd Date: 15/12/2021 Figure No. 2

Atterberg Limits Test Result Summary Sheet									
Test carried out in accordance with BS 1377-2:1990(2003) cl. 3.2, 4.2, 4.3, 5.3 & 5.4									
Project No :		JN1631		Checked By :		OJ		Date: 15-Dec-2021	
Project Name :		Back Lane, Stevenage							
Client :		Croudace Homes Group & Warden Developments Ltd							
Plot No	TH No.	Depth	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	Class-ification	% Passing 425µm	Visual Description
		(m)	(%)	(%)	(%)	(%)		(%)	
1	TP1	2.00	19.7	51	15	36	CH	88	Orange brown veined grey brown slightly sandy slightly gravelly CLAY. Gravel consists of fine to coarse angular to subrounded flint.
2	TP3	1.50	20.1	50	14	36	CI/CH	90	Orange brown sandy slightly gravelly CLAY. Gravel consists of fine to coarse angular to rounded flint and quartzite.
3	TP4	2.00	19.6	56	16	40	CH	89	Brown veined dark grey slightly sandy slightly gravelly calcareous CLAY with frequent shell fragments. Gravel consists of fine to coarse angular to rounded flint chalk and limestone.
4	TP5	1.00	25.0	63	18	45	CH	91	Orange brown veined grey brown slightly sandy slightly gravelly CLAY. Gravel consists of fine and medium angular to well rounded flint and quartzite.
5	TP7	3.00	38.8	81	27	54	CV	99	Red brown veined brown slightly sandy CLAY.



APPENDIX D

Not Used



D