

SITE INVESTIGATION FACTUAL REPORT

Report No: 815400
Client: Crawford Claims Management
Site: 5 MOOR PLACE, EAST GRINSTEAD

Client Ref: SU2005303
Date of Visit: 26/01/2021



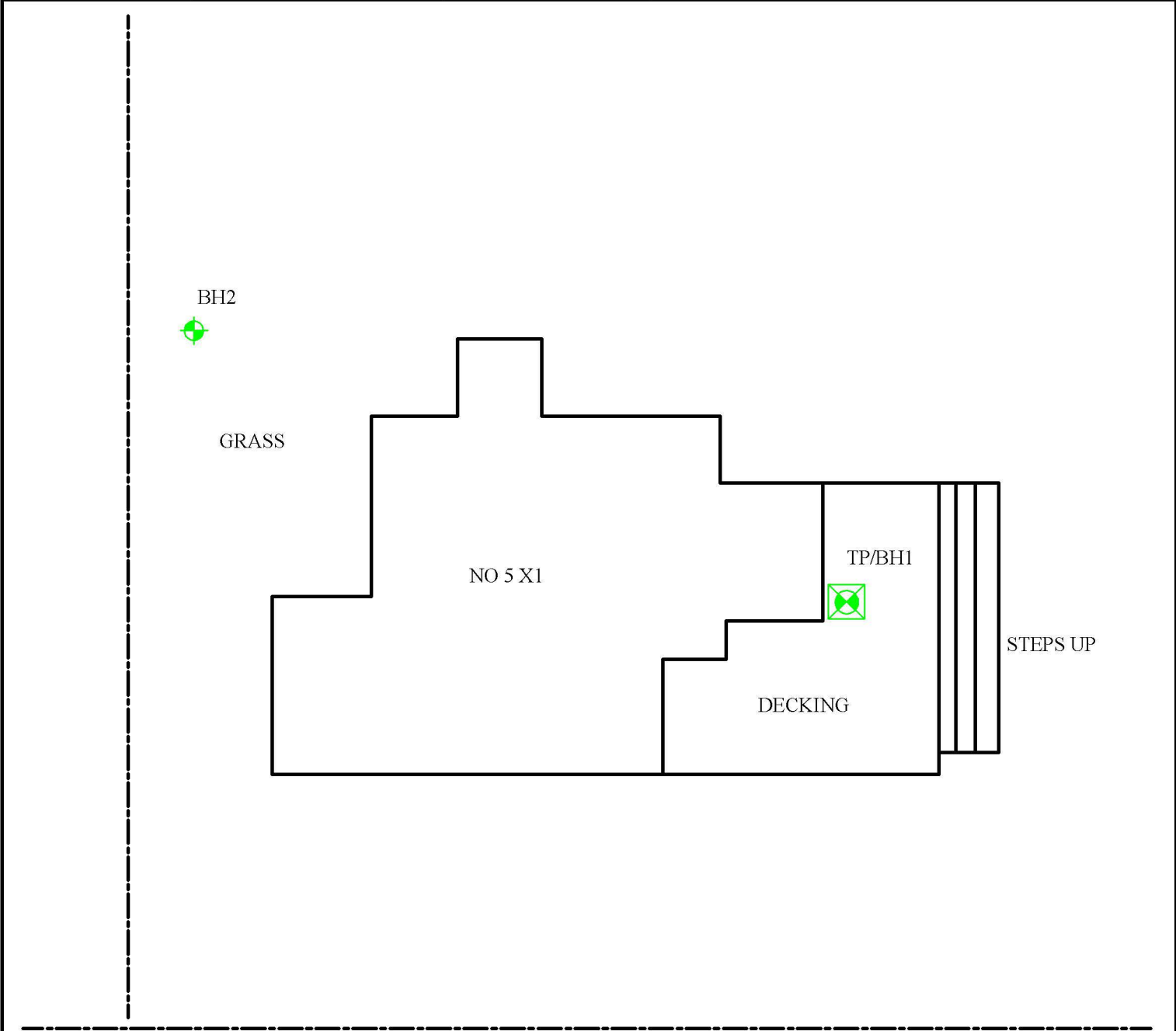
Home Emergency Response - Subsidence Investigation - Drainage Services – Crack & Level Monitoring – Property Video Surveys

Unit E2 First Floor Suite, Boundary Court
Willow Farm Business Park, Castle Donington
Leicestershire, DE74 2NN

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CET is the trading name of CET Structures Ltd
Registered in England No. 02527130

Investigation Layout Plan			Sheet: 1 of 1	Site: 5 MOOR PLACE Work carried out for: Crawford Claims Management
			Job No: 815400 Date: 26/01/21	
AH (SI)	SA (Checked)	DVC (Drawn)	Weather: RAIN	



TREE

HT=10m

D=10m

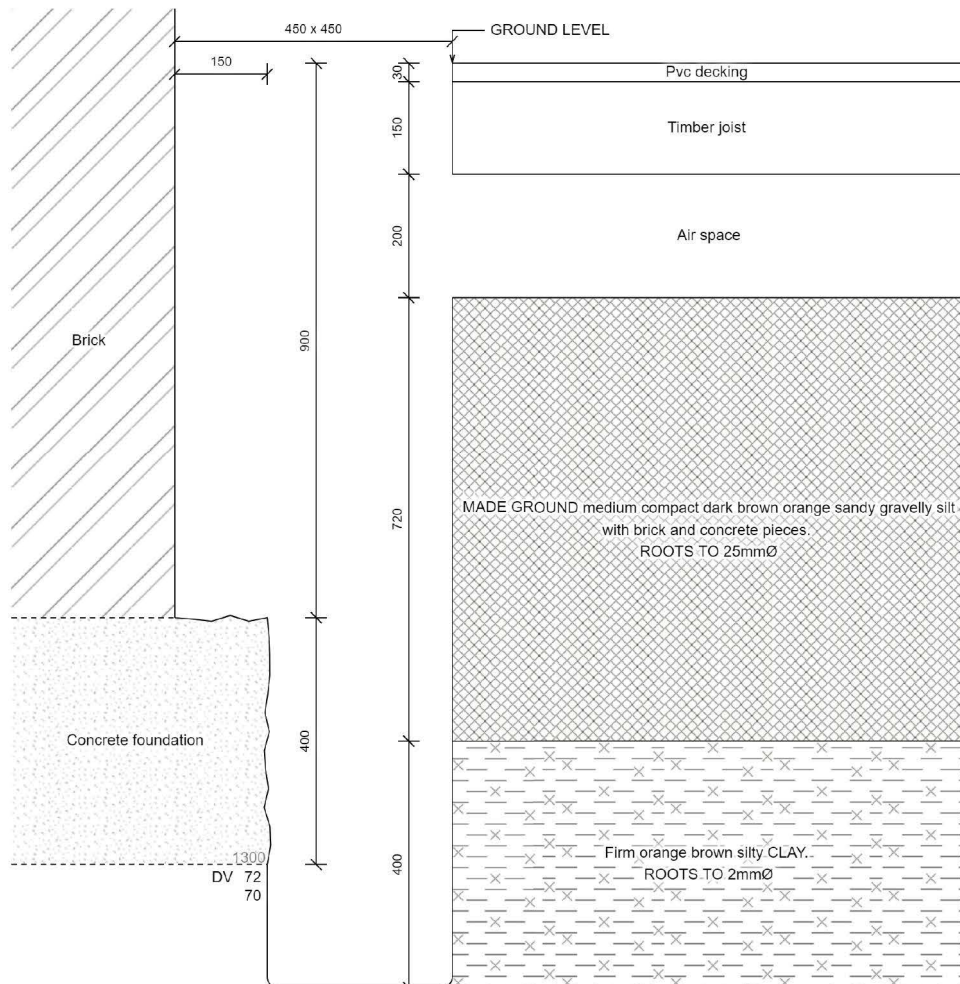
TREES/

SHRUBS

ON SITE TREE IDENTIFICATION FOR GUIDANCE ONLY. NOT AUTHENTICATED.

Remarks:	Key:	Surface Water Drain		
	Combined Gulley	RWWG	Foul Water Drain	
	Manhole	MH	Tree / Bush	
	Rain Water Pipe	RWP	(approx. ht in m)	
	Rain Water Gulley	RWG	Trial Pit	
	Soil Vent Pipe	SVP	Borehole	
Scale: N.T.S.	Waste Gulley	WG	O/D - Open Discharge	
	Waste Pipe	WP		

TEST REPORT:	Trial Pit		
REPORT NUMBER:	C1049287 / 123855.1.1.1		
TRIAL PIT REF:	TP1	DATE:	26/01/2021
CLIENT:	Crawford & Co	SITE:	5 MOOR PLACE
JOB NO:	815400	WEATHER:	Raining
EXCAVATION METHOD:	Hand tools		



Key:

D	Small disturbed sample	J	Jar sample
B	Bulk disturbed sample	V	Pilcon vane (kPa)
W	Water sample	M	Mackintosh probe

TDTD Too dense to drive

Remarks:

Test results reported relate only to the items tested.

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Amended report. This test report supersedes test report version 1

For and on behalf of CTS
Scott Alger - Lab

Report Format:

Approved Signatory
28-Jan-21

DE74 2UD

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Construction Testing Solutions Ltd.
Registered in England No. 05998333

Report version 2

Page 1 of 1

Borehole		1			Sheet:	1 of 1	Site:	5 MOOR PLACE								
					Job No:	815400										
					Date:	26/01/2021										
Boring Method:		Hand Auger			Ground Level:			Client:	Crawford Claims Management							
Diameter (mm):		75	Weather:		rain											
Depth	Soil Description							Samples and Tests								
(m)								Thickness	Legend	Depth	Type	Result				
0.00	See Trial Pit							1.40								
1.40	Stiff orange-brown-grey silty CLAY							1.60	⊗ — ⊗							
									⊗ — ⊗	1.50	DV	130+				
									⊗ — ⊗			130+				
									⊗ — ⊗							
									⊗ — ⊗							
									⊗ — ⊗							
									⊗ — ⊗	2.00	DV	130+				
									⊗ — ⊗			130+				
									⊗ — ⊗							
									⊗ — ⊗							
									⊗ — ⊗							
									⊗ — ⊗	2.50	DV	130+				
									⊗ — ⊗			130+				
									⊗ — ⊗							
									⊗ — ⊗							
3.00	End of BH									3.00	DV	130+				
Remarks: BH ends at 3.0m.BH open and dry on completion.							Key:	To	Max	Depth	Dia					
												(m)	(mm)			
														D - Disturbed Sample		
														B - Bulk Sample		
														W - Water Sample	Roots	
														J - Jar Sample	Roots	
														V - Pilcon Shear Vane (kPa	Roots	
														M - Mackintosh Probe	Depth to Water (m)	
														TDTD - Too Dense To Drive		
														Logged:	AH	SA

[illegible]

SITE INVESTIGATION LABORATORY TEST REPORT

SI REPORT NUMBER: 815400

CLIENT : CET Property Assurance (Crawford Claims Management)

SITE:
5, Moor Place
East Grinstead

DATE OF SITE VISIT:
26/01/2021

DATE RECEIVED BY LABORATORY:
29/01/2021

Com 
J. Garrett - Laboratory Supervisor (B)

Approved by : 
J. Garrett - Laboratory Supervisor (B)

DATE REPORTED: 10-Feb-2021

REPORT ON HEAVE POTENTIAL
5 MOOR PLACE, EAST GRINSTEAD
For
CRAWFORDS CLAIMS MANAGEMENT

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Approval Sheet and Foreword

Report Number: 815400.GEO

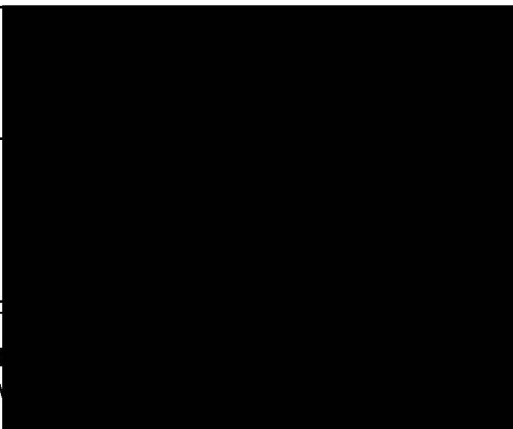
REPORT ON HEAVE POTENTIAL

At

5 MOOR PLACE, EAST GRINSTEAD

For

CRAWFORD CLAIMS MANAGEMENT

Report Status/Issue No: Final		Date of Issue - February 2021
Issued to: CET Property Assurance		Job No: 815400
	Name:	Signature:
Author:	Sam Patterson	
Approved:	Phil West	
Issued for and on behalf of CET Infrastructure by the above signatories.	Northdown House Ashford Road Harrietsham Kent ME17 1QW	

FOREWORD

This document has been prepared by Construction Testing Solutions Limited with all reasonable skill, care and diligence within the terms of the contract with the Client and within the limitations of the resources devoted to it by agreement with the Client.

This document is confidential to the Client and Construction Testing Solutions Limited accepts no responsibility whatsoever to third parties to whom this document, or any part thereof, is made known. Any such party relies upon the document at their own risk.

This document shall not be used for engineering or contractual purposes unless signed above by the author and the approver for and on behalf of Construction Testing Solutions Limited and unless the document status is 'Final'.

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The interpretation of the data contained herein is outside the UKAS accreditation of Construction Testing Solutions Limited.

Distribution Sheet

Our ref: 815400.G2

REPORT ON HEAVE POTENTIAL

At

5 MOOR PLACE, EAST GRINSTEAD

For

CRAWFORD CLAIMS MANAGMENT

DISTRIBUTION			
Date:	Issued to:	Name:	No:
Feb 2021	CET Billericay		1
Feb 2021	File Copy		1

1.0 INTRODUCTION

- 1.1 This report has been prepared on the instruction of CET Property Assurance, Billericay to support the ground investigation undertaken on 26 January 2021.
- 1.2 It is understood that the property, 5 Moors Place, has been subject to ground movement that has been attributed to volume change in the underlying soils. A nominated ground investigation, comprising a single hand dug trial pits extended by a hand augered borehole and an additional hand auger borehole to depths of 3m has established that the site is underlain by Made Ground to a maximum depth of 1.1m overlying predominantly cohesive soils. Laboratory tests were carried out on samples recovered from the boreholes and this report has been requested to provide an estimate of heave potential based on the results of these laboratory tests.
- 1.3 Attention is drawn to the fact that, whilst every effort has been made to ensure the accuracy of the data supplied and any analysis derived from it, the possibility exists of variations in ground and groundwater conditions between and beyond the exploratory hole positions. No liability can be accepted for any such variations in these conditions. Furthermore, any analysis is specific to the purpose described above and no liability will be accepted should the comments contained herein be used for the design of alternative schemes without prior consultation with Construction Testing Solutions Limited.

2.0 HEAVE POTENTIAL

2.1 The heave potential has been assessed based on the results of the laboratory tests provided by CET Property Assurance, using the methods described in BRE Digest 412;1996 "Desiccation in Clay Soils". The analysis has been undertaken using both the water content profile method and soil suction profiles. The results of these analyses are presented in the table below:

RESULTS OF HEAVE ANALYSIS					
Depth (mbgl)	Heave potential based on moisture deficit assuming BH1 at equilibrium moisture content (mm)		Heave potential based on soils suction tests assuming equilibrium based on $K_o = 2.5$ (mm)		Comments
	BH1	BH2	BH1	BH2	
1.0					Moisture contents in BH2 lower than those recorded in BH1 despite roots only being noted in BH1. Soil suctions in BH1 very high at base of borehole but only one test in BH2 so unsuitable as control. Inconsistent data makes heave assessment impossible.
1.5					
2.0					
2.5					
3.0					

Laboratory Summary Results

Our Ref : 815400

Location : 5, Moor Place, East Grinstead

Client: CET Property Assurance (Crawford Claims Management)

Address: Unit 4, Boundary Court, Willow Farm Business Park, Castle Donington, Leicestershire, DE74 2NN

Date Sampled: 26/01/2021

Date Received : 29/01/2021

Date Tested : 29/01/2021

Date of Report : 10/02/2021

Sample Ref		Type	Moisture Content (%) [1]	Soil Fraction > 0.425mm (%) [2]	Liquid Limit (%) [3]	Plastic Limit (%) [4]	Plasticity Index (%) [5]	Liquididity * Index [5]	Modified * Plasticity Index (%) [6]	Soil * Class [7]	Filter Paper Contact Time (d)	Soil Sample Suction (kPa) [8]	Oedometer Strain [9]	Estimated * Heave Potential (Dd) (mm)[10]	In situ * Shear Vane Strength (kPa) [11]	Organic * Content (%) [12]	pH * Value [13]	Sulphate Content * (g / l)		* Class [16]
TP/BH No	Depth (m)																	SO ₃ [14]	SO ₄ [15]	
1	U/S 1.30	D	21	12	34	17	17	0.24	15	CL	7	10.6			71					
	1.5	D	24	<5											> 130					
	2.0	D	20	<5	51	20	31	-0.01	31	CH	7	408			> 130					
	2.5	D	18	<5											> 130					
	3.0	D	19	<5	43	17	26	0.06	26	CI	7	1040			> 130					

Test Methods / Notes

[1] BS 1377 : Part 2 : 1990, Test No 3.2

[2] Estimated if <5%, otherwise measured

[3] BS 1377 : Part 2 : 1990, Test No 4.4

[4] BS 1377 : Part 2 : 1990, Test No 5.3

[5] BS 1377 : Part 2 : 1990, Test No 5.4

[6] BRE Digest 240 : 1993

[7] BS 5930 : 2018 : Figure 8 - Plasticity Chart for the classification

of fine soils

[8] In-house method S9a adapted from BRE IP 4/93

[9] In-house Test Procedure S17a: One Dimensional Swell/Strain Test

[10] Estimated Heave Potential (Dd)

[11] Values of shear strength were determined in situ by CET using

a Pilcon hand vane or Geonor vane (GV).

[12] BS 1377 : Part 3 : 1990, Test No 4

[13] BS 1377 : Part 2 : 1990, Test No 9

[14] BS 1377 : Part 3 : 1990, Test No 5.6

[15] SO₄ = 1.2 x SO₃

[16] BRE Special Digest One (Concrete in Aggressive Ground) August 2005

Note that if the SO₄ content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4M or DS-5M class respectively unless water soluble magnesium testing is undertaken to prove otherwise.

* These tests are not UKAS accredited

Full reports can be provided upon request.

Key

D Disturbed sample (small)
 B Disturbed sample (bulk)
 U Undisturbed sample
 W Groundwater sample
 ENP Essentially Non-Plastic by inspection.
 U/S Underside of Foundation



Test results reported relate only to the items tested.

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Construction Testing Solutions Ltd - Lawness Barns, Mountnessing Road, Billericay, Essex CM12 0TS

Version: 5BH V1 - 06.01.21

0927

Our Ref : 815400

Laboratory Testing Results

Location : 5 , Moor Place, East Grinstead

Client: CET Property Assurance (Crawford Claims Management)

Address: Unit 4, Boundary Court, Willow Farm Business Park, Castle Donington, Leicestershire, DE74 2NN

Sample Ref.		Type	Moisture Content	Soil Fraction > 0.425mm	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity * Index	Modified * Plasticity Index	Soil * Class	Filter Paper Contact Time	Soil Sample Suction	Oedometer Strain	Estimate Heave Potential
TP/BH No.	Depth (m)													
BH2	1.0	D	16	26	29	16	13	-0.01	10	CL	Not suitable for suction testing - Too Sandy			
	1.5	D	17	<5										
	2.0	D	17	<5	37	18	19	-0.07	19	CI	7	335		
	2.5	D	19	<5										
	3.0	D	15	<5	35	17	18	-0.09	18	CI	Not suitable for suction testing - Too Sticky			

Test Methods / Notes

[1] BS 1377 : Part 2 : 1990, Test No 3.2.

[2] Estimated if <5%, otherwise measured

[3] BS 1377 : Part 2 : 1990, Test No 4.4

[4] BS 1377 : Part 2 : 1990, Test No 5.3

[5] BS 1377 : Part 2 : 1990, Test No 5.4

[6] BRE Digest 240 : 1993

[7] BS 5930 : 1981 : Figure 31 - Plasticity Chart for the classification of fine soils

[8] In-house method S94 adapted from BRE IP 4/93

[9] In-house Test Procedure S17a: One Dimensional Swell/Strain Test

[10] Estimated Heave Potential (Dd)

[11] Values of shear strength were determined in situ by CET using a Pilon hand vane or Geonor vane (GV).

[12] BS 1377 : Part 3 : 1990, Test No 4

[13] BS 1377 : Part 2 : 1990, Test No 9

[14] BS 1377 : Part 3 : 1990, Test No 5.6

[15] $SO_4 = 1.2 \times SO_3$

[16] BRE Special Digest One (Concrete in Aggressive Ground) August 2005

Note that if the SO₄ content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4M or DS-5M class respectively unless water soluble magnesium testing is undertaken to prove otherwise.

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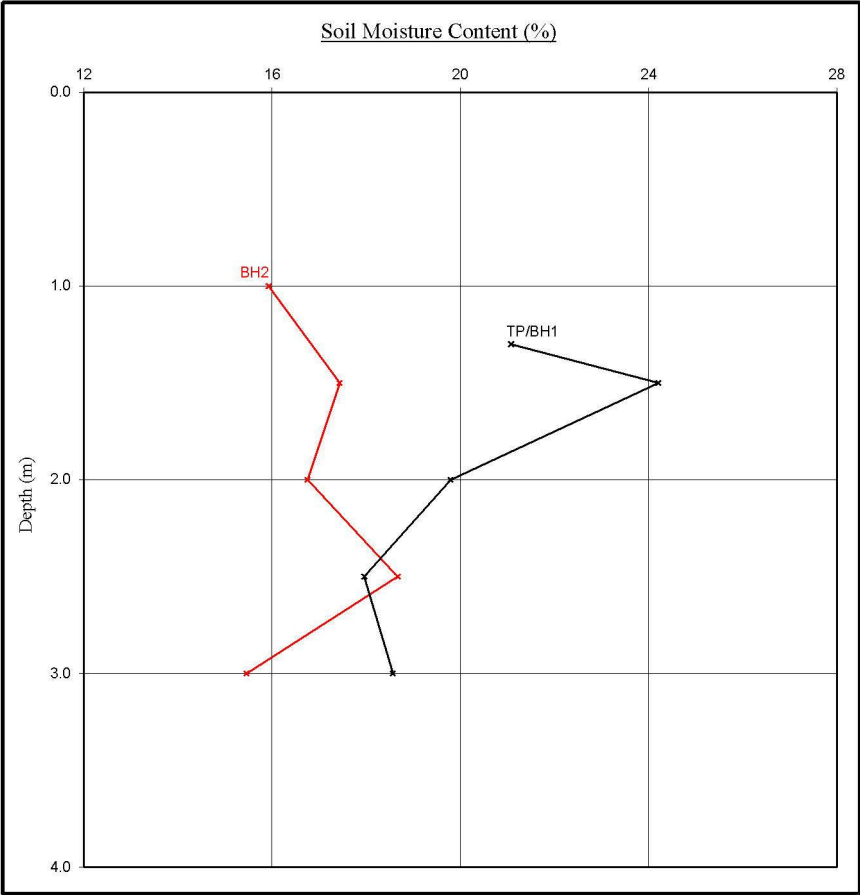
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Moisture Content Profiles

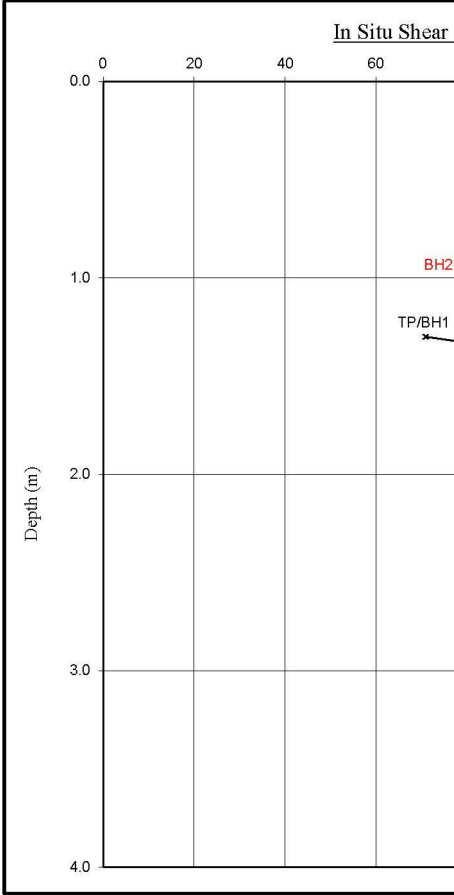
Our Ref : 815400
Location : 5, Moor Place, East Grinstead
Work carried out for: CET Property Assurance (Crawford Claims Management)



Notes

1. If plotted, 0.4 LL and PL+2 (after Driscoll, 1983) should only be applied to London Clay (and similarly overconsolidated clay) at shallow depths.
2. Unless specifically noted the profiles have not been related to a site datum.

Shear Str

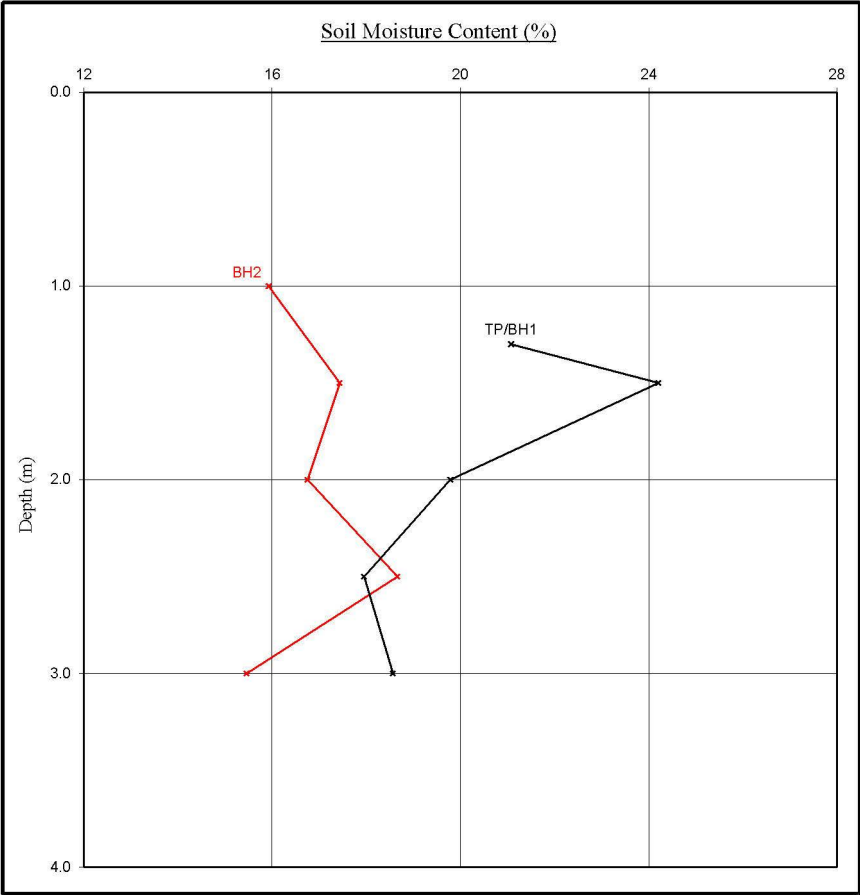


Note

1. Unless otherwise stated, values of Shear Stress are in kPa. CET using a Pilcon Hand Vane the calibration factor is 1.0, giving a maximum reading of 130 kPa.
2. Unless specifically noted the profiles have not been related to a site datum.

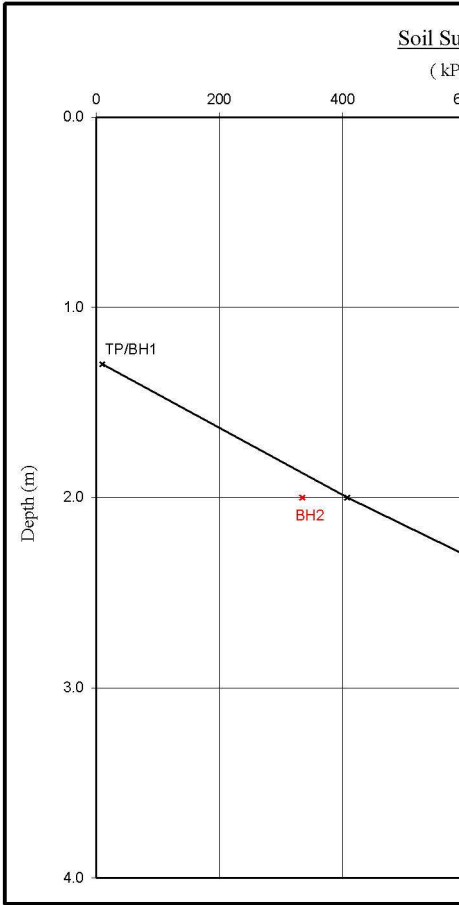
Moisture Content Profiles

Our Ref : 815400
Location : 5, Moor Place, East Grinstead
Work carried out for: CET Property Assurance (Crawford Claims Management)



Notes
1. If plotted, 0.4 LL and PL+2 (after Driscoll, 1983) should only be applied to London Clay (and similarly overconsolidated clay) at shallow depths.
2. Unless specifically noted the profiles have not been related to a site datum.

Soil Suction



Note
When shown, the theoretical equilibrium suction profiles are based on with London Clay (and similarly overconsolidated clays) at shallow depths. The suction component is dependant on the method of sampling and any subsequent disturbance. This is to be 100kPa which is the value suggested by the BRE on the basis of recompact samples. This may or may not be appropriate in this instance.

EPSL**European Plant Science Laboratory**

Sheet: 1 of 1

Job No: **815400**Date: **04/02/2021**Order No: **MDManual**EPSL Ref: **R40633**Site: **5 Moor Place,**Work carried
out for: **Crawford Claims MGMT SUS*****Certificate of Analysis***

The following work was commissioned by CET on behalf of their client. Root samples were obtained in sealed packets from the above site with no reference given as to the types of tree or shrub from which they may have originated.

The results were as follows -

<u>Trial pit/ Borehole number</u>	<u>Root diameter (mm)</u>	<u>Tree, shrub or climber from which root originates</u>	<u>Result of starch test</u>
TP1 (USF)	1 mm	Acer spp. *	Negative
BH1 (1.5-2m)	2 mm	either Quercus spp. or Castanea spp. 2 roots	Positive
BH1 (1.5-2m)	1.5 mm	Acer spp.	Negative

* In a state of decay.

Acer spp. are maples, including sycamore, Norway maple, and Japanese maples.

Quercus spp. are oaks. Castanea spp. include sweet chestnut.

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Telephone: 01248 672 652

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Plant Anatomist : Dr G S Turner B.Sc. (Hons), M.Sc., Ph.D

Plant Anatomist : Dr R J Shaw B.Sc. (Hons), Ph.D

Consultant: Dr M P Denne B.Sc. (Hons), M.Sc., Ph.D

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