Cunningham Lindsey

Subsidence Scanning Centre, Woodhead House, Centre 27 Business Park, Woodhead Rd, Birstall, WF17 9TD
Telephone 01489 567700 Facsimile 01489 565816

Policyholder: [redacted]

Subject Property Address:

107, Chetwynd Road

LONDON

NW5 1DA

INSURANCE CLAIM

CONCERNING SUSPECTED SUBSIDENCE

SUPPLEMENTARY ENGINEERING APPRAISAL REPORT

This report is prepared on behalf of [redacted] Commercial for the purpose of investigating a claim for subsidence. It is not intended to cover any other aspect of structural inadequacy or building defect that may otherwise have been in existence at the time of inspection.

Date:6/9/2011

Cunningham Lindsey Ref: SOHPC/CAS/3721189

INTRODUCTION

The technical aspects of this claim are being overseen by our Project Manager Raymond Borrow BSc, CEng, MICE, in accordance with our Project Managed Service.

DESCRIPTION OF BUILDING

The subject property is a circa 1900 semi detached house in a residential estate location on a plot that is steeply sloping, sloping generally from right to left.

The overall layout is recorded on our site plan.

DISCOVERY OF DAMAGE

The policyholder and homeowner, [redacted], first discovered the damage in August 2010.

The damage appeared suddenly.

The policyholder then advised insurers..

NATURE AND EXTENT OF DAMAGE

Description and Mechanism

The main area of damage is to the rear addition and extension and took the form of tapering vertical and diagonal cracks in the region of 1- 25 (estimated) at the junction of the rear addition and extension.

This pattern of damage indicates a mechanism of downwards movement to rear extension and rotation away from the rear addition

Significance

The level of damage is severe, and is classified as category 4 in accordance with BRE Digest 251 - Assessment of damage in low-rise buildings

Onset and Progression

Mrs T Dallimore has advised that damage first commenced in Summer 2010.

We consider that the damage has occurred recently.

It is likely that movement will be of a cyclical nature with cracks opening in the summer and closing in the winter.

Subsidence repairs have been progressed to the property. We have been advised of damage recurrence to the rear of the property.

SITE INVESTIGATION

A site investigation was carried out on 15th November 2010 by CET Safehouse Ltd.

A copy of their report dated 25th November 2010 is attached for information.

The investigation comprised a trial pit extended by hand auger to the rear of the property.

The building foundations within the area of damage were found to be at a depth of 1000 mm below ground level with the subsoil beneath the foundation comprising of a stiff mid brown silty clay with the presence of tree roots to a depth of 1500 below ground level.

Roots were found underside of the foundation from members of the Leguminosae include Laburnum, Robinia (false acacia) and the climber, Wisteria.

The laboratory results have shown that the subsoil is dessicated to a depth of 2000 mm below ground level.

A further site investigation was carried out on 9th August 2011 by CET Safehouse Ltd.

A copy of their report dated 22nd August 2011 is attached for information.

The investigation comprised a trench excavation extended by hand auger to the rear of the property.

The building foundations within the area of damage were found to be at a depth of 750 mm below ground level with the subsoil beneath the foundation comprising of a stiff mid brown silty clay with the presence of tree roots to a depth of 2400 below ground level.

9 root samples were found underside of the foundation from a member of the group Pomoideae that include include apple (Malus), pear (Pyrus), hawthorn (Crataegus), rowan and whitebeam (both Sorbus). A number of shrubs also belong to this group including quince (Cydonia), Cotoneaster and Pyracantha.

The laboratory results have shown that the subsoil is dessicated to a depth of 2500 mm below ground level.

CAUSE OF DAMAGE

Based on the information detailed above, we are of the opinion that damage has occurred due to clay shrinkage subsidence. This has been caused by moisture abstraction by roots altering the moisture content of the clay subsoil resulting in volume changes, which in turn have affected the foundations.

RECOMMENDATIONS

Mitigation

We consider the damage will not progress if appropriate measures are taken to remove the cause. In this instance it is likely that vegetation for which the policyholder and other private owners are responsible is contributing toward the cause of damage.

We initially recommended removal of a Pear Tree and Wisteria from the rear garden of the policyhoders property and a Pear Tree from the neighbours garden at 105 Chetwynd Road. Whilst no roots were formally identified from the Pear trees we maintain our recommendation for removal on the basis of the significant nature of the building damage and close proximity of the trees to the building movement.

The policyholder agreed with our recommendations and we removed a Pear Tree and Wisteria from the rear garden of the policyhoders property.

The owner of the adjoining property at 105 Chetwynd Road previously declined to agree with our recommendations to remove the Pear Tree from the rear garden of this property.

We now recommend removal of the Pear tree located within 105 Chetwynd Road.

FACTUAL REPORT

OF

INVESTIGATION

AT:-		107, Chetwynd Road LONDON
ON:-		09 August 2011
FOR:-		[redacted]
	c/o	Cunningham Lindsey - Solent
REF:-		3721189-[redacted]
JOB NO:-		112608
REPORT ISSUED:-		22/08/2011

SPECIALIST CONTRACTING DIVISION

CET SAFEHOUSE LIMITED

Lawness Barns, Mountnessing Road, Billericay, Essex CM12 0TS

WWW.CETSAFEHOUSE.COM

Tel: 01277 655377 Fax: 01277 655977

Investigation Layout Plan

Sheet: 1 of 1

Job No: 112608E

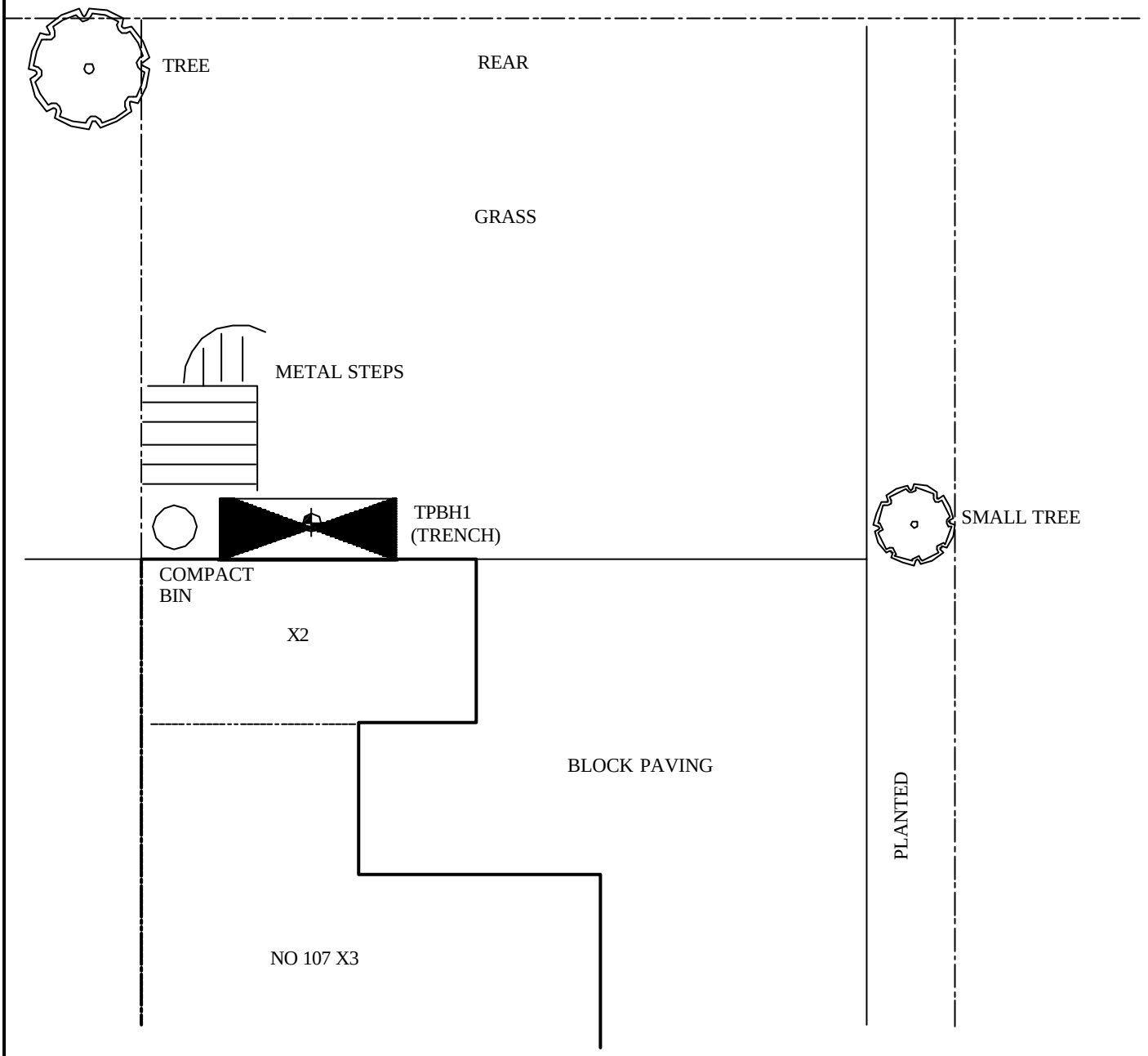
Date: 09/08/11

Site: 107, Chetwynd Road, NW5

Work carried out for: Cunningham Lindsey

AH	SE	Jo F
(SI)	(Checked)	(Drawn)

Weather: Dry



ON SITE TREE IDENTIFICATION FOR GUIDANCE ONLY. NOT AUTHENTICATED.

Remarks:

Scale: N.T.S.

Key:

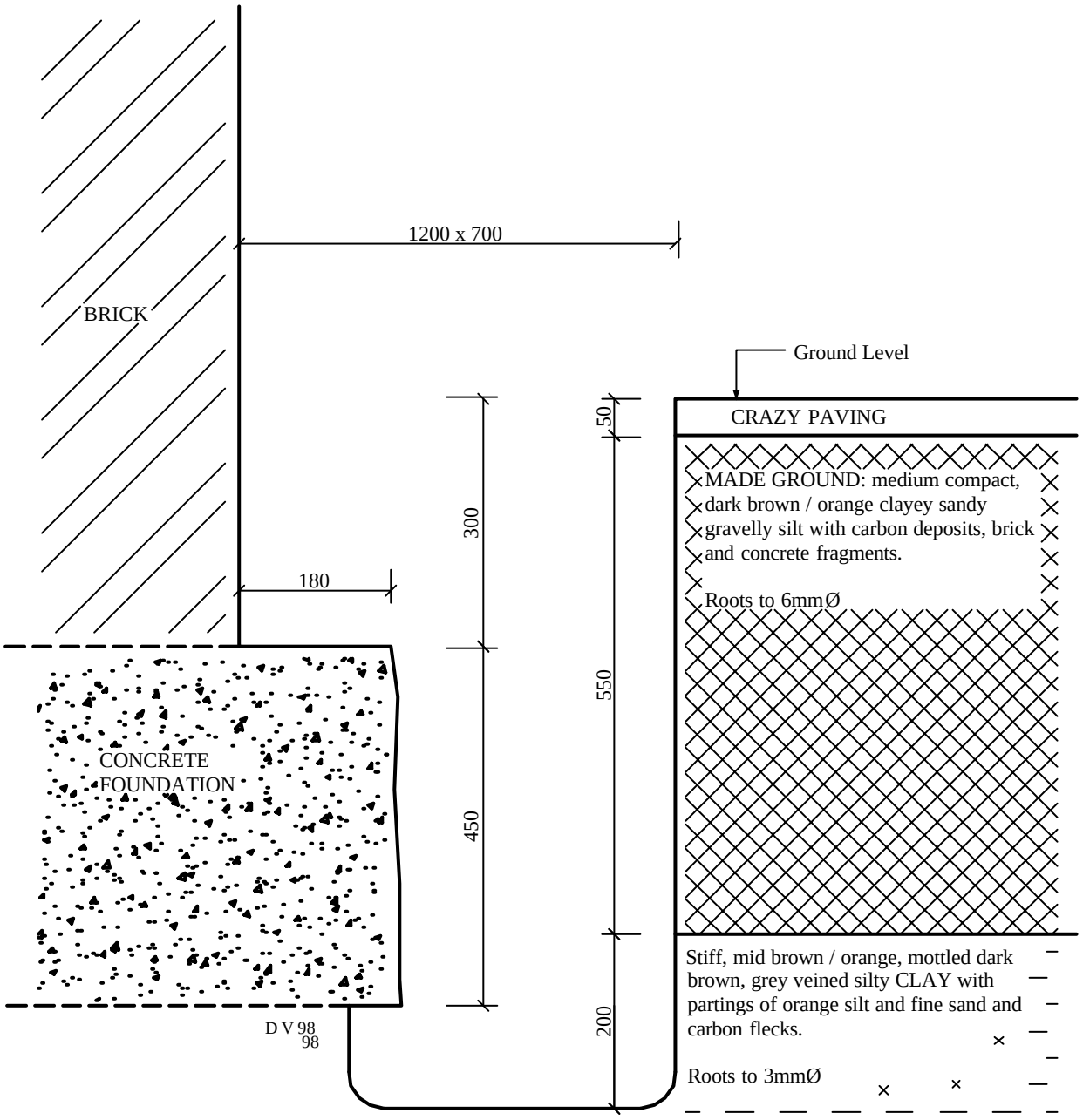
Combined Gulley	RWWG	Surface Water Drain	
Manhole	MH	Foul Water Drain	
Rain Water Pipe	RWP	Tree / Bush (approx. ht in m)	
Rain Water Gulley	RWG		
Soil Vent Pipe	SVP	Trial Pit	
Waste Gulley	WG	Borehole	
Waste Pipe	WP		

Trial Pit No: 1

Sheet: 1 of 1
Job No: 112608E
Date: 09/08/11

Site: 107, Chetwynd Road, NW5
Work carried out for: Cunningham Lindsey

Excavation Method: Hand Tools
Weather: Dry
Drawn by: Jo F
Ground Level mOD:



FOR STRATA BELOW 800mm SEE BH LOG 1

Remarks:
All measurements in millimetres.

Key:
D Small disturbed sample
B Bulk disturbed sample
W Water sample
TDTD Too dense to drive
J Jar sample
V Pilcon Vane (kPa)
M Mackintosh probe

Logged: AH | Checked: SE | Approved: | Scale: N.T.S.

Borehole No: 1

Sheet: 1 of 1

Job No: 112608E

Site: 107, Chetwynd Road, NW5

Boring Method: Hand Auger

Date: 09/08/2011

Diameter: 75mm

Coordinates:

Ground Level mOD:

Work Carried out for: Cunningham Lindsey

Depth (m)	Description of Strata	Thick-ness (m)	Legend	Sample	Test Type	Test Result	Depth (m)	Field Records/Comments	Depth to water (m)
	As trial pit 1	0.80							
0.80	Stiff, mid brown / orange, mottled dark brown, grey veined silty CLAY with partings of orange silt and fine sand and carbon flecks	0.50	__.x __ __ __ __ __ x __	D	V	80 80	1.00	Roots to 1mm diameter to 2.4m	
1.30	Stiff, mid brown, grey veined silty CLAY with partings of orange silt and fine sand and occasional crystals	3.70	__.x __ __ __ __ __ x __ __ __ __ __ __ __x. __ __ __ __x__ __ __ __ __ __ __ __ __ __ x.__ __ __ __ __ __ __x. __ __ __ __x__ __ __ __	D D D D D D D	V V V V V V V	120+ 120+ 120+ 120+ 120+ 120+ 120+ 120+ 120+ 120+ 120+ 120+ 120+ 120+	1.50 2.00 2.50 3.00 3.50 4.00 4.50	No roots observed below 2.4m	
5.00	Borehole ends at 5.0m						5.00		

Remarks:
Borehole dry and open on completion

Key: T.D.T.D. Too Dense to Drive
D Small disturbed sample
J Jar sample
B Bulk disturbed sample
V Pilcon Vane (kPa)
W Water sample
M Mackintosh Probe

Logged: AH | Checked: SE | Drawn by Jo F | Scale: NTS | Weather: Dry

Our Ref : 112608

Laboratory Testing Results

Date Sampled: 09/08/2011

Location : 107, Chetwynd Road

Date Received : 10/08/2011

Work carried out for: Cunningham Lindsey - Solent

Date Tested : 10/08/2011

Date of Report : 18/08/2011

Sample Ref		Type	Moisture Content	Soil Fraction	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Modified Plasticity Index	Soil Class	Filter Paper Contact Time	Soil Sample Suction	In situ Shear Vane Strength	Organic Content	pH Value	Sulphate Content (g / l)		Class
TP/BH No	Depth (m)		(%) *[1]*	> 0.425mm (%) *[2]*	(%) *[3]*	(%) *[4]*	(%) *[5]*	*[5]*	(%) [6]	*[7]*	(h) *[8]*	(kPa)	(kPa) *[9]*	(%)*[10]*	*[11]*	SO_3 *[12]*	SO_4 *[13]*	*[14]*
1	0.75(U/S)	D	32	<5	91	24	67	0.12	67	CE	168	540	98					
	1.0	D	28	<5									80					
	1.5	D	27	<5	84	22	62	0.07	62	CV	168	1024	> 120					
	2.0	D	30	<5									> 120					
	2.5	D	31	<5	79	25	54	0.12	54	CV	168	636	> 120					
	3.0	D	32	<5									> 120					
	3.5	D	28	<5	76	24	52	0.07	52	CV	168	675	> 120					
	4.0	D	28	<5									> 120					
	4.5	D	29	<5							168	534	> 120					
	5.0	D	30	<5									> 120					

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 S9a adapted from BRE IP 4/93

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

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

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

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

[13] $SO_4 = 1.2 \times SO_3$

[14] BRE Special Digest One (Concrete in Aggressive Ground) August 2001

Note that if the SO_4 content falls into the DS-4 or DS-5 class, it would be prudent to consider the samnple as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise

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

Moisture Content and Suction Profiles

Our Ref : 112608

Location : 107, Chetwynd Road

Work carried out for: Cunningham Lindsey - Solent

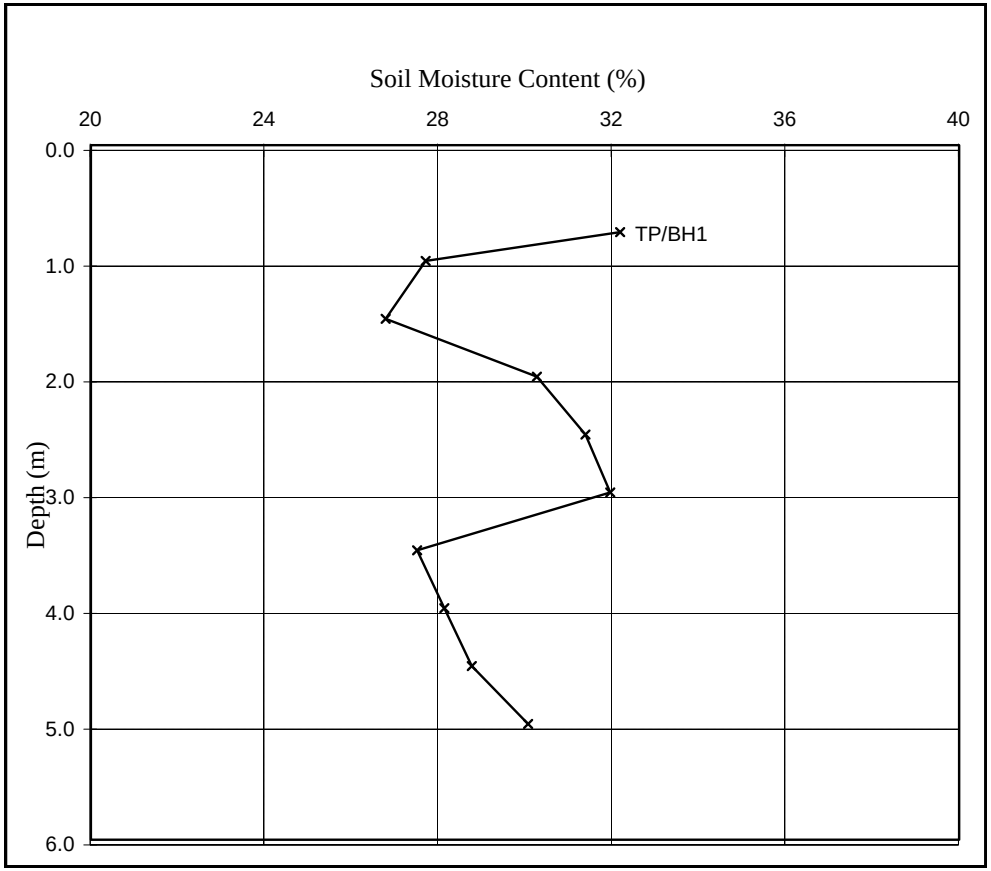
Note : Unless specifically noted the profiles have not been related to a site datum.

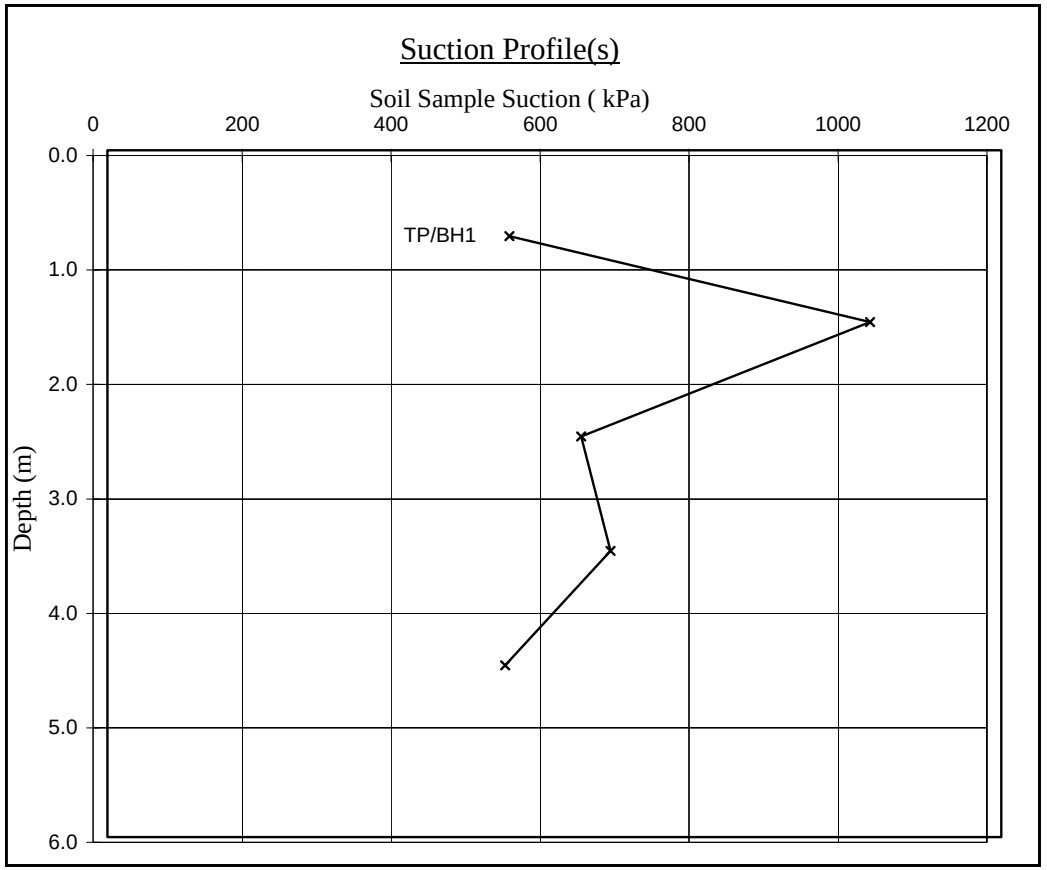
Date Sampled : 09/08/2011

Date Received : 10/08/2011

Date Tested : 10/08/2011

Date of Report : 18/08/2011





Notes

1. If the Soil Fraction > 0.425mm exceeds 5% the Equivalent Moisture Content of the remainder (calculated in accordance with BS 1377: Part 2 : 1990, cl.3.2.4 note 1) is also plotted and the alternative profile additionally shown as an appropriately coloured broken line.
2. If plotted, 0.4 LL and PL+2 (after Driscoll, 1983) should only be applied to London Clay (and similarly overconsolidated clays) at shallow depths.

Note

When shown, the theoretical equilibrium suction profiles are based on conventional assumptions associated with London Clay (and similarly overconsolidated clays) at shallow depths. Note that the sample disturbance component is dependant on the method of sampling and any subsequent recompaction. The above plots show this to be 100kPa which is the value suggested by the BRE on the basis of their limited number of tests on recompacted samples. This may or may not be appropriate in this instance and judgement should be exercised.

Moisture Content and Shear Strength Profiles

Our Ref : 112608

Location : 107, Chetwynd Road

Work carried out for: Cunningham Lindsey - Solent

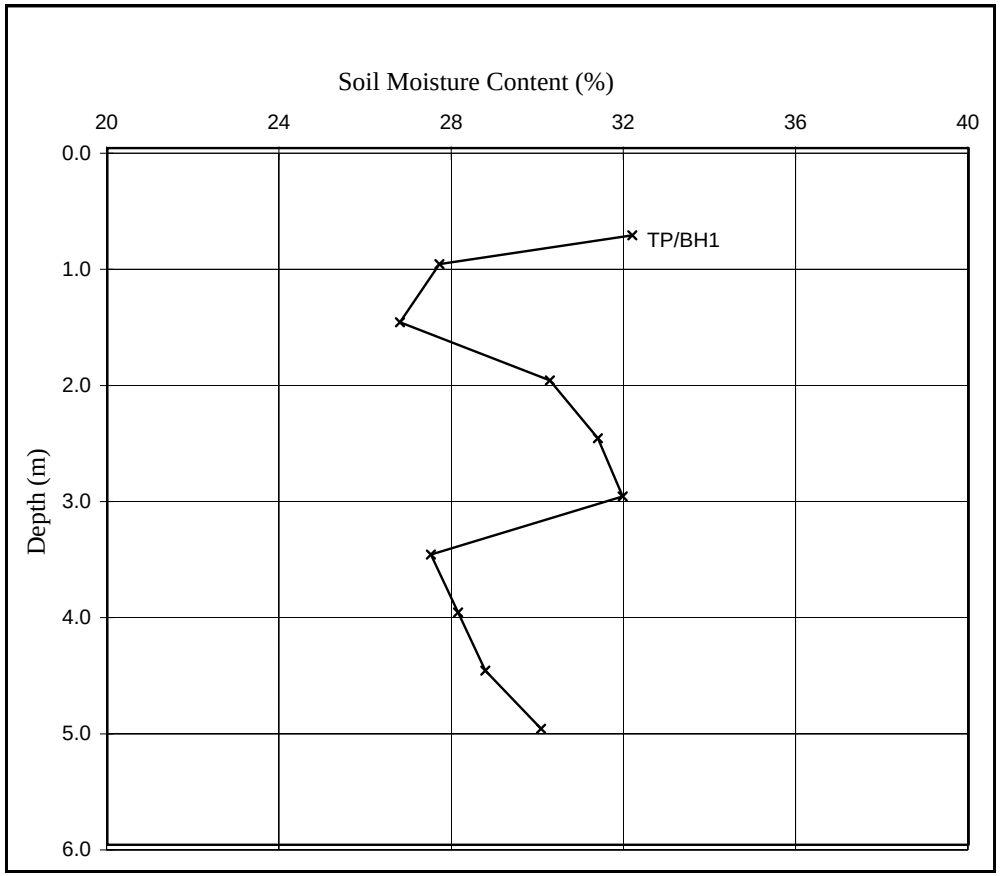
Note : Unless specifically noted the profiles have not been related to a site datum.

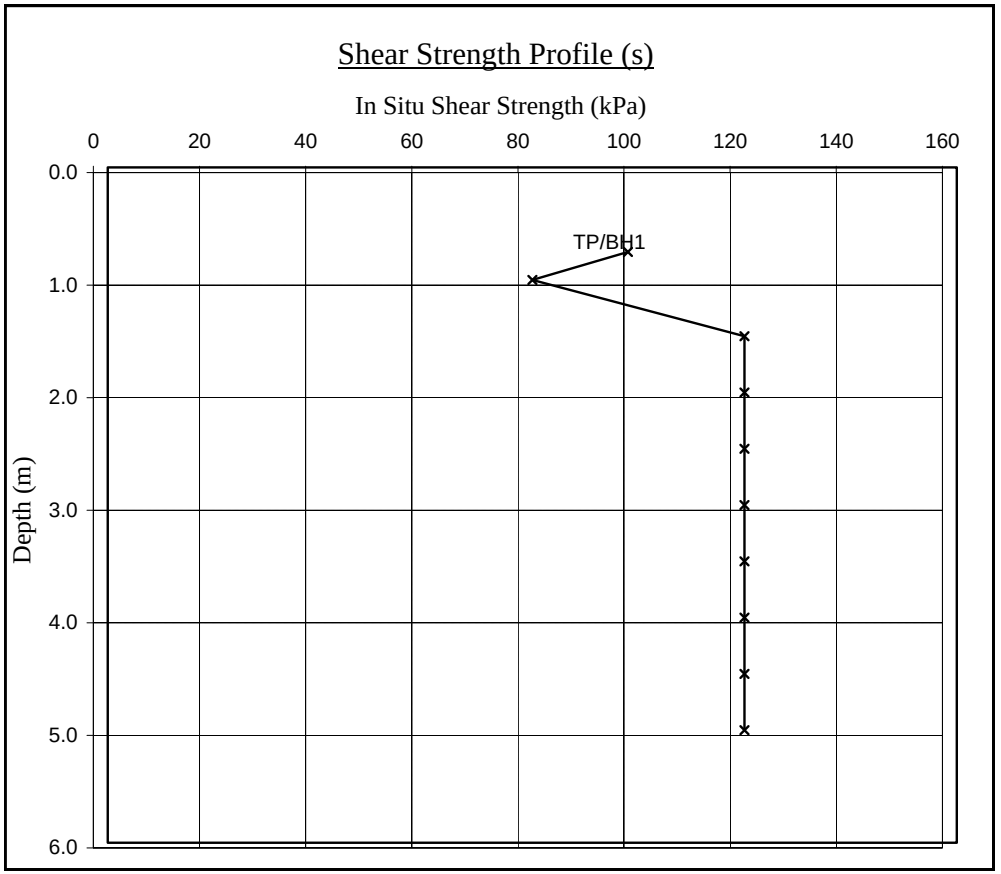
Date Sampled : 09/08/2011

Date Received : 10/08/2011

Date Tested : 10/08/2011

Date of Report : 18/08/2011





Notes

1. If the Soil Fraction > 0.425mm exceeds 5% the Equivalent Moisture Content of the remainder (calculated in accordance with BS 1377: Part 2 : 1990, cl.3.2.4 note 1) is also plotted and the alternative profile additionally shown as an appropriately coloured broken line.
2. If plotted, 0.4 LL and PL+2 (after Driscoll, 1983) should only be applied to London Clay (and similarly overconsolidated clays) at shallow depths.

Note

Unless otherwise stated, values of Shear Strength were determined in situ by CET Group using a Pilcon Hand Vane the calibration of which is limited to a maximum reading of 120 kPa.

Tree Root Identification Ltd

Sheet: 1 of 1

Job No: 112608
Date: 16/08/2011
Order No: 366899

Our Ref: CET160811

Site: 107 Chetwynd Road, London.

Work carried out for: Cunningham Lindsey

Certificate of Analysis

The following work was commissioned by CET Safehouse Limited 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 -

Trial pit/ Borehole number	**Root diameter (mm)**	**Tree, shrub or climber from which root originates**	**Result of starch test#**
TP1 (ground level to 600mm)	8.0	a member of the group Pomoideae* (4 roots)	positive
TP1 (underside)	3.0	a member of the group Pomoideae* (4 roots)	positive
BH1 (depth: 2400mm)	<0.5	a member of the group Pomoideae* (1 root)	positive

The presence of starch indicates that the root was alive in the recent past.

* Tree members of the Pomoideae include apple (Malus), pear (Pyrus), hawthorn (Crataegus), rowan and whitebeam (both Sorbus). A number of shrubs also belong to this group including quince (Cydonia), Cotoneaster and Pyracantha.

Ronald Macleod

DR RONALD D MACLEOD
Principal Scientist

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