Cunningham Lindsey United Kingdom

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:

12, Glenilla Road

London

NW3 4AS

INSURANCE CLAIM

CONCERNING SUBSIDENCE DAMAGE

ENGINEERING APPRAISAL REPORT

This report is prepared on behalf of [redacted] 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: 22/10/2010

Cunningham Lindsey Ref: SOHPC/RB/3748395

INTRODUCTION

This report has been prepared by our Project Manager Anthony Demetrius BSc(Hons) MCIOB MBEng and is being investigated in accordance with our Project Managed Service.

Unless stated otherwise all directions are referred to as looking towards the front door from the outside the property.

DESCRIPTION OF BUILDING

The subject property is a 1898 built detached house in a residential estate location on a plot that is gently sloping, sloping generally from front to back. The overall layout is recorded on our site plan.

There are a group of commercial third party deciduous trees within influencing distance to the rear left hand side of the property.

CIRCUMSTANCES OF DISCOVERY OF DAMAGE

The policyholder and homeowner, [redacted], first discovered the damage in Summer 2009.
The damage was discovered some time ago but was not considered to be of any significance.
An Architect was then asked to inspect the damage, reporting it may be subsidence related and that insurers should be notified.

NATURE AND EXTENT OF DAMAGE

Sketches showing the layout of the site and the damage are attached.

Description and Mechanism
The principal is to the single storey dining room and the rear of the main building damage takes the form of 18mm to 1mm vertical detachment cracking.

Internal junction damage takes the form of 18mm to 1mm cracking to the wall abutment area.
The indicated mechanism of downward movement is to the rear in the direction of the poplar tree.

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

[redacted] has advised that damage first commenced in summer 2009.

We consider that the crack damage has occurred recently, but that distortions are historic.

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

SITE INVESTIGATIONS

A ground investigation was carried out by CET Safehouse Limited on 29th September 2010 and for details of the trial pit and borehole locations, together with test results, please refer to the attached CET factual report

Trial Pit 1/Borehole 1

This was located at the external rear left hand side of the single storey dining room

The underside of the foundation for the main building is at 0.90m below ground level with the foundation comprising of brick footings on concrete foundations. The soil beneath the property foundations has been identified as stiff mid brown/orange grey veined silty CLAY with partings of silt and fine sand with occasional claystone nodules and carbon flecks, with roots beneath the foundations.

The trial hole was extended by a hand auger to a depth of 6.0m. The CLAY component became stiffer with depth. Roots were encountered to a depth of 0.90m and 1.7m.

Laboratory analysis of the CLAY taken at various depths confirmed that the material of very high plasticity and therefore subject to volumetric changes due to moisture removal. There was a marked reduction in moisture contents within the subsoil, which also corresponds with the increase in soil suctions in the area of the root activity.

Samples of Populous roots taken from beneath the foundations have been analysed and originate from a poplar tree. There is a large poplar tree located to the rear left hand side of the property which is in the ownership of a commercial third party.

The site investigation results confirm that the poplar tree is having an impact on the property.

No drainage Investigations have been undertaken and the site investigation has shown the soil to be dry which suggests the drains have not adversely affected the soils.

MONITORING

Deep datum level monitoring has been underway since September 2010.

CAUSE OF DAMAGE

Taking an overview of all the site investigation results referred to above, it is my opinion that the cause of damage results from clay shrinkage subsidence brought about by the action of roots from the poplar tree located to the rear left hand side of the neighbouring property.

I base this view on the fact that the foundations of the property in the area of damage have been built at a relatively shallow depth, bearing onto shrinkable clay subsoil. The soil is susceptible to movement as a result of changes in volume of the clay with variations in moisture content and analysis of the site investigation results indicates that the soil has been affected by shrinkage. Populus tree roots are present in the clay subsoil beneath the foundations. In this case, I am satisfied that the damage has therefore been caused by clay shrinkage subsidence following moisture extraction by the poplar tree.

I am satisfied that there is no factor, other than the poplar, that is causing the damage.

RECOMMENDATIONS

It is recommended that the poplar tree located in the rear of the property is removed to mitigate against further movement. Oriel Services Ltd shall liaise with the Local Authority in this regard.

Level monitoring will continue after removal of the tree in order to check for stability. A detailed scope of repairs will be finalised upon conclusion of the monitoring.

Anthony Demetrius

Project Managed Services

Rachael Baker

Customer Support – South Region
Direct dial: 01489 567733
E-mail: Rachael.Baker@cl-uk.com

FACTUAL REPORT

OF

INVESTIGATION

AT:-		12, Glenilla Road, London London
ON:-		29 September 2010
FOR:-		
	c/o	Cunningham Lindsey - Solent
REF:-		3748395-
JOB NO:-		95171
REPORT ISSUED:-		14/10/2010

SPECIALIST CONTRACTING DIVISION

CET SAFEHOUSE LIMITED

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

WWW.CETSAFEHOUSE.COM

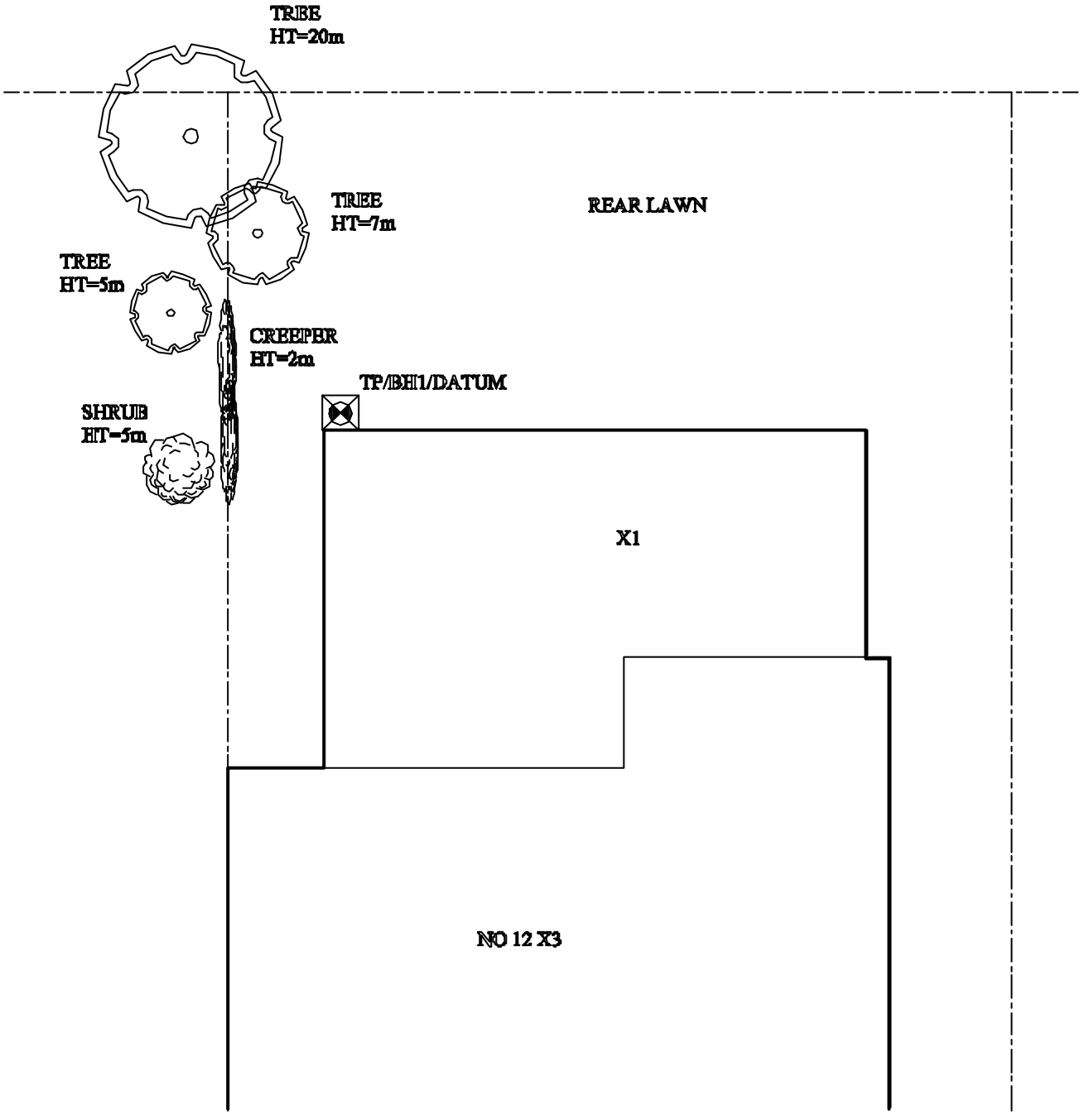
Tel: 01277 655377 Fax: 01277 655977

Investigation Layout Plan

Sheet: 1 of 1
Job No: 95171E
Date: 29/09/10
Weather: Dry

Site: 12 Glenilla Road, London NW3
Work carried out for: Cunningham Lindsey

DB	PM	DVC
(SI)	(Checked)	(Drawn)



ON SITE TREE IDENTIFICATION FOR GUIDANCE ONLY. NOT AUTHENTICATED.

Remarks:

Scale: N.T.S.

Key:

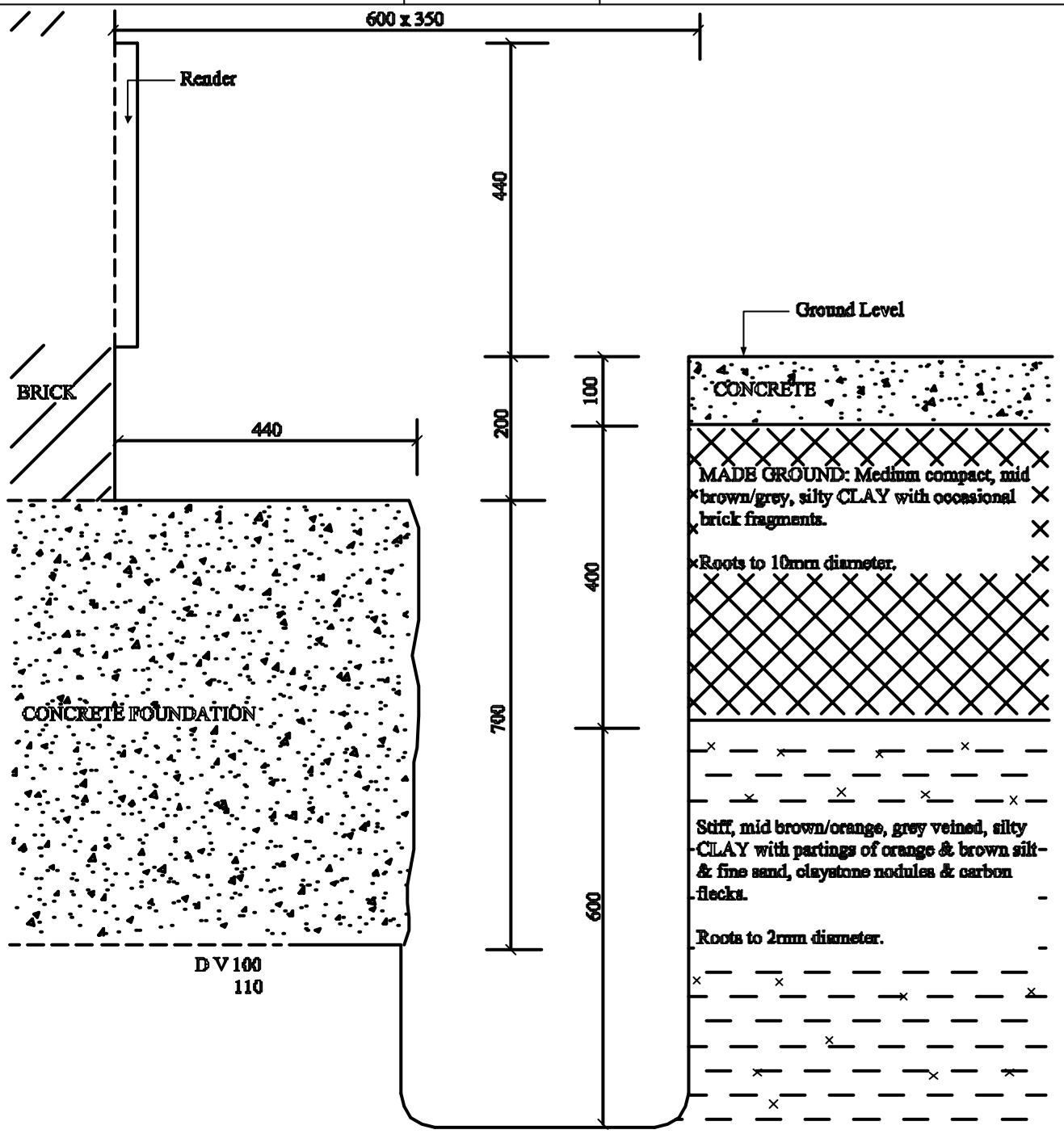
Combined Gulley	RWWG	Surface Water Drain	
Manhole	MH	Foul Water Drain	
Rain Water Pipe	RWP	Tree / Bush (approx. ht in m)	
Rain Water Gulley	RWG		
Soil Vent Pipe	SVP	Trial Pit	
Waste Gulley	WG	Borehole	
Waste Pipe	WP		

Trial Pit No: 1

Sheet: 1 of 1
Job No: 95171E
Date: 29/09/10

Site: 12 Glenilla Road, London NW3
Work carried out for: Cunningham Lindsey

Excavation Method: Hand Tools
Drawn by: DVC
Weather: DRY
Ground Level mOD:



FOR STRATA BELOW 1100mm SEE BH LOG 1

Remarks: All measurements in millimetres.

Only able to podge U/S approximately 200mm - large spread

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: DB | Checked: PM | Approved:

Scale: N.T.S.

Borehole No: 1 & Datum	Sheet: 1 of 2 Job No: 95171E	Site: 12 Glenilla Road, London NW3
Boring Method: Hand Auger	Date: 29/09/2010	
Diameter: 75mm / Coordinates:	Ground Level mOD:	Work Carried out for: Cunningham Lindsey

Depth (m)	Description of Strata	Thickness (m)	Legend	Sample	Test Type	Test Result	Depth (m)	Field Records/Comments	Depth to water (m)
1.10	As Trial Pit 1	1.10						Roots to 1mm diameter to 1.7m	
1.50	Stiff, mid brown/orange, grey veined, silty CLAY with partings of orange silt & fine sand, claystone nodules & carbon flecks.	0.40		D	V	74 68	1.50		
1.70	Firm, as above.	0.20						No roots observed below 1.7m	
2.00	Pungent, mid olive, mottled orange & grey, silty CLAY with partings of orange silt & fine sand.	0.30		D	V	98 120+ 120+	2.00		
	Stiff, as above.	1.00		D	V	80 90	2.50		
3.00				D	V	92 102	3.00		
3.50	Stiff, mid brown/orange, grey veined, silty CLAY with partings of orange silt & fine sand.	0.50		D	V	102 110	3.50		
	Stiff, mid brown, mottled orange, grey veined, silty CLAY with partings of orange silt & fine sand & very occasional carbon flecks.	2.50		D	V	120+ 120+	4.00		
				D	V	120+ 120+	4.50		

Remarks:

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: DB	Checked: PM	Typed by: DVC	Scale: NTS	Weather: DRY

Borehole No: 1 & Datum

Sheet: 2 of 2

Job No: 95171E

Site: 12 Glenilla Road, London NW3

Boring Method: Hand Auger

Date: 29/09/2010

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)
	Stiff, mid brown, mottled orange, grey veined, silty CLAY with partings of orange silt & fine sand & very occasional carbon flecks.	2.50		D	V	120+ 120+	5.00		
6.00	Borehole ends at 6m								

Remarks:

Borehole dry and open on completion

Datum installed at 6m

Key: T.D.T.D. Too Dense to Drive

D Small disturbed sample

B Bulk disturbed sample

W Water sample

J Jar sample

V Pilcon Vane (kPa)

M Mackintosh Probe

Logged: DB

Checked: PM

Typed by: DVC

Scale: NTS

Weather: DRY

Our Ref : 95171

Laboratory Testing Results

Date Sampled: 29/09/2010

Location : 12, Glenilla Road

Work carried out for: Cunningham Lindsey - Solent

Date Received : 01/10/2010

Date Tested : 01/10/2010

Date of Report : 12/10/2010

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	0.90(U/S)	D	29	<5	74	25	49	0.07	49	CV	168	167	105					
	1.5	D	29	<5	76	25	51	0.09	51	CV	168	195	71					
	2.0	D	29	<5									> 120					
	2.5	D	25	<5	74	22	52	0.05	52	CV	168	122	85					
	3.0	D	31	<5									97					
	3.5	D	29	<5	78	24	53	0.09	53	CV	168	130	107					
	4.0	D	29	<5									> 120					
	4.5	D	31	<5							168	121	> 120					
	5.0	D	29	<5							168	150	> 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

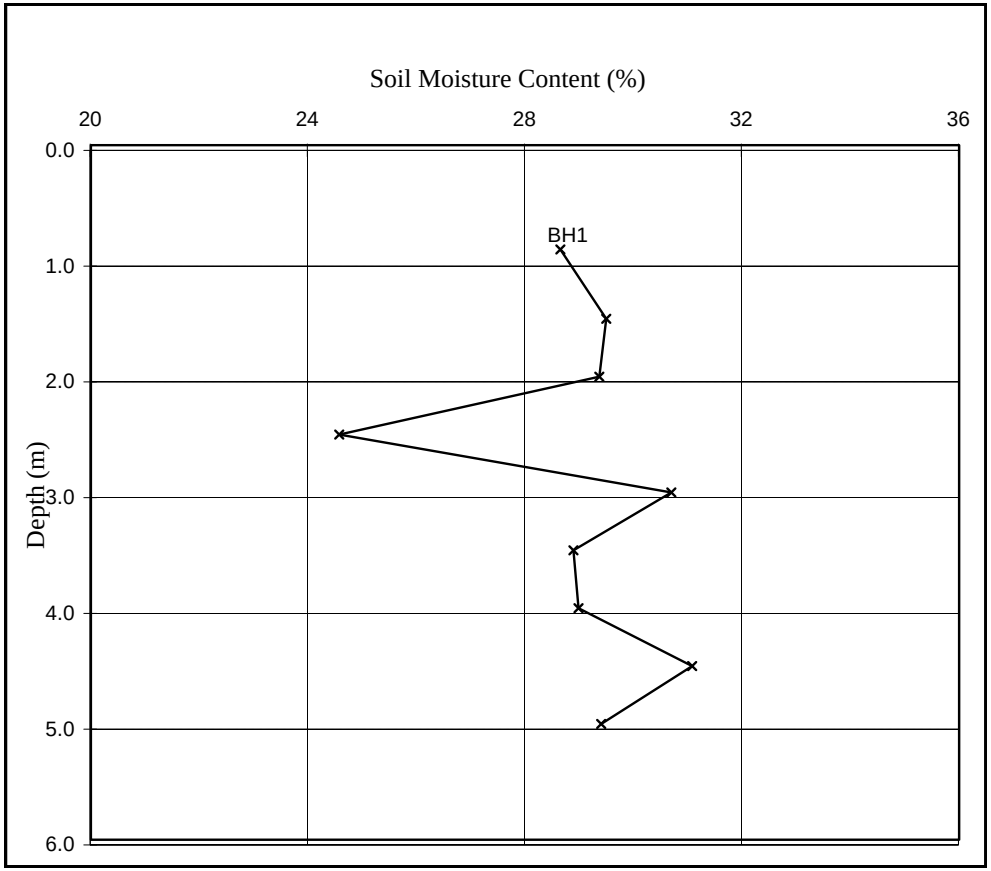
Note that if the SO_4 content falls into the DS-4 or DS-5 class, it would be prudent to consider the samnple as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise

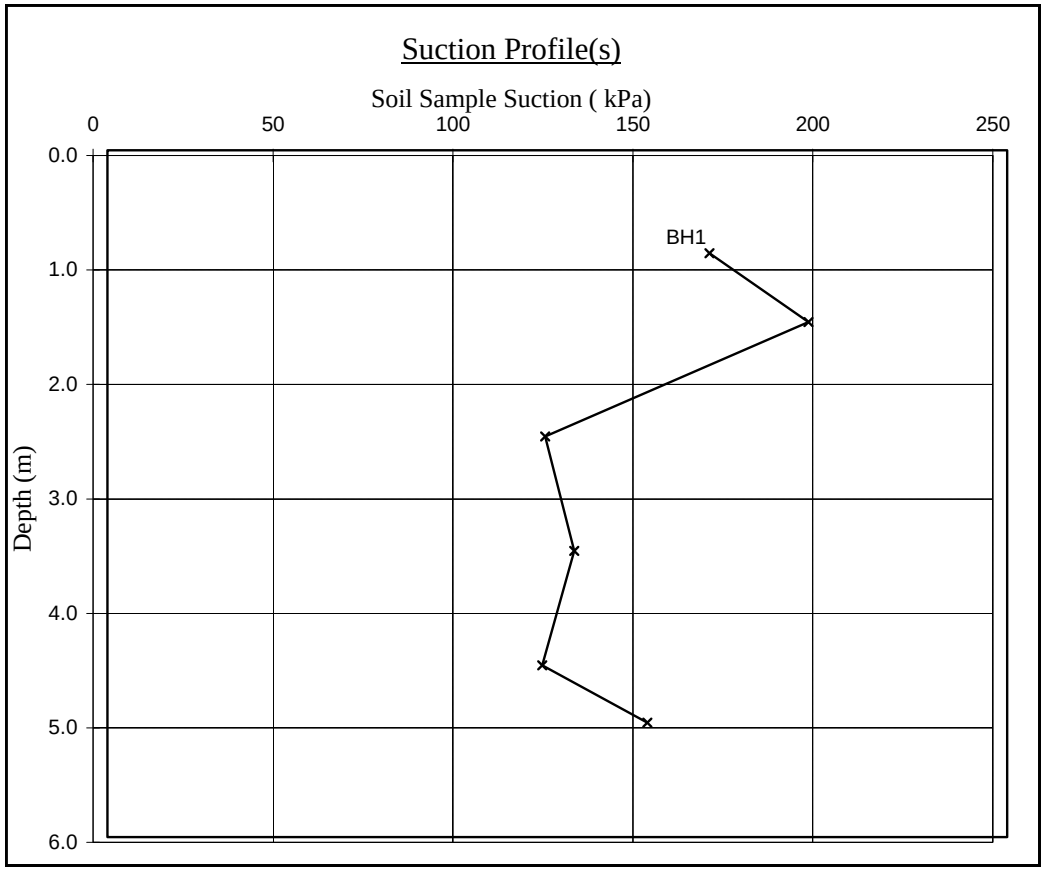
Key

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 :	95171		Date Sampled : 29/09/2010
Location :	12, Glenilla Road		Date Received : 01/10/2010
Work carried out for:	Cunningham Lindsey - Solent	Note : Unless specifically noted the profiles have not been related to a site datum.	Date Tested : 01/10/2010
			Date of Report : 12/10/2010





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 : 95171

Location : 12, Glenilla Road

Work carried out for: Cunningham Lindsey - Solent

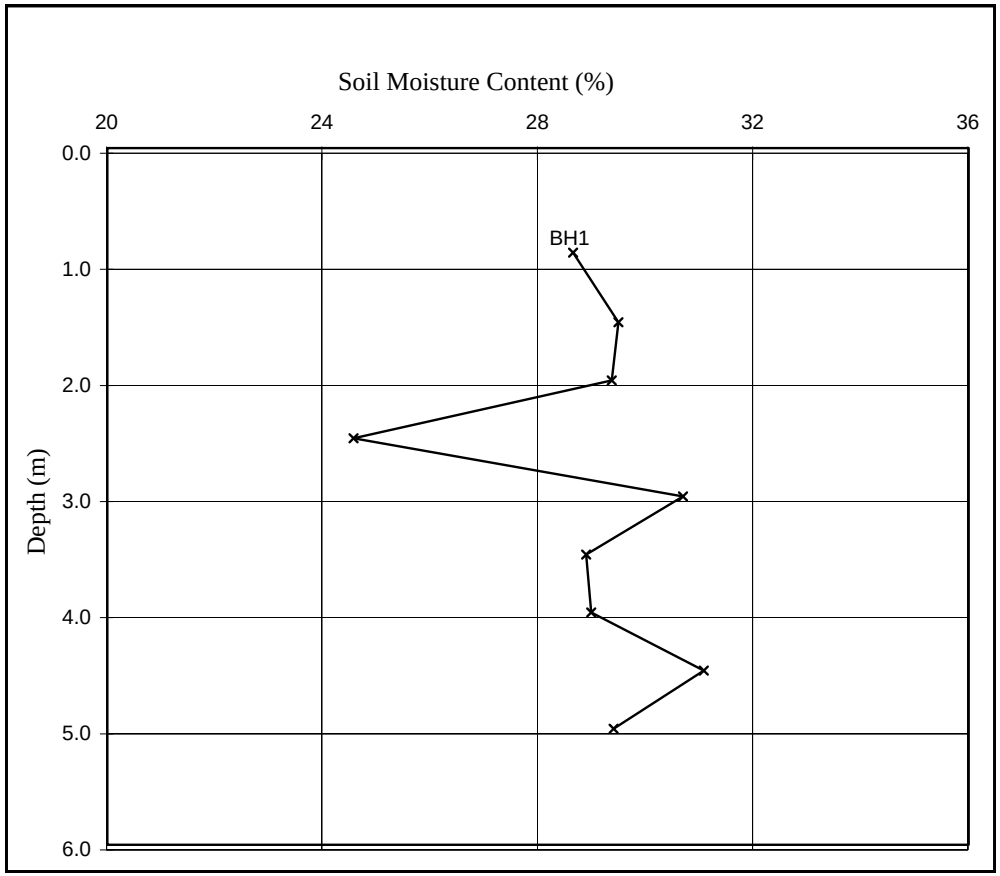
Note : Unless specifically noted the profiles have not been related to a site datum.

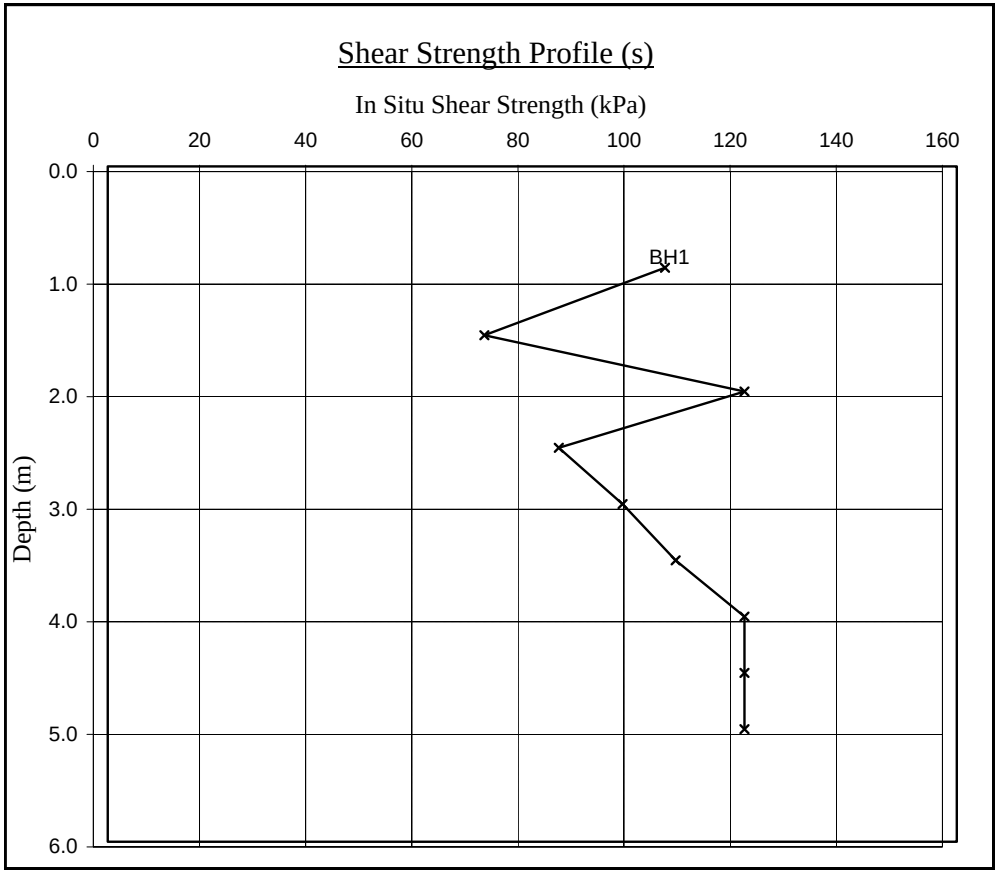
Date Sampled : 29/09/2010

Date Received : 01/10/2010

Date Tested : 01/10/2010

Date of Report : 12/10/2010





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 140 kPa.

Tree Root Identification Ltd

Sheet: 1 of 1

Job No: 95171
Date: 07/10/2010
Order No: 320715
Our Ref: CET071010

Site: 12 Glenvilla Road, London, NW3.

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 (underside)	1.0	Salix (willow) or Populus (poplar)* (3 roots)	positive
BH1 (depth: 1.7m)	<0.5	Salix (willow) or Populus (poplar)* (1 root)	positive

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

* Roots of willows and poplars are indistinguishable.

Ronald Macleod

DR RONALD D MACLEOD
Principal Scientist

Address for correspondence: 3 Langley Drive, Kinnoull Hill, Perth, PH2 7XA.
Telephone: 01738 630873
e-mail: rdmmacleod@btconnect.com
Principal Scientist: R.D. MacLeod, B.Sc., Ph.D.,
Accounts/Quality Manager: Fiona M. Sinclair, H.N.C. (Management)
Registered in Scotland, No. 358068. Registered Office: "Mandaya", Highfield Place, Bankfoot, PH1 4AX.

CETSAFEHOUSE

LEVEL MONITORING - RELATIVE SURVEY READINGS

Provider Details		Client Details		Risk Address	
Name:	CETSafehouse	Insurance Co.:		Occupier:	
		Client Name:	Cunningham Lindsey	Address:	12 Glenilla Road
Our Ref:	00/25191	Technical Mgr:	Anthony Demitrius	Address:	
Date of Issue:	16/8/11	Email:		Town:	London
		Client Ref:	3748395	County:	
Monitoring Details		Address:		Post Code:	NW3 4AS
Instruction Date:	04/10/10	Address:		Tel Home:	
First Reading Date:	11/10/10	Town:		Tel Work:	
Maximum No Visits:	6	County:		Mobile:	
Anticipated Expiry Date:		Post Code:		Other:	
Monitoring Int (Wks):	8	Other Email:		Other:	

Target Date:														
Reading Date:	11/10/10	24/11/10	6/1/11	11/2/11	22/3/11	3/5/11	14/6/11	8/8/11						
Issue Date:		29/11/10	11/1/11	23/2/11	29/3/11	15/5/11	21/6/11	16/8/11						

Row No.	Point Name	X Co-ordinate	Y Co-ordinate	1	2	3	4	5	6	7	8	9	10	11	12
1		0.00	0.00												
2		2.00	0.00												
3		2.00	-1.00												
4		5.00	-1.00												
5		5.00	0.00												
6		7.00	0.00												
7		7.00	7.00												
8		6.00	7.00												
9		6.00	8.00												
10		7.00	8.00												
11	1	7.00	13.00	10.7435	10.7431	10.7435	10.7450	10.7443	10.7442	10.7443	10.7433				
12		7.00	14.00												
13	2	6.50	14.00	10.6616	10.6614	10.6618	10.6631	10.6625	10.6636	10.6627	10.6615				
14	3	6.50	15.00	10.6488	10.6487	10.6491	10.6510	10.6493	10.6513	10.6496	10.6480				
15	4	4.30	15.00	11.4189	11.4193	11.4198	11.4214	11.4206	11.4212	11.4187	11.4177				
16	5	0.50	15.00	10.7025	10.7031	10.7035	10.7064	10.7053	10.7063	10.7050	10.7015				
17	6	0.50	13.00	10.5374	10.5380	10.5382	10.5394	10.5388	10.5387	10.5389	10.5380				
18	7	0.50	11.00	10.5315	10.5326	10.5322	10.5325	10.5325	10.5322	10.5322	10.5315				
19		0.00	11.00												
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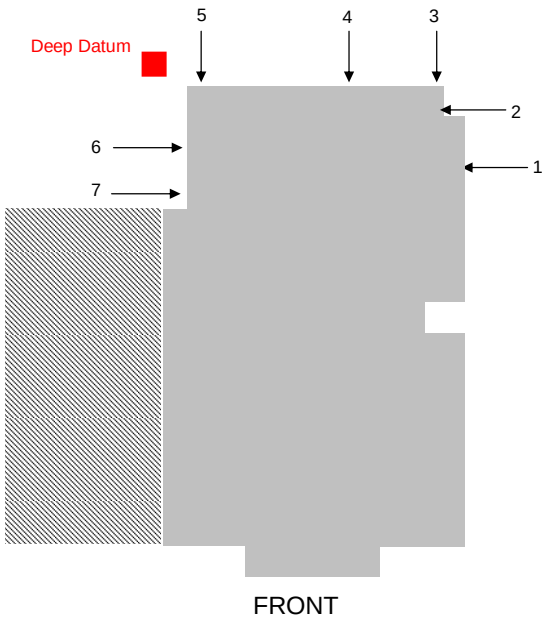
22															
23															
24															
25															

Sketch Plan



Comments

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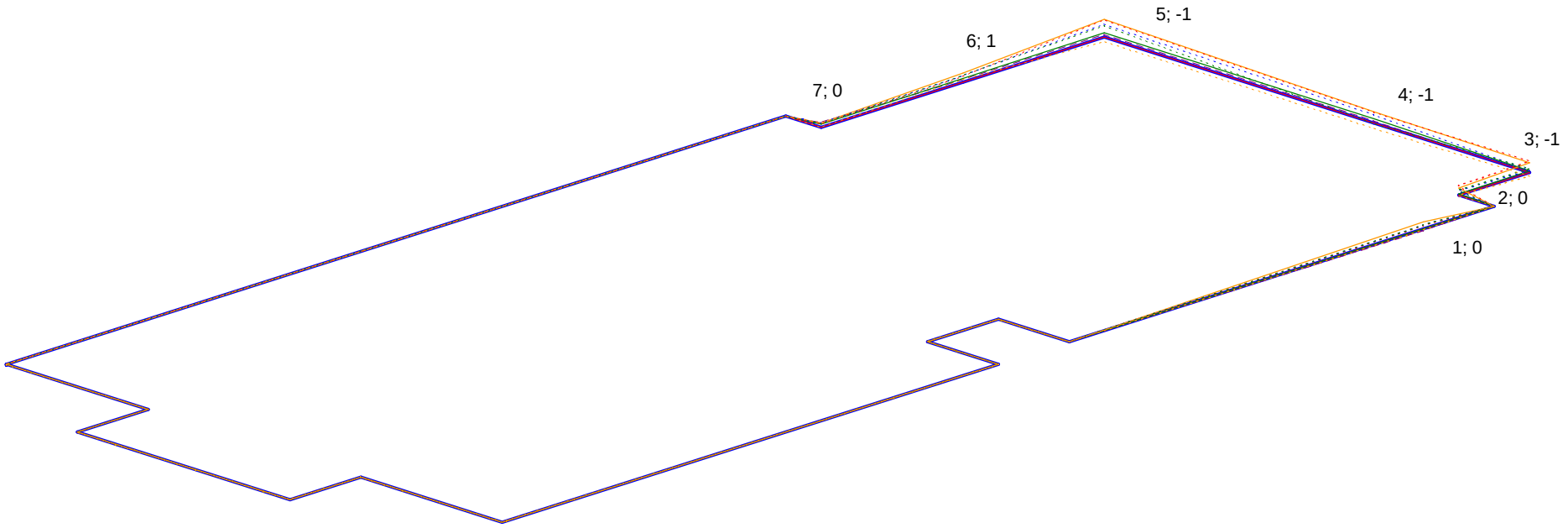
LEVEL MONITORING - RELATIVE MOVEMENT SKETCH

Client:	Cunningham Lindsey	Client Ref:	3748395	CETSafehouse Ref:	00/25191

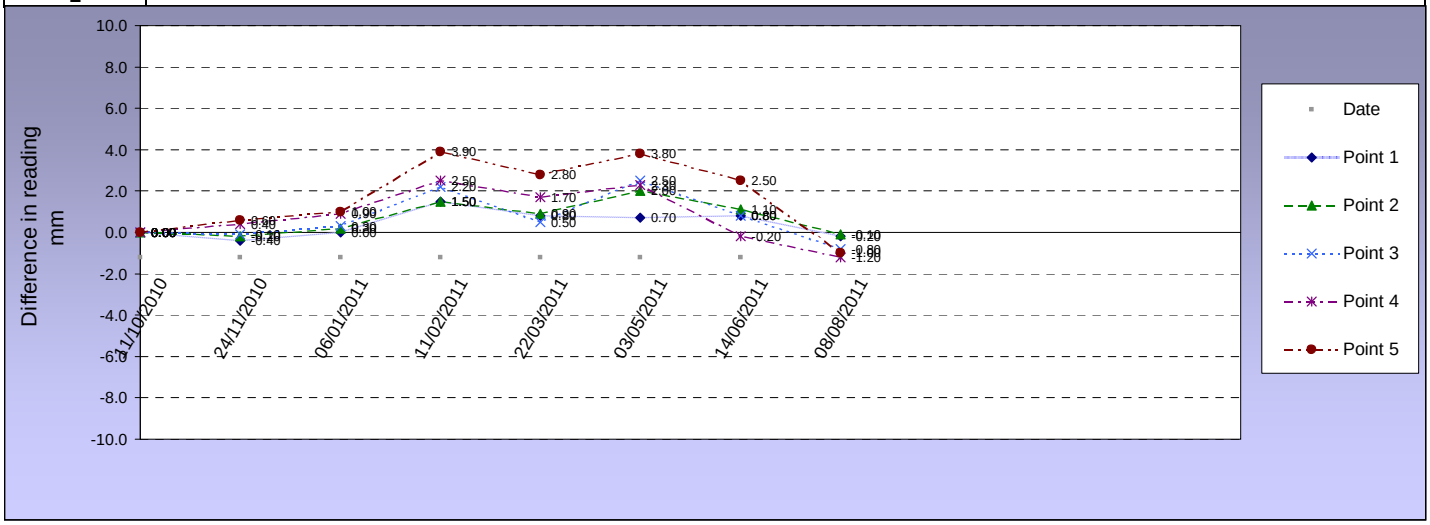


Notes:
Vertical distorted scale 1: 100
Chart is displaying Subsidence
Point labels give level difference of last reading from original datum in mm.

CETSAFEHOUSE **LEVEL MONITORING - RELATIVE SURVEY READINGS**

Client: Cunningham Lindsey **Client Ref:** 3748395 **CETSafehouse Ref:** 00/25191 **Chart Scale 1:1000**

1



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