

Arboricultural Assessment Report

Summary Report on Trees

For:	Client:	Oriel Services Limited
	Insurer:	Aviva
Site:	Policyholder:	Mr Marks
	Risk Address:	166 Belsize Road, London NW6 4BJ
Refs:	OCA Ref:	44839
	Client Ref:	3702831
	Insurer Ref:	8361532

Survey By:	Andrew Graham		
Title:	Senior Consulting Arborist	Date:	17 August 2010
Report By:	Andrew Graham		Amended
Title:	Senior Consulting Arborist	Date:	17 November 2010



Consulting Arboriculturists

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1.0 Introduction & brief

1.1 OCA UK Limited has been instructed by Oriel Services Limited on behalf of the building insurers of 166 Belsize Road, London NW6 4BJ (the Insured Property). We have been advised by Oriel Services Limited that the Property has suffered differential movement and damage which is considered to have been caused by trees growing adjacent the property influencing soils beneath its foundations.

1.2 We have been instructed to undertake a survey of the vegetation growing adjacent the Insured Property, to provide our opinion as to whether, based on the available information any of this vegetation is likely to be influencing soil moisture levels beneath the foundations of the property and if so to provide recommendations as to what tree management could be implemented to effectively prevent damage continuing.

2.0 Limitations

2.1 Recommendations with respect to tree management are associated with the risk address as stated on the front cover of this report and following consultation with investigating engineers. The survey of trees and any other vegetation is associated with impacts on the risk address subject of this report. Matters of tree health, structural condition and/or of the safety of vegetation under third party control are specifically excluded. Third party land owners are strongly advised to seek their own professional advice as it relates to the health and stability of trees under their control.

In relation to the possibility of heave damage, the owners of any trees within third party control must obtain their own advice in respect of the possibility of any damage to their own or any other structures outside of the control of the insurers of the risk address subject of this report from any soil heave.

2.2 Recommendations do not take account of any necessary permission (statutory or otherwise) that must be obtained before proceeding with any tree works.

3.0 Vegetation and subsidence of low rise buildings – property owner’s guide

3.1 Soils, soil water and vegetation

All vegetation requires water to live and this water is substantially accessed from the soil within which the plants roots grow.

If the soil is classified as a clay soil then it will hold very much more water than sands, gravels and loam soils. During the summer as plants abstract water from the clay soil then the soil volume will “shrink” and “swell” as water is first removed and then added by summer rainfall.

In years in which rainfall during the summer is less than the total amount of water taken from the soil by plants then shrinkage will continue. This shrinkage may remove support from building foundations leading to cracking in the fabric of the building.

3.2 Vegetation management

The control of trees, shrubs and climbers by removal and/or pruning is a proven technique that controls total soil water loss thereby minimising soil shrinkage and allowing repairs to proceed.

If vegetation management works are carried out promptly then repairs can usually proceed very quickly and the duration and distress associated with the disruption that tree related subsidence brings can be minimised.

3.3 Third party liaison and statutory controls

Tree roots do not respect physical or property boundaries and can travel for many metres beyond the above ground “dripline” of the canopy of the vegetation.

The purpose of this report is to ascertain on a preliminary basis which vegetation is the most likely substantial and/or effective contributory cause of the damage witnessed to allow for liaison with third parties or with local administrative Councils as necessary.

You can learn more about tree related subsidence of low rise buildings by visiting:

www.oca-arb.co.uk/whatIsSubsidence.htm

4.0 Conclusions and Recommendations

4.1 Results of the field survey

We can confirm that vegetation exists on or near the Insured Property that is considered to be causing or contributing to the current subsidence damage.

4.2 Preliminary recommendations

On the basis of our preliminary findings we have considered a practical vegetation management specification. This specification will assist in reducing the impact of the adjacent vegetation on soil moisture levels thereby potentially stabilising foundations of the affected area of the building.

4.3 Recommended vegetation management to address the current subsidence:

Tree No:	Species	Works Required
T1	Lime	Fell to ground level and treat the stump with an appropriate herbicide
T2	Lime	Fell to ground level and treat the stump with an appropriate herbicide
G2	Mahonia	Fell to ground level and treat the stump with an appropriate herbicide

5.0 Vegetation Survey

The vegetation growing adjacent the risk address has been surveyed in accordance with the Brief set out at s.1.0 of this report. All vegetation has been surveyed from the ground using digital measuring devices and/or standard tape measures. All distances are measured to the nearest point of the risk address unless otherwise stated.

Key to Abbreviations

Age Class	Y – Young. EM - Early Mature. M – Mature. FM - Fully Mature. OM - Over Mature
Condition	A – Good. B - Minor problems. C - Major problems. D – Dead, Dying or Dangerous
Stem Diameter	MS - Multi-stemmed tree
Ownership	PH - Within boundary of risk address. 3 – Within boundary of third party properties. LA – within land owned by a Local Authority. U – Within land of indeterminable ownership.

Tree No.	Species (Common Name)	Estimated Age	Age Class	Cond	Height (m)	Crown Spread (m)	Stem Diam (mm)	Dist to bldg (m)	Ownership
T1	Lime	51-75	M	B	18	5	2 X 600	1.9	PH

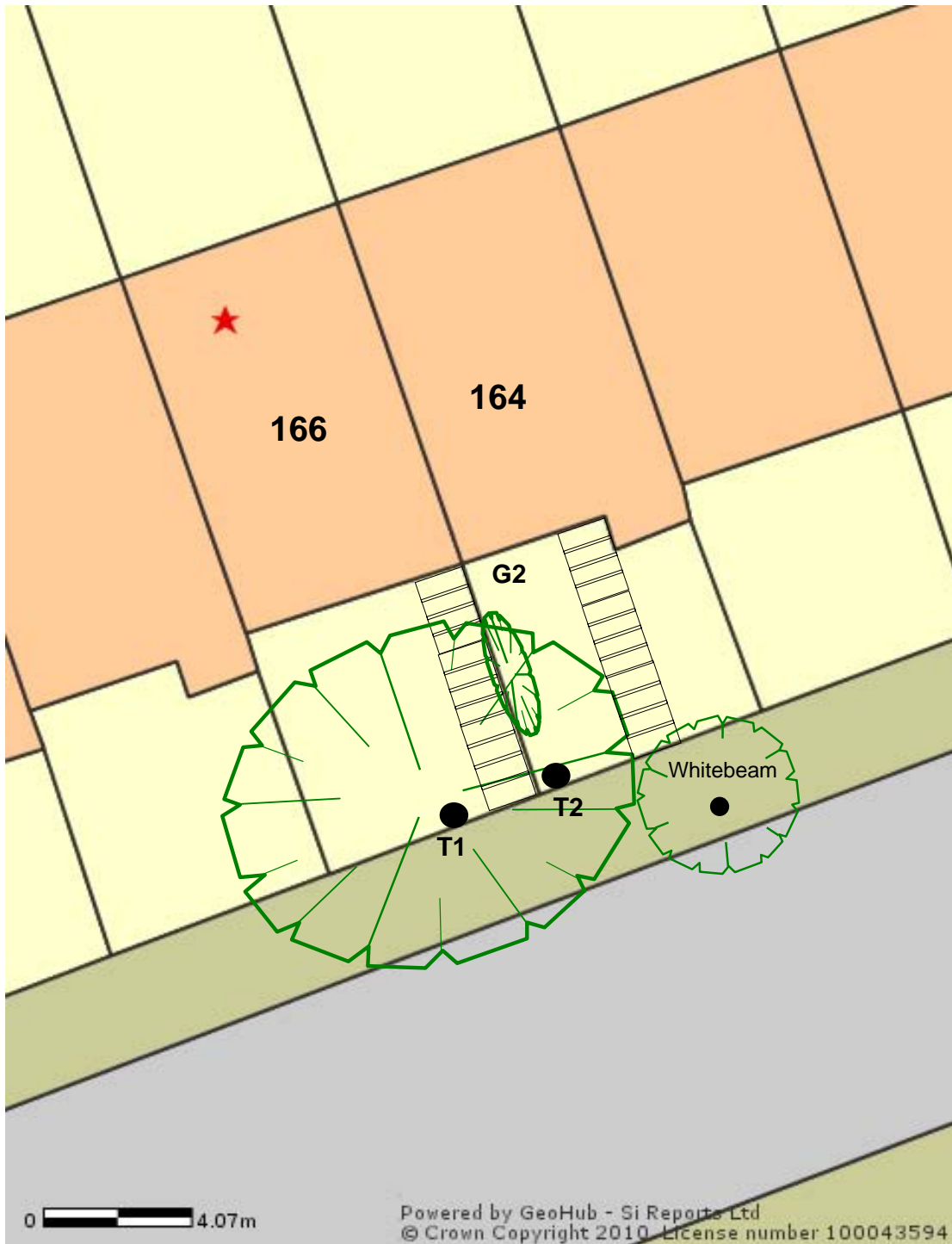
Comments: Lime T1 is situated in the front garden of 166 Belsize Road. T1 appears to have been the subject of pruning works in the past.

Tree No.	Species (Common Name)	Estimated Age	Age Class	Cond	Height (m)	Crown Spread (m)	Stem Diam (mm)	Dist to bldg (m)	Ownership
T2	Lime	51-75	M	B	18	5	2 X 600	1.9	3P

Comments: Lime T2 is situated in the front garden of 164 Belsize Road. T2 appears to have been the subject of pruning works in the past.

Tree No.	Species (Common Name)	Estimated Age	Age Class	Cond	Height (m)	Crown Spread (m)	Stem Diam (mm)	Dist to bldg (m)	Ownership
G2	Rose & Mahonia	11-25	M	B	2-4	2	MS	0	3P

Comments: Rose & Mahonia G2 are situated in the front garden of 164 Belsize Road directly adjacent the entrance steps. This vegetation does not appear to have been subject to pruning works in the past.



(NB: This plan may not be a comprehensive record of site features.)

Title: 166 Belsize Road, London
NW6 4BJ

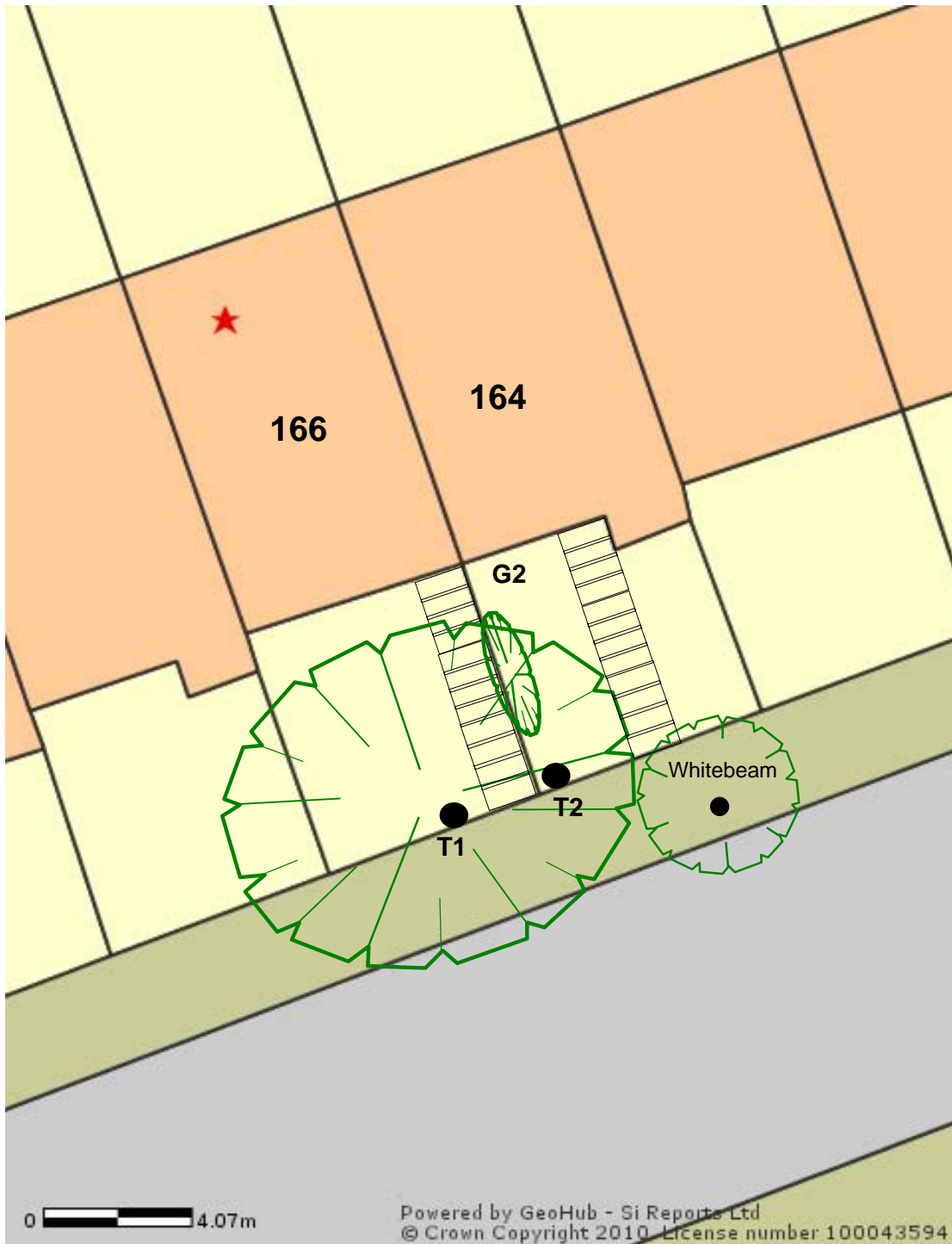
Client: Aviva

Scale: N T S

Drawn Date: 17/08/10

Job Ref: 44839





(NB: This plan may not be a comprehensive record of site features.)

Title: 166 Belsize Road, London
NW6 4BJ

Client: Aviva

Scale: N T S

Drawn Date: 17/08/10

Job Ref: 44839



Consulting Arboriculturists

19 November 2010

Our Ref: 44839/3702831

London Borough of Camden
Planning Department
5th Floor Extension
Town Hall
Argyle Street
London WC1H 8NG



4 THE COURTYARDS
PHOENIX SQUARE
SEVERALLS PARK
WYNCOLLS ROAD
COLCHESTER
ESSEX CO4 9PE

Tel: **01206 751626**

Fax: **01206 855751**

Email: colchester@oca-arb.co.uk

Web: www.oca-arb.co.uk

Dear Sir / Madam

**Re: Tree Related Subsidence at 166 Belsize Road, London NW6 4BJ
Notice under s.211 of the Town and Country Planning Act 1990 of intent to
Fell one tree at 164 Belsize Road, London NW6 4BJ**

We are arboriculturists appointed on behalf of the building insurers of the above property.

It is the view of chartered engineers that the property has suffered differential movement and subsequent damage consistent with clay shrinkage subsidence.

We understand that the tree referenced in our plan as T2 is within a designated Conservation Area.

Please accept this letter as our formal notice that the works detailed below will commence on or after 31 December 2010:

Tree No. (as per OCA plan)	Species	Works applied for
T2	Lime	Fell as close to ground level as possible and treat stump with an appropriate herbicide.

Reasons

The above tree removal works are proposed both as a remedy to the current subsidence at the above address and to ensure the long-term stability of the building.

London Borough of Camden

Please provide your formal acknowledgement of this notice.

We trust that the above information is of assistance but should you have any queries please do not hesitate to contact us.

Yours faithfully

H. Klarner.

Helen Klarner
Administrator (Contracts)

OCA UK Limited

Email: helen.klarner@oca-arb.co.uk
DDI: 01206 754993

Job folder/44839 CA Notice Ltr

Cunningham Lindsey

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

Policyholder:

Subject Property Address:

166 Belsize Road

London

NW6 4BJ

INSURANCE CLAIM

CONCERNING SUSPECTED SUBSIDENCE

ENGINEERING APPRAISAL REPORT

This report is prepared on behalf of Aviva 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: 7/2/2010

Cunningham Lindsey Ref: SOHPC/KG/3441187

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 1890 mid terrace house converted into 4 flats in a city centre location on a plot that is level.

The overall layout is recorded on our site plan.

DISCOVERY OF DAMAGE

The damage was most likely discovered some time ago but was not considered to be of any significance until quite recently.

The policyholder then advised insurers.

NATURE AND EXTENT OF DAMAGE

Description and Mechanism

The main area of damage is to the front right entrance steps and takes the form of tapering vertical cracks in the region of 1-2 mm in width.

This pattern of damage indicates a mechanism of downwards movement to front entrance steps

Significance

The level of damage is slight, and is classified as category 2 in accordance with BRE Digest 251 - Assessment of damage in low-rise buildings

Onset and Progression

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.

SITE INVESTIGATIONS

A site investigation may be necessary to assist in identifying mitigation measures.

MONITORING

We do not consider that monitoring is required.

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.

No drainage mitigation repairs are required at this stage.

Repair

We have decided on the final type of repair required and have produced an outline of the requirements. This involves undertaking superstructure repairs and redecoration. This decision has been taken based on our knowledge and experience of dealing with similar claims. In addition the results of the Site Investigation and laboratory testing will be taken into account.

Raymond Borrow BSc, CEng, MICE

Adjuster

Direct dial:

E-mail:

FACTUAL REPORT
OF
INVESTIGATION

AT:- 166 Belsize Road
London

ON:- 16 August 2010

FOR:- Norwich Union
c/o Cunningham Lindsey - Solent

REF:- 3441187-Mr Ben Marks

JOB NO:- 91132

REPORT ISSUED:- 26/08/2010

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: 91132E
 Date: 16/08/10

Site: 166 Belsize Road, NW6

MR (SI) SE (Checked) NR (Drawn)

Weather: Dry

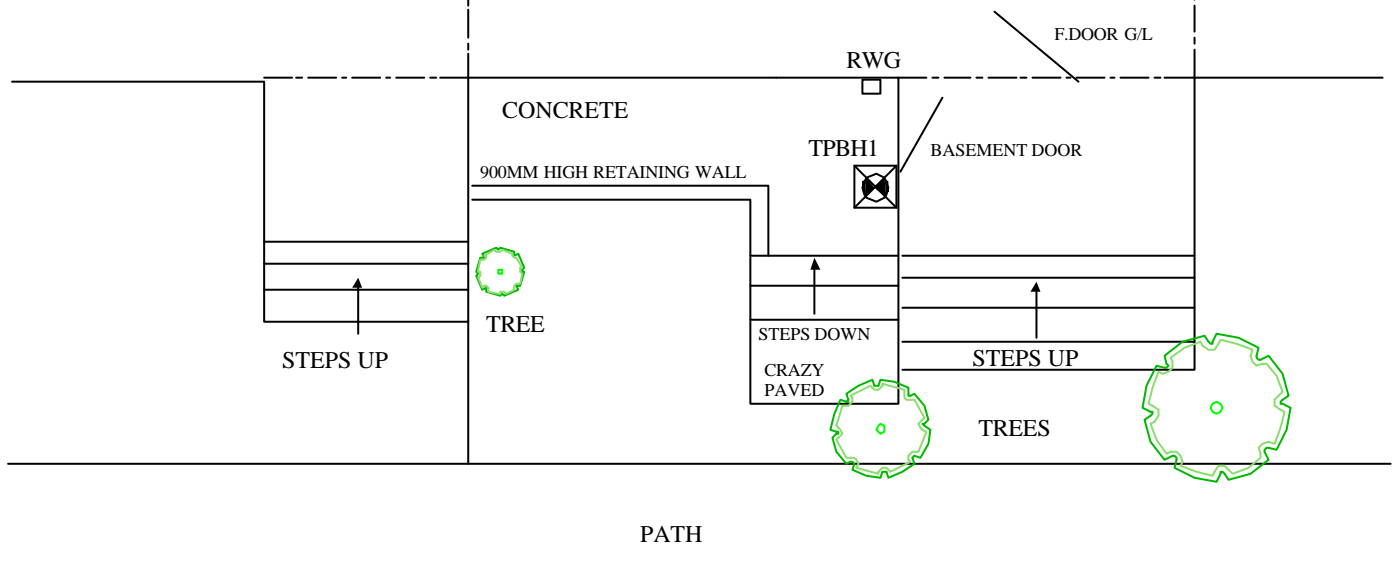
Work carried out for: Cunningham Lindsey

REAR

NO 168
X3
BASEMENT

NO 166
X3
MAIN HOUSE &
BASEMENT
FLAT

NO 164
X3 +
BASEMENT



FRONT BELSIZE ROAD

ON SITE TREE IDENTIFICATION FOR GUIDANCE ONLY. NOT AUTHENTICATED.

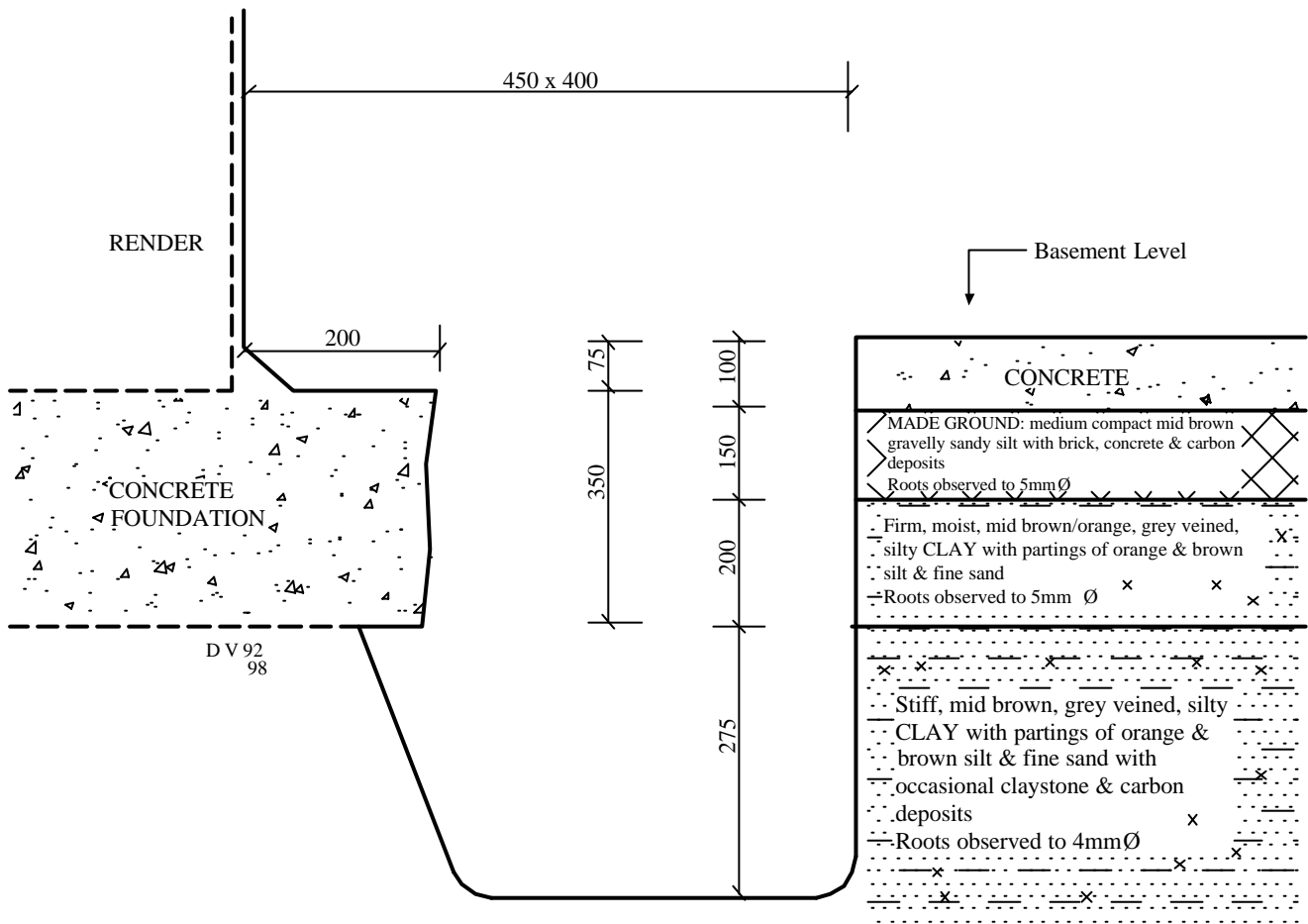
Remarks:

Key:

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

Scale: N.T.S.

Trial Pit No: 1	Sheet: 1 of 1	Site: 166 Belsize Road, NW6
	Job No: 91132E	
Excavation Method: Hand Tools	Date: 16/08/10	Work carried out for: Cunningham Lindsey
Weather: Dry	Drawn by: NR	
	Ground Level mOD:	



D V 92
98

FOR STRATA BELOW 725mm 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: MR	Checked: SE	Approved:	Scale: N.T.S.
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Borehole No: 1		Sheet: 1 of 1			Site: 166 Belsize Road, NW6				
Boring Method: Hand Auger		Date: 16/08/2010			Job No: 91132E				
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)
0.725	As Trial Pit 1	0.725						Roots observed to 1mm diameter to 2.0m	
1.40	Stiff, mid brown/orange, grey veined, silty CLAY with partings of orange & brown silt & fine sand with occasional claystone carbon & occasional fine crystal deposits	0.675	___x ___ ___ x___ ___ ___	D	V	130+ 130+	1.00		
			___x ___ ___ x___ ___ ___	D	V	130+ 130+	1.50		
	Stiff as above with claystone deposits	1.90	___x ___ ___ x___ ___ ___	D	V	130+ 130+	2.00	Hair & fibrous roots to 2.2m	
			___x ___ ___ x___ ___ ___	D	V	130+ 130+	2.50	No roots observed below 2.2m	
3.30			___x ___ ___ x___ ___ ___	D	V	130+ 130+	3.00		
			___x ___ ___ x___ ___ ___	D	V	130+ 130+	3.50		
4.70	Stiff, mid brown, grey veined, silty CLAY with partings of orange & brown silt & fine sand with occasional claystone nodules & crystals	1.40	___x ___ ___ x___ ___ ___	D	V	130+ 130+	4.00		
			___x ___ ___ x___ ___ ___	D	V	130+ 130+	4.50		
	BH ends at 4.7m Too dense to hand auger (thought to be claystone)								
Remarks: Borehole dry & 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: MR	Checked: SE	Drawn By: NR	Scale: NTS		Weather: Dry				

Our Ref : 91132

Laboratory Testing Results

Date Sampled: 16/08/2010

Location : 166 Belsize Road

Date Received : 17/08/2010

Work carried out for: Cunningham Lindsey - Solent

Date Tested : 17/08/2010

Date of Report : 26/08/2010

Sample Ref		Type	Moisture Content (%) [1]	Soil Fraction > 0.425mm (%) [2]	Liquid Limit (%) [3]	Plastic Limit (%) [4]	Plasticity Index (%) [5]	Liquidity Index [5]	Modified Plasticity Index (%) [6]	Soil Class [7]	Filter Paper Contact Time (h) [8]	Soil Sample Suction (kPa)	In situ Shear Vane Strength (kPa) [9]	Organic Content (%) [10]	pH Value [11]	Sulphate Content (g/l)		Class [14]
TP/BH No	Depth (m)															SO ₃ [12]	SO ₄ [13]	
1	0.43(U/S)	D	31	<5	79	24	55	0.12	55	CV	168	253	95					
	1.0	D	31	<5	80	23	57	0.13	57	CV	168	342	> 130					
	1.5	D	33	<5									> 130					
	2.0	D	32	<5	80	25	55	0.13	55	CV	168	256	> 130					
	2.5	D	29	<5	75	22	53	0.14	53	CV	168	333	> 130					
	3.0	D	31	<5									> 130					
	3.5	D	31	<5	79	25	54	0.10	54	CV	168	294	> 130					
	4.0	D	31	<5									> 130					
	4.5	D	30	<5									> 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 : 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] SO₄ = 1.2 x SO₃

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

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

Key

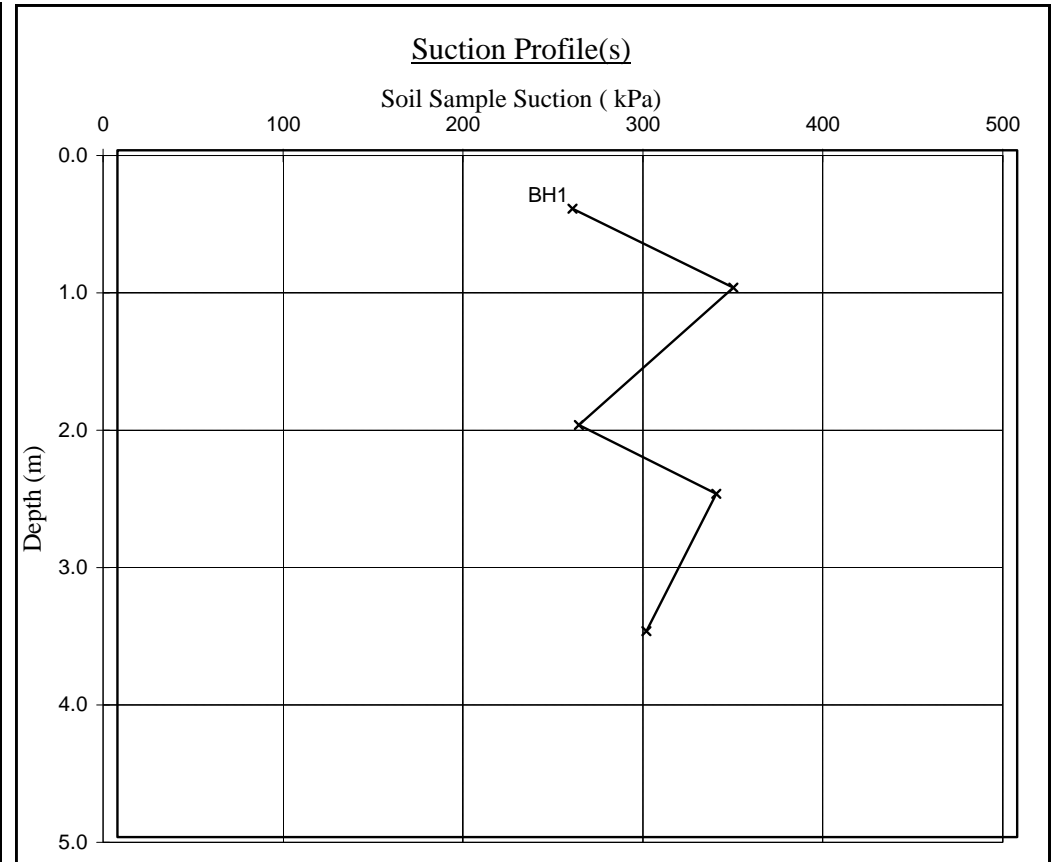
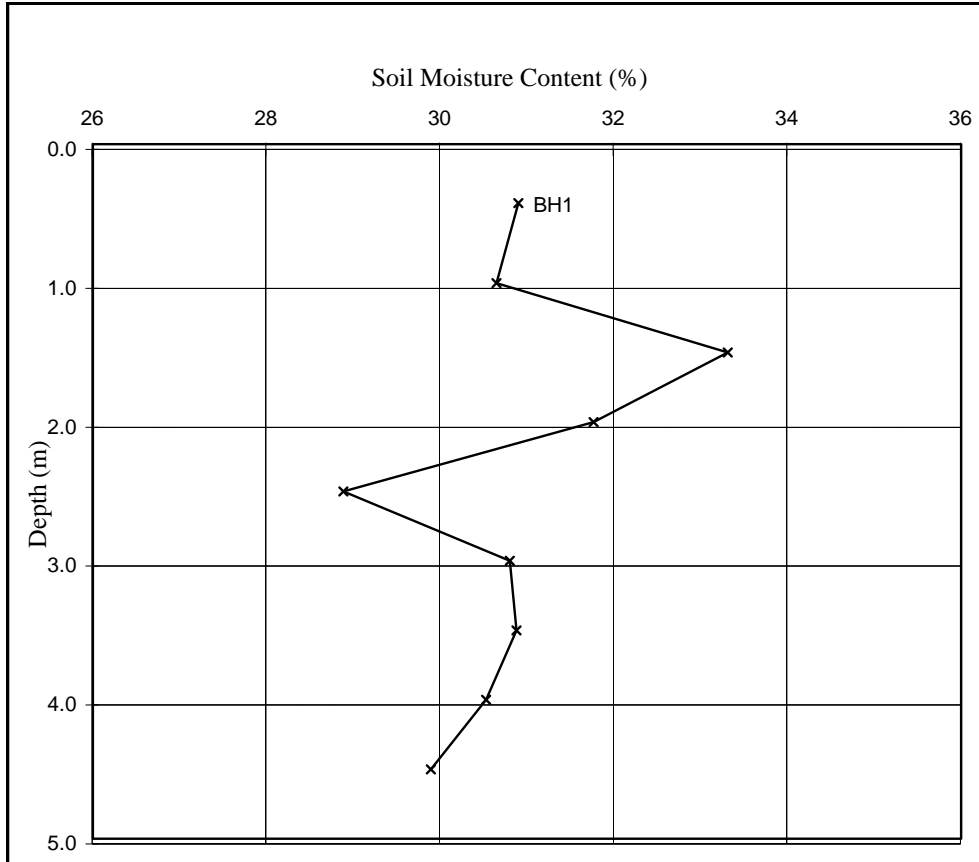
- D Disturbed sample (small)
- B Disturbed sample (bulk)
- U Undisturbed sample
- W Groundwater sample
- ENP Essentially Non-Plastic by inspection
- U/S Underside of Foundation

Moisture Content and Suction Profiles

Our Ref : 91132
 Location : 166 Belsize Road
 Work carried out for: Cunningham Lindsey - Solent

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

Date Sampled : 16/08/2010
 Date Received : 17/08/2010
 Date Tested : 17/08/2010
 Date of Report : 26/08/2010



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.

Our Ref : 91132

Location : 166 Belsize Road

Work carried out for: Cunningham Lindsey - Solent

Moisture Content and Shear Strength Profiles

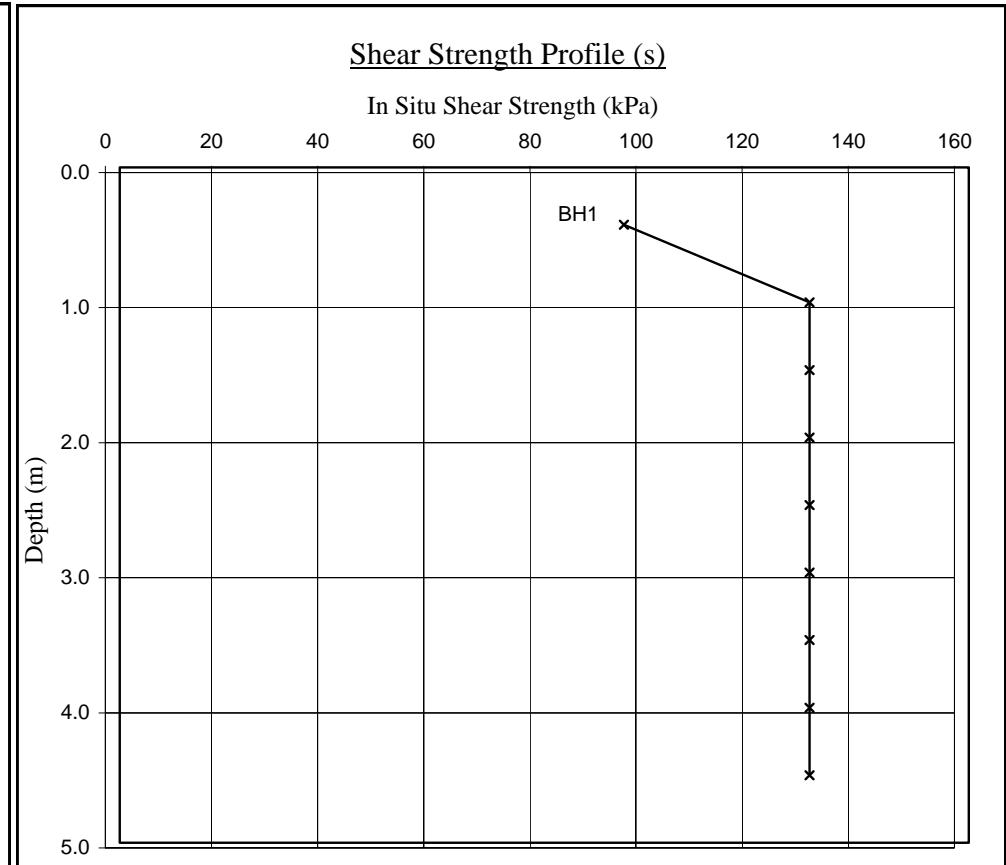
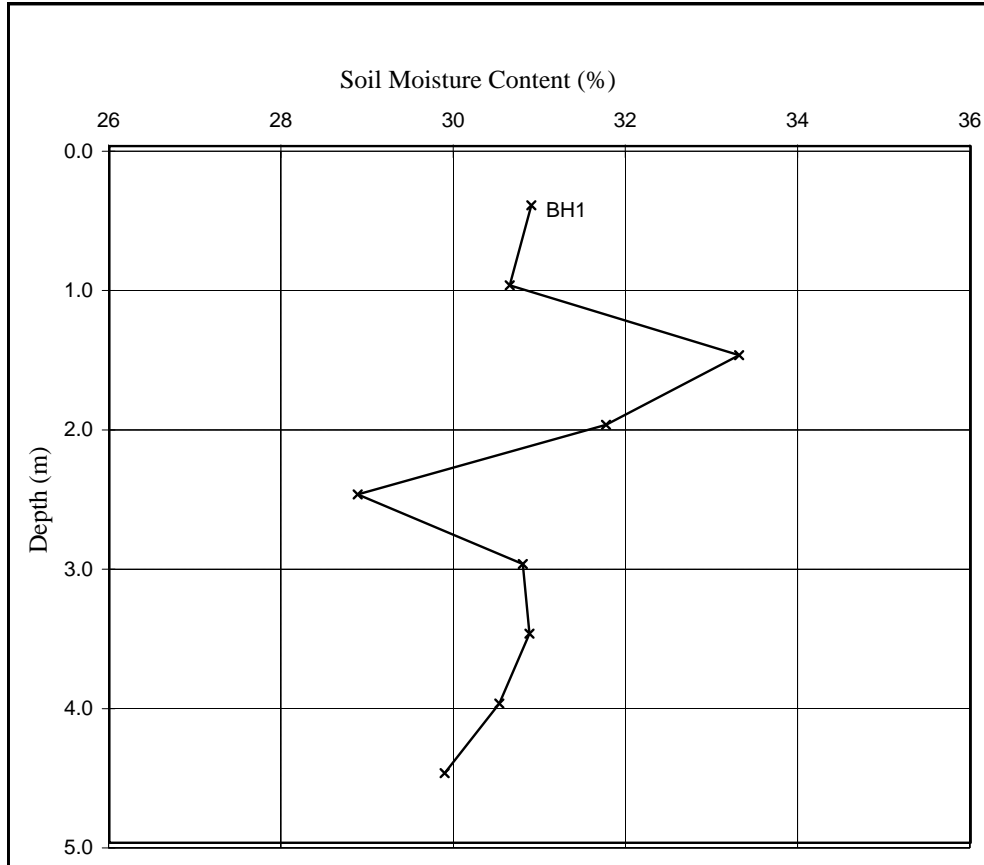
Date Sampled : 16/08/2010

Date Received : 17/08/2010

Date Tested : 17/08/2010

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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: 91132
Date: 26/08/2010
Order No: 314356
Our Ref: CET260810

Site: 166 Belsize Road,
London, NW6.

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 -

<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 (underside)	3.0	<u>Tilia</u> (lime) (2 roots)	negative
BH1 (depth: 2.0m)	1.5-2.0	<u>Tilia</u> (lime) (2 roots)	negative

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



DR RONALD D MACLEOD
Principal Scientist

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Telephone: 01738 630873

e-mail: rdmmacleod@btconnect.com

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Accounts/Quality Manager: Fiona M. Sinclair, H.N.C. (Management)

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