

ADDENDUM TECHNICAL REPORT ON A SUBSIDENCE CLAIM

97 Sutton Road
Waterlooville
Hampshire
PO8 8PT



Date of Report 15 November 2012

Crawford and Company

SPECIALIST PROPERTY SERVICES – SUBSIDENCE DIVISION

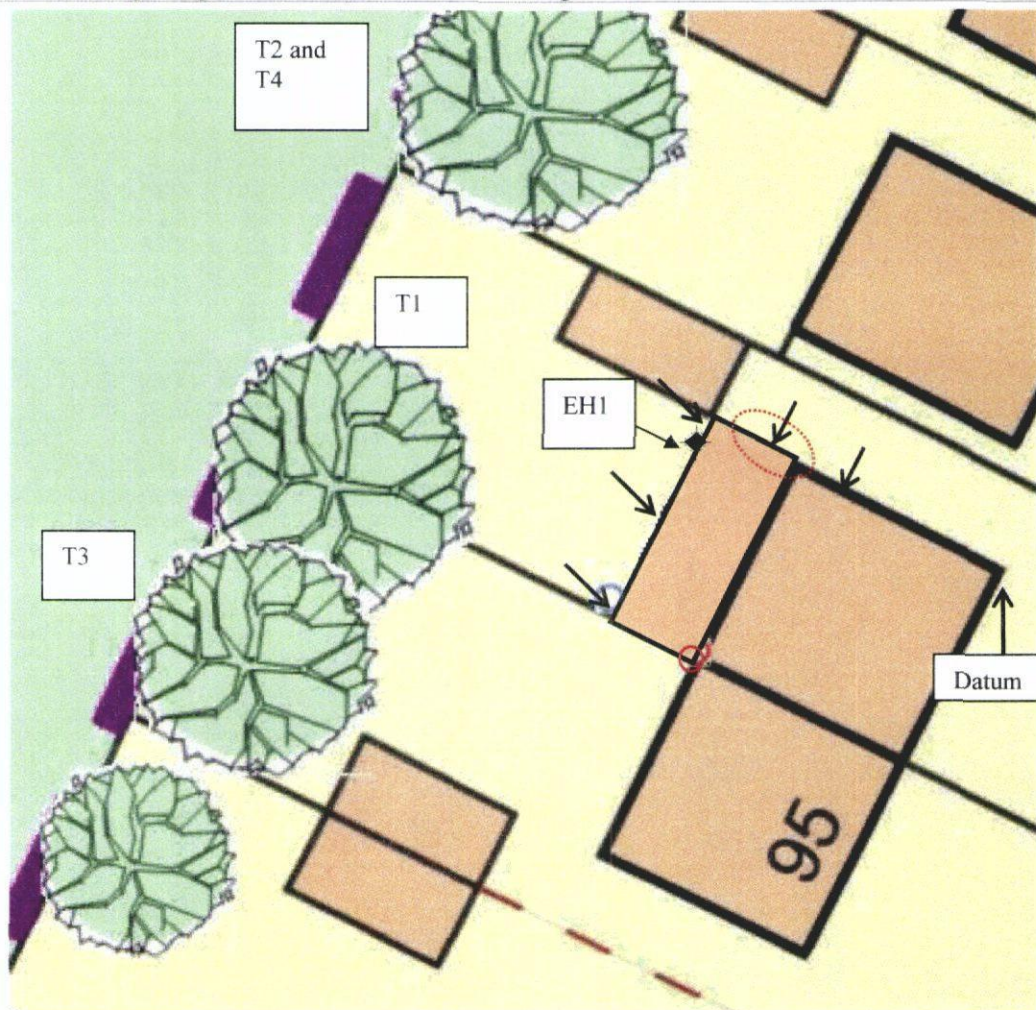
Cartwright House,
Tottle Road,
Riverside Business Park,
Nottingham, NG2 1RT
Tel: 0115 943 8260
Fax: 0121 200 0309
E Mail subsidence@crowco.co.uk



Site Plan

This plan is Not to Scale

This plan is diagrammatic only and has been prepared to illustrate the general position of the property and its relationship to nearby trees etc. The boundaries are *not* accurate, and do not infer or confer any rights of ownership or right of way. Position of utilities is only indicative and contractors must satisfy themselves regarding actual location before commencing works.



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Map Reproduced with the Permission of Ordnance Survey License Number #####

Key:

	Tree: Deciduous		Tree: Conifer		Shrub
	Hedge		Area of Damage		Bore Hole
	Trial Hole		Trial & Bore Hole		Level Monitoring
	Rain Water Manhole		Rain Water Gulley		Rain Water Pipe
	Waste Water Manhole		Waste Water Gulley		Toilet Pipe
	Rain Water Drain		Waste Water Drain		Electricity Cable
	Water Supply Pipe		Gas Supply Pipe		Incoming Gas Pipe
	Incoming Water		Incoming Electrics		

INTRODUCTION

We have been instructed by insurers to investigate a claim for subsidence at the above property. The area of damage, timescale and circumstances are outlined in our initial Technical Report. This report should be read in conjunction with that report.

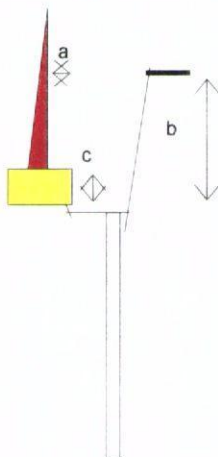
To establish the cause of damage, further investigations have been undertaken and these are described below.

INVESTIGATIONS

The following investigations were undertaken to identify the cause of movement.

TRIAL HOLES

A trial hole was excavated to expose the foundations - see site plan for location (labelled EH1) and the diagram below for details. Trial Hole 1 on the rear right hand corner of the rear extension revealed a concrete strip footing founded at a depth of 1m below ground level which bears onto firm brown slightly sandy CLAY. Root activity of live appearance was noted to the underside of the foundations.



Foundation Details

No.	Borehole Depth	Footing (a)	Underside (b)	Thickness (c)
TH1	3.00 m.	100 mm.	1,000 mm.	400 mm.

AUGERED BOREHOLES

One 50mm diameter hand auger were sunk through the base of the trial holes- see site plan for location of borehole.

SOIL SAMPLES

The soil was found to be highly plastic clay. Only slight desiccation was recorded due to the timing of the site investigation.

ROOTS

Under the foundations depths discovered roots were retrieved from the trial hole and were submitted to a botanist for identification. Live Oaks tree roots were found in the borehole. Shrubs roots were found due to the proximity of the borehole next to the shrubs in the Insured's garden. These shrubs have negligible water demand absolutely and relatively speaking, when compared to the Oak tree.

DRAINS

No water rise was found in the site investigation as to suggest there is no escape of water in operation. Also, the soil is non-granular and not prone to be affected by erosion.

ARBORICULTURAL REPORT

Marishal Thompson have implicated the Oak and Ash trees T1, T2 and T4 as the cause of the claim, based on their proximity to the trees, size and the species. They have recommended the felling of the trees to bring about property stability.

DISCUSSION

The monitoring readings show cyclical movement. This sort of movement is only associated with clay shrinkage movement. Nominal clay shrinkage through evaporation only affects the top 0.3m of soil. As the foundation is greater than 1m in depth another factor has to be in operation. The roots found, by proximity, are seen to be this factor.

Based on the investigation and monitoring data, our initial view held in the Technical Report holds that this is a root induced clay shrinkage claim. The Ash and Oak trees are seen as the dominant cause of this movement based on the evidence and in the absence of any other cause.

RECOMMENDATIONS

An application shall be submitted to reduce the Oak and Ash trees as an attempt of mitigation over tree felling. Tree reduction will generate relative property stability. If tree reduction is refused then partial underpinning will be needed which will escalate the claim reserve from £1k to £40k.

Tom Walker-Smith

Tom Walker-Smith BA (Hons) MSc MRICS Cert CII
Specialist Property Services - Subsidence Division
Crawford & Company Adjusters (UK) Ltd
subsidence@crowco.co.uk

TECHNICAL REPORT ON A SUBSIDENCE CLAIM

97 Sutton Road
Waterlooville
Hampshire
PO8 8PT



Date of Report 27 February 2012



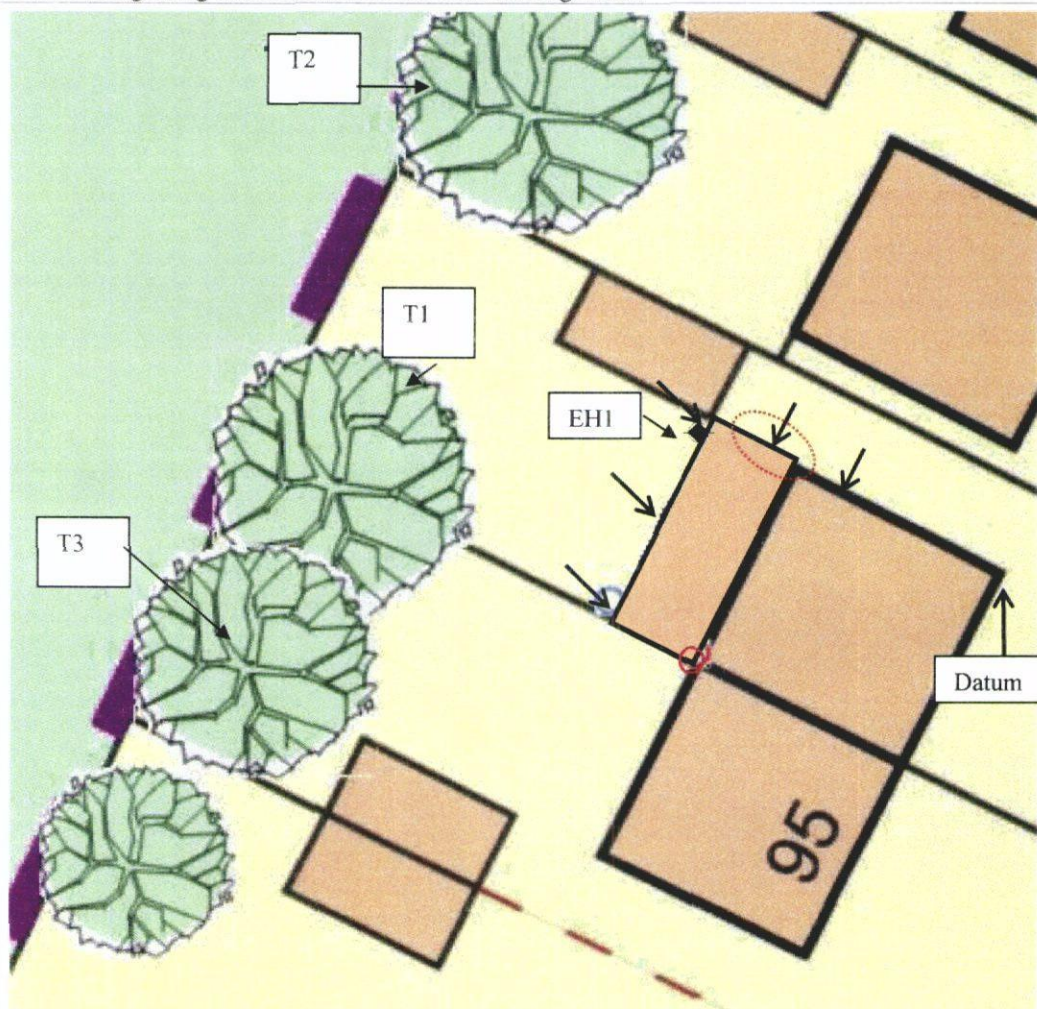
Crawford Home - Subsidence
Cartwright House, Tottle Road, Riverside Business Park,
Nottingham, NG2 1RU
Tel: 0115 943 8260
Fax: 0121 200 0309



Site Plan

This plan is Not to Scale

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Key:

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	Water Supply Pipe		Gas Supply Pipe		Incoming Gas Pipe
	Incoming Water		Incoming Electrics		

SHEET 2

INTRODUCTION

We have been asked by Axa Insurance to comment on movement that has taken place to the above property. We are required to briefly describe the damage, establish a likely cause and list any remedial measures that may be needed.

Our report should not be used in the same way as a pre-purchase survey. It has been prepared specifically in connection with the present insurance claim and should not be relied on as a statement of structural adequacy. It does not deal with the general condition of the building, decorations, , timber rot or infestation etc.

The report is made on behalf of Crawford & Company and by receiving the report and acting on it, the client - or any third party relying on it - accepts that no individual is personally liable in contract, tort or breach of Statutory duty. Where works address repairs **that are not covered** by the insurance policy we recommend that you seek professional advice on the repair methodology and whether the works will involve the Construction (Design & Management) Regulations 2007. Compliance with these Regulations is compulsory; failure to do so may result in prosecution. We have not taken account of the regulations and you must take appropriate advice.

Investigations have been carried out in accordance with the requirements of The Institution of Structural Engineers¹.

We have not commented on any part of the building that is covered or inaccessible.

This document and information provided relate to personal claim information and therefore should not be circulated or placed anywhere to make this freely available. By doing so, you will be in breach of Data Protection Act requirements

TECHNICAL CIRCUMSTANCES

The policy holder has noticed cracks within the rear addition becoming significantly worse within the last few months and was concerned. The cracks may have first appeared late summer 2011. The policy holder deemed it prudent to notify insurers.

PROPERTY

The property is a two storey semi-detached house of traditional construction with brick walls surmounted by a hipped, tiled roof.

HISTORY & TIMESCALE

Date of Construction.....	Circa 1970
Purchased	2009
Policy Inception Date.....	01/10/2011
Damage First Noticed.....	October 2011
Claim Notified to Insurer.....	16/02/2012
Date of our Inspection	23/02/2012
Issue of Report	01/03/2012
Anticipated Completion of Claim	Winter 2012

TOPOGRAPHY

The property occupies a reasonably level site with no unusual or adverse topographic features.

¹ Institution of Structural Engineers (1994) "Subsidence of Low Rise Buildings"

GEOLOGY

Reference to the 1:625,000 scale British Geological Survey Map (solid edition) OS Tile number SUSE suggests the underlying geology to be Oldhaven Series.

Woolwich and Readings Beds occur in three facies² and have recently been redefined as a member of The Lambeth Group. They comprise marine fossiliferous sand (East Kent), estuarine deposits known as Woolwich Beds (West Kent, East Surrey and Essex) and fluvial strata known as the Reading Beds (West and North). They are a sedimentary complex comprising a basal bed of glauconic sands, loams and pebbles with variable clays and sands above.

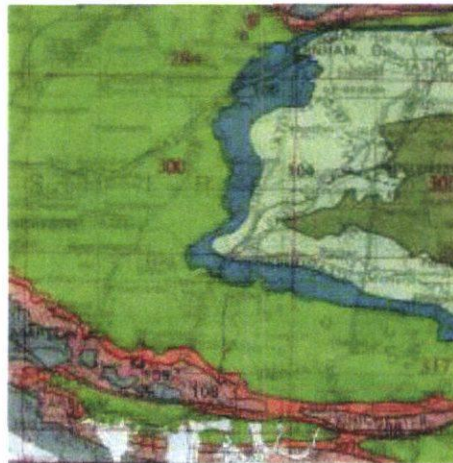
Page and Skipper³ regard them as "highly diverse – there is probably no other group of sediments within the UK that displays such a range of textures and fabrics within such a small stratigraphical thickness".

The sands are yellow, greenish brown, containing layers of mottled clay. They have an average depth of around 15mtrs. The Reading beds consist of mottled, plastic clays and light coloured sands with thin bands of flint pebbles.

From an engineering perspective they are probably more prone to loss of fines and erosion due to flowing water (leaking drains etc.) than clay shrinkage. However, if there is a high clay content they can suffer root induced clay shrinkage (seasonal shrinkage alone is probably quite rare) although the movement is usually fairly modest, depending on the provenance of the clay in the soil matrix.

The superficial deposits are thought to be Clay Soils. Clay soil superficial deposits are a cohesive soil characterised by their fine particle size and are usually derived from weathering of an underlying "solid geology" clay soil such as London Clay or Oxford Clay.

Like the solid geology sub-soil from which they are derived they shrink when dry, and swell when wet and can be troublesome when there is vegetation⁴ nearby and Gypsum and selenite crystals can be encountered (particularly in the south east). Protection using Class II Sulphate Resisting cement is therefore recommended for buried concrete.



Geology. Reproduced with consent of The British Geological Survey at Keyworth.
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² Sherlock R.L. (1962) "LONDON & THAMES VALLEY" H.M.S.O.

³ Page D. & Skipper J (2000). "Ground Engineering Journal"

⁴ Driscoll R. (1983) "Influence of Vegetation on Clays" Geotechnique. Vol 33.

VEGETATION

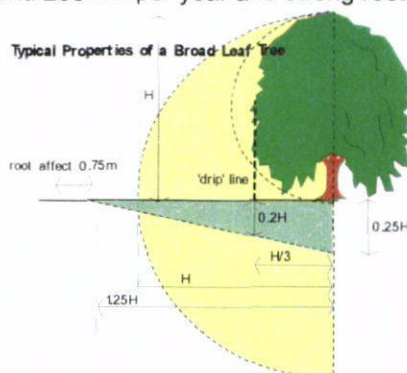
There are several trees and shrubs nearby, some with roots that may extend beneath the house foundations. The following are of particular interest:-

Type	Height	Distance	Ownership
Oak (T1)	12 m	12 m	Neighbour 1
Oak (T2)	14 m	14 m	Neighbour 5
Oak (T3)	12 m	14 m	Neighbour 1

See sketch. Tree roots can be troublesome in cohesive (clay) soils because they can induce volumetric change. They are rarely troublesome in non-cohesive soils (sands and gravels etc.) other than when they enter drains, in which case blockages can ensue.

Oak

Oak trees (*Quercus*) are deciduous and native to Europe. They can reach heights in excess of 35m, but more typically grow to between 18 - 25m, depending on health, environment and soil conditions. They have a medium growth rate of around 250mm per year and strong root activity⁵.



Typical proportions of an Oak showing the potential root zone. They have by far the most aggressive of root systems, often spreading considerable distances (1.5 x height or more).

Maximum tree-to-damage distance recorded in the Kew survey was 30mtrs, with 50% of all cases occurring within 9.5mtrs⁶. They have a life expectancy > 100 years, although they are vulnerable to insect and fungal attack. Old and young trees are tolerant of quite heavy pruning and crown reduction, although re-growth can be an ongoing problem. Oaks are worthy of considerable respect when dealing with subsidence claims. Their root system extends for surprising distances and can be associated with particularly high soil suctions.

⁵ Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications

⁶ Cutler & Richardson (1991) "Tree Roots & Buildings" Longman Scientific

CATEGORY

In structural terms the damage falls into Category 1 of Table 1, Building Research Establishment⁷ Digest 251. This describes it as "very slight".

Category 0	"negligible"	< 0.1mm
Category 1	"very slight"	0.1 - 1mm
Category 2	"slight"	>1 but < 5mm
Category 3	"moderate"	>5 but < 15mm
Category 4	"severe"	>15 but < 25mm
Category 5	"very severe"	>25 mm

Extract from Table 1, B.R.E. Digest 251
Classification of damage based on crack widths.

DISCUSSION

The pattern and nature of the cracks is indicative of a minor episode of subsidence. Whilst the damage is presently very slight, the movement on the rear right corner is conducive with localised subsidence to the rear right corner of the rear addition. The cause of movement appears to be clay shrinkage.

The timing of the event, the presence of shrinkable clay beneath the foundations and the proximity of vegetation where there is damage indicates the shrinkage to be root induced. This is a commonly encountered problem and probably accounts for around 70% of subsidence claims notified to insurers.

Fortunately, the cause of the problem (dehydration) is reversible. Clay soils will re-hydrate in the winter months, causing the clays to swell and the cracks to close. Provided the cause of movement is dealt with (in this case, vegetation) there should not be a recurrence of movement.

RECOMMENDATIONS

Although the cause of the movement needs to be dealt with, we note that some of the implicated vegetation is subject to a Preservation Order. Unfortunately, current legislation requires certain investigations to be carried out to support an application for the tree works.

Typically, these investigations would involve trial pit(s) to determine the depth and type of footings, boreholes to determine the nature of the subsoil/influence of any roots and monitoring to establish the rate and pattern of movement. The monitoring data provided must be sufficient to show a pattern of movement consistent with the influence of the vegetation and therefore it may be necessary to carry out the monitoring for up to a 12 month period.

It will also be necessary to obtain a specialist Arboricultural Report.

We will report further once these investigations have been completed.

Tom Walker-Smith

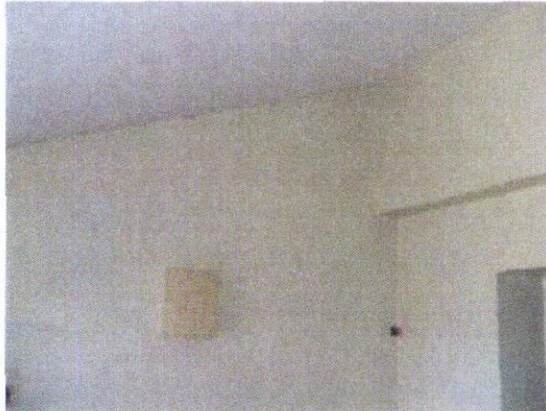
Tom Walker-Smith BA (Hons) MSc MRICS Cert CII
Crawford Home – Subsidence
Crawford & Company Adjusters (UK) Ltd
subsidence@crawco.co.uk

27 February 2012

⁷ Building Research Establishment, Garston, Watford. Tel: 01923.674040

OBSERVATIONS

The area of concern is internal and external damage to the single storey rear addition. The following is an abbreviated description. Photographs accompanying this report illustrate the nature and extent of the problem.

INTERNAL

Rear addition



Rear addition

REAR ADDITION (DINING AREA) (5.8x2.5x3m vaulted ceiling):

There was evidence of movement at the junction of the house and rear addition on the right side junction. There was no evidence of movement on the left side junction. There was also a very slight crack on the outside wall of main house close. The crack widths were up to 1mm.

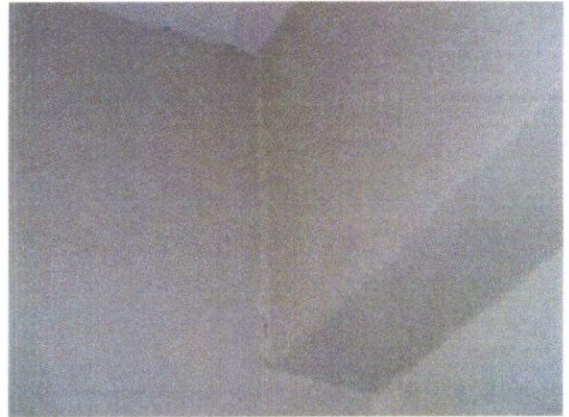
EXTERNAL**RIGHT SIDE WALL:**

There was evidence of movement at the junction of the rear addition and house. The separation gap was no larger than 2mm.

Photographs



House/addition abutment



House/addition abutment



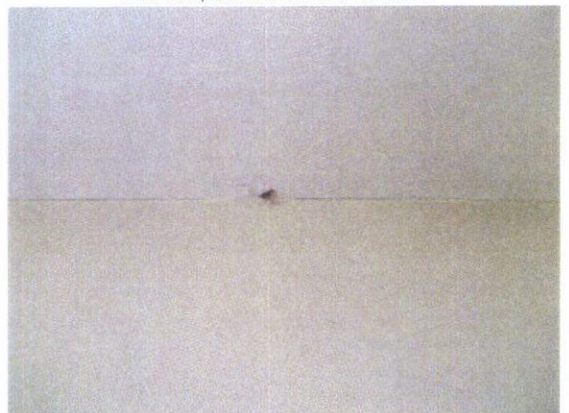
House/addition abutment



House/addition abutment



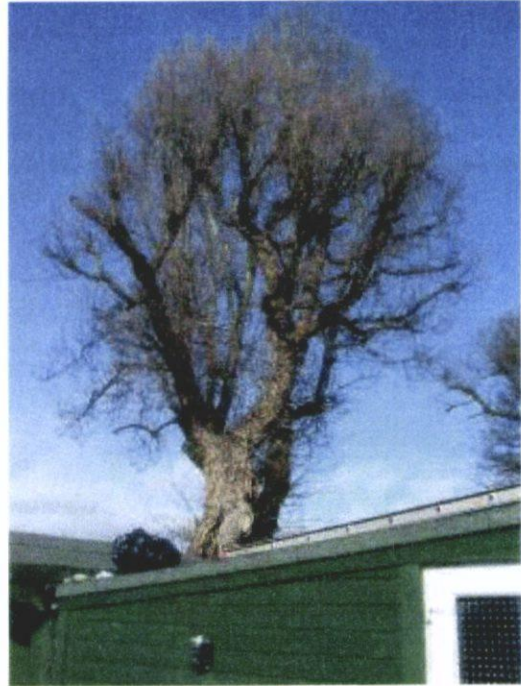
Dining area



Wall/ceiling junction



Rear addition



T1



HAVANT BOROUGH
COUNCIL

17 DEC 2012

RECEIVED

SITE INVESTIGATION REPORT

Client's Name: Baker

Address: 97 Sutton Road,
Waterlooville,
Hampshire,
PO8 8PT

Report Date: 20-Mar-12

Job No.: 53763

(If _R suffix appears after Job No.,
this indicates Revision Number)

Insurance Co.: AXA

Claim Ref. No.:

Project Engineer: Tom Walker-Smith

From: Crawford & Company,

Engineers Ref.: SU1200800

Contents: Site and Drainage Layout
Foundation Exploratory Hole Records
Penetrometer Plot

Address: Mat Lab Ltd
The Dell
Bickenhill Lane
Catherine-De-Barnes
Solihull
B92 0DE

Phone No.: 0121 704 3339

Fax No.: 0121 704 4675

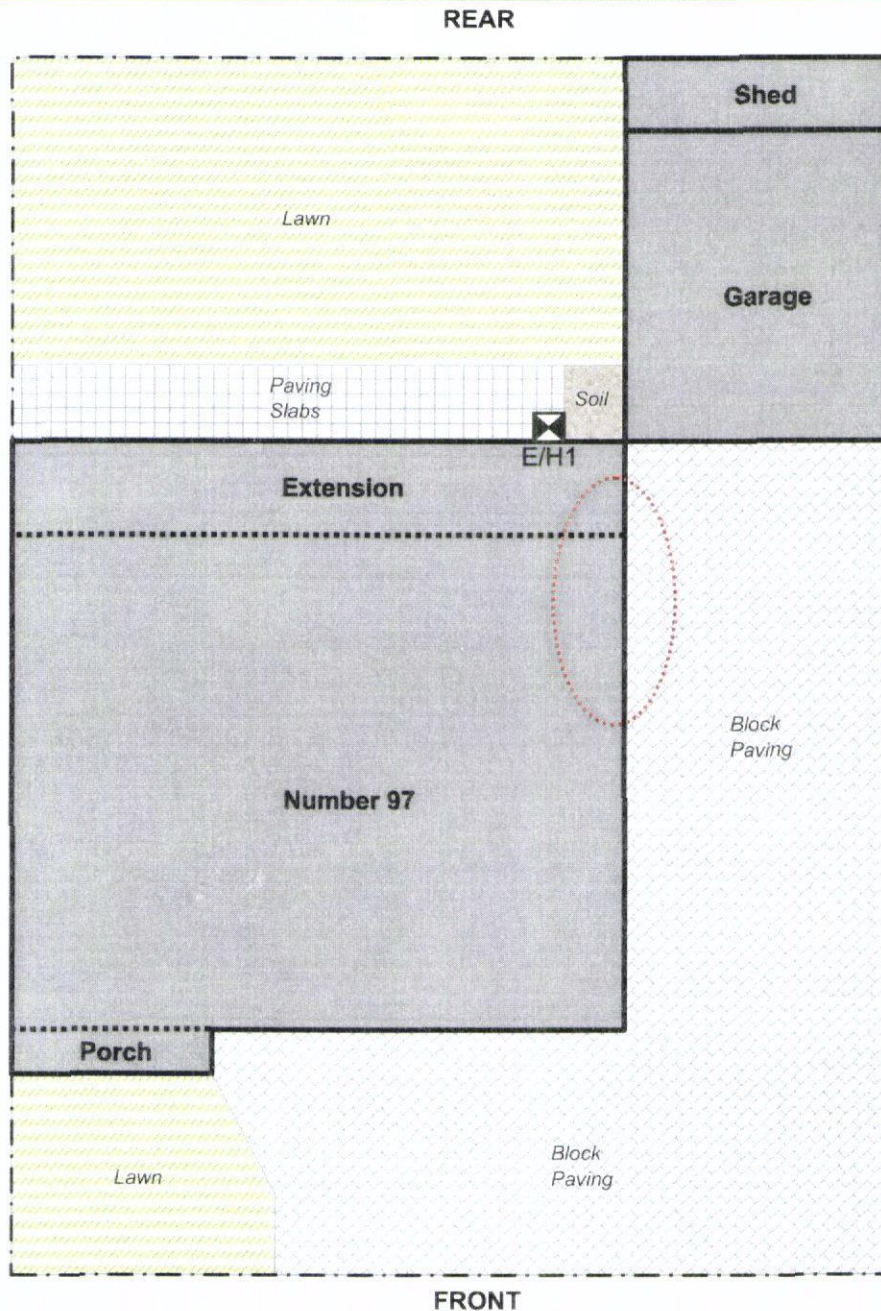
E-mail: post@mat-lab.com

Checked By : SS

Date : 20/03/2012

Site Crew: Colin

Date: 09-Mar-12



(This plan is not to be scaled and is provided to illustrate general layout only)

General Comments:

Key:

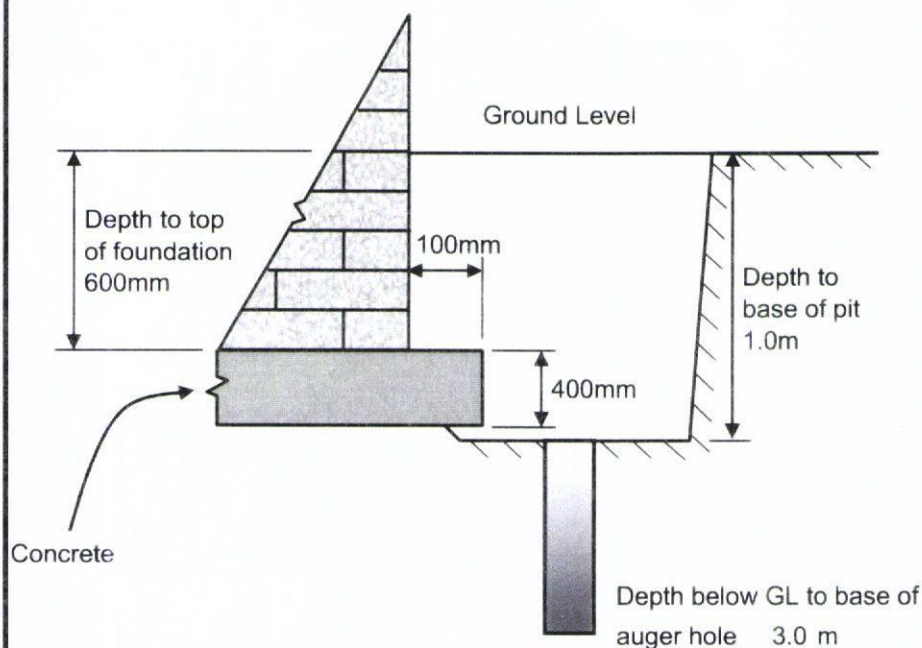
- =RWGully
- =RWPipe
- =FWGully
- =W/C or S.V. pipe
- =Inspection Chamber
- =Rodding Eye
- =Surveyed pipe indicating flow
- =Unsurveyed pipe
- =E/H=Exploratory Hole (hand dug pit and/or hand auger)
- =Area of Damage
- =Hedge or Shrub
- =Trees
- =Boundary line
- =Outlet at 6 o'clock
- =Inlet at 12 o'clock

Address: 97 Sutton Road, Waterlooville, Hampshire, PO8 8PT

Job No. 53763

Date:	09-Mar-12
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Hole at instructed depth

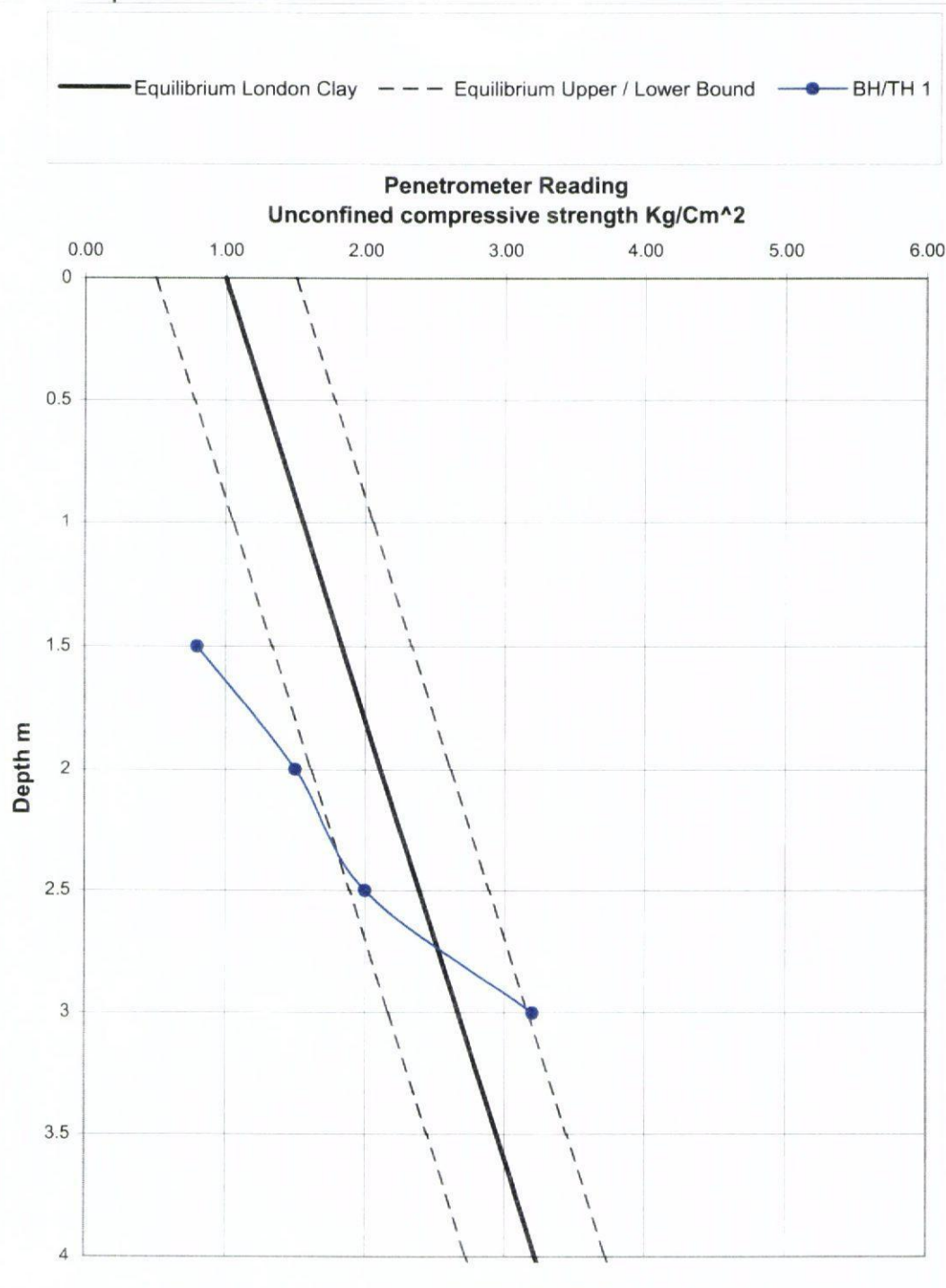
[illegible]

General Comments :

Key: Mac=Macintosh Probe Blow Count, V(n)=Natural Shear Vane (kN/m²), P.P. = Pocket Penetrometer (Kg/cm²)

Job No. 53763

BH/TH No	Location
1	Rear Right Hand Corner Of Rear Extension



For the interpretation of the above penetrometer results please refer to :-

- 1) Desiccation in clay soils. BRE Digest. 412. February 1996, Comparisons of strength profiles.
- 2) Pugh R. S., Parnell P. G. and Parkes R. D. A rapid and reliable on-site method of assessing desiccation in clay soils. Proceedings of the Institution of Civil Engineers Geotechnical Engineering, 1995, 113, Jan., 25-30.

Address: **97 Sutton Road, Waterlooville, Hampshire, PO8 8PT**

Job No. **53763**



LABORATORY REPORT

Client's Name: Baker

Address: 97 Sutton Road,
Waterlooville,
Hampshire,
PO8 8PT

Report Date: 30-Mar-12

Job No.: 53763

(If _R suffix appears after Job No.,
this indicates Revision Number)

Insurance Co.: AXA

Claim Ref. No.:

Project Engineer: Tom Walker-Smith

From: Crawford & Company,

Engineers Ref.: SU1200800

Contents: Root Analysis
Swell Strain Tests
Moisture Content
Atterberg Limits

Address: Mat Lab Ltd
The Dell
Bickenhill Lane
Catherine-De-Barnes
Solihull B92 0DE
E-mail: post@mat-lab.com

Phone No.: 0121 704 3339 **Fax No.:** 0121 704 4675

Authorised By:

J Crooks - Reports Technician

Date Authorised: 30/03/2012

Analysis subcontracted to European Plant Science Laboratory

Your ref: 53763

Job No: Root200312124330

Re: Root Identification

Sample Origin: 97 Sutton Road, Waterlooville, Hampshire, PO8 8PT

The sample of roots taken from the above property and received by us on 20 March 2012, has been examined and identification appears to be as follows:

Reference	Depth	Species Identified		Root Diameter	Starch
BH1 lab	1-3m	either <i>Quercus</i> spp. or <i>Castanea</i> spp.	1	1 mm	None Visible
BH1 lab	1-3m	<i>Hydrangea</i> spp.	2	<1 mm	Moderate

Comments:

- 1 - Three the same; all in a state of decay.
- 2 - Plus 1 other also identified as *Hydrangea* spp.

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

Hydrangea spp. are common garden shrubs.

2 species were identified.

Signed MDM

Unless we are otherwise instructed in writing, the above sample material will normally be disposed of 3 years after the date of this report.

Address: 97 Sutton Road, Waterlooville, Hampshire, PO8 8PT

Job No. 53763

Swell/Strain Test Method

(UKAS accredited)

Test Date: 22-Mar-12

The In-house Procedure MTLB002 is based on "Determination of swelling and collapse characteristics" British Standards 1377:Part 5:1990 Section 4.4, carried out on a disturbed, remoulded sample.

Test specimen has cylindrical dimensions 50mm (diameter) by 17mm (height).

Prior to the introduction of distilled water the specimen is reconsolidated to the approximate in situ vertical effective stress, calculated from the average sample extraction depth using the assumptions below.

Laboratory tests are conducted in a controlled environment within a temperature range of 16°C to 24°C.

Assumptions

Soil Bulk Density (Moist Unit Weight) is equal to 2039 kg / m³. Depth to water table has been assumed as to be below sampling depth. Any possible surcharge stresses due to construction are not considered.

Predicted Free Surface Heave Calculation

(Not UKAS accredited)

An approximated value of 0.010 strain is deducted from the measured oedometer strain to account for remoulding of the sample. Therefore strain in excess of Remoulding Disturbance Line (see Results Chart) is extrapolated for calculation of Predicted Heave per incremental layer displayed in the following table(s), in column labelled "Dd mm". A Shrinkage factor (Sf) of 2 is also applied to each heave value. Heave values per layer are summed as a total for each Borehole (in mm), and then displayed as a range in (in cm).

Predicted Free Surface Heave is calculated over a range defined by the sample depths tested, but not shallower than 0.2m below ground level, the assumed depth of topsoil. Heave inadvertently measured above foundation depth may be discounted by deducting the relevant layer value from the Borehole total.

Please note that the swell predicted is that expected of the ground if it were allowed to fully re-hydrate and come to equilibrium. This is possibly greater than the expected annual variation; due to reasons such as persistent annual deficits, changes in vegetation and annual climatic conditions, amongst others.

The predicted total swell can take many years to fully propagate and in some cases this can take up to 25 years, though usually at least 70% happens within the first few years.

Uncertainty of Measurement

The accuracy of the quoted strain measurement in an individual test is deemed to be within +/- 2.5%.

The variation of repeated results on the same sample is determined by the uniformity of sample.

Due to variability in strata changes and sample uniformity, it is more appropriate to consider the Heave Potential by the quoted range (in cm) rather than the precise total (in mm).

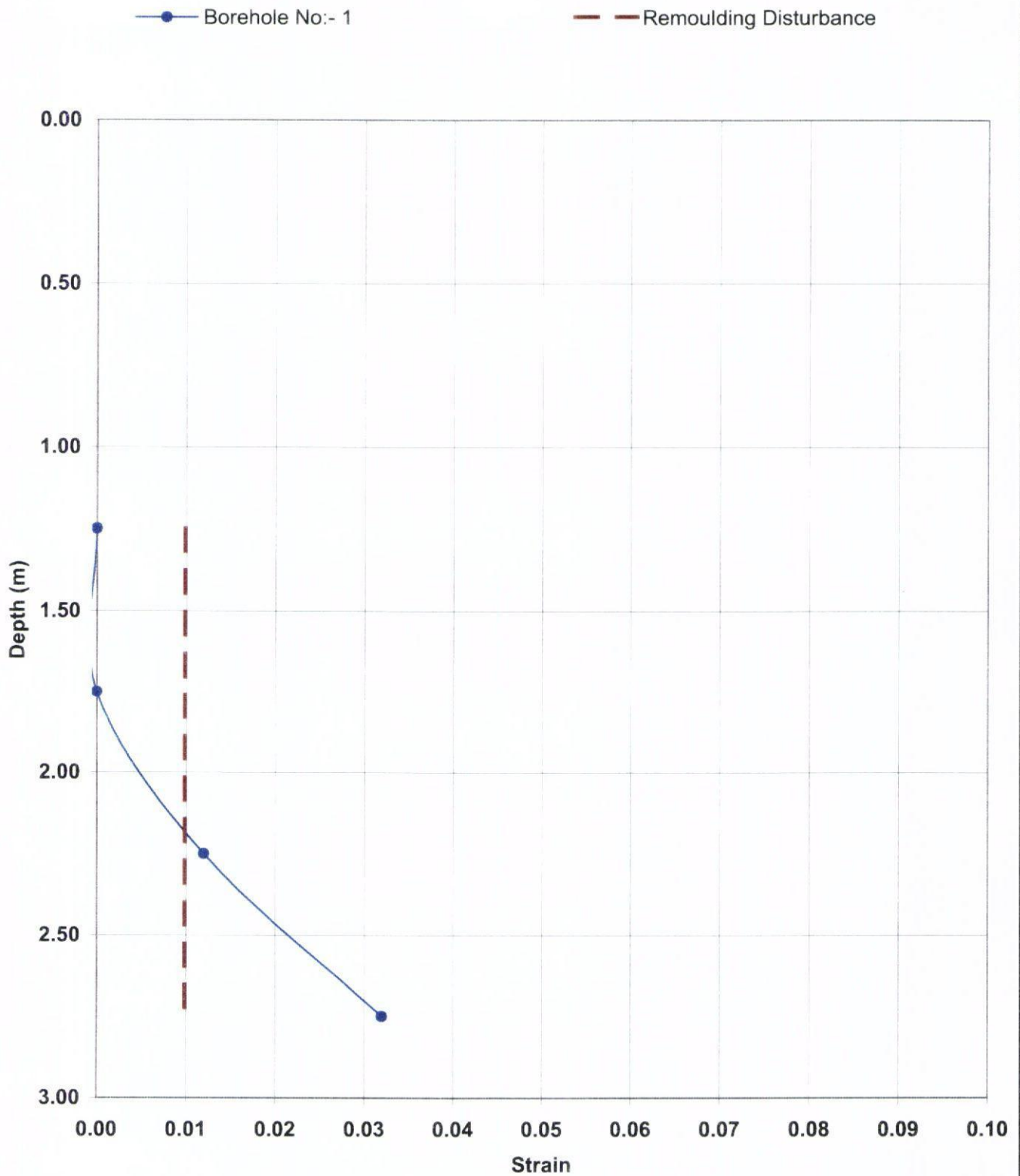
Further information relating to Swell/Strain Test is available on the MAT LAB Website:- www.mat-lab.com

Address: 97 Sutton Road, Waterlooville, Hampshire, PO8 8PT**Job No. 53763**

Total Column Dd=6mm Therefore Free Surface Heave Potential Over B/H Depth Is About 0cm to 2cm.

Job No. 53763

Oedometer Strains



Address: 97 Sutton Road, Waterlooville, Hampshire, PO8 8PT

Job No. 53763

Date Soil Samples Received in Laboratory: 15-Mar-12

Date Testing Requirements Approved: N/A

This Soils Report contains results for 1 borehole(s) on 1 page(s)

General

Soils were prepared in accordance with BS1377:Part 1:1990 Section 7

Laboratory soil sample descriptions in general accordance with BS5930:1999

Where samples are not tested on same date for a particular test type, Test Date quoted refers to the day of testing of final sample

All samples will be disposed of within 1 month of presentation of this report unless otherwise advised

Natural Moisture Content

Test Date: 18-Mar-12

Tested in accordance to BS1377:Part 2:1990 Section 3.2

A sample quantity of 100g is used for fine-grained soils, where available

Where sample quantity is critical, a minimum of 50g may be used, in accordance with BS1377:Part 2:1990

A sample quantity of 300g to 350g is used for medium-grained soils, 3kg is used for coarse-grained soils.

Atterberg Limits

Test Date: 25-Mar-12

Tested in accordance to BS1377:Part 2:1990; Section 4.4 for the Liquid Limit, Section 5 for the determination of the Plastic Limit and Plasticity Index

Suction Tests

Test Date: N/A (Q)*

Suction Test carried out in accordance to the accredited In-house Procedure MTLB001 with reference to the BRE paper IP4/93 (Corrected) 'A Method of Determining the State of Desiccation in Clay Soils'

(Unless otherwise stated the filter paper moisture content was determined after 5 to 10 days contact and the test was prepared from a remoulded disturbed sample in accordance with in-house procedures)

** Where denoted by '(Q)' following Test Date above, the test has been performed using 2 soil discs and quartered filter papers.*

The filter paper tests are conducted in a controlled environment within a temperature range of 16oC to 24oC.

Average Suction values (in kPa) calculated using the BRE paper IP4/93 calibration are quoted with the maximum and minimum suction obtained, as indicated by error bars either side of plotted point.

Where possible, suction values should be compared with remote borehole values, to determine relative desiccation.

Each new batch of filter papers used for testing is checked for its consistency against the standard BRE calibration curve using a pressure membrane extractor. The current filter paper batch has been tested and shows good correlation to the BRE curve. More information is available upon request. Studies on In-house calibrations using a pressure membrane extractor continue.

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Address: 97 Sutton Road, Waterlooville, Hampshire, PO8 8PT

Job No. 53763

JOB No.:- 53763

INSURANCE COMPANY AXA REF:-

DATE SAMPLES EXTRACTED:- 09 Mar 12

ENGINEER:-

Tom Walker-Smith REF:-SU1200800

CLIENT/INSURED NAME:- Baker

FROM :-

Crawford & Company,

ADDRESS:- 97 Sutton Road,

B.H. No. :-

1

Waterlooville,

LOCATION:-

Rear Right-Hand Corner of Rear Extension.

Hampshire,

REPORT DATE:-

30 Mar 12

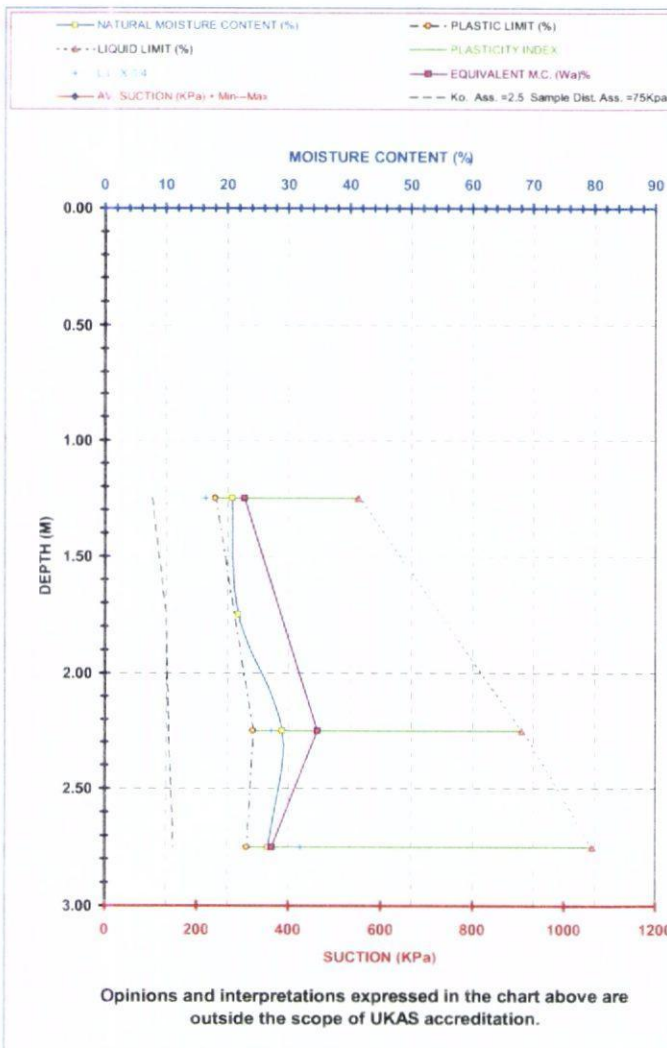


2093

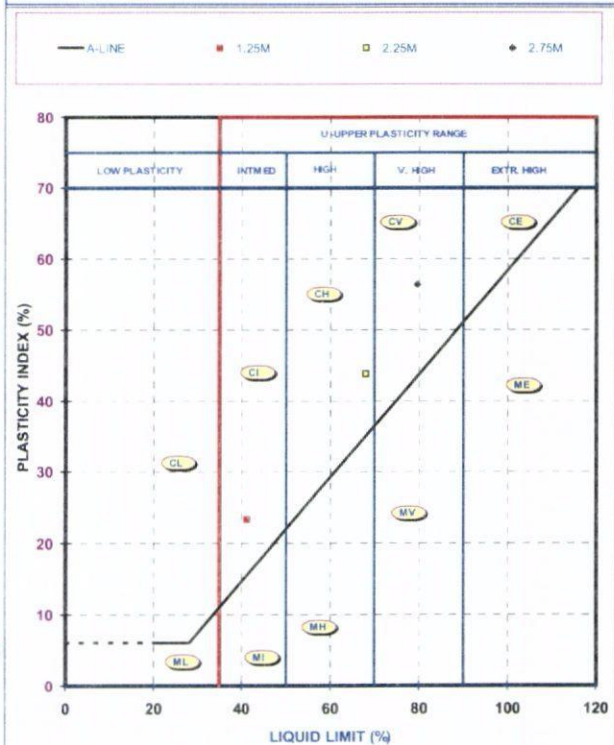
PO8 8PT

ATTEBERG LIMITS.

DEPTH. M.	M.C. (%)	L.L. (%)	P.L. (%)	P.I. (%)	425um (%)	AV. Filter Paper M.C.(%) & No.	BRIEF SOIL DESCRIPTION
1.25	21	41	18	23	92	-	Firm brown slightly sandy CLAY with occasional grey veinings, rare fine/medium gravel & roots.
1.75	22	-	-	-	-	-	Firm brown slightly sandy CLAY with rare fine/medium gravel, grey veinings & roots.
2.25	29	68	24	44	84	-	Firm brown/grey CLAY with occasional fine/medium gravel, rare sand & roots.
2.75	27	80	23	57	99	-	Firm/stiff grey/brown CLAY with rare sand, fine/medium gravel & roots.



The interpretations below are outside of UKAS accreditation.



Authorised by :-

J C



LEVEL MONITORING - RELATIVE SURVEY READINGS

17 DEC 2012

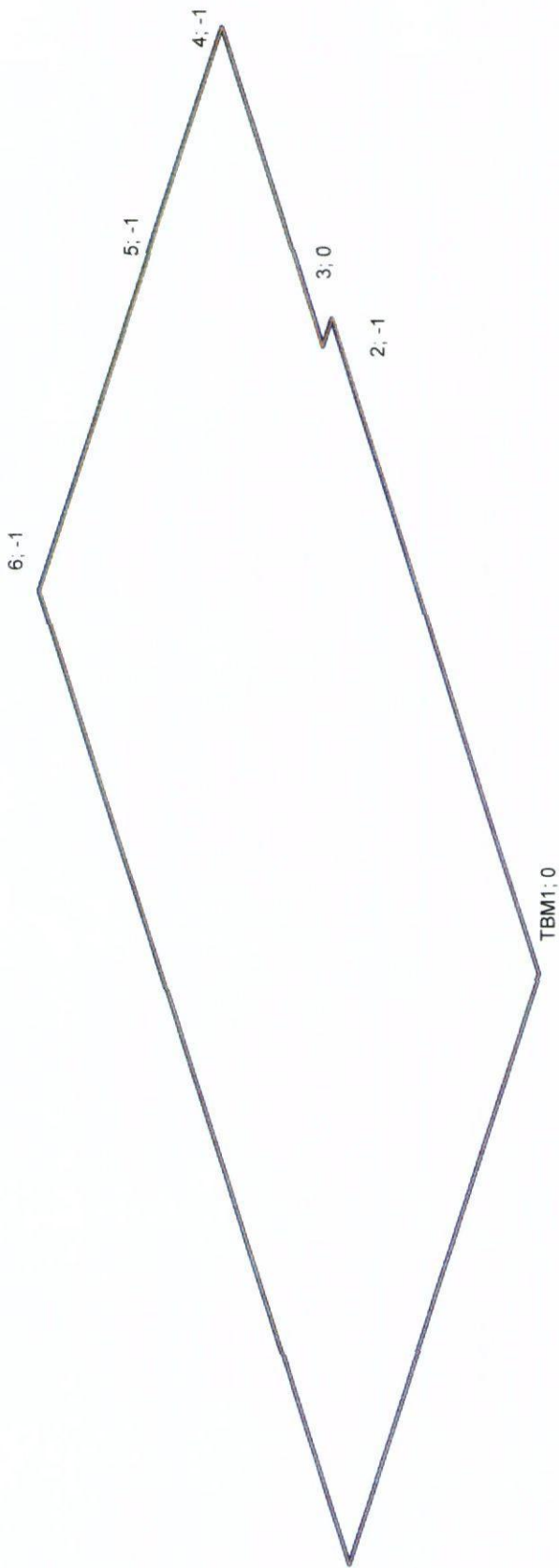
Provider Details		Client Details		Risk Address	
Name:	Knight Associates.	Insurance Co.:	Axa	Occupier:	Mr & Mrs Baker
Our Ref:	SU1200800	Client Name:	Crawford	Address:	97 Sutton Road
		Technical Mgr:	Walker-smith T	Address:	
		Email:		Town:	Waterlooville
		Client Ref:	SU1200800	County:	Hampshire
		Address:	National Subsidence Unit	Post Code:	PO8 8PT
		Address:	4th Floor 30 St Pauls Square	Tel Home:	02392 267710
		Town:	Birmingham	Tel Work:	02392 325511 ext 277 Mrs
		County:		Mobile:	
		Post Code:	B3 1QZ	Other:	
		Other Email:	subsidence.monitoring@crowco.co.uk	Other:	
Monitoring Details					
Instruction Date:	6/3/12				
First Reading Date:	28/03/2012				
Maximum No Visits:	4				
Anticipated Expiry Date:	COMPLETED				
Monitoring Int (Wks):	8				

Target Date:															
Reading Date:				28/3/12	28/5/12	25/7/12	18/9/12								
Issue Date:				30/3/12	29/5/12	26/7/12	19/9/12								
Row No.	Point Name	X Co-ordinate	Y Co-ordinate	1	2	3	4	5	6	7	8	9	10	11	12
1	TBM1	0.00	0.00	10.0000	10.0000	10.0000	10.0000								
2	2	0.00	7.20	10.0060	10.0059	10.0054	10.0049								
3	3	-0.30	7.20	10.0079	10.0089	10.0088	10.0081								
4	4	-0.30	10.70	10.0195	10.0202	10.0199	10.0190								
5	5	-2.60	10.70	10.0205	10.0210	10.0207	10.0195								
6	6	-6.50	10.70	10.0282	10.0283	10.0283	10.0273								
7		-6.50	0.00												
8		0.00	0.00												
9															
10															
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LEVEL MONITORING - RELATIVE MOVEMENT SKETCH

Client: Crawford

Client Ref: SU1200800



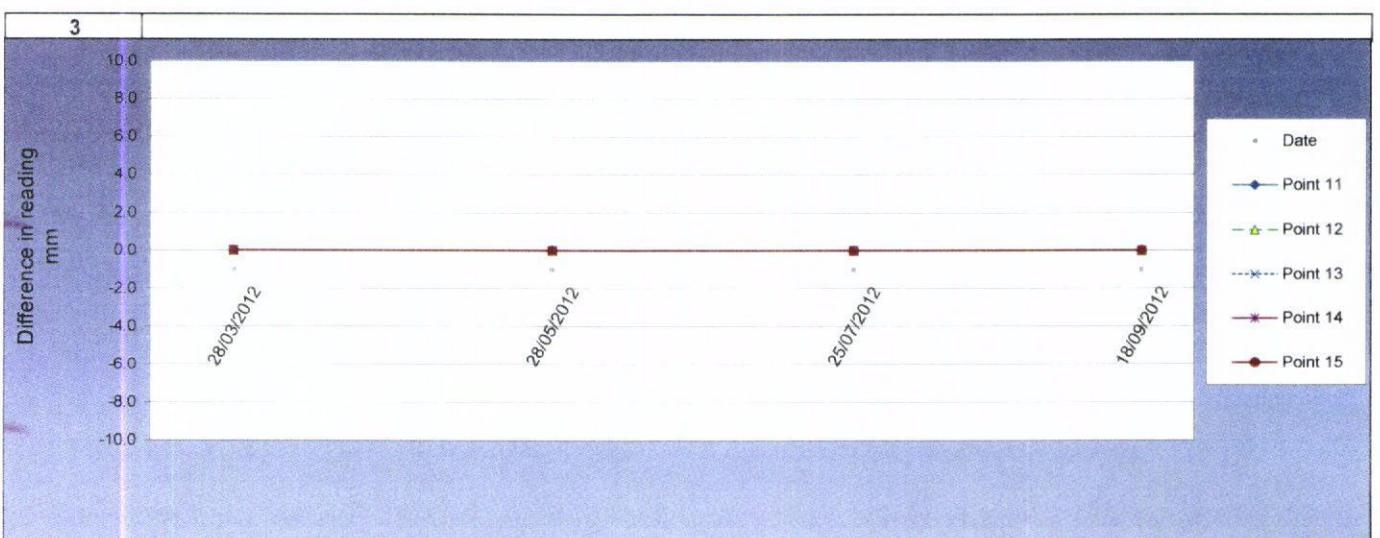
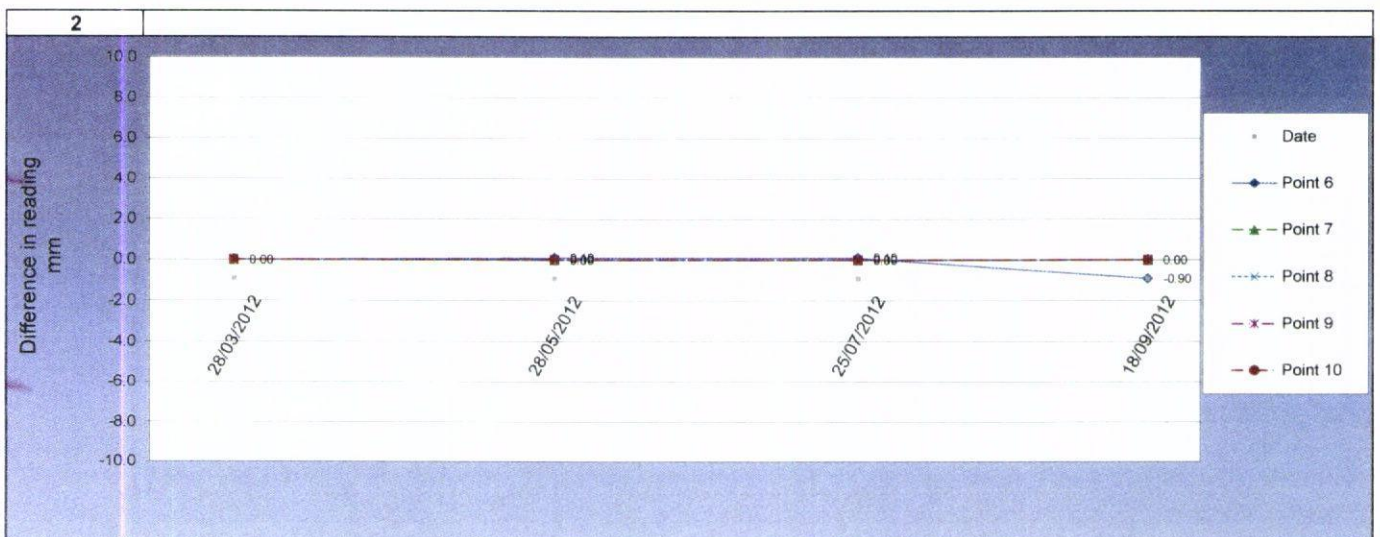
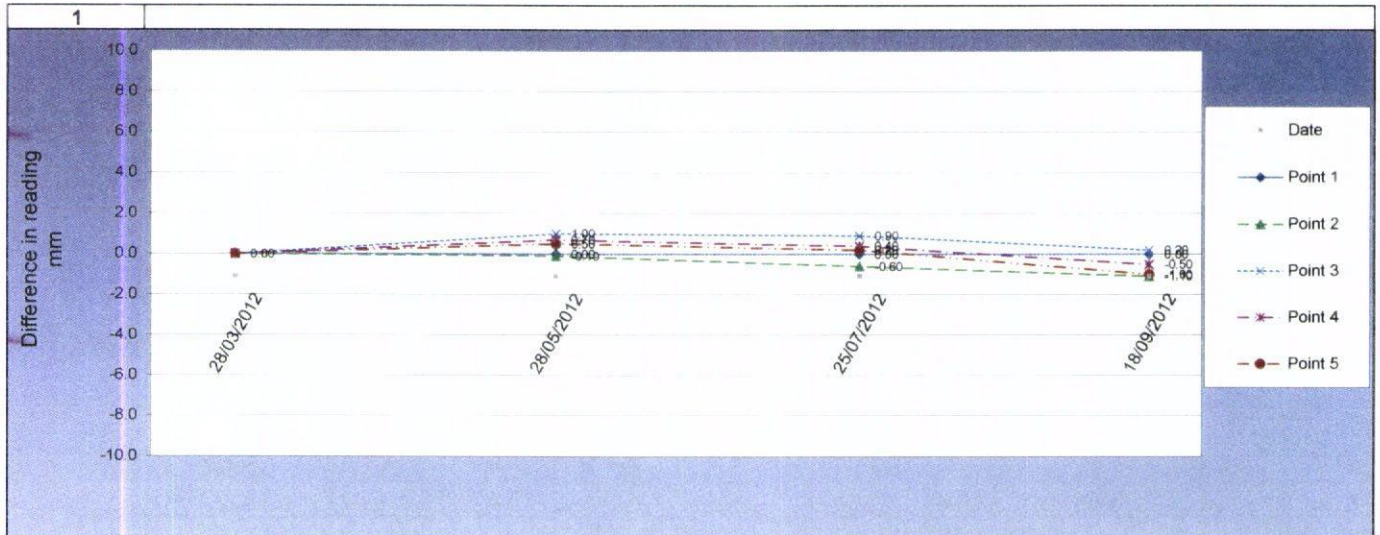
Notes:
Vertical distorted scale 1: 20
Point labels give level difference of last reading from original datum in mm.

LEVEL MONITORING - RELATIVE SURVEY READINGS

Client: Crawford

Client Ref: SU1200800

Chart Scale 1:1000



Standard Comments for selection in Readings and Sketch Worksheets
User may edit these as appropriate

Standard Comments	
No Comment	
Standard Comment 1	The Occupier expressed concerns.
Standard Comment 2	The Occupier expressed no concerns.
Standard Comment 3	Next visit due :
Standard Comment 4	Standard Comment 4
Standard Comment 5	

Standard Bullet
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