ADDENDUM TECHNICAL REPORT

Crawford Reference: SU1000537

Mr D Davies
Baytree Cottage
50 Main Road
Hockley
SS5 4QS

prepared for

Axa Insurance
Household Claims
PO Box 97
Lancaster
LA1 1WG

Claim Reference G71240044YW

Crawford
Crawford and Company
Cartwright House,
Tottle Road,
Riverside Business Park,
Nottingham, NG2 1RT
Tel: 0115 943 8260
Fax: 0121 200 0309

SUBSIDENCE CLAIM

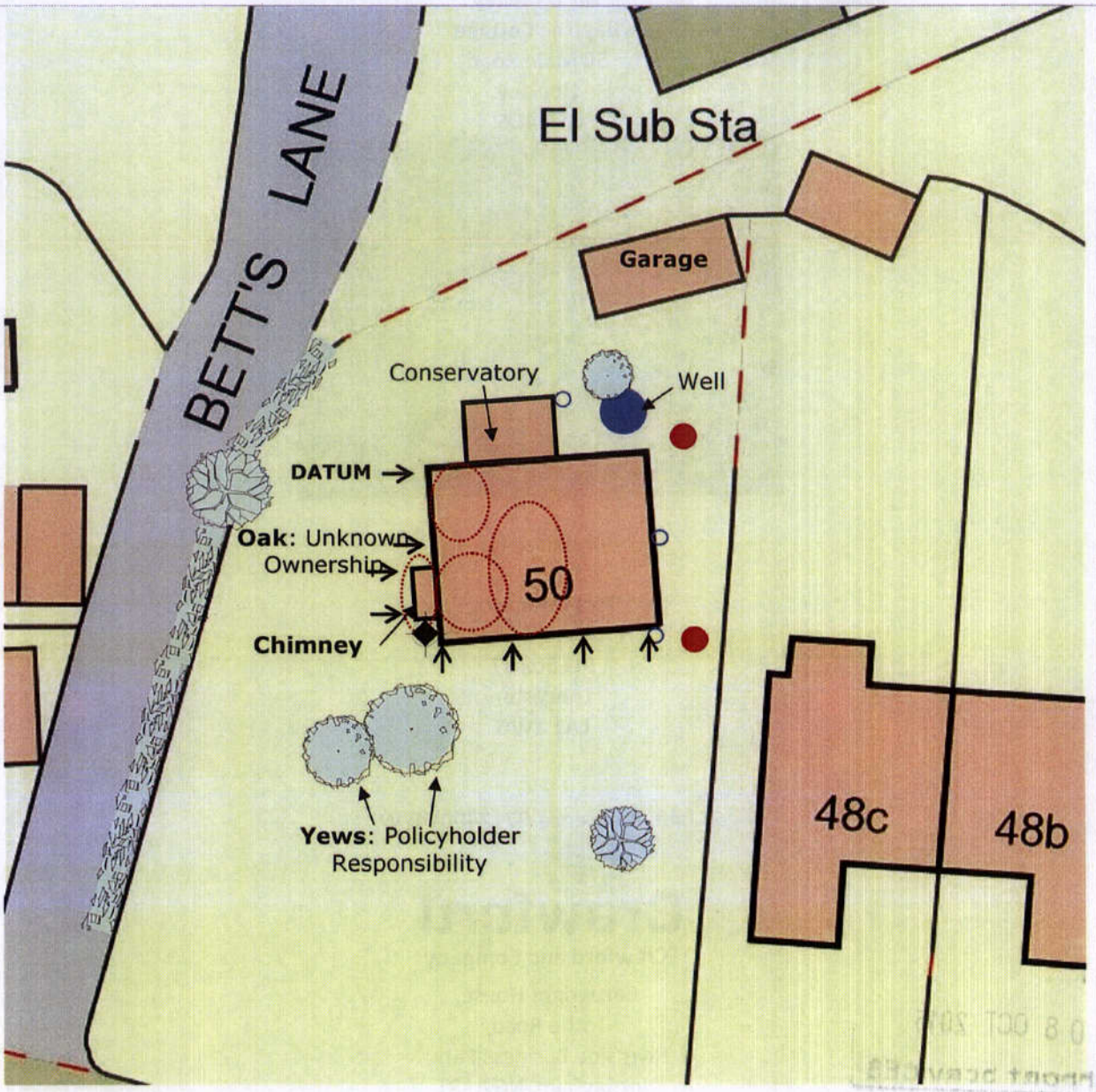
DATE 28 April 2014

Crawford

Site Plan

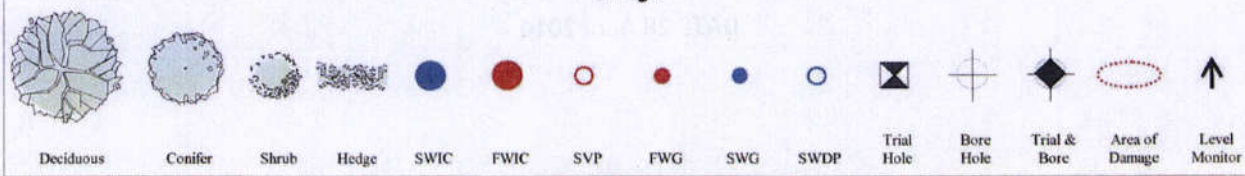
Not to Scale

This plan is diagrammatic only and has been prepared to illustrate the general position of the property and its relationship to nearby drains and trees etc. The boundaries are not accurate, and do not infer or confer any rights of ownership or right-of-way.



Reproduced with the permission of Ordnance Survey. Licence Number 100040388.

Key:



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.

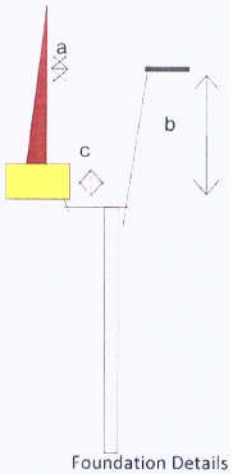
INVESTIGATIONS

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 and the diagram below for details. Trial Hole 1 revealed a concrete footing to the main house founded at a depth of 750mm below ground level which bears onto stiff mid brown / orange, grey veined silty CLAY thinly laminated with orange silt and fine sand. It also revealed a concrete footing at a depth of 400mm to the chimney.

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.	515 mm.	750 mm.	450 mm.
TH1	3.00 m.	50 mm.	450 mm.	400 mm.

AUGERED BOREHOLES

A 50mm diameter hand auger was sunk - see site plan for location. Borehole 1 confirmed the continuation of the clay subsoil encountered within the trial put, with roots to a depth of 2.5m below ground level. The borehole remained dry and open on completion.

In-situ shear vane testing confirmed the clay subsoil to be stiff in nature.

Crawford®

SOIL SAMPLES

Soil samples were retrieved from the bore, wrapped in clingfilm before being bagged and deposited with a testing laboratory the same day. The laboratory has instructions to test the samples to determine if there is evidence of root induced desiccation. The following laboratory tests were carried out on soil samples retrieved from the borehole :-

Moisture content

Values ranged from 28% to 35% over the depth of Borehole 1.

ROOTS

Roots were retrieved from the trial hole and have been submitted to a botanist for identification.

Roots in Borehole 1 were identified as the species Taxus spp. which includes yews and a broadleaved species, too decayed for positive identification, possibly Acer spp. which includes sycamore and other maples.

DRAINS

The drainage is remote from the area of current damage and trial pit / borehole investigations did not reveal any suggestion that leakage from drainage is adversely affecting the property. As such, a drainage investigation was not warranted.

DISCUSSION

The results of the site investigation confirm that the cause of subsidence is root-induced clay shrinkage. The clay is plastic and thus will shrink and swell with changes in moisture content. Roots have extracted moisture below the depth of the footings, thus causing differential foundation movement to occur. This is supported by the following investigation results :-

- The foundations are at a depth of 0.75m (main house) and 0.45m (chimney) which is below the level that normal seasonal movement would occur.
- The moisture content profile indicates a reduction in moisture content between a depth of 0.75m and 2m which is indicative of desiccation at this level. This is also co-incident with the depth of root activity.
- Roots were found to a depth of 2.5m.
- Level monitoring indicates cyclical movement in the area of damage which is characteristic of foundation movement where vegetation is concerned. No other cause produces a similar pattern.
- Shear vane readings indicate an increase in shear strength of the clay between a depth of 0.75m and 2m indicating desiccation at this depth.

RECOMMENDATION

The cause of the movement needs to be dealt with first. From the results of the site investigation, we are satisfied that your Yew Trees can be removed. Based on our analysis, we are satisfied there is no adverse heave risk to the property.

We will obtain a quotation for the recommended tree works and undertake statutory checks for Preservation Orders or whether the tree(s) are in a Conservation Area. Following completion of the tree management works. We will undertake a suitable period of monitoring to confirm stability has been achieved before undertaking repairs to the property.

Crawford

HISTORY & TIMESCALE

We will arrange for limited site investigations to confirm the cause of damage to the property.

Date of Construction	17th century
Purchased	May 2007
Policy Inception Date	06/09/2009
Damage First Noticed	November 2009
Claim Notified to Insurer	26/01/2010
Date of our Inspection	19/02/2010
Issue of Report	21/10/2010
Anticipated Completion of Claim	Autumn 2014
Anticipated Duration of Works	3 Weeks
Anticipated Completion of Works	Autumn 2014

Yours faithfully,

Harpal Gillar
Harpal Gillar BEng (Hons), MIStructE
Specialist Property Services - Subsidence Division
Direct Dial : 0115 943 8260
subsidence@crawco.co.uk

28 April 2014

CET PROPERTY ASSURANCE
Giving our all

SITE INVESTIGATION
FACTUAL REPORT

Report No:	177596
Client:	Crawford Claims Management
Site:	Baytree Cottage, 50 Main Road
Client Ref:	SU1000537-Mr D Davies
Date of Visit:	20/03/2014

ISO 9001 REGISTERED FIRM | ISO 14001 REGISTERED FIRM | OHSAS 18001 REGISTERED FIRM | Link-up Qualified via Audit | Safecontractor Approved | CHAS Accredited Contractor | constructionline

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

☎ 0843 2272362
✉ enquiries@cet-uk.com
www.cet-uk.com

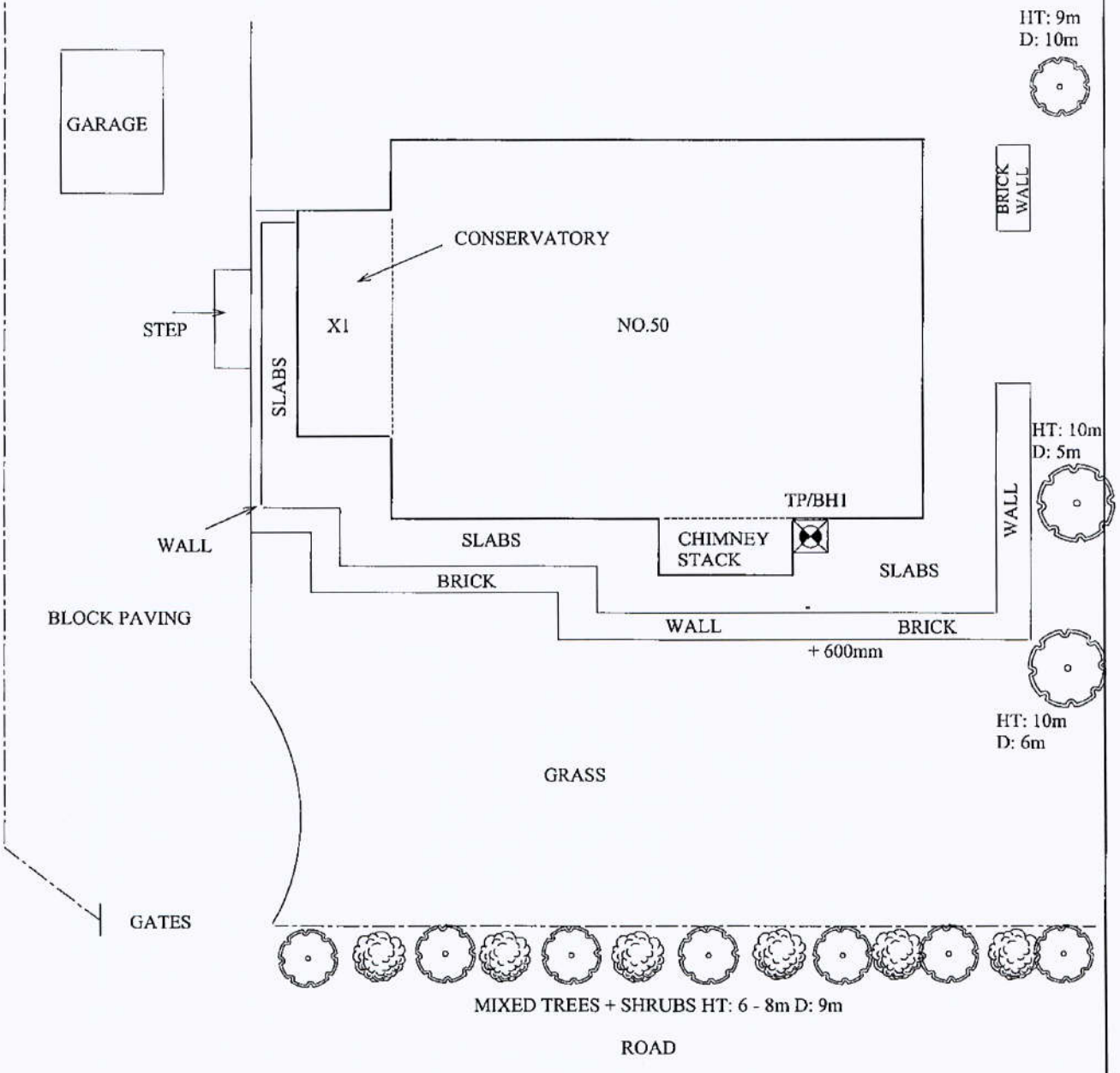
Investigation Layout Plan

Sheet: 1 of 1
Job No: 177596
Date: 20/03/2014

Site: 50 Main Road, Hockley
Work carried out for: Crawford Claims MGMT SUS

RL (SI) | SE (Checked) | AR (Drawn)

Weather: Dry



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 (SEC A)

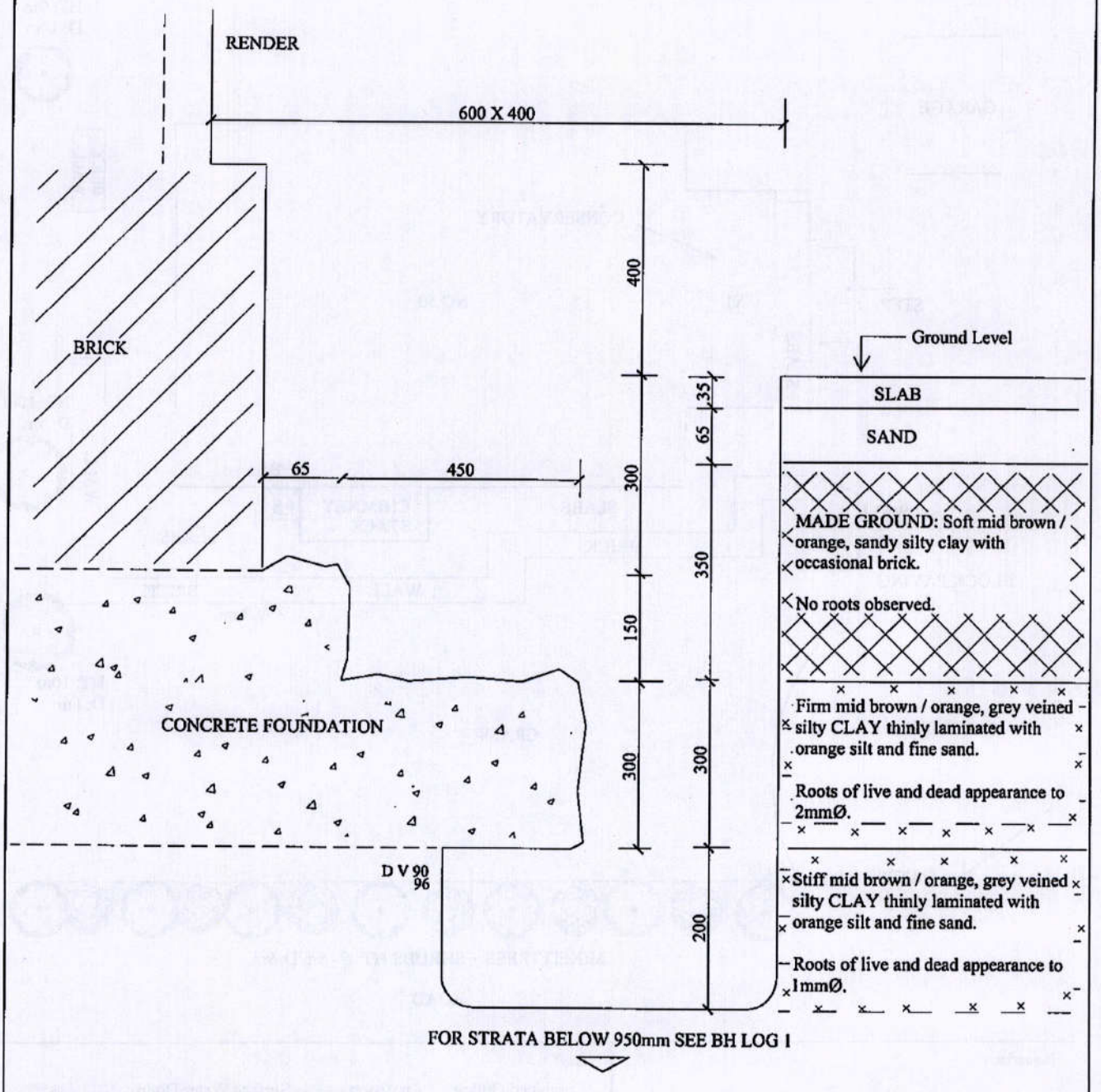
Sheet: 1 of 2
Job No: 177596
Date: 20/03/2014

Site: 50 Main Road, Hockley

Excavation Method: Hand tools
Drawn by: AR
Ground Level mOD:

Work carried out for: Crawford Claims MGMT SUS

Weather: Dry



FOR STRATA BELOW 950mm SEE BH LOG 1

Remarks: All measurements in millimetres.
200mm of standing water in trial pit.
Borehole augered at rear of pit to avoid water.

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: RL	Checked: SE	Approved:	Scale: N.T.S.

Trial Pit No: 1 (SEC B)

Sheet: 2 of 2

Job No: 177596

Date: 20/03/2014

Site: 50 Main Road, Hockley

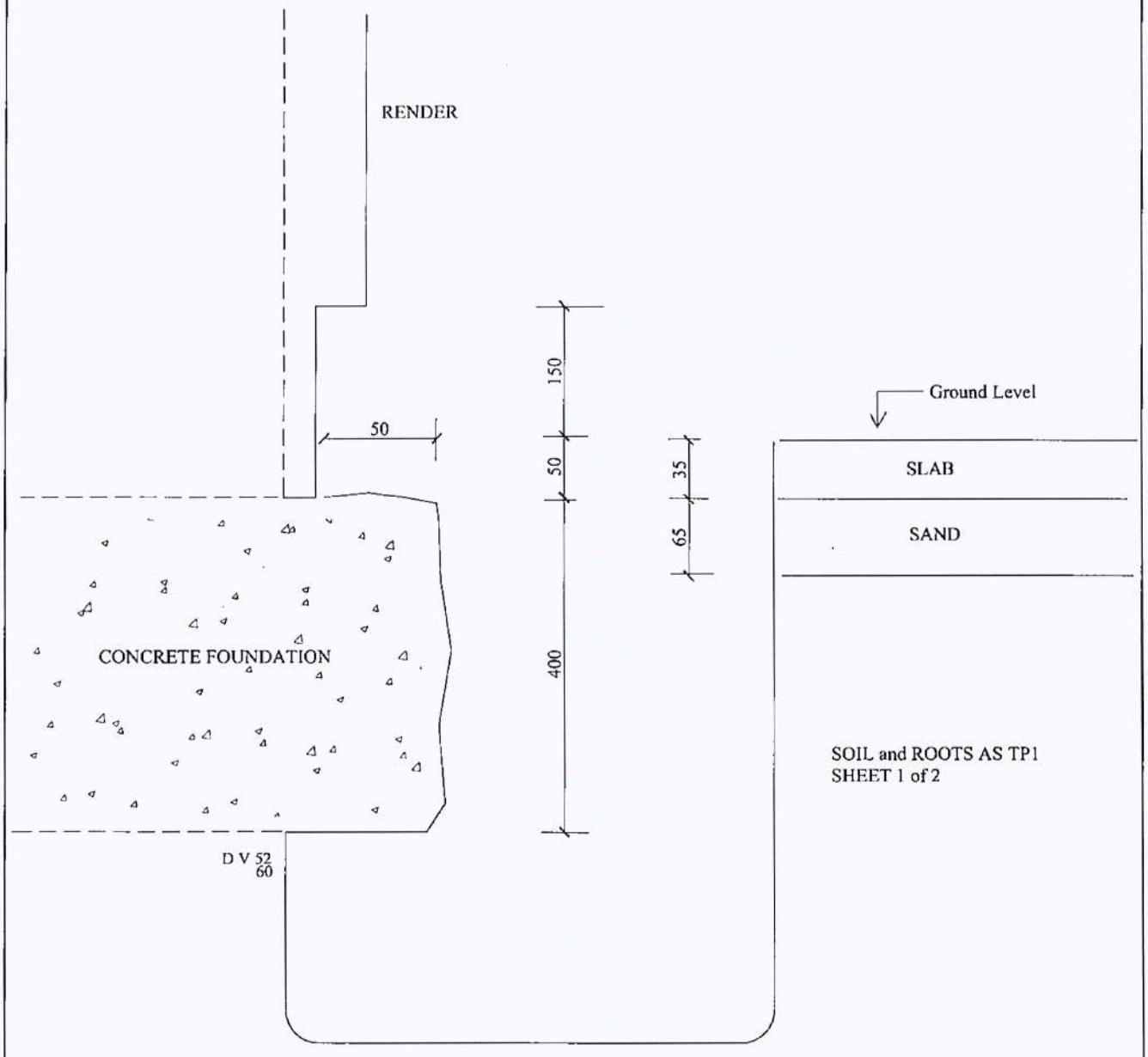
Work carried out for: Crawford Claims MGMT SUS

Excavation Method: Hand tools

Drawn by: AR

Weather: Dry

Ground Level mOD:



Remarks: All measurements in millimetres.

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		

Logged: RL | Checked: SE | Approved:

Scale: N.T.S.

Borehole No: 1	Sheet: 1 of 1	
	Job No: 177596E	Site: 50, Main Road, Hockley
Boring Method: CFA	Date: 20/03/2014	
Diameter: 100mm Coordinates:	Ground Level mOD:	Work Carried out for: Crawford Claims MGMT SUS

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	0.95							
0.95	Stiff, mid brown / orange, grey veined silty CLAY thinly laminated with orange silt and fine sand	1.25		D	V	100 106	1.00	Roots of live and dead appearance to 1mm diameter to 2.5m	
				D			1.50		
2.20				D	V	126 130+	2.00		
	Stiff, dark brown / grey silty CLAY with partings of orange silt and fine sand with occasional claystone nodules	0.80		D			2.50	No roots observed below 2.5m	
3.00				D	V	130+ 130+	3.00		
	Borehole ends at 3.0m								

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: RL	Checked: SE	Drawn by Jo F	Scale: NTS	Weather: Dry

Our Ref : 177596

Laboratory Testing Results

Date Sampled: 20/03/2014

Location : Baytree Cottage, 50, Main Road, Hockley

Work carried out for: CRAWFORD CLAIMS MGMT SUS

Date Received : 21/03/2014

Date Tested : 24/03/2014

Date of Report : 25/03/2014

Sample Ref TP/BH No	Sample Ref Depth (m)	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) SO_3 [12]	Sulphate Content (g/l) SO_4 [13]	Class [14]
1	0.45(U/S)	D	35	<5	87	27	60	0.13	60	CV			56					
	0.75(U/S)	D	32	<5	86	24	62	0.13	62	CV			93					
	1.0	D	28	<5									103					
	1.5	D	29	<5	74	26	48	0.08	48	CV								
	2.0	D	31	<5									128					
	2.5	D	31	<5														
	3.0	D	31	<5	69	27	42	0.11	42	CH			> 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 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 2005
Note that if the SO_4 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 Shear Strength Profiles

Our Ref : 177596

Location : Baytree Cottage, 50, Main Road, Hockley

Work carried out for: CRAWFORD CLAIMS MGMT SUS

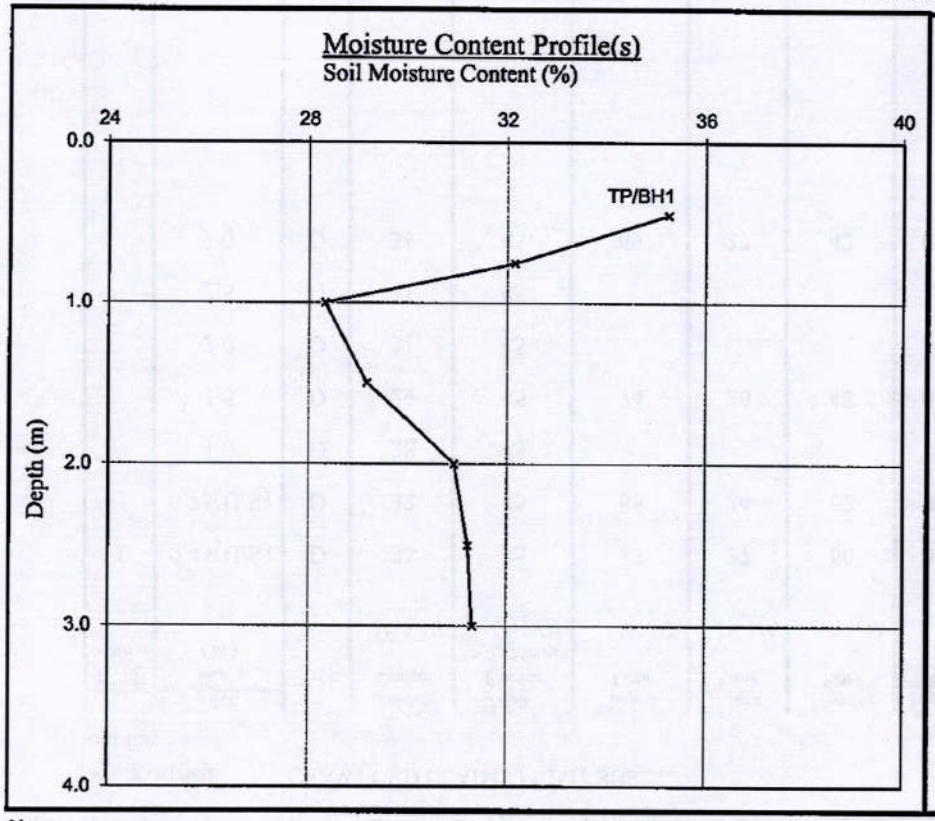
Note : Unless specifically noted the profiles have not been related to a site datum.

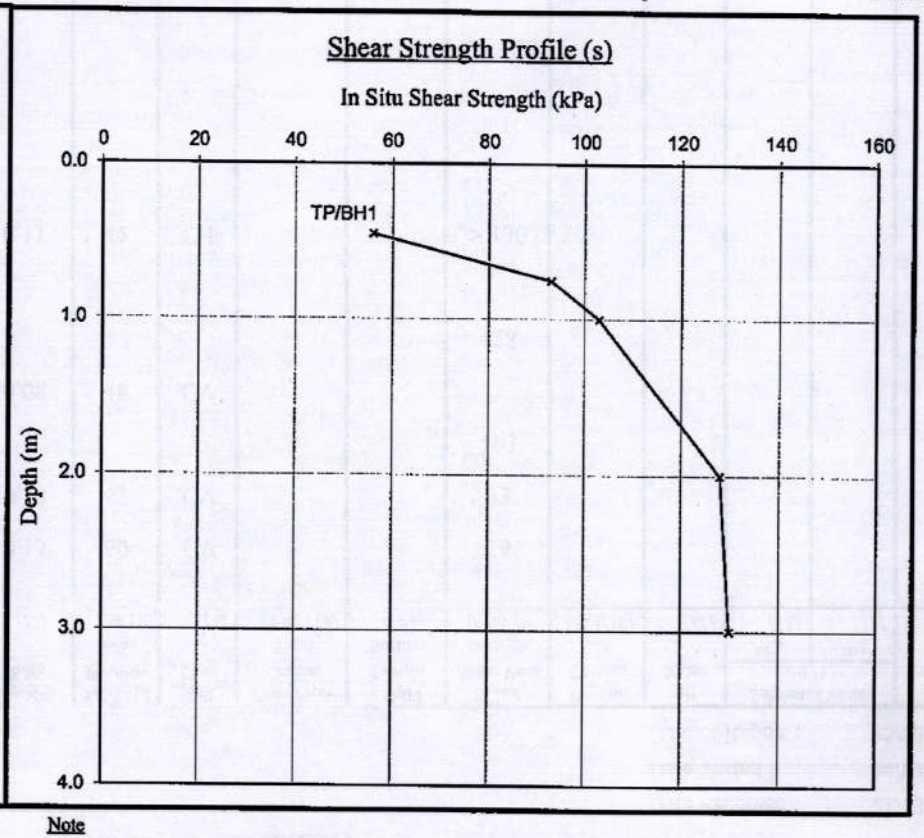
Date Sampled : 20/03/2014

Date Received : 21/03/2014

Date Tested : 24/03/2014

Date of Report : 25/03/2014





Notes

1. 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 using a Pilcon Hand Vane the calibration of which is limited to a maximum reading of 130 kPa.

Moisture Content and Suction Profiles

Our Ref : 177596

Location : Baytree Cottage, 50, Main Road, Hockley

Work carried out for: CRAWFORD CLAIMS MGMT SUS

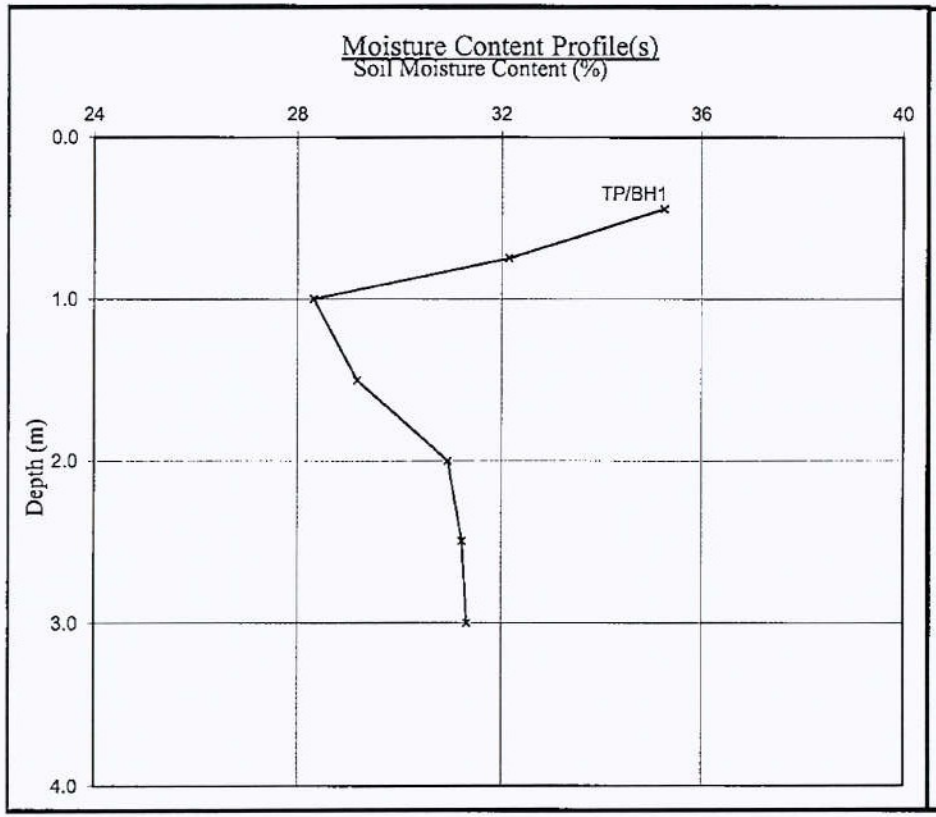
Note : Unless specifically noted the profiles have not been related to a site datum.

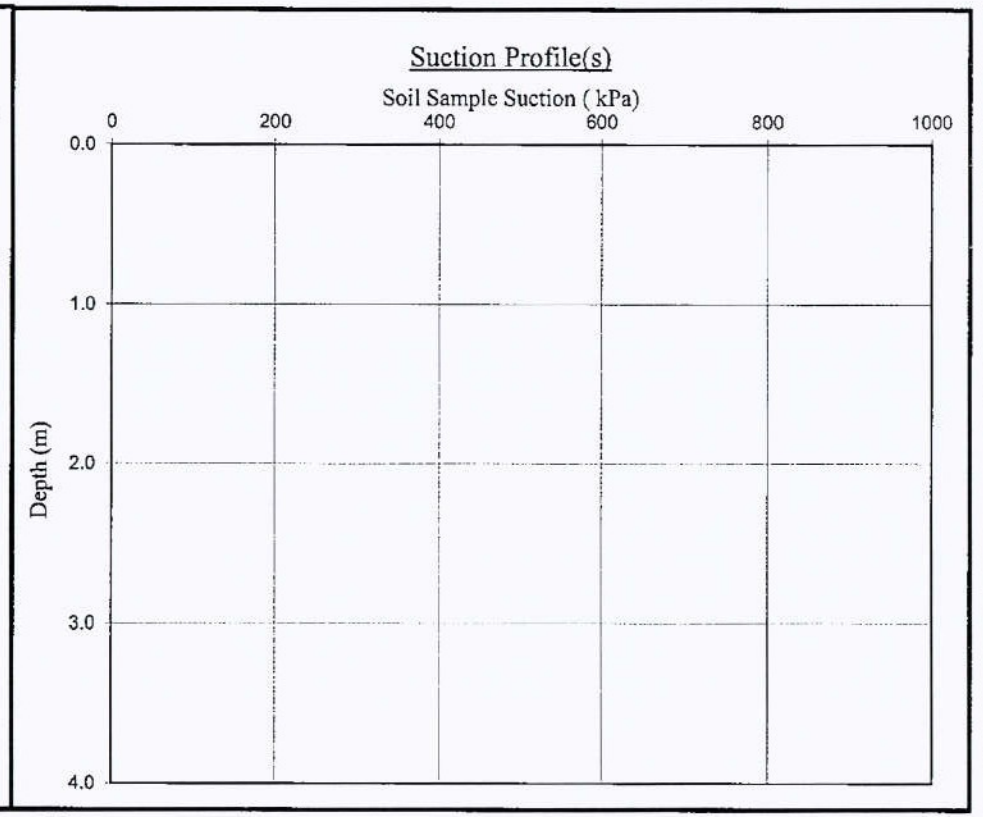
Date Sampled : 20/03/2014

Date Received : 21/03/2014

Date Tested : 24/03/2014

Date of Report : 25/03/2014





Notes

1. 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.

EPSL ***European Plant Science Laboratory***	Sheet: 1 of 1 Job No: **177596** Date: **25/03/2014** Order No: **529522** EPSL Ref: **R4870**	Site: **Baytree Cottage, Hockley,** 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 -

Trial pit/ Borehole number	Root diameter (mm)	Tree, shrub or climber from which root originates	Result of starch test
TP1A (USF)	<1 mm	broadleaved species, too decayed for positive identification * 2 roots	Negative
TP1B (USF)	2 mm	Taxus spp. 4 roots	Negative
BH1 (to 2.5m)	<1 mm	broadleaved species, too decayed for positive identification †	Negative
BH1 (to 2.5m)	<1 mm	too small and decayed for identification 3 roots	Negative

* Possibly Acer spp. (sycamore and other maples).

Taxus spp. are yews.

† It may be possible to include/discount certain species from the list of possibilities. If this would be useful, please contact the laboratory.

MDM

Address for correspondence: EPSL , Intec, Parc Menai, Bangor, Gwynedd, North Wales, LL57 4FG
Telephone: 01248 672 652
e-mail: lab@marishalthompson.co.uk
Head of Laboratory Services : M D Mitchell B.Sc. (Hons), M.Phil.
Plant Anatomist : Dr G S Turner B.Sc. (Hons), M.Sc., Ph.D
Consultant: Dr M P Denne B.Sc. (Hons), M.Sc., Ph.D
Registered in England. No 295427, Registered Office: 6G Greensfield Court, Alnwick, Northumberland, NE66 2DE

LEVEL MONITORING - RELATIVE SURVEY READINGS

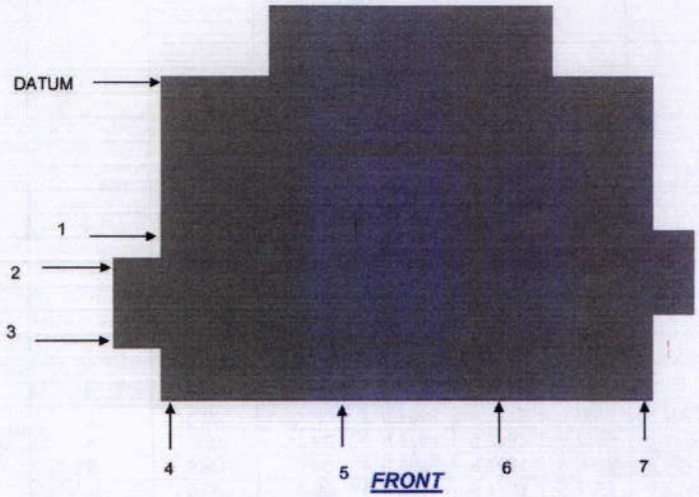
Provider Details	
Name:	GryphonSurveys
Our Ref:	C0537
Date of Issue:	7/9/10

Monitoring Details	
Instruction Date:	13/6/13
First Reading Date:	22/03/2010
Maximum No Visits:	7
Anticipated Expiry Date:	Completed
Monitoring Int (Wks):	8

Client Details	
Insurance Co.:	AXA
Client Name:	Crawford
Technical Mgr:	Anstey W
Email:	
Client Ref:	SU1000537
Address:	National Subsidence Unit
Address:	4th Floor 30 St Pauls Square
Town:	Birmingham
County:	
Post Code:	B3 1QZ
Other Email:	subsidence.monitoring@crawco.co.uk

Risk Address	
Occupier:	MR D DAVIES
Address:	BAYTREE COTTAGE
Address:	50 MAIN ROAD
Town:	HOCKLEY
County:	
Post Code:	SS54QS
Tel Home:	07889 132923
Tel Work:	
Mobile:	
Other:	
Other:	

			Target Date:												
			Reading Date:	22/3/10	17/5/10	12/7/10	7/9/10	14/6/13	30/8/13	18/10/13	6/1/14	10/2/14	12/4/14	11/6/14	
			Issue Date:	24/3/10	18/5/10	13/7/10	7/9/10	17/6/13	3/9/13	21/10/13	7/1/14	11/2/14	15/4/14	12/6/14	
Row No.	Point Name	X Co-ordinate	Y Co-ordinate	1	2	3	4	5	6	7	8	9	10	11	12
1	datum	0.00	0.00	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	
2	1	0.00	-4.69	9.9382	9.9382	9.9371	9.9367	9.9371	9.9375	9.9374	9.9384	9.9388	9.9381	9.9383	
3	2	-0.97	-4.69	9.8157	9.8147	9.8145	9.8137	9.8117	9.8117	9.8116	9.8120	9.8118	9.8117	9.8120	
4	3	-0.97	-6.55	10.1210	10.1184	10.1185	10.1179	10.1150	10.1148	10.1146	10.1156	10.1150	10.1149	10.1150	
5		0.00	-6.55												
6	4	0.00	-7.80	9.7777	9.7753	9.7751	9.7746	9.7734	9.7729	9.7730	9.7735	9.7735	9.7735	9.7734	
7	5	3.50	-7.80	9.7675	9.7654	9.7652	9.7647	9.7664	9.7667	9.7670	9.7661	9.7665	9.7662	9.7665	
8	6	6.30	-7.80	9.7784	9.7762	9.7760	9.7755	9.7776	9.7777	9.7777	9.7781	9.7781	9.7783	9.7783	
9	7	9.63	-7.80	9.7688	9.7672	9.7666	9.7661	9.7675	9.7667	9.7669	9.7679	9.7683	9.7683	9.7677	
10		9.63	-6.38												
11		10.12	-6.38												
12		10.12	-4.83												
13		9.63	-4.83												
14		9.63	0.00												
15		0.00	0.00												
16															
17															
18															
19															
20															
21															
22															
23															
24															
25															
26															
27															
28															
29															
30															
31															
32															

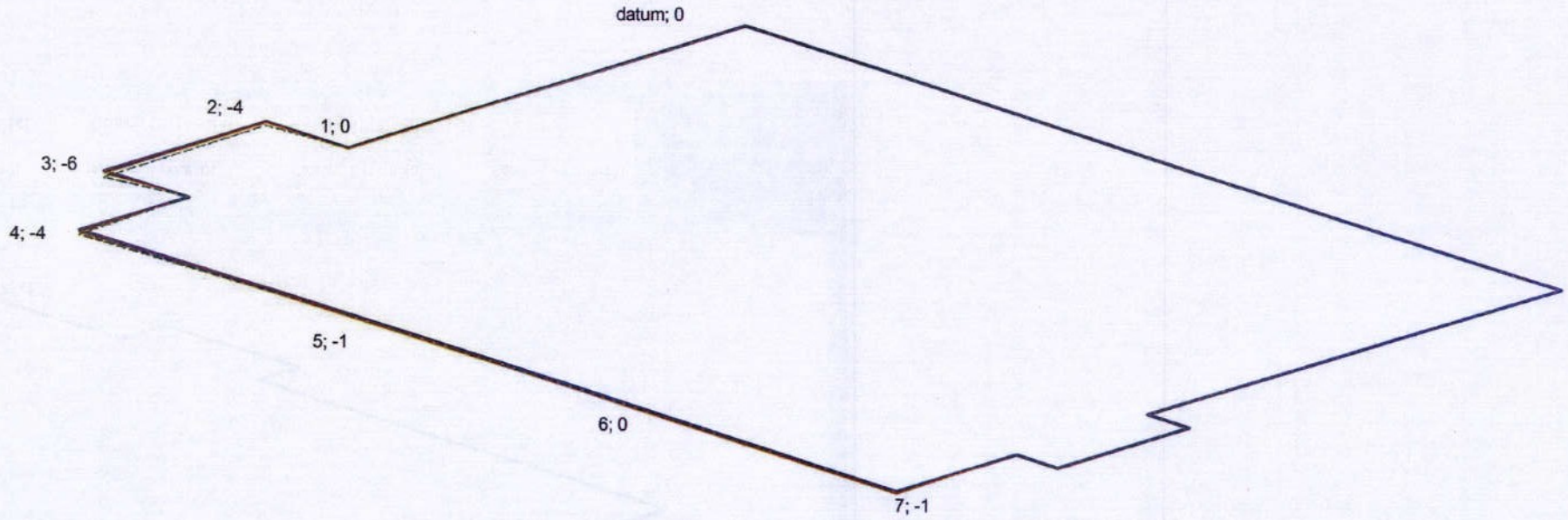


-
- A common brickcourse could not be followed, subsequently relative data only.
-
- Readings Complete

LEVEL MONITORING - RELATIVE MOVEMENT SKETCH

Client: Crawford

Client Ref: SU1000537



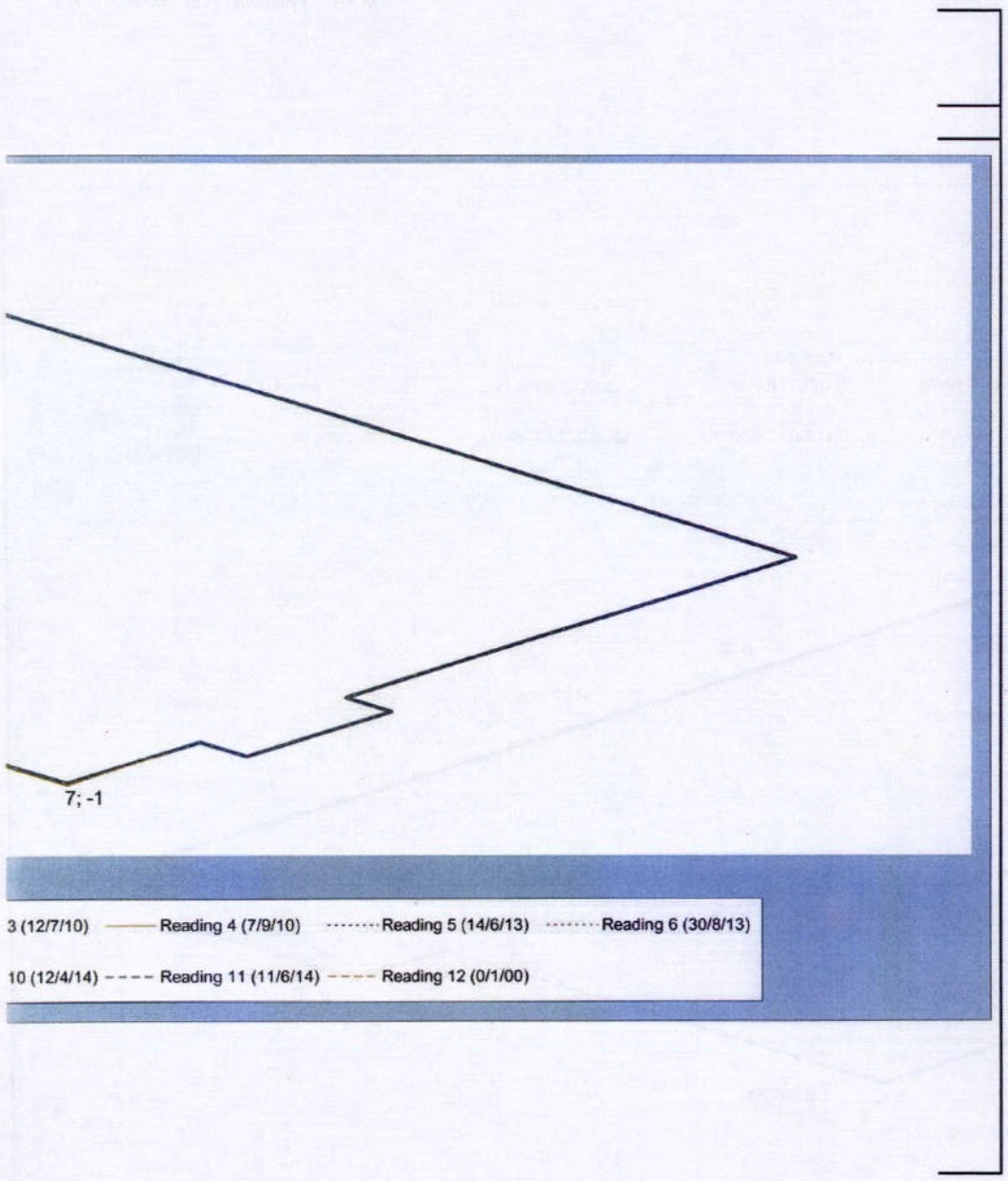
Datum Reading — Reading 1 (22/3/10) — Reading 2 (17/5/10) — Reading 3 (12/7/10) — Reading 4 (7/9/10) — Reading 5 (14/6/13) — Reading 6 (30/8/13)

Reading 7 (18/10/13) — Reading 8 (6/1/14) — Reading 9 (10/2/14) — Reading 10 (12/4/14) — Reading 11 (11/6/14) — Reading 12 (0/1/00)

Notes:

Vertical distorted scale 1: 20

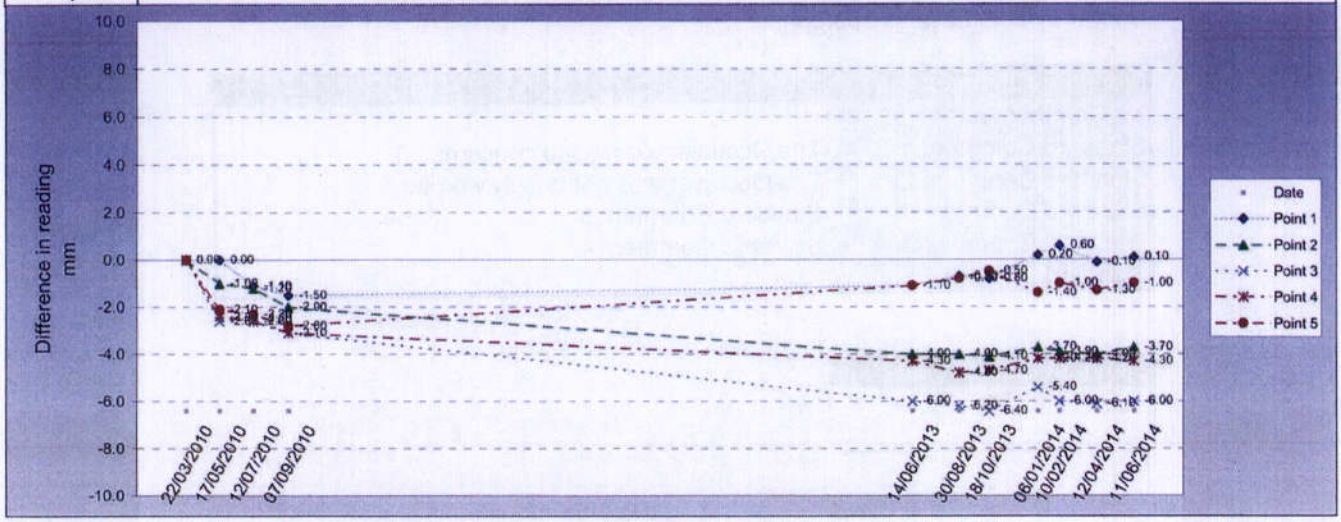
Point labels give level difference of last reading from original datum in mm.


7; -1
3 (12/7/10)
Reading 4 (7/9/10)
Reading 5 (14/6/13)
Reading 6 (30/8/13)
10 (12/4/14)
Reading 11 (11/6/14)
Reading 12 (0/1/00)

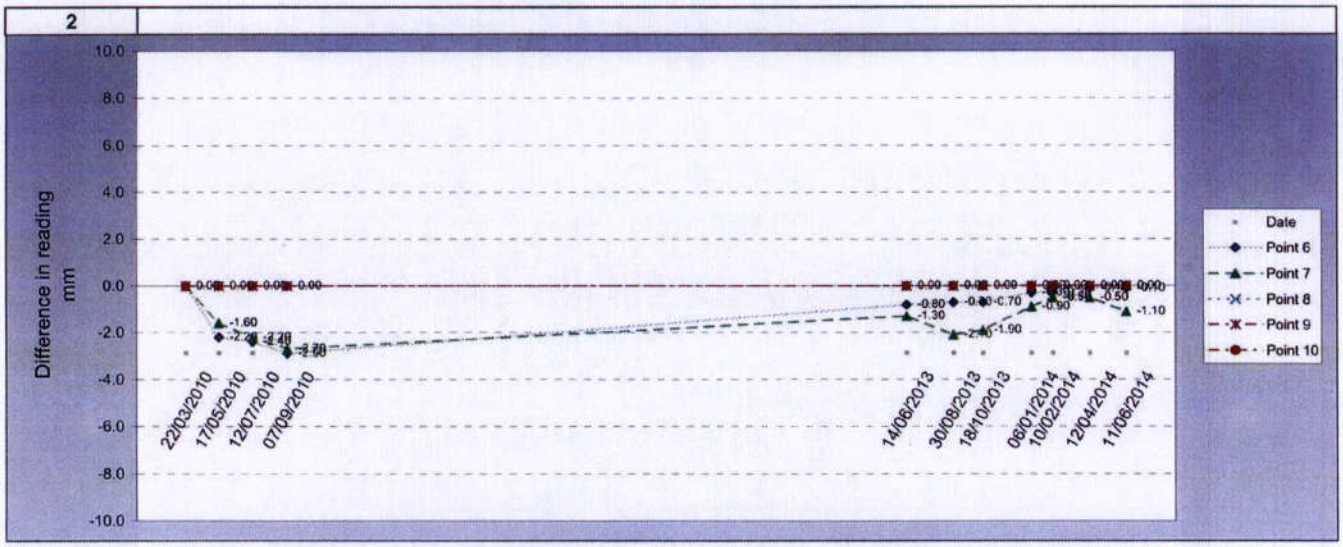
LEVEL MONITORING - RELATIVE SURVEY READINGS

Client: Crawford **Client Ref:** SU1000537 **Chart Scale 1:1000**

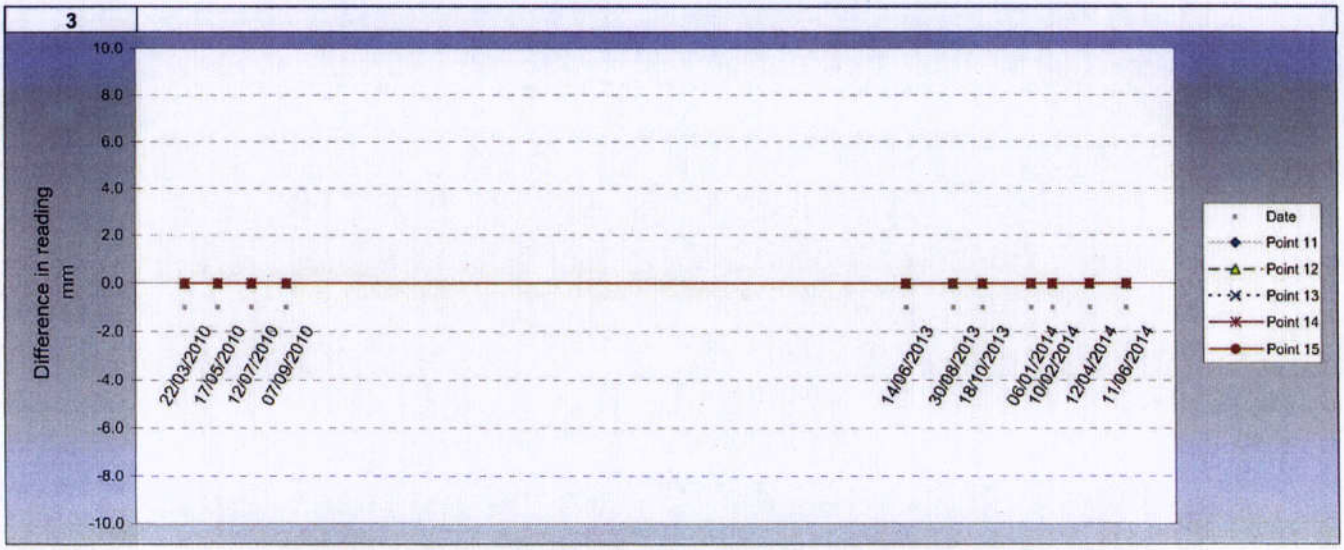
1



2



3



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 was not unduly worried
Standard Comment 3	Standard Comment 3
Standard Comment 4	Standard Comment 4
Standard Comment 5	

Standard Bullet
•