MAT LAB LIMITED

LABORATORY REPORT

Client's Name: Rowrange Properties Ltd

Address: 105 Bartholomew Road,
London,
NW5 2AR

Report Date: 27-Apr-12
Job No.: **54293** (If _R suffix appears after Job No., this indicates Revision Number)
Insurance Co.: Aviva
Claim Ref. No.: 11T601238

Project Engineer: Matt Deller
From: Crawford & Company,
Engineers Ref.: SU1200782

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: 27/04/2012

MAT LAB LIMITED

ROOT IDENTIFICATION

MAT LAB LIMITED

Analysis subcontracted to European Plant Science Laboratory

Your ref: 54293
Job No: Root190412125301

Re: Root Identification
Sample Origin: 105 Bartholomew Road, London, NW5 2AR

The sample of roots taken from the above property and received by us on 19 April 2012, has been examined and identification appears to be as follows:

Reference	Depth	Species Identified		Root Diameter	Starch
BH1 site	0.48-2.5m	*Platanus* spp.	1	1.5 mm	Abundant

Comments:

1 - Plus 4 others also identified as *Platanus* spp.

Platanus spp. include London plane and Oriental plane.

1 species was 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.

OEDOMETER RESULTS DATA

Swell/Strain Test Method **(UKAS accredited)** **Test Date: 24-Apr-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: **105 Bartholomew Road, London, NW5 2AR** | Job No. **54293**

OEDOMETER RESULTS DATA

Borehole No:- 1			
Location	Front Bay		
Depth(m)	Specimen No. & Comments	STRAIN	
0.74	Specimen No. 1A	0.0240	3.8
1.25	Specimen No. 2A	0.0400	7.7
1.75	Specimen No. 3A	0.0510	10.3
2.25	Specimen No. 4A	0.0450	8.8
2.75	Specimen No. 5A	0.0300	5.0
Total Column Dd=35mm Therefore Free Surface Heave Potential Over B/H Depth Is About 2cm to 5cm.			

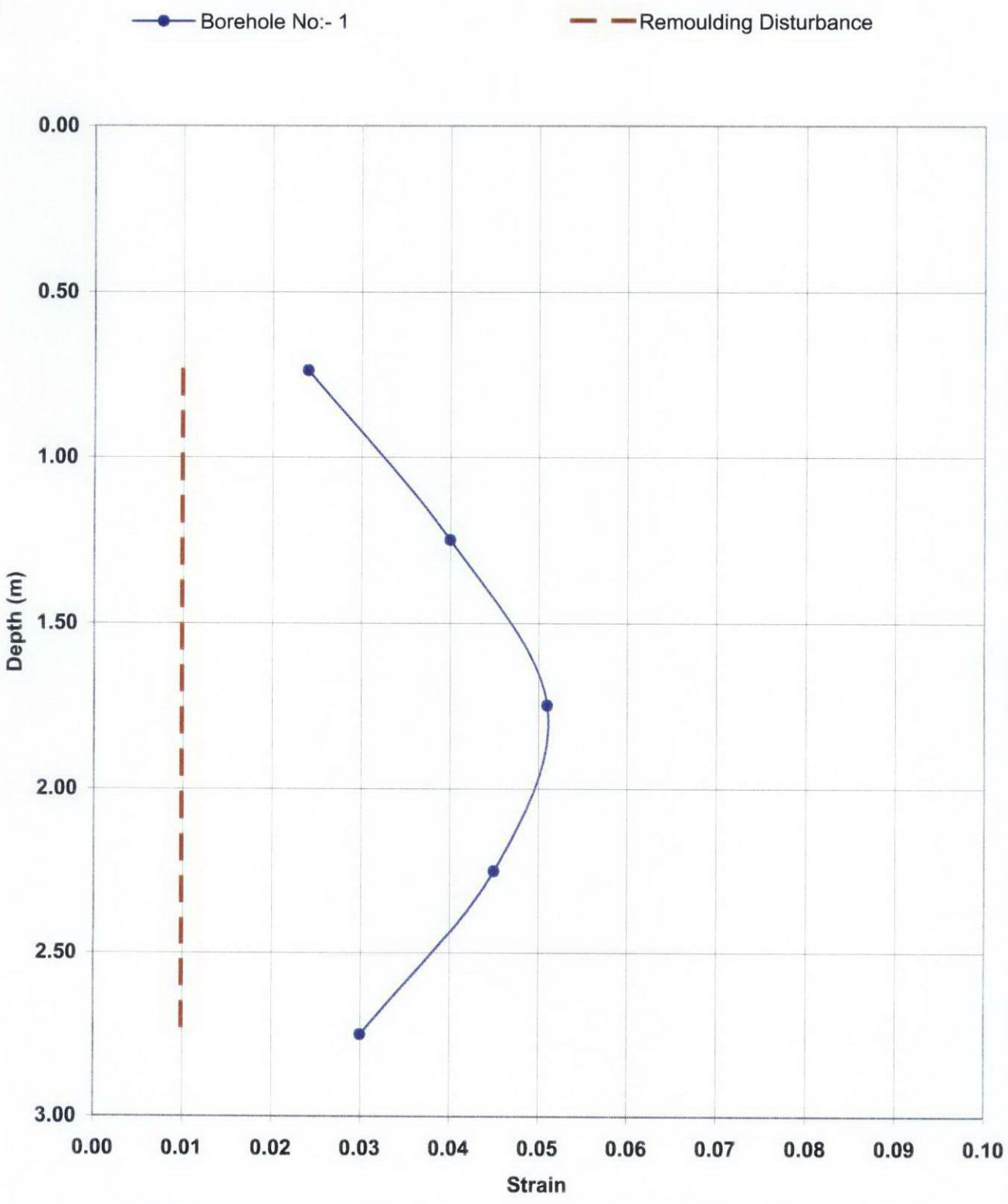
Address: **105 Bartholomew Road, London, NW5 2AR** | Job No. **54293**

MAT LAB LIMITED

OEDOMETER RESULTS CHART

MAT LAB LIMITED

Oedometer Strains



Address: **105 Bartholomew Road, London, NW5 2AR**	Job No. **54293**

Notes relating to Soils Report

Date Soil Samples Received in Laboratory: 17-Apr-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: 22-Apr-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-Apr-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.

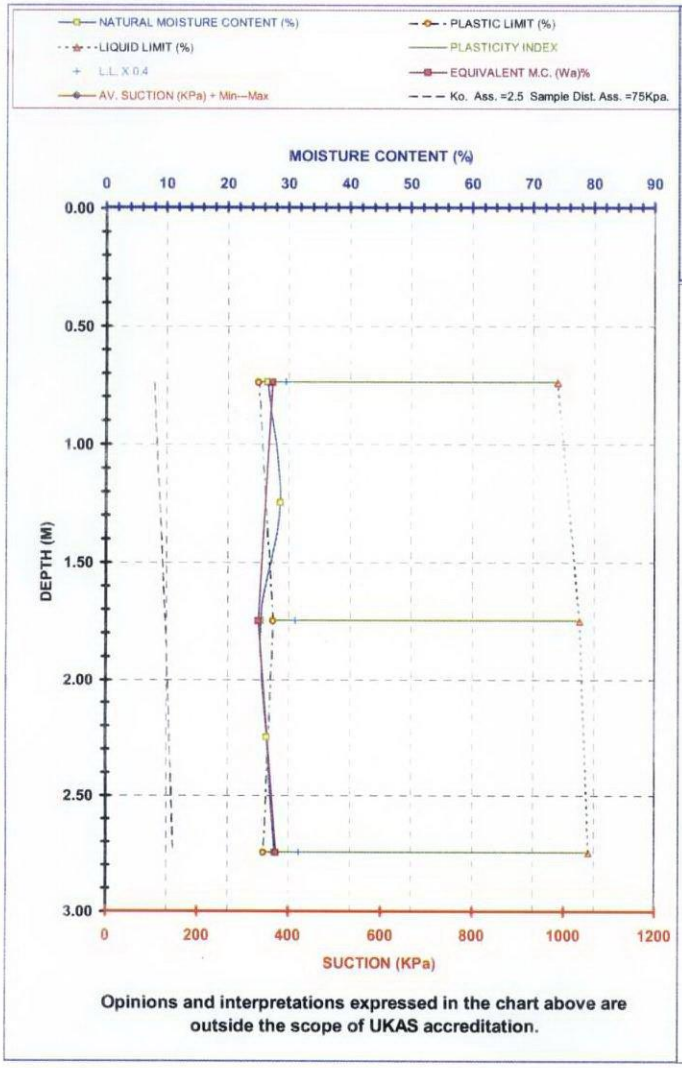
UKAS TESTING
2093

Address: **105 Bartholomew Road, London, NW5 2AR** | Job No. **54293**

JOB No.:-	54293_R1	INSURANCE COMPANY	Aviva REF:-11T601238
DATE SAMPLES EXTRACTED:-	10 Apr 12	ENGINEER:-	Matt Deller REF:-SU1200782
CLIENT/INSURED NAME:-	Rowrange Properties Ltd	FROM :-	Crawford & Company,
ADDRESS:-	105 Bartholomew Road,	B.H. No. :-	1
	London,	LOCATION:-	Front Bay
	NW5 2AR	REPORT DATE:-	27 Apr 12

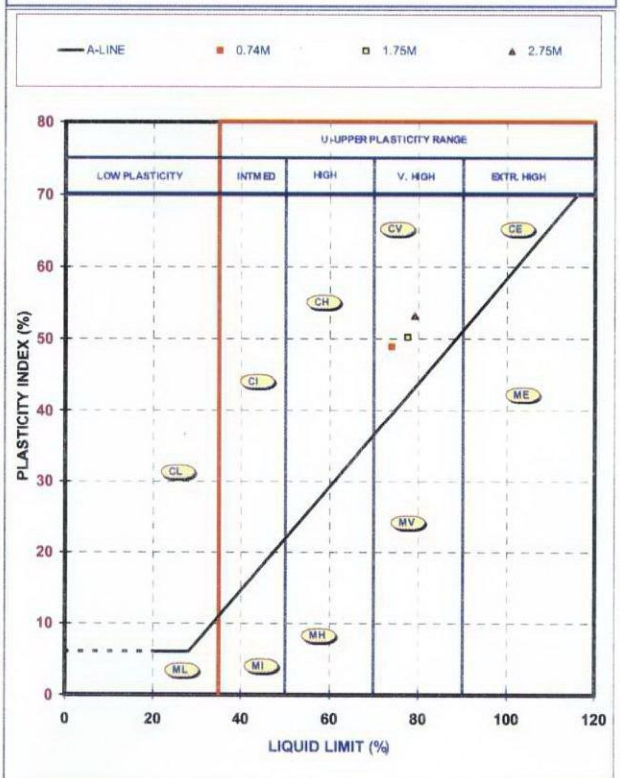
UKAS TESTING 2093

		ATTERBERG LIMITS.						
DEPTH. M.	M.C. (%)	L.L. (%)	P.L. (%)	P.I. (%)	425um (%)	AV. Filter Paper M.C.(%) & No.		BRIEF SOIL DESCRIPTION
0.74	27	74	25	49	99	-		Firm brown CLAY with rare sand & fine gravel.
1.25	29	-	-	-	-	-		Firm/stiff brown CLAY with rare sand & fine gravel.
1.75	25	78	27	51	100	-		Stiff brown CLAY with rare sand & fine gravel.
2.25	26	-	-	-	-	-		Stiff brown CLAY with rare sand, fine gravel & light grey veinings.
2.75	28	79	26	53	100	-		Firm/stiff brown CLAY with rare sand, fine gravel & light grey veinings.



Opinions and interpretations expressed in the chart above are outside the scope of UKAS accreditation.

The interpretations below are outside of UKAS accreditation.



Authorised by :-	J C

MAT LAB LIMITED

Arboricultural Consultancy for Aviva

Note: This reduced format report is an initial appraisal only and may have been produced without the benefit of site investigations. It is intended for use between the client, Marishal Thompson Group and any parties detailed within the report. It is based on the assumption that Engineers are satisfied that current damage is due to clay shrinkage subsidence attributable to vegetation.

1. Case Details

Insured	Rowrange Properties Ltd	**Address**	105 Bartholomew Road, London, NW5 2AR		
Client	Crawford & Company	**Contact**	Chloe Moreton	**Claim No.**	SU1200782
MT Ref	NL/1105121003/TP	**Consultant**	Thomas Peppiatt	**Contact No.**	08702 416 180
Report Date	13/06/2012				

Scope of Report: To survey the property and determine significant vegetation contributing to subsidence damage, make recommendation for remedial action and initiate mitigation action. The survey does not make an assessment for decay or hazard evaluation.

2. Property and Damage Description

The insured structure is a 4 storey mid-terrace house. The property occupies a level site with no adverse topographical features.

Damage relates to the front elevation of the insured dwelling.

3. Technical Reports

No technical investigations are available at the time of reporting, therefore assumptions outlined in Note[1] above apply: recommendations may be subject to change following evaluation of any investigations that may be forthcoming.

4. Action Plan

Mitigation	
Insured Involved?	Yes
Local Authority involved?	No
Other third party Mitigation involved?	Yes

Treeworks	
TPO / Conservation Area / Planning Protection Searches	Insured: TPO/Conservation Area Third Party: Conservation Area

Additional Comments

Awaiting Further Instructions.

5. Technical Synopsis

This report is based upon our understanding at the time of visiting the property that Crawford & Company engineers are satisfied that damage is due to clay shrinkage subsidence exacerbated by vegetation.

Vegetation is judged to have the potential to be exerting a contributory influence in respect of the current damage to the insured property.

Based on our site investigations, and taking account of vegetation location, relative to the focal area of movement / damage, it is our opinion that T1 (Plane (London)) will be exerting a significant vegetative influence.

This influence is determined by species, size and the proximity of vegetation to the area of damage as well as known species characteristics.

Given the above information and results of our investigations, a program of vegetation management is judged appropriate with a view to restoring stable conditions.

Although T1 (Plane (London)) has been reduced, known practice and established research (Hortlink 212) suggest that pruning is a largely ineffective means of controlling water uptake; for this reason removal is recommended.

Please refer to the Recommendations Table in Section 6 for full details of management prescriptions. We recommend the efficacy of this management is determined by further monitoring.

We have been informed by the insured that T1 (Plane (London)) is the subject of a Tree Preservation Order (TPO). If confirmed it is likely that a full set of site investigations will be required before the Local Authority will validate the TPO application (in accordance with TPO's a guide to the law and good practice Section 6.40C). This information must include, as well as this report: 1. Measurement of the extent and distribution of vertical movement using level monitoring. However, where level monitoring is not possible, the applicant should state why and provide crack-monitoring data. The data provided must be sufficient to show a pattern of movement consistent with the presence of the implicated tree(s). 2. A profile of a trial/bore hole dug to identify soil characteristics and foundation type and depth 3. The sub-soil characteristics including soil type (particularly that on which the foundations rest), liquid limit, plastic limit and plasticity index. 4. The location and identification of roots found. Where identification is inconclusive, DNA testing should be carried out 5. Proposals and estimated costs of options to repair the damage.

Is vegetation likely to be a contributory factor in the current damage?	Yes
Is vegetation management likely to contribute to the future stability of the property?	Yes
Is replacement planting considered appropriate?	No
Would DNA profiling be of assistance in this case?	No

6.0 Recommendations

6.1 Table 1 - Current Claim Requirements

These recommendations may be subject to review following additional site investigations

Tree No.	Species	Age Cat	Approx. Height (m)	Distance to Building (m)	Ownership	Action	Requirement
T1	Plane (London)	1	18	3	C - Insured	Remove	Remove and treat stump to inhibit regrowth.
Age Cat: 1 = Younger than property; 2 = Similar age to the property; 3 = Significantly older than property							

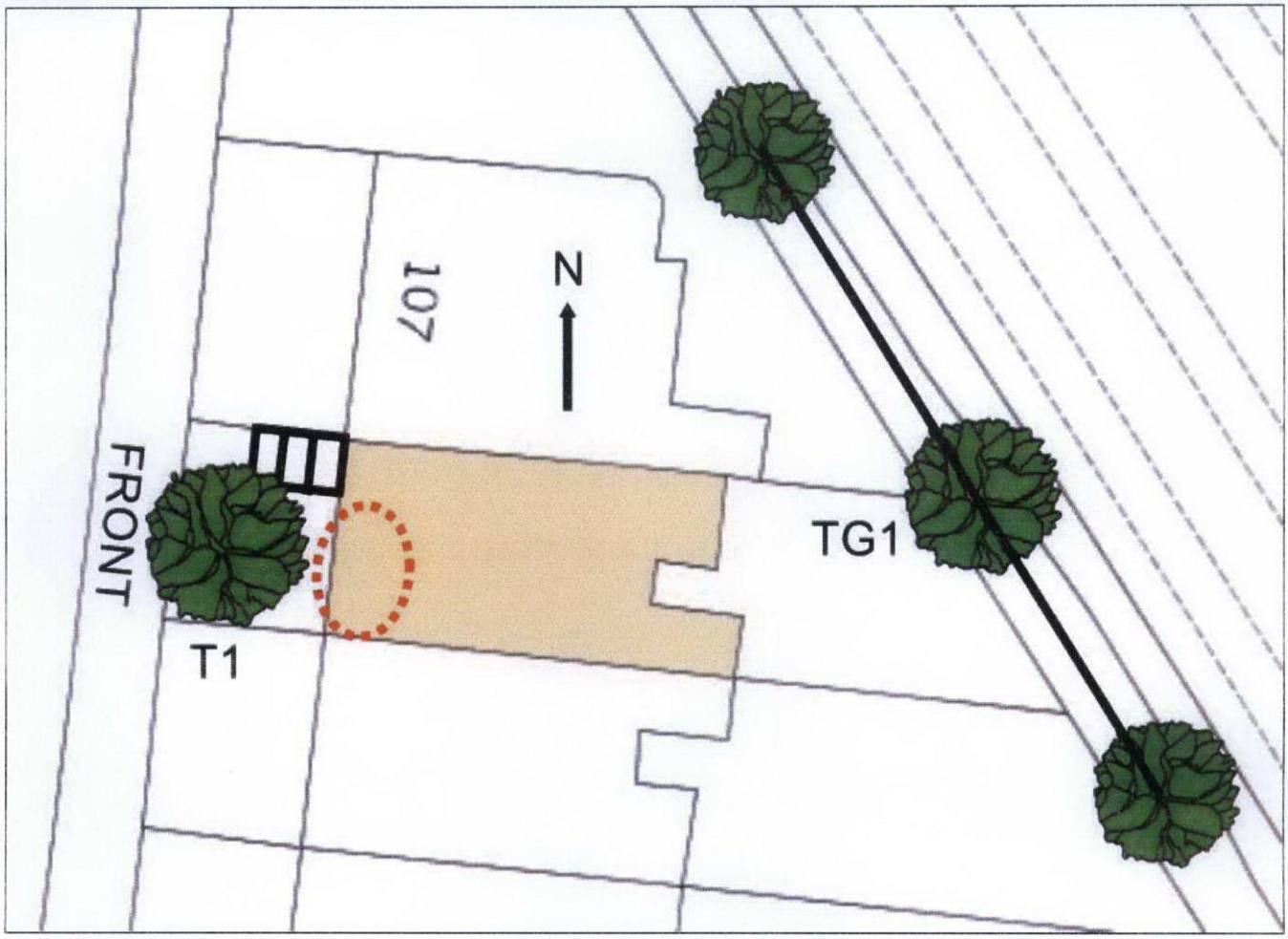
6.2 Table 2 - Future Risk Recommendations

Tree No.	Species	Age Cat	Approx. Height (m)	Distance to Building (m)	Ownership	Action	Requirement
TG1	Acer	1	16	6	A - Third Party Network Rail.	Action to avoid future risk	Remove and treat stump to inhibit regrowth. x3 Acer trees.
Age Cat: 1 = Younger than property; 2 = Similar age to the property; 3 = Significantly older than property							

* Estimated

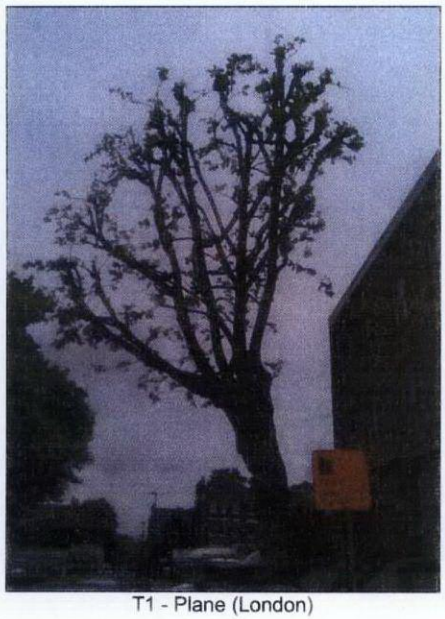
Third party property addresses should be treated as indicative only, should precise detail be required then Marishal Thompson can undertake Land Registry Searches

7. Site Plan

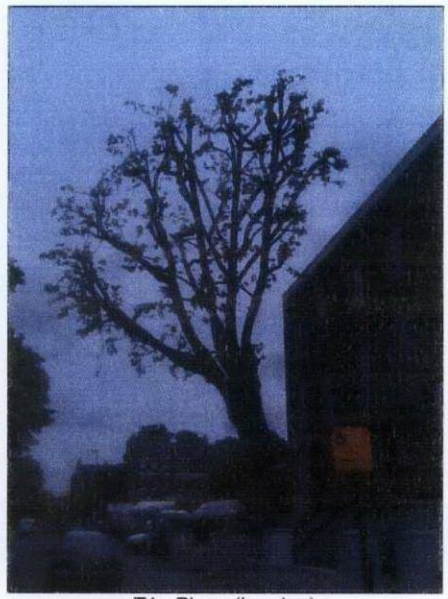


Please note that this plan is not to scale. OS Licence No. 100043218

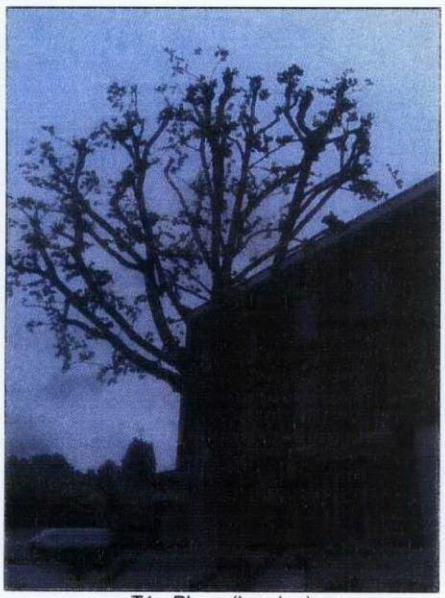
8. Photographs



T1 - Plane (London)



T1 - Plane (London)



T1 - Plane (London)

9. Tree Works Reserve - Does not include recommendations for future risk.

Insured Property Tree Works	£1800
Third Party Tree Works	£0
Provisional Sum	£900

- The above prices are based on works being performed as separate operations.
- The above is a reserve estimate only.
- Ownerships are assumed to be correct and as per Section 6.
- A fixed charge is made for Tree Preservation Order/Conservation Area searches unless charged by the Local Authority in which case it is cost plus 25%.
- Should treeworks be prevented due to statutory protection then we will automatically proceed to seek consent for the works and Appeal to the Secretary of State if appropriate.
- All prices will be subject to V.A.T., which will be charged at the rate applying when the invoice is raised.
- Stump removal is not included within the above price, and would be an additional charge if required. Where this is requested please note that responsibility cannot be accepted for damage to underground services unless these are identified prior to the works being undertaken.
- Where chemical application is made to stumps it cannot always be guaranteed that this will prevent future re-growth. Should this occur we would be pleased to provide advice to the insured on the best course of action available to them at that time. Where there is a risk to other trees of the same species due to root fusion, chemical control may not be appropriate.

10. Limitations

This report is intended as a preliminary appraisal of vegetation influence on the property and assumes that engineers suspect or have confirmed that vegetation is contributing to clay shrinkage subsidence, which is impacting upon the building. Recommendations for remedial tree works and, where relevant, future management are made to meet the primary objective of assisting in the restoration of stability to the property. In achieving this, it should be appreciated that recommendations may in some cases be contrary to best Arboricultural practice for tree pruning/management and is a necessary compromise between competing objectives.

Any connection between the structural damage to the property and trees will require the clear identification of shrinkable clay soils below foundation depths. Following tree works we recommended that the building be monitored to establish the effectiveness of the works. Should sufficient stability not be achieve this may be indicative of the fact that an Arboricultural solution is not possible in isolation.

The influence of trees on soils and building is dynamic and vegetation in close proximity to vulnerable structure should be inspected annually.

The presence of Tree Preservation Orders (TPO) or Conservation Area status must be determined prior to any tree works being implemented, failure to do so can result in fines in excess of £20,000.

A legal Duty of Care requires that all works specified in this report should be performed by qualified, arboricultural contractors who have been competency tested to determine their suitability for such works in line with Health & Safety Executive Guidelines. Additionally all works should be carried out according to British Standard 3998 (1989) *"Recommendations for Tree Work".*

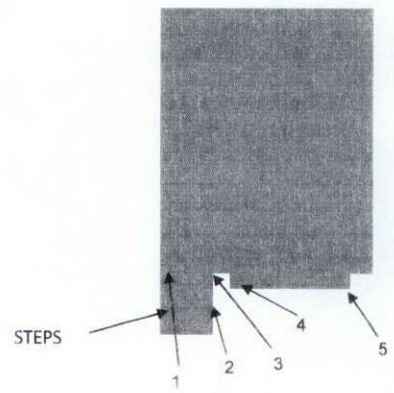
LEVEL MONITORING - RELATIVE SURVEY READINGS

Provider Details		Client Details		Risk Address	
Name:	MHN Ltd	Insurance Co.:	Aviva	Occupier:	Rowrange Properties Ltd
		Client Name:	Crawford	Address:	105 Bartholomew Rd
Date of Issue:	9/10/12	Technical Mgr:		Address:	London
		Email:		Town:	
Monitoring Details		Client Ref:	SU1200782	County:	
Instruction Date:	19/3/12	Address:	National Subsidence Unit	Post Code:	NW5 2AR
First Reading Date:	02/04/2012	Address:	4th Floor 30 St Pauls Square	Tel Home:	02072 670 437 Catherine Elliott
Maximum No Visits:	Fix + 3	Town:	Birmingham	Tel Work:	07771 764 933
Anticipated Expiry Date:	COMPLETED	County:		Mobile:	
Monitoring Int:	2 month	Post Code:	B3 1QZ	Other:	
		Other Email:	subsidence.monitoring@crawco.co.uk	Other:	

			Target Date:												
			Reading Date:	2/4/12	11/6/12	6/8/12	4/10/12								
			Issue Date:	4/4/12	13/6/12	8/8/12	9/10/12								
Row No.	Point Name	X Co-ordinate	Y Co-ordinate	1	2	3	4	5	6	7	8	9	10	11	12
1	1	0.00	0.00	11.4118	11.4142	11.4141	11.4147								
2		0.00	-3.50												
3		2.00	-3.50												
4	2	2.00	-1.70	9.3018	9.3040	9.3025	9.3048								
5	3	2.00	0.00	9.1801	9.1814	9.1807	9.1833								
6		2.40	0.00												
7	4	2.40	-0.70	9.2540	9.2557	9.2550	9.2581								
8	5	5.10	-0.70	9.2509	9.2525	9.2521	9.2550								
9		5.10	0.00												
10		5.70	0.00												
11		5.70	9.00												
12		0.00	9.00												
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															
23															
24															
25															
26															
27															
28															
29															
30															
31															
32															

REAR

The rear of the building was not measured. The plan is just for illustarative purposes only.

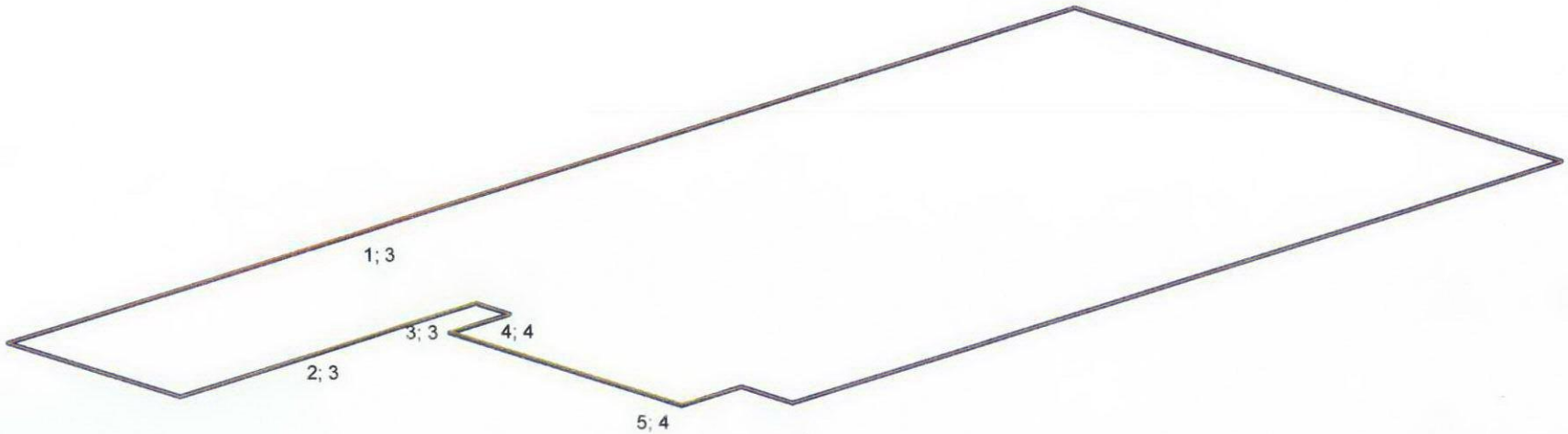


FRONT

- 04/10/2012
  The Occupier was not unduly worried
- Stations haveNOT been installed within the same brick course. There fore initial readings care Relative
- Readings have been made relative to rim of cover to front . It has an assumed value of 10.0000m. If this is not appropriate, please advise if a deep datum is required?
- No further visits planned.

LEVEL MONITORING - RELATIVE MOVEMENT SKETCH

Client: Crawford Client Ref: SU1200782



Datum Reading | Reading 1 (2/4/12) | Reading 2 (11/6/12) | Reading 3 (6/8/12) | Reading 4 (4/10/12) | Reading 5 (0/1/00) | Reading 6 (0/1/00)

Reading 7 (0/1/00) | Reading 8 (0/1/00) | Reading 9 (0/1/00) | Reading 10 (0/1/00) | Reading 11 (0/1/00) | Reading 12 (0/1/00)

Notes:
Vertical distorted scale 1: 10

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

LEVEL MONITORING - RELATIVE SURVEY READINGS

Client: Crawford **Client Ref:** SU1200782 **Chart Scale 1:1000**