ADDENDUM TECHNICAL REPORT

Crawford Reference: SU1500403

88 Savernake Road
London
NW3 2JR

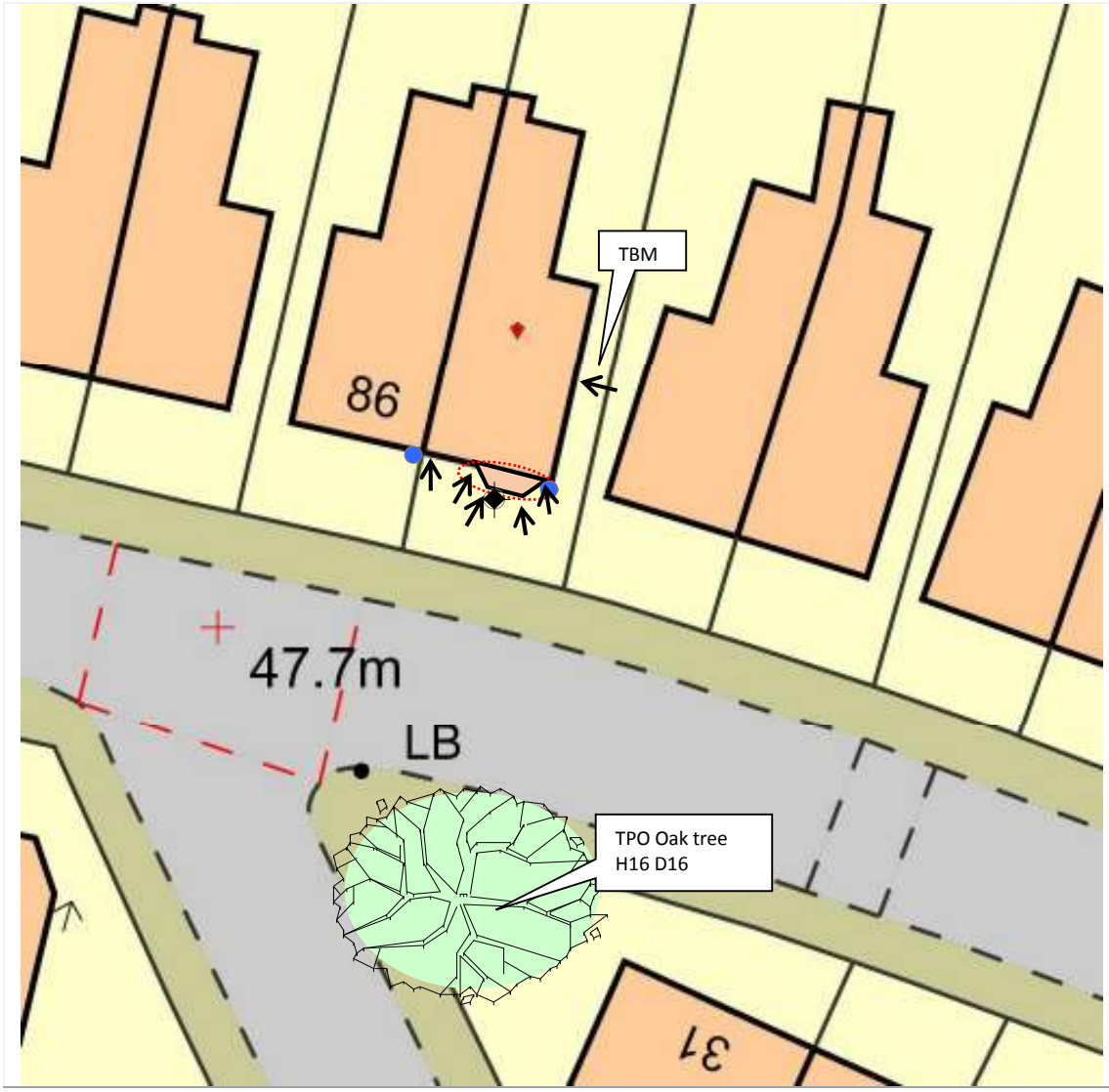
Aviva - Commercial

SUBSIDENCE CLAIM

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

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.



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.

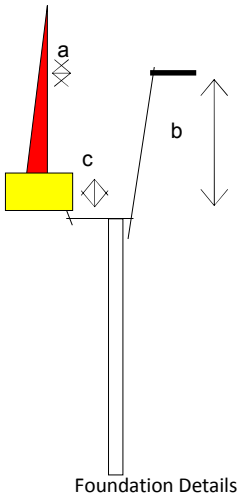
INVESTIGATIONS

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 and the diagram below for details. Trial Hole 1 revealed brick corbel on a crushed brick footing founded at a depth of 0.98m below ground level which bears onto stiff, mid brown, mottled orange, grey veined, silty CLAY with partings of orange silt and fine sand.

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.	180 mm.	975 mm.	825 mm.

AUGERED BOREHOLES

A 50mm diameter hand auger was sunk - see site plan for location(s). Borehole 1 confirmed the continuation of the clay subsoil encountered within the trial pit, with roots to a depth of 1.5m below ground level. The borehole remained dry and open upon completion.

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

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 have 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 boreholes:-

Moisture Content

Values ranged from 37% to 31% over the depth of Borehole 1
Values ranged from 36% to 32% over the depth of Borehole 2

Atterberg Limits

Results indicate that the clay subsoil can be classified as a very high plasticity clay in accordance with the Casagrande chart.

Suction Tests

Suction tests on disturbed samples is a recognised method of assessing clay desiccation. The results in Borehole 1 indicate evidence of slight to medium desiccation between a depth of 1.3m and 1.8m.

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:

- Monocotyledon spp. which includes palms, grasses, bamboos and lillies. Starch was negative which indicates that the roots were not alive at the time of retrieval.
- Quercus spp. which are oaks. Starch was positive which indicates that the roots were alive at the time of retrieval.

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.

LEVEL MONITORING

The monitoring results to date show subsidence of the site of c5mm between May 2015 and August 2015. The subsequent ground recovery of c2.4mm following rains in the area confirms that the retrieved oak roots are exerting an influence over the property stability.

DISCUSSION

The results of the site investigations 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 0.98m which is below the level that normal seasonal movement would occur.
- Atterberg limit testing indicates that the soil has a very high plasticity and hence will shrink and swell with changes in moisture content.
- Suction tests indicate slight to medium desiccation between a depth of 1.3m and 1.8m coincident with the depth of root activity.
- Roots were found to a depth of 1.5m.
- Level monitoring confirms a cyclical pattern of movement, thus implicating the oak as the trigger of instability.

RECOMMENDATION

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

Our Mitigation Unit will liaise with the Local Authority to arrange a TPO application to be submitted and advise of the outcome when it is received. A decision is normally taken by the Local Authority after 8 weeks of submission.

If the decision is favourable, our Mitigation Unit will arrange for the tree works to be undertaken, subject to authority from the tree owner(s). If the application is refused, there are possible grounds to Appeal or submit a further Application if there is new evidence. This will be reviewed in detail at the time. If the tree is removed, superstructure repairs will suffice and the current reserve is held at c6k. In the event of TPO refusal and continued movement, we anticipate that localised underpinning of the bay structure will increase the total reserve from c4k (current) to c40k.

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.

Gordon McEwan BSc (Hons) Building Surveying Cert CILA
Specialist Property Services - Subsidence Division
Direct Dial: 07500 891857
subsidence@crawco.co.uk