# Arboricultural Appraisal Report

## Subsidence Damage Investigation at:

37 Greville Road
London
NW6 5JB

| | |
|---|---|
| CLIENT: | Crawford & Company |
| CLIENT REF: | SU1504550 |
| MWA REF: | SUB160216-556 |
| MWA CONSULTANT: | David Williams (N.D.Arb MArborA) |
| REPORT DATE: | 07-03-2016 |

## SUMMARY

| Statutory Controls | | | Mitigation (current claim) | |
|---|---|---|---|---|
| TPO | No | | Insured | Yes |
| Cons. Area | Yes | | 3rd Party | No |
| Trusts schemes | N/A | | Local Authority | No |
| Planning | N/A | | Other | No |
| Local Authority: - | London Borough of Camden | | | |

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## Introduction

Acting on instructions received from Crawford & Company, the insured property was visited on 23/02/2016 for the purpose of assessing the potential role of vegetation in respect of subsidence damage.

We are instructed to provide opinion on whether moisture abstraction by vegetation is a causal factor in the damage to the property and give recommendations on what vegetation management, if any, may be carried out with a view to restoring stability to the property. The scope of our assessment includes opinion relating to mitigation of future risk. Vegetation not recorded is considered not to be significant to the current damage or pose a significant risk in the foreseeable future.

This is an initial appraisal report and recommendations are made with reference to the technical reports and information currently available and may be subject to review upon receipt of additional site investigation data, monitoring, engineering opinion or other information.

This report does not include a detailed assessment of tree condition or safety. Where indications of poor condition or health in accessible trees are observed, this will be indicated within the report. Assessment of the condition and safety of third party trees is excluded and third party owners are advised to seek their own advice on tree health and stability of trees under their control.

## Property Description

The property comprises a detached two storey, bay-fronted dwelling dating back to c.1850. A basement has been added involving excavations and foundations to c.4.0m across the footprint of the dwelling in 2013. However, the LPA prevented any foundation enhancement to the front bay window construction.

External areas comprise gardens to the front and rear occupying a predominantly level plot.

## Damage Description & History

The current damage affects the front bay only where cracking is focused externally at the junction with the main body of the dwelling.

At the time of the engineers' inspection 3rd November 2015 the structural significance of the damage was found to fall within Category 3 (moderate) of Table 1 of BRE Digest 251.

## Site investigations

Site investigations were carried out by CET on 20th January 2016 when a single trial pit was excavated to reveal the foundations, with a borehole being sunk through the base of the trial pit to determine subsoil conditions.

**Foundations:**

| Ref | Foundation type | Depth at Underside (mm) |
|---|---|---|
| TH1 | Crushed brick | 1200 |

**Soils:**

| Ref | Description | Plasticity Index (%) | Volume change potential (NHBC) |
|---|---|---|---|
| BH1 | Firm, mid brown, grey veined, silty CLAY | 49.0 | High |

**Roots:**

| Ref | Roots Observed to depth of (mm) | Identification | Starch content |
|---|---|---|---|
| BH1 | 1600 | *Acer spp.* | Present |
| BH1 | U/S/F | *Leguminoseae spp.* | Present |
| BH1 | U/S/F | *Hedera or Fatsia spp*. | Present |

**Drains:** The drains have been surveyed and no significant defects identified.

**Monitoring:** Level monitoring is in progress.

## Discussion

Opinion and recommendations are made on the understanding that Crawford & Company are satisfied that the current building movement and the associated damage is the result of clay shrinkage subsidence and that other possible causal factors have been discounted.

Site investigations and soil test results have confirmed a plastic clay subsoil of high volume change potential (NHBC Classification) susceptible to undergoing volumetric change in relation to changes in soil moisture. A comparison between moisture content and the liquid limits suggests desiccation in TP/BH1 below the foundation underside to 2000mm depth.

Soil suction values reveal 'moderate' (BRE Digest 412) desiccation matching the depth profile of the Atterberg limits data.

There is desiccation at depths beyond normal ambient soil drying processes such as evaporation indicative of the soil drying effects of vegetation.

Shear vane testing of the substrate indicates that it is sufficiently consolidated to bear the imposed load and as such the damage cannot be attributed to consolidation settlement. This is borne out by the relative age of the building and the recent appearance of damage.

Roots analysis confirms the drying role of nearby policy holder vegetation below the damaged bay window.

Based on the technical reports currently available, engineering opinion and our own site assessment we conclude the damage is consistent with shrinkage of the clay subsoil, the dominant cause of which is judged to be the drying action of T1 with C1 exerting a secondary influence.

The influence of C2 is thought to be minimal and we do not consider removal of this element to be justified unless monitoring indicates that movement persists after the removal of T1 and C1.

Consideration has been given to pruning as a means of mitigating the vegetative influence, however in this case, this is not considered to offer a viable long term solution due to the proximity of the responsible vegetation (T1 and C1).

## Conclusions

- Conditions necessary for clay shrinkage subsidence to occur related to moisture abstraction by vegetation have been confirmed by site investigations and the testing of soil and root samples.

- Engineering opinion is that the damage is related to clay shrinkage subsidence.

- There is significant vegetation present with the potential to influence soil moisture and volumes below foundation level.

- Roots have been observed underside of foundations and identified samples correspond to vegetation identified on site.

## Table 1 **Current Claim** - Tree Details & Recommendations

| Tree No. | Species | Ht (m) | Dia (cm) | Crown Spread (m) | Dist. to building (m) | Age Classification | Ownership |
|---|---|---|---|---|---|---|---|
| T1 | Sycamore | 4.0 | 50* | 7.0 | 3.0-4.0 | Younger than property | Policy Holder |
| Management history | | Recently pollarded to current dimensions | | | | | |
| Recommendation | | Remove and treat stump to inhibit regrowth | | | | | |
| C1 | Wisteria | 3.3 | M/S | 2.0 | 0.0 | Younger than property | Policy Holder |
| Recommendation | | Remove and treat stump to inhibit regrowth | | | | | |

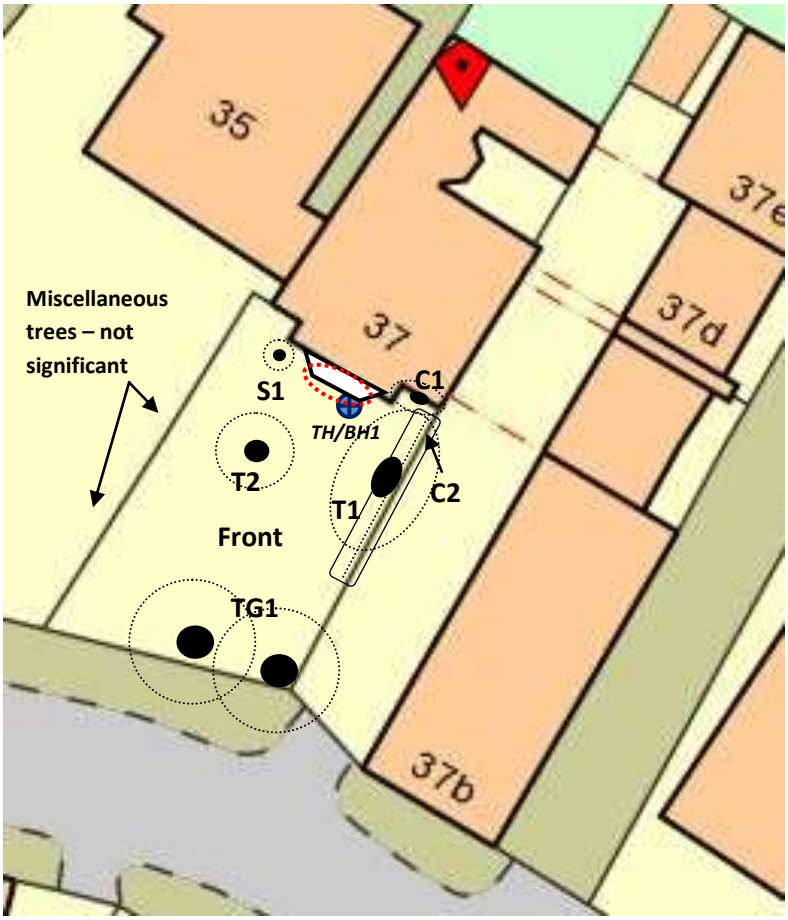
Ms: multi-stemmed * Estimated value

## Table 2 **Future Risk** - Tree Details & Recommendations

| Tree No. | Species | Ht (m) | Dia (cm) | Crown Spread (m) | Dist. to building (m) | Age Classification | Ownership |
|---|---|---|---|---|---|---|---|
| T2 | Magnolia | 4.2 | M/S Av12* | 6.0 | 7.2 | Younger than property | Policy Holder |
| Recommendation | | Do not allow to exceed current dimensions | | | | | |
| TG1 | Lime x 2 | 6.0 | M/S Av37* | 6.0 | 17.0 | Younger than property | Policy Holder |
| Recommendation | | Recently pollarded – repeat every 4th year. | | | | | |
| C2 | Ivy | 2.5 | M/S | 7.0 | <2.0 | Younger than property | Policy Holder |
| Recommendation | | Do not allow to exceed current dimensions | | | | | |
| S1 | Camellia | 1.7 | M/S | 1.5 | 1.5 | Younger than property | Policy Holder |
| Recommendation | | Do not allow to exceed current dimensions | | | | | |

Ms: multi-stemmed * Estimated value

**SITE PLAN**




Plan not to scale – indicative only

Approximate areas of damage

## Images

View of Front elevation

View of C1, T1 and C2