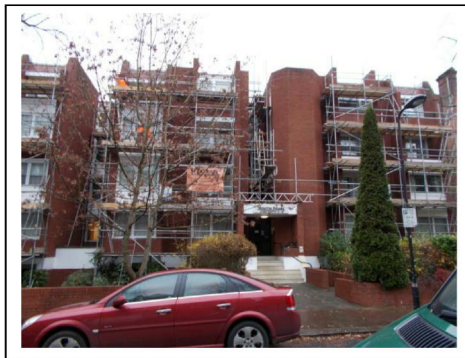
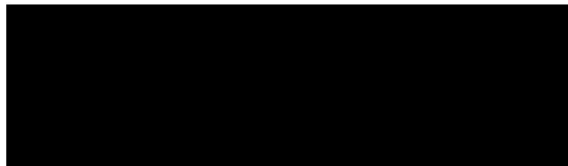


Addendum Arboricultural Report

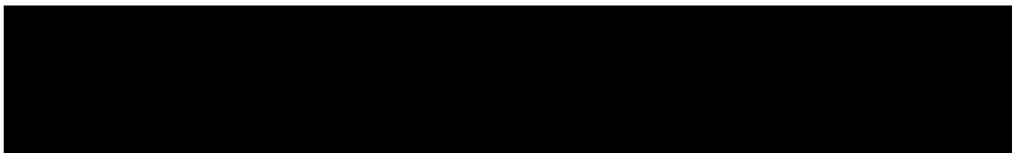
Subsidence Damage Investigation at:



CLIENT: Crawford & Company
 CLIENT REF: [REDACTED]
 MWA REF: [REDACTED]
 MWA CONSULTANT: [REDACTED]
 INITIAL REPORT DATE: 02/12/2019
 REVISION DATE: Add 01 20/07/2020

SUMMARY

| Statutory Controls | | Mitigation (Current claim tree works) | |
|--------------------|--------------------------|--|-----|
| TPO current claim | Yes – T1, T2 | Policy Holder | No |
| TPO future risk | No | 3 rd Party | Yes |
| Cons. Area | Yes | Local Authority | No |
| Trusts schemes | No | Other | No |
| Local Authority: - | London Borough of Camden | | |



Introduction

This is an addendum to our initial appraisal report dated 02/12/2019 and has been produced following receipt of a site investigation report by Auger, root identification and monitoring data.

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.

Acting on instructions from Crawford & Company, the insured property was visited on 26/11/2019 to assess 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 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 4-storey purpose-built block of flats constructed in 1976. There is a car park at basement level. External areas comprise gardens to the front and rear.

The site is generally level with no adverse topographical features.

Damage Description & History

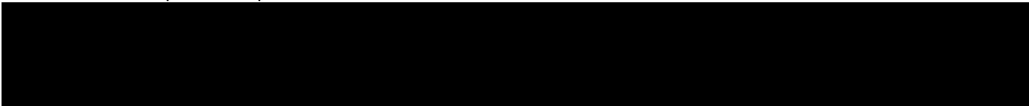
Damage relates to the stairway to the rear right-hand corner of the building and was initially noted in September 2019.

At the time of the engineer's inspection (15/10/2019) the structural significance of the damage was found to fall within Category 5 (very severe) of Table 1 of BRE Digest 251.

Geology / Soils

The online 1:50 000 scale British Geological Survey map records the bedrock geology as London Clay Formation which mainly comprises poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay.

No superficial deposits were recorded.



Site investigations

Site investigations were carried out by Auger on 12/11/2019 when two trial pits were hand excavated to reveal the foundations, each with a borehole being sunk through the base of the trial pit to determine subsoil conditions. Additional root samples were taken from TP/BH1 in early 2020.

Foundations:

| Ref | Foundation type | Depth at Underside (mm) |
|-----|-----------------|-------------------------|
| TP1 | Concrete | 1000 |
| TP2 | Concrete | 1000 |

Soils:

| Ref | Description | Plasticity Index (%) | Volume change potential (NHBC) |
|--------|--|----------------------|--------------------------------|
| TP/BH1 | Dry, stiff, gravelly, silty CLAY to 1.50m. Dry, stiff, silty CLAY to 2.00m. Dry, stiff, gravelly, silty CLAY to 2.50m. Dry, stiff, silty CLAY to 3.00m. Terminated at 3.00m. | 58 - 60 | High |
| TP/BH2 | Dry, stiff, gravelly, silty CLAY to 1.50m. Dry, stiff, silty CLAY to 2.00m. Dry, stiff, gravelly, silty CLAY to 3.00m. Terminated at 3.00m. | 52 - 58 | High |

Roots:

| Ref | Roots Observed to depth of (mm) | Identification | Starch content |
|--------|---------------------------------|---|----------------|
| TP/BH1 | 1500 | <i>Quercus spp.</i> | Present |
| TP/BH2 | 1500 | <i>Acer spp.</i> , <i>Carpinus spp.</i> or <i>Aesculus spp.</i> | Absent |

Quercus spp. are oaks.

Acer spp. are maples and includes sycamore.

Aesculus spp. are horse chestnuts.

Drains: No information available at the time of writing.

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 plastic and liquid limits suggests moisture depletion at the time of sampling in TP/BH1 at depths beyond normal ambient soil drying processes such as evaporation indicative of the soil drying effects of vegetation. Readings in TP/BH2 suggest that soils are close to experiencing depletion but this is not as advanced as in TP/BH1.

Roots were observed to a depth of 1500mm bgl in TP/BH1 and recovered samples have been positively identified (using anatomical analysis) as *Quercus spp.*, the origin of which will be T2, confirming the influence of this tree on the soils below the foundations.

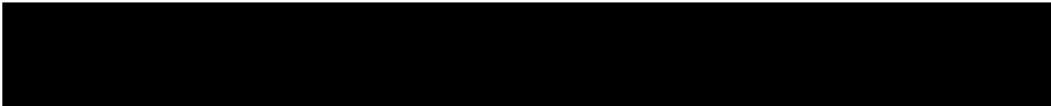
Roots were observed to a depth of 1500mm bgl in TP/BH2 and recovered samples have been identified (using anatomical analysis) as potentially *Acer spp.*, *Carpinus spp.* or *Aesculus spp.* These samples were not readily identifiable due to their small size, and the potential list includes a wide range of potential species, none of which corresponds with trees identified in our inspection.

Level monitoring data for the period 03/12/2019 to 04/06/2020 shows most pins to be relatively stable but with significant seasonal movement at Pin 4 at the rear right corner of the dwelling.

In our initial report we considered that the vegetation considered to be most significant in relation to the current damage to be T1 and T2 and that these trees should both be removed. Following notification to the council of intention to remove the trees, a provisional Tree Preservation Order was raised covering both T1 and T2.

The site investigation, root identification and monitoring data clearly implicate T2 in the current damage.

T1 is a large tree in very close proximity to the dwelling but has a significantly smaller crown spread than T2 and is of a species (beech) that is less often implicated in subsidence damage than oak. This does not however exclude the tree from being a contributor in the damage.



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 related to moisture abstraction by vegetation. Having considered the available information, it is our opinion that T1 and T2 are the principal cause of or are contributing to the current subsidence damage.

We note that there is currently no root evidence to directly implicate T1 in the current damage. If a predictable arboricultural solution is to be achieved, we do not consider it practicable to retain a tree of this size in such close proximity to a building which has suffered subsidence damage, which is categorised as severe, even if the tree were subject to a heavy reduction. However, we recommend T2 is removed in the first instance with the removal of T1 being considered further once the effects of removing T2 are known.

Recommended tree works may be subject to change upon receipt of additional information.

Other vegetation recorded presents a potential future risk to building stability and management is therefore recommended. There are several well managed shrubs and small trees in both the front and rear garden that are not noted within the report; this vegetation should continue to be managed at its current dimensions by periodic pruning.

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.
- Replacement planting may be considered subject to species choice and planting location.

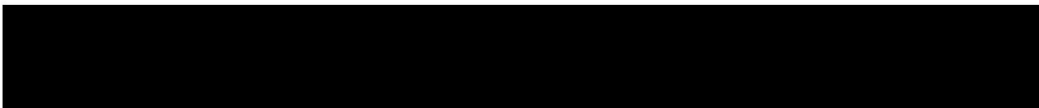


Table 1 Current Claim - Tree Details & Recommendations

| Tree No. | Species | Ht. (m) | Dia. (mm) | Crown Spread (m) | Dist. to building (m) | Age Classification | Ownership |
|--------------------|---------|--|-----------|------------------|-----------------------|---------------------|--|
| T1 | Beech | 17* | 550* | 8* | 2 | Older than Property | Third Party 15 Maresfield Gardens NW3 5SN |
| Management history | | No recent management noted. | | | | | |
| Recommendation | | PROVISIONAL - Remove (fell) to near ground level subject to the effects of removing T2 being assessed. | | | | | |
| T2 | Oak | 17* | 700* | 17* | 3 | Older than Property | Third Party 15 Maresfield Gardens NW3 5SN |
| Management history | | No recent management noted. | | | | | |
| Recommendation | | Remove (fell) to near ground level and treat stump to inhibit regrowth. | | | | | |

Ms: multi-stemmed * Estimated value

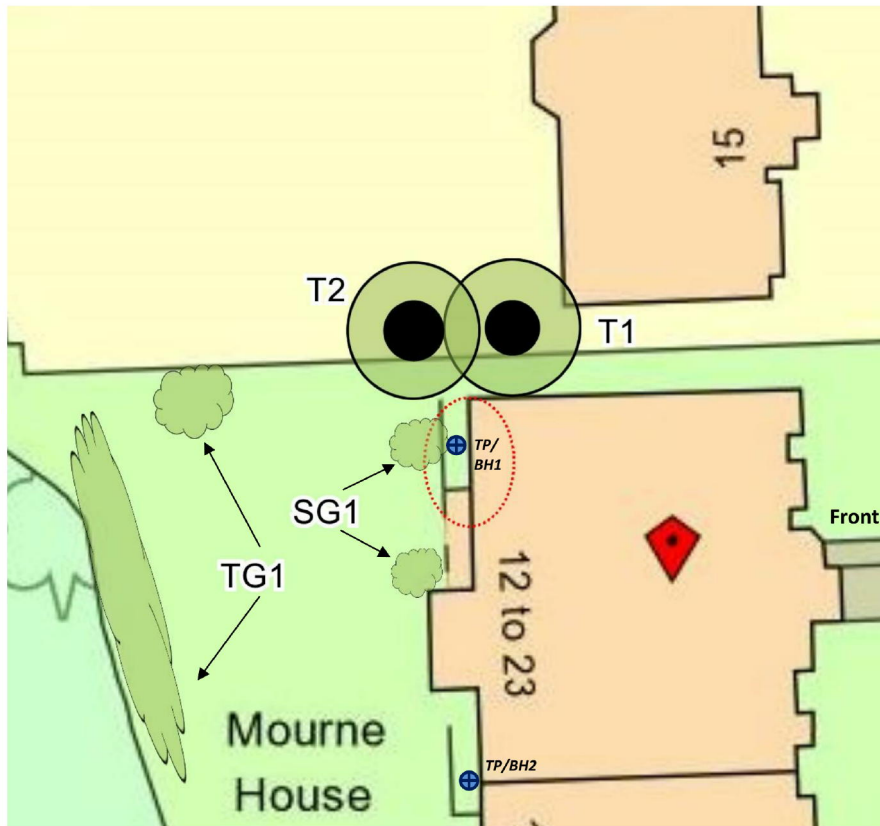
Table 2 Future Risk - Tree Details & Recommendations

| Tree No. | Species | Ht. (m) | Dia. (mm) | Crown Spread (m) | Dist. to building (m) | Age Classification | Ownership |
|--------------------|--|--|-----------|------------------|-----------------------|-----------------------|---------------|
| TG1 | Mixed species group including Birch, Prunus & Cypress | 8 | 300* | 8* | 8 | Younger than Property | Policy Holder |
| Management history | | Subject to past management/pruning. | | | | | |
| Recommendation | | Maintain broadly at no more than current dimensions by periodic pruning. | | | | | |
| SG1 | Mixed species shrubs comprising Cotoneaster and Pyracantha | 2.25 | Ms | 2.5 | 0.25 | Younger than Property | Policy Holder |
| Management history | | Subject to past management/pruning. | | | | | |
| Recommendation | | Maintain broadly at no more than current dimensions by periodic pruning. | | | | | |


Ms: multi-stemmed * Estimated value

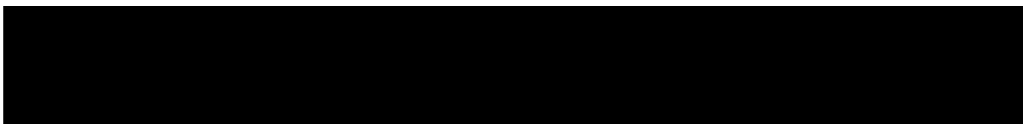


Site Plan



Plan not to scale – indicative only

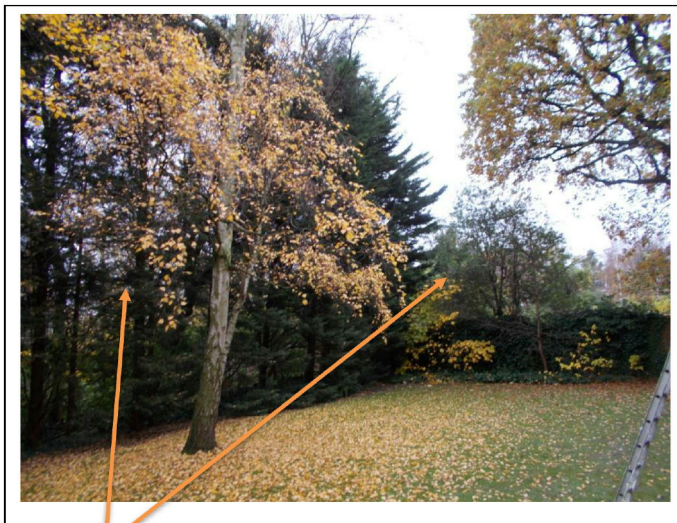
 Approximate areas of damage



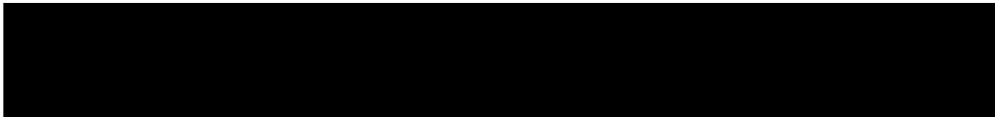
Images



View of T2 and T1



View of TG1





View of SG1

