

Arboricultural Appraisal Report

Subsidence Damage Investigation at:

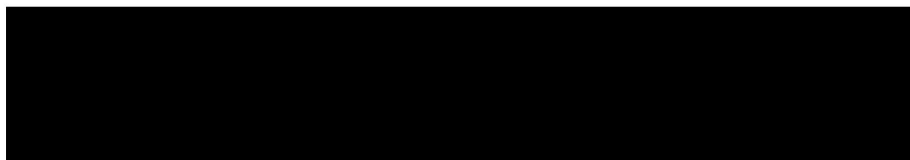
Heath Court, 10-12 Frognal
London
NW3 6AH



CLIENT:	Crawford & Company
CLIENT REF:	[REDACTED]
MWA REF:	[REDACTED]
MWA CONSULTANT:	Andy Clark
REPORT DATE:	06/07/2020

SUMMARY

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



Introduction

Acting on instructions from Crawford & Company, the insured property was visited on 25/06/2020 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 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 3 storey block of flats of traditional construction, built C.1890.

External areas comprise communal open plan gardens to the front and rear.

The property occupies a site that slopes gently downhill from left to right.

Damage Description & History

Damage relates to the rear projection, front bay and front right hand corner of the property with cracking evident throughout multiple flats.

At the time of the engineer's inspection (18/11/2019) the structural significance of the damage was found to fall within Category 2 (Slight) of Table 1 of BRE Digest 251. For a more detailed synopsis of the damage please refer to the surveyor's technical report.

We understand there was a previous episode of subsidence 28-30 years ago which resulted in underpinning at the rear. A further claim was investigated in 1996. No information on either claim has been provided.



Site Investigations

Site investigations were initially carried out by Auger on 15/01/2020 when a single trial pit [TP/BH3] was hand excavated at the front of the property to reveal the foundations with a borehole sunk through the base of the trial pit to determine subsoil conditions. A second visit was made on 14/02/2020 when two further trial pit and boreholes [TP/BH1 and TP/BH2] were excavated at the property rear.

Foundations:

Ref	Foundation type	Depth at Underside (mm)
TP/BH1	Concrete	1300
TP/BH2	Concrete	1300
TP/BH3	Brick corbel	1600

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
TP/BH1	Brown sandy fine to medium gravelly silty CLAY	60 – 61	High
TP/BH2	Brown sandy fine to medium gravelly silty CLAY	51 – 55	High
TP/BH3	Moist very stiff brown CLAY	37 – 38	Medium

Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
TP/BH1	2300	Acer spp. or Carpinus spp. or the family Salicaceae spp. [small samples]	Absent
TP/BH2	1300	Salicaceae spp.	Absent
TP/BH3	1650	Betula spp. and Prunus spp.	Present

Acer spp. includes Maples and Sycamore

Carpinus spp. are Hornbeam

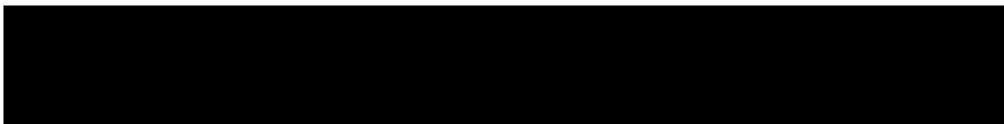
Salicaceae spp. includes Willow [Salix] and Poplar [Populus]

Betula spp. are Birch

Prunus spp. includes Cherry, Plum, Damson, Almond, Peach, Apricot, Sloe and shrubs Cherry-laurel and Portugal-laurel

Drains: No information available at the time of writing.

Monitoring: No information available at the time of writing.



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 susceptible to undergoing volumetric change in relation to changes in soil moisture.

Roots were observed to a depth of 2.3m bgl in TP/BH1 and to 1.3m bgl in TP/BH2 at the property rear, and recovered samples have been positively identified (using anatomical analysis) as Acer spp. or Carpinus spp. or the family Salicaceae spp. [small samples] and Salicaceae spp. Roots were also observed to 1.65m bgl in TP/BH3 at the property frontage, with retrieved samples being identified as Betula spp. and Prunus spp.

The origin of the Prunus spp. roots retrieved at the property frontage will be from the Laurel, HG1. The source of the Betula spp. roots is unclear, as no significant related vegetation was observed within influencing distance of the building.

Irrespective of the identification of recovered root samples at the frontage, the roots of T4 Lime will have a significant presence below the area of damage at the front left hand corner of the building and will be influencing soil moisture and volumes.

In relation to the damage at the rear, the retrieved root samples tested negative for Starch suggesting them to be dead at the time of retrieval, however there is corresponding vegetation within influencing distance which is likely to account for some of the samples – in particular the Salicaceae spp. roots, which will likely originate from the large dominant Poplars of TG1 group. No Acer spp. or Carpinus spp. vegetation however was observed nearby. Proximal vegetation to the rear may also have a contributory localised influence, particularly T1 Bay and TG2 Cypress group.

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 information currently available, it is our opinion that TG1 Poplar group is the principal cause of movement of the building and the arising current damage. T1 Bay, T4 Lime, HG1 Laurel group and TG2 Cypress group will also likely be exacerbating the movement locally and are a contributory factor.

If an arboricultural solution is to be implemented to mitigate the influence of the implicated trees/vegetation we recommend that the Poplars of TG1 group are removed, combined with the removal of T1 Bay, T4 Lime, nearby stems of HG1 group and TG2 Cypress group. Other vegetation recorded presents a potential future risk to building stability and management is therefore recommended.

Consideration has been given to pruning alone 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. Recommended tree works may be subject to change upon receipt of additional information.

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.
- 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	Bay	6.5	100	4.5	2.9	Younger than Property	Policy Holder
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Remove (fell) to near ground level and treat stumps to inhibit regrowth.					
T4	Lime	19.0	550 *	9.5 *	7.0	Younger than Property	Third Party 8 Frognal NW3 6AJ
Management history		No significant past management noted.					
Recommendation		Remove (fell) to near ground level and treat stumps to inhibit regrowth.					
TG1	Poplar with Lime understorey	24.0 *	900 *	22.0	11.6 closest Poplar stem	Younger than Property	Third Party Elm Tree House 13 Netherhall Gdns NW3 5RN
Management history		Subject to past management/pruning – Poplars previously pollarded at approx. 18.0m (regrowth appears <10yrs age). Furthest poplar @ approx. 22.5m.					
Recommendation		Remove (fell) all 4 Poplars to near ground level and treat stumps to inhibit regrowth.					
TG2	Cypress group	4.5	90 Ms *	4.0	2.4	Younger than Property	Policy Holder
Management history		No significant past management noted.					
Recommendation		Remove (fell) to near ground level.					
HG1	Laurel hedgerow group	2.5	60 Ms *	1.5	0.3	Younger than Property	Policy Holder
Management history		Subject to past management/pruning - appears regularly trimmed.					
Recommendation		Remove (fell) right hand boundary section within 3.0m to near ground level and remove regrowth as it emerges [Herbicide translocation risk].					

Ms: multi-stemmed * Estimated value



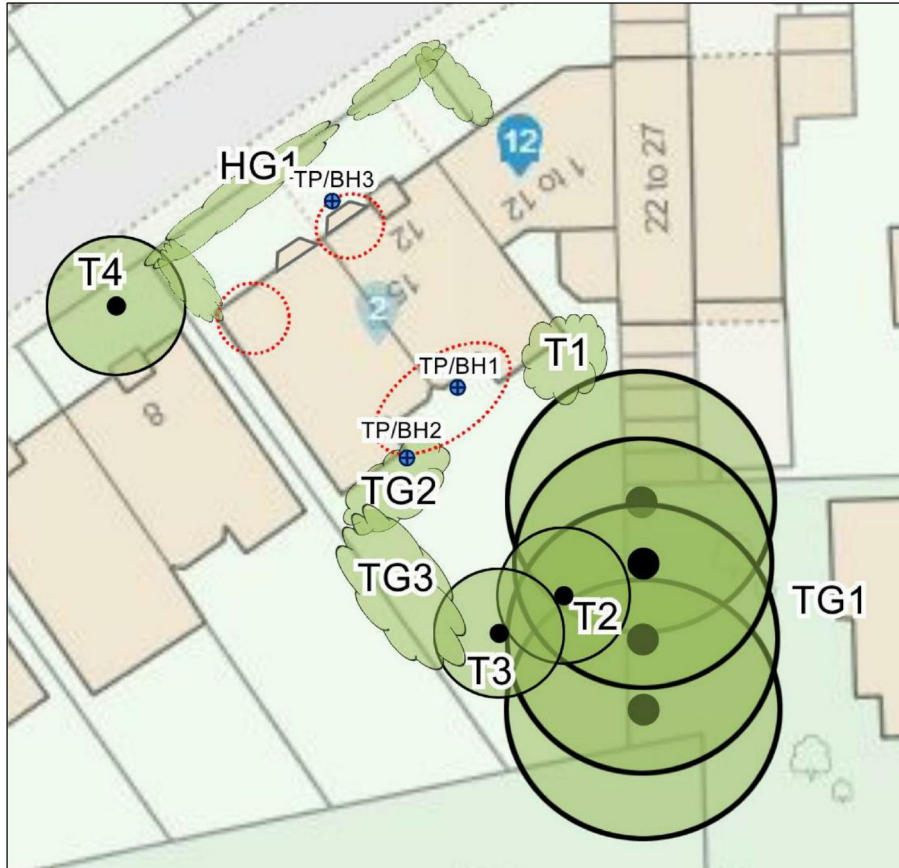
Table 2 Future Risk - Tree Details & Recommendations

Tree No.	Species	Ht (m)	Dia (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
T2	Plum	9.0	390 Ms	9.5	15.0	Younger than Property	Policy Holder
Management history		No significant past management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
T3	Purple Leaved Plum	8.0	430	9.0	13.6	Younger than Property	Policy Holder
Management history		No significant past management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
TG3	Cypress	6.5	120 Ms *	4.5	4.6	Younger than Property	Policy Holder
Management history		No significant past management noted.					
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

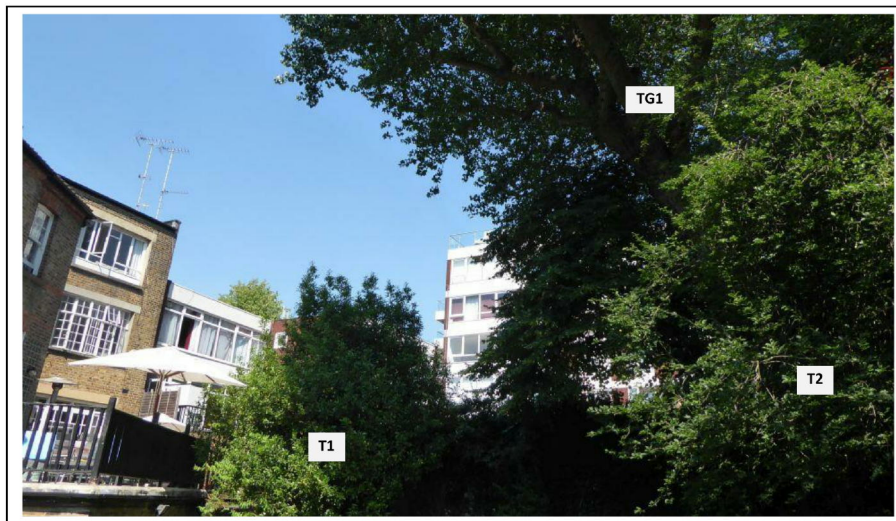
 Approximate areas of damage



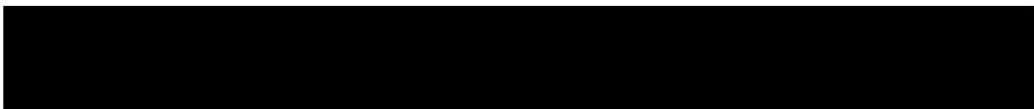
Images

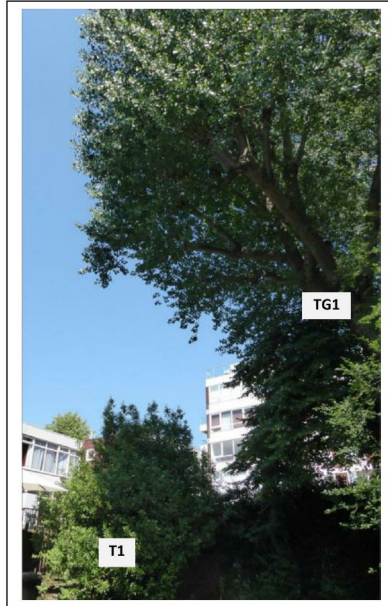


View of T4 Lime and HG1 Laurel hedgerow. Small shrubs are not considered relevant



View of T1 Bay, T2 Plum and the closest Poplar stem of TG1 group





View of T1 Bay and closest Poplar stem
of TG1 group



View of TG1 group beyond boundary fence

