

Arboricultural Appraisal Report

Subsidence Damage Investigation at:

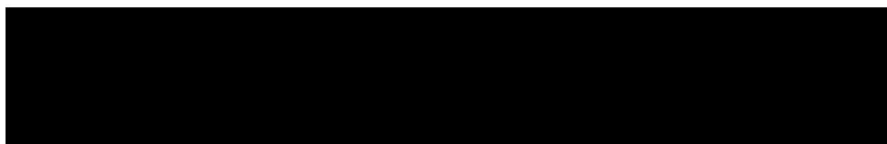
170 Maygrove Road
London
NW6 2EP



CLIENT: Crawford & Company
CLIENT REF: [REDACTED]
MWA REF: [REDACTED]
MWA CONSULTANT: Andy Clark
REPORT DATE: 25/07/2022

SUMMARY

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



Introduction

Acting on instructions from Crawford & Company, the insured property was visited on 22/07/2022 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 mid-terrace house of traditional construction, built c.1890 and since converted into self-contained flats and subject to a loft conversion.

External areas comprise gardens to the front and rear.

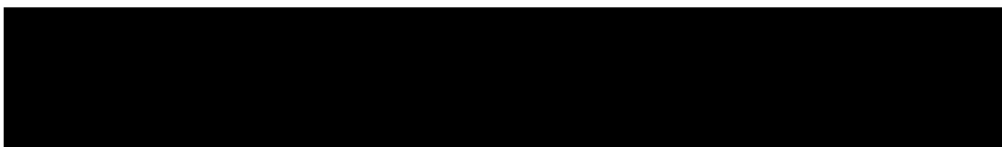
The site is generally level with no adverse topographical features.

Damage Description & History

Two separate areas of damage are evident, relating to the front bay window and associated areas of the front elevation, as well as damage to the rear projection. Damage at the rear projection appears longstanding however, and has not been confirmed as subsidence related. Damage is reported to have first been observed during July 2021.

At the time of the engineer's inspection (19/01/2022) the structural significance of the damage was found to fall within Category 3 (Moderate) of Table 1 of BRE Digest 251. For a more detailed synopsis of the damage please refer to the building surveyor's technical report.

We have not been made aware of any previous claims.



Site Investigations

Site investigations were carried out by Auger on 18/03/2022, when 2 trial pits were hand excavated to reveal the foundations, with a borehole sunk through the base of the trial pit to determine subsoil conditions. A drains survey was also undertaken.

Foundations:

Ref	Foundation type	Depth at Underside (mm)
TP/BH1	Concrete	1050
TP/BH2	Concrete	1050

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
TP/BH1	Dry very stiff brown fine to medium gravelly silty CLAY	48 – 60	High
TP/BH2	Moist stiff brown fine to medium gravelly silty CLAY	44 – 46	High

Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
TP/BH1	2550	Pomoideae gp. and Salicaceae spp.	Present
TP/BH2	No Roots Observed	N/A	N/A

Pomoideae gp includes Apple, Pear, Hawthorn, Rowan, Whitebeam, Service tree and Medlar, and shrubs including Pyracantha, Chaenomeles, Quince, Amelanchier and Cotoneaster
Salicaceae spp. are Salix (Willows) and Populus (Poplars)

Drains: The drains have been surveyed and defects have been identified, however leaking drains are concluded not to be a cause of the current damage.

Monitoring: Level monitoring is in progress, commencing on 28/04/2022 and with one subsequent reading available at the time of writing.

Monitoring shows mostly downward movement focussed on the front of the property of up to -5.2mm [stud 1].

Further readings, as they become available, will confirm the extent of movement and whether any seasonal pattern is evident.

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 2.55m bgl in TP/BH1 and recovered samples have been positively identified (using anatomical analysis) as Pomoideae gp. and Salicaceae spp.; the origins of which will be T4 Cockspur thorn and the nearby stems of TG2 Poplar group, confirming their influence on the soils below the foundations.

Irrespective of the identification of recovered root samples, the roots of the nearby HG1 Privet hedgerow will also likely be present below foundation level in proximity to the area of movement/damage and contributing to the influence of soil moisture and volumes.

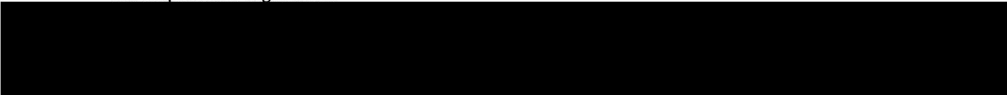
Level monitoring between April and June 2022 records pronounced downward movement across the front elevation illustrating the drying action of nearby current claim vegetation. Further downward movement is likely given weather patterns to late July.

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.

If an arboricultural solution is to be implemented to mitigate the influence of the implicated trees/vegetation we recommend that T4 Cockspur thorn and the eastern-most 4 x stems of TG2 Poplar group are removed, along with significant crown management of the Privet hedgerow HG1.

Other vegetation recorded presents a potential future risk to building stability and management is therefore recommended. Recommended tree works may be subject to change upon receipt of additional information.

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.



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.

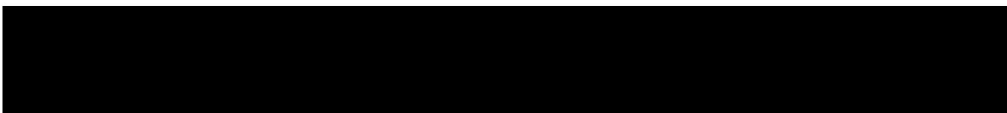


Table 1 **Current Claim - Tree Details & Recommendations**

Tree No.	Species	Ht (m)	Dia (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
T4	Cockspur Thorn (Crataegus spp.)	9.5	310	7.0	5.7	Younger than Property	Local Authority
Management history		No significant past management noted.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					
HG1	Privet hedge	3.0	20 Ms *	2.0	2.7	Younger than Property	Third Party 172 Maygrove Road NW6 2EP
Management history		No significant recent management noted.					
Recommendation		Reduce height to 1.5 and cut back sides to leave hedge no wider than 0.5m. Trim on an annual cycle thereafter to maintain at broadly reduced dimensions.					
TG2	Poplar group	19.0	400 *	10.0 *	19.2	Younger than Property	Local Authority
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Remove (fell) eastern-most 4x stems to near ground level and treat stumps 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
T1	Philadelphus	5.0	40 Ms *	4.5	3.1	Younger than Property	Third Party 131 Iverson Road NW6 2RA
Management history		No significant past management noted.					
Recommendation		Reduce height to 1.0m and thereafter re-prune on an annual cycle to maintain at broadly reduced dimensions.					
T2	Ash	9.5	200 *	7.5 *	7.8	Younger than Property	Third Party 168 Maygrove Road NW6 2EP
Management history		No significant past management noted.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					
T3	Cherry	4.0 *	100 *	3.5 *	8.1	Younger than Property	Third Party 123-127 Iverson Road NW6 2RA
Management history		No significant past management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
T5	Crataegus	5.5	220	4.5	11.3	Younger than Property	Local Authority
Management history		No significant past management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
T6	Ginkgo	8.5	160	5.0	12.7	Younger than Property	Local Authority
Management history		No significant past management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					

Ms: multi-stemmed * Estimated value



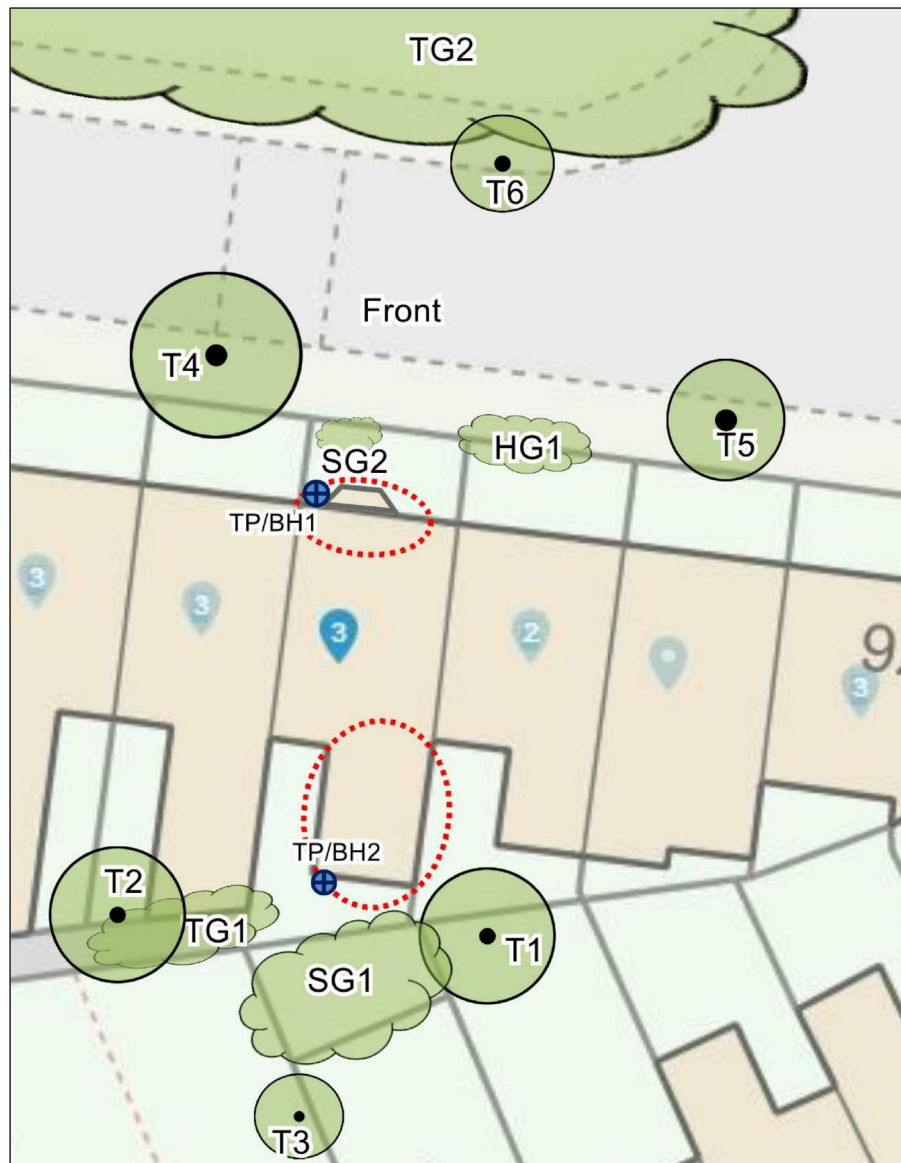
Table 2 **Future Risk - Tree Details & Recommendations (contd.)**

Tree No.	Species	Ht (m)	Dia (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
TG1	Sycamore self sown	5.5	30 Ms *	3.0	3.0	Younger than Property	Third Party 168 Maygrove Road NW6 2EP
Management history		No significant past management noted. Growing in access alleyway – likely self-sown.					
Recommendation		Remove (fell) to near ground level and treat stumps to inhibit regrowth.					
SG1	Mixed spp. group of mostly Rose, Lavender, Fuchsia and Camelia	2.0	10 Ms *	1.5	2.5	Younger than Property	Third Party 129 & 129A Iverson Road NW6 2RA
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
SG2	Dog rose and Berberis group	1.0	20	1.0	1.9	Younger than Property	Policy Holder
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					


Ms: multi-stemmed * Estimated value



Site Plan



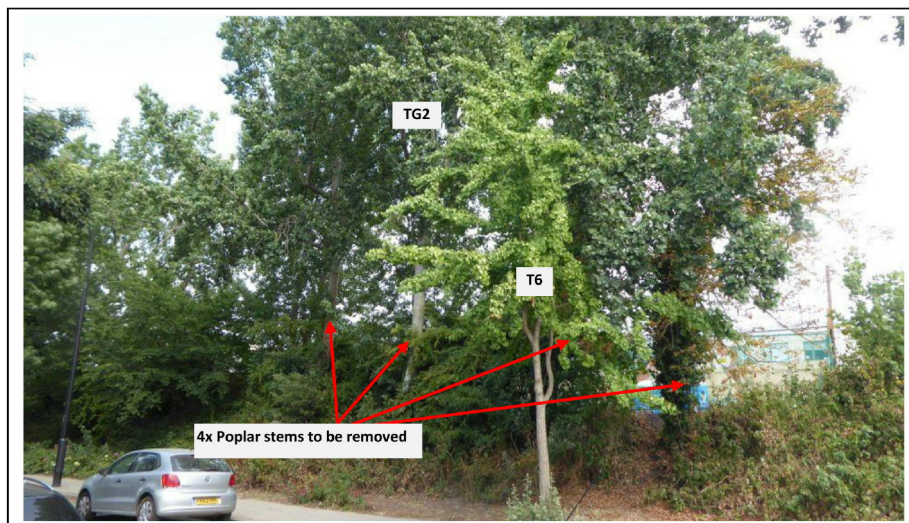
Plan not to scale – indicative only


 Approximate areas of damage

Images



View of T1 Crataegus and HG1 Privet hedgerow



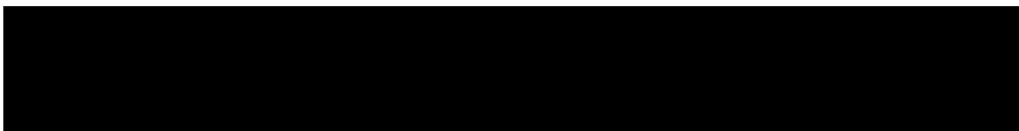
View of T6 Ginkgo tree with TG2 Poplar group visible beyond



View of T1 Philadelphus with SG1 shrub group visible to right



View of T2 Ash and TG1 Sycamore group



Management of vegetation to alleviate clay shrinkage subsidence.

All vegetation requires water to survive which is accessed from the soil. Clay soils shrink when water abstracted by vegetation exceeds inputs from rainfall, which typically occurs during the summer months. When deciduous vegetation enters dormancy and loses its leaves and rainfall increases during the winter months, soil moisture increases and the clay swells. (Evergreen trees and shrubs use minimal/negligible amounts of soil water during the winter).

Buildings founded on clay are susceptible to movement as the clay shrinks and swells which can result in cracking or other damage.

Where damage does occur, pruning (reducing leaf area) can in some circumstances be effective in restoring stability however, removal of the influencing vegetation (trees, shrubs, climbers) causing the ground movement offers the most predictable and quickest solution in stabilising the clay and hence the building and for this reason is frequently initially recommended as the most appropriate solution.

Often this is unavoidable due to the size or number of influencing trees, shrubs etc and their proximity to the building. Very heavy pruning of some species to a level required to effectively control its water use can result in the trees decline and ultimately death and is one factor considered when making recommendations for remedial tree works. Pruning alone, whilst reducing soil moisture uptake is often an unpredictable management option in restoring building stability either in the short or long term.

In some circumstances however, where vegetation initially recommended for removal is subsequently pruned and monitoring indicates the building has stabilised, removal becomes unnecessary with decisions based on best evidence available at the time.

