Arboricultural Appraisal Report

Subsidence Damage Investigation at:

Flat 1, 129 West End Lane
London
NW6 2PE

CLIENT:	Crawford & Company
CLIENT REF:	[redacted]
MWA REF:	
MWA CONSULTANT:	Andy Clark
REPORT DATE:	16/05/2022

SUMMARY

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

[redacted]

Introduction

Acting on instructions from Crawford & Company, the insured property was visited on 13/05/2022 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 ground floor flat within a 3-storey detached house of traditional construction, originally built C.1890 and since converted into self-contained flats during the 1970's/80's and further since extended with a single-storey addition to the rear.

External areas comprise gardens to the front and rear.

The site is generally level with no adverse topographical features.

Damage Description & History

Damage relates prdominatly to the central areas of the flat, with internal cracking to the partition walls affecting the Hall, Kitchen/Dining room and communal areas. Isolated cracking is also noted to the rear right bedroom.

At the time of the engineer's inspection (10/01/2022) 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 building surveyor's technical report.

We understand the property was the subject of a previous claim for subsidence damage, which resulted in the front right-hand section of the property being underpinned in 1998.

[redacted]

Site Investigations

Site investigations were carried out by Auger on 07/03/2022, 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	Brick corbel	1100
TP/BH2	TP abandoned	N/A

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
TP/BH1	Brown fine to course gravelly silty CLAY, becoming medium gravelly with depth.	47 – 48	High
TP/BH2	TP abandoned	N/A	N/A

Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
TP/BH1	1100	Platanus spp.	Present
TP/BH2	TP abandoned	N/A	N/A

Platanus spp. are Planes, London Plane and Oriental Plane

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: No information available at the time of writing.

[redacted]

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 1.1m bgl in TP/BH1, and recovered samples have been positively identified (using anatomical analysis) as Platanus spp.; the origin of which will most likely be the Policy Holders T1 London Plane at the rear of the building.

Whilst T1 London Plane is likely to be a contributor to the damage, the tree appears regularly pollarded and as such its moisture uptake is controlled. The significantly larger T3 London Plane will have a much greater soil moisture use and in our view is the likely principal cause of 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.

If an arboricultural solution is to be implemented to mitigate the influence of the implicated trees/vegetation we recommend that T1 London Plane and T3 London Plane are removed.

Other vegetation recorded presents a potential future risk to building stability and management is therefore recommended. Recommended tree works may however 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.

[redacted]

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.

[redacted]

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	London Plane	11.5	470	5.5	9.6	Older than extension(s)	Policy Holder
Management history		Subject to past management/pruning - previously pollarded at approx. 10.0m.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					
T3	London Plane	16.0	690	12.0	7.4	Younger than Property	Local Authority
Management history		Subject to past management/pruning - previously crown reduced.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					

Ms: multi-stemmed * Estimated value

[redacted]

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	Cypress	5.5	220	3.0	5.5	Older than extension(s)	Policy Holder
Management history		Recently reduced/pruned.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
T4	Lime	9.5	330	4.5	9.6	Younger than Property	Local Authority
Management history		Subject to past management/pruning - previously crown reduced.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
SG1	Ivy and Fig group	5.0	120 Ms *	7.0	6.6	Older than extension(s)	Third Party 131 West End Lane NW6 2PD
Management history		No significant past management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
SG2	Mixed spp. group of mostly Pyracantha, Rose, Forsythia and Virginia Creeper	5.0	40 Ms *	6.0	8.1	Younger than Property	Policy Holder
Management history		No significant past management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
SG3	Mixed spp. group of mostly Lilac, Cypress, Bay and Fig	6.0	80 Ms *	4.5	1.8	Older than extension(s)	Third Party 127 West End Lane NW6 2PD
Management history		No significant past management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					

Ms: multi-stemmed * Estimated value

[redacted]

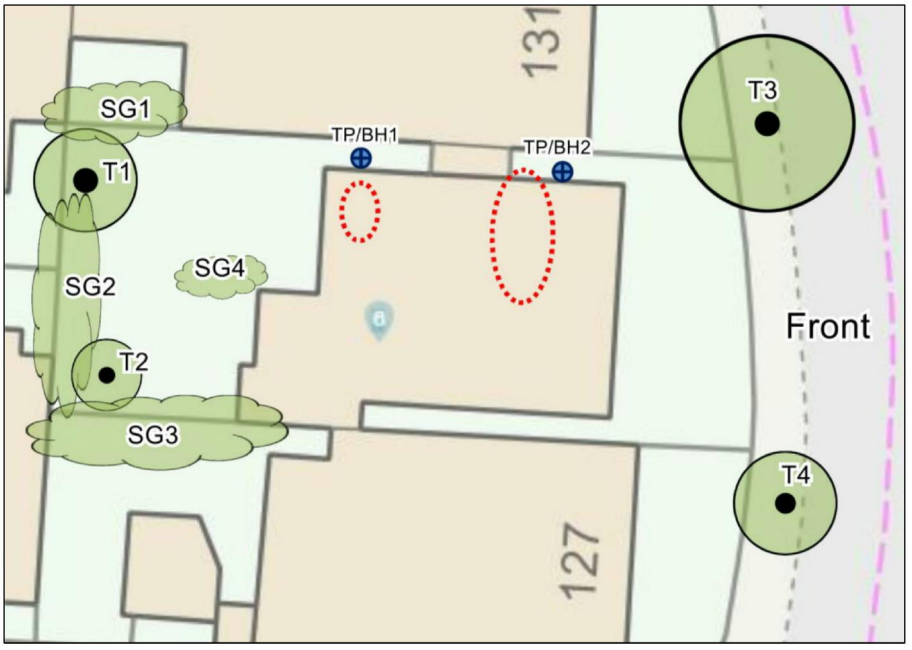
Table 2 **Future Risk** - Tree Details & Recommendations (contd.)

Tree No.	Species	Ht (m)	Dia (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
SG4	Laurel group	2.0	20 Ms *	1.0	1.0	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

[redacted]

Site Plan

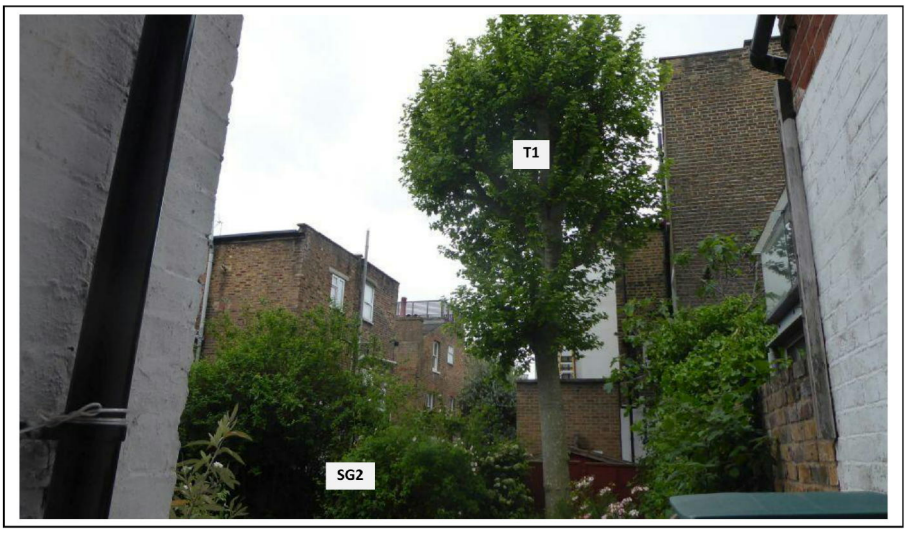


Plan not to scale – indicative only

Approximate areas of damage

[redacted]

Images



View of T1 London Plane with SG2 understorey

View of T3 London Plane

[redacted]

Overview of property rear

[redacted]

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.

[redacted]