Arboricultural Appraisal Report

Subsidence Damage Investigation at:

10 Park Village East
London
NW1 7PX

CLIENT:	Crawford & Company
CLIENT REF:	[redacted]
MWA REF:	
MWA CONSULTANT:	Richard Percival (TechArborA)
REPORT DATE:	17/03/2023

SUMMARY

Statutory Controls			Mitigation (Current claim tree works)	
TPO current claim	No		Policy Holder	Yes
TPO future risk	No		Domestic 3rd Party	Yes
Cons. Area	Yes		Local Authority	No
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 24/11/2022 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 three-storey semi-detached house built in c.1840. It has been extended to the rear right-flank with a single storey addition built roughly 8 to 10 years ago.

External areas comprise gardens to the front and rear.

The property occupies a site that slopes steeply downhill from front to rear with the first floor of the main house at street level and the ground floor (including the extension) at the level of the rear garden which also continues to slope downwards.

Damage Description & History

Damage relates to the extension where internal and external cracking indicates downward movement.

For a more detailed synopsis of the damage please refer to the surveyor's technical report.

We have not been made aware of any previous claims.

[redacted]

Site Investigations

Site investigations were carried out by Auger on 27/01/2023, 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.

Foundations:

Ref	Foundation type	Depth at Underside (mm)
TH1a	Concrete (Extension)	500
TH1b	Concrete (Balcony Extension)	1300
TH2	Concrete	500

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
TH1	Brown fine to medium gravelly clayey SILT becoming Brown fine to medium gravelly silty CLAY	36 - 43	Medium - High
TH2	Brown fine to medium gravelly silty CLAY	46 - 54	High

Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
TH1	No Roots Observed	NA	NA
TH2	500	*Rosoideae*	Present
TH2	500	*Shrub*	Absent

Rosoideae is a group of closely related shrubs which include roses, brambles & potentilla.

Drains: No information available at the time of writing.

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. A comparison between moisture content and the plastic and liquid limits suggests moisture depletion at the time of sampling in TH2 at depths beyond normal ambient soil drying processes such as evaporation indicative of the soil drying effects of vegetation.

Roots were observed to a depth of 0.5m bgl in TH2 and recovered samples have been positively identified (using anatomical analysis) as *Rosoideae,* the origin of which will be elements of CG1 confirming its influence on the soils below the foundations. A shrub root was also identified which is likely to be from a component of G1.

Irrespective of the identification of recovered root samples, the roots of the remaining vegetation recorded in Table 1 (see below) are also likely to be present below foundation level in proximity to the area of movement/damage and influencing soil moisture and volumes.

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 the trees and shrubs detailed in Table 1 are the principal cause of or are materially contributing to the current subsidence damage.

If an arboricultural solution is to be implemented to mitigate the influence of the implicated trees/vegetation we recommend that the works specified in Table 1 are carried out. 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.

[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	Cypress (Italian)	9 *	200 *	2 *	0.1 *	Older than extension(s)	Third Party 8 Park Village East NW1 7PX
Management history		Growing in elevated position level with road. No recent management noted.					
Recommendation		Remove (fell) to near ground level					
T3	Ash	16	640	4	6.2	Older than extension(s)	Policy Holder
Management history		Recently reduced/pruned.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					
CG1	Ivy, rose, jasmine	2.5	30 Ms *	2	0.5	Younger than Property	Policy Holder
Management history		Subject to past management/pruning.					
Recommendation		Remove (fell) to near ground level and treat stumps to inhibit regrowth.					
G1	Photinia, cordyline, jasmine, laurel, prunus	6	200 *	4	0.6 *	Older than extension(s)	Third Party 8 Park Village East NW1 7PX
Management history		No recent management noted.					
Recommendation		Remove (fell) to near ground level and treat stumps 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	Olive	5 *	180 *	5	2 *	Older than extension(s)	Third Party 8 Park Village East NW1 7PX
Management history		Growing in elevated position level with road. No recent management noted.					
Recommendation		No works at present. Subject to review if movement persists.					
T4	Ash	15 *	387	12	21	Older than extension(s)	Policy Holder
Management history		No recent management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
T5	Cupressus family	2	100	0.8	3 *	Younger than Property	Policy Holder
Management history		No recent management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
T6	Beech	7 *	80 *	1.6 *	2 *	Younger than Property	Third Party 12 Park Village East NW1 7PX
Management history		No recent management noted.					
Recommendation		No works at present.					
TG1	Cotoneaster	7 *	185	9	10.8	Older than extension(s)	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

[redacted]

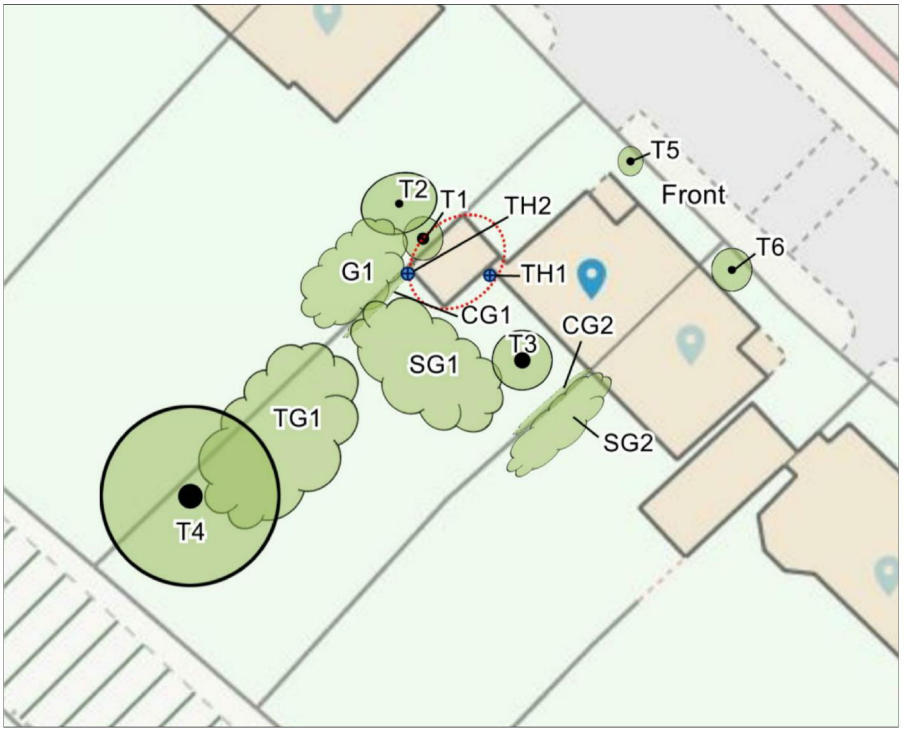
Table 2 **Future Risk** - Tree Details & Recommendations Cont'd

Tree No.	Species	Ht (m)	Dia (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
SG1	Mixed ornamental shrub group	2.5	50 Ms *	2	2.5	Older than extension(s)	Policy Holder
Management history		Subject to past management/pruning.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning. Subject to review if movement persists.					
SG2	Bamboo	5	15 Ms *	2.5	1 *	Younger than Property	Third Party 12 Park Village East NW1 7PX
Management history		No past management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
CG2	Ivy	1.4	30 *	0.2	1 *	Older than extension(s)	Policy Holder
Management history		No recent management noted.					
Recommendation		No works at present.					

Ms: multi-stemmed * Estimated value

[redacted]

Site Plan

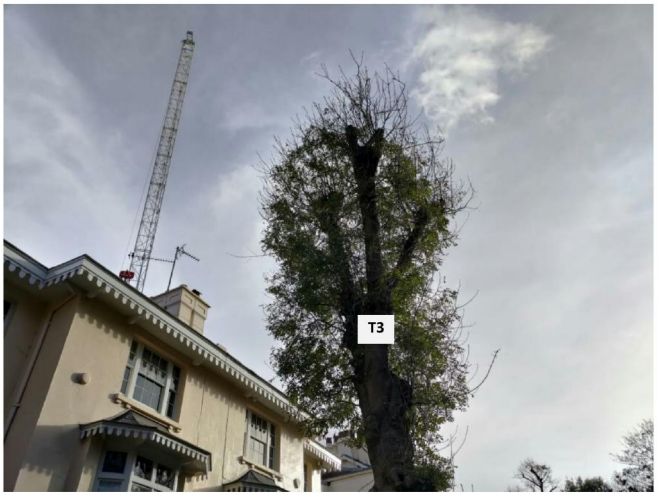


Plan not to scale – indicative only

Approximate areas of damage

[redacted]

Images



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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.