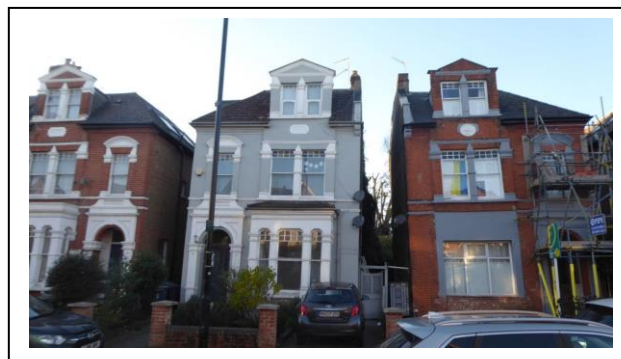


Arboricultural Appraisal Report

Subsidence Damage Investigation at:

14 Park Avenue
London
N22 7EX



CLIENT:	Crawford & Company
CLIENT REF:	SU2205934
MWA REF:	SUB221117-11294
MWA CONSULTANT:	Andy Clark
REPORT DATE:	21/07/2023

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	None at present
Trusts schemes	No	Other	No
Local Authority: -	London Borough of Haringey		

Introduction

Acting on instructions from Crawford & Company, the insured property was visited on 08/12/2022 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 end-terrace house of traditional construction, built C.1890 and since extended 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 is noted throughout the property but primarily affecting the right hand side. Damage is reported to have first been observed during August 2022. 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 CET on 19/06/2023, when three 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 carried out. Please refer to the Site Investigation report for further details.

Discussion

Opinion and recommendations in this report are made on the understanding that Crawford & Company have identified clay shrinkage subsidence as a cause of building movement and damage.

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 at depths beyond normal ambient soil drying processes, such as evaporation, which is indicative of the soil drying effects of vegetation.

Roots were observed below foundation depths in TP/BH1, TP/BH2 and TP/BH3, and recovered samples have been positively identified (using anatomical analysis) as Cupressaceae spp., Populus spp., Clematis spp., Magnolia spp. and broadleaved species, too decayed for positive identification.

At present the most significant of the retrieved root samples are those relating to the Clematis and Magnolia elements. These will originate from the Clematis of the CG1 and the Magnolia T2 and the climber group which swamps the rear right hand corner of the building and surrounding areas. The Populus spp. roots will emanate from the T7 Poplar, but at present are not considered significant while the climbers and more proximal vegetation remains in situ. The Cupressaceae spp. roots at TP/BH1 at the property frontage are not considered relevant.

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 the climbers of CG1 and T2 Magnolia are removed in the first instance.

Removals of the CG1 group should include removal of any and all understorey trees/shrubs which have been swamped by the growth and are no longer visible. Removals of the CG1 should also include related elements which have grown outside of the property boundary and progressed into the adjacent third party garden.

Once the proximal vegetation has been addressed, then the involvement of the more distant trees can be effectively assessed. This may include a requirement for a re-visit to site to assess/record any vegetation obscured from view by the CG1 climber group.

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.

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.

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

Tree No.	Species	Ht (m)	Dia (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
CG1	Group of mixed spp. climbers including Ivy, Passionflower and Clematis	15.0	60 *	15.0 *	1.0 *	Younger than Property	Joint Policy Holder & 12 Park Avenue N22 7EX
Management history		No significant past management noted. Extensive growth over boundary fence and colonisation of rear right-hand corner of building					
Recommendation		Remove (fell) all within 6.0m of the building to near ground level and treat stumps to inhibit regrowth. Removal should include any/all understorey trees and shrubs and any elements that have crossed the boundary into adjacent third party garden.					
T2	Magnolia	5.0	150 Ms *	5.5	4.8	Younger than Property	Policy Holder
Management history		No significant past 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
T5	Eucalyptus	7.0	220 *	3.0	19.0	Younger than Property	Policy Holder
Management history		No significant past management noted. In a state of part collapse.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					
T6	Mimosa	13.5	400 *	9.5	24.5	Younger than Property	Policy Holder
Management history		No significant past management noted.					
Recommendation		No works required at present (subject to review if movement persists).					
T7	Poplar	16.5	1300	16.0	33.0	Younger than Property	Local Authority
Management history		Subject to past management/pruning - previously pollarded at approx. 8.0m.					
Recommendation		No works required at present (subject to review if movement persists).					
T8	Ash	14.0	220 *	7.5	13.5	Younger than Property	Third Party 10 Park Avenue N22 7EX
Management history		No significant past management noted.					
Recommendation		No works required at present (subject to review if movement persists).					
TG1	Ash group	16.0	450 *	14.5	19.7	Younger than Property	Third Party 12 Park Avenue N22 7EX
Management history		No significant past management noted.					
Recommendation		No works required at present (subject to review if movement persists).					

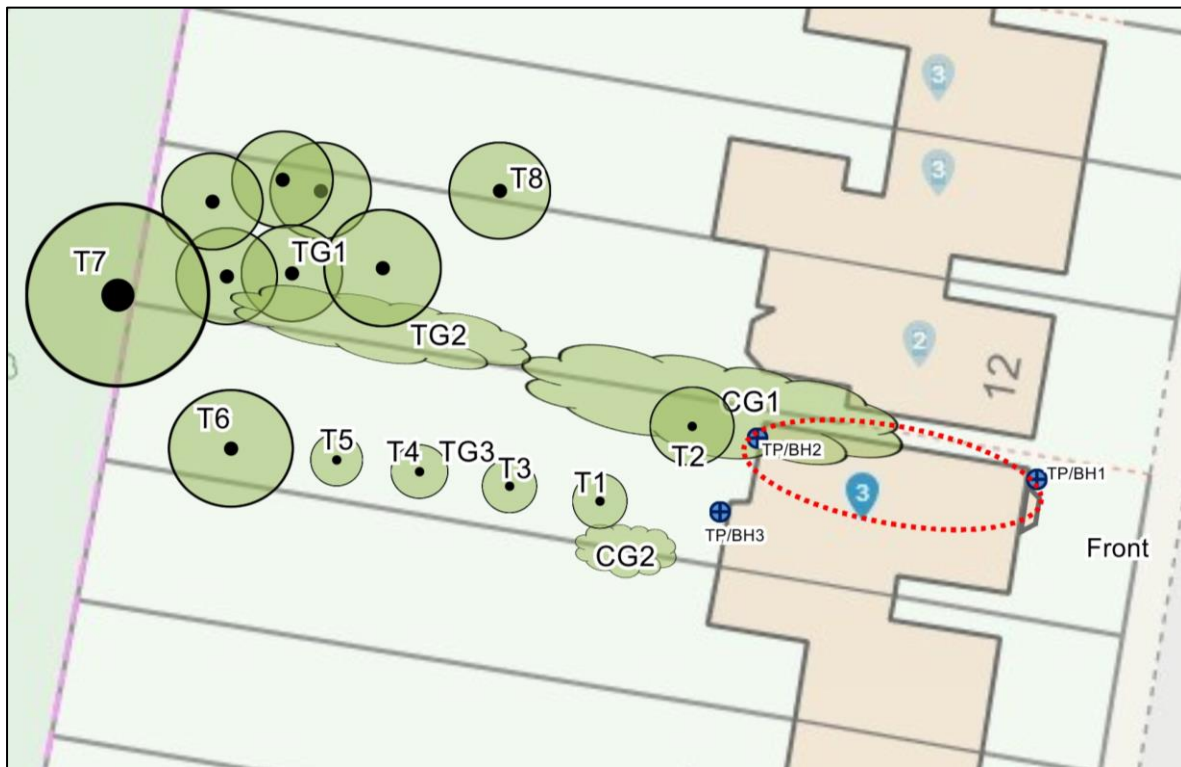
Ms: multi-stemmed * Estimated value

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
TG2	Mixed spp. boundary group of mostly Viburnum, Plum and Ash with Ivy	6.0	240 Ms *	70	8.0	Younger than Property	Third Party 12 Park Avenue N22 7EX
Management history		No significant past management noted.					
Recommendation		No works required at present (subject to review if movement persists).					
TG3	Lilac and Apple group	3.0	120 Ms *	2.0	6.0 *	Younger than Property	Policy Holder
Management history		Group of small sporadically planted trees – all previously crown reduced. Individual stems annotated as T1, T3 and T4.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
CG2	Ivy group	3.0	50 *	3.0	3.0	Younger than Property	Policy Holder
Management history		No significant past management noted.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					

Ms: multi-stemmed * Estimated value

Site Plan



Plan not to scale – indicative only



Approximate areas of damage

Images



View from right-hand flank of CG1 group



View from rear of CG1 group and T2 Magnolia



View of T6 Mimosa and T7 Poplar



View of TG1 Ash 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.