

Arboricultural Appraisal Report

Subsidence Damage Investigation at:

84B Bartholomew Road
London
NW5 2AS



CLIENT:	Crawford & Company
CLIENT REF:	[REDACTED]
MWA REF:	[REDACTED]
MWA CONSULTANT:	Andy Clark
REPORT DATE:	16/06/2023

SUMMARY

Statutory Controls		Mitigation (Current claim tree works)	
TPO current claim	Yes – T4	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 02/05/2023 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 4 storey mid-terrace house of traditional construction, built C.1890 and since converted into self-contained flats and 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 relates to the front elevation of the insured dwelling, with cracking first observed during July 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 Auger on 05/04/2023, when a single remote borehole was excavated within the property front garden to determine subsoil conditions.

Foundations:

Ref	Foundation type	Depth at Underside (mm)
BH1	N/A – remote BH	N/A

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
BH1	TOPSOIL to 500mm, becoming moist brown silty CLAY below	36 – 45	Medium – High

Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
BH1	1000	Tilia spp.	Absent

Tilia spp. are Limes

Drains: No information available at the time of writing.

Monitoring: No information available at the time of writing.



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 to a depth of 1.0m bgl in BH1, and recovered samples have been positively identified (using anatomical analysis) as *Tilia* spp; the origins of which will be one or both of T3 and T4 both of which are within influencing distance of the building.

Irrespective of the identification of recovered root samples, our survey has identified vegetation within influencing distance of the building with a current potential to influence soil volumes below foundation level; the most significant of which in relation to the current damage are the SG2 shrub group, and the TG1 group, as well as the limes T3 and T4.

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 SG2 and TG1 groups are removed, and the limes T3 and T4 are subject to significant crown management [pollarding].

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 at depth 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
T3	Lime	17.0	650	7.5	7.8	Younger than Property	Third Party 88 Bartholomew Road NW5 2AS
Management history		Subject to past management/pruning - previously pollarded at approx. 14.0m.					
Recommendation		Pollard at approx. 10.0m and re-pollard thereafter on a biennial cycle to maintain at reduced dimensions.					
T4	Lime	12.0	500	7.5	10.0	Younger than Property	Third Party 82 Bartholomew Road NW5 2AS
Management history		Subject to past management/pruning - previously pollarded at approx. 10.0m.					
Recommendation		Re-pollard to previous points at approx. 10.0m and re-pollard thereafter on a biennial cycle to maintain at reduced dimensions.					
TG1	Mixed spp. group of mostly Forsythia, Snowberry, Cotoneaster and Cypress	6.5	80 Ms *	5.5	1.5	Younger than Property	Third Party 82 Bartholomew Road NW5 2AS
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Remove (fell) all to near ground level and treat shrub stumps to inhibit regrowth.					
SG2	Mixed spp. group of mostly Cotoneaster, Rose and Honeysuckle	3.0	10	2.5	1.1	Younger than Property	Policy Holder
Management history		No significant recent management noted.					
Recommendation		Remove (fell) all to near ground level and treat stumps to inhibit regrowth.					

Ms: multi-stemmed * Estimated value



Table 2 **Future Risk - Tree Details & Recommendations**

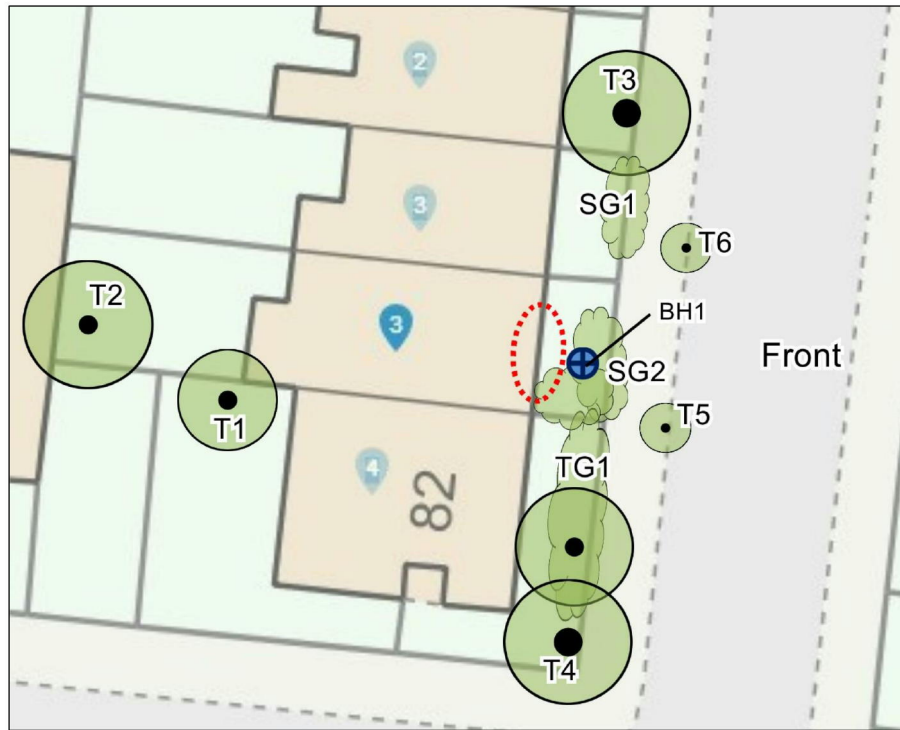
Tree No.	Species	Ht (m)	Dia (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
T1	Bay	6.5	110 Ms *	4.5	1.2	Younger than Property	Third Party 82 Bartholomew Road NW5 2AS
Management history		No significant recent management noted.					
Recommendation		Remove (fell) all to near ground level and treat stump to inhibit regrowth.					
T2	Garrya	7.0	110 Ms *	6.0	6.5	Younger than Property	Policy Holder
Management history		No significant recent management noted.					
Recommendation		Reduce height to 5.0m and re-prune on an annual cycle to maintain at broadly reduced dimensions.					
T5	Sorbus	5.0	40	1.5	5.0	Younger than Property	Local Authority
Management history		Recently planted.					
Recommendation		No works required.					
T6	Sorbus	4.0	30	1.5	5.4	Younger than Property	Local Authority
Management history		Recently planted.					
Recommendation		No works required.					
SG1	Euonymus group	3.0	10 Ms *	3.0	3.5	Younger than Property	Local Authority Located at 86 Bartholomew Road NW5 2AS
Management history		Subject to past management/pruning - appears regularly trimmed.					
Recommendation		Maintain broadly at no more than current dimensions.					

Ms: multi-stemmed


* Estimated value



Site Plan



Plan not to scale – indicative only

 Approximate areas of damage

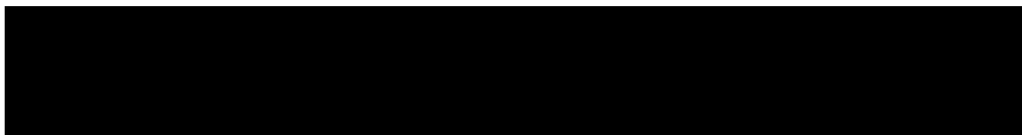
Images



Overview of vegetation at property frontage



View of proximal vegetation



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.

