

Arboricultural Appraisal Report

Subsidence Damage Investigation at:

Garden Flat
37 Redington Road
London
NW3 7QY



CLIENT:	Pyle Consulting
CLIENT REF:	BRC/sp/8356
MWA REF:	SUB170724-1616
MWA CONSULTANT:	Andy Clark
REPORT DATE:	11-08-2017

SUMMARY

Statutory Controls		Mitigation (current claim)	
TPO	Yes – T1	Insured	Yes
Cons. Area	Yes	3 rd Party	No
Trusts schemes	N/A	Local Authority	No
Planning	N/A	Other	No
Local Authority: -	London Borough of Camden		

Introduction

Acting on instructions received from Pyle Consulting, the insured property was visited on 26/07/2017 for the purpose of assessing the role of vegetation in respect of subsidence damage.

Specifically, we are instructed to provide opinion and give recommendations on what vegetation management, if any, may be carried out with a view to restoring stability to the subject 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 made available to us at the time of writing and may be subject to review upon receipt of additional site investigation data, monitoring, engineering opinion or other information as it comes to bare.

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 detached semi-detached 3 storey house with a single-story kitchen addition to the rear built in C.1982.

External areas comprise hardstanding driveway and gardens to the front and gardens to the rear.

The site slopes downward significantly to the rear with steps downwards to the right-hand elevation over a level drop of approx. 4m.

Damage Description & History

The current damage affects the rear addition and the rear central bay. Damage to the rear addition is understood to have first been noticed in late summer 2016.

We have not been made aware of any previous claims, however understand that ongoing investigations pertaining to the subject property have been underway since early 2017.

At the time of the engineers' inspection (03/04/2017) the structural significance of the damage was found to fall within Category 2 (Slight) of Table 1 of BRE Digest 251.

Site investigations

Site investigations were carried out by GEOTECHNICAL on 17/02/2017 when two trial pits were hand excavated to reveal the foundations, with a borehole being sunk through the base of the trial pit to determine subsoil conditions. An additional four boreholes were sunk by FASTRACK on 20/06/201.

Foundations:

Ref	Foundation type	Depth at Underside (mm)
TH1	Concrete	1000
TH2	Concrete	1000

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
TH/BH1	Firm to soft light brown sandy CLAY with rare fine gravel	29 - 39	Medium
TH/BH2	Firm to soft brown sandy CLAY with rare fine gravel	35 - 42	Medium - High
TH/BH3	Firm to stiff mid brown silty slightly gravelly CLAY containing orange sand pockets	31 - 33	Medium
TH/BH4	Firm to stiff mid brown sandy CLAY containing orange sand pockets & grey mottling	26 - 30	Medium
TH/BH5	Stiff mid brown to brown/green silty sandy CLAY containing grey mottling & sand pockets	22 - 36	Medium
TH/BH6	Stiff mid brown silty sandy CLAY containing grey mottling & orange sand pockets	23 - 37	Medium

Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
TH/BH1	2000	Quercus spp. [but possibly Castanea spp.]	Present
TH/BH2	2000	Quercus spp. [but possibly Castanea spp.]	Present
TH/BH6	2700	Samples not identified	N/A

Drains: No information available at the time of writing.

Monitoring: We understand that crack and level monitoring are underway, however no results are available at the time of writing.

Discussion

Opinion and recommendations are made on the understanding that Pyle Consulting are satisfied that the current building movement and the associated damage is the result of clay shrinkage subsidence with T1 Oak being implicated as causal, and that other possible causal factors have been discounted.

Site investigations and soil test results have confirmed a plastic clay subsoil of medium to high volume change potential (NHBC) susceptible to undergoing volumetric change in relation to changes in soil moisture.

Based on a comparison between moisture content and the plastic and liquid limits, there is no evidence of significant desiccation in February 2017 (Geotechnical SI). Typically desiccation would not be expected in February due to the hydration of the soils over the preceding winter. Using the same criteria, the results of the Fastrack investigation of June 2017 does indicate desiccation which is corroborated by the suction values indicating very severe desiccation.

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

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 and that T1 Oak is the principle cause, with the addition that H1, 3rd party Leyland Cypress hedge, is a potential contributory factor based on size and proximity.

The removal of the oak would normally offer the most predictable long term arboricultural solution in stabilising the property however in view of engineers concerns in relation to 'heave' should the tree be removed, consideration is to be given to the reduction and subsequent management of the tree.

Having considered the available information and reviewed the condition, structure and physiology of the Oak T1, it is our opinion that the tree benefits from sufficient "inner crown" growth such that a reduction of approx. 50% of the trees crown volume should not pose either a significant physiological or structural detriment to its continued growth potential.

Whilst a crown reduction of T1 Oak of this magnitude will reduce the moisture demand on the surrounding soil, it is not however known if this reduction in moisture demand will be sufficient to completely return the soil moisture to a point of equilibrium and remove the potential for further

subsidence. In this regard, it must be understood that a continuing commitment to retaining the tree at its new dimensions would be required in order to sustain the reduced soil moisture uptake.

Given that removal of the tree has the potential to result in heave and lead to further damage to the property, if an arboricultural solution is to be implemented to help mitigate the current damage and allow the soils beneath the property to recover to a position such that an effective repair solution can be implemented we believe that T1 Oak can undergo a crown reduction of approximately 50% volume.

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.
- Investigations have confirmed that T1 Oak has the potential to influence soil moisture and volumes below foundation level and as such is considered the principle cause of the current subsidence damage.
- Roots have been observed underside of foundations and identified samples correspond to T1 Oak.
- Investigations have confirmed that complete removal of T1 Oak has the potential to cause heave which has the risk of resulting in further damage.

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	Oak	16.0*	1290	15.0	8.4	Older than property	Policy Holder
Management history		Twin stemmed growth habit with main fork @ approx. 1.5m Large longitudinal decay column in south-eastern stem Moderate basal decay pocket to south side of main stem No signs of significant past management however understood to have been crown reduced C.2015					
Recommendation		Reduce in height to suitable growth points at approx. 11m and reduce lateral limbs by approx. 3.5m radius to balance crown - ensure inner crown growth is retained. Do not allow to exceed new dimensions by a program of regular (triennial) re-pruning.					

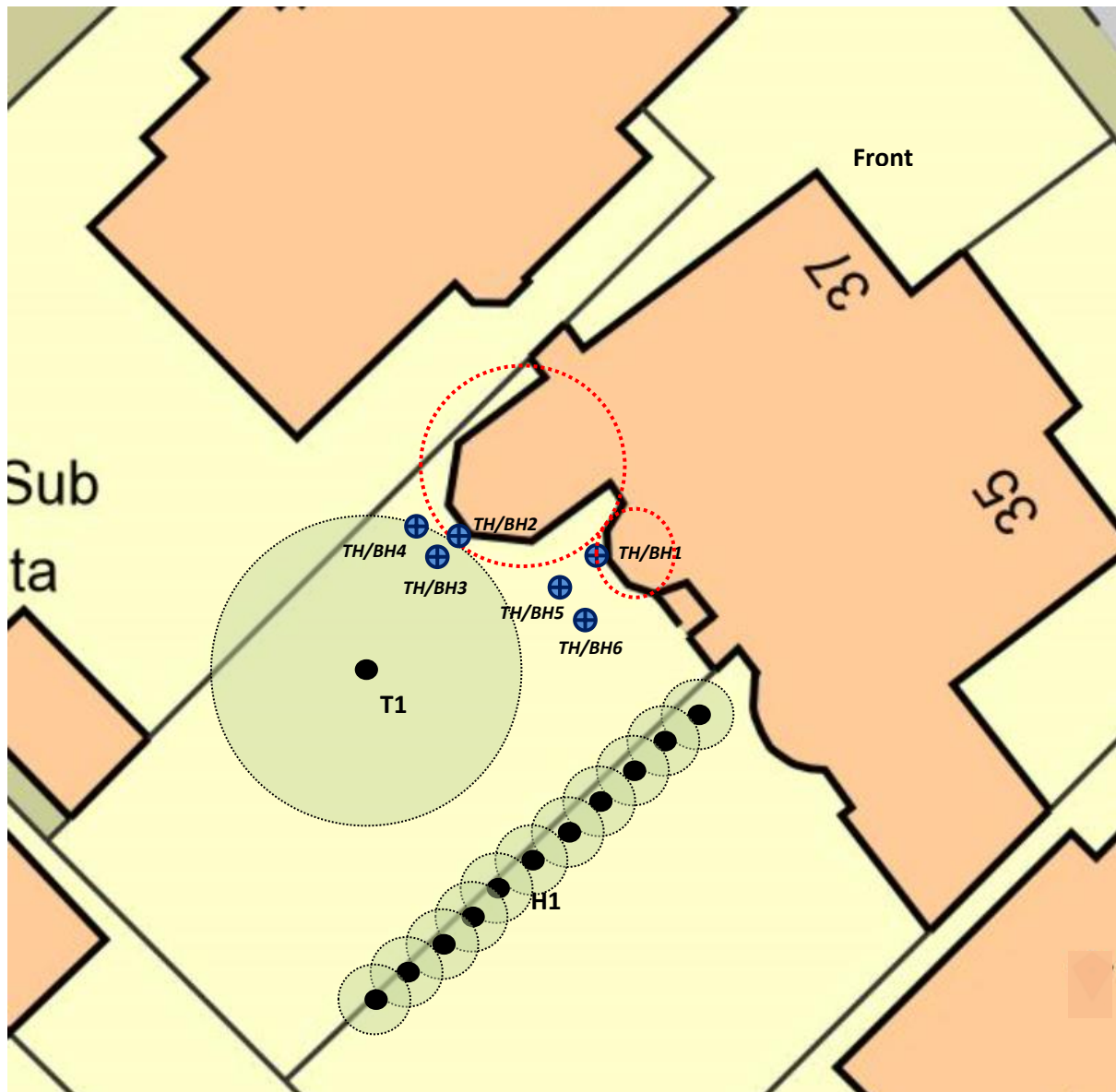
Ms: multi-stemmed * Estimated value

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


Tree No.	Species	Ht (m)	Dia (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
H1	Leyland Cypress hedge	11.0	250*	5.0	8.8 [closest stem]	Younger than property	3rd Party:- 35 Redington Road, NW3
Management history		Topped in past @ approx. 10m – regrowth appears <5yrs					
Recommendation		Reduce in height to 5m Do not allow to exceed new dimensions by a program of regular (annual) trimming					

Ms: multi-stemmed * Estimated value

SITE PLAN



Plan not to scale – indicative only

 Approximate areas of damage

Images



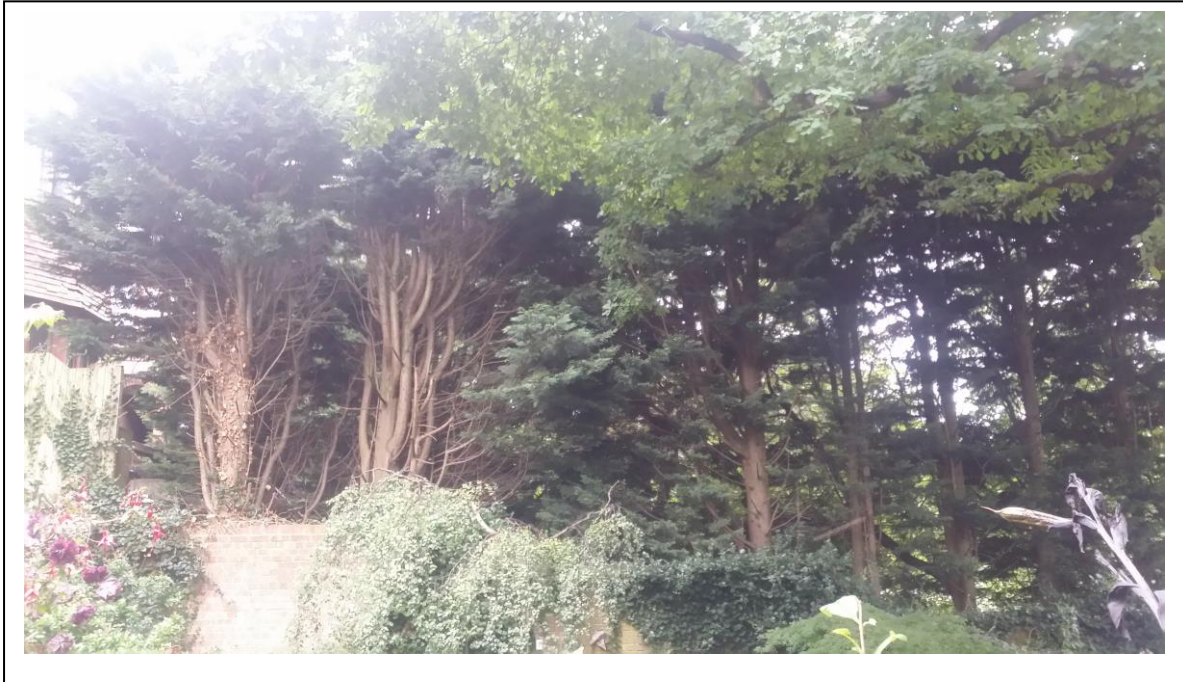
View of T1 Oak



View of T1 Oak - basal decay pocket to south side of main stem



View of T1 Oak – longitudinal decay column in south-eastern stem



View of H1 – Leyland Cypress Hedge