Addendum Arboricultural Appraisal Report

Subsidence Damage Investigation at:

36 Blossom Way
Uxbridge
Middlesex
UB10 9LN

CLIENT:	Crawford & Company
CLIENT REF:	SU2102700
MWA REF:	SUB210624-9153Rev01
MWA CONSULTANT:	Andy Clark
REPORT DATE:	28/07/2022

SUMMARY

Statutory Controls			Mitigation (Current claim tree works)	
TPO current claim	Yes – T1, T2, T8		Policy Holder	Yes
TPO future risk	Yes – T3, T6, T7, TG1(purple leaf plum only)		Domestic 3rd Party	No
Cons. Area	No		Local Authority	No
Trusts schemes	No		Other	No
Local Authority: -	London Borough of Hillingdon			

MWA Arboriculture Ltd
Bloxham Mill Business Centre
Barford Rd, Bloxham
Banbury
OX15 4FF

Tel: 0191 432 9560
Email: office@mwaarboriculture.co.uk

Introduction

This is an addendum to our initial report [dated 30/07/2021] to add results of site investigations and details of crack-width monitoring.

Acting on instructions from Crawford & Company, the insured property was visited on 20/07/2021 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 two storey dormer bungalow of traditional construction, built during the 1930's and since extended with a two-storey addition to the left-flank built in 1995 and a conservatory 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 right-hand sections of the insured dwelling. Cracking first appeared approx. 2 years ago however they were repaired and the hall re-decorated. A return of cracking prompted the policy holder to notify insurers during June 2021.

At the time of the engineer's inspection (17/06/2021) 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 have not been made aware of any previous claims.

Site Investigations

Site investigations were carried out by CET on 21/01/2022 when two 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 drainage survey was also carried out.

Foundations:

Ref	Foundation type	Depth at Underside (mm)
TP/BH1	Concrete	600
TP/BH2	Concrete	700

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
TP/BH1	Firm orange brown to very stiff brown-grey veined silty CLAY with claystone nodules	45 – 55	High
TP/BH2	Firm orange brown to very stiff brown-grey veined silty CLAY with claystone nodules	47 – 56	High

Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
TP/BH1	1500	*Cupressaceae spp.*	Present
TP/BH2	2200	*Pomoideae gp. and Cupressaceae spp.*	Present

Cupressaceae spp. include Lawson cypress, western red cedar, Monterey cypress, Leyland cypress and junipers
Pomoideae gp include apple, cotoneaster, hawthorn, pear, pyracantha, quince, rowan, snowy mespil and whitebeam

Drains: The drains have been surveyed and defects identified, however defective drains are concluded not to be a cause of the current damage.

Monitoring: Crack monitoring is underway, commencing on 14/07/2021 and with five subsequent readings available at the time of writing.

Readings show crack opening during the summer of 2021, followed by crack closure over the autumn/winter of 2021 – with a return to crack widening into the late spring of 2022.

This pattern is indicative of the seasonal pattern of movement associated with seasonal moisture abstraction by vegetation.

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 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 1.5m bgl in TP/BH1 and to 2.2m bgl in TP/BH2, and recovered samples have been positively identified (using anatomical analysis) as Pomoideae gp. and Cupressaceae spp.; the origins of which will be the Pyracantha elements of TG1, and the Monterey Cypresses of T1 and T2 as the most proximal related trees to the area of damage.

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 is T8 Lombardy Poplar.

Based on the information currently available, engineering opinion and our own site assessment we conclude the damage appears consistent with shrinkage of the clay fraction due to the soil drying effects of vegetation.

Recommendations are detailed in Tables 1 & 2 below.

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.
- Crack monitoring confirms a seasonal pattern of movement.
- 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.

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 (Monterey)	20.0 *	1010	15.0	8.3	Similar Age to Property / Older than extensions	Policy Holder
Management history	Subject to past management/pruning - appears regularly pruned.						
Recommendation	Remove (fell) to near ground level and treat stump to inhibit regrowth.						
T2	Cypress (Monterey)	18.5 *	850	15.0	8.6	Similar Age to Property / Older than extensions	Policy Holder
Management history	Subject to past management/pruning - appears regularly pruned.						
Recommendation	Remove (fell) to near ground level and treat stump to inhibit regrowth.						
T8	Lombardy Poplar	20.0	800 *	5.5	16.1	Younger than Property / Older than extensions	Policy Holder
Management history	Previously crown reduced.						
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
T3	Cypress (Monterey)	17.0 *	740	12.0	16.0	Similar Age to Property / Older than extensions	Policy Holder
Management history		No significant past management noted.					
Recommendation		Do not allow to exceed current dimensions.					
T4	Cypress (Monterey)	14.5 *	700 Ms *	12.0	16.0 *	Similar Age to Property / Older than extensions	Third Party
Management history		Subject to past management/pruning – recently crown reduced at current dimensions.					
Recommendation		Do not allow to exceed current dimensions.					
T5	Cypress (Monterey)	17.0 *	740 *	12.0	8.2	Similar Age to Property / Older than extensions	Policy Holder
Management history		No significant past management noted.					
Recommendation		Do not allow to exceed current dimensions (subject to review if movement persists).					
T6	Cypress (Monterey)	15.0 *	460	12.0	8.8	Similar Age to Property / Older than extensions	Policy Holder
Management history		No significant past management noted.					
Recommendation		Do not allow to exceed current dimensions (subject to review if movement persists).					
T7	Cypress (Monterey)	18.5 *	1000 *	14.5	13.7	Similar Age to Property / Older than extensions	Policy Holder
Management history		No significant past management noted.					
Recommendation		Do not allow to exceed current dimensions (subject to review if movement persists).					

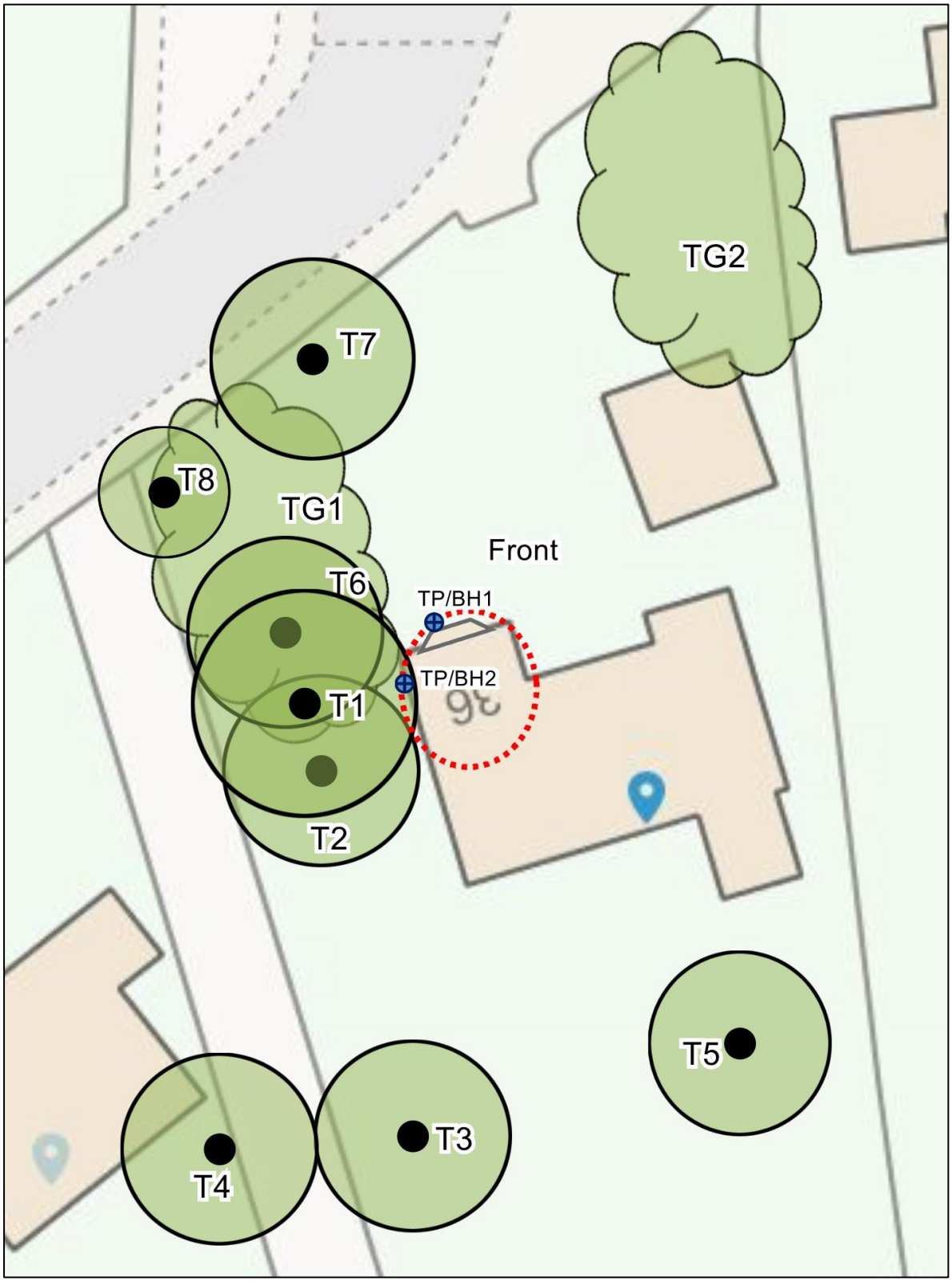
Ms: multi-stemmed * Estimated value

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
TG1	Mixed spp. group of mostly Plum, Purple Leaved Plum, Hornbeam, Portuguese Laurel, Yew and Pyracantha	12.0	430	9.5	6.5	Younger than Property	Policy Holder
Management history		No significant past management noted.					
Recommendation		Do not allow to exceed current dimensions (subject to review if movement persists).					
TG2	Mixed spp. group of mostly Purple Leaved Plum, Laurel and Yew	7.5	200 Ms	5.0	1.5 [to garage]	Younger than Property	Policy Holder
Management history		No significant past management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					

Ms: multi-stemmed * Estimated value

Site Plan



Plan not to scale – indicative only

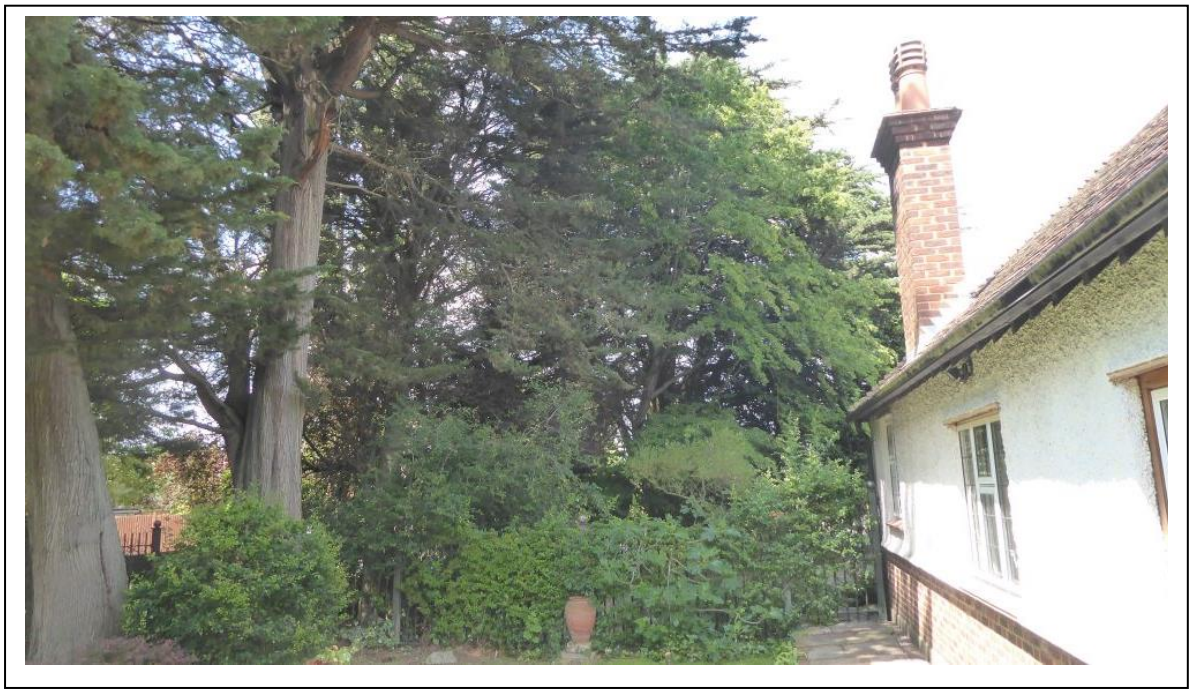
Approximate areas of damage

Images

View from property rear of T1 and T2 Monterey Cypresses

View from roadside of T8 Lombardy Poplar with T1, T2 and T7 Monterey Cypresses visible beyond

View of T7 Monterey Cypress with TG1 group understorey and T1 and T2 Monterey Cypresses visible beyond



View of TG1 understorey with T1 and T2 Monterey Cypress stems visible to foreground

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.