Arboricultural Consultancy for Aviva

Note(1): This report is intended for use between the client, Marishal Thompson Group and any parties detailed within the report. It is based on the understanding at the time of visiting the property that Engineers are satisfied that damage is attributable to clay shrinkage subsidence exacerbated by vegetation.

1. Case Details

Insured	Mr Anthony Dworkin	**Address**	62 Albert Street, London, NW1 7NR		
Client	Infront Innovation	**Contact**	Arif Khalifa	**Claim No.**	IFS-AVI-SUB-14-0048840
MT Ref	NL/2301141643/TP-REV1	**Consultant**	Thomas Peppiatt	**Contact No.**	08702 416 180
Report Date	13/02/2014 ***Revised 13/07/2016***				

Scope of Report: To survey the property and determine significant vegetation contributing to subsidence damage, make recommendation for remedial action and assess initial mitigation and recovery prospects. The survey does not make an assessment for decay or hazard evaluation.

This is a revised report based on the inclusion of recent site investigation results.

2. Property and Damage Description

The insured structure is a 4 storey mid-terrace house. The property occupies a level site with no adverse topographical features.

Damage relates to the rear elevation of the insured dwelling.

3. Technical Reports (Revised)

In preparing our revised port we have had the benefit of the following technical investigations:

Foundation Detail / Borehole Log	☒	Drain Survey	☒	Soil Analysis	☒
Root Analysis	☒	Engineers Report	☒	Level Monitoring	☒

4. Action Plan

Mitigation	
Insured Involved?	Yes
Local Authority involved?	No
Other third party Mitigation involved?	Yes
Recovery	
Is there a potential recovery action?	Yes

Tree Works	
Local Authority	Camden London Borough
TPO / Conservation Area / Planning Protection Searches	Insured: Conservation Area Third Party: Conservation Area

Additional Comments

Awaiting Further Instructions.

A potential recovery action has been identified.

Engineers should consider focusing investigations to strengthen factual evidence for disclosure to third party tree owners.

5. Technical Synopsis (Revised)

This report is based upon our understanding at the time of visiting the property that Infront Innovation's engineers are satisfied that damage is due to clay shrinkage subsidence exacerbated by vegetation.

We have been instructed to advise on the causal vegetation and to deliver management proposals which will provide on-going and long-term stability, thereby allowing repairs to be undertaken.

Site Investigations indicate that the foundations to the rear of the property extend to a depth of 800mm below ground level in TP/BH1 and 300mm in TP/BH2.

Foundations bear onto subsoil described within the borehole log as Clay, thereby indicating the potential for the observed damage to be the result of clay shrinkage subsidence exacerbated by the influence of vegetation.

NHBC 4.2 (2010) classifies these soils as being of High plasticity i.e. capable of significant volumetric change potential in response to moisture content.

Desiccation of the underlying clay strata is demonstrated by an abnormal soil moisture content profile (BRE 412).

Atterberg testing for soils recovered in TP/BH1 showed the soil moisture content to be below plastic limit at 1800mm below ground level and close to plastic limit for the remainder of TP/BH1 and throughout TP/BH2.

Moisture content comparison with plastic limit is a reliable indicator of desiccation, whilst moisture depletion at the depths identified are beyond that to which ambient soil drying can be influential and thereby indicate a vegetative influence in the movement/damage.

A survey of the drainage system at the property was undertaken, and although defects were noted, Engineers have confirmed that they do not consider damaged or leaking drains to be a material cause of the current subsidence damage and soils analysis confirms this position.

Atterberg tests demonstrate that the load bearing capacity of the soil has not been compromised by excessive water content due to leaking drains and is therefore capable of bearing the imposed load.

As such, the evidence available does not support the possibility that damage is a result of damaged or leaking drains. Vegetation is therefore deemed to retain the capacity to be causal to the current movement/damage.

Site Investigations revealed the presence of roots in TP/BH1 to a depth of 1800mm; this depth is in excess of foundations which extend to a depth of 800mm.

Samples of these roots were recovered from underside of foundations and throughout the borehole, these roots were identified (using anatomical analysis) as having emanated from the genus *Platanus spp.*

Our survey of the site identified T7 (Plane (London)), which, given its position relative to the damage it is our opinion that the roots identified emanate from this tree.

Sample trial pits are generally small in size and the recovery of roots from such a small excavation leads us to conclude that these will not be isolated examples; there is significant potential for further root proliferation below the insured structure.

Vitaceae spp roots were also found in TP/BH2 at 800mm; these are likely to originate from CG1 (Mixed Species Group).

CG1 (Mixed Species Group) cannot therefore be discounted as contributing to the overall level of soil drying proximate to the area of damage and is therefore also considered to retain a localised/limited contributory influence when compared to T7.

However, whilst not directly implicated by positive root analysis, based on our site investigations, and taking account of vegetation location, relative to the focal area of movement/damage, it is our opinion that T5 (Apple) also retains the capacity to be extending roots below the focal areas of movement and accordingly we have also identified it as a secondary contributory factor in the current subsidence damage.

The role of vegetation is further supported by the results of level monitoring which has been undertaken since 29/04/2015 with 8 readings available through to 20/06/2016.

Where vegetation is involved it produces a characteristic 'seasonal' pattern of foundation movement (subsidence through the summer, recovery through the winter); no other cause produces a similar pattern.

If it is occurring soil drying by vegetation must be involved, unless the foundations are less than 300mm in depth, which in this case they are not. The pattern of movement exhibited in this instance is consistent with the known influence of vegetation.

In assessing the extent of damage and the potential drying influence of the vegetation on site, T7 (Plane (London)) is judged to be the dominant feature and accordingly we have identified it as the principal cause of the subsidence.

T5 (Apple) and CG1 (Mixed Species Group) are also considered to retain a contributory influence, albeit in a limited/secondary capacity when compared to T7 (Plane (London)).

Considering engineers conclusions, results of site investigations and our observations on site, vegetation management is considered appropriate with a view to restoring stability.

Please refer to Section 6 for management prescriptions.

In order to mitigate the current damage and allow soils beneath the property to recover to a position such that an effective engineering repair solution can be implemented we recommend a program of removals as listed by this report.

Whilst we have given consideration to pruning as a means of mitigating the vegetative influence of the above, this has been discounted.

Pruning is generally ineffective and in the context of the current claim we consider the above vegetation is simply too large and/or close for pruning to be effective.

Removal of T5 (Apple), CG1 (Mixed Species Group) and T7 (Plane (London)), will offer the most certain and reliable arboricultural solution likely to restore long-term stability.

Replacement planting is considered appropriate however due consideration must be given to the ultimate size of the replacement and future management requirements.

Species selection should be appropriate for the chosen site and ultimate tree height should not exceed 75% of the available distance to built structures.

We recommend the efficacy of the management recommendations be qualified by means of further monitoring to confirm stability.

Is vegetation likely to be a contributory factor in the current damage?	Yes
Is vegetation management likely to contribute to the future stability of the property?	Yes
Is replacement planting considered appropriate?	See Above
Would DNA profiling be of assistance in this case?	No

6.0 Recommendations (Revised)

6.1 Table 1 - Current Claim Requirements (Revised)

These recommendations may be subject to review following additional site investigations

Tree No.	Species	Age Cat	Approx. Height (m)	Distance to Building (m)	Ownership	Action	Requirement
T5	Apple	1	4	3.7	C - Insured	Remove	Remove and treat stump to inhibit regrowth.
T7	Plane (London)	1	18.5	17.6	A - Third Party 64 Albert Street London NW1 7NR	Remove	Remove and treat stump to inhibit regrowth.
CG1	Mixed species climbers	1	3	2.7	C - Insured	Remove	Remove and treat stump to inhibit regrowth.
Age Cat: 1 = Younger than property; 2 = Similar age to the property; 3 = Significantly older than property							

6.2 Table 2 - Future Risk Recommendations (Revised)

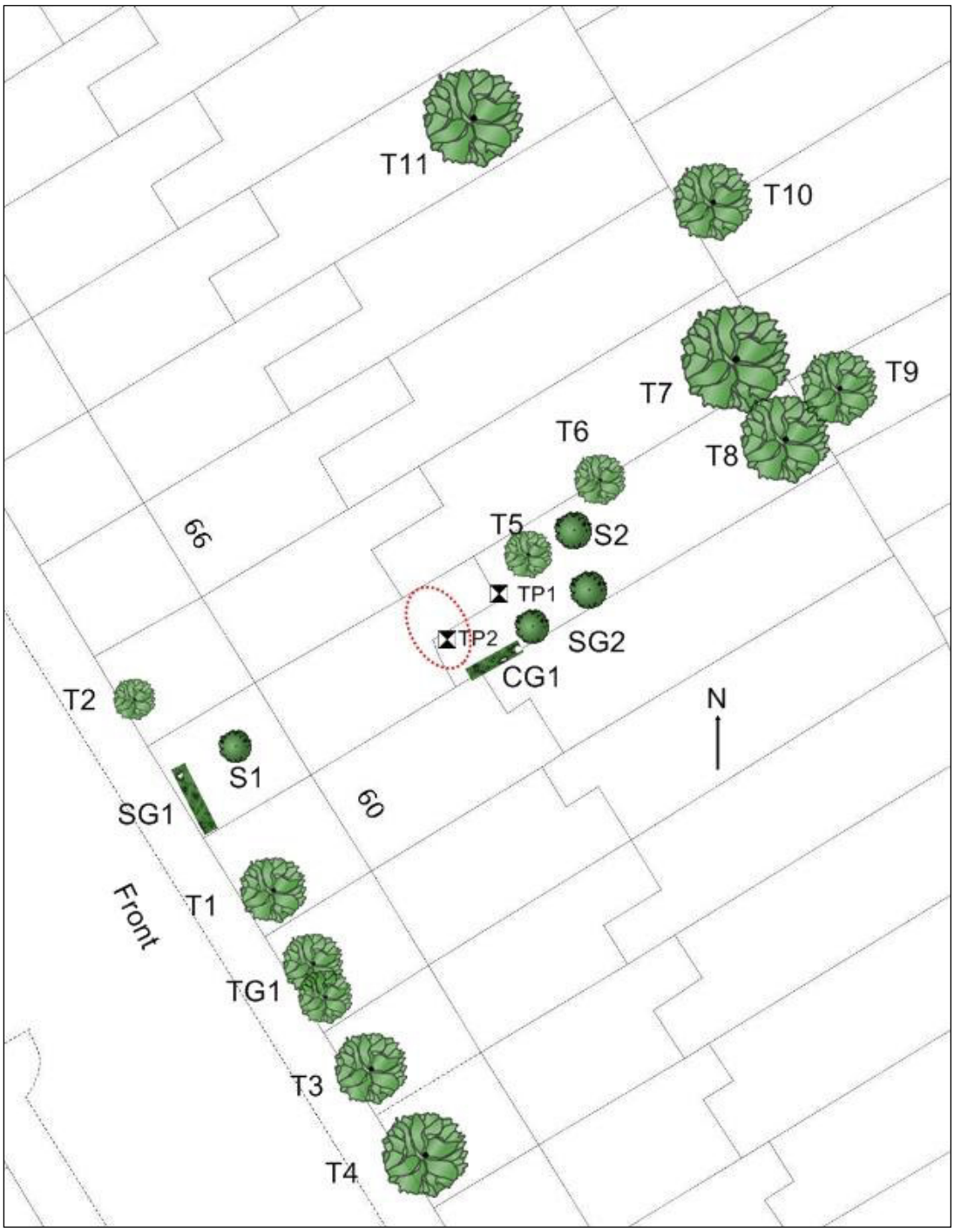
Tree No.	Species	Age Cat	Approx. Height (m)	Distance to Building (m)	Ownership	Action	Requirement
S1	Euonymus	1	2	1.2	C - Insured	Action to avoid future risk	Do not allow to exceed current dimensions.
S2	Escallonia	1	3.8	4.4	C - Insured	Action to avoid future risk	Do not allow to exceed current dimensions.
SG1	Mixed species group Including Choisya and Euonymus.	1	2.2	5.3	C - Insured	Action to avoid future risk	Do not allow to exceed current dimensions.
SG2	Mixed species group x1 Box, x1 Hydrangea.	1	1.8	2	C - Insured	Action to avoid future risk	Do not allow to exceed current dimensions.
T1	Prunus	1	5.5	5.5	A - Third Party 60 Albert Street London NW1 7NR	Action to avoid future risk	Do not allow to exceed current dimensions.
T2	Ash	1	3.5	6	A - Third Party 64 Albert Street London NW1 7NR	Action to avoid future risk	Do not allow to exceed current dimensions.
T3	Acer	1	17	16*	A - Third Party 56 Albert Street London NW1 7NR	Action to avoid future risk	Crown reduce by 2m-3m all around and maintain at reduced dimensions by way of regular pruning (3-year max).
T4	Acer	1	20	18*	A - Third Party 54 Albert Street London NW1 7NR	Action to avoid future risk	Crown reduce by 2m-3m all around and maintain at reduced dimensions by way of regular pruning (3-year max).
T6	Apple	1	4	7.6	A - Third Party 64 Albert Street London NW1 7NR	Action to avoid future risk	Do not allow to exceed 5m height.
T8	Horse Chestnut	1	11	17	C - Insured	Action to avoid future risk	Do not allow to exceed 14m height.

T9	Ash	1	10	19*	A – Third Party 67 Arlington RD London NW1 7ES	Action to avoid future risk	Do not allow to exceed 16m height.
T10	Ash	1	17	21.4	A – Third Party 71 Arlington RD London NW1 7ES	Action to avoid future risk	Do not allow to exceed 18m height.
T11	Plane (London)	1	26	25.2	A - Third Party 70 Albert Street London NW1 7NR	Action to avoid future risk	Crown reduce by 2m-3m all around and maintain at reduced dimensions by way of regular pruning (3-year max).
TG1	Lime x2	1	14	11*	A - Third Party 58 Albert Street London NW1 7NR	Action to avoid future risk	Crown reduce by 3m-4m all around and maintain at reduced dimensions by way of regular pruning (3-year max).
Age Cat: 1 = Younger than property; 2 = Similar age to the property; 3 = Significantly older than property							

* Estimated

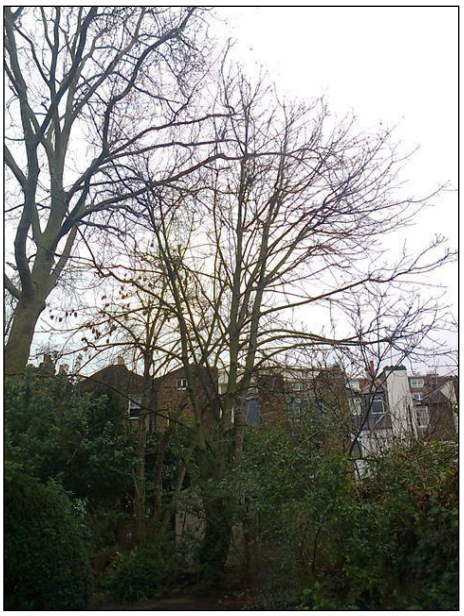
Third party property addresses should be treated as indicative only, should precise detail be required then Marishal Thompson can undertake Land Registry Searches

7. Site Plan

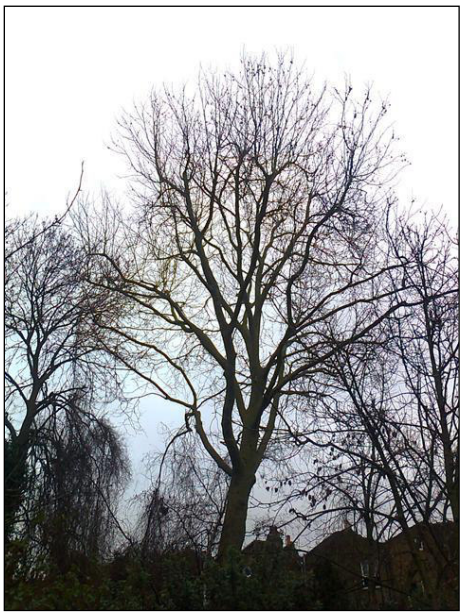


Please note that this plan is not to scale. OS Licence No. 100043218

8. Photographs



T8 - Horse Chestnut



T11 - Plane (London)

T5 - Apple

T7 - Plane (London)

T8 - Horse Chestnut

9. Tree Works Reserve - Does not include recommendations for future risk.

Insured Property Tree Works	£750
Third Party Tree Works	£3500
Provisional Sum	£900

- The above prices are based on works being performed as separate operations.
- The above is a reserve estimate only.
- Ownerships are assumed to be correct and as per Section 6.
- A fixed charge is made for Tree Preservation Order/Conservation Area searches unless charged by the Local Authority in which case it is cost plus 25%.
- Should tree works be prevented due to statutory protection then we will automatically proceed to seek consent for the works and Appeal to the Secretary of State if appropriate.
- All prices will be subject to V.A.T., which will be charged at the rate applying when the invoice is raised.
- Trees are removed as near as possible to ground level, stump and associated roots are not removed or included in the price.
- Where chemical application is made to stumps it cannot always be guaranteed that this will prevent future re-growth. Should this occur we would be pleased to provide advice to the insured on the best course of action available to them at that time. Where there is a risk to other trees of the same species due to root fusion, chemical control may not be appropriate.

10. Limitations

This report is an appraisal of vegetation influence on the property and is made on the understanding that that engineers suspect or have confirmed that vegetation is contributing to clay shrinkage subsidence, which is impacting upon the building. Recommendations for remedial tree works and future management are made to meet the primary objective of assisting in the restoration of stability to the property. In achieving this, it should be appreciated that recommendations may in some cases be contrary to best Arboricultural practice for tree pruning/management and is a necessary compromise between competing objectives.

Following tree surgery we recommended that the building be monitored to establish the effectiveness of the works in restoring stability.

The influence of trees on soils and building is dynamic and vegetation in close proximity to vulnerable structure should be inspected annually.

The presence of Tree Preservation Orders (TPO) or Conservation Area status must be determined prior to any tree works being implemented, failure to do so can result in fines in excess of £20,000.

Our flagging of a possible recovery action is based on a broad approach that assume all third parties with vegetation contributing to the current claim have the potential for a recovery action (including domestic third parties). This way opportunities do not “fall through the net”; it is understood that domestic third parties with no prior knowledge may be difficult to recover against but that decision will be fully determined by the client.

A legal Duty of Care requires that all works specified in this report should be performed by qualified, arboricultural contractors who have been competency tested to determine their suitability for such works in line with Health & Safety Executive Guidelines. Additionally all works should be carried out according to British Standard 3998:2010 *"Tree Work. Recommendations".*