# Arboricultural Consultancy for Co-operative Insurance Society

**Note:** This report is intended for use between the client, Environmental Services 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 David Blagbrough | Address | 160 Camden Road, London, NW1 9HJ | | |
| Client | Subsidence Management Services | Contact | Danielle Irving | Claim No. | IFS-CIS-SUB-11-0031154 |
| ES Ref | SA-19426 | Consultant | Giles Mercer | Contact No. | 0330 380 1036 |
| Report Date | 18/06/2018 **Revised:** 18/06/2018 | | | | |

**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.

## 2. Property and Damage Description

The property is a ground floor flat in a two storey semi-detached house. The site is level with no adverse features.

Damage relates to the junction between the front porch/bathroom projection and the main front elevation. Please refer to the engineers report for a full description of the claim history and damage.

## 3. Technical Reports

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

| | | | | | |
|---|---|---|---|---|---|
| Soil Analysis | ☑ | Drain Report | ☑ | Foundation Detail | ☑ |
| Root Analysis | ☑ | Borehole Log | ☑ | Engineers Report | ☑ |
| Monitoring | ☑ | | | | |

## 4. Action Plan

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

| Treeworks | |
|---|---|
| Local Authority | Camden London Borough |
| TPO / Conservation Area / Planning Protection Searches | Insured: TPO and Conservation Area Adjacent & Adjoining properties: TPO and Conservation Area |
| **Additional Comments** | |
| Awaiting Further Instructions. | |

## 5. Technical Synopsis

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

We understand that the property has been subject to previous claims for similar damage in 1990 and 2011, further damage was investigated in 2013 and the current claim notified to insurers in 2016.

The OCA (UK) Ltd report produced as part of the 2011 claim was written without Site Investigations (SI) however, they concluded that the Plane (T1) was 'the probable cause of any vegetation related movement and damage at the insured property'.

The recommendation made at that point was to remove the tree (T1); OCA did not consider that pruning offered 'an effective or sustainable means of controlling the water use of London Plane T1' and noted that the 'tree has been the subject of regular pruning works in the past but that these works have not prevented current damage from occurring'.

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An application was made to Camden Council who refused consent to fell but granted consent for a 30% crown reduction; we understand that these works were undertaken and that the property was subject to a scheme of foundation enhancement and other repair works.

As part of the 2011 claim, the front porch / bathroom extension was rebuilt on a new piled beam (with heave protection) and an expansion joint was installed at the junction with the main house.

We understand from the policyholder, that the tree (T1) is subject to a 30% crown reduction every three years'.

In 2013 Innovation group revisited the property as further, repeat damage was identified with the Engineer noting that 'The main area of damage is at the junction between the front porch/bathroom projection and the main front elevation' and that ' At this stage it is still anticipated that the tree is an influencing factor in the movement of the house, and therefore efforts should continue in persuading the local authority to remove the tree'.

In January 2016 further site investigations were undertaken (TP/BH1); this comprised a trial pit and borehole to the front left corner of the porch and steps.

The underside of the foundation was estimated to be 2200mm below ground level and bearing onto subsoil described within the borehole log as containing clay, thereby indicating the potential for the observed damage to be the result of clay shrinkage subsidence exacerbated by the influence of vegetation.

Natural clay was identified from 2900mm and described as very stiff / hard at 3200mm with refusal of the auger at 3500mm.

The supporting subsoil has been analysed by a UKAS accredited Laboratory (to relevant BS, EN and ISO standards).

NHBC chapter 4.2 (2017) categorises the supporting subsoil as being of MEDIUM plasticity, i.e. capable of moderate volumetric change potential in response to moisture content.

Moisture depletion has been demonstrated by way of Atterberg testing; moisture depletion at the depths identified is beyond the maximum depth of ambient soil drying and commensurate with root activity.

Soil suction testing within TP/BH1 indicates the presence of Moderate - Very Severe desiccation in accordance with BRE digest 412 at 2200mm to 3200mm below ground level.

BRE Digest 412; Desiccation in Clay Soils states that 'soil sample suctions, since they will reflect any changes in in-situ pore water pressures due to desiccation, provide the most fundamental indicator of desiccation of all of the techniques'.

Atterberg / Suction 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.

Site Investigations revealed the presence of roots in Trial Pit / Borehole 1 to a maximum depth of 2900mm; this depth is likely to be in excess of foundations.

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 T1 (Plane (London)), given its position relative to the damage it is our opinion that the roots identified within TP/BH1 will 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.

In terms of species profile, size and proximity to the damaged structure T1 is therefore, in our opinion the dominant vegetation, the source of the roots identified and accordingly the principal cause of the ongoing damage.

The role of vegetation is further supported by the results of level monitoring.

The results of the available monitoring have confirmed a pattern of movement consistent with the known influence of vegetation.

Dr. Biddle (who advises many Local Authorities) states that 'monitoring provides definitive information and in most situations is the only investigation which should be necessary. Where vegetation is involved, it produces a characteristic 'seasonal' pattern of foundation movement; subsidence in the summer reaching a maximum usually in September, followed by upward recovery in the winter. No other cause produces a similar pattern. Monitoring can demonstrate this pattern. If it is occurring, there is no need to try to demonstrate shrinkable clay or desiccation – soil drying by vegetation must be involved (unless the foundations are less than 300mm). One does not need to demonstrate the full cycle; just sufficient to confirm movement is consistent with this pattern. Monitoring upward recovery in the winter is particularly valuable'.

Considering engineers conclusions, results of site investigations and our observations on site, vegetation is judged to retain the capacity to be causal.

A programme of vegetation management is therefore considered appropriate in this instance 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 T1 be removed.

Whilst we have given consideration to further pruning as a means of mitigating the vegetative influence of the above tree, this has been discounted; in the context of the current claim we consider the above vegetation to be too large and close for pruning to be considered effective.

Removal of T1 will offer the only certain and reliable arboricultural solution likely to restore long-term stability.

In this instance, the alternative options for repair if the tree cannot be remove are limited.

The installation of a root barrier is not practical given the proximity of the tree to the house, the likely asymmetric root distribution (biased towards the house given the inclement rhizosphere under the highway), the requirement to install the barrier through the RPA of T1, the depth of the root barrier and the need for extensive excavation, the fact that the root barrier would need to extend into third party properties.

Engineers advise that an underpin scheme would also be extremely difficult; removal of the tree T1 is therefore deemed to offer the most viable option.

The extent of vegetation management required to restore and maintain long-term stability at this property is high and its impact acknowledged. However, we consider the impact on the wider public amenity from the proposed tree works is mitigated by the presence of further trees within the street and the scope for replacement planting.

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 |

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## 6.0 Recommendations

## 6.1 Current Claim Requirements

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 |
|---|---|---|---|---|---|---|---|
| T1 | Plane (London) | 2 | 26 | 6.4 | C - Insured | Remove | Remove close to ground level and treat stump to inhibit regrowth. |
| **Age Cat:** 1 = Younger than property; 2 = Similar age to the property; 3 = Significantly older than property | | | | | | | |

* Estimated

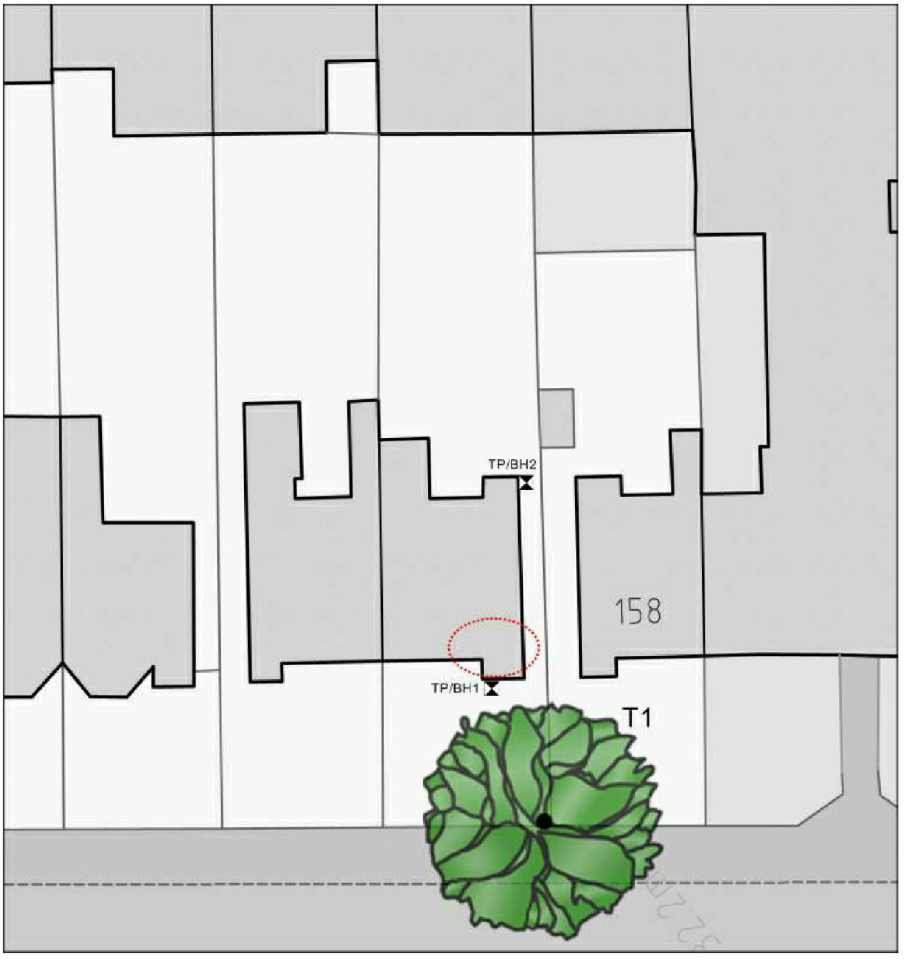
## 6.2 Future Risk Recommendations

There are no Future Risk recommendations assigned at the present time.

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

[redacted]

## 7. Site Plan




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

[redacted]

## 8. Photographs

Fence embedded in trunk of T1

Site

T1

T1

[redacted]

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T1

T1

[redacted]

Date: 18/06/2018 Property: 160 Camden Road, London, NW1 9HJ

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

| | |
|---|---|
| Insured Property Tree Works | £4500.00 |
| Third Party Tree Works | £0.00 |
| Provisional Sum | £0.00 |

- 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 regrowth. 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 statutory tree protection status as notified by the Local Authority was correct at the time of reporting. It should be noted however that this may be subject to change and we therefore advise that further checks with the Local Authority MUST be carried out prior to implementation of any tree works. 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"*.**