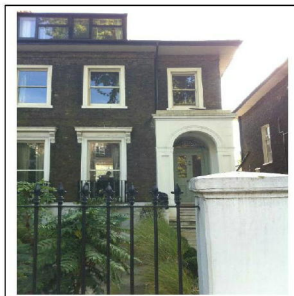


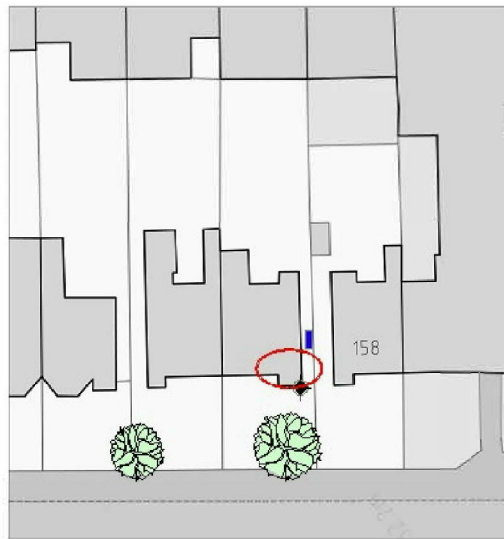
ADDENDUM ENGINEERING REPORT

Our Reference [REDACTED]
Claim Reference [REDACTED]
Prepared for Co-op Insurance

Claim Details:

Report Date 10 May 2018
Claim address 160 Camden Road
London
NW1 9HJ





Site Plan

CLAIM HISTORY

It is understood that the house was constructed circa 1840 and has been owned by the policy holder since 1989. Damage occurred to the front entrance porch and steps circa 1997 and this was due to root induced clay shrinkage as a result of the moisture demand of the Plane tree on the front boundary. The tree is subject to a Preservation Order and consequently the porch and steps were re-built off a piled foundation. No further problems were encountered until the summer of 2011 when cracking occurred around the junction of the house and the porch area. Consequently a further subsidence claim was submitted to insurers. Investigations and monitoring have been carried out however, no remedial strategy has been proposed and damage continues to deteriorate. Consequently a revisit was carried out by Steve Brown on 01 May 2018.

PROPERTY

The property is a 2 bedroom ground floor flat in a two / three storey semi-detached house of traditional construction with solid brickwork walls surmounted by a gabled tile covered roof. The property is a converted house with a two storey basement flat at the bottom and two storey first and second floor flat at the top.

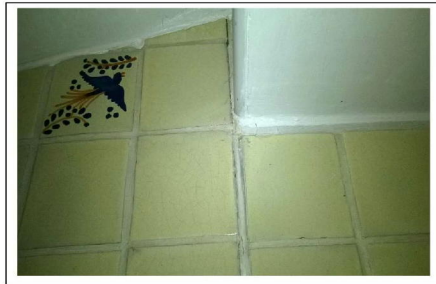
TOPOGRAPHY

The site is relatively flat and is located on the main Camden Road.

DAMAGE

The damage is fully detailed in our initial Engineer's Report dated 30 October 2011. The main cracking is evident in the basement bathroom with cracking through the tiling at the junction between the main house and the porch structure. Cracks have been previously filled but continue to open seasonally. Similar cracking is evident externally and the paving slabs are very uneven along the front path and adjacent to the steps. The front gate pillar is leaning over severely and is also being physically pushed by the tree, along with the front boundary fence. The base of the tree is now protruding into the public footpath creating a trip hazard.

Cracking is also evident across the living room ceiling and a floor crack is noted towards the rear outrigger.



Cracking to Left Hand Wall in Bathroom



Cracking to Right Hand Wall in Shower Room



Pulling and Cracking of Kitchen Ceiling



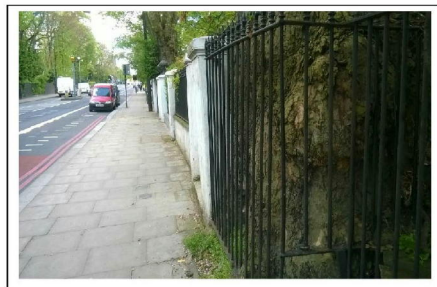
Movement Between House and Porch



Leaning Gate Pillar - Gate Unable to Close



Tree Protruding into Public Footpath



Gate Pillar Leaning into Public Footpath



Uneven Paving to Front Path

SITE INVESTIGATIONS

An initial site investigation was undertaken in November 2011. This comprised a trial pit and borehole on the front right hand corner of the porch. The base of the footing was confirmed at 950mm below ground level bearing on firm to stiff clay of medium to high shrinkage potential. Moisture contents were equal to or just below the plastic limit of the clay and suction readings up to 541 kPa indicated a heave potential of 10 to 40mm. Roots were evident for the full depth of the borehole and these were identified as Platanus and Prunus roots.

A further site investigation was undertaken in January 2016. 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 2.2 metres deep and bearing on made ground comprising very stiff clay with occasional brick fragments. This was confirmed as natural clay at 2.9 metres and became very stiff / hard at 3.2 metres with refusal of the auger at 3.5 metres. The clay was found to be of medium shrinkage potential and moisture contents at depth were below the plastic limit and with suctions measured in excess of 800 kPa. Roots were evident to a depth of 2.9 metres and these were identified as Platanus roots.

Drainage surveys have been carried out. Minor defects were found including displaced and open joints and root ingress. The drains have been repaired under a separate insurance claim.

MONITORING

Level monitoring has been carried out since 2012 although due to the restricted nature of the site there was difficulty in establishing a stable datum point and consequently the readings are not consistent. However, it is clear that the monitoring confirms that differential seasonal movement is occurring across the site and this is up to 7mm. It is considered that the total movement will be in excess of 7mm.

DISCUSSIONS

There is absolutely no doubt whatsoever that the front of the property is being damaged by clay shrinkage of the sub-soil due to the moisture demand of the Plane tree. This is in addition to the more obvious damage to the front gate pillar and paving.

The evidence obtained suggests that the front porch may not have been underpinned as understood by the policy holder however, it is difficult to draw definite conclusions from localised trial pitting at such depth. The 2011 investigation indicated that the foundation on the right hand side of the porch is 950mm deep whilst the 2016 investigation found a different construction on the front left hand side. Notwithstanding, roots from the Plane tree have been found to 4 metres depth and this is not surprising given the close proximity and size of the tree (7.5 metres to the main house and circa 28 metres in height).

It is evident that the works undertaken circa 1997 to the front porch have been effective in stabilising that part of the structure however, it is also clear that the front right hand corner of the main property is also subject to seasonal movement. The Plane tree is the only feasible cause of such movement. It is understood that the tree is subject to a three year pruning cycle however, this has not been sufficient to reduce the degree of seasonal movement sufficiently to prevent cracking to the superstructure. Given the location of the tree and the hard landscaping all around the tree will struggle for water and consequently the root growth will increase whenever there are prolonged dry periods of weather.

Given the size and location of the tree it is recommended that it is removed. If it is not removed then the gate pillar will need to be demolished to prevent it from collapsing into the public footpath and the paving will continue to be uneven, representing a trip hazard to anyone visiting the property. The base of the tree is already protruding into the public footpath creating a trip hazard. Further pruning or pollarding may be effective in the short term but in the medium term it will fail as the root system of the

tree is well established beneath the property.

As the tree is subject to a Preservation Order then consent will be required from the Local Authority to remove the tree. It is accepted that the tree is a dominant feature however, there are numerous other trees along the highway to provide similar amenity value. Although the tree is fully mature, the site investigation results confirm that there is no significant risk of heave damage occurring if the tree is removed.

In the event that consent to remove the tree is refused, the only way of stabilising the foundations will be by underpinning. Ideally a root barrier or rehydration channel would be installed however, due to the short space between the porch and the tree, such an excavation would sever much of the structural root system and risk de-stabilising the tree. Such work would require a Root Severance Agreement with the Local Authority and it is unlikely that this would be agreed.

Unfortunately it is totally impractical to carry out underpinning in the small basement bathroom. It is very small and set 1.5 metres below ground level. Roots are known to extend to at least 2.5 metres below this level and therefore it will be dangerous to excavate at this depth in such a confined space. It may be possible to install some form of piled system but this will require removal of the external walls to provide sufficient access and working space. In the event that permission to remove the tree is refused then this aspect will need to be considered further with foundation specialists. At this stage it is estimated that any such work will be disproportionately expensive and costs are likely to exceed £50,000. The bathroom will also be removed for several weeks and access to the front door will be restricted, therefore alternative accommodation will be required, probably on a minimum six month let.

RECOMMENDATIONS

It is strongly recommended that the Plane tree is removed to allow the property to stabilise. Whilst the degree of cracking and movement is not severe, it will continue to recur periodically whilst the tree remains in place, regardless of any pruning regime. In addition the damage to the external landscape will continue whilst the tree is in-situ and the risk of tripping on the public footpath will increase.

An application to lift the Tree Preservation Order should be made and hopefully this will be granted and the tree can either be removed or, as a minimum, pollarded. If it is not then the technical difficulties in effectively repairing and stabilising the property will need to be reassessed and a clearer assessment of the cost implications and disruption to the residents. It is understood that these costs can be recovered from the Local Authority based on the evidence available.

Steve Brown BSc (Hons) CEng MStructE MICE Cert CII
Subsidence Management Services