Optera Structural Solutions

[redacted]

Arboricultural Method Statement

Date

December 21, 2020

[redacted]

POLICY HOLDER ADDRESS: 10 Brookfield Park, London. NW5 1ER

OUR REFERENCE:

ANTICIPATED START DATE: [redacted]

PROJECT MANAGER: Paul Milliam

Project Discussion

The proposed works consist of installing a root barrier to the above property to defend against root nuisance from the nearby walnut tree.

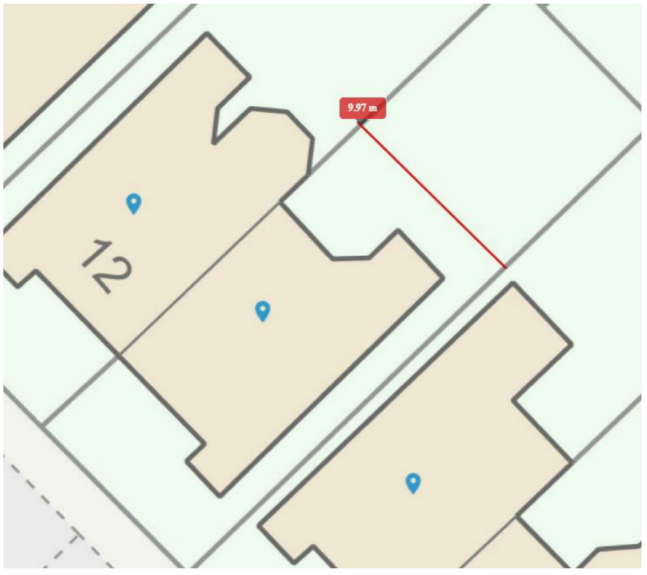
Damage principally affects the rear elevation and inner core of the property.

Site investigations show a concrete strip footing that extends 700mm below ground level resting upon a very stiff brown clay. Roots were found to the underside of the footing down to a depth of 0.9m. The laboratory testing shows a moisture deficiency on the zone of root activity. Roots found were identified as walnut - most probably from the tree located to the rear.

Project Description

Clay shrinkage subsidence is reversible and removal of the influence of tree roots will allow clay soils to hydrate and swell, encouraging the building back to its original position. Typically, this process is achieved by removing the offending vegetation. We understand that attempts to get the offending Walnut tree removed has been made but without success. Optera have therefore been asked to provide a root barrier to sever the roots between the vegetation and under the footing. The roots under the building will die by virtue of them being disconnected from the tree and consequently, the same rehydration process will occur.

Ordinarily the barrier is installed using a 3t excavator but in this instance, this is not possible due to access restrictions. It is therefore recommended that the Optera Compact Barrier be installed. The barrier is formed using a series of augered boreholes with a specialist bespoke auger machine to make a secant trench. The resultant trench is then cleaned out before being lined with a copper cored geotextile root barrier. The trench will be 3.5m deep and approximately 10m long. The trench is then backfilled with pea shingle before being covered over with the original soft landscaping.



Barrier location

Works in Brief

- Arrange for parking bay suspension for skip and welfare.
- Set up site and take delivery of welfare and plant, and store in compound area created with Heras fencing.
- Carry out a thorough CAT scan of the works area, identifying the incoming services to property.
- Protect the works area with plastic sheeting and Sterling boards.
- Take down timber shed (All contents to be cleared by others beforehand)
- Form barrier using a series of augered boreholes with a specialist machine to make a secant trench.
- Any roots found will be severed with a sharp saw on the side of the auger closest to the tree.
- Protect the works area with plastic sheeting and Sterling boards.
- Excavated material to be barrowed by hand to skips on the highway.
- Clean face of trench to ensure all roots are severed
- Line the trench with copper impregnated bio-barrier and backfill with pea shingle 200mm short of the surface.
- Back fill top layer with 200mm topsoil.
- Reinstate lawn with grass seed.
- Reconstruct timber shed.
- Remove all, plant, machinery and spoil and leave works area clean and tidy.

Completion Criteria

Contractor shall have fulfilled its obligations when:

- Contractor accomplishes the contractor activities described within this method statement
- The Policy Holder is in agreement that works have been carried out as per the agreed specification to an acceptable standard.
- Agreement that works have been carried out as per the agreed specification to an acceptable standard by the appropriate Sedgewick Engineer
- Site has been vacated and all plant and materials removed for which Optera are responsible

Project Variation Procedure

The following process will be followed if a change to this method statement is required:

- A project variation request will be submitted to Sedgwick. The variation must describe the change, the rationale for the change, and the effect the change will have on the project.
- The designated Technical Manager for OPTERA will review the proposed change and determine whether to submit the request to the other party.
- If variation works are agreed, works will be booked in at the request of the Sedgwick Engineer and OPTERA will seek formal approval via Sedgwick.
- Upon completion of the variation works, these will be invoiced separately to the initial authorised project.

Intervention Explained

How do Copper Root Barriers work ?

In the UK the shrinkage and swelling of clay soils, particularly when influenced by trees, is the single most common cause of foundation movements that damage domestic buildings.

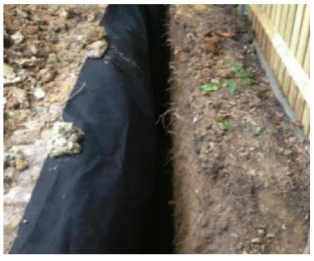
Trees are known to cause clay soils to shrink by drawing water through their roots, predominantly during spring and summer. This shrinkage results in both vertical and horizontal ground movements that, when transmitted to a building's foundations, cause damage to the building structure. The amount of shrinkage depends on the type of clay soil, the type and size of vegetation, and on climate. Trees growing under grass cover are forced to compete for their water and to extract water from greater depths than they might otherwise do, as is the case in this instance.

The water content of a shrinkable clay soil will vary with depth remote from and near to a large tree. Near the ground surface there can be relatively large changes in soil water content between summer and winter as a result of evaporation from the ground surface and transpiration by the grass. Such variations are normally confined to the top 1-1.5m of the ground, possibly less adjacent to buildings. Where mature trees grow at the same location, then the water-content profiles will vary and the seasonal fluctuations in soil water content are both larger and extend to a greater depth. Soil volume changes and hence ground movements will be greater.

A crack due to differential foundation movement occurring after a tree has reached maturity, there being no cracks up to that time, means it is probable that an exceptionally long dry spell has also had an influence. But cracks will recover when ground moisture contents recover and will not recur to any greater width in future. BRE Cracking in Buildings. The intention of the Bio root shield is to mitigate against this periodically damaging effect. The solution adopted in this case seeks to decrease water uptake by the trees thereby lessening subsidence risk by conserving soil moisture and reducing clay subsoil shrinkage. This aim is to achieve an impairment to root growth by the focused introduction of a proprietary bio root-shield that offers all the benefits of being both flexible and permeable. In addition it works as a biological repellent.

The Copper signal barrier details a cooper foil securely bonded between porous geotextile, releasing copper ions and forming copper carbonate (verdigris) that signals an adverse reaction to roots deflecting them away from the barrier. The presence of copper does not constitute an eco-system burden or impact on groundwater

This solution is multipurpose and ideally suited to the current application. Traditional impervious barriers divert rather stop roots and may block moisture movement. Also, roots getting under such barriers can grow back to the surface. Therefore, the use of this permeable barrier stops roots either by engaging and constricting them or by chemically inhibiting them.



The benefits of such a shield are its dual protection both physical and biological. The multi layered sheets can be welded together whilst retaining its flexible qualities, i.e. can be cut and effectively resealed to fit round services and foundations, inert with a 50 year service life expectancy. Equally the solution inhibits root growth on the barrier face which is often problematic with conventional barriers where increased moisture levels can cause root growth to become more prolific on the face of a traditional barrier. Research has shown that the use of the recommended style of copper based screening has greatly reduced the effects of root growth when compared to other traditional physical barrier installations

Following the installation of the shield the trench will be backfilled and compacted mechanically with 20mm single sized stone. Alternatively, dependent upon site conditions backfill using lean mix concrete will utilised on the structure side of the shield. On occasions some natural settlement is anticipated following completion. In all instances the project envisages a return visit to the property to affect any required maintenance of the surface of the reinstatement routinely programmed within 6 months following completion of the installation.

Specification of front Barrier					
Barrier Type	length	Max Root Depth	Minimum depth to be achieved with barrier	Distance between tree / Vegetation and barrier	shortest distance between barrier and foundation
Front Copper	10m	0.9m	3.5m	5m+	4m+