Arboricultural Method Statement

Optera Structural Solutions

The Barn, Oxburgh,
Fosse Way, Stretton on Dunsmore, Rugby, Warwickshire, CV23 9JF
Telephone: 02476 553 776

Arboricultural Method Statement to install a root barrier to 3.5m depth at rear of 6 Orchard Close, Cuffley.

Date

August 20, 2020

Services Performed By:

Optera Structural Solutions

The Barn, Oxburgh,
Fosse Way, Stretton on Dunsmore,
Rugby, Warwickshire, CV23 9JF
Telephone: 02476 553 776

Services Performed For:

360Globalnet Subsidence Team

Regus House, Herald Way
Pegasus Business park
Castle Donington, DE74 2TZ
Telephone: 01164 781258

POLICY HOLDER ADDRESS:	**6 Orchard Close, Cuffley. EN6 4QD**
CLIENT REFERENCE:	**DLG-SH-19-001241**
OUR REFERENCE:	**4825**
ANTICIPATED START DATE:	**TBC**
PROJECT MANAGER:	**Paul Milliam**

Project Description

The property is a significant detached house occupying an elevated position at the end of a cul-de-sac. Access to the property is via entrance steps and a side passage to the rear garden.

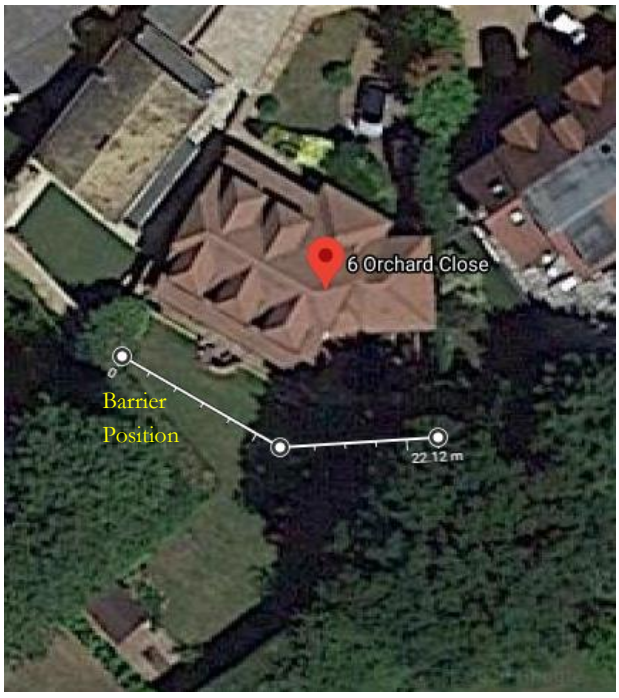
Site investigations have determined root induced clay shrinkage to be the cause of damage to the property arising from moisture extraction of mature trees and vegetation to the rear. Oak roots were found below foundation level to 2.8m depth.

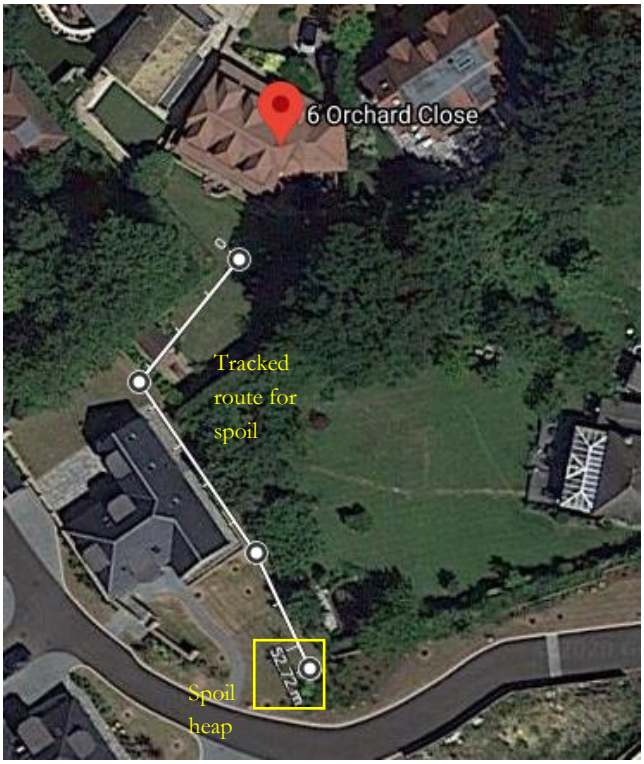
The clay shrinkage process is reversible and removal of the influence of the tree roots will allow the clay soils to hydrate and swell, encouraging the building back to its original position. Typically, this process is achieved with tree removal, but in this instance, Welwyn & Hatfield Council have refused permission for removal of a protected oak tree, and therefore a root barrier is required. The barrier should allow for rdhydration of the clay soil, leading to stability of the property.

The barrier will be a nominal 22m long and 3.5m deep, this being 700mm below the depth of the last root. For the barrier to be effective it will need to extend across the whole rear garden due to the multiple number of influencing trees and their position. The site plan shows the proposed location of the barrier. The barrier extends from the left boundary to the right. Access to the property has been negotiated from the rear property. This is by far the most convenient options to access for plant and machinery, although does give a tracked route of 55m to the spoil heap and compound area. The rear fence will need to be taken down, timber planter and laurel hedge will need to be removed, before an access ramp can be constructed. Polythene and clipped track mats will be laid to protect the route and OSB board surrounded by Heras fencing will be used to create the spoil compound. Heras fencing will also be used to safe guard and protect the route. Spoil will be removed by grab lorry periodically to prevent a buildup of waste.

The trench will be formed in short sections, not exceeding 5m. Where tree roots greater than 25 mm in diameter are found they will be cut with a clean sharp saw on the side of the trench closest to the tree. The trench will be lined with a copper impregnated geotextile barrier and backfilled with 20mm single sized stone to within 200mm of the surface. The stone is compacted in layers and the top 1m compacted with a trench rammer. The top 200mm will be reinstated topsoil overlaid with turf as existing. The lawn will be regraded and the barrier line will be reinstated with topsoil and turf. Where the trench is formed through hard surfaces, the top 200mm will be topped up with compacted type 1 MOT stone, whacked down allowing the hard surfaces to be reinstated. Upon completion of the barrier installation, the site will be cleared of waste and plant. The ramped access will be taken down and the timber planter and hedge reinstated, before re-erection of the fence. All track mats will be lifted and the tracked route cleared, cleaned and tidied. The compound area will be decommissioned and the site left clean and tidy.

Barrier Location





Works in Brief (Root Barrier)

- Enable site and take down rear fencing and posts top of the garden to allow access from neighbours property
- Take our laurel hedge and remove timber planter and dispose
- Build ramped access for plant and machinery
- Lay polythene protection along tracked dumper route and lay clipped together track mats 53m.
- Build compound area at front of neighbours property with polythene and OSB ground protection surrounded by Heras Fencing,
- Heras fence off tracked route to avoid unauthorised access.
- Carry out a thorough CAT scan of the works area, identifying the incoming services to property.
- Excavate a trench 300mm wide, in 5m lengths to 3.5m in depth and remove all spoil.
- Excavated material to be tracked by dumper 53m to spoil compound.
- Line the trench with copper impregnated bio-barrier and backfill with 20mm single sized stone, compacting in layers.
- Re-turf and reinstate lawn along line of root barrier.
- Rebuild timber planter top of garden and fill with topsoil
- Replant Laurel hedge.
- Reinstate concrete fence posts and panels
- Lift and clear protection and track mats
- Decomission compound area
- Clear, clean and tidy site

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 360Globalnet. 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 any change may affect a protected tree the project arboriculturist will be consulted prior to the works taking place.
- If variation works are agreed, works will be booked in at the request of the 360Globalnet Engineer and OPTERA will seek formal approval via 360Globalnet.
- Upon completion of the variation works, these will be invoiced separately to the initial authorized project.

Intervention Explained

How do Copper Root Barriers work ?

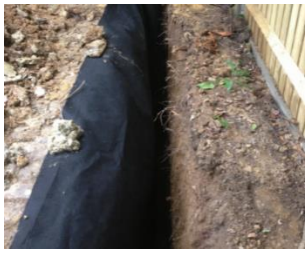
In the UK the shrinkage and swelling of clay soils, particularly when influenced by trees, is the single most common cause of foundation movements that damage domestic buildings.

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 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
Copper	22m	2.8m	3.5m	5m+	3m+