

Optera Structural Solutions

Oxburgh – The Barn, Fosse Way, Stretton-On-Dunsmore, Warwickshire.
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Arboricultural Method Statement to install root barrier across the front of the property & neighbouring property.

Date

August 10, 2021

Services Performed By:

Optera Structural Solutions
Oxburgh – The Barn, Fosse Way,
Stretton-On-Dunsmore,
Warwickshire. CV23 9JF
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Services Performed For:

Sedgwick
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LS12 6NY.
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POLICY HOLDER ADDRESS: 133 Long Lane, Hillingdon, Uxbridge, Middlesex, UB10 0AT

CLIENT REFERENCE: 6891233

OUR REFERENCE: 5549

ANTICIPATED START DATE: TBC

PROJECT MANAGER: Spencer Caizley

Project Description

The risk address is a large detached house of traditional construction, surmounted by a hipped tiled roof. The property has been extended on a number of occasions both to the front and rear. The front garden is laid primarily to block paving and is defined by 1.8m high brick walls with a pair gates to the entrance.

The insured has an oak tree to the front right-hand corner of their drive and the right hand neighbour, 135 Long Lane, has an additional 2 oaks. These are believed to be causal in the ongoing claim but are subject to TPO protection. The closest tree, T1 in the insured's ownership is 14m from the front of the house.

Site investigations show the property is founded on a concrete strip footing, 340mm thick, 900mm BGL and bears directly onto a stiff CLAY. Level monitoring confirms the majority of movement to be occurring front right.

Roots were recovered in all boreholes but at the front right-hand corner of the property, roots were noted to 3.5m BGL. The diameter of roots are recorded at 16mm at 3.5m.

The works are to install a tree root barrier to sever the roots which extend under the property and to provide ongoing protection for the property from the trees.

Tree root barriers are typically installed by excavating a 30 cm wide trench to the required depth. In this case, to 4m below ground level (BGL). This is 500mm past the last detected root and into soils which are starting to become affected by overburden and typically present an inhospitable growing horizon.

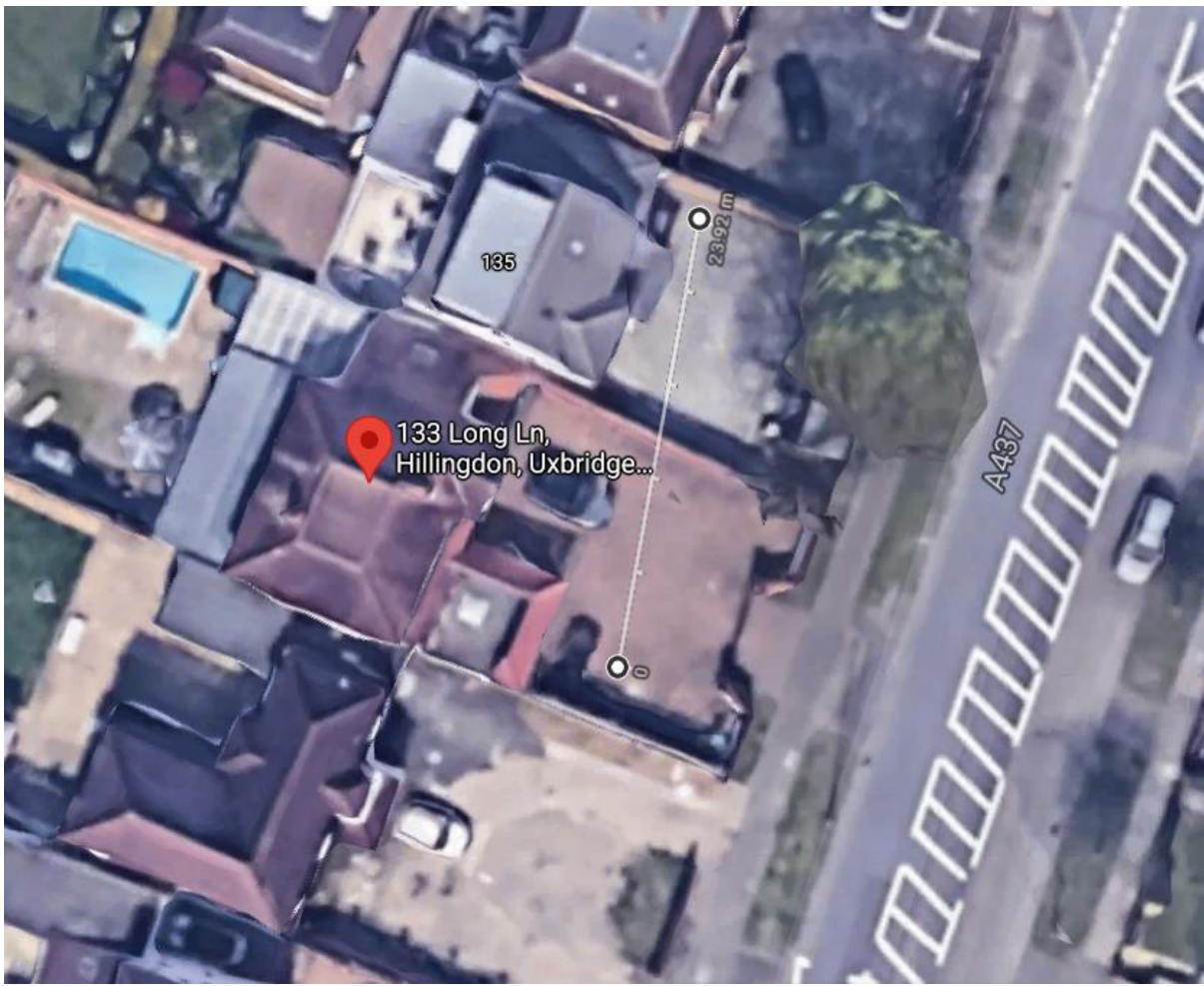
The barrier will cover the front of the insured's property and also the neighbouring property at 135 as they have trees in their garden and simply excavating to the boundary would pose risk of the barrier being outflanked.

The insureds driveway will be boarded and protected and an area will be delineated with herras fencing for the storage of spoil. The barrier will be marked out across both gardens and the area CAT scanned to determine the route of incoming services. These will be hand excavated and exposed prior to machine digging. The area either side of the barrier will be boarded and protected and on the insured's driveway, the block pavers will be lifted and set aside for later reinstatement.

A 300mm wide trench to 4m in depth will be dug. Excavations in the top 50 cm of soil will be under supervision so that any significant roots (>25 mm diameter) will be identified and cut cleanly with a sharp saw on the edge of the trench closest to each tree. The arisings will be placed in a 3 ton dumper and conveyed to the spoil pile where it will be periodically collected by grab lorry. Once the first 5m has been formed, the trench will be lined with the copper impregnated bio-barrier and bund the leading edge of the excavation with sheet piles. The trench will then be backfilled with 20mm stone to within 200mm of the surface and the process repeated until all 24m of the barrier is installed.

We will reform the footing of the garden wall, tying the concrete footing into the adjoining sections with resin bonded re-bar and cast in site mixed C35 concrete.

The aerial image below indicates the size and position of the proposed barrier:



Works in Brief for barrier

- Set up site and board and protect driveway. Whilst the driveway is large, it will be unusable by the insured whilst works are ongoing.
- The barrier will be marked out on the drive and across the neighboring drive and we will measure 1.25m from the centre line of the barrier to either side of the garden wall and saw cut down the wall.
- Board and protect and area of the drive and fence off for the storage of spoil. The wall is to be taken down and the arisings placed on the boards. The remaining wall is to be toothed out to allow reconstruction upon of the works.
- Lift the block paving across the drive along the barrier line and set aside. Cut and remove the turf on the neighbours front lawn.
- CAT scan and determine the location of the services and hand excavate to expose prior to machine excavation.
- Break and remove a section of the footing under the garden wall where the barrier passes cross.
- Line each side of the trench with 22m sterling board for protections and using an 8 ton excavator and 3 ton dumper, form a trench 300mm wide to 4m in depth and remove all spoil to the spoil pile.
- The trench is to be formed in 5m sections. Excavation in the top 50 cm will be under supervision to identify any significant roots which will be cleanly cut. Once the first five metres has been excavated, we will line the trench with the copper impregnated bio-barrier and bund the leading edge with sheet piles.

- The trench is to be backfilled with 20mm single sized angular stone to within 200mm of the surface.
- The process of excavation and backfilling will be continued across the entire 24m.
- Once installed, where the barrier passes across the wall, a new foundation will be formed. We will drill and dowel into the existing footing on either side and form a shallow ground beam with 2 layers of A393 mesh.
- The wall is to be rebuilt in bricks and gauged mortar to match existing.
- Across the drive, the trench will be excavated 400mm either side of the trench to 200mm below finished driveway and the arisings cleared from site. A single layer of A393 mesh will be laid over the raft and we will cast a 100mm thick RC slab in C35 concrete.
- Once cured, a 50mm layer of compacted sharp sand will be laid and screeded to surrounding levels. The block pavers will be relaid to line and level and compacted with the compactor plate.
- We will brush sharp sand into the joints of the blocks and compact with the plate compactor to vibrate between the joints.
- The site will be cleaned down with all plant, protections, waste and welfare cleared from the project and the area left 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 Sedgwick 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 authorized project.

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	24m	3.5m	4m	5m	2m

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 movement that damages 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 differential movement leading to 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.

The intention of a root barrier, also known as 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 copper 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 than 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 60 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 be 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.

