





Site Note Assessment March 2020			
Ref No:	WCEL/PEW/5ATA/TPISN01		
Re:	Site Supervision and Compliance Monitoring of Investigations for Foundation Trench Excavations.		
Site:	Dannatt House, 5A Templewood Avenue, Hampstead, London. NW3 7UY		
Instructing Client:	Julian Furman as Client & Bev Dockray as Architect	Date of Site Visit: 05 & 10/03/2020	Date of Site Note: 16/03/2020

I refer to my site visit and watching brief supervision of the 5th & 10th March 2020. Detailed below are some of the key points from my notes in relation to the proposed foundation investigation trench excavations undertaken at the site for which the tree of main interest is growing on the adjoining property behind the boundary wall near the public highway adjacent to the property.

Overview:

One trial trench was excavated, next to the previous trial trenches that had been excavated before to identify the depth of the footings of the wall and the main house. The trench was dug at two levels, one was a shallower level running from the house to the boundary wall and a lower section that was excavated to a much lower level and under the existing boundary wall foundations as requested by the local authority tree officer. A selection of hand digging tools were used to evacuate the soil from the trench area. A shovel, metal bar and other hand tools were used for the soil and a small micro pick for rubble and lower level subsoil removal from within the trench. The location of the trench would require some excavation within the theoretical root protection area of the established tree to confirm the presence or absence of roots and if any significant roots had managed to enter the site and to what degree the roots proliferated and utilised the soil under the foundation of the boundary wall. The routes of the trench chosen was to follow the location of the proposed down turn toe of the foundation slab and the flank wall of the proposed extension being the subject of the planning approval. This site note identifies those activities undertaken on the days of inspection. The process of inspection and monitoring that was carried out over two days. Final soil backfill and any subsequent final reinstatement will be undertaken at a later date. The location of the down turn toe slab location and foundation investigation trench (here after referred to as the trial trench) are sketched on the attached plan. Wood Consulting Environmental Limited [WCEL] were instructed to undertake a watching brief and monitor the careful excavation of the trial trench. This was to assess the presence/absence of roots in the locations required for the slab and foundation, to identify the depth and extent of structural or large arterial feeding roots that may be present within the ground profile, to determine if it is possible to achieve the extension and its foundations without causing excessive significant root loss, or relocate or amend the location of the extension, subject to identifying the maximum or minimum parameters required to insert the slab and foundations. Data obtained is considered in relation to arboricultural matters and to reduce the level of impact to the RPA of the Oak tree growing in the neighbouring property.

The purpose of the planned site visit undertaken by WCEL was to supervise and undertake watching brief monitoring, to observe the presence or absence of roots within the trial trench, and to avoid undue damage to roots of the adjacent tree. Also, to assess the possible implication and any changes





required to the slab and foundation location. So that the trial trench can be achieved without excessively damaging the tree's roots and utilise this information to support the AIA already submitted with the planning application, to ensure appropriate levels of tree protection.

The client, Julian Furman had engaged the services of a team of labourers to carry out the excavation and careful root exposure works [the contractor]. Prior to the days of fully supervised excavation, the contractor had previously removed paving and soil for two trial pits to determine the foundations of the building and boundary wall to enable the structural engineer to prepare an appropriate foundation design. These trial pits were adjacent to the trial trench, but as the front wall of the extension had been moved back, at the request of the conservation/design officer, these previous excavations were now next to the proposed location of the trench. For the trench, only hand-held equipment was used to remove paving and soil. The trial trench was prepared removing the soil in layers working along areas of the trench until the desired depth was reached, the area adjacent to the wall had to be excavated down to enable the soil under the foundation to be dug out (very similar to underpinning) before carefully removing the soil to a point that roots were identified that had to be retained and worked around which helped to establish the extent of root presence, the details of which are provided within this site note report and the attached photographs evidenced on site. There was generally a very low volume of roots identified in the trial trench and it is likely that the boundary walls foundation had deflected a percentage of the upper profile roots and the depth of the foundation had meant that only one notable adventitious root was present under the boundary wall foundation therefore having limited the root development within the site.

These noted:

Trial Trench 1 was formed in two parts; the area running perpendicular from the flank wall of the house to the boundary with a stepdown text to the boundary wall and under the boundary wall. The depth and profile of this trench follows that of the proposed foundation of the extension, as designed by the structural engineer. The shallower section of the trench was excavated to 500mm BGL and 2.99m long and the return deeper section adjacent to and under the boundary wall was excavated down to 2.1m BGL and was 1.76m long. The first shallow section had a low level of root activity mainly in the upper 350mm of the soil profile, there was a distinct change in layering of the soil and it appeared that there was a section of backfill rubble layer from 300mm to 650mm close to the wall end of the trench. There was a few small to moderate roots and the remaining roots were small, with a number of roots identified as not being from the Oak tree. The deeper section of the trench closest to the wall had significant non-Oak related root activity close to the boundary wall emanating from old climbing plants and a large clump of bamboo. There was only one moderate Oak root identified (27mm in diameter reducing to 12mm when it dives to the bottom of the trench) and this was carefully excavated around and can be very clearly seen in the photos. There was a small number of smaller roots located near the underside of the foundation and these were Oak (and possibly Photinia) again, very small in volume and size, much lower than would have been expected, but this is likely due to the depth of the foundation which is seated in the clay subsoil and the distance from the tree. Ground level was noted as the top surface level of the soil under the 50-80mm paving surface, measurements taken refer to the level below this soil surface [BGL].

Trial Trench Details and Findings:

Trial trench 1 runs perpendicular from the flank wall of the house to the boundary wall with a right-angle step in the trench in the area close to the boundary wall. The location proposed agreed between WCEL and the LPA tree officer is located within the theoretical RPA of the Oak which is growing in the front garden of the neighbour's garden outside the site's boundary. The trench measured 2.99m long between the walls and 1.76m long under the boundary wall foundation by





600mm for the shallower section of the trench (widening to 1.2m in parts including the old trial whole areas) with deeper return section under the foundations being 500mm wide to enable access past the foundations then a further 800mm wide under the existing foundation, therefore totalling 1.3m in full width within the sub-soil layer. Subject to ground conditions and the presence of roots that are required to be retained and worked around this enabled the trench to achieve a good representative even depth. The trench was in the majority excavated down to 500mm BGL for the shallow downturn slab toe section and 2.1m BGL for the deeper boundary wall section. The area being investigated is within the theoretical root protection area (RPA) of the Oak (T15), so precautionary measures were being exercised. Upon initial lifting of a section of the paving this identified a friable layer of backfill made-ground top-soil which in turn was located over a moderately compacted clayey gravel subsoil, this then overlays a very distinct brown lower level clayey sub-soil 950mm BGL, most of which was well hydrated and not desiccated likely due to the lack of root activity. The general level of this section of the site was even before the site starts to have gradient, front to back, which the soil is then retained by the boundary wall with the public highway. The upper soil level was at a consistent, even level and appeared to have been raised or levelled out in parts above a section of rubble fill material nearer the boundary wall.

A fine layer of ephemeral feeding roots was noted within the first 300mm of lighter friable topsoil below the paving, there was a low level of Oak roots but there was a greater mixture of other roots from vegetation that had previously been removed from the garden. There was almost no root activity in the backfill rubble area, there were a few small to moderate sized roots present but most of these had been affected by the previous site investigation works that had been carried out. There were no major or large substantial arterial roots located within the soil profile excavated as can be seen in the initial site excavation photographs. The level of root activity was significantly lower in the trench than would have normally been experienced for such relatively close proximity to the tree if there had not been a significant modern replacement boundary wall and there had been no alteration to the soil profile of the garden in the past. There was only a handful of more significant arterial roots (of which none would be classed as structural) generally grouped in the upper soil profile with a couple present in the lower clayey sub soil widely spaced as can be seen from the pictures (a couple of which are not Oak).

In the shallow trench only three notable arterial roots were observed and only one notable arterial root emanating from the Oak, the other two were from a small tree or large shrub now removed. In the deeper section of the trench near or under the boundary wall there were only two significant arterial roots observed (just greater than 25mm in diameter) one measuring 26mm at a depth of 1040mm at the edge of the excavation and would be retained and protected. The second is a slightly larger 27mm diameter root entering at 1020mm, (and would be removed to provide the foundation) the root reduces to 20mm very rapidly within the trench before doglegging and the dropping to the base of the tree pit at 2.1m BGL with a diameter of 12mm. It should be noted this adventitious root was generally at odds with the roots observed and is relatively inconsequential, the root can be observed in the photo. Overall, there were very few Oak roots observed, there were some other small arterial roots but they were all sub 23mm in diameter were observed crossing the trench perpendicular to the trench growing along and within the site. This is observed as being a very low volume of root activity and no structural or large arterial roots were observed. The soil at the top of the trench was friable compost/nutrient rich soil, though considering the friable nature there was a very low level of root activity





It was possible to evacuate the soil from the trench down to a depth of 500mm BGL in the shallower section and 2.1m BGL where the clayey lower-level sub-soil was observed from 950mm consisting very dense brown weather clay and this was well compacted. The topsoil and sub-soil were moist and well hydrated even given its location under the paved area, but this is likely due to the lack of significant volumes of feeding roots that would have normally led to a more desiccated soil moisture content. The root distribution was considered to be very low but representative of the rooting pattern where Oak trees have orientated their root growth to a more favourable location within a garden area or where they have been diverted by a sub-surface obstruction such as the boundary wall. The trial trench depth varied slightly in places along its length but was able to achieve the required depth BGL to achieve the structural engineer's foundation detail.

Roots identified during trial excavations crossing the trench were mainly at the lower end of root size and there were only very few small to moderate sized roots. Those smaller roots observed tended to be bunched where there were smaller pockets of favourable soil though the roots were generally root runners rather than fanning out sub-roots from the other roots, the smaller roots close to the wall were reaching the extent of the feeding run and likely benefitting from the rain runoff from the wall of the property but very few roots were observed crossing perpendicular across the trench, which again implied that the root dynamic in the area of the trench closest to the wall, within the site is more exploratory and opportunist rather than that which would be expected as part of a normal well balance a-symmetrical root distribution. The remaining majority of Oak (T15) roots observed were relatively small.

In the shallow section of the trench: 1x 22mm @ 300mmBGL, 2x22mm Not Oak at 250mm & 300mmBGL, 1x18mm @ 200mmBGL, 1x18mm subdividing to 12mm and 8mm across the trench @300mmBGL, 1x15mm@ 150mmBGL, 1x12mm @ 100mmBGL, 1x8mm @ 270mmBGL, 2x6mm @ 100mm & 350mmBGL. There were also very small numbers of small ephemeral sized feeding roots observed crossing the trench down to a depth of 300mm which are easy for the tree to regenerate within a growing season: 10x<2mm and 5x2-5mm diameter roots of live appearance through the trial trench profile, many of the roots appeared to have low starch content being dull and not very vibrant in appearance. This again indicates the limited interest of the specimen in being able to utilise the soil profile at present especially given the relatively modest distance from the Oak tree.

In the deep section of the trench: 2x6mm @ 1700mmBGL, 2x 5mm @ 120mmBGL, 3x 5mm @ 900mmBGL various locations. There were also very small numbers of small ephemeral sized feeding roots observed crossing the trench down to a depth of 1350mmBGL but none below this level. These ephemeral roots which are easy for the tree to regenerate within a growing season: 6x 2-5mm @ 50mm-400mmBGL and 6x2-4mm @ 1000mm-1350mmBGL these roots were of live appearance through the trial trench profile, many of the roots appeared to have low starch content being dull and not very vibrant in appearance. This again indicates the limited interest of the specimen in being able to utilise the soil profile at present especially given the relatively modest distance from the Oak tree.

It is likely that the limited volume and distribution/nature of the roots is concurrent with the presence of historic soil alterations and level changes in the garden, a sub-surface obstruction (such as the boundary wall and its foundations) and poor dense clayey sub-soil conditions.

The site photos can be seen within Appendix A and sketch plan identify the revised locations of the trenches as seen in Appendix B.





Conclusion & Recommendation

This site note is intended to record and determine the presence or absence of the roots on site within a specific section of the theoretical site-specific adjusted root protection area. This evidence gathering is to see to what extent structures or obstructions may have deflected or altered the normal open ground root pattern of the Oak (T15) and to determine if the installation of the extension of the building on a specially designed foundation solution prepared by the structural engineer is achievable and any parameters or alteration that may need to be considered for the extension. The following conclusions and recommendations are noted and should be considered when the tree officer reassess the scheme currently submitted for planning approval and this site evidence will then be able to inform and confirm the assessment already made within WCEL's Arboricultural Impact Assessment.

Trial Trench 1:

This trench identified a very low number of smaller sized arterial roots emanating from the Oak (T15) as well as low distribution of small to mid-sized ephemeral feeding roots also from the Oak (T15). Due to the soil conditions and hand digging of the trench it was possible to retain a higher number of roots than if the trench had been excavated by machine and if unsupervised.

Some groups of small-moderate sized roots were identified crossing the trench but there were also a number of smaller arterial roots present which are likely to have emanated from other trees and shrubs recently removed.

The position of the trench was to be the same as the proposed extension but there were still trial hole areas open from the previous investigation pits carried out to determine foundation depths with part of the excavations being located under the boundary wall as required by the LPA tree officer. The presence of such low levels of roots, with only a couple of notable roots being present, demonstrates there is lower than expected root activity in this area of the site and roots have been deflected, or have not proliferated in any great extent in this area proposed for the extension. It is probable to conclude one of the reasons is the past changes and backfill present on site in the garden and the depth of the boundary walls foundations. Such passed activities have led to roots being deflected away from entering the site.

The distribution and limited number of roots within the trench and the location and lack of the more significant arterial roots makes it favourable to conclude that the building location can be achieved based on the structural engineers foundation solution with very very minimal impact to the tree if carried out with appropriate sensitivity, care and tree protection measures.

The trench confirmed a very low level of root activity in most areas of the soil profile and with the majority of roots being located away from the area of concern. Therefore, there was only a need to remove one modest adventitious arterial root and only a couple of smaller roots also being removed. It is acknowledged there was some ephemeral feeding root loss, which is unavoidable when carrying out such an investigation but there was a much lower than expected level of root activity, the percentage loss was relatively small in comparison to the overall RPA of the tree and installing the foundation, as designed would not require additional root loss in the areas already investigated. Also, the supervised hand dug nature of the trench had secured a much greater retention of significant roots and limited the level of soil disturbance compared to the works being undertaken by machinery or unsupervised.





It is concluded that:
the assessment made in WCEL's AIA are still valid.

It is recommended that:
The design for the position of extension should be approved by the LPA tree officer with suitable tree protection conditions attached to the approval.

For this site the following guidance must be observed:

- ✿ It is considered possible that there has been a relatively high level of deflection of roots out of the site or to other parts of the front garden, though roots were observed so therefore the remaining front garden is still considered an important RPA as indicated on the previously adjusted site-specific RPA plan.
- ✿ The positioning of any, drainage, mains supply pipes and ducts would still need to be located on the courtyard side of the building as already agreed with the architects.
- ✿ There must be no further excavation closer to the tree than those of the trench and the position of the proposed specialist foundation, unless agreed in advance with WCEL.
- ✿ The open ground soil area above and outside the locations of the trench/building must still be protected with appropriate ground protection boards over the existing paving and the areas outside the proposed building (within RPAs) must be designed as permeable retaining levels as is, unless otherwise agreed with WCEL.
- ✿ It is extremely important and vital that the soil outside the trench is not compacted using a mechanical trench-foot rammer or similar where roots are present within the RPA of retained protected trees, especially where those trees are growing/rooted outside the site.

I hope you find my brief observations and photographic evidence helpful.

Kind Regards

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Principal Consultant & Director
Wood Consulting Environmental Limited





Appendix A

Site Visit Photographs





Site Visit Photographs Site Investigation Trench

Trench 1 Previous Vegetation Removed



Trench 1 (Former Trial Pit Locations Adjacent to New Trench)



Trench 1 (Shallow and Deep Sections)



Trench 1 Deep Under Wall Foundation



Trench 1 Only 1 Notable Root Present



Trench 1 Very Limited Root Activity





Appendix B

Site Investigation Trench Sketch Plan Approximate Location Plan

Showing Trench Location and Root Locations





End of Report

