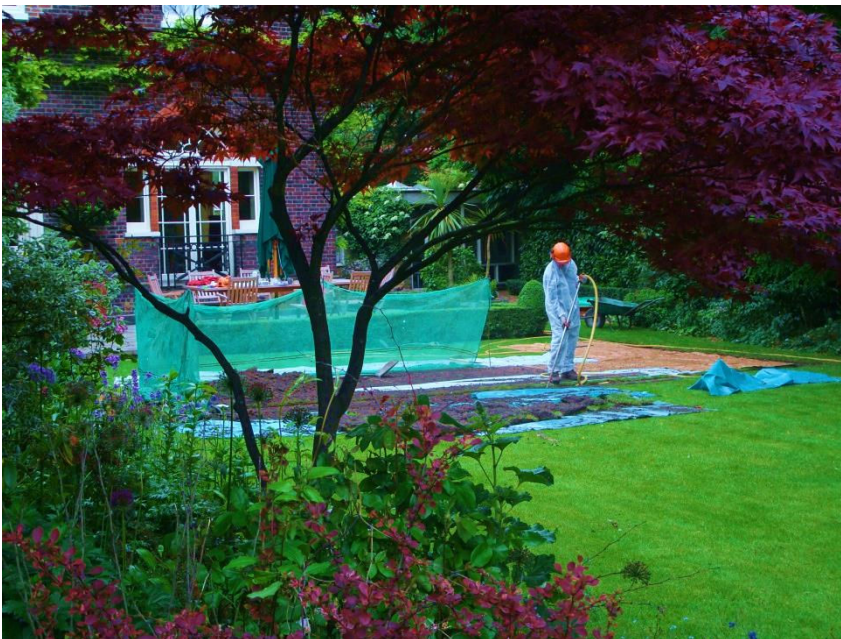


Air-spade Root Investigation. 11 Rosslyn Hill.



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DOCUMENTS TO VIEW:

- LANDSCAPE TRENCHES JPEG.
- AIRSPADE INVESTIGATION – PHOTOGRAPHIC EVIDENCE & LOCATIONS.
- EXCAVATION BOUNDARY CONDITIONS.
- PLAN A, BS: 5837 2012, 11 Rosslyn Hill, London
- For root diameters in each rooting zone see table 1. In appendix.

This report is an extension of the BS: 5837 2012 arboricultural report and impact assessment which found that the root protection area (RPA - the area which is predicted to be in use by a tree based upon a calculation derived from the stem diameter) of several trees was found to extend into the proposed basement area at 11 Rosslyn Hill, where the light-well, stairs, store room and kitchen are to be located. This includes the RPA of two mature category B Horse Chestnuts (tagged 3778 & 3776) and also a mature category C Sycamore (tagged 3777). Of these only tree 3776 is growing from the grounds of number 11 (See Plan A, BS:5837 2012 11 Rosslyn Hill, London).

Air-spade works were carried out by Mr Michael Boys, Geoffrey Finnimore and Matthew Jellings between the 18th and 21st of June 2013. The weather during this period was dry and suitable for carrying out trench digging using compressed air blown through a hollow lance, a method which removes the soil but leaves the root system intact. The positioning of the trenches was recommended by Stuart Hookham of Alan Baxter & Associates LLP, although slight modifications were necessary due to the presence of a previously unknown layer of concrete and a drainage inspection chamber (See 'Exact landscape trenches jpg.')

The turf over the trenches was carefully removed in sections to allow it to be laid back onto the lawn. Outside of the predicted root protection area the trenches were excavated 30-35cm wide and taken to a depth of 1m using a mini-digger to produce a steep vertical soil profile which made the use of the air-spade more efficient. Soil was blown along the trench until it could be removed with the mini-digger or by hand, until either a root of significant size or a dense rooting mat of thinner feeding roots was discovered. The location of any roots above 1cm in diameter was recorded, and were covered in damp hessian material to protect from desiccation. Any damaged roots were severed using secateurs to give the cleanest possible wound and reduce the likelihood of future root decay. After excavation, the soil was carefully placed back in to the trenches.

Trench 1

Soil Type: Under the lawn there is a brown earth soil roughly 20cm deep, below which is a mixture of semi-loose soil and rubble, with a horizon of flint and pebbles embedded in thick grey clay emerging around 60-100cm.

Root Content: As predicted, within the RPA of tree 3776 there were a number of significant roots, with larger roots closer to the base of the tree. The majority of the roots over 1cm in diameter were found in the top 20cm of soil however one was found at a depth of 46cm. Two important roots belonging to Horse Chestnut Tree 3776, of 6cm diameter were found at the southern corner of the trench.

Key Points: We would recommend that the existing RPA of tree 3776 is respected (see Excavation Boundary conditions).

Trench 2

Soil Type: Same as trench 1

Root Investigation: A dense rooting matt of fine and coarse roots (>1cm) were discovered in the top 20cm of the soil under the lawn between trench 1 and the gravel area, proving the trees are utilising this area for water/nutrient uptake. We did not excavate deeper in this section of the trench for fear of damaging these surface roots.

Key Points: Excavation around this part of the lawn should be avoided. It can be inferred that the roots discovered in this area could be attributed to the adjacent horse chestnut (3776), and hence the area located north of the trench line relating to the RPA of sycamore 3777 is potentially

negligible, however without an in-depth analysis of species identification on the roots, and an excavation to determine the depth of footing for the the patio, this hypothesis cannot be confirmed.

Trench 3

Soil Type: The soil composition changes below the gravel matting, where there is a concrete surface 10-15cm deep which is joined to the main house, extending outwards from the property SW by 2m. The trench was dug along the edge of this concrete. Outside of the concrete surface there is a small man-made sand layer below the ground sheet which is mixed with a small dirt surface layer 10-20cm deep. Below this the soil horizon turns to orange/brown clay. Some rubble was found in the layer around 50cm down.

Root Investigation: Underneath the gravel, some smaller roots were discovered parallel to the patio area spreading up to 5m away from the step between the lawn and gravel. The largest root in this section of the trench branched into two in a south westerly direction (K). The observed branching angles of this root suggest that this root is growing from the adjacent Wisteria rather than the mature trees to the south. Smaller roots were found at a depth just above the compacted clay at 40-50cm.

Key Points: Note the presence of the concrete drain access manholes at either end of the trench (See *Photographic Evidence and Locations*.) One was measured to an internal depth of 2.2m. An old drain pipe was found roughly 40-50cm down to the South West of the trench. Whether this is in service is not known. The RPA north of the trench is attributed to sycamore 3777. The north easterly side of the trench provided no evidence of root activity relating to the RPA's in question. No significant roots were discovered within this trench

Trench 4

Soil Type: This trench was the most difficult to dig using the air-spade with the soil made up of a highly compacted mixture of grey clay, flint and rubble.

Root Investigation: No fine roots discovered, only a single main root which flared out to the North of the existing guest house.

Key Points: It is possible that the hard condition of the ground here made it difficult for the adjacent tree (3778) to develop a fine rooting system in this predicted rooting area. As such, although a significant root was discovered here, in general this area is not being utilised by trees feeding roots.

RECOMMENDATIONS:

In light of the excavation, we suggest that the area marked for development to the south west of the main building is relocated outside of existing RPA's or otherwise removed from the development proposal. However the easterly proposed plans will not significantly affect existing root activity.

BS5837:2012 section 7.2.1 states in relation to RPA's that "Intrusion into the soil (other than for Piling), within the RPA is generally not acceptable", suggesting that with the assistance of a structural engineer, a development incorporating a 'no dig' strategy using pile foundations within the RPA may be approvable. However a basement level would require a strip retaining wall and is as such unsuitable within an RPA.

In conjunction with the above paragraph, BS5837:2012 section 7.4.2.3 states that new permanent hard surfacing should not exceed 20% of any existing surfaced ground. Implying that a development could sit on top of the ground within the RPA, provided that no excavation was required and that its total area of ground did not exceed 20% of the RPA.

The excavation highlighted areas that did not contain significant roots within the RPA. For a diagram showing zones within the nominal RPA that can and cannot be exploited for development See *Excavation Boundary Conditions*.

APPENDIX

Table 1; Diameter of significant roots found in air-spade investigation.

Map Label	Trench	Diameter of root/roots/mm
A	1	10, 16, 12, 22
B	1	14
C	1	30
D	1	28, 18, 12
E	1	19
F	1	12, 13
G	1	60, 65
J	3	21
K	3	60, branching to 30 and 25
L	3	20, 10, 23, 23, 10
M	4	29