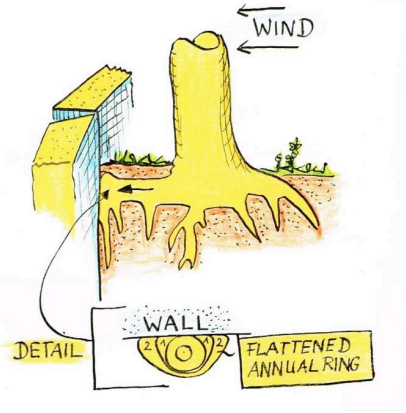
Consideration of Findings
South Hampstead Synagogue
Tree Condition Survey

Consideration of Findings

The incremental root growth of the tree has contributed to the subsequent damage to the surrounding infrastructure. More instrumental to the damage to this infrastructure will be the transference of the tree movement in high winds to the root system that abuts the brick structures.

The consequent root morphology of trees within confined rooting areas and their effect on built structure is depicted below. The flattening of the root surface against the confinement increases surface area and consequent pressure on the structure. This is relevant, not in this instance related to the damage to the structure, but because of the consequent relationship that is established between the tree and the structure. The increased surface area of the root to the structure whilst impeding the natural development of the tree's root plate will aid in an effective anchorage of the tree. Consequent removal of the structure can lead to compromised structural stability of the tree.



The root plate structure of trees as they develop naturally will differ according to the species of tree and the soil type in which they grow. Therefore, there is no established base model by which to compare the rooting structure of this tree.

It is clear that the root morphology of the tree has developed in relation to the soil environment and not in response to environmental wind conditions. The way that the root plate has developed, primarily shaped by the size of the planter and the soils in which the tree has grown, suggests that the lack of development of the root plate to the observable south and the deducted north, would leave the stability of the tree vulnerable to strong winds from either of these directions.

It is considered that the brick built structures are contributing to the stability of the tree. The extent to which this is occurring is unknown. Given the general soil conditions of loose made ground, it is considered, however, that the surrounding infrastructure will play a large role in aiding the stability of the tree. It is considered unadvisable to determine the extent of root activity by further removal of these structures, either below the exposed side of the root plate to the south or by demolition of the existing brick built structure to the north.

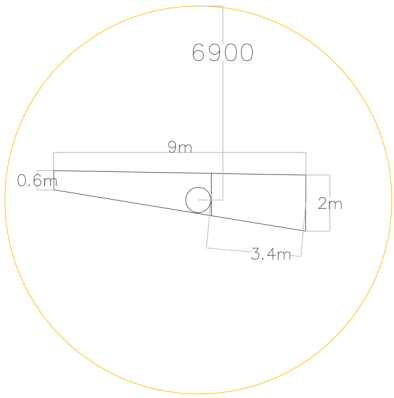
Consideration of Findings
South Hampstead Synagogue
Tree Condition Survey

Consideration of Findings

If it is considered necessary to ascertain the stability of the root plate structure further, it is advised that a 'Static Pull test' is instigated to ascertain the structural stability of the tree. This requires that the tree be pulled with a known force to ascertain the movement of roots within the root plate. It should be noted that if the test confirms instability of the tree that such a test may increase the destabilisation of the tree further.

The dimensions of the planter are uncertain, as the depth of the planter is unknown. The concrete plinth visible to the south side of the underside of the tree cannot be suitably traced to ascertain whether this is the established depth of the planter.

It is evident that the 2-dimensional aspect of the planter has severely restricted the natural development of the root plate as well as the rooting area that would naturally be attributed to a tree of this size. Working in accordance with 'B.S. 5837:2012 Trees in relation to design, demolition and construction – Recommendations', the tree would require an area 149.6 square metres, assuming no downward vertical constraint to root development. The planter represents an area of approximately 12 square metres.



It is evident that the tree has survived within the existing planting conditions, regardless of the discrepancy in suitable root growth area. It is assumed that it has been able to make use of water resources below the surrounding infrastructure. For this reason it is assumed that, regardless of the base of the planter, adventitious roots have grown to draw on available water resources outside of the planter. However, such roots are unlikely to contribute significantly to the structural stability of the tree.

Given the observable root morphology of the tree it is apparent that the structural root plate of the tree has been limited to the confines of the surrounding infrastructure. It is considered that changes to the infrastructure adjacent to the root plate of the tree, will compromise the mechanical structural integrity of the root plate.

Consideration of Findings
South Hampstead Synagogue
Tree Condition Survey

Consideration of Findings

It is considered that given the size of the tree in its current position, it would not be expedient to retain the tree. The planter could be re-modelled around the existent tree if it was proven that the stability was not compromised by the current root morphology through static pull testing. However, it is considered that the economic costs of such mitigation for the retention of the tree would be excessive given the life expectancy of the tree. The tree was previously categorised as an 'A' tree and therefore would have a viable life expectancy of 40 years plus. However, the constricted root morphology of the tree would not have been known until the consequent removal of the surrounding infrastructure.

It is now evident the tree has grown in accord with the existing ground conditions and as such has out grown its position. It is unlikely that the tree will develop a new root plate structure to account for the lack of development of roots to the south and (by inference) to the north.

The damage to the root to the east is significant. The root is 200mm in diameter and as such would contribute to the structural anchorage of the tree. It is further suspected that the loss of this root will reduce water uptake to the tree and may result in die back within the crown; the wound also presents an entry point for fungal decay pathogens.

The loss of this root may have compromised the structural stability of the tree. However, it is considered the root morphology consequent to restrictive growth will have had a more detrimental effect on the structural stability of prevalent winds from the north and south.

If the tree is to be retained it will be necessary to correctly prune this root and to incorporate soil ameliorants that will encourage callous development tissue and reduce soil borne pathogens within the planter.

It is not currently known what the prevalent wind conditions are. It is assumed that the previous build and infrastructure would have provided suitable shelter from the wind. It is uncertain whether the new build or infrastructure will provide a similar shelter or exacerbate wind conditions.