

Property Services - Estates,  
Royal Free London - NHS Foundation Trust,  
Pond Street,  
London,  
NW3 2QG

Date: 22 January 2017

Your ref:

My ref 16/103

FAO Stephen Whiston

**By e mail**

Dear Mr Whiston,

### **Tree root damage to Fleet Road Boundary Wall**

1. Further to your recent instructions I visited the site and inspected the tree and wall on 7 December 2016, with David Wareham of Wareham & Associates and I hope this report is helpful. I have also seen Mr Wareham's report and have referred to it below. I have also attached two photographs which illustrate relevant points. Left and right are used as if facing the tree from the road.
2. You asked me to advise because the tree is affecting the wall next to the pavement on Fleet Road and there are concerns about the stability and safety of both, as the road carries heavy vehicle and pedestrian traffic.

#### **The wall**

3. The wall is described in more detail in Mr Wareham's report, but is 1.3m high and the main section retains the ground behind for its full height, i.e. the soil at the tree's base is level with the top of the wall. The section of wall concerned is about 9m long and ground level behind reduces towards the left hand end which is next to a hospital entrance. The top of the wall and its fully exposed sections are one brick length thick although, as Mr Wareham comments, it is possible that it is thicker under the retained material.
4. The wall forms the boundary between the hospital grounds and the highway and now leans out over the footway by 80 - 90mm at the top. Next to the tree it has a vertical crack about 40mm wide at the top where sides are offset by about 20mm. Mr Wareham's view is that the wall might not have been built to support the retained earth and tree and comments that it..... *"is currently in an unsafe condition and could collapse without warning which could result in serious injury to persons using the public footpath or vehicles on the highway."*
5. Mr Wareham's report sets out some suitable temporary risk reduction measures, and the Hospital Estates Department intend to close or restrict the nearest section of the public footway. However Mr Wareham comments that permanent measures will be required, so he lists four options for these and discusses the pros and cons of each. I address the arboricultural implications of these below.

## **The tree**

6. The tree is a mature London plane with a survey tag numbered 0410 on the trunk. It is approximately 18m high with a single trunk 1.3m in diameter at 1.5m that has a slight lean towards the road. It is about mid way along the 9m section and is immediately behind the wall, so the face of the trunk is about 250mm from the wall, which already leans out at this point. The trunk divides at about 4m into three main limbs, which spread and ascend to form the main framework of the crown. Each of these subdivides 2 - 3m higher due to the tree being cut back or pollarded at those points when younger. That is a common practice in urban trees and the consequent regrowth might have been recut regularly for some time, but this has been neglected for several decades, so the tree has grown on to develop a broad domed, natural looking crown. It has been pruned lightly since then.
7. The twig growth is of normal density and healthy looking and there is no significant dead wood in the crown, nor any signs of structural decay. Earlier in the year the foliage was also healthy looking.

## **Discussion**

### **Condition of the tree**

8. It is not clear when the tree was planted, but planes grow rapidly in urban conditions, so it could be decades old, rather than centuries, although regular pollarding will have slowed its crown growth and the expansion of the trunk. To the best of my knowledge it has no historic or commemorative interest. It is mature but naturally long lived and capable of more growth.
9. It flares at current ground level, but does not have very pronounced root buttresses, which suggests that ground level round it has been raised during its life. That can be harmful, but planes tolerate it better than many other species. It is possible that it has some small feeding roots under the footway, but is not likely that many large structural ones are there, as there are no signs of disturbance or localised repairs to the paving, which might be expected if large roots were present. The root system will be almost completely contained by the retaining wall and the others around the raised bed in which it is growing.

### **Remedial options**

10. The roadside wall is too weak to be giving the tree any physical support, so dismantling it carefully would not destabilize it immediately although it would expose a 1.3m high overhanging bank of earth and roots, which would be susceptible to erosion, so it could not be left like that. The main problem is that the tree is very close to the back of the wall, which has leant under the pressure from the growing trunk and roots below ground, so replacing the wall now would be difficult and carry a high risk of harming it severely. As the wall is on the boundary any replacement will need to be vertical and robust enough to resist further lateral pressure as the tree grows.
11. The options listed by Mr Wareham are listed below with comments on the arboricultural implications.

***Option 1 - conventional gravity retaining wall***

12. This would need to be on the same line as the existing wall, but significantly thicker with foundations to match. The existing wall is still concealing exactly what is behind, but this option would inevitably involve significant cutting back of the base and main roots, which would reduce the tree's stability. In addition to the immediate effect on stability, the large wounds made by the cutting would be susceptible to colonisation by decay fungi, which would weaken the tree further. That would be occurring underground, so could not be detected easily or monitored. Reducing the tree's crown to lessen the mechanical load might lessen the risk to some degree, but the tree would need to be maintained at a smaller size and its vitality and ability to resist decay would be reduced.

***Option 2 - reinforced retaining wall***

13. This is similar to a conventional retaining wall, but would be L shaped in section with a toe extending under the retained ground and into the site at about ground level or lower in order to improve its stability. That would involve similar direct damage to the parts of the tree behind the existing wall as option 1 and it would also be damaged by the need to excavate horizontally in order to construct the toe. Mr Wareham comments that the only way to accommodate that with the tree in situ would be if the council allowed the wall to be built into their land, although that might involve extending beyond the existing footway into the carriageway.

***Option 3 - sheet or bored pile retaining wall***

14. This would involve complete removal of the existing wall and its foundations and construction of a new wall using contiguous driven sheet steel or bored concrete piles. This would still involve trimming back the soil / root mass behind the wall to create space for a vertical piled wall 300mm thick and, as the existing one leans by 80 - 90mm, that still would involve significant damage to the tree's roots. The piles need to be driven to a depth at least twice the height of the wall so, allowing for the height of the piling rig itself, the vertical clearance needed would be about 8m. Given the tree's trunk lean and branch structure that could not be achieved without massive cutting back and damage, including complete removal of one of the main limbs.

***Option 4 - king post pile wall***

15. This uses precast concrete sections dropped in between H section piles, but the width requirement is similar to the previous option at 250 - 300mm, so the tree's root system would still need significant cutting back, similar to that required for the other three options. The piles are not contiguous, which would avoid the need to sink them next to the trunk centre. However the estimated spacing would be 2.4 - 3m, so there would still be one close to each side of the trunk and there would still be a need for drastic cutting back, particularly the main limb on the right hand side as seen from the road. Therefore this option reduces the damage to the tree's superstructure associated with Option 3, but still involves major cutting back of the root system. I agree with Mr Wareham's comments that this appears to be the most feasible option, but that the amount of cutting back is still likely to reduce the tree's vitality and stability.

## Summary

16. All four of the options above involve major cutting back of the tree's roots and two involve cutting the top as well, which would cause significant harm. The immediate impact on its stability would be exacerbated in the longer term by fungal decay in the main roots and base of the trunk. That could not be detected or monitored reliably and reducing it as a precaution would involve maintaining it as a much smaller and less natural looking specimen. In view of these points the only viable option is to remove the tree.

## Restrictions / amenity

17. The other side of fleet Road is in Mansfield Conservation Area, but the site is outside it. However the tree is protected by a tree preservation order (TPO), so Camden Council's consent would be needed for removing it. In arriving at a decision they would need to weigh the benefits provided by the tree against the problems associated with retaining it. It is a large specimen that makes a significant contribution to the street scene, but the wall needs to be repaired urgently for public safety and that cannot be achieved practically with the tree in situ. Removing the plane would involve a loss of public amenity, but the other trees nearby would mitigate that.

18. I have prepared this report so that it can be submitted with the application, together with Mr Wareham's engineering report.

## Replacement planting

19. The problems caused by this tree are due largely to its very close proximity to the back of the wall. Unlike subsidence caused by clay shrinkage this kind of direct damage only occurs where the tree is very close to the structure concerned. There is ample space to plant a new tree farther back in the site where a suitable species could mature to make a comparable or better contribution to the locality without the problems associated with the plane. Another plane would be suitable, but there is an epidemic (canker stain) affecting plane trees spreading north from southern Europe, so an alternative of similar mature size might be a safer choice. A tulip tree (*Liriodendron tulipifera*) or maidenhair fern tree (*Ginkgo biloba*) would be safer choices. These are available as large nursery stock 5 - 6m high, so would make an immediate effect.

cont...

## Conclusions

20. The wall has been damaged by progressive growth of the tree's lower trunk and roots pushing it so that it leans over the public footway. The engineer considers that it is unstable and needs to be repaired or rebuilt urgently as a matter of public safety.
21. The wall is too weak to be providing support, so demolition alone would not destabilize the tree. However the wall needs to be rebuilt back on the boundary line and, given the movement over the years, that would involve significant cutting back of major roots. If the tree is retained the new wall would need to be robust enough to accommodate future growth, making it larger and increasing the amount of damage during construction.
22. All four of the options considered involve significant damage to the tree; piling might reduce below ground damage to some degree, but would not eliminate it and would need major cutting back of the trunk and main limbs to accommodate the piling rig. Option 4 is probably the most feasible, but would still cause significant damage.
23. Pruning to reduce weight and wind resistance would not be a reliable precaution and the tree would need to be retained in a much reduced and less natural looking form, so that approach is not justified here.
24. Therefore the only viable option is to remove the tree. There would be a loss of public amenity, but there are other trees nearby that would mitigate the immediate effect and ample space farther back from the wall where a new tree would mature to make a comparable or better contribution to the street scene without the problems associated with this one.
25. As the tree is protected its removal would need consent from Camden Council. This report has been prepared so it can be submitted with the application.
26. I hope this is helpful but if you have any queries or wish to discuss the matter further please do not hesitate to contact me.

Yours sincerely,

*Simon Pryce*

Simon Pryce

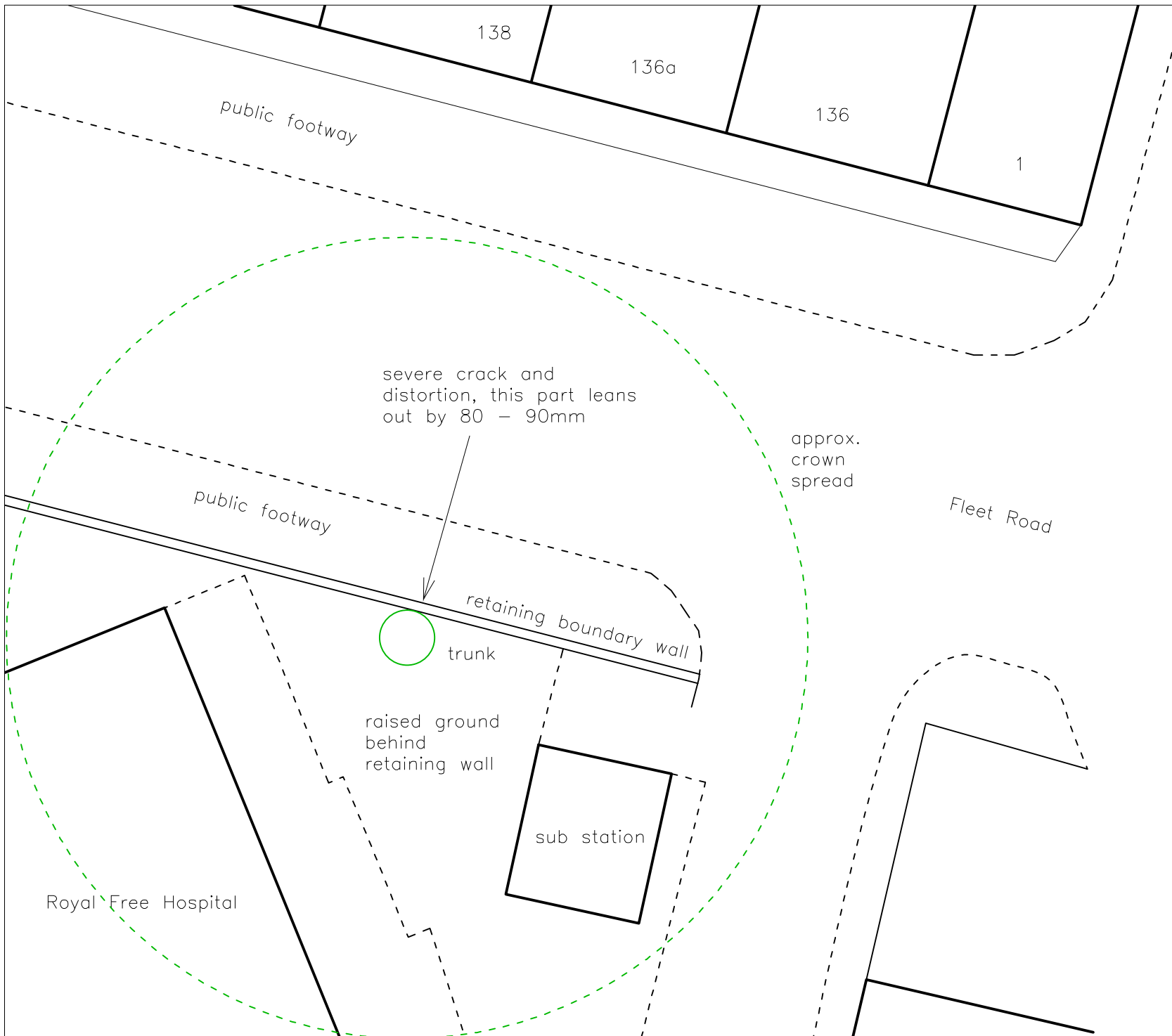
## Photographs



1) view from across Fleet Road. Red arrows indicate the earlier pollarding points

2) View along the wall showing lean in the wall and the tree's trunk and the crown overhang which would impede piling equipment.





<b>Simon Pryce Arboriculture</b>	
Client: Royal Free Hospital	
Site: Royal Free Hospital, Fleet Road, London, NW3 2QG	
Title: Plane tree and damaged wall	
Date: 23 January 2017	
Ref: 16/103	Rev:
Scale: approx 1:125 at A4	
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Original drawing: Simon Pryce	
Notes:	