Arboricultural Impacts

Impacts	Nos. of trees
Trees to be removed	15
Groups to be removed (Partial removals)	6 (1)
Trees to be transplanted	4
Groups to be transplanted	0
Trees with proposed incursions into RPAs	0
Groups with proposed incursions into RPAs	0
Trees that will pruning	0
Groups that will pruning	0

Tree Work Schedule

No.	Species	Works	Category
10	Yew	Fell to ground level; grind out stump	B_1
11	Elder	Fell to ground level; grind out stump	C_1
12 (G3)	Sycamore	Fell to ground level; grind out stump	B_2
13 (G3)	Sycamore	Fell to ground level; grind out stump	
14 (G3)	Sycamore	Fell to ground level; grind out stump	
36	Prunus sp.	Fell to ground level; grind out stump	C_1
37	Prunus sp.	Fell to ground level; grind out stump	B_1
38	Swedish whitebeam	Fell to ground level; grind out stump	B_1
39	Prunus sp.	Fell to ground level; grind out stump	C_1
40	Norway maple	Fell to ground level; grind out stump	B_1
41	Norway maple	Fell to ground level; grind out stump	B_1
42	Norway maple	Fell to ground level; grind out stump	B_1
43	Norway maple	Fell to ground level; grind out stump	B_1
45	Lime	Fell to ground level; grind out stump	B_1
46	Lime	Fell to ground level; grind out stump	B_1
G2	Sycamore	Fell to ground level; grind out stumps	C_2
G3	Sycamore	Partial removal - Fell to ground level; grind out stumps	B_2
G6	Various	Fell to ground level; grind out stumps	C_2
G7	Various	Fell to ground level; grind out stumps	C_2
G8	Silver birch	Fell to ground level; grind out stumps	B_1
G9	Various	Fell to ground level; grind out stumps	C_2
G10	Various	Fell to ground level; grind out stumps	C_2

All tree work is to be undertaken in accordance with British Standard BS 3998:2010 Tree work - Recommendations.
All arisings are to be removed and the site is to be left as found.
Care is to be taken of the ground around retained trees to make sure that it does not become compacted as a result of tree surgery operations. No equipment or vehicles such as timber lorries, tractors, excavators por cranes shall be parked or driven beneath the crowns of any retained trees, to prevent subsequent compaction and root death..

Arboricultural Method Statement

All tree work is to be undertaken in accordance with British Standard Please refer to Arbtech Consulting Ltd. Tree Schedule, Arboricultural Method Statement and Tree Protection Plan, for full details on all surveyed trees and how all aspects of the development maybe implemented without determent to retained trees.

Issue: Proposed walls within the RPAs of tree nos. 15, 16, 18, 19, 20 (G3) and 47 - 49.
Solution: Foundations of the proposed walls situated within the footprint of the existing footpath are to be situated no deeper than the existing sub-base; with the exception of any piles or pads that may be required. Foundations of all structures are to be designed in conjunction with site investigations and arboricultural advice.

Issue: Proposed walls within the RPAs of tree nos. 15, 16, 18, 19, 20 (G3) and 47 - 49.
Solution: Foundations of the proposed walls situated outside of the footprint of the existing footpath are to be situated above the existing ground level; with the exception of any piles or pads that may be required. Foundations of all structures are to be designed in conjunction with site investigations and arboricultural advice.

Issue: Proposed retaining walls and steps within the RPA of tree no. 48.
Solution: Foundations of all structures are to be designed in conjunction with site investigations and arboricultural advice to reduce the amount of impact upon the tree. All excavations are to be undertaken manually under arboricultural supervision.

Issue: Proposed subterranean development & building are situated within the RPAs of tree nos. 47 & 48.
Solution: All excavations are to be undertaken manually under arboricultural supervision. To prevent the lose of the rooting environment the edge of the subterranean development is to have sheet piling or similar retaining system installed to to prevent soil collapse, unless deemed unnecessary by the project engineers due to the geology of the site.

Note: Tree no.9 was removed by others in June 2014.

Note: Proposed subterranean development could cause a potential issue with the possibility of soil collapse within or adjacent to the RPAs of tree nos. 1-5 (G1).
To prevent this potential issue the line of subterranean development should have sheet piling or similar retaining system installed to retain the rooting environment, unless deemed unnecessary by the project engineers; if piling it is to be installed under arboricultural supervision.

Issue: Proposed hard landscaping within the RPAs of tree nos. 1-5 (G1).
Solution: Proposed hard landscaping features to be situated no closer than the existing; all foundations are to be situated no deeper than any existing foundations or sub-bases. Foundations of all structures are to be designed in conjunction with site investigations and arboricultural advice.

Tree Categories

Trees are categorised in accordance with the cascade chart in Table 1 of the British Standard BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations'

Category 'U' - Trees in such condition that they cannot realistically be retained as living trees in context of the current land use for longer than 10 years.
Category 'A' - Trees of high quality with an estimated remaining life expectancy of at least 40 years.
Category 'B' - Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
Category 'C' - Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.

Root Protection Area

In order to avoid damage to the roots or rooting environment of retained trees, the Root Protection Areas (RPAs) should be plotted around each of the category A, B and C trees. This is a minimum area in m^2 which should be left undisturbed around each retained tree.

The RPA is calculated using the British Standard BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations.

The calculated RPA is capped to $707m^2$, which is the equivalent to a circle with a radius of 15m. Where there appears to be restrictions to root growth the root protection area is reshaped to more accurately reflect the likely distribution of the roots.

Foundations within RPAs

The use of traditional strip foundations can result in excessive root loss and as such should be avoided.
Designs for foundations that would minimize the adverse impact upon trees soul include particular attention to the existing levels, proposed finished levels and cross sectional details. Site specific and specialist advice should be sought from the project engineers and arboriculturist.

Root damage can be minimized by using;

- Piles with site investigation used to be determined their optimal location whilst avoiding damage to roots important for the stability of the tree, by means of hand tools or compressed air soil displacement, to a minimum depth of 600mm;
- Beams, laid at or above ground level, and cantilevered as necessary to avoid tree roots identified by site investigation.

Where a slab for minor structures (e.g. shed base) is to be formed within the RPA, it should bear on the existing ground level, and should not exceed an area greater than 20% of the existing unsurfaced ground.

Slabs for larger structures (e.g. dwellings) should be constructed with a ventilated air space between the underside of the slab and the existing soil surface (to enable gas exchange and venting through the soil surface. In such cases, a specialist irrigation system should be employed (e.g. roof run-off redirected under the slab). The design of the foundation should take into account of the effect on the load bearing properties of the underlying soil from the redirected roof run-off. Approval in principle for a foundation that relies on topsoil retention and roof run-off under the slab should be sought from building control authority prior to this approach being relied upon.

Where piling is to be installed near to trees, the smallest practical pile diameter should be used, as this reduces the possibility of striking major tree roots, and reduces the size of the rig required to sink the piles. If a piling mat is required, this should conform to the parameters for ground boarding. Use of the smallest practicle piling rig is also important where piling within the branch spread is proposed, as this can reduce the need for access facilitation pruning. The pile type should be selected bearing in mind the need to protect the soil and adjacent roots from the potentially toxic effects of uncured concrete, e.g. sleeved bored piles or screw piles.

This information is compliant with British Standard BS5837:2012 Trees in relation to design demolition and construction - Recommendations, section 7.5 Special engineering for foundations within the RPA.

ARBTECH
Consulting Limited

Project:
The Pears Building,
Royal Free Hospital,
London,
NW3 2QG.

Client:
The Royal Free Charity

Drawing:
Arboricultural Impact Assessment

Based on:
Royal Free Proposed Site Base; &
Stage D architectural drawings

Drawing No:	Rev:
Arbtech AIA 03	

Date:	Scale:	Drawn:
Oct 2014	1:200 @ A1	MGM

Key:

Tree Nos.:	1	Tree Canopies:		Trunks:	
RPAs:		Category 'A' trees:		Category 'B' trees:	
Category 'B' groups:		Category 'C' trees:		Trees to be removed:	39
Incursions - Hard landscaping		Incursions - Basement:		Incursions - Building:	

All dimensions should be checked on site. No dimensions are to be scaled from this drawing.
Please notify us of any discrepancies found. Arbtech Consulting Ltd. cannot be held responsible for inaccuracies in the base drawing in which this plan is based.
This drawing is designed to reflect the principles of the layout or design only, and relates only to the protection of retained trees.
This drawing is not to be read as a definitive part of the engineering or construction designs or method statement. An architect or structural engineer should be contacted over any matters of construction, detailing or specification and for any standards or regulatory requirements relating to proposed structures, hard surfacing or underground services.
This drawing was produced in colour - a monochrome copy should not be relied upon.