



Landmark Trees

**ADDENDUM ARBORICULTURAL IMPACT ASSESSMENT CONSIDERING
USE OF PRIVATE ROAD BY CONSTRUCTION TRAFFIC ASSOCIATED
WITH THE DEVELOPMENT OF:**

53 Fitzroy Park
London
N6 6JA

REPORT PREPARED FOR:

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Ref: FA/53FZP/RSP/01a

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Summary

This is a report on the potential effects of the passage of construction traffic associated with the re-development of 53 Fitzroy Park on trees along the private road. It was originally produced in response to the Landscape Planning Limited Arboricultural Impact Assessment report reference 68936 which was produced on behalf of objectors to a previous planning application.

Our report will show with reference to British Standard 5837: 2012 Trees in relation to design, demolition and construction – Recommendations and other guidance that:

- **Replacement of the road surface is not necessary;**
- **The levels of theoretical impacts to both trees are well within the limits set out in published guidance.**

1. Replacement of Road Surface

- 1.1 The Landscape Planning Limited (LPL) takes the view at paragraphs 7.2.1 and 8.3 that the passage of construction traffic requires the re-engineering of the road surface to adequately bear the anticipated loading. It goes on to cite at paragraph 7.2.6 a WSP report which recommends that a minimum 300-400mm depth is required for this.
- 1.2 The LPL report comments that this would sever the roots of a number of trees making them potentially liable to windthrow (failure at the root plate).
- 1.3 I would rebut this in two separate but linked ways: firstly that comparable development to that proposed has already taken place at Fitzroy Farm and secondly that wholesale re-engineering of the road is not required.
- 1.4 It is self-evident that the significant development of Fitzroy Farm did not require the re-engineering of the private road in question, a bond was instead set aside to make good any damage resulting from the increased usage of the road. As I understand things, very little of this bond was utilised: what little was spent was put to use repairing the odd pot-hole. Nor has any historic effect on tree health been alleged. There is no evidence that the soil conditions have significantly changed in the period between that development and now, so I fail to see why further development of comparable scale would result in a different outcome.

- 1.5 Whilst I do not wish to call into question the recommendations made as to re-engineering of the roadway, I would refer to comments made by Andrew Dawson of Nottingham University with regard to the calculation of California Bearing Ratios (CBR) when data is converted from alternative testing methods. Mr Dawson comments that data from such alternative tests can be converted only “*very approximately*” and that hand penetrometer measurements tend to under-read values of strength.
- 1.6 Regardless of the difficulties in accurately assessing the CBR of ground below existing carriageways, the fact remains that similar levels of construction traffic did not require the re-engineering of the road surface.
- 1.7 I would also note that should the sub-soil the trees along the road may be colonising have the potential to be compacted by the passage of heavy goods vehicles, this compaction would have occurred during the development of Fitzroy Farm. It is widely accepted and reported that the greatest soil density changes occur within the first few passes of vehicles. As no symptoms of root dysfunction were identified in either LPL’s survey or ours, one of three conclusions can be drawn: (1) the existing tarmac surface is sufficient to bear the weight of construction traffic; (2) soil compaction has occurred but this has had no impact on tree health or (3) the trees are not rooting below the roadway. In the absence of evidence indicating (3) is correct, one must assume that some combination of (1) and (2) applies.

2. Levels of Impacts

- 2.1 In the unlikely event that the road is now no longer able to bear construction traffic adequately and that the soil beneath it has not already been compacted, it is necessary to determine what impact this will have on the health of the trees along it.
- 2.2 BS5837: 2012 gives Recommended Protection Areas (RPA's) for any given tree size. The individual RPA's are calculated in the Tree Schedule in Appendix 1 to this report, or rather the notional radius of that RPA, based on a circular protection zone. The prescribed radius is 12-x stem diameter at 1.5m above ground level, except where composite formulae are used in the case of multi-stemmed trees.
- 2.3 In BS5837, paragraph 4.6.2 states that RPA's should reflect the morphology and disposition of the roots; where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution. Not infrequently, LT are requested by LPA Tree Officers to modify the RPA's to reflect their assumptions that e.g. a road will have drastically limited root growth. Whilst we are not suggesting this be done in this instance, it serves to identify that the identification of soil beneath paved roads as a *priority* area to protect is not universally accepted: we are frequently asked by local authorities to discount roads from consideration as Root Protection Areas.
- 2.4 At paragraph 7.1.1, the LPL report asserts that the private road passes within the Root Protection Area (RPA) of 15 trees surveyed. No assessment of the amount of RPA affected is provided.

- 2.5 Following a survey undertaken on 14th September 2017 and subsequent production of a Tree Constraints Plan, we found that the private road passes through the RPA of 10 trees and identified the extent of this for each tree. The full survey schedule, Tree Constraints Plan and arboricultural impact assessment are appended to this document.
- 2.6 Of the 10 trees whose RPAs the private road passes through, it comprises 20% or less for 8 individuals. An RPA encroachment of $\leq 20\%$ of RPA may be considered as low impact, given the permissive references to 20% RPA relocation and impermeable paving within BS5837:2012 and other published references to healthy trees tolerating up to 30-50% root severance (Coder, Helliwell and Watson in *Tree Roots in the Built Environment*, 2006).
- 2.7 The private road therefore covers more than 20% of the RPA of two specimens, T5 (21%) and T13 (24%). Given the references to the tolerability of 30-50% *root severance*, the areas that could potentially be compacted are not likely to result in an adverse effect upon tree health. Indeed, Thomas (*Trees: Their Natural History*, 2000 & 2014: Cambridge University Press) comments that “In practice 50% of roots can sometimes be removed with little problem, provided there are vigorous roots elsewhere. Inevitably, this degree of root loss will temporarily slow canopy growth and even lead to some dieback”.

3. Conclusion

- 3.1 The road was previously seen to be durable enough to withstand the passage of construction traffic serving a development of comparable scale, and CBR values stated should be treated with caution.
- 3.2 Only minor damage to the roadway resulted from previous construction traffic, and no impacts on lane trees recorded or alleged.
- 3.3 Any compaction of the soil beneath the roadway will have already occurred as a result of the previous construction traffic.
- 3.4 The levels of encroachment of RPAs are generally such that should any further compaction occur, it will not result in detriment to the trees along the private road.
- 3.5 The principle of reactive repair of potholes in conjunction with a bond should serve equally well on this development.



Landmark Trees

APPENDICES

APPENDIX 1

TREE SCHEDULE

Botanical Tree Names

Apple, Crab:	Malus sylvestris	Pine, Monterey	: Pinus radiata
Ash, Common:	Fraxinus excelsior	Pine, Scots	: Pinus sylvestris
Cedar, Atlantic:	Cedrus atlantica	Plum spp	: Prunus spp
Cherry, Japanese:	Prunus spp	Plum, Purple	: Prunus cerasifera 'Nigra'
Cypress, False :	Chamaecyparis	Sycamore	: Acer pseudoplatanus
Lime, Common:	Tilia x europea	Yew, Common	: Taxus baccata
Magnolia, Southern:	Magnolia grandiflora		

Notes for Guidance:

1. Height describes the approximate height of the tree measured in metres from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is expressed as an average of NSEW aspect if symmetrical.
3. Ground Clearance is the height in metres of crown clearance above adjacent ground level.
4. Stem Diameter (Dm) is the diameter of the stem measured in millimetres at 1.5m from ground level for single stemmed trees. BS 5837:2012 formula (Section 4.6) used to calculate diameter of multi-stemmed trees. Stem Diameter may be estimated where access is restricted and denoted by '#'.
 5. Protection Multiplier is 12 and is the number used to calculate the tree's protection radius and area
 6. Protection Radius is a radial distance measured from the trunk centre.
 7. Growth Vitality - Normal growth, Moderate (below normal), Poor (sparse/weak), Dead (dead or dying tree).
 8. Structural Condition - Good (no or only minor defects), Fair (remediable defects), Poor - Major defects present.
 9. Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
 10. B.S. Cat refers to (British Standard 5837:2012 section 4.5) and refers to tree/group quality and value; 'A' – High, 'B' - Moderate, 'C' - Low, 'U' - Unsuitable for retention. The following colouring has been used on the site plans:
 - High Quality (A) (Green),
 - Moderate Quality (B) (Blue),
 - Low Quality (C) (Grey),
 - Unsuitable for Retention (U) (Red)
 11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservational, Historic and Commemorative.
 12. Useful Life is the tree's estimated remaining contribution in years.



Site: Fitzroy Park

Date: 14/9/17

Appendix 1

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Kim Dear

Ref: WFA/53FZP/AIA

BS5837 Tree Constraints Survey Schedule

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
1	Apple, Crab	4	1224	1.5	130	Young	1.6	Moderate	Fair	C		10+	
2	Cedar, Atlantic	19	4646	4.5	580	Early Mature	7.0	Moderate	Fair	B		20+	Co-dominant stems with weak union
3	Cypress, False	22	4443	2.0	700	Mature	8.4	Normal	Good	B		20+	
4	Pine, Monterey	23	8879	6.5	850	Mature	10.2	Normal	Good	A		>40	
5	Cherry, Japanese	9	6554	2.5	500	Mature	6.0	Moderate	Fair	B		20+	Low branches over highway
6	Magnolia, Southern	5	2222	1.5	100	Semi-mature	1.2	Normal	Fair	C		20+	



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7	Pine, Scots	8	4464	5.5	450	Early Mature	5.4	Normal	Fair	B		20+	Lost lead stem / topped
8	Magnolia, Southern	9	2533	1.0	180	Early Mature	2.2	Normal	Good	B		20+	
9	Plum, Purple	9	2533	1.5	380	Early Mature	4.6	Moderate	Fair	C		20+	Leaning (slightly)
10	Yew, Common	8	3333	1.0	460	Early Mature	5.5	Normal	Fair	B		>40	
11	Lime, Common	11	5110	3.5	210	Semi-mature	2.5	Moderate	Fair	C		20+	Leaning (significantly) leans into adjacent sycamore.
12	Sycamore	19	3458	4.5	480	Early Mature	5.8	Normal	Fair	C		20+	Ivy clad epicormic growth



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Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
13	Sycamore	19	2856	3.0	560	Early Mature	6.7	Moderate	Fair	C		10+	Ivy clad ivy to 6 m.
14	Sycamore	17	3233	3.5	430	Semi-mature	5.2	Normal	Fair	B		>40	
15	Sycamore	16	3234	4.0	380	Semi-mature	4.6	Normal	Fair	B		>40	
16	Plum, Wild	6	2111	1.5	180	Semi-mature	2.2	Moderate	Fair	C		10+	
17	Ash, Common	19	4565	6.5	650	Mature	7.8	Normal	Fair	B		20+	Ivy clad in scrub on bank
g1	Ash, Common	6	2122	1.5	140	Semi-mature	1.7	Moderate	Fair	C		20+	Remote survey only (RS) group hawthorn/ash on slight bank, alongside road.

APPENDIX 2

ARBORICULTURAL IMPACT ASSESSMENT

Appendix 2: Arboricultural Impact Assessment
(Impacts assessed prior to mitigation and rated with reference to Matheny & Clark (1998))

Hide irrelevant

Show All Trees

Ref: WFA/53FZP/AIA

B.S. Cat.	Tree No.	Species	Impact	Tree / RPA Affected	Age	Growth Vitality	Species Tolerance	Impact on Tree Rating	Impact on Site Rating	Mitigation
B	2	Cedar, Atlantic	Construction Traffic within RPA	30.5 m ² 20.04 %	Early Mature	Moderate	Moderate	Low	Low	Ground protection
B	3	Cypress, False	Construction Traffic within RPA	20.2 m ² 9.11 %	Mature	Normal	Moderate	Very Low	Very Low	Ground protection
A	4	Pine, Monterey	Construction Traffic within RPA	43.7 m ² 13.37 %	Mature	Normal	Moderate	Low	Low	Ground protection
B	5	Cherry, Japanese	Construction Traffic within RPA	23.8 m ² 21.04 %	Mature	Moderate	Moderate	Medium	Medium	Ground protection
B	7	Pine, Scots	Construction Traffic within RPA	11.4 m ² 12.44 %	Early Mature	Normal	Moderate	Low	Low	Ground protection
B	10	Yew, Common	Construction Traffic within RPA	1.1 m ² 1.15 %	Early Mature	Normal	Moderate	Very Low	Very Low	Ground protection
C	12	Sycamore	Construction Traffic within RPA	15.5 m ² 14.87 %	Early Mature	Normal	Moderate	Low	Low	Ground protection

Appendix 2: Arboricultural Impact Assessment

(Impacts assessed prior to mitigation and rated with reference to Matheny & Clark (1998))

Hide irrelevant

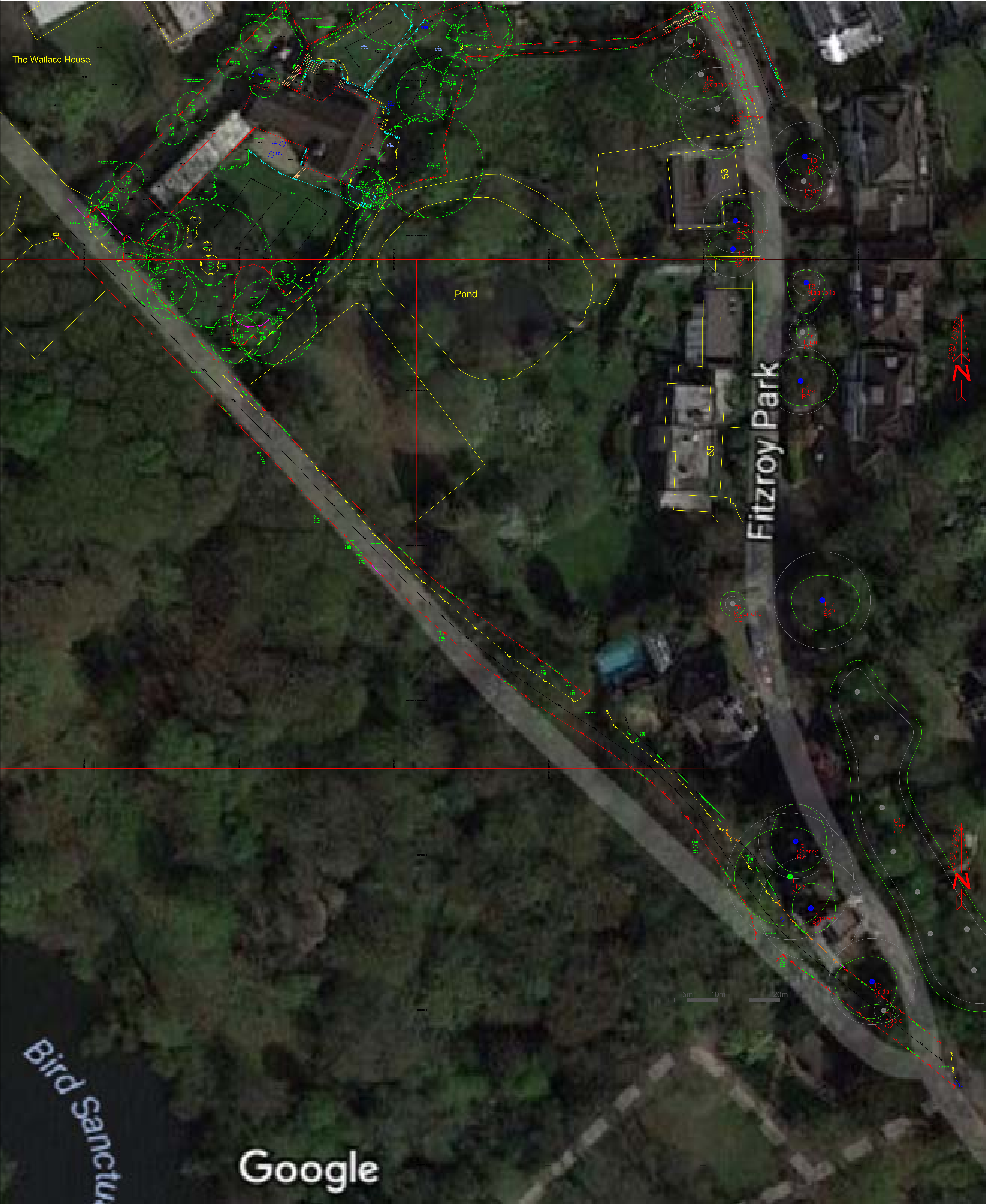
Show All Trees

Ref: WFA/53FZP/AIA

B.S. Cat.	Tree No.	Species	Impact	Tree / RPA Affected	Age	Growth Vitality	Species Tolerance	Impact on Tree Rating	Impact on Site Rating	Mitigation
C	13	Sycamore	Construction Traffic within RPA	34 m ² 23.96 %	Early Mature	Moderate	Moderate	Medium	Medium	Ground protection
B	14	Sycamore	Construction Traffic within RPA	13.8 m ² 16.5 %	Semi-mature	Normal	Moderate	Low	Low	Ground protection
B	15	Sycamore	Construction Traffic within RPA	4.8 m ² 7.35 %	Semi-mature	Normal	Moderate	Very Low	Very Low	Ground protection

APPENDIX 3

TREE CONSTRAINTS PLAN



NOTE:
This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.
Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.
Root Protection Areas (RPA) are derived from stem diameter measured at 1.5 m above adjacent ground level (taken on sloping ground on the upslope side of the tree base).

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Site: The Waterhouse
Drawing Title: Tree Constraints Plan
July 2017

Key:
Category A
High Quality
Category B
Moderate Quality
Category C
Low Quality
Category U
Trees Unsuitable for Retention
Crown Spread
Tree Number
Species
Category
Root Protection Area
Note: All Tree Positions Are Approximate (not shown on original survey)