

60 Coombe Gardens New Malden, Surrey, KT3 4AA

BS 5837:2012 Tree Survey & Impact Assessment For Proposed Extension

Address: St Mary's Church, Primrose Hill

Site Surveyed by Peter Holloway

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Report Prepared for St Mary's Church

Tree Survey & Arboricultural Impact Assessment St Mary the Virgin Parish Church, Primrose Hill

Table of Contents

<u>1.</u>	INTRODUCTION
<u>2.</u>	DOCUMENTS
<u>3.</u>	BACKGROUND
<u>4.</u>	TREE SURVEY
<u>5.</u>	ARBORICULTURAL IMPACT APPRAISAL
<u>6.</u>	MITIGATION
<u>7.</u>	APPENDIX 1 STANDARD METHODOLOGY7
<u>8.</u>	APPENDIX 2 TABLE 1 'TREE DATA' 10
<u>9.</u>	APPENDIX 3 EXISTING SITE PLAN WITH TREE CONSTRAINTS
10.	APPENDIX 4 PROPOSED EXTENSION AND TREE CONSTRAINTS

1. Introduction

I am instructed by Mr Wyn Jones on behalf of St Mary's Church to produce an **Arboricultural Implications Assessment (AIA)** of the proposed extension of the church.

The methodology is based on British Standard 5837: 2012 'Trees in relation to design, demolition and construction – Recommendations' April 2012.

2. Documents

- 2.1 I was provided with the following documents:
 - i. Topographical Site Survey (no details)
 - ii. Foundation Ground Floor Plan 4455-01 25.05.21
 - iii. Proposed Ground Floor Plan 430-00-100-C 05.10.20
 - iv. Proposed South Elevation 430-00-200-C 2.12.20
 - v. Proposed East Elevation 430-00-210-C 2.12.20
 - vi. Proposed North Elevation 430-00-220-C 2.12.20
 - vii. Proposed First Floor Plan 430-00-110-C 05.10.20
 - viii. Proposed Roof Plan 430-00-120 C 05.10.20
 - ix. Proposed Section AA 430-00-300 9.03.21
 - x. Proposed Section DD 430-00-330 9.03.21

3. Background

- 3.1 The existing church extension was built on a piled foundation to retain rooting space for the existing trees on the frontage. The current extension will use a similar foundation as described in drawing 2.1.ii above.
- 3.2 This report includes:
 - i. Standard BS5837 Methodology (Appendix 1)
 - ii. Tree Survey Data (Appendix 2)
 - iii. Existing Site Plan with Tree Constraints (Appendix 3)
 - iv. Extension details with Tree Constraints (Appendix 4)
- 3.4 The trees were surveyed from ground level using a visual tree assessment method. No detailed tree examinations were undertaken during the survey.
- 3.5 I looked at the site and surveyed the trees on 12th August 2020.

- 3.6 The site is within Elsworthy Conservation Area and the Church is a grade II listed building. Judging from the planning application history, I believe that the Catalpa and Aesculus are included in Tree Preservation Orders and the Apple is not. The status of tree protection should be confirmed, and the appropriate procedure followed before undertaking any tree works.
- 3.7 The Wildlife and Countryside Act 1981 (as amended), the Conservation (natural habitats etc.) Regulations 1994, and the Countryside and Rights of Way Act 2000 provide protection for many species of animal that live in trees. I did not see any protected species in the trees I surveyed.
- 3.8 The Geology in the wider site (as indicated at <u>http://mapapps.bgs.ac.uk/geologyofbritain/home.html)</u> is London Clay. This geology will influence foundation design to avoid problems from shrinkable 'soils' and tree rooting depth will be shallower than on gravel geology.

4. Tree Survey

- 4.1 The methodology for the tree survey is described in Appendix 1.
- 4.2 I recorded seven trees, two areas of shrubs and three hedges. The details are listed in Appendix 2, Table 1.

5. Arboricultural Impact Appraisal

- 5.1 I have adjusted the shape of the RPAs of the trees to match the existing building shape. Some roots of T5 and possible T6 could be growing beneath the existing low impact foundation for the existing extension.
- 5.2 The existing foundation for the curved vestibule consisted of a 200mm reinforced concrete slab on 400mm deep ground beam above piled foundations. The proposed vestibule extension uses the same foundation, but it is extended in some places with a 250mm concrete reinforced floor slab with screw piles to support the edge of the cantilevered slab. See Foundation Ground Floor Plan 4455-01 25.05.21.

- 5.3 The excavation for the floor slab is 250mm. The existing flagstone hard surface will be at least 100mm deep. The net excavation is of the order of 150mm which is minimal. The screw piles can be located to avoid any significant roots (25mm or greater in diameter).
- 5.4 The small Japanese Maple (T4) and the Privet hedge (H9) cannot be retained as they are growing within the footprint of the extension. The hedge (H9) appears to be growing outside of the site, but it is rooted within the site and the stems are aligned along the boundary.
- 5.5 The proposed extension will affect 14.5m² (9%) of the adjusted root protection area (RPA) of the Indian Bean Tree (T5) and the crown will be pruned to accommodate the building (and where it overhangs the road to clear traffic). The crown overlaps the proposed 2 story extension by 2.4 m and the road by 2.4 south and 3m east. The 2-storey extension is between 5 and 7.7m high adjacent T5 as it is a pitched roof. It is normal to provide at least 2m working space for a new building but the tree is approximately 2m from the front elevation so the building's front elevation should be constructed with minimal working space to preserve as much of the branch structure as possible.
- 5.6 The proposed extension will affect 3m² (4%) of the RPA of the Apple (T6). The extension affects the southwest corner of the crown which will be pruned. The building should be constructed with minimal working space so that as much crown is retained as possible.

6. Mitigation

- 6.1 The amount of rooting space on the Catalpa T5 is small and because of the limited depth it is tolerable. The crown pruning for the building is more substantial. The crown can regrow, but Catalpa has a domed spreading crown and so there will be conflicts (as there currently are) with the building and the road. It would be preferable to remove the tree and plant a species with a fastigiate (upright) growth habit, but the tree can be retained and shaped into a taller narrower tree by pruning, albeit less effective.
- 6.2 The loss of rooting space on the Apple T6 is minimal and tolerable. The pruning required to accommodate the extension will affect the building side of the tree, but it will regrow new foliage.

6.3 The retained trees will need to be protected from construction damage. The existing hard surface will need to be retained to protect the roots. Additional ground protection may be required during foundation works when the ground is exposed. The tree stems will need to be protected with boxed structures and there will be limited space for storage and construction work within the site.

7. Appendix 1 Standard Methodology

- A.1 Survey
- A1.1 All my observations were from ground level without detailed investigations, and I measured tree stem diameters where possible and estimated height and crown spread by pacing and using a clinometer. I do not normally have access to trees outside the boundaries and so my observations and comments on these trees are based on the visual assessment made from within the site or the surrounding public highway.
- A.1.2 I surveyed all trees objectively without reference to any design proposals supplied or suggested by the client. The trees were located using the topographical survey where provided. If the topographical plan did not include all relevant trees, they would be added in their approximate positions.
- A.1.3 As suggested in the BS 5837:2012 all single stem trees with a stem diameter of less than 75 mm at 1.5 m above ground level can be excluded from the survey as they are not deemed to be of significant size to be included. Multi stemmed trees were measured in accordance with the standard.
- A.1.4 Trees and shrubs are living organisms whose health and condition can change rapidly, for this reason the BS 5837 grades, along with any conclusions or tree management recommendations can only remain valid for a period of 12 months.
- A.1.5 Where possible trees were assessed as individual specimens, however, where there were trees that formed distinctive groups of the same species within the landscape they can be assessed and graded as groups.
- A.1.6 Trees on or adjacent to development sites are a material consideration that may have a significant impact on the future development and use of the site.
- A.2 Use of survey data.
- A.2.1 The British Standard 5837:2012 provides guidance on the principles to be applied to achieve a satisfactory juxtaposition of trees with structures.
- A.2.2 The tree survey with minimum requirements of BS5837 is enclosed in the appendices of this report.

- A.2.3 The British Standard 5837: 2012 'Trees in relation to design, demolition and construction – Recommendations' provides guidance and specifies measures to be adopted to avoid or minimise damage to trees retained on or in proximity to construction sites. One of the key recommendations is that a Root Protection Area (RPA) should be established around each retained tree. The RPA is calculated as an area equivalent to a circle with a radius 12 times the stem diameter measured at 1.5 metres above ground level for a single stem tree. To prevent disturbance or contamination of the RPA they are usually enclosed by robust fencing.
- A.2.4 Circular Root Protection Areas (RPAs) can be adjusted by an arboriculturist by considering obstructions for root growth, including building foundations, retaining walls, metalled roads, topography, soil type and tolerance of individual trees.
- A.2.5 The British Standard recommends that trees within categories A-C (where A is highest quality) are a material consideration in the development process. Category U trees are trees that will not be expected to exist for long enough to justify their consideration in the planning process. The tree categories are used with the number 1, 2, or 3, which is shown in Table 1. These signify whether the justification for the category was made based on mainly arboricultural values, mainly landscape values or mainly cultural/conservation values, respectively. The tree categories are shown on the tree constraints plan by colour coding. Category A trees are green, category B trees are blue, category C are grey and category U are dark red.
- A.2.6 It is important to recognise that tree roots are particularly vulnerable during any adjacent construction operations. Tree roots grow where conditions are most favourable, this tends to be near the soil surface, for this reason most tree roots grow in the upper 600mm of the soil. This means that operations during construction such as shallow excavations, soil compaction by heavy plant or machinery or contamination by substances such as cement, diesel, or other chemicals, even water in excess, can be damaging to the root system.
- A.2.7 The presence of surrounding walls, roads and retaining walls can affect the root distribution of trees within and around the site. Normally when a Root Protection Area is adjusted its shape is changed but the total area is maintained.

- A.2.8 Approved tree work should be carried out in accordance with BS 3998:2010 by suitably qualified and experienced professional tree surgeons. Under no circumstances shall site personnel undertake any tree pruning operations. All tree works should also take into consideration The Wildlife and Countryside Act 1981(as amended), the Conservation (natural habitats etc.) Regulations 1994, and the Countryside and Rights of Way Act 2000 protected species of flora and fauna.
- A.2.9 If the site is within a conservation area, then the local authority will need to be notified of your intention to prune the tree which they can prevent by making a Tree reservation Order. Some forms of tree work are exempt from this requirement and tree works directly required to accommodate a development that has planning permission would be exempt. However, to avoid error I would always recommend notifying the local authority to avoid costly mistakes.
- A.2.10If individual trees are protected by Tree Preservation Orders, then written consent is required for tree pruning or tree removal except for a few exemptions and if the work is directly required to accommodate a development which has planning permission. As above, I would always recommend applying for consent rather than assuming that works are exempt from requiring consent.

Tree Survey & Arboricultural Impact Assessment St Mary the Virgin Parish Church, Primrose Hill

8. Appendix 2 Table 1 'Tree data'

- Tree number: The number used in the table 1 corresponds to numbers on the plans.
- **Species**: The Common and Botanical names of each tree.
- Height and branch spread are estimated and listed in metres.
- **Stem diameter** is usually measured at 1.5m above ground level (a.g.l.). It is listed in the table in mm.

Height of crown above ground level (a.g.l.):

This gives an indication of whether the crown extends to the ground or has low hanging branches. The height of the lowest branch and its direction will also be recorded.

Direction of Lowest Branch:

The direction is given as a compass direction however where all branches originate at the same point (like a pollarded tree) the letter 'CB' may be used, where the lower branches originate at the same height 'AR' for all 'round may be used.

Age class: This refers to the age of the individual tree relating to the average life expectancy of each species in a similar environment.

Physiological condition:

The general state of health of the tree, good (G), fair (F), poor (P) or dead (D).

Structural condition:

A description of any defects/habits/any previous management of note.

Remaining contribution in years:

This has been estimated by taking the age of the tree away from an estimate of the total number of years the tree may live for in current site conditions, it has listed in bands as recommended in BS5837:2012.

Retention category:

Each tree is placed in a category using the guidance in BS 5837:2012.

Table 1		St Mary's Church Primrose Hill 12.08.20																	Recommended Work		
Tree	Species			Height	No. of	Stem	Root Protection			Crown constraints (m)							Summary of	Structural Condition & General	Remaining	Tree	
Number	Common Name	Latin Name	dim.	(m)	Stems	Diameter (mm)	Radius m	Area m2	Crown height	Lowest branch	Direction lowest branch	North	South	East	West		Physiological condition	comments	contribution years	Category	
T1	Californian Buckeye	Aesculus californica	No	10	1	500	6	113	2.5 W	4	Crown break		5 7	5	5	6 Mature	Fair	Scattered deadwood, one large dead branch. Branch and stem cavities.	20 to 40 yrs	B1,3	Remove major deadwood
T2	Tulip Tree	Liriodendron tulipifera	No	23	1	610	7.3	168	1.5 S	5	Crown break	5	9 9	7	7	8 Mature	Good		>40 yrs	A1,2	Remove major deadwood, raise low canopy to 3m
Т3	Maidenhair Tree	Ginkgo biloba	No	27	1 1	490	5.9	108	4 W	4.5	5 South		6	7	7	3 Mature	Good		>40 yrs	A1,2	No action
Т4	Smooth Japanese Maple	Acer palmatum	Yes	4	3	80,70,40	1.4	5.9	1.2	0	0 Multistem		2	3	3	2 Young	Good		20 to 40 yrs	C1	No action
Т5	Indian Bean Tree	Catalpa bignonioides	No	11.5	1	600	7.2	163	2 W	2.4	Crown break	3	8	5	3	4 Mature	Good	Minor deadwood, stem bark wounds, poor lower limb junction (length reduced)	20 to 40 yrs	B1,2	Raise low canopy to 5m over road
Т6	Purple Crab Apple 'Lemoinei'	Malus Lemoinei'	No	10	1	390	4.7	69	2E	1.5	5 Crown break	5	3 7	7	7	3 Mature	Fair	Species not certain without flowers.	20 to 40 yrs	B1,2	No action
S7	Pittosporum	Pittosporum tenuifolium	Yes	6	4	20, 60,60,5	1.2	4.6	0	0	0 Multistem		2 2	1	1	2 Semi-matu	JGood		20 to 40 yrs	C1	No action
S8	Mixed shrubs	See condition column	NA	NA		NA												Cotinus, Pyrus (small), Pyracantha, Griselina, Spiraea, Mahonia	NA	NA	No action
H9	Privet hedge	Ligustrum ovalifolium	No	1.2		NA			0	0)	0.5	0.5	0.5	5 0.	5 Young	Fair	Hedge	NA	NA	No action
H10	Privet hedge	Ligustrum ovalifolium	No	1.2		NA			0	0)	0.5	0.5	0.5	5 0.	5 Young	Fair	Hedge	NA	NA	No action
H11	Privet hedge	Ligustrum ovalifolium	No	1.2		NA			0	0		0.5	0.5	0.5	5 0.	5 Young	Fair	Hedge	NA	NA	No action
S12	Mixed shrubs	See condition column	NA	NA		NA												Hydrangea, Rosa, Trachelospermum, Lonicera	NA	NA	No action

9. Appendix 3 Existing Site Plan with Tree Constraints



10. Appendix 4 Proposed Extension and Tree Constraints

