



BS5837:2012

**Trees in relation to design, demolition and construction –
Recommendations**

Tree Survey

Highgate School

Richards Music Centre

Highgate School

Adj. 2 Bishopswood Road

London N6 4PR

25th April 2016

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N6 4AY

25/04/16

Tree Survey Report

Richards Music Centre, Highgate School, Adj. 2 Bishopswood Road, London N6 4PR

Arbtech Consulting Limited (Arbtech) received written instruction on 17th March 2016 from Mr D E Jones of Highgate School. to attend Highgate School, Adjacent 2 Bishopswood Road, London N6 4PR (site) to undertake an arboricultural survey to BS5837:2012 guidance to assess trees, hedges and major shrub groups growing on and within influencing distance of the site and to produce a Schedule of trees, Tree Constraints Plan, Arboricultural Impact Assessment, Arboricultural Method Statement and Tree Protection Plan.

I am Jon Hartley, an arboricultural surveyor at Arbtech Consulting Ltd. I undertook the tree survey on 19th April 2016 and subsequently have produced this summary of my findings.

I hold the FDS in Arboriculture and benefit from professional industry experience spanning sixteen years. I also have an associate membership with the Institute of Chartered Foresters and professional memberships with the Consulting Arborist Society and the Arboricultural Association.

The advice below and appended is underwritten by our Professional Indemnity insurance for the business practice of Arboricultural Consultancy in the sum of one million Pounds Sterling in each and every claim.

Tree Survey Executive Summary

A total of 24no individual trees and 3no groups of trees were surveyed.

During the survey I categorised the group of trees using “Table 1 – Cascade chart for tree quality assessment” of the BS5837:2012.

Richards Music Centre (RMC) is located on the of the boundary playing field with a synthetic pitch. The RMC group of buildings is on the south boundary of the site.

It is likely that arboricultural impacts can be addressed with arboricultural methodology or minor amendments to the proposal.

Individual notes on each tree’s structural and physiological condition are found in the Notes section of the survey schedule.

BS5837 Scope

This standard recognizes that there can be problems of development close to existing trees which are to be retained, and of planting trees close to existing structures. This standard sets out to assist those concerned with trees in relation to construction to form balanced judgements. It does not set out to put arguments for or against development, or for the removal or retention of trees. Where development, including demolition, is to occur, the standard provides guidance on how to decide which trees are appropriate for retention, on the means of protecting these trees during development, including demolition and construction work, and on the means of incorporating trees into the developed landscape.

Definitions

Arboriculturist

An arboriculturist (or arboricultural consultant) is a person who has, through relevant education, training and experience, gained recognized qualifications and expertise in the field of trees in relation to construction.

Tree Survey

A tree survey should be undertaken by an arboriculturist and should record information about the trees on a site independently of and prior to any specific design for development. As a subsequent task, and with reference to a design or potential design, the results of the survey should be included in the preparation of a tree constraints plan, which should be used to assist with site layout design.

Tree Constraints Plan

A TCP is plan, typically delivered as an AutoCAD drawing (.dwg file format), prepared by an arboriculturist for the purposes of layout design showing the root protection area and representing the effect that the mature height and spread of retained trees will have on layouts through shade, dominance, etc.

Root Protection Area

An RPA is a layout design tool indicating the area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree, shown in plan form in m².

Construction Exclusion Zone (also termed Tree Protection Zone)

A construction exclusion or tree protection zone is an area based on the RPA (in m²), identified by an arboriculturist, to be protected during development, including demolition and construction work, by the use of barriers and/or ground protection fit for purpose to ensure the successful long-term retention of a tree.

Arboricultural Impact Assessment

This is a study, undertaken by an arboriculturist, to identify, evaluate and possibly mitigate the extent of direct and indirect impacts on existing trees that may arise as a result of the implementation of any site layout proposal.

Tree Protection Plan

A TPP is plan, typically delivered as an AutoCAD drawing (.dwg file format), prepared by an arboriculturist showing the finalized layout proposals, tree retention and tree and landscape protection measures detailed within the arboricultural method statement, which can be shown graphically.

Arboricultural Method Statement

This is a methodology for the implementation of any aspect of development that has the potential to result in loss of or damage to a tree. The AMS is likely to include details of an on-site tree protection monitoring regime.

Methodology

The methodology used to assess the trees was the British Standard 5837:2012 *Trees in relation to design, demolition and construction – recommendations* tree survey method. The aim of the survey is to establish which trees are moderate and good quality; suitable for retention and justifying protection. And, which trees are low or poor quality; either undesirable or unsuitable to retain and protect.

The tree survey includes all trees included in the land survey red line boundary plan, as well as any that may have been missed, and it should categorize trees or groups of trees, including woodlands for their quality and value within the existing context, in a transparent, understandable and systematic way. Where the arboriculturist has deemed it appropriate, the trees have been tagged with small metal or plastic tags, placed as high as is convenient on the stem of each tree.

Whilst master plan proposals for the development of the site might be available, the trees have been surveyed without taking these into consideration. All detailed design work on site layout should take into consideration the results of the tree survey (and the TCP).

Trees forming groups and areas of woodland (including orchards, wood pasture and historic parkland) are identified and considered as groups where the arboriculturist has determined that this is appropriate, particularly where they contain a variety of species and age classes that could aid long-term management. It is often expedient to assess the quality and value of such groups of trees as a whole, rather than as individuals. However, an assessment of individuals within any group has been undertaken if they are open-grown or if there is a need to differentiate between them.

The quality and value of each tree or group of trees has been recorded by allocating it to one of the four categories; **A**, **B**, **C**, or **U** (highest to lowest quality respectively). The categories are differentiated on the tree survey plan by colour, or by suffixing the category adjacent to the tree identification number on the TCP.

The survey schedule lists all the trees or groups of trees. The following information is also provided:

- I. reference number (to be recorded on the tree survey plan);
- II. species (common or scientific names);
- III. height in metres (m);
- IV. stem diameter in millimetres (mm) at 1.5 m above adjacent ground level or immediately above the root flare for multi-stemmed trees;
- V. branch spread in metres taken at the four cardinal compass points;
- VI. height of crown clearance above adjacent ground level in metres (m);
- VII. age class (Newly planted, Young, Semi-mature, Early mature, Mature, Over mature);
- VIII. physiological condition (e.g. good, fair, poor, decline and dead);
- IX. structural condition (e.g. good, fair, poor and ivy);
- X. preliminary management recommendations, including further investigation of suspected defects that require more detailed assessment and potential for wildlife habitat; and
- XI. The retention category referring to the quality and useful contribution in years; **U** = <10yrs; **A** = >40yrs; **B** = >20yrs; **C** = >10yrs. The retention sub category referring to the type of amenity; 1 = Arboricultural; 2 = Landscape; 3 = Cultural including conservation.

Recommendations

With the benefit of making an assessment of your planning proposals, we make the following recommendation to ensure that no conditions relating to arboriculture are attached to any planning consent secured; obtain an arboricultural report to include:

- a) An arboricultural impact assessment (AIA);
- b) An arboricultural method statement (AMS); and
- c) A tree protection plan drawing (TPP).

Limitations

Trees were inspected from using visual observation from ground level only. Trees were not climbed or inspected below ground level. Inaccessible trees will have best estimates made about the location, physical dimensions and characteristics. Trees have been grouped where BS5837 guides us that it is expedient to do so. Trees have been excluded from the survey if they are found by us to be sufficiently far away from the proposed developable area or if they are outside of the red line boundary plan showing the expectations of our Client for the extent of the survey. BS5837 does not draw any distinction between trees subject to statutory protection, such as a Tree Preservation Order (“TPO”), and those trees without. This is principally because a detailed planning consent overrides any TPO protection. Consequently, we do not seek to offer any comparison between or infer any difference in the quality or importance of TPO trees and other trees.

Appendices

The following documents were released to the Client as appendices to this report:

- Survey Schedule (PDF)
- Tree Constraints Plan drawing (PDF)

If you require clarification of information contained herein, please do not hesitate to contact us via 01244 660558.

Yours Sincerely,



Jon Hartley DipHort(Arb) FdSc MArborA

Senior Consultant

Appendix 1: Schedule of Trees

BS5837:2012 Tree Survey

Arbtech Consulting Ltd.

Client: Highgate School
 Project: Richards Music Centre
 Survey Date: 19/04/2016
 Surveyor: Jon Hartley



Unit 3, Well House Lane
 Chester Road
 Chester
 Cheshire
 CH4 0DH
 Phone: 01244661170

Tree and Tag No Species	Hght (m)	Stems		Crown		Age	RP A (m ²) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations Survey Comment	Cat ERC
		No	Ø (mm)	Spread (m)	Clear (m)						
G1										Estimated Measurements	
A Group	6	1	200	N	3	2	SM	A: 18.1	Good	C: Good	C.2
--				E	3	2		R: 2.4		S:	
				S	3	2				B:	
				W	3	2				Off site mixed species group including Prunus spp. and Ilex sp.	20 to 40 yrs
G2										Estimated Measurements	
A Group	3.5	1	75	N	1.5	1	Y	A: 2.5	Good	C: Fair	C.2
--				E	1.5	1		R: 0.89		S: Fair	
				S	1.5	1				B: Fair	
				W	1.5	1				Off site linear group including yew, holly and lilac.	20 to 40 yrs
G3										Estimated Measurements	
A Group	4	1	100	N	1	1	Y	A: 4.5	Good	C: Good	C.1
--				E	1	1		R: 1.19		S: Good	
				S	1	1				B:	
				W	1	1				Off site boundary group of Malus sp. and Ilex sp.	20 to 40 yrs
T1										Estimated Measurements	
Common Lime	18	1	890	N	6	4	M	A: 358.4	Fair	C: Fair	A.1.2
<i>Tilia europaea</i>				E	6	4		R: 10.68		S: Good	
				S	6	4				B: Good	
				W	6	4				Basal and epicormic shoot development throughout typical of the species. Historically reduced with pruning wounds to 70mm diameter and regrowth to 70mm diameter.	>40 yrs
Age Classifications: N Newly planted EM Early Mature Condition: C Crown Stems: Ø Diameter Y Young M Mature S Stem (Eq) Equivalent stem diameter using BS5837:2012 definition SM Semi-mature OM Over Mature B Basal area											

Tree and Tag No Species	Hght (m)	Stems		Crown		Age	RP A (m²) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations Survey Comment	Cat ERC
		No	Ø (mm)	Spread (m)	Clear (m)						
T2										Estimated Measurements	
Common Lime <i>Tilia europaea</i>	18	1	810	N E S W	6 6 6 6	4	M A: 296.9 R: 9.72	Fair	C: Fair S: Good B: Good	Basal and epicormic shoot development throughout typical of the species. Historically reduced with pruning wounds to 70mm diameter and regrowth to 70mm diameter.	A.1.2 >40 yrs
T3											
Sycamore <i>Acer pseudoplatanus</i>	15	1	500	N E S W	3 3 3 3	5	M A: 113.1 R: 6	Good	C: Fair S: Good B: Good	Boundary tree regular maintained with reduction works. Works resulting in pruning wounds up to 50mm diameter with regeneration up to 30mm.	B.1.2 >40 yrs
T4											
Sycamore <i>Acer pseudoplatanus</i>	15	1	290	N E S W	3 3 3 3	5	M A: 38.1 R: 3.48	Good	C: Fair S: Good B: Good	Boundary tree regular maintained with reduction works. Works resulting in pruning wounds up to 50mm diameter with regeneration up to 30mm.	B.1.2 >40 yrs
T5											
Sycamore <i>Acer pseudoplatanus</i>	15	1	270	N E S W	3 3 3 3	5	M A: 33 R: 3.24	Good	C: Fair S: Good B: Good	Boundary tree regular maintained with reduction works. Works resulting in pruning wounds up to 50mm diameter with regeneration up to 30mm.	B.1.2 >40 yrs
T6											
Sycamore <i>Acer pseudoplatanus</i>	15	1	270	N E S W	3 3 3 3	5	M A: 33 R: 3.24	Good	C: Fair S: Good B: Good	Boundary tree regular maintained with reduction works. Works resulting in pruning wounds up to 50mm diameter with regeneration up to 30mm.	B.1.2 >40 yrs
T7											
Sycamore <i>Acer pseudoplatanus</i>	15	1	220	N E S W	3 3 3 3	5	M A: 21.9 R: 2.64	Good	C: Fair S: Good B: Good	Boundary tree regular maintained with reduction works. Works resulting in pruning wounds up to 50mm diameter with regeneration up to 30mm.	B.1.2 >40 yrs
Age Classifications: N Newly planted EM Early Mature Condition: C Crown Stems: Ø Diameter Y Young M Mature S Stem (Eq) Equivalent stem diameter using BS5837:2012 definition SM Semi-mature OM Over Mature B Basal area											

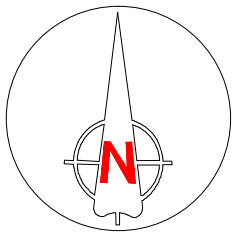
Tree and Tag No Species	Hght (m)	Stems		Crown		Age	RP A (m) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations Survey Comment	Cat ERC
		No	Ø (mm)	Spread (m)	Clear (m)						
T8											
Sycamore <i>Acer pseudoplatanus</i>	15	2	581 (Eq)	N E S W	5 3 4 4	4 5 5 5	M A: 152.9 R: 6.97	Good	C: Good S: Good B: Poor	Two codominant stems from base with included bark from base to 600mm. Crown has been reduced to wounds up to approximately 50mm diameter with regeneration up to approximately 30mmdiameter.	B.2 20 to 40 yrs
T9											
Sycamore <i>Acer pseudoplatanus</i>	15	1	420	N E S W	4 2 4 4	5 5 5 5	M A: 79.8 R: 5.03	Good	C: Fair S: Good B: Good	Boundary tree regular maintained with reduction works. Works resulting in pruning wounds up to 50mm diameter with regeneration up to 30mm.	B.1.2 >40 yrs
T10										Estimated Measurements	
Common Oak <i>Quercus robur</i>	14	1	650	N E S W	4 4 5 4	6 3 3 3	M A: 191.2 R: 7.8	Good	C: Fair S: Fair B:	Off site tree. Historical stem wound from base to 6m extending half circumference commensurate with fire damage. Historical reduction up to 200mm diameter wounds.	B.2.3 >40 yrs
T11											
Sycamore <i>Acer pseudoplatanus</i>	16	1	350	N E S W	2 2 1 2	4 4 4 4	M A: 55.4 R: 4.19	Good	C: Good S: Good B: Good	Boundary tree. Reduced 30mm diameter with regeneration up to 30mm diameter.	B.2 >40 yrs
T12											
Sycamore <i>Acer pseudoplatanus</i>	16	1	570	N E S W	3 3 3 5	5 7 5 5	M A: 147 R: 6.84	Good	C: Good S: Good B: Good	Boundary tree regular maintained with reduction works. Works resulting in pruning wounds up to 70mm diameter with regeneration up to 30mm.	B.2 >40 yrs
T13											
Sycamore <i>Acer pseudoplatanus</i>	16	1	390	N E S W	1 3 3 3	5 5 5 5	M A: 68.8 R: 4.67	Good	C: Good S: Good B: Poor	Boundary tree regular maintained with reduction works. Works resulting in pruning wounds up to 70mm diameter with regeneration up to 30mm. Historical basal wound originally 300mmx300mm now 100mmx200mm.	C.2 10 to 20 yrs
Age Classifications:	N Y SM	Newly planted Young Semi-mature	EM M OM	Early Mature Mature Over Mature	Condition:		C S B	Crown Stem Basal area	Stems:	Ø (Eq)	Diameter Equivalent stem diameter using BS5837:2012 definition

Tree and Tag No Species	Hght (m)	Stems		Crown		Age	RP A (m ²) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations Survey Comment	Cat ERC
		No	Ø (mm)	Spread (m)	Clear (m)						
T14										Estimated Measurements	
London Plane <i>Platanus x hispanica</i>	22	1	1200	N E S W	6 0 8 9	6 22 4 4	M A: 651.5 R: 14.4	Fair	C: Poor S: Fair B:	Appears to be historically of two codominant stems with eastern stem removed. Asymmetrical crown distribution resulting from poor pruning. observations made from site and obscured by 4m fence.	B.2 20 to 40 yrs
T15										Estimated Measurements	
Common Lime <i>Tilia europaea</i>	12	1	490	N E S W	2.5 2.5 2.5 2.5	6 6 6 6	SM A: 108.6 R: 5.87	Fair	C: Fair S: Fair B: Fair	Off site street tree regularly pollarded.	B.2 20 to 40 yrs
T16										Estimated Measurements	
Common Lime <i>Tilia europaea</i>	12	1	470	N E S W	2.5 2.5 2.5 2.5	6 6 6 6	SM A: 99.9 R: 5.63	Fair	C: Fair S: Fair B: Fair	Off site street tree regularly pollarded.	B.2 20 to 40 yrs
T17										Estimated Measurements	
Common Yew <i>Taxus baccata</i>	9	2	354 (Eq)	N E S W	2 3 3 3	8 2 2 2	SM A: 56.6 R: 4.24	Good	C: Fair S: Good B: Fair	Off site tree. Ivy obscures inspection of stem and base.	B.2 >40 yrs
T18										Estimated Measurements	
Bay <i>Laurus nobilis</i>	5	4	281 (Eq)	N E S W	3 3 3 2	2 2 2 2	SM A: 35.7 R: 3.37	Good	C: Good S: Good B: Good	Off site boundary tree.	B.2 >40 yrs
T19											
Common or Black Elder <i>Sambucas nigra</i>	4	1	110	N E S W	2 0 0 3	2 2 2 2	M A: 5.5 R: 1.32	Good	C: Fair S: Good B: Good	Boundary tree of low quality and value.	C.1 20 to 40 yrs
Age Classifications: N Newly planted EM Early Mature Y Young M Mature SM Semi-mature OM Over Mature Condition: C Crown S Stem B Basal area Stems: Ø Diameter (Eq) Equivalent stem diameter using BS5837:2012 definition											

Tree and Tag No Species	Hght (m)	Stems		Crown		Age	RP A (m²) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations Survey Comment	Cat ERC
		No	Ø (mm)	Spread (m)	Clear (m)						
T20										Estimated Measurements	
Common Beech <i>Fagus sylvatica</i>	12	1	320	N E S W	4.5 4 4 4	3	SM A: 46.3 R: 3.83	Good	C: Fair S: Good B: Good	Off site tree. Recently reduced to current dimensions.	B.1.2 20 to 40 yrs
T21										Estimated Measurements	
Common Hawthorn <i>Crataegus monogyna</i>	6	1	250	N E S W	3 3 3 3	2	M A: 28.3 R: 3	Good	C: Fair S: Ivy B:	Off site tree. Ivy obscures inspection of stem and primary branch unions from base to 6m.	B.1.2 20 to 40 yrs
T22										Estimated Measurements	
Purple leaf plum <i>Prunus cerasifera</i>	6	1	300	N E S W	3 4 3 3	2	M A: 40.7 R: 3.59	Good	C: Fair S: Fair B:	Off site boundary tree. Two codominant stems from 2m with included bark at stem union.	C.1.2 10 to 20 yrs
T23										Estimated Measurements	
Southern Magnolia <i>Magnolia grandiflora</i>	9	1	300	N E S W	4 4 4 4	2	M A: 40.7 R: 3.59	Good	C: Good S: Good B: Good	Off site tree. Recorded observations made from on-site with very limited visual access to subject.	B.2 20 to 40 yrs
T24										Estimated Measurements	
Silver Birch <i>Betula pendula</i>	10	1	250	N E S W	4 2 4 4	5	SM A: 28.3 R: 3	Good	C: Good S: Fair B:	Off site tree. Recorded observations made from on-site with very limited visual access to subject.	C.2 20 to 40 yrs
Age Classifications: N Newly planted EM Early Mature Condition: C Crown Stems: Ø Diameter Y Young M Mature S Stem (Eq) Equivalent stem diameter using BS5837:2012 definition SM Semi-mature OM Over Mature B Basal area											

Appendix 2: Tree Constraints Plan

NOTE: Nominal root protection areas (RPAs) have been modified to consider existing buildings and roads as barriers to root development.



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 m² 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 707m², 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.

Rev:	Date:	Notes:

ARBTECH

Consulting Limited

Project:
Richards Music Centre
Highgate School
Adj. 2 Bishopswood Road
London
N6 4PR

Client:
Highgate School

Drawing:
Tree Constraints Plan

Based on:
HS-BWR_Topo Survey_160304

Drawing No: Arbtech TCP 01	Rev:
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Date: Apr 2016	Scale: 1:200 @ A1	Drawn: JCH
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Key:					
Tree Nos.:	1	Tree Canopies:		Trunks:	
RPAs:		Category 'C' groups:		Category 'A' trees:	
Category 'B' trees:		Category 'C' trees:			

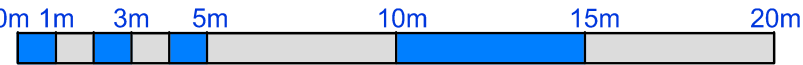
All dimensions should be checked on site. No dimensions are to be scaled from this drawing. Please notify us of any discrepancies found. Arbtech Consulting Ltd. cannot be held responsible for inaccuracies in this drawing or where the plan is used.

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 design or method statement, an architect or structural engineer should be consulted 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.

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Document Production Record

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