



**BS5837:2012**

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

## **Tree Survey**

**Kenneth Wong**

7 Tatham Place,  
London  
NW8 6AF

**25 June 2021**

Author: Chris Wren BSc (Hons)

## Introduction

Arbtech Consulting Limited (Arbtech) received written instruction on 15<sup>th</sup> June 2021 from John Deeble to attend 7 Tatham Place, London, NW8 6AF; grid reference, TQ 26814 83443 (site) to undertake an arboricultural survey a 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, and Tree Constraints Plan.

I am Chris Wren, an arboricultural surveyor for Arbtech Consulting Ltd. I undertook the tree survey on 22<sup>nd</sup> June 2021 and subsequently, have produced this summary of my findings.

I have ten years of industry experience and hold a BSc (Hons) in arboriculture and urban forestry. I am a member of the Arboricultural Association and the Institute of Chartered Foresters.

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.

**Table 1: Documents referred to.**

Document	Reference No.
Survey base drawing	4975/02/R3
British Standard 5837:2012	"BS5837"
Tree Survey Schedule	Arbtech TS 01
Tree Constraints Plan	Arbtech TCP 01

## Tree Survey

Survey: An arboricultural survey to BS5837 of all trees within impacting distance of the site was undertaken by Chris Wren on 22<sup>nd</sup> June 2021

During the survey, I categorised the trees using "Table 1 – Cascade chart for tree quality assessment" of the BS5837:2012 (see Appendix 1).

A total of 5No individual trees, were surveyed. Details for each of the trees surveyed are provided in the Schedule of Trees (see Appendix 2).

The box (*Buxus sempervirens*) hedge that sits in the raised planting area underneath trees one to four does not meet the <75mm stem diameter at 1.5m minimum requirement and so was not recorded.

**Table 2: Documents upon which this tree survey has been based.**

Document	Originator	Reference Number	Title
Topo	3S Architects and Designers	4975/02/R3	Floor Plan

Limitations: The survey was made at ground level using visual observation only. Detailed examinations, such as climbing inspections and decay detection equipment were not employed, though may form part of the survey's management recommendations. Measurements were taken using specialist tapes, laser and GPS devices. Where this was not possible, measurements are estimated.

Scope: Pre-development tree surveys make arboricultural management recommendations based exclusively upon the individual tree or group of trees condition relative to their present context (*i.e. not in relation to the proposed development*).

Legal Status: No statutory protection check has been performed. 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.

\* For more information on the surveyed trees please see Arbtech Consulting Ltd, Tree Survey Schedule (Appendix 1), Tree Survey Report and Tree Constraints Plan.

### Site description

Existing late 1990's townhouse development in open ended courtyard configuration. Mid corner terrace property, with rear courtyard garden. Access is through the property at ground level through to the rear garden. Initial trial pits suggest that a solid substrate underneath the decking is possible. 5m tall rear boundary wall with approx. 1.5m side boundary walls surrounding the courtyard garden.



Figure 1: OS Map (Bing Maps)



Figure 2: Aerial Image of Site (Bing / Google Maps)

### Proposed development.

It is proposed to construct a basement extension underneath the rear courtyard and garden. Existing rear retaining wall with silver birch trees to be retained or reinstated subject to structural engineer's design for basement. Tall rear boundary wall to be retained.

Proposals look to retain or replace existing silver birch trees in existing planter. Likely the tall boundary retaining wall will already have footings which limit the RPA of the neighbour's tree.

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



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## BS5837:2012 Scope

This standard recognises that there can be problems for 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.

## Methodology

The methodology used to assess the trees was the British Standard 5837:2012 'Trees in Relation to Construction' 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:

- Sequential reference number (to be recorded on the tree survey plan);
- Species (common and/or taxonomic names);
- Height in meters (m);
- Trunk diameter in millimetres (mm) at 1.5 m above adjacent ground level or immediately above the root flare for multi-stemmed trees;
- Crown (branches) spread in meters taken at the four cardinal and/or intercardinal compass points;
- Height of crown clearance above adjacent ground level in meters (m);
- Age class
- Physiological condition
- Structural condition
- Comments/description of features
- Estimated remaining contribution
- Retention Category as described by application of the BS5837:2012 **Cascade Chart for Tree Quality Assessment (Appendix 1)**

## 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 a plan, typically delivered as an AutoCAD drawing (.dxf or .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 m<sup>2</sup>.

### Construction Exclusion Zone (also termed Tree Protection Zone)

A construction exclusion or tree protection zone is an area based on the RPA (in m<sup>2</sup>), 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 a 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.



## Recommendations

With the benefit of making an assessment of your planning proposals, we make the following recommendation to ensure that there are no irrevocable issues to the proposed retained trees and so 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 (.dwg/.dxf & .pdf)

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

Yours Sincerely,



Chris Wren BSc (Hons). Arboricultural Surveyor

## Appendix 1: Cascade Chart for Tree Quality Assessment

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## Cascade Chart for Tree Quality Assessment (BS5837:2012)

Category and definition	Criteria (including subcategories when appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
<b>Category U</b>  Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	<ul style="list-style-type: none"> <li>Trees that have serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)</li> <li>Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline</li> <li>Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality</li> </ul> <p><i>NOTE Category U trees can have existing or potential conservation value which might be desirable to preserve; see 4.5.7.</i></p>			Dark red
	<b>1 Mainly arboricultural qualities</b>	<b>2 Mainly landscape qualities</b>	<b>3 Mainly cultural values, including conservation</b>	
<b>Trees to be considered for retention</b>				
<b>Category A</b>  <b>Trees of high quality</b> with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	Light green
<b>Category B</b>  <b>Trees of moderate quality</b> with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remedial defects, including unsympathetic management and storm damage), such that they are unlikely to be suitable for retention of beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	Mid blue
<b>Category C</b>  <b>Trees of low quality</b> with an estimated remaining expectancy of at least 10 years, or young trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape value	Trees with no material conservation or other cultural value	Grey

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## Appendix 2: Schedule of Trees

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Client: Kenneth Wong  
 Project: 7 Tatham Place, London, NW8 6AF  
 Survey Date: 22/06/2021  
 Surveyor: Chris Wren



Unit 3, Well House Barns  
 Chester Road  
 Chester  
 Cheshire  
 CH4 0DH  
 Phone: 01244 661170

Tree and Tag No Species	Hght (m)	Stems		Crown		Age	RP A (m <sup>2</sup> ) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations Survey Comment	Cat ERC		
		No	Ø (mm)	Spread (m)	Clear (m)								
<b>T01</b>													
Silver Birch	8	1	90	N	1	2	SM	A: 3.7	Good	C: Good	<b>C.2</b> 20+ yrs Crown raised to current dimensions. Asymmetrical crown due to proximity of companion trees. Trench recently dug approx 1.5m to the east. Basal area obscured by 0.5m tall Buxus sp hedge.		
<i>Betula pendula</i>				E	1.5	2		R: 1.08		S: Good			
				S	1.5	2				B: Not visible			
				W	1	2							
<b>T02</b>													
Silver Birch	8	1	90	N	1	2	SM	A: 3.7	Good	C: Good	<b>C.2</b> 20+ yrs Off site tree. Crown raised to current dimensions. Asymmetrical crown due to proximity of companion trees. Basal area obscured by 0.5m tall Buxus sp hedge.		
<i>Betula pendula</i>				E	1	2		R: 1.08		S: Good			
				S	2	2				B: Not visible			
				W	2	2							
<b>T03</b>													
Silver Birch	8	1	90	N	1	2	SM	A: 3.7	Good	C: Good	<b>C.2</b> 20+ yrs Crown raised to current dimensions. Asymmetrical crown due to proximity of companion trees. Trench recently dug approx 1.5m to the west. Basal area obscured by 0.5m tall Buxus sp hedge.		
<i>Betula pendula</i>				E	1	2		R: 1.08		S: Good			
				S	2	2				B: Not visible			
				W	1.5	2							
<b>T04</b>													
Silver Birch	8	1	90	N	1	2	SM	A: 3.7	Good	C: Good	<b>C.2</b> 20+ yrs Off site tree. Crown raised to current dimensions. Asymmetrical crown due to proximity of companion trees. Basal area obscured by 0.5m tall Buxus sp hedge.		
<i>Betula pendula</i>				E	1.5	2		R: 1.08		S: Good			
				S	1	2				B: Not visible			
				W	1	2							
<b>Age Classifications:</b>	N	Newly planted	EM	Early Mature	<b>Condition:</b>			C	Crown	<b>Stems:</b>		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	<b>ERC:</b>			Estimated Remaining Contributio

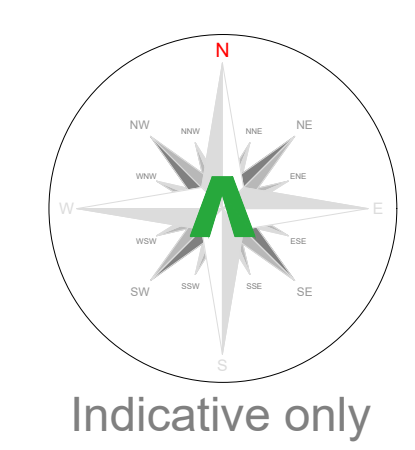
Tree and Tag No Species	Hght (m)	Stems		Crown		Age	RP A (m <sup>2</sup> ) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations Survey Comment	Cat ERC
		No	Ø (mm)	Spread (m)	Clear (m)						
T05										Estimated Measurements	
Silver Birch <i>Betula pendula</i>	9	2	292 (Eq)	N	3.5	3	M	A: 38.5 R: 3.5	Decline	C: Good S: Not visible B: Not visible	<b>U</b> <10 yrs
				E	3	3				Off site tree. Weeping sub sp. Crown at <20% expected density and no visible signs of recent pruning or epicormic/reaction growth. Stem and basal area obscured by 3.5m (to raised planting area) boundary wall. Ground level on far side of boundary wall is approx. 2m higher than the ground level within the garden area.	
				S	3	3					
				W	3	3					
<b>Age Classifications:</b>	N	Newly planted	EM	Early Mature							
	Y	Young	M	Mature							
	SM	Semi-mature	OM	Over Mature							
<b>Condition:</b>	C	Crown									
	S	Stem									
	B	Basal area									
<b>Stems:</b>	Ø	Diameter									
	(Eq)	Equivalent stem diameter using BS5837:2012 definition									
<b>ERC:</b>		Estimated Remaining Contributio									



## Appendix 3: Tree Constraints Plan

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**Note:** Existing dwelling(s), retaining wall(s), road(s) and structures are likely to be partial or complete root barriers. We currently do not have enough information with regards to the existing and surrounding properties and structures, foundations, soil types etc. to definitively determine the root barriers. Site features that are significant enough to be considered barriers to root development, irrespective of proximity to trees, have been identified with a light blue hatch (see key for details).



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<sup>2</sup> 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<sup>2</sup>, 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.

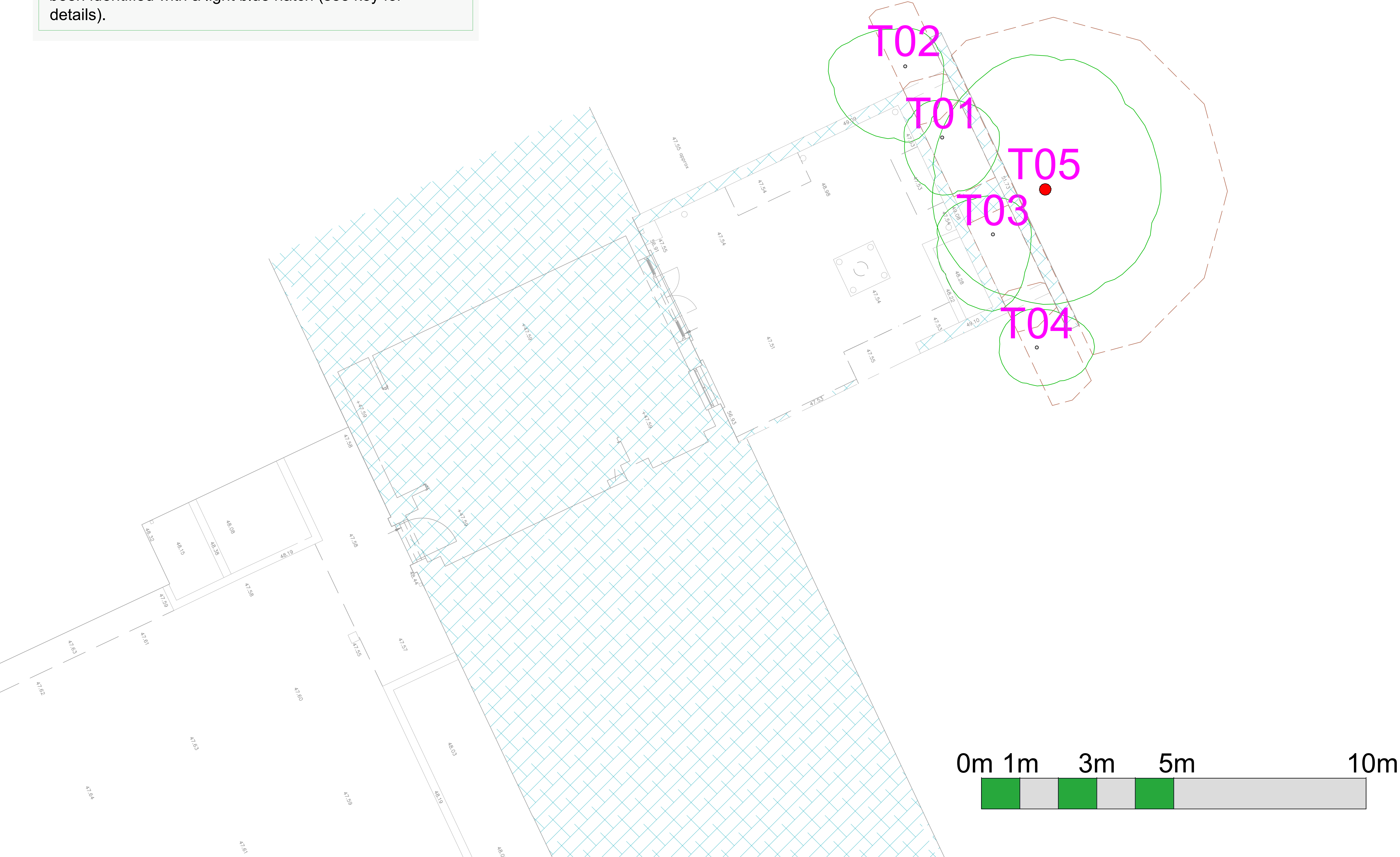
**Tree Survey Report**

Please refer to Arbttech Consulting Ltd. Tree Survey Report and Tree Schedule for full details on all surveyed trees, hedgerows and major shrub groups.

All trees were surveyed and categorised in accordance with the guidance as set out in the British Standard BS5837:2012 'Tree in relation to design, demolition and construction - Recommendations'.

We make the following recommendation to ensure that no conditions relating to arboriculture are attached to any planning consent secured: obtain and arboricultural report to include:

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



**ARBTECH**

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<https://arbttech.co.uk>, 01244 661170

Project: 7 Tatham Place  
 London  
 NW8 6AF

Client: Kenneth Wong

Drawing: Tree Constraints Plan

Based on: 4975/02/R3

Drawing No: Arbttech TCP 01 Rev: 01

Date: June 2021 Scale: 1:50 @ A1 Drawn: CMW


Key:

Tree Nos.: T01	Tree Canopies: [Green outline]	Trunks: [Black dot]	[White circle]
RPAs: [Red dashed line]	Category 'U' trees: [Red dot]	Category 'C' trees: [Grey dot]	[Grey circle]
Potential root barriers: [Blue hatch]			

All dimensions should be checked on site. No dimensions are to be scaled from this drawing. Please notify us of any discrepancies found. Arbttech Consulting Ltd. cannot be held responsible for inaccuracies in the base drawing on 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 design 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, load carrying or underground services. This drawing was produced in colour - a monochrome copy should not be relied upon. © Arbttech Consulting Ltd. 2021



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Document number	Editor	Signature	Position	Issue number	Date
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