

Arboricultural Survey & Report

Implication Assessment and Method Statement in Support of Development

BS5837:2012 Trees in Relation to Design, demolition and construction – Recommendations



CLIENT: Kyson
SITE REF: 10 Clorane Gardens, London, NW3 7PR
MWA REF: DEV150825-64
MWA CONSULTANT: Graham Underhill (MICFor, CEnv, FArborA)
REPORT DATE: 17 September 2015

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1.0 Introduction

1.1 We are instructed by Kyson to undertake a tree survey in accordance with BS 5837:2012 'Trees in relation to design, demolition and construction- Recommendations'. The report is to support a Planning Application relating to the development at 10 Clorane Gardens, London, NW3 7PR.

1.2 The proposed development consists of the construction of an extension and basement and the following plans and documents have been supplied by the client:

- Existing and Proposed block plan

1.3 The site survey was undertaken on the 10 September 2015 and the following report is based upon the findings of that visit and the conditions found on that day.

1.3 We have been provided with a digital file of the existing site and the proposed development.

1.4 Tree position was triangulated using a minimum of three reference points.

1.5 Components of Report

This report comprises the following elements:

- Baseline tree survey of trees that may be impacted by proposals
- Tree Constraints Plan (TCP)
- Arboricultural Implication Assessment (AIA)
- Preliminary Arboricultural Method Statement (AMS)
- Tree Protection Plan (TPP)

1.6 Technical Synopsis

Few of the trees on site are significant. One large tree, a eucalyptus, is in the way of the proposal and will need to be removed. There are other large trees in the immediate vicinity which will reduce the impact of this. There will be no incursions into the root protection areas of retained trees and retained trees can be successfully protected using barriers as specified within this report.

2.0 Scope & Objectives

- 2.1 This report has been commissioned by Kyson and the scope of the report reflects their instructions.
- 2.2 The scope of this report is limited to an appraisal of the existing trees on (and/or adjoining) the site and identification of the implications of development on retained trees.
- 2.3 The brief is to appraise the trees in relation to the proposed development of the site in accordance with British Standard 5837:2012 'Trees in relation to design, demolition and construction - Recommendations'.
- 2.4 To prepare clear recommendations supported by relevant plans and data in order to facilitate consideration of the Arboricultural implications by the Local Planning Authority.
- 2.5 To consider the development proposals, identify areas where there are arboricultural issues and to recommend possible solutions.
- 2.6 To consider additional information supplied, to identify arboricultural issues arising from this information and to recommend possible solutions.
- 2.7 This report is not a Tree Risk Management Report or a Hazard Analysis Report and its use as such is invalid.
- 2.8 The trees have been assessed from ground level only. Assessment of condition is based on a visual tree assessment (VTA). No detailed inspection of the upper crown has been carried out. No decay detection equipment (destructive or non-destructive) has been used to further assess the condition of the trees, which is beyond the scope of the survey. Any dangerous trees requiring further assessment on safety grounds will be identified.
- 2.9 Due to the changing nature of trees and other site circumstances this report and any recommendations made are limited to a 5-year period. Any alteration to the application site or any development proposals could change the current circumstances and may invalidate this report and any recommendations made. Should this be the case this report will require revision to reflect the development Proposals.
- 2.10 Trees are dynamic structures that can never be guaranteed 100% safe; even those in good condition can suffer damage under average conditions. Regular inspections can help to identify potential problems before they become acute.
- 2.11 A lack of recommended work does not imply that a tree is safe and likewise it should not be implied that a tree will be made safe following the completion of any recommended work.
- 2.12 Tree dimensions were measured using a combination of a Trupulse 200 Laser Range Finder, a Leica Disto Laser Rangefinder and a Richter Diameter tape. All instruments were used in accordance with appropriate user guides.
- 2.13 No soil samples were taken and no soils analysis was undertaken.
- 2.14 Any legal description or information given to MWA Arboriculture Ltd is believed to be accurate.

- 2.15 Where solutions to arboricultural problems are specified which require the usage of a third party product e.g. no dig roadway construction. No liability is assumed for the performance or suitability of the product and specialist advice as to the suitability or installation of the product should be sought from the manufacturer or other specialist.
- 2.16 No responsibility is assumed by MWA Arboriculture Ltd for legal matters that may arise from this report, and the consultant shall not be required to give testimony or to attend court unless additional contractual arrangements are made.
- 2.17 Any alteration or deletion from this report shall invalidate it as a whole.

3.0 Site Description

- 3.1 The subject property comprises a detached house in a road with similar properties in a built up part of London.



4.0 Development Proposal

- 4.1 The proposed development will be an extension to the property including a basement.
- 4.2 London Borough of Camden publish planning guidance documents and two are relevant to this proposal.

CPG 1 – Design. Published in July 2015. This document makes a tree survey a requirement of a planning application and also that retained trees are protected following the principles set out in BS 5837: 2005 [*sic*]. This report complies with this other than following the more up to date British Standard.

CPG 4 – Basements and Lightwells. Published in July 2015. In respect to trees, this document addresses the issues of building basements close to trees and the importance of root protection areas. The root protection areas of all retained trees are outside the footprint of the basement and other proposed works and therefore no works are required within root protection areas.

5.0 Tree Survey

- 5.1 The survey of the trees was carried out on 10 September 2015. Tree data is recorded in Table 1 with locations indicated on plans attached to this report.

A total of 13 individual trees, one group of trees and three shrubs were assessed as part of the Survey.

- 5.2 Overview of category **B** trees recorded during our survey:

Tree ID	Species	Cat	Details
T1	Eucalyptus	B	Tall tree visible from outside site. Potential future problems due to lean and twin-stems. Reasonable tree although not characteristic of local area.
T5	Lime	B	Offsite tree. Crown and root protection area extend into site.
T6	Sycamore	B	Offsite tree. Crown and root protection area extend into site.

5.3 Overview of category **C** trees recorded during our survey:

Tree ID	Species	Cat	Details
T4	Ash	C	Offsite tree. Crown and root protection area extend into site.
T7	Leyland cypress	C	Small tree of little significance.
T9	Ash	C	Small tree of little significance.
T10	Ash	C	Small tree of little significance.
T11	Ash	C	Small tree of little significance.
T12	Lawson cypress	C	Small tree of little significance.

5.4 Overview of category **U** trees recorded during our survey:

Tree ID	Species	Cat	Details
T2	Plum	U	Poor condition. Of no significance.
T3	Apple	U	Poor condition. Of no significance.
T8	Unknown	U	Dead and entirely covered in dense ivy. Does not need to be removed as part of the development however it is recommended that it is either removed or closely inspected to assess its structural integrity.
T13	Unknown	U	Dead and entirely covered in dense ivy. Does not need to be removed as part of the development however it is recommended that it is either removed or closely inspected to assess its structural integrity.

Table 1 – Tree Survey Schedule

Tree No.	Species	Hgt (m)	Dia. @ 1.5m (mm)	No of stems	CS N (m)	CS E (m)	CS S (m)	CS W (m)	ER CY	Crown Ht	Age Class	Description & Recommendations	RPA (Radial)	BS Cat
T1	Eucalyptus sp.	17	420 230	2	4.5	4.5	4.5	4.5	20+	3	EM	Twin-stemmed tree in good health. Leaning and twin stem possibly problematic in the future.	RPA: 5.7	B1
T2	Plum <i>Prunus domestica</i>	3	50	3	0.5	0.5	0.5	0.5	<10	-	M	Originally planted as wall trained but now almost entirely covered in ivy.	RPA: -	U
T3	Apple <i>Malus domestica</i>	2.5	150	1	0.5	0.5	0.5	0.5	<10	-	M	Originally planted as wall trained but now almost entirely covered in ivy.	RPA: -	U
T4	Ash <i>Fraxinus excelsior</i>	10	200e	1	3	3	3	3	20+	3	Y	Offsite. Growing adjacent to boundary fence. Overhangs site by c. 3m.	RPA: 2.4	C2
T5	Common lime <i>Tilia x europaeae</i>	12	600e	1	4	4	4	4	20+	3	M	Offsite. Previously reduced Overhangs site by c. 2m.	RPA: 7.2	B1
T6	Sycamore <i>Acer pseudoplatanus</i>	14	600e	1	3.5	3.5	3.5	3.5	20+	3	M	Offsite. Unable to see base due to ivy growth. Overhangs site at height by c. 1m.	RPA: 7.2	B1
T7	Leyland cypress <i>X Cuprocyparis leylandii</i>	7	100	1	1.5	1.5	1.5	1.5	20+	1	Y	Small tree of poor form due to suppression. Of little significance.	RPA: 1.2	C2
T8	Unknown	6	500	-	-	-	-	-	-	-	D	Dead. Entirely covered in dense ivy growth with no visible branches. Good ecological value but integrity of trunk unknown due to ivy growth.	RPA: -	U

Table 1 – Tree Survey Schedule (continued)

Tree No.	Species	Hgt (m)	Dia. @ 1.5m (mm)	No of stems	CS N (m)	CS E (m)	CS S (m)	CS W (m)	ER CY	Crown Ht	Age Class	Description & Recommendations	RPA (Radial)	BS Cat
T9	Ash	7	150	1	1	1	1	1	20+	-	Y	Self-set. Damaged base and leaning. No long-term future.	RPA: 1.8	C2
T10	Ash	7	100	1	1	1	1	1	20+	-	Y	Self-set. Poor form. Of little significance.	RPA: 1.2	C2
T11	Ash	7	150	1	1	1	1	1	20+	-	Y	Self-set. Poor form. Of little significance.	RPA: 1.8	C2
T12	Lawson cypress <i>Chamaecyparis lawsoniana</i>	5	130 60	2	1	1	1	1	10+	-	EM	Poor form. Suppressed. Never likely to make a good tree.	RPA: 1.7	C2
T13	Unknown	4	-	-	-	-	-	-	-	-	D	Dead. Entirely covered in dense ivy growth with no visible branches. Good ecological value but integrity of trunk unknown due to ivy growth.	RPA:	U
G1	Elder Lilac Bay Holly Laurel	5	-	-	-	-	-	-	10+	-	EM-M	Mostly entirely covered in dense ivy growth so all individual trees and shrubs are of poor form and condition. Good screening effect and good ecological value.		C2
S1	Forsythia	3	-	-	-	-	-	-	-	-	EM	Planted against trellis to grow as a wall shrub but now outgrown position and poorly maintained.		

Table 1 – Tree Survey Schedule (continued)

Tree No.	Species	Hgt (m)	Dia. @ 1.5m (mm)	No of stems	CS N (m)	CS E (m)	CS S (m)	CS W (m)	ER CY	Crown Ht	Age Class	Description & Recommendations	RPA (Radial)	BS Cat
S2	Climbing rose	3	-	-	-	-	-	-	-	-	EM	Planted against trellis to grow as a wall shrub but now outgrown position and poorly maintained.		
S3	Elder	3.5	-	-	-	-	-	-	-	-	EM	Shrub within crown spread of large trees. Of little consequence.		

Headings and Abbreviations:

No. Allocated sequential reference number - Tree ('T'), Group ('G'), Woodland ('W') or Hedge ('H') reference number - refer to plan and to numbered tags where applicable

Species: Common name

Height: In metres, to half nearest metre – where possible approximately 80% are measured using an electronic clinometer and the remainder estimated against the measured trees. In the case of Groups and Woodlands the measurement listed is that of the highest tree

Stem Diam.: Stem diameter in millimetres, to nearest 10mm - measured and calculated as per Annex C of BS5837:2012. MS = multi-stemmed, TS = twin-stemmed

Branch Spread: Crown radius measured (or estimated where considered appropriate) from the four cardinal points (north, east, south and west) to give an accurate visual representation of the crown

Crown Height: Existing height above ground level, in metres, of first significant branch and direction of growth (e.g. 2.5-N) and of canopy at lowest point – to inform on crown to height ratio, potential for shading, etc.

Age Class: Estimated age class - Y = young, SM = semi-mature, EM = early-mature, M = mature, PM = post-mature

ERCY: Estimated Remaining Contribution - in years as per BS5837:2012 (i.e. <10, 10+, 20+, 40+)

BS Cat.: Category Grading - tree retention value listed as U, A, B or C - in accordance with BS5837:2012 Table 1

RPA Radius (m): Root Protection Area Radius - in metres measured from the centre of the stem to the line of tree protection

***(Estimated Dimensions):** Where trees are located off-site, or are inaccessible for any other reason, and accurate measurements or other information cannot be taken then the information provided is estimated and is duly suffixed with a “#” symbol

6.0 Arboricultural Impact Assessment

6.1 BS5837 (2012) requires that the root protection area is calculated for each of the retained trees on the development. The root protection area is the minimum area in m² which should be left undisturbed around each retained tree. The standard calculated RPA's and the protection zone radii are detailed in the Tree Survey Schedule (Table 1) above.

6.2 For single stem trees, the RPA has been calculated as an area equivalent to a circle with a radius 12 times the stem diameter. For trees with more than one stem, one of the two calculation methods below has been used.

6.3 For trees with multiple stems the following rules apply.

a) For trees with two to five stems, the combined stem diameter has been calculated as follows:

$$\sqrt{(\text{stem diameter } 1)^2 + (\text{stem diameter } 2)^2 \dots + (\text{stem diameter } 5)^2}$$

b) For trees with more than five stems, the combined stem diameter is calculated as follows:

$$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$$

6.4 The RPA for each tree is plotted as a circle centred on the base of the stem.

6.5 The calculated RPA for each tree has been capped to 707 m².

6.6 Where pre-existing site conditions or other factors suggest that rooting has occurred asymmetrically, a polygon of equivalent area has been produced.

6.7 Where modifications to the shape of the RPA have been specified they reflect a soundly based arboricultural assessment of likely root distribution. Any deviation in the RPA from the original circular plot takes account of the following factors whilst still providing adequate protection for the root system:

- a) the morphology and disposition of the roots, when influenced by past or existing site conditions (e.g. the presence of roads, structures and underground apparatus);
- b) topography and drainage;
- c) the soil type and structure;
- d) the likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management.'

- 6.8 The proposed development does not impede on the root protection areas of trees to be retained.
- 6.9 It is recommended that the following works are undertaken prior to the erection of protective fencing and certainly prior to development.

Tree ID	Species	Details
T1	Eucalyptus	Fell to ground level
T2	Plum	Fell to ground level
T3	Apple	Fell to ground level
S1	Forsythia	Fell to ground level
S2	Climbing rose	Fell to ground level
Part of G1	Various	Fell to ground level enough to give clearance with new development

- 6.10 Permissions: Under no circumstances is any tree work to be instigated without having first checked with the Local Planning Authority that no statutory controls apply in respect of the trees. All arborists shall have the relevant NPTC qualifications and shall submit completed risk assessments to the project manager prior to commencement of tree-work.
- 6.11 All pruning shall be done in accordance with the principles of 'Natural Target Pruning' and in accordance with the current relevant British Standard, **BS3998: 2010** 'Recommendations for Tree Work'. All pruned sections shall be lowered to the ground in a controlled manner such that no damage is done to other trees or vegetation and structures beneath. The implementation of tree works must have regard to the presence of any nesting Birds or Bats and their roosts, which are protected under the Wildlife and Countryside Act (1981) (as amended); the Countryside and Rights of Way Act, 2000; the Natural Environment and Rural Communities Act (NERC, 2006); and by the Conservation of Habitats and Species Regulations (2010).
- 6.12 Irrespective of our belief that the impact will be limited, in order to safeguard the tree we advise that any excavation undertaken within the RPA is supervised by a competent arboriculturist and that any root pruning which way be necessary is undertaken in accordance with NJUG10.

7.0 Potential incursions in to the RPA (Root Protection Area)

- 7.1 There are no incursions into the RPAs of trees to be retained.

8.0 Arboricultural Method Statement (preliminary) – Demolition / Removal of existing surfaces

- 8.1 Where it is intended to undertake demolition or construction operations within the root protection area, precautions should be taken to maintain the condition and health of the root system and in particular to:
- a) prevent physical damage to the roots during demolition or construction (such as by soil compaction or severing);
 - b) make provision for water and oxygen to reach the roots;
 - c) allow for the future growth of the root system;
 - d) preserve the soil structure at a suitable bulk density for root growth and function (in particular for soils of a high fines content).
- 8.2 Throughout the process of demolition or construction, including piling (see 11.6.3), the soil structure within the root protection area should be protected. The methods of protecting trees from damage during all phases of demolition and construction work will be specified in section 9.0 and conform to the specifications laid down in the Standard.
- 8.3 All plant and vehicles engaged in demolition works will either operate outside the RPA, or will run on a temporary surface designed to protect the underlying soil structure. Where such ground protection is required, it will be installed prior to commencement of operations.
- 8.4 Should the level of dust build-up on trees become significant, the advice of an arboriculturist will be sought. If considered appropriate by the attending arboriculturist the affected trees will be hosed down immediately.
- 8.5 Where an existing hard surface is scheduled for removal, care will be taken not to disturb tree roots that may be present beneath it. Hand held tools or appropriate machinery will be used (under arboricultural supervision) to remove the existing surface. Tree roots exposed by such operations will be treated in accordance with details in 8.6.
- 8.6 Any excavations which have to be undertaken within the root protection area will be carried out carefully using air-spade technology, avoiding damage to the protective bark covering larger roots. Roots, whilst exposed, will be wrapped in dry, clean hessian sacking to prevent desiccation and to protect from rapid temperature changes. Those roots smaller than 25mm in diameter may be pruned back, preferably to a side branch; using a proprietary cutting tool such as secateurs or a handsaw. Roots larger than 25mm in diameter will only be severed following consultation with an arboriculturist, as they may be essential to the tree's health and stability. Prior to backfilling, any hessian wrapping will be removed and retained roots should be surrounded with sharp sand (builders' sand will not be used because of its high salt content which is toxic to tree roots), or other loose granular fill, before soil or other material is replaced. This material will be free of contaminants and other foreign objects potentially injurious to tree roots.

8.7 Arboricultural Method Statement (preliminary) - Installation of Services (Underground and above ground services)

8.8 Trenching for the installation of underground services severs any roots present and may change the local soil hydrology in a way that adversely affects the health of the tree. For this reason particular care should be taken in the routeing and methods of installation of all underground services.

8.9 At all times where services are to pass within the RPA, detailed plans showing the proposed routeing should be drawn up in conjunction with an arboriculturist. Such plans should also show the levels and access space needed for installing the services and be accompanied by arboricultural method statements (AMS).

8.10 Additional precautions outside the exclusion zone

8.11 Once the exclusion zone has been protected by barriers and/or ground protection, construction work can commence. All weather notices should be erected on the barrier with words such as: "Construction exclusion zone — Keep out".

8.12 Planning of site operations should take sufficient account of wide loads, tall loads and plant with booms, jibs and counterweights (including drilling rigs), in order that they can operate without coming into contact with retained trees.

8.13 Such contact can result in serious damage to the trees and might make their safe retention impossible. Consequently, any transit or traverse of plant in proximity to trees should be conducted under the supervision of a banks man, to ensure that adequate clearance from trees is maintained at all times. Access facilitation pruning should be undertaken where necessary to maintain this clearance. NOTE In some instances, local planning authority consent for pruning might be required.

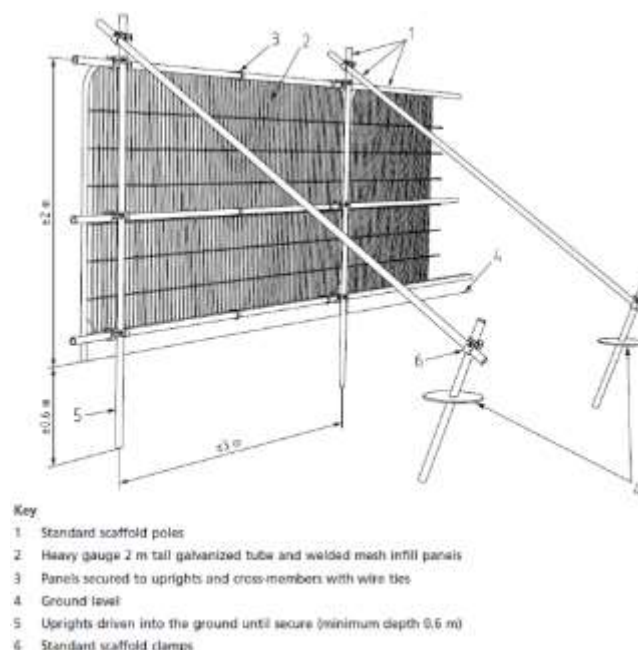
8.14 Fires on sites should be avoided if possible. Where they are unavoidable, they should not be lit in a position where heat could affect foliage or branches. The potential size of a fire and the wind direction should be taken into account when determining its location and it should be attended at all times until safe enough to leave. NOTE Local environmental health authorities might have specific restrictions.

8.15 Any materials whose accidental spillage would cause damage to a tree should be stored and handled well away from the outer edge of its RPA. It is essential that allowance should be made for the slope of the ground so that damaging materials such as concrete washings, mortar or diesel oil cannot run towards trees.

8.16 Arboricultural Method Statement (preliminary) - Tree Protection

8.17 The exclusion zones as defined in this report will be protected with fencing strong enough to resist impacts and suitable to the degree of construction activity on the site and to be in accordance with that specified within BS5837:2012.

- 8.18 Where hard surfacing exists within the RPA and where it is to remain, protective barriers will be erected at the edge of the hard surface and the space may be utilised for operational purposes.
- 8.19 All fencing will be in place prior to any other development work (with the exception of necessary tree works) commencing on site. Such fencing will therefore be erected before any materials or machinery is brought onto site. Once erected the fences will not be moved or altered in any way without prior consultation with the Local Planning Authority other than for operations detailed in this report. If the fencing is damaged in any way it will be re-instated to its original condition before construction work can re-commence Notices will be erected on the fencing stating 'Protected Area – No Operations within Fenced Area'. Protective fences shall be maintained in situ until all equipment, machinery and surplus materials have been removed from the site. Nothing will be stored or placed in any area fenced in accordance with this condition and the ground levels within those areas shall not be altered, nor shall any excavation be made other than those detailed in this report, without the written consent of the Local Planning Authority.
- 8.20 The total exclusion zones are marked on the accompanying drawing in Appendix 5 (retained trees). British Standard 5837:2012 indicates the recommended areas for the Root Protection Areas (RPA) which should be enforced with protective fencing. Specifications within BS5837:2012 inform our recommendations for both the fencing type as detailed below in figure 2 and the location of this fencing which given the works within the RPA is located at the point where works within the RPA stop.
- 8.21 All protective fencing (except where specified above) is to be constructed in accordance with BS:5837 (2012) – specification reproduced below.



9.0 Conclusion and recommendations

- 9.1 There are trees within the site which fall within the constraints of BS5837 (2012).
- 9.2 Thirteen individual trees, one group and three shrubs were assessed in response to a proposed development. We have recommended the removal of three tree trees and two shrubs in order to facilitate the development.
- 9.3 One tree, a eucalyptus, is a tall tree of some visual significance. This tree needs to be removed as part of the development. Other large trees around the site will reduce the impact of the loss of this tree.
- 9.4 There are two dead trees within the site which are entirely covered in dense ivy growth. These trees provide good screening and ecological benefits however their structural integrity is not known and it is recommended that this is assessed if they are to be retained. This is a safety recommendation and is not related to the proposed development.
- 9.3 The impact of the proposed development has been assessed and in our professional opinion provided that the works take place in accordance with the method statements specified in this report the works will not be detrimental to the retained trees.
- 9.4 No work shall commence on site until such time as this method statement has been submitted to and approved in writing by the Local Planning Authority. All retained trees on and trees immediately adjoining the site shall be protected from damage as a result of the works on site, to the satisfaction of the Local Planning Authority in accordance with its guidance notes and relevant British Standards (e.g. BS5837:2012) for the duration of the development. In the event that trees become damaged during construction, the Local Planning Authority shall be notified and remedial action agreed and implemented. In the event that any tree(s) dies or is removed without the prior consent of the Local Planning Authority, it shall be replaced within the first available planting season, in accordance with details agreed with the Local Planning Authority.
- 9.5 All technical issues relating to arboriculture should be addressed to MWA Arboriculture Ltd in the first instance. MWA Arboriculture Ltd will liaise between the Local Planning Authority and any interested parties.
- 9.6 It is suggested that the development proceeds in accordance with the above recommendations.

10.0 Images



View of eucalyptus T1



View of base of T1 showing lean and twin stem



Offsite lime T2



Offsite sycamore T3



View of group G1



View of ivy covered T2 & T3 and shrubs S1 & S2