



**BS5837 2012  
Trees in Relation  
To Design, Demolition and Construction**

**Tree Report**

**at**

**GE Aviation Site  
Hamble  
Southampton  
SO31 4NF**

**February 2018  
Revised August 2018**

---

## Summary

This is a tree report to support an application for planning permission.

This is a tree survey and tree constraints plan that seeks to address the constraints posed by existing trees on any proposed development.

The report is advisory in nature and intended to help inform the design process and is suitable for submission to support an application for either outline or full planning consent.

The report has been written following the recommendations and guidance given within British Standard 5837 2012 Trees in relation to design, demolition and construction.

All the trees of material consideration have been inspected within and immediately adjacent to the proposed development site. These trees are listed at Appendix 1 and annotated on the Tree Plan at Appendix 7.

The proposed development may require the removal of a total of 38 trees including 13 individual A and B category trees, 7 low value category C trees, 18 category U trees (trees that are dead or are showing signs of significant, immediate, and irreversible overall decline) and 6 hedges of low quality and low amenity value.

Some minor facilitation pruning works will be required to enable ultimate clearances and access.

The proposed development will only partially encroach upon a small number of root protection areas (RPAs) of significant A and B category trees on site to enable construction.

Due consideration has been given to the proximity of retained trees with allowance and space permitted for their future growth.

The construction activity should not adversely impact upon any retained trees if the specified precautions detailed within the arboricultural method statement included within this report are followed.

Neil Smith

CES Consulting Arborist

**Table of Contents**

1.0	Instructions .....	4
2.0	Report Limitations .....	4
3.0	Introduction .....	4
4.0	Site Survey .....	5
5.0	Tree Survey .....	5
6.0	Tree Constraints and Considerations .....	5
7.0	Arboricultural Impact Assessment .....	9
8.0	Arboricultural Method Statement .....	9-10
	Appendix 1 - Tree Survey and Tree Quality Assessment.....	
	Appendix 2 - Cascade Chart for Tree Quality Assessment .....	
	Appendix 3 - Photographs .....	
	Appendix 4 - Default Specification for a Protective Barrier.....	
	Appendix 5 - Guidance for Working in Root Protection Areas (RPAs) .....	
	Appendix 6 - Exemplar Record of Arboricultural Supervision .....	
	Appendix 7 -Tree Plan.....	
	Appendix 8 - References.....	

## **1.0 Instructions**

- 1.1 Camps Environmental Services (CES) Ltd has been instructed to prepare a tree report to assess the influence that the trees on and adjacent to the site may have on any proposed development and vice versa. The proposed latest design (FD16-1431-55S Proposed Site Layout) includes the demolition and construction of various buildings, the construction of approximately 148 new dwellings and car parking areas. Importantly this large development should retain and improve the existing access roads by the addition of a new configuration.

## **2.0 Report Limitations**

- 2.1 Trees are living organisms whose health and overall condition can change rapidly. The conclusions and recommendations contained within this report are valid for a period of 12 months. The period of validity may be reduced if significant changes occur to either the trees or to the landscape within the immediate proximity of the trees.

## **3.0 Introduction**

- 3.1 The report has been written following the recommendations and guidance given within British Standard 5837:2012 Trees in relation to design, demolition and construction - Recommendations (hereinafter BS5837).
- 3.2 BS5837 provides recommendations and guidance for arboriculturists, architects, builders, engineers, and landscape architects and all others interested in harmony between trees and development in its broadest sense.
- 3.3 BS5837 is intended to assist decision-making with regard to existing and proposed trees in the context of design, demolition and construction.
- 3.4 Existing trees are an important factor on construction sites, whether on or near the working areas and trees are a material consideration in the UK planning system.
- 3.5 The report is intentionally concise with minimal background explanations. Where appropriate, further guidance and information is included as appendices.
- 3.6 The report contains the following appendices:
- a) a tree survey and a tree quality assessment at Appendix 1;
  - b) a cascade chart for tree quality assessment at Appendix 2;
  - c) photographs at Appendix 3;
  - d) a default specification for a protective barrier at Appendix 4;
  - e) guidance for working in Root Protection Areas (RPAs) at Appendix 5;
  - f) an exemplar record of arboricultural supervision at Appendix 6; and

- g) a scale drawing at Appendix 7 showing existing site features and the proposed development. This drawing has been amended to show tree quality assessment, root protection areas and shadow patterns, as appropriate, and should be read in conjunction with this report.

#### **4.0 Site Survey**

- 4.1 The site survey included within the Tree Plan at Appendix 7 contains:
  - a) the location of all trees and hedges of material consideration within the development site;
  - b) other relevant features, such as buildings, other structures and boundary features;
  - c) the approximate location of trees on land adjacent to the development site that might influence the site or might be important as part of the local landscape character.

#### **5.0 Tree Survey**

- 5.1 The tree survey and tree quality assessments were carried out during February 6-15<sup>th</sup> 2017 and report revised using latest designs proposals in February and July 2018.
- 5.2 The tree survey and tree quality assessment at Appendix 1 includes all pertinent and trees shown on the Tree Plan with a stem diameter of 150mm or greater.
- 5.3 Each tree or group of trees has been allocated to one of four categories (A, B, C or U for Unsuitable for retention). The category allocated to each tree or group of trees depends in part upon the information gathered in the tree survey, it depends in part upon the 'cascade chart for tree quality assessment' at Appendix 2 and it is in part, subjective. The trees have been differentiated on the Tree Plan by the colour allocated to each category.

#### **6.0 Tree Constraints and Considerations**

Paragraphs 6.1 to 6.10 inclusive set out the **general principles** of tree constraints and considerations associated with a proposed development site.

Paragraphs 6.11 to 6.21 inclusive set out the tree constraints and considerations associated with **this specific site**.

### **General Principles**

- 6.1 In order to avoid damage to the roots or rooting environment of retained trees, the Root Protection Area (RPA) is plotted around category A and B trees as necessary to illustrate potential constraints to the proposed development. This area should be left undisturbed. However, where construction is proposed within the RPA, technical solutions may be available to enable the successful retention of trees.
- 6.2 The current and estimated height (in 40 years' time) of category A and B trees may be annotated on the Tree Plan where this would cause unreasonable obstruction of sunlight or daylight to the development. This is represented by a segment, with a radius from the centre of the stem, equal to the current or estimated height of the tree. It is drawn from due North West to due East indicating the shadow pattern through the main part of the day.
- 6.3 To maximize the probability of successful tree retention a realistic assessment of the probable impact of any proposed development on the trees and vice versa should take into account the characteristics and condition of retained trees, with due allowance and space permitted for their future growth and maintenance requirements.
- 6.4 The relationship of buildings to large trees can cause apprehension to occupiers or users of nearby buildings or spaces. Buildings and other structures should be sited allowing adequate room for retained trees, and with due allowance and space permitted for their future growth.
- 6.5 Buildings and open spaces should be designed with due consideration to the proximity of retained trees, especially in terms of the foliage, flowers, fruit and other debris associated with the normal functions of a healthy tree.
- 6.6 Tree preservation orders, conservation areas or other regulatory tree protection.
- 6.7 The access and working area required to enable the construction of the proposed development, including the effects of pruning on the amenity value of retained trees.
- 6.8 The protection of overhanging tree canopies where they could be damaged by construction.
- 6.9 The requirements of infrastructure including above and below ground services, visibility splays, refuse stores, lighting, signage, solar collectors, satellite dishes and CCTV sightlines.

- 6.10 The potential for new planting to mitigate proposed tree loss.

**This Specific Site**

- 6.11 The RPAs of all trees, shrub masses, hedges etc. of material consideration on and adjacent to the proposed development site are given in the right hand column of the tree survey at Appendix 1.
- 6.12 A total of 164 individual trees, 18 groups and 6 hedges are given with Appendix 1 including 6 category A, 95 category B, 63 category C and 18 category U trees or groups.

Of these the indicative RPA's of all significant category A and B trees and groups are annotated on the Tree Plan. The remaining category C trees, are also annotated on the plan at this stage but are not considered significant or worthy of material constraint within planning.

The site consists predominantly of large tree groups/mature woodland surrounding the perimeter with few distinct individual trees.

Where these trees are present in number they may attract a higher collective rating than they might as individuals, or they occur as collectives but are situated to make little visual contribution to the wider locality. As such most groups have been assessed as of moderate value category B groups and 1 high value A woodland group.

Where there are trees of note within the groups, these individual trees are of significance to any development on this site and have been annotated on the tree plan.

The design and layout of the proposed development aims to incorporate these trees (both crown and rooting area) for retention. The RPA protection has been considered during the design process and suitably protected during construction in accordance with BS5837.

There are however, trees present in number that exist without this conferring on them significantly greater collective landscape value. These groups are of limited significance due to their form, species, age or condition and these have been assessed as low value category C groups and should not be worthy of material constraints within the context of planning.

- 6.13 The estimated heights of all trees of material consideration on and adjacent to the proposed development site are given in the third column of the tree survey at Appendix 1. The obstruction of sunlight is represented by a segment equal to the estimated height of the tree through the main part of the day. However, the indicative shadow patterns for all trees are not annotated on the Tree Plan as shading should not be considered a constraint to development.

- 6.14 Tree preservation orders, conservation areas or other regulatory tree protection- the local planning authority have not been contacted to determine whether any or all of the trees on the proposed development site are legally protected i.e. the subject of a Tree Preservation Order (TPO). However, it is known that the woodland edge along north eastern site boundary and trees fronting Hamble Lane are protected by TPO.
- 6.15 No constraints are considered significant in terms of effects of pruning on the amenity value of any retained trees.
- 6.16 Due consideration has been given to the proximity of the retained trees with allowance and space permitted for their future growth.
- 6.17 There are constraints posed by the proximity of retained trees to the proposed parking areas and footpaths. These can be overcome with careful precautions.
- 6.18 No constraints are posed for the requirements of infrastructure including above and below ground services, visibility splays, refuse stores, lighting, signage, solar collectors, satellite dishes and CCTV sightlines.
- 6.19 Tree losses will occur on a scheme of this size but there is the significant potential for new planting within the site. The location for new tree planting and landscaping works will be submitted by the landscape architects.

## 7.0 Arboricultural Impact Assessment

### Summary of Impact

7.1 CES Ltd have assessed the impact of the proposed development on the trees, shrubs and woody vegetation (trees) of material consideration, present on and immediately adjacent to the site. All the trees that may be directly affected by the development are listed in Table 1 below.

**Table 1 - Summary of trees that will or may be affected by the proposed development**

	Category A Trees	Category B Trees	Category C Trees	Category U Trees
Trees to be retained on site	TBC	TBC	TBC	-
Trees/hedges to be removed	758	702, 763, 764 765, 770 771, 756 766, 768, 832 834, 840, small northern area of G861-TBC,	757, 760, 836 837, 838, 839,857 H1-H6	714, 715, 857, 699, 746, 749, 750, 772,773,774, 793, 807, 808, 815, 816, 821, 824, 833
Retained trees to be pruned	-	G861(TBC), G856 (TBC), 701, 831	-	-
Retained trees that may be adversely affected by encroachment within the RPA to allow construction of footpaths/junction works	-	Parts of G861 and G862, 701,704-707	-	-

TBC= to be confirmed

### Detail of Impact

#### 7.2 Trees to be retained:

The proposed development will retain the majority of all significant A and B trees identified within the tree survey and annotated on the tree plan.

#### 7.3 Trees to be removed:

The proposed development will require the removal of 1 category A tree, 12 category B trees, 7 category C individual trees and 6 hedge-lines and 18 category U trees listed above. A small section of the tree groups of G856 and G861 which are to be confirmed to allow for the construction of car park (near G856) and a small building

on the northern side of the sports pitch(G861). Details are provided within the tree schedule in Appendix 1

**7.4 Retained trees that may be adversely affected by encroachment within the RPA to allow construction of new footpaths/ roads/ junctions/car parking:**

To allow the construction of the new footpaths, including along the northern boundary, and at the junction with Hamble Lane it may/will be necessary to work within the RPAs of G861, G862 and G856 and trees T704-707.

The encroachment within these RPAs should equate to less than 20% of the cohesive RPAs. **Therefore, the level of impact can be rated low.** Please see below and sections 7.6 to 7.8.

G861, G862 and G856 and trees 704-707 are the significant trees and groups/woodlands on site, containing mature oak, ash and horse chestnut trees. These trees have a high potential to contribute to amenity and have been assessed as mostly category B groups. The major impact around these groups will be new footway and landscaping and these works will be carried out to at such a distance to cause minimal impact to retain trees successfully into the future.

To allow the construction of the proposed roads and car parking it will be necessary to work within the RPAs of T701 and T831.

The encroachment within these RPAs should equate to less than 10% of their RPAs. **Therefore, the level of impact can be rated low.** Please see below and sections 7.6 to 7.8.

It should be noted that these 2 trees are over-mature and less able to withstand root damage through construction though based upon the final design these trees should be retained successfully.

Tree 701 is a prominent oak tree situated within traffic island near the existing reception building/car park along the Kings Avenue access road. The oak has been heavily reduced in the past and has suffered significant root damage through construction. The RPA of the oak T701 has been shown as being circular, but in practice, due to the level of construction around it, will be confined to the traffic island it sits on. Based upon its condition, form and size it has been assessed as a moderately high value B category tree and due to the proposed design should be retained successfully without further damage.

Tree 831 is probably largest tree on site and is a significant over-maturing holm oak. It is situated on a bank on the eastern boundary side of Sydney Lodge. Evidence suggests that its root plate has shifted in the past and it now leans towards adjacent properties. Although it appears stable, its safe retention in the coming years is uncertain, and to retain this tree even without development around it would require a substantial crown reduction. With its history, form and structural condition, and its proposed relationship with new car parking, it is recommended that it can be retained successfully but with significant reduction work.

The major impact around these trees above will be footway/parking construction/ landscaping and these would need to be carried out to protect the existing levels around them particularly the footpath by adopting no-dig construction techniques.

- 7.6 The principal of RPA encroachment is established within BS5837 2012 and supported by the source document, National Joint Utilities Guidelines 10 / Vol. 4 1995 / 2010. NJUG introduced the x12 diameter Precautionary Zone for supervised working and Prohibited Zone at a universal 1m from the base of the tree. RPAs are frequently confused with the NJUG Prohibited Zone, when they clearly correlate with the NJUG Precautionary Zone.
- 7.7 An RPA encroachment of <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 CEH 2006). The trees in question are good specimen of species with a good resistance to development impacts, and quite capable of tolerating this low impact.
- 7.8 “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” (Thomas 2000). CES would not recommend annexing such high proportions of the root system; rather that within the context of the published science, planning should not be unduly concerned by impacts that are well below the subcritical threshold – tree health is not at stake.

7.9 **Retained trees to be pruned:**

Secondary impacts relate to the maintenance of a convenient canopy clearance between trees to allow clearance, avoid shade and litter deposition. Some facilitation pruning will be required to provide clearance over the new footway on the northern and eastern boundaries. Shading will always be an issue with trees of this size and on-going lifting works only may be necessary, but not such as to impose a burden of frequent, onerous management.

**Therefore, the impact, in terms of its consequence, will be rated low.**

8.0 **Arboricultural Method Statement**

**General Principles- for general design advice only.** 8.1 to 8.11 inclusive set out the **general principles** of good arboricultural management for a proposed development site.

8.12 to 8.20 inclusive will set out the management details that must be followed to ensure successful tree retention on **this specific site**.

- 8.1 The Tree Plan shows the existing trees numbered and categorised in their present context. The Tree Plan also shows the approximate location of the proposed protective measures for both existing trees and areas of structural landscaping, as necessary. This plan should only be used for dealing with the tree issues and all scaled measurements should be checked against original documents.
- 8.2 A default specification for barrier design, taken from BS5837, is included at Appendix 4.
- 8.3 Any RPAs outside the protective barriers must be covered by ground protection, assuming no suitable existing hard surfacing, based on the recommendations within BS: 5837 until there is no risk of damage from the demolition and/or construction activity. The precise design and the sequencing of the installation and removal should be agreed with the local planning authority on site before any demolition and/or construction activity starts.
- 8.4 Any work within RPAs must be done with care as set out at Appendix 5.
- 8.5 All landscaping activity within RPAs has the potential to cause severe damage and any adverse impact must be minimised by following the guidance set out in Appendix 5.
- 8.6 It is often difficult to clearly establish the detail of services until the construction is in progress. Where possible, existing services should be used and all new services ought to be outside RPAs of retained trees. However, where existing services within RPAs require upgrading or new services have to be installed in RPAs, trenchless insertion methods ought to be used with entry and retrieval pits being sited outside the RPAs. Provided that roots can be retained and protected, excavation using hand-held tools might be acceptable for shallow service runs. Any adverse impact must be minimised by following the guidance set out in Appendix 5.
- 8.7 All site storage areas, cement mixing and washing points for equipment and vehicles must be outside RPAs unless otherwise agreed with the local planning authority. Where there is a risk of polluted water runoff into RPAs, heavy-duty plastic sheeting and sandbags must be used to contain the runoff and prevent contamination.
- 8.8 Tree protection cannot be reliably implemented without arboricultural input. The nature and extent of that input varies according to the complexity of the issues and the resources available on site. An arboricultural consultant must be instructed by the project management team to oversee the implementation of the protective measures and management proposals set out in this arboricultural method statement.
- 8.9 Arboricultural planning conditions can only be reliably and effectively discharged with supervision by an arboricultural consultant. Such supervision must be confirmed by formal written records circulated to all relevant parties, including the local planning authority. These records will form an auditable system of site monitoring and thus enable planning conditions to be discharged. The project management team must instruct an arboricultural consultant to undertake the required supervision.

- 8.10 An arboricultural consultant must be included in the project management team and involved in the following phases;
- a) Pre-commencement site visit: A pre-commencement site meeting ought to be held before any demolition and/or construction work starts. This ought to be attended by the site manager, the arboricultural consultant and a local planning authority tree officer. The details of the meeting and any agreements ought to be confirmed by formal written records and circulated by either the site manager or the arboricultural consultant to all relevant parties. If the local planning authority tree officer is not able to attend, either the site manager or the arboricultural consultant ought to inform the local planning authority and other interested parties, in writing, of the details agreed at the meeting. The meeting ought to include but not be confined to; above and below ground protection measures, tree surgery works, works within RPAs, site storage/usage and arboricultural supervision.
  - b) Site supervision: When demolition and/or construction work starts the arboricultural consultant ought to visit the site, as agreed, at the pre-commencement site meeting. The arboricultural consultant ought to observe the agreed measures, works and site usage and should record their observations and notify the interested parties.
  - c) Ongoing consultancy: It is often difficult to clearly establish the detail of all aspects of the development until construction is in progress. The site manager ought to inform the local planning authority and the arboricultural consultant of any unforeseen tree matters arising as a result of the ongoing construction.
- 8.11 It is the site manager's responsibility to ensure that the details of this arboricultural method statement and any agreed amendments are known and understood by all site personnel. Copies of the agreed documents must be kept on site and be readily available at all times. This method statement should form part of the site induction for all personnel.

#### **This Specific Site**

- 8.12 The following sets out the management details that must be followed to ensure successful tree retention. It is based on the guidelines and recommendations set out in BS5837 and the National Joint Utilities Group: Guidelines for the planning, installation and maintenance of utility services in proximity to trees. Volume 4, issue 2. London: NJUG, 2007. (NJUG 4). **The methodology is provisional in nature and a full method statement should be conditioned through planning.**
- 8.13 Pruning: Any prescribed pruning works as detailed within the preliminary works column of the tree schedule must be in accordance with British Standard 3998:2010 Tree Work.

- 8.14 Protective Barriers: The precise location of the barriers, their design and the sequencing of their installation and removal must be agreed with the local planning authority on site before any construction or demolition activity starts. The approximate line of all fencing is shown on the tree plan at Appendix 7.
- 8.15 Ground protection: Any RPAs outside the protective barriers must be covered by ground protection based on the recommendations within BS5837 until there is no risk of damage from the demolition and/or construction activity. This must be installed before any demolition and/or construction starts. The approximate area for ground protection will be shown on the tree plan at Appendix 7.
- 8.16 Encroachment within RPAs: On this site, it may be necessary to work within the RPA of certain trees. It may be necessary to install ground protection within the RPA. Additionally, it will be necessary to follow the general guidance set out within the Arboricultural Method Statement and within Appendix 5.

**The encroachment within the RPA of these trees will require a limited dig method of construction to successfully retain these trees. Levels around these trees must not be altered significantly.**

- It will be necessary to install hard surfaces within the RPA of these trees. Any adverse impact must be minimised by following the guidance set out in Appendix 5. The installation will require a no-dig construction technique, either using a cellular confinement system with no fines aggregate for the sub base or simply building upon an existing sub-base without disturbing the ground below. Choice of construction method will initially depend upon root penetration within the existing sub-grade. The key principle is not to excavate in the presence of roots and to provide a porous surface to promote healthy soil water relations for future root growth. A further consideration in the use of a more expensive cellular confinement system, or similar, may be the claimed reduction in risk of possible future surface displacement by roots of trees growing in paved areas. It is recommended that “no-dig” surfacing be employed in accordance with BS5837:2012 and ‘The Principles of Arboricultural Practice: Note 1, Driveways Close to Trees, AAIS 1996 [APN1]’.
- 8.17 **Soft landscaping within RPAs:** soft landscaping within RPAs of retained trees has the potential to cause severe damage and any adverse impact must be minimised by following the guidance set out in Appendix 5.
- 8.18 **Installation of new services below ground and within RPAs or above ground and within the crown spread of retained trees:** New services will be required.
- Where possible, existing services should be used and all new services ought to be outside RPAs of retained trees. However, where existing services within RPAs require upgrading or new services must be installed in RPAs, trenchless insertion methods ought to be used with entry and retrieval pits being sited outside the RPAs. If roots can be retained and protected, excavation using hand-held tools might be

GE AVIATION SITE- HAMBLE  
BS5837 TREE REPORT

acceptable for shallow service runs. Any adverse impact must be minimised by following the guidance set out in Appendix 5.

8.19 The activities on this site that will require arboricultural supervision and the number and/or frequency of site visits are listed in table 2 below.

Table 2. Summary of Arboricultural Supervision

Activity	Supervision required?	Number and/or frequency of site visits	Timing of site visits
Site access, movement and parking of construction traffic	Yes	2	Pre Construction/ demolition
Installation of barriers, ground protection and signage	Yes	2	Pre Construction/ demolition
Recommended tree works	Yes	2	Pre Construction/ demolition
Changes in soil levels within any RPAs	No	1	Construction
Excavation within any RPAs	Yes	1	Construction
Compaction within any RPAs	No		Construction
Location of: 1. site hut 2. temporary toilets 3. bonfires 4. cement mixing and washout areas 5. storage of materials	Yes	1	Construction
Installation or removal of hard surfaces within RPAs	No	TBC	Construction
Soft landscaping within RPAs	No	TBC	Construction
Work within areas of designated structural landscaping	Yes	TBC	Construction
Inspection of retained trees	Yes	TBC	Post construction
Recommended tree planting	Yes	TBC	Post construction
Other			

**Construction:** *site-based operations with the potential to affect existing trees*

TBC=to be confirmed

**Appendix 1**  
**Tree Survey and**  
**Tree Quality Assessment**

GE AVIATION SITE- HAMBLE  
BS5837 TREE REPORT

**Tree Survey and Tree Quality Assessment**

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m2)	Preliminary Works
699	Horse Chestnut	7	430	3	Middle	Poor condition/ diseased- fell	<10	U	-	-	
701	Oak	12	1800	7	Over-mature	Heavily reduced oak within traffic island/ old pruning wounds/ decay pockets within several branches/good vitality/ low volume of deadwood/ root damaged through construction and RPA will be restricted to island bed that the tree is situated in	>40	B	15.0	707	
702	Yew	10	1220	5	Mature	Yew tree within car parking area/ previous root damage causing severe dieback in crown	>40	B	14.6	673	Fell
703	Oak	9	740	5	Mature	Asymmetric crown shaped by adjacent tree/ fair vitality/ minor deadwood	>40	B	8.9	248	
704	Oak	10	680	5	Mature	Significant tree	>40	B	8.2	209	
705	Sycamore	11	600	4	Mature	Decline with significant dieback/ large pruning wounds/pocket decay/ short useful life expectancy/ will be lost in short term	10-20	C	7.2	163	
706	Oak	7	370	3	Middle	Crown suppressed	>40	B	4.4	62	
707	Oak	8	400	4	Middle	Significant tree	>40	B	4.8	72	

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m <sup>2</sup> )	Preliminary Works
708	Oak	12	620	5	Mature	Significant tree	>40	B	7.4	174	
709	Oak	6	340	3	Middle	Small good oak	>40	B	4.1	52	
710	Oak	10	590	4	Mature	Ivy covered	>40	B	7.1	157	
711	Oak	8	580	4	Mature	Asymmetric crown	>40	B	7.0	152	
712	Oak	9	420	4	Mature		>40	B	5.0	80	
713	Yew	6	400	4	Middle	2 stemmed yew tree close to 711/ both stems 340mm	>40	B	4.8	72	
714	Ash	10	430	4	Mature	Inonotus hispidus (decay fungi) present in stem wounds/ short useful life expectancy	<10	U	5.2	84	Fell
715	Sycamore	9	440	4	Mature	Dieback/ basal growth/ root disease- buttress decay	<10	U	5.3	88	Fell
716	Sycamore	6	320	3	Young	Twin stemmed/ low potential 260/190mm	>40	C	3.8	46	
717	Oak	11	870	7	Mature	Poorly reduced in past/ low vitality/major deadwood over road	>40	B	10.4	342	Remove major deadwood
718	Oak	10	620	6	Mature		>40	B	7.4	174	
719	Oak	10	530	5	Mature		>40	B	6.4	127	
720	Oak	9	480	4	Mature		>40	B	5.8	104	
721	Sycamore	11	530	5	Mature	Dieback in high crown/ significant basal growth	>40	B	6.4	127	
722	Oak	10	450	5	Mature		>40	B	5.4	92	
723	Oak	9	460	5	Mature	Topped at some stage	>40	B	5.5	96	
724	Oak	11	520	4	Mature	Topped at some stage	>40	B	6.2	122	
725	Oak	12	550	4	Mature	Topped at some stage	>40	B	6.6	137	

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m2)	Preliminary Works
726	Sycamore	12	320	4	Middle	Good potential	>40	B	3.8	46	
727	Sycamore	12	450	4	Middle	Leaning over fence/ 1 stem removed/ ivy covered/ compost underneath/ limited potential	10-20	C	5.4	92	
728	Sycamore	12	620	4	Middle	5 stems with one outside fence line/ limited potential/ 300/240/400/220/230mm stems	10-20	C	7.4	174	
Offsite 32	Horse chestnut	10	450	4	Mature	offsite tree along cycle path/ no impact anticipated	>40	B	5.4	92	
Offsite 33	Lime	14	530	4	Mature	offsite tree along cycle path/ no impact anticipated	>40	B	6.4	127	
Offsite 34	Lime	15	540	4	Mature	offsite tree along cycle path/ no impact anticipated	>40	B	6.5	132	
Offsite 35	Lime	14	710	4	Mature	offsite tree along cycle path/ no impact anticipated	>40	B	8.5	228	
Offsite 36	Turkey oak	7	360	3	Mature	offsite tree along cycle path/ no impact anticipated	>40	B	4.3	59	
Offsite 1	Turkey oak	6	240	3	Young	offsite tree along cycle path/ no impact anticipated	>40	C	2.9	26	
Offsite 2	Turkey oak	14	720	5	Mature	offsite tree along cycle path/ no impact anticipated	>40	B	8.6	234	
Offsite 3	Lime	14	540	5	Mature	offsite tree along cycle path/ no impact anticipated	>40	B	6.5	132	
Offsite 4	Turkey oak	8	540	4	Mature	offsite tree along cycle path/ no impact anticipated	>40	B	6.5	132	
Offsite 5	Lime	12	360	4	Middle	offsite tree along cycle path/ no impact anticipated	>40	B	4.3	59	

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m2)	Preliminary Works
Offsite 6	Lime	11	560	4	Mature	offsite tree along cycle path/ no impact anticipated	>40	B	6.7	142	
Offsite 7	Turkey oak	15	740	5	Mature	offsite tree along cycle path/ no impact anticipated	>40	B	8.9	248	
729	Turkey oak	18	1220	12	Mature	Largest oak in tree line on eastern boundary of football pitch/ significant tree on site/ huts built underneath so previous RPA encroachment/-9m from lamp/ offset=3.6m to middle	>40	A	14.6	673	
730	Horse chestnut	13	430	4	Middle	Significant within tree line	>40	B	5.2	84	
731	Horse chestnut	16	580	4	Middle	Significant within tree line	>40	A	7.0	152	
732	Oak	18	700	6	Mature	Significant within tree line	>40	A	8.4	222	
857	Sycamore	4	200	1	Young	Dead	<10	U	2.4	18	Fell
699	Horse chestnut	7	430	3	Middle	Poor condition/ diseased	<10	U	5.2	84	Fell
G861	Mixed species	6 to 8	300	2	Young	Significant tree line on northern boundary with mix of sycamore oak horse chestnut and holly and dense understory/ footpath shown near this group- low impact	>40	B	3.6	41	Position of new small building not clear but only small number of trees affected.
733	Turkey oak	18	810	12	Mature	Significant oak in tree line on eastern boundary of football pitch/ hangers/ deadwood but good tree	>40	A	9.7	297	May need some lifting- To be advised by designers
734	Lime	11	380	4	Middle	Significant basal growth	>40	B	4.6	65	
735	Lime	16	520	6	Mature	Significant lime	>40	B	6.2	122	
736	Turkey oak	9	430	5	Middle	Suppressed by larger oak	>40	B	5.2	84	

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m2)	Preliminary Works
737	Lime	8	380	4	Middle		>40	B	4.6	65	
738	Turkey oak	18	980	8	Mature	Large significant oak/ no significant defects- 11m from hedge/ 2.5 from boundary fence	>40	B	11.8	434	
739	Lime	13	600	4	Mature	Dieback/epicormic basal/some deadwood	20-40	B	7.2	163	Potential small reduction to tidy
741	Lime	7	320	4	Mature	Significant basal growth	20-40	B	3.8	46	
742	Lime	7	450	4	Mature	Significant basal growth	20-40	B	5.4	92	
743	Lime	11	430	4	Mature	Significant basal growth/ ivy covered	20-40	B	5.2	84	
744	Horse chestnut	9	510	4	Mature	Significant basal growth/ ivy covered	20-40	B	6.1	118	
745	Turkey oak	15	460	6	Mature	Poor pruning cuts, ivy covered, deadwood	>40	B	5.5	96	
746	Horse chestnut	9	606	4	Mature	Twin stem, dieback, small cavities in crown severe bleeding canker/ 370/480	20-40	U	7.3	166	Fell
747	Turkey oak	20	740	7	Mature	Poor pruning cuts, minor deadwood, ivy covered	>40	B	8.9	248	
748	Lime	9	320	3	Mature	Significant basal growth, minor deadwood, small cavities, dieback	20-40	B	3.8	46	
749	Turkey oak	10	560	5	Mature	Mostly dead	<10	U	6.7	142	Fell
750	Sycamore	10	600	4	Mature	Ganoderma spp. fungi present in stem	<10	U	7.2	163	Fell
751	Oak	15	790	6	Mature	-7m from fence line along hedge/ 8m from boundary fence	>40	B	9.5	282	
752	Oak	16	850	6	Mature	Ivy covered	>40	B	10.2	327	
753	Turkey oak	16	600	4	Mature		>40	B	7.2	163	

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m2)	Preliminary Works
754	Turkey oak	16	670	5	Mature	Low risk hanger to remove at some stage	>40	B	8.0	203	
G755	Turkey oak	7	320	3	Middle	Group of 4 small oaks/ no great significance	10-20	C	3.8	46	
756	Lime	9	489	4	Mature	Twin stem lime/ 1 stem dying back/ basal growth/320/370 mm stems	20-40	B	5.9	108	Fell
757	Cherry	2	150	2	Mature	Cherry in poor condition	10-20	C	1.8	10	Fell
758	Field Maple	9	690	5	Mature	Significant tree/ low risk hanger in crown	>40	A	8.3	215	Fell
759	Maple	3	210	2	Young	Shrubby low value maple by building	10-20	C	2.5	20	Fell
760	Conifer	2	200	1	Middle	Low value conifer	10-20	C	2.4	18	Fell
761	Conifer	2	200	1	Young	Low value conifer	10-20	C	2.4	18	
762	Himalayan birch	4	190	2	Middle	Good tree/ commemorative plaque	20-40	C	2.3	16	Fell
763	Blue cedar	6	480	5	Middle	Poor form twin stemmed	>40	B	5.8	104	Fell
764	Birch	7	595	3	Mature	Minor deadwood/ 320/360/350mm stems	20-40	B	7.1	160	Fell
765	Oak	9	520	5	Middle	Good potential	>40	B	6.2	122	Fell
766	Monterey pine	6	670	7	Middle	Squat wide pine tree close to wall	>40	B	8.0	203	Fell
767	Mixed group	5	250	NA	Young	Group including holm oak Lawson and sycamore-	10-20	B	3.0	28	
768	Holm oak	9	38	3	Middle	Within group- good potential	>40	B	5	72	Fell
769	Mixed group	6	300	3	Middle	Mixed group surrounding chimney block	>40	B	3.6	41	

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m2)	Preliminary Works
G862	Mixed group	14	800	4	Mature	Mature group of mainly 1 pine and 1 lime of high value/ average distance from car park edge is 8m/ new trench for lamp column recently installed/ small ash by LC could be removed	>40	B	9.6	289	Tree works to be confirmed around this group.
770	Oak	12	480	6	Mature		>40	B	5.8	104	
771	Beech	15	680	8	Mature		>40	B	8.2	209	Fell
772	Beech	15	670	6	Mature	Diseased/ severe defects/ poor condition	<10	U	8.0	203	Fell
773	Beech	13	580	6	Mature	Little crown left/ low value	<10	U	7.0	152	Fell
774	Yew	7	840	5	Over-mature	Mostly dead	<10	U	10.1	319	Fell
G775	Poplar/ yew	15	400	3	Middle	Group of 5 trees in far corner of site next to boundary	10-20	C	4.8	72	
776	Ash	6	320	2	Young	2 ash in cottage garden	<10	C	3.8	46	
777	Apple	2	200	2	Mature	Within walled garden	10-20	C	2.4	18	
778	Apple	2	200	2	Mature	Within walled garden	10-20	C	2.4	18	
779	Apple	2	200	2	Mature	Within walled garden	10-20	C	2.4	18	
780	Apple	2	200	2	Mature	Within walled garden	10-20	C	2.4	18	
781	Apple	2	200	2	Mature	Within walled garden	10-20	C	2.4	18	
782	Apple	2	200	2	Mature	Within walled garden	10-20	C	2.4	18	
783	Apple	2	200	2	Mature	Within walled garden	10-20	C	2.4	18	
784	Ash	7	330	3	Middle	Good potential	>40	C	4.0	49	
G785	Mixed species	9	400	3	Middle	Overgrown hedgeline with poor form throughout/ ash/ holm oak etc.	10-20	C	4.8	72	

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m2)	Preliminary Works
786	Oak	12	490	4	Middle	Good oak within tree line	>40	B	5.9	109	
787	Oak	7	320	2	Young	Damaging wall	>40	B	3.8	46	
788	Oak	7	220	2	Young	Damaging wall	>40	B	2.6	22	
789	Birch	7	240	2	Young		20-40	C	2.9	26	
790	Birch	7	230	2	Young		20-40	C	2.8	24	
791	Sycamore	9	695	5	Middle	No long-term potential/ 460/520mm stems	10-20	C	8.3	218	
792	Turkey oak	13	520	4	Middle	Good potential	>40	B	6.2	122	
793	Turkey oak	13	550	4	Middle	Poor union/410/370mm stems	<10	U	6.6	137	
794	Turkey oak	13	450	4	Middle		>40	B	5.4	92	
795	Turkey oak	9	230	2	Young		10-20	C	2.8	24	
796	Birch	6	430	3	Middle	240/230/260mm	10-20	C	5.2	84	
797	Oak	7	290	3	Young		20-40	C	3.5	38	
798	Oak	4	160	2	Young		10-20	C	1.9	12	
799	Birch	5	220	3	Young	Multi-stemmed	10-20	C	2.6	22	
800	Birch	5	220	3	Young	Multi-stemmed	10-20	C	2.6	22	
801	Ash	5	300	3	Young		20-40	C	3.6	41	
G802	Mixed group	12	300	NA	Middle	Large group of conifer sycamore and holly etc. along boundary/ cohesively important but individually limited	>40	B	3.6	41	
803	Oak	15	1080	8	Over-mature	Union poor but retainable/ within group	>40	B	13.0	527	

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m2)	Preliminary Works
804	Oak	15	1300	6	Mature	Within group	>40	B	15.6	764	
805	Oak	14	570	5	Mature	Within group	>40	B	6.8	147	
806	Oak	14	890	5	Mature	Within group	>40	B	10.7	358	
807	Turkey oak	11	530	4	Mature	Severe lean/ decayed base	<10	U	6.4	127	Fell
808	Elm	4	200	1	Young	Dead		U	2.4	18	Fell
G809	Leylandii	8	400		Middle	Row of 6 with 2 middle ones removed	10-20	C	4.8	72	
G810	Sycamore	8	250	NA	Young	Long linear plot along and around car parking area/ tarmac up to stems/ no significant individuals but as cohesive line good screening/ part of group next to some houses topped at 3m	10-20	C	3.0	28	
811	Sycamore	15	890	5	Mature	No significant defects noted/ minor basal decay	>40	B	10.7	358	
812	Sycamore	15	830	5	Mature		>40	B	10.0	311	
813	Holm oak	11	710	5	Mature		>40	B	8.5	228	
814	Holm oak	11	630	5	Mature	Large tear in stem/ overhanging building 12b	>40	B	7.6	179	
815	Sycamore	11	530	4	Mature	Poor condition/ significant decay/ leans into plot	<10	U	6.4	127	Fell
816	Holm oak	7	720	5	Mature	Poor condition/ significant decay/ diseased	<10	U	8.6	234	Fell
817	Sycamore	11	480	4	Middle	Overhanging 12b	>40	B	5.8	104	
818	Holm oak	8	790	7	Mature	Misshapen crown over plot	10-20	C	9.5	282	
819	Sycamore	9	380	4	Middle	Suppressed by 818/ limited potential	10-20	C	4.6	65	
820	Sycamore	9	410	4	Middle	Slight sweep to stem	20-40	B	4.9	76	

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m2)	Preliminary Works
821	Horse chestnut	5	440	4	Middle	Severe bleeding canker/ short sure	<10	U	5.3	88	Fell
G822	Conifers	5	330	3	Middle	Group of 3 conifers- all topped	20-40	C	4.0	49	
823	Blue cedar	8	660	7	Middle	Weeds- access difficult	>40	B	7.9	197	
824	Maple	8	350	3	Middle	Dead	<10	U	4.2	55	Fell
825	Maple	8	340	3	Middle		20-40	B	4.1	52	
826	Holly	4	240	2	Middle		10-20	C	2.9	26	
827	Pine	10	740	6	Mature		20-40	B	8.9	248	
828	Oak	15	720	6	Mature		>40	B	8.6	234	
829	Oak	15	510	6	Mature		>40	B	6.1	118	
830	Oak	15	470	7	Mature	360/440/470mm stems	>40	B	5.6	100	
831	Holm oak	17	1640	12	Over-mature	Possible previous root plate movement / no significant other defects noted/reduction work likely needed to retain long term/ bias towards houses/ 1230/700/830mm stems	>40	B	15.0	707	Will be close to new parking/ Large crown reduction to be confirmed.
832	Sycamore	9	440	5	Middle		>40	B	5.3	88	Fell
833	Sycamore	9	410	3	Middle	Ustulina present- causes brittle fracture	<10	U	4.9	76	Fell
834	Oak	15	955	9	Mature	Twin stemmed oak/ dieback on front stem/some decay/710/640mm stems	20-40	B	11.5	412	Fell
835	Holly	6	230	3	Middle	Fallen stems	10-20	C	2.8	24	
836	Sycamore	7	410	4	Middle	Self-set suppressed under oak	10-20	C	4.9	76	Fell

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m2)	Preliminary Works
837	Sycamore	11	680	4	Middle	3 stemmed sycamore by fence/ limited value/ 480/260/410mm stems	10-20	C	8.2	209	Fell
838	Sycamore	6	270	2	Young	Low value	<10	C	3.2	33	Fell
G839	Elm/cherry	4	200	NA	Young	Some dead elm stems amongst self-set cherries/ low importance	<10	C	2.4	18	Fell all
840	Yew	6	760	4	Mature	Good yew tree	>40	B	9.1	261	
841	Crab apple	3	220	1	Mature	No significant value	<10	C	2.6	22	
842	Cherry	4	240	3	Mature	Severe canker- poor condition	<10	C	2.9	26	
843	Willow	5	420	3	Mature	Leaning/ low value	<10	C	5.0	80	
844	Purple leaved plum	4	240	2	Middle	Low value	<10	C	2.9	26	
845	Pear	8	380	2	Mature	Low value	10-20	C	4.6	65	
846	Sycamore	7	270	3	Middle	Low value	<10	C	3.2	33	
G847	Sycamore	7	330	3	Middle	Group of approx. 10 stems/ no access/ 1 dead stem/ others relatively low value	20-40	C	4.0	49	
G848	Sycamore	9	400	4	Middle	No access- grouped trees of 5 sycamores	20-40	C	4.8	72	
G849	Mixed group	5	260	2	Young	mostly holly of no special significance	<10	C	3.1	31	
850	Sycamore		530	2	Young	Multi-stemmed tree by wall/ 220mm x6 stems	<10	C	6.4	127	
G851	Sycamore	12	340	4	Middle	Group of 2 multi-stemmed self-set sycamore by gate entrance/ no significance/ 5 stems in total	20-40	C	4.1	52	

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m2)	Preliminary Works
852	Pine	8	600	3	Middle		20-40	B	7.2	163	
853	Conifers	8	530	3	Middle	Topped leylandii conifers of no special significance	10-20	C	6.4	127	
G854	Mixed group	7	300	NA	Young	Self-set sycamore and small groups of hedging conifers beside houses by building 12b	10-20	C	3.6	41	
G855	Conifer	6	340	3	Middle	no significance	10-20	C	4.1	52	
G856	Mixed species	12	600	NA	Mature	Large woodland with mature oak etc. of importance	>40	A	7.2	163	
857	Oak	14	650	6	Mature	Offsite oak within 1m of fence line	>40	B	7.8	191	
858	Oak	14	580	6	Mature	Offsite oak within 1m of fence line	>40	B	7.0	152	
G859	Mixed species	12	450	NA	Mature	offsite woodland	>40	B	5.4	92	
860	Yew	7	900	NA	Mature	neighbouring yew tree 2m off fence line/ no access/ dbh estimated	>40	B	10.8	366	
863	Sweet Chestnut	12	900	NA	Mature	offsite reduced tree close to side entrance/ no access/ dbh estimated	20-40	B	10.8	366	
H1	Conifer hedge	2 to 3	NA	NA	Middle	Low value hedgeline/ not significant in landscape terms	<10	C	NA	NA	Remove
H2	Conifer hedge	3 to 4	NA	NA	Middle	Low value hedgeline/not significant in landscape terms	<10	C	NA	NA	Remove
H3	Conifer Hedge	1 to 2	NA	NA	Middle	Low value hedgeline with gaps	<10	C	NA	NA	Remove
H4	Privet hedge	1 to 2	NA	NA	Middle	Low value privet	<10	C	NA	NA	Remove

Tree Tag no.	Species	Height (m)	Stem Diameter (mm)	Average Crown Spread NESW (m)	Life Stage	Observations / Recommendations	Contribution in years	Category	RPA radius (m)	Nominal RPA area(m2)	Preliminary Works
H5	Conifer hedge	4 to 5	NA	NA	Middle	Low value hedgeline/not significant in landscape terms	<10	C	NA	NA	Remove
H6	Privet hedge	1 to 2	NA	NA	Middle	Low value privet	<10	C	NA	NA	Remove

agl: above ground level

# indicate estimated measurements

Tree survey schedule:

- a) an sequential reference number for each tree or group of trees (also recorded on the Tree Plan);
- b) species (common names only);
- c) estimated height in metres;
- d) stem diameter measured in millimetres typically at 1.5 metres above ground level;
- e) estimated branch spread in metres taken at the four cardinal points, as appropriate; (also recorded on the Tree Plan, as appropriate);
- f) life stage as follows,
  - i. young - a tree in the first third of average life expectancy for species.
  - ii. middle - a tree in the middle third of average life expectancy for species.
  - iii. mature- a tree in the last third of average life expectancy for species.
  - iv. over mature- a mature tree, which by reason of its physical or structural condition, has an estimated remaining contribution of less than 20 years
  - v. veteran - 'a tree which, because of its great age, size or condition is of exceptional value culturally, in the landscape or for wildlife' English Nature.
- g) general observations/ recommendations, particularly of structural and/or physiological condition, as appropriate;
- h) estimated remaining contribution in years (e.g. less than 10, 10 - 20, 20 - 40, more than 40);
- i) a category is allocated to each tree or group of trees depending in part upon the information gathered in the tree survey, it depending in part upon the 'cascade chart for tree quality assessment' at Appendix 2 and it is in part, subjective; and
- j) RPA is based on the guidance given within BS 5837.
- k) Preliminary work recommendations, as appropriate;

**Appendix 2**  
**Cascade Chart for**  
**Tree Quality Assessment**

### Cascade Chart for Tree Quality Assessment (April 2012)

Category and definition	Criteria (including subcategories where appropriate)			Identification on Plan
<b>Trees unsuitable for retention</b>				
<p><b>Category U</b> Trees 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</p>	<ul style="list-style-type: none"> <li>• Trees that have a 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 style="text-align: center;"><i>NOTE: Category U trees can have existing or potential conservation value which it might be desirable to preserve</i></p>			<b>DARK RED</b>
<b>Trees to be considered for retention</b>				
	<b>1. Mainly arboricultural qualities</b>	<b>2. Mainly landscape qualities</b>	<b>3. Mainly cultural values, including conservation</b>	<b>Identification on plan</b>
<p><b>Category A</b> <i>Trees of high quality</i> with an estimated remaining life expectancy of at least 40 years</p>	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)	<b>LIGHT GREEN</b>
<p><b>Category B</b> <i>Trees of moderate quality</i> with an estimated remaining life expectancy of at least 20 years</p>	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for 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	<b>MID BLUE</b>
<p><b>Category C</b> <i>Trees of low quality</i> with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm</p>	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 benefits	Trees with no material conservation or other cultural value	<b>GREY</b>

**Appendix 3**  
**Photographs**

GE AVIATION SITE- HAMBLE  
BS5837 TREE REPORT

---



GE AVIATION SITE- HAMBLE  
BS5837 TREE REPORT

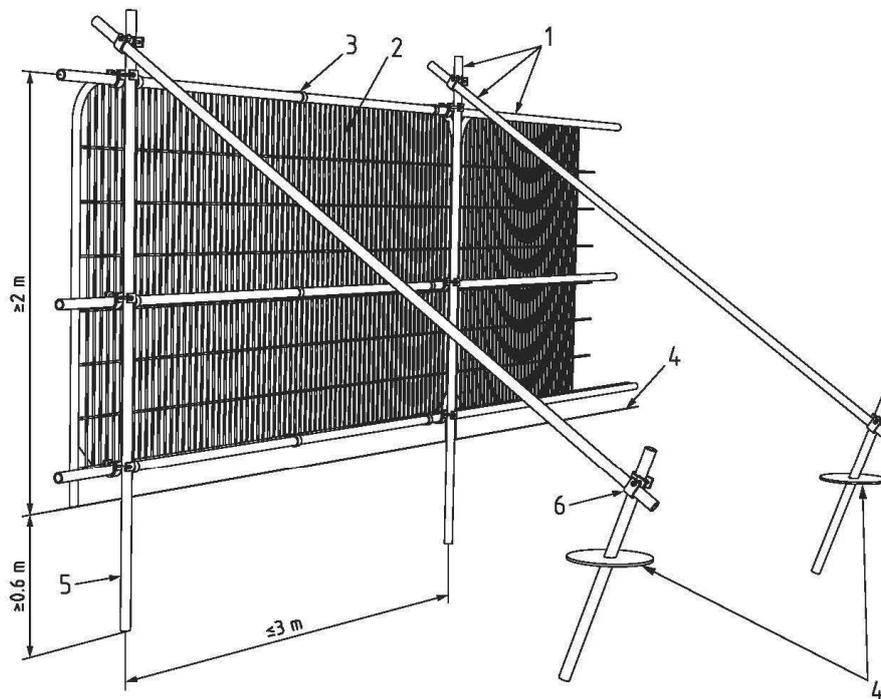
---



All photographs above are examples of trees or groups within the site

**Appendix 4**  
**Default Specification**  
**for a Protective Barrier**

**Default Specification for a Protective Barrier**



**Key**

- 1 Standard scaffold poles
- 2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
- 6 Standard scaffold clamps

The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated above. The vertical tubes should be spaced at a maximum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed.

Reference: BS 5837 2012 Section 6.2.2 Barriers

**Appendix 5**  
**Guidance for Working**  
**in**  
**Root Protection Areas (RPAs)**

## **Guidance for Working in Root Protection Areas (RPAs)**

### **1.0 Introduction**

The following sets out the guidance for working in RPAs that should be followed to ensure successful tree retention. It is based on the guidelines and recommendations set out in British Standard 5837 2012 Trees in relation to design, demolition and construction - Recommendations (hereinafter BS5837) and the National Joint Utilities Group: Guidelines for the planning, installation and maintenance of utility services in proximity to trees. Volume 4, issue 2. London: NJUG, 2007 (hereinafter NJUG 4).

### **2.0 General Guidance for Working in RPA's**

#### **2.1 What is the purpose of this guidance?**

The purpose of this guidance is to set out the general principles that must be followed when working in RPAs as follows;

- a) pre site commencement: to demonstrate that tree protection issues have been properly considered and sets out how they must be implemented, and
- b) post site commencement: to inform all site personnel of their obligations towards protected trees and how to meet them.

#### **2.2 What are RPAs?**

RPAs are the areas of root protection where;

- a) roots must not be severed, cut or broken i.e. no excavation, no soil stripping
- b) ground levels must not be changed i.e. no soil stripping, no soil level raising
- c) soil must not be compacted - no movement of vehicles

All RPAs close to the construction area are illustrated on the tree protection plan within this report.

Any and all works within RPAs must be carried out with great care if trees are to be successfully retained.

#### **2.3 When must this guidance be followed?**

This guidance must be followed by all personnel entering into or working within an RPA.

The main scenarios where this guidance must be followed are;

- a) demolition,
- b) construction of new hard surfacing,
- c) construction of new structures,
- d) subterranean construction,
- e) underground and above-ground utility apparatus, and
- f) landscaping activities.

Broad definitions of surfacing, services, structures and landscaping are set out in the following sections.

#### 2.4 **Arboricultural supervision:**

All work within RPAs must be carried out with care if trees are to be successfully retained. An arboriculturist must be consulted if there is any risk of misunderstanding or misinterpretation.

Ongoing work must be inspected regularly and, on completion, the work must be signed off by the arboricultural consultant.

### 3.0 **Demolition within RPA's**

#### 3.1 **Basic principles:**

Demolition within the RPA should accord to the principle that the tree and soil structure take priority, and the most reliable way to ensure this is to preserve the RPA completely undisturbed.

The ability of a tree to tolerate some disturbance and alteration of its growing conditions depends on specific circumstances, including prevailing site conditions, and in general, the older the tree, the less successfully it will adapt to new conditions.

#### 3.2 **Avoiding physical damage to the roots during demolition:**

To avoid damage to tree roots, existing ground levels should be retained within the RPA. Intrusion into soil (other than for piling) within the RPA is generally not acceptable, and topsoil within it should be retained in situ. However, limited manual excavation within the RPA might be acceptable, subject to justification.

Such excavation should be undertaken carefully, using hand-held tools and preferably by compressed air soil displacement.

Roots, whilst exposed, should immediately be wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.

Roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in clumps. Roots occurring in clumps or of 25 mm diameter and over should be severed only following consultation with an arboriculturist; as such roots might be essential to the tree's health and stability.

Prior to backfilling, retained roots should be surrounded with topsoil or un-compacted sharp sand, or other loose inert granular fill, before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.

#### **4.0 Construction of New Hard Surfacing within RPA's**

##### **4.1 Basic principles:**

The design should not require excavation, including changes of soil levels other than the removal, of turf or other surface vegetation.

The new hard surface must to avoid localized compaction by evenly distributing the loading over the track width and wheelbase of any vehicles expected to use the access.

New permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA.

If the new surface is likely to be subject to de-icing salt application, an impermeable barrier should be incorporated to prevent contamination of the rooting area and run-off should be directed away from the RPA.

Where a permeable surface is to be used by vehicular traffic, a geotextile should be used at the base of construction to help prevent pollution contamination of the rooting area below.

Where there is a risk of water logging suitable land drainage must be incorporated.

The new hard surface should be resistant to or tolerant of deformation by tree roots, and should be set back from the stem of the tree and its above ground root buttressing by a minimum of 500 mm to allow for growth and movement.

Mature and over-mature trees are more prone to suffer because of these changes than young and middle aged trees. Adverse impact on trees can be reduced by minimising the extent of these changes within RPAs.

The actual specification of the surfacing is an engineering issue that needs to be considered in the context of the bearing capacity of the soil, the intended loading and the frequency of loading.

Product and specification are beyond the scope of this guidance and must be provided separately by the appropriate specialist.

##### **4.2 Sub-base and finishing layers:**

Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems. Alternatively, piles, pads or elevated beams can be used to support surfaces to bridge over the RPA or, following exploratory investigations to determine location, to provide support within the RPA while allowing the retention of roots greater than 25 mm in diameter.

Suitable surface finishes include washed gravel, permeable tarmac or block pavements set on a sand base. However, for lightly loaded surfacing or limited widths (<3m) such as pedestrian paths, pre-formed concrete slabs may be appropriate if the sub-base preparation is as set out above.

In some situations, limited width floating concrete rafts constructed directly on to the soil surface may be acceptable but the design must not include any strip supports.

**4.3 Edge retention:**

The excavation needed for the placement of kerbs, edgings and their associated foundations and haunchings can damage tree roots. Within the RPA, this should be avoided either by the use of alternative methods of edge support or by not using supports at all.

**4.4 Installing new hard surfacing on top of existing surfacing:**

In some instances, existing surfacing can be retained and used as a base for new surfacing. Normally, this will not result in significant excavation that could expose roots so special precautions are not necessary.

If large roots already protrude above the proposed sub-base level, then the precautions and procedures set out above must be observed.

**5.0 Construction of New Structures within RPA's**

**5.1 Basic principles:**

Construction within the RPA should accord to the principle that the tree and soil structure take priority, and the most reliable way to ensure this is to preserve the RPA completely undisturbed.

The ability of a tree to tolerate some disturbance and alteration of its growing conditions depends on specific circumstances, including prevailing site conditions, and in general, the older the tree, the less successfully it will adapt to new conditions.

Where alternative design solutions are not available such that construction is proposed within the RPA, the potential impact of the proposals on the tree should be assessed and a tree protection plan and arboricultural method statement produced. Details of design proposals should be developed in conjunction with the project arboriculturist and, where required, input from a suitably qualified engineer.

In order to demonstrate that the proposals are technically feasible such details should be included within planning applications. The exception to this is the installation of underground utility apparatus, where it can be demonstrated that this is achievable by the use of trenchless technology and where entry and retrieval pits can be formed outside the RPA.

Where utility operations do not require planning permission, including those performed by statutory undertakers, they should still be undertaken in accordance with these principles.

**5.2 Avoiding physical damage to the roots during construction:**

To avoid damage to tree roots, existing ground levels should be retained within the RPA. Intrusion into soil (other than for piling) within the RPA is generally not acceptable, and topsoil within it should be retained in situ. However, limited manual excavation within the RPA might be acceptable, subject to justification. Such excavation should be undertaken carefully, using hand-held tools and preferably by compressed air soil displacement.

Roots, whilst exposed, should immediately be wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.

Roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in clumps. Roots occurring in clumps or of 25 mm diameter and over should be severed only following consultation with an arboriculturist; as such roots might be essential to the tree's health and stability.

Prior to backfilling, retained roots should be surrounded with topsoil or un-compacted sharp sand, or other loose inert granular fill, before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.

## **6.0 Subterranean construction within RPAs**

### **6.1 Basic principles:**

Where it is proposed to form subterranean structures, e.g. basement extensions, within the RPA, it is essential to avoid excavating down through rootable soil if trees are to be retained. In some cases, it might be technically possible to form the excavation by undermining the soil beneath the RPA.

## **7.0 Underground and above-ground utility apparatus within RPAs**

### **7.1 Basic principles:**

Mechanical trenching for the installation of underground apparatus and drainage severs any roots present and can 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 apparatus.

Wherever possible, apparatus should be routed outside RPAs. Where this is not possible, it is preferable to keep apparatus together in common ducts. Inspection chambers should be sited outside the RPA.

Where underground apparatus is to pass within the RPA, detailed plans showing the proposed routeing should be drawn up in conjunction with the project arboriculturist. In such cases, trenchless insertion methods should be used with entry and retrieval pits being sited outside the RPA. Provided that roots can be retained and protected excavation using hand-held tools might be acceptable for shallow service runs.

## **8.0 Landscaping within RPA's**

### **8.1 Basic principles:**

The general treatment of areas around newly planted and existing trees should allow for adequate infiltration of water and free gas exchange, reduction of water evaporation and the retention of an open soil structure to encourage root growth.

### **8.2 Soil compaction and remediation measures:**

Soil that has been compacted will not provide suitable conditions for the survival and growth of vegetation, whether existing or new, and is a common cause of post-construction tree loss on development sites.

Compacted soil will adversely affect drainage, gas exchange, nutrient uptake and organic content, and will seriously impede or restrict root growth. The risk of soil compaction is greatest in soils with significant clay content and in wet conditions.

Soil compaction should be avoided around existing vegetation, including trees, and in areas where new planting or seeding is proposed.

Where soil compaction has occurred in the vicinity of existing trees, arboricultural advice should be taken before carrying out any remedial or other works within RPAs to mitigate risk of further damage to roots.

Remedial works may include sub-soil aeration using compressed air, and the addition of other materials, preferably of a bulky, organic nature (but excluding peat), to improve structure. Heavy mechanical cultivation such as ploughing or rotavation should not occur within the RPA.

Any cultivation operations should be undertaken carefully by hand in order to minimize damage to the tree, particularly the roots. Decompaction measures include forking, spiking, soil augering and tilled radial trenching. Care should be taken during such operations to minimize the risk of further damage to tree roots.

### 8.3 **Use of herbicides:**

The use of herbicides in the vicinity of existing trees should be appropriate for the type of vegetation to be killed, and all instructions, warnings and other relevant information from manufacturers should be strictly observed and followed. Care should be taken to avoid any damaging effects upon existing plants and trees to be retained, species to be introduced, and existing sensitive habitats, particularly those associated with aquatic or drainage features.

### 8.4 **Tree work within RPAs:**

Care should be taken to ensure during tree removal or remedial work that damage to the retained trees and/or disturbance to the RPA is avoided. Precautions should include dismantling techniques to reduce the risk of accidental damage, and ground protection measures where excessive pedestrian movements or use of plant and machinery might lead to compaction.

If temporary access is required for plant or vehicles within the RPA, this should be provided by means of temporary ground protection.

**Appendix 6**  
**Exemplar Record**  
**of**  
**Arboricultural Supervision**

GE AVIATION SITE- HAMBLE  
BS5837 TREE REPORT

---

**Record of Arboricultural Supervision**

Please see also the Schedule for Arboricultural Supervision at Section 8 in the report

Planning Application No:

Client:

Site Address:

Agent:

Tree Officer:

Tree Consultant:

Copy to: Client, Agent, Tree Officer and Site Manager

No. of Photographs provided:

Activity	Time and Date	Observations	Recommendations



**Appendix 7**  
**Tree Protection Plan-**  
**[attached separately]**

## Appendix 8

### References

Barlow JF & Harrison G. 1999. Shade By Trees, Arboricultural Practice Note 5, AAIS, Farnham, Surrey.

British Standards Institute. 2012. Trees in Relation to Design, Demolition and Construction - Recommendations BS 5837: 2012 HMSO, London.

Centre for Ecology & Hydrology (CEH). 2006. Tree Roots in the Built Environment, HMSO, London.

Helliwell R (1980) Provision for New Trees; Landscape Design; July/August issue

International Society of Arboriculture (ISA). 1994. The Landscape Below Ground. ISA, Champaign, Illinois. USA.

Lonsdale D 1999. Research for Amenity Trees No.7: Principles of Tree Hazard Assessment and Management, HMSO, London.

Matheny, N; Clark, J. R. 1998. Trees and Development: A Technical Guide to Preservation of Trees during Land Development. ISA, Champaign, Illinois. USA.

Mattheck C. & Breloer H. 1994. Research for Amenity Trees No.2: The Body Language of Trees, HMSO, London.

Thomas P, 2000. Trees: Their Natural History, Cambridge University Press, Cambridge.

Trowbridge J & Bassuk N (2004) Trees in the Urban Landscape: Site Assessment, Design, and Installation; J Wiley & Sons inc. NJ USA