

**BS5837:2012**

**Arboricultural Impact Assessment**

**Survey**

**For**

**The Grange Centre for People with disabilities,**

**Rectory Lane,**

**Great Bookham, Surrey**

**SIMON FFOULKES**

Tree consultant

AA Tech Cert

61 Georgia Road,

Thornton Heath,

Surrey,

CR7 8DW

07979 095623

[ffoulkesfenner@btinternet.com](mailto:ffoulkesfenner@btinternet.com)



**Tree Survey with Preliminary**

**Tree Constraints.**

**Assessed in accordance with**

**BS5837:2012**

**'Trees in relation to design, demolition and construction**

**-Recommendations'**

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## **1.0 Introduction**

### **1.1 Client Instruction**

- 1.1.1 Simon Ffoulkes Tree Consulting was instructed by The Grange Centre for People with disabilities to undertake a preliminary tree survey at The Grange accordance with BS5837:2012 – Trees in relation to design, demolition and construction – Recommendations.
- 1.1.2 The reason for a BS5837 survey is to comply with The Town and Country Act 1990 legislation, requiring consultation on trees that will or may be affected by the construction process.
- 1.1.3 As part of the survey a Tree Constraints plan was to be formulated to show the trees that would be a constraint to the building process.
- 1.1.4 There is a proposal to demolish the existing buildings on the north of the walled garden area and construct new out buildings with access and parking on the site on the footprint of existing area used for teaching and storage. The client requires information that will show the impacts of the buildings and processes to build on the surrounding trees.
- 1.1.5 The requirement of the survey was;
- To record relevant information about the trees on the topographical plan survey.
  - Include any trees or groups not included on the plan.
  - To provide a report that includes a tree survey and an arboricultural impact assessment (AIA) that will indicate any impacts of the proposed development on the adjacent trees and any effects of retaining the trees on the development.
  - To provide information that shows which trees are a constraint to development.
  - To recommend any trees that require pre-construction management or removal.

### **1.2 Documents provided:**

- 1.2.1 A preliminary topographical survey supplied.
- 1.2.2 Site Survey Plan view was supplied by Matter Architecture.
- 1.2.3 Details of the demolition construction and Landscaping in plans 460 – PL – 11-14 Proposal  
Scale (1:300)

### **1.3 Scope of the survey**

- 1.3.1 The survey relates to trees that are over 75mm diameter at 1.5m height. Groups and hedges may include trees with a smaller diameter.
- 1.3.2 The scope included trees on the Plan drawing that are likely to be affected by the building proposal.

- 1.3.3 The data from the tree survey is provided as an independent survey and does not adhere to specific proposals for the development.

## **1.4 Survey method**

- 1.4.1 The survey method is based around a 'Visual Tree Assessment system' (VTA) that is ratified by the Arboricultural Association and is based on the VTA by *Matteck, C Breloer, H (1994), 'Visual Assessment of Trees'*.
- 1.4.2 No soil samples were taken. The tree inspection was carried out from the ground. The only tools used were a rubber hammer, a steel probe, a dbh tape, a measuring tape and the use of a Sunto height measuring tool. Pictures were taken with a digital camera.
- 1.4.3 All the data recorded was in line with those required within BS5837:2012.
- 1.4.4 All the tree species were recorded, and the trees were categorised in conjunction with the Cascade chart within the BS5837:2012 document.

## **1.5 Limitations**

- 1.5.1 Trees are living organisms means their health and wellbeing can change over time and with climatic conditions. The assessment of risk because of unpredictable events recognises that the tree that is surveyed can only be judged upon factors evident at that time of inspection by a suitably qualified arboricultural inspector. All trees that are within the remit of a survey should be checked on a regular basis that is commensurate with the level of risk posed by the trees. A suitable time frame is between one year and 18 months.

## **2.0 Site visit and observations**

### **2.1 Site visit**

- 2.1.1 A site visit was undertaken on the 3<sup>rd</sup> July 2021 by Simon Ffoulkes a trained arboriculturist

### **2.2 Site observations**

- 2.2.1 The land is accessed via Rectory Lane. The area where the building proposal is situated is on the South eastern boundary with the walled garden. The area for the proposal is being used for a horticultural unit and is a mixture of sheds, portacabins and purpose built temporary structures.

## **3.0 Tree survey**

### **3.1 Tree survey with the constraints**

- 3.1.1 The tree survey indicates the grades allocated to the trees and groups on the survey drawing in the **Appendix 2** Tree Survey.
- 3.1.2 The survey identified 17 features that are single trees and groups applicable to the proposed site and construction process. The **Table 1** below indicates which grade has been applied and to how many trees.

**Table 1: Grading of features**

BS 5837:2012 categories	Trees	Groups
'A' grade	0	0
'B' grade	4	0
'C' grade	8	2
'U' grade	3	0

3.1.3 The grading of the trees is based on the cascade chart from BS5837:2012 which will be found in the **Appendix 2**

3.1.4 The Root Protection Area (RPA) of each tree will be calculated by the tables within BS5837:2012 which are in the **Table 2** below. They are based on the principle of a circle with its centre on the base of each tree.

**Table 2 Tree RPA calculation**

Number of stems	Calculation
Single stem tree	$\text{RPA(m}^2\text{)} = \frac{(\text{stem diameter mm @ 1.5m x 12})^2 \times 3.142}{1000}$
Tree with more than one stem arising below 1.5m above ground level	$\text{RPA(m}^2\text{)} = \frac{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 \dots + (\text{stem diameter 5})^2}{1000} \times 3.142$
Trees with more than five stems arising below 1.5m above ground level	$\text{RPA(m}^2\text{)} = \frac{(\text{mean stem diameter})^2 \times \text{number of stems @ 1.5m x 12} \times 3.142}{1000}$

3.1.5 The RPA is not always consistent with a circle and many factors will affect the rooting area of a tree. The deviation of the RPA is discussed in (section 4.6.3 of the BS5837:2012) document. Some factors that may affect the RPA are;

- The presence of roads.
- Topography.
- Drainage
- Soil type and structure
- Previous management

3.1.6 The Tree Constraints drawing is attached within **Appendix 3** and shows the extent of RPA along with Tree protection measures. The above ground constraints are indicated by the tree canopy spread and tree height. The below ground constraints are indicated by the Tree Constraints plan. Where a tree canopy extends beyond the RPA of the tree, the constraints plan will be extended to include the canopy.

#### 4.0 Arboricultural Impact Assessment (AIA)

##### 4.1 Legal constraints

4.1.1 The Local Planning authority (LPA) will be able to supply details of any Conservation areas or Tree Preservation Orders on the site

##### 4.2 Trees to be removed:

4.2.1 The site plans show that to allow the proposal to go ahead the trees that will need to be removed are:

Tree Ref number	Species	Grade
T1	Sycamore	C1
T3	Yew	B1
T6	Field maple	B1
T12	Plum	C1
T13	Plum	U
T14	Apple	C1

### 4.3 Tree encroachment

- 4.3.1 The re-development plans show the following trees will have their RPA encroached by the proposed development or will be encroached by the building process. The encroached trees are indicated in **Table 3** below.

**Table 3**

T = Tree      G = Tree Group

Tree Ref number	Species	Grade
T2	English oak	B1
T4	Sycamore	C1
T5	Horse Chestnut	C1
T7	Field maple	C1
T8	Field maple	C1
T9	Purple plum	C1
T10	Elm	U
T11	English oak	B1
G17	Apple	C1

## 5.0 Tree protection measures

### 5.1 General tree protection

- 5.1.1 Tree protection for the retained trees should be installed before any of the construction process work is undertaken. This must include protection before there is movement of plant and machinery on site.
- 5.1.2 Tree protection shall include protection for the trees that require tree surgery management before any construction process begins. This is to ensure that the ground is not compacted, and no other trees are damaged by the tree surgery.
- 5.1.3 The Tree Root Protection Area (RPA) must be regarded as unavailable for use during the re-development process and access within the RPA is to be strictly limited. Access to facilitate work within this area will need to be discussed with the LPA and/ or the arboriculturist involved in monitoring the trees.
- 5.1.4 Trees that are to be retained should be protected in a manner consistent with that indicated in the British Standard 5837:2012 to protect the RPA to the end of the project. The



protection area is known as the Tree Protection Plan (TPP) and will need to be implemented when the scheme is finalised.

- 5.1.5 Materials must not be stored within the RPA during the construction process. No vehicles are permitted within the RPA. No washings should be allowed to soak into the RPA and any fires or cement mixing should be at least five metres from any tree.
- 5.1.6 Where root severance is required, roots up to 25mm in diameter can be severed and larger roots should follow the NJUG 10 guidelines, volume 4, with arboricultural supervision.
- 5.1.7 Before any utilities are routed or any underground work is carried out within the RPA there will need to be arboricultural consultation from a suitably qualified arboriculturist.
- 5.1.8 Changes to any of the original soil levels can have a dramatic effect on existing trees whether these include mounding of soil or trenching and soil removal even if only temporary. Changes to any soil levels should be discussed before the final plans are decided upon.
- 5.1.9 Tree protection includes protection to the canopy of the trees and where the canopy of a tree extends beyond the RPA this area should be included as part of the tree protection zone.

## **6.0 Discussion**

### **6.1 Tree Constraints**

- 6.1.1 From the Tree constraints plan **Appendix 3**, the trees that are to be removed are trees T1, T3, T6, T12, T13 and T14. They are an impediment to the build and need to be removed prior to the start of the process of excavation.
- 6.1.2 The trees with some encroachment are trees T2, T4, T5, T7, T8, T9, T10, T11, and G17. The trees T2, T7, T8 and T11 will require suitable tree trunk protection. Other trees being retained although of a lower grade than 'B' will require measures to protect their canopies, trunks and rooting areas.
- 6.1.3 Off site trees cannot be felled without the owner's consent but the canopies and rooting areas can be cut back to the boundary line if required.
- 6.1.4 The tree T2 and some of the trees in G17 group will not have their RPA directly encroached but possibly their canopies, it will be necessary to formalise measures to protect the canopies and trunk whilst the building work is carried out as movement around the site could directly affect this tree through physical damage from vehicular traffic or indirectly by changes in soil levels, excavation or run off.
- 6.1.5 The group G16 are two lines of Hazel clumps that are better described as shrubs than trees in this context, so are not considered an impediment to the proposal.
- 6.1.6 The Arboricultural Impact Assessment (AIA) shows the impacts upon the trees and those that will be affected.
- 6.1.7 The method of protection of the retained trees will be discussed in the Arboricultural Method statement (AMS) once the final decision on position of the buildings is worked through and the type of foundations that are to be used.

## 7.0 Conclusions

### 7.1 Conclusions

- 7.1.1 The proposal is achievable, but two 'B' grade trees will require removal. All 'C' grade trees are not considered an impediment to the proposal.
- 7.1.2 There will need to be an Arboricultural Method Statement (AMS) for the site that will set out the processes to achieve a joined up and harmonious approach to protecting the trees that are to be retained. This will be implemented as soon as the final plans for the site are detailed.
- 7.1.3 All tree work should be carried out in accordance with BS 3998:2010 – Recommendations for tree works.
- 7.1.4 All the trees must be assessed for nesting birds and protected species i.e bats. As disturbing protected species is an offence under the **Wildlife and Countryside Act 1981** and the **Countryside and Rights of Way Act 2000**. Advice on Bats and birds nesting can be obtained by contacting.
- Bats: Bat Conservation Trust (0845 1300 2280/ [www.bats.org.uk](http://www.bats.org.uk))
  - Nesting Birds: Natural England (0845 600 3078/ [www.naturalengland.ork.uk](http://www.naturalengland.ork.uk))
- 7.1.5 The Arboricultural Impact Assessment (AIA) indicates the impacts of the project and as there is a requirement for Tree Protection measures, an Arboricultural Method Statement (AMS) will provide the instruction on how the trees are to be protected.

## 8.0 References

British Standards Institution (2012) *BS5837:2012 – Trees in relation to design, demolition and construction – Recommendations* London: BSI

Mattheck. C and Breloer.H (1994). *The Body Language of Trees*. London: H.M.S.O

*NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees*

## Appendix 1 – Cascade chart

Table 1 – Cascade Chart For Tree Quality Assessment				
Trees for removal				
Category and definition	Criteria			Identification on plan
<b>Category U</b> Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management	Trees that have serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other R category trees such as where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline.  Trees infected with pathogens of significance to the health and/or safety of other trees nearby, for example Dutch Elm Disease, or very low quality trees suppressing adjacent trees of better quality  Note – Habitat reinstatement may be appropriate. For example R category tree used as a bat roost: installation of bat box in nearby tree.			<b>Dark Red</b>
Trees to be considered for retention				
Category and definition	Category – Subcategories			Identification on plan
	1. Mainly arboricultural values	2. Mainly landscape values	3. Mainly cultural values, including conservation	
<b>Category A</b> Those of high quality and value: in such a condition as to be able to make a substantial contribution. A minimum of 40 years is suggested.	Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or of formal or semi-formal Arboricultural features for example the dominant and/or principal trees within an avenue	Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particular visual importance for example avenues or other arboricultural features assessed as groups	Trees, groups or woodlands or significant conservation, historical, commemorative or other value for example veteran trees or wood-pasture	<b>Light Green</b>
<b>Category B</b> Those of moderate quality and value: those in such a condition as to make a significant contribution. A minimum of 20 years is suggested.	Trees that might be included in the high category, but are downgraded because of impaired condition. Examples include the presence of remediable defects including unsympathetic past management and minor storm damage	Trees present in numbers, usually as groups or woodlands, so they form distinct landscape features which attract a higher collective rating than they might as individuals. But which are not, individually, essential components of formal or semi-formal arboricultural features. For example trees of moderate quality within an avenue that includes better, A category specimens. Or trees which are internal to the site, therefore individually having little visual impact on the wider locality	Trees with clearly identifiable conservation or other cultural benefits	<b>Mid Blue</b>
<b>Category C</b> Those trees of low quality and value: currently in adequate condition to remain until new planting could be established - a minimum of 10 years is suggested - or young trees with a stem diameter below 150 mm	Trees not qualifying in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit	Trees with very limited conservation or other cultural benefits	<b>Grey</b>
	Note – Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150mm should be considered for relocation.			

**Appendix 2 – Tree survey**

Tree Reference codes:

T = Tree      G = Group

Tree Reference number	Species	Height m	Stem Diameter mm	Branch spread m	Height of canopy and first major branch cardinal point	Age class	Physiological Conditions	Preliminary management recommendations	Estimated remaining years	Category Rating
T1 1434	Sycamore	8	230	N4 S2 E1 W3	N3	SM	S) Fair P) Fair, Suppressed crown with some squirrel damage to the bark, asymmetric crown	None	10+	C1
T2 1435	English oak	15	910	N4 S7 E8 W4	S3	M	S) Good P) Good, minor dead wood	None	20-40	B1
T3 1436	Yew	10	610	N3.5 S3.5 E3.5 W3.5	W4	EM	S) Fair P) Fair, ivy clad base and trunk	None	20-40	B1
T4 offsite tree	Sycamore	10	320	N1 S2 E3 W3	E3	SM	S) Good P) Good, trunk and basal growth	None	10+	C1
T5 1437	Horse Chestnut	10	470	N2 S2 E3 W4	W3	EM	S) Fair, P) Fair, bark necrosis and an asymmetric crown	None	10+	C1

Tree Reference number	Species	Height m	Stem Diameter mm	Branch spread m	Height of canopy and first major branch cardinal point	Age class	Physiological Conditions	Preliminary management recommendations	Estimated remaining years	Category Rating
T6 1438	Field maple	10	610	N4 S4 E2 W4	W3	M	S) Fair, minor occlusion P) Good, minor squirrel damage to the bark in the crown	None	20-40	B1
T7 1439-1	Field maple	8	610	N1 S1 E2 W5	E2	M	S) Fair, heavily pollarded, with one long lateral limb P) Fair, an asymmetric crown, trunk suckers	None	10+	C1
T8 1439-2	Field maple	10	530	N4 S1 E4 W4	E4	M	S) Fair, previously reduced P) Fair	None	10+	C1
T9 offsite	Purple plum	7	est 150	N1 S1 E2 W1	W2	SM	S) Fair, multi stemmed P) Fair, an ivy clad trunk	None	10+	C1
T10	Elm	7	est 150	N1 S1 E0.5 W1	W2	SM	S) Poor P) Poor, a dying tree	None	>10	U
T11 1441	English oak	9	250	N2 S2 E2 W3	E1	SM	S) Good P) Good, ivy on the base and trunk	None	20-40	B1
T12 1442	Plum spp	4	25	N3 S2 E2 W2	N2	OM	S) Fair, crown wound sites P) Fair	None	10+	C1

Tree Reference number	Species	Height m	Stem Diameter mm	Branch spread m	Height of canopy and first major branch cardinal point	Age class	Physiological Conditions	Preliminary management recommendations	Estimated remaining years	Category Rating
T13 1443	Plum spp	3	380	N2 S0.5 E0 W0	S2	OM	S) Poor, trunk decay, recent pruning. P) Poor	None	>10	U
T14 1444	Apple spp	4	340	N2 S2 E2 W1	S0.5	M	S) Fair P) Fair, a great deal of sucker growth	None	10+	C1
T15 1445	Plum spp	3	140	N2 S2 E1 W2	S1	M	S) Fair, trunk bleeding P) Fair	None	>10	U
G16	Hazel	4	150	N20 S20 E5 W5	0	EM	S) Good P) Good, a group of healthy trees	None	10+	C1
G17 1433	Apple spp	3	300	N3 S3 E2 W2	1	M	S) Good P) Good, a group of healthy trees	None	10+	C2

**Appendix 3 – Tree constraints plan**



**SIMON F FOULKES**

Tree consultant - AA Tech Cert

61 Georgia Road,  
Thornton Heath, Surrey,  
CR7 8DW  
07979 095623

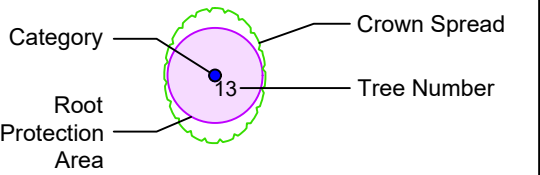
[ffoulkesfenner@btinternet.com](mailto:ffoulkesfenner@btinternet.com)

Site: The Grange 1-250@A2

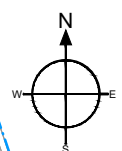
Drawing Title: Arboricultural Impact Assessment Rev A, Sept 2021

**Key:**

- Category A
- Category B
- Category C
- Category U



NOTE: Tree/group numbers marked with an \* have approximate locations.



5m 10m