

BS5837:2012

Arboricultural Impact Assessment

Survey

for

The proposed New village hall,

Adjacent to the Haven Centre,

Hophurst Lane,

Crawley Down,

RH10 4LJ

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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 Les Humphrey Associates to undertake a preliminary tree survey at the land adjacent to The Haven centre, Hophurst Lane, Crawley Down, RH10 4LJ, in 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 build a new Village Hall next to the car park adjacent to the Haven centre.
- 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 sketch proposal from Les Humphrey Associates, scale 1:200
- 1.2.2 Site Survey Block Plan (ACAD Mapping) – 1:200 Crawley Down Village Hall (Drg. No. r1002)

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 binoculars. 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 16th February 2019 by Simon Ffoulkes a trained arboriculturist. The trees and groups surveyed were based on the Plan drawing provided, of the land adjacent to The Haven centre within the car park area and surrounding land

2.2 Site observations

- 2.2.1 The land is accessed via a carpark entrance from Hophurst Lane on the southern boundary. There is a small car park with the eastern boundary with a property. The northern boundary is marked by a low hedge, fence and two trees. The western boundary is marked by mixed trees and fencing. The proposed site encompasses several trees. The southern boundary is marked by a mixed hedge with one very large oak tree on the south eastern boundary.

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 18 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	1	0
'B' grade	13	1
'C' grade	3	0
'U' grade	0	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	$\text{RPA(m}^2\text{)} = \frac{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 \dots + (\text{stem diameter 5})^2 \times 3.142}{1000}$
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), Mid-Sussex Council, shows maps of Conservation areas and trees covered by Tree Preservation Orders. I am unaware of any constraints to the site.

4.2 Trees to be pruned or removed

4.2.1 The site plans show that trees T2, T7, T8, T9 and T10 will have to be removed to accommodate the proposed build.

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	Hornbeam	A1
T3	English oak	B1
T4	Ash	B1
T7	Beech	B1
T8	Beech	B1
T9	English oak	B1
T10	Hornbeam	B1
T14	English oak	B3

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 the 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) is 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 The ground protection for the working area will consist of a permeable black membrane being placed onto the ground and then a 150mm layer of composted bark will be placed onto this. The outer edges of the ground protection will be contained by suitably strong wooden boards (6"x2") to contain the wood mulch. A double layer of overlapping scaffold style wooden boards will be used to resist any compaction of the soil and allow weight distribution. This level of protection will be sufficient to protect against soil compaction for the labour force using the site and any plant moving over the site that is under 1.5t in weight. If there is to be plant access required over 1.5t weight the scaffold boards will need to be replaced with steel plates or a suitable tracked system will be required to be installed. Any scaffolding that is supported by the ground must be on steel feet to spread the load of the scaffolding structure.
- 5.1.8 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.
- 5.1.9 Changes to any of the original soil levels can have a dramatic effect on existing trees weather 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.
- 5.1.10 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 with some form of encroachment within their RPA are trees T4 and T14.
- 6.1.2 The trees T2, T7, T8, T9 and T10 will require removal as the proposal will be built over or very close to these trees. T2 is a grade 'A' tree and its removal will require suitable replacement with an adequate number of trees around the accompanying land to mitigate the loss.
- 6.1.3 The tree T15 has a large decay point and as it has been downgraded because its life expectancy will be reduced so its retention is not of paramount importance.

- 6.1.4 It is essential to find a solution that causes minimal damage to the trees that are to be retained whether on or off-site trees.
The most common method of digging foundations is the trench fill method. This method will be the most intrusive method of construction to the trees root system. Using a pile and beam foundation process would be considerably less intrusive to the retained trees.
- 6.1.5 The trees T4, and T14 will be encroached by the construction of the foundations, when these are being dug there will need to be a way of protecting any roots that are exposed. The method of protection will be discussed in the Arboricultural Method statement (AMS).

7.0 Conclusions

7.1 Conclusions

- 7.1.1 The proposed build is achievable, but it will require significant tree removal as the proposed site is directly on top of the existing trees T2, T7, T8, T9 and T10.
- 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.
- 7.1.4 All tree work should be carried out in accordance with BS 3998:2010 – Recommendations for tree works.
- 7.1.5 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)
 - Nesting Birds: Natural England (0845 600 3078/ www.naturalengland.ork.uk)
- 7.1.6 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
Category U 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.			Dark Red
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	
Category A 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 there 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 aboricultural features assessed as groups	Trees, groups or woodlands or significant conservation, historical, commemorative or other value for example veteran trees or wood-pasture	Light Green
Category 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	Mid Blue
Category C 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	Grey
	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

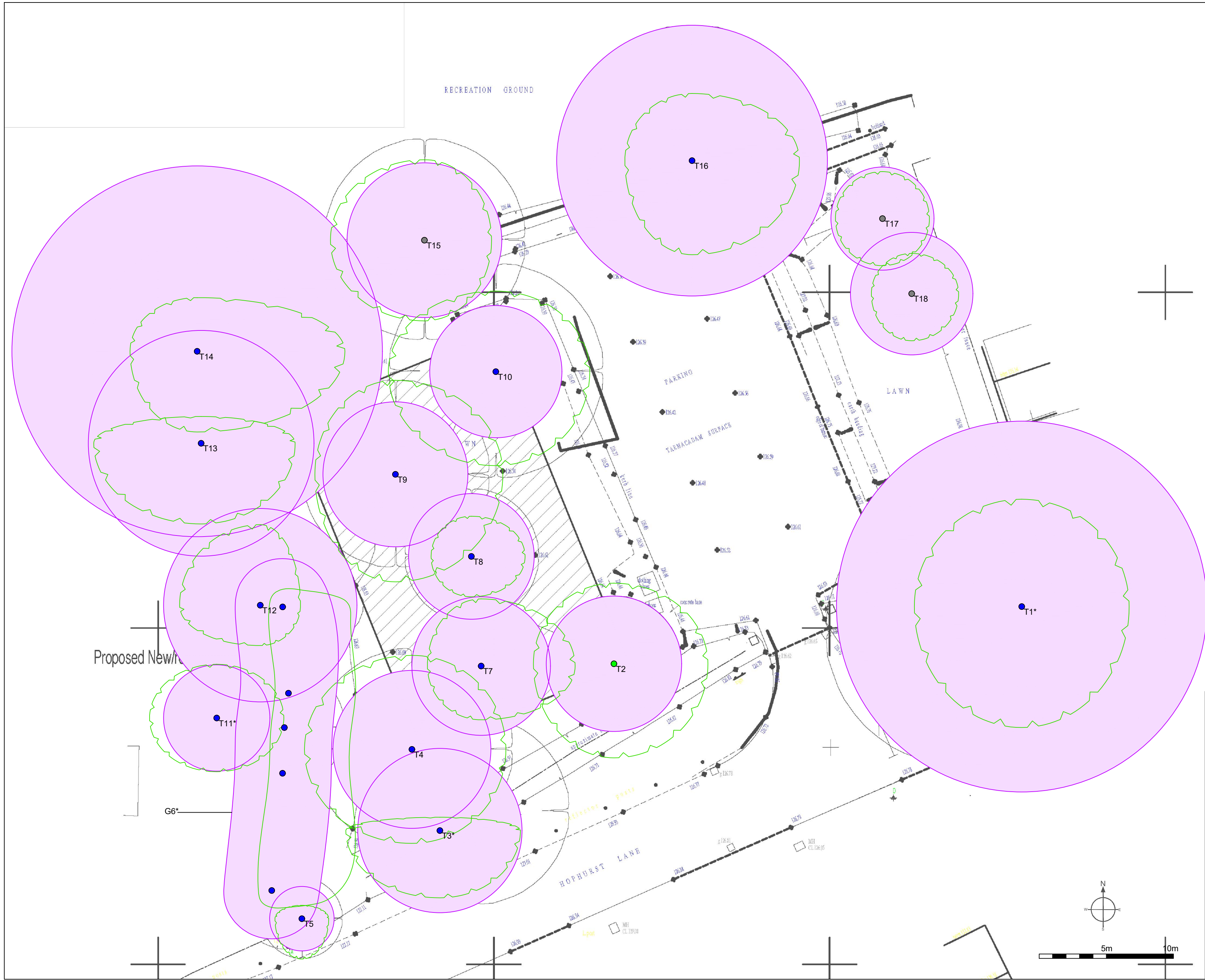
Tree Reference number	Species	Height m	Stem Diameter mm	Branch spread m	Height of canopy and first major branch cardinal point	Age class	Physiological Conditions	Preliminary management recommendations	Estimated remaining years	Category Rating
T1	English oak	20+	1150	N8 S9 E8 W8	3W	OM	(S) Poor. There is major crown die back. (P) Fair. There is <i>Fistulina hepatica</i> decay fungus at the base with <i>Sparasis crispa</i> fungus remnants at the base	Remove the major dead wood	20+	B3
T2	Hornbeam	10	420	N6 S7 E7 W6	0	M	(S) Good, a spreading evenly grown tree. (P) Good	None	40+	A2
T3	English oak	10	510	N1 S5 E6 W7	2S	M	(S) Fair. The growth has been suppressed to the north by competing trees. (P) Fair. The trunk is ivy clad and could not be examined	Sever the ivy to 1m and raise the crown on the road side to 4m	20+	B1
T4	Ash	14	490	N7 S7 E7 W8	3E	M	(S) Good. (P) Fair. Some large crown dead wood	Remove the dead wood	20+	B1

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
T5	Beech	12	200	N1 S3 E2 W2	2S	SM	(S) Good. (P) Fair. Etiolated growth habit	None	20+	B1
G6	Holly x 6	10	300	N13 S13 E5 W1	0	SM	(S) Good, a line of similarly aged trees growing along the boundary. (P) Good The growth to the west is suppressed by overarched trees	None	20+	B1
T7	Beech	19	430	N5 S4 E7 W4	2S	M	(S) Good. (P) Good. A few minor crown crossing limbs and anomalies.	None	20+	B1
T8	Beech	18	390	N3 S3 E4 W3	1N	M	(S) Good. An upright growth habit (P) Good. A few minor crown crossing limbs and anomalies.	None	20+	B1
T9	English oak	18	450	N7 S7 E8 W6	3E	M	(S) Good. (P) Good. A few minor crown crossing limbs and large dead wood.	Remove the major dead wood	20+	B1
T10	Hornbeam	11	410	N6 S7 E7 W8	0	M	(S) Good. Some minor bark wounds (P) Good. A few minor crown crossing limbs and large dead wood.	None	20+	B1

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
T11 off site	Yew	18	est 330	N4 S4 E5 W5	3N	M	(S) Fair. The base could not be assessed as a fence was on the boundary (P) Good.	None	20+	B1
T12 off site	Scots pine	20+	est 600	N6 S3 E3 W6	6S	M	(S) Fair. The base could not be assessed as a fence was on the boundary (P) Fair. Some large dead wood in the crown.	None	20+	B1
T13 off site	English oak	20+	est 700	N2 S6 E7 W8	8S	M	(S) Fair. The base could not be assessed as a fence was on the boundary (P) Fair. A lopsided crown owing to competing trees.	None	20+	B3
T14	English oak	20+	1150	N4 S6 E11 W5	7S	OM	(S) Fair. Any ivy covered trunk. (P) Fair. The growth to the north has been reduced over the garden leaving a lopsided crown.	None	20+	B3
T15	London plane	12	480	N6 S6 E5 W7	2W	M	(S) Fair. A large trunk wound from a split-out section, minor fungal decay. (P) Fair.	None	10+	C1
T16	London plane	16	840	N5 S7 E8 W5	2W	M	(S) Fair. The trunk was ivy clad and could not be assessed. (P) Good. Minor dead wood and hanging limbs	None	20+	B1

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
T17	Birch	11	320	N3.5 S3.5 E3.5 W3.5	2N	M	(S) Fair. A trunk wound and crown decay, from previous management (P) Fair	None	10+	C1
T18	Birch	11	380	N3 S3.5 E3.5 W3	1W	M	(S) Fair. A trunk wound and crown decay, from previous management (P) Fair	None	10+	C1

Appendix 3 – Tree constraints plan



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Site: Crawley Down Village Hall

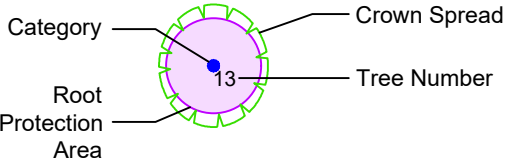
1:200 @ A2

Drawing Title: Arboricultural Impact Assessment

Feb 2019

Key:

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



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