

BS5837:2012 Tree Survey
Land north of Otway House
Spalding Road,
Pinchbeck
Lincolnshire
NGR TF 24382 25164

Survey by
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BS5837 Tree Survey, Land NORTH OF Otway House, Pinchbeck

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Introduction

1.1 Site Description and Location

The site surveyed is a roughly rectangular parcel of land divided into two field compartments with a small open access area leading from the Otway House access track. It is situated on the east side of Spalding Road north of Otway House, centered at NGR TF24322 25601. It is bounded on the west side by Spalding Road and the north by Otway House. The location of the site is shown on the plan within **Figure 1** and an aerial photograph has been provided within **Figure 2** to place the site in context.

In order to facilitate an application to obtain permission to redevelop the site area the Client has requested a BS5837 (2012) Tree Survey should be completed to assess the quality of any trees within and close to the boundary of the survey area. An inspection of the site and the immediate surrounding areas was carried out on 10 August 2016. A photographic record of the trees at the site is included within the report.

Figure 1: Site location.

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1.2 Neighbouring Land Uses and Recent Site History

The defined site area comprises two roughly rectangular fields of poor improved grassland which has started to naturalise around the margins of which are linear woodland areas. There are some small internal copses of trees within the field compartments. It is accessed via a track from the south extending off the access road to Otway House.

To the west, on the opposite side of Spalding Road is the village of Pinchbeck. The south boundary of the site is defined by Otway House and the road leading to this. Land to the north and east is an area of grazing land and an arable field. The location of the survey area defined by a red line is shown in the aerial photograph below.

Figure 2: Site Contextual Aerial Photograph

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The site lies within South Holland and assessment of the site area using the South Holland District Council online mapping system confirms it is entirely within the designated Pinchbeck Conservation Area. Any tree within the Conservation Area are protected under the auspices of this and no work can be carried out to these trees without the prior written approval of the Planning Authority.

In undertaking the tree survey the assessment has been carried out in accordance with the specifications contained within BS 5837 Trees in Relation to Design, Development and Construction (2012).

An inspection of the site and the immediate surrounding areas was completed in August 2016 by Christopher Barker, dipHort, CEnv, an experienced arboricultural consultant.

2. Tree Survey Appraisal Methodology

2.1 Survey Objectives

This tree survey has been carried out with the objective of:

- Identifying the individual tree species present at the site by means of visual inspection;
- To define the approximate age, condition and canopy spread of all individual mature and semi-mature trees identified and the value of these within the development context;
- To identify any trees that present a risk to existing or proposed foundations or other structures that may be constructed on the site and recommend action to remove this risk; and
- Recommend tree management / mitigation measures where appropriate.

The survey broadly assessed the condition and arboricultural value of the trees lying in or adjacent to the site area, paying particular attention to any mature individual trees present within or adjacent to the site area in order to prepare an assessment in accordance with BS 5837 Trees in Relation to Design, Development and Construction (2012).

2.2 Survey Methodology

The methodology set out below is a detailed summary of the suggested approach to tree assessment as described in British Standard 5837:2012. This report has applied the methodology to all significant individual trees or groups of trees present at or near to the site. A topographical plan has been provided by the Applicant and this has been annotated to show the location of the significant trees identified within the site area in **Figure 3**. The location of the trees is also shown within the Root Protection Area plan plotted within **Figure 4**.

2.3 Trees

Trees have been broadly assessed based on guidance set out within the British Standard BS 5837:2012 'Trees in Relation to Design, Development and Construction'. This standard provides recommendations and guidance on the principles to be applied to achieve successful integration of development with trees, shrubs and hedgerows. Where development is to occur, the standard provides guidance on the approach needed to decide which trees are appropriate for retention, and the means for protecting these trees during the development (including demolition and construction work) and the means of incorporating trees into the developed landscape.

Trees on the site have been divided into one of four categories (based on the cascade chart for tree quality assessment). These are classed as A, B, C or U (Section 4 of BS 5837) within the table in Appendix 1. This gives an indication as to the tree's importance in relation to the site, the local landscape and, also, the value and quality of the existing trees on site. This assists informal decisions concerning which trees should be removed or retained should development occur. For a tree to qualify under any given category it should fall within the scope of that category's definition (see below). Categories A, B and C cover trees that should be a material consideration in the development process, each with three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural (nature conservation) values. Category U trees may have no significant landscape value but it is not presumed that there is any overriding need to remove these unless stated otherwise in the description and recommendations. They are for this reason not considered as being significant within the planning process. In assigning trees to the A, B or C categories, and the presence of any serious disease or tree-related hazard is taken into account. If the disease is considered fatal and/or irremediable, or likely to require sanitation for the protection of other trees it may be categorised as U with a recommendation for work or even removal, even if they are otherwise of considerable value.

Category (A): Trees whose retention is most desirable and are of high quality and value. These trees are considered to be in such a condition as to be able to make a lasting contribution (a minimum of 40 years) and may comprise:

- (i) Trees which are particularly good examples of their species especially rare or unusual, or essential components of groups or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue);
- (ii) Trees, or groups of trees 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 (e.g. avenues or other arboricultural features assessed as groups);
- (iii) Trees or groups of significant conservation, historical, commemorative or other value (e.g. Veteran or wood-pasture trees).

Category (B): Trees whose retention is considered desirable and are of moderate quality and value. These trees are considered to be in such a condition as to make a significant contribution (a minimum of 20 years) and may comprise:

- (i) Trees that might be included in the high category but because of their numbers or slightly impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage), are downgraded in favour of the best individuals;
- (ii) Trees present in numbers such that they form distinct landscape features and attract a higher collective rating than they would as individuals. Individually these trees are not essential components of formal or semi-formal arboricultural features, or trees situated mainly internally to the site and have little visual impact beyond the site;
- (iii) Trees with clearly identifiable conservation or other cultural benefits.

Category (C): Trees that could be retained and are considered to be of low quality and value. These trees are in an adequate condition to remain until new planting could be established (a minimum of ten years) or are young trees with a stem diameter below 150 mm and may comprise:

- (i) Trees not qualifying in higher categories;
- (ii) 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;
- (iii) Trees with very limited conservation or other cultural benefits.

Category (U): Trees that are considered to have no significant landscape value but it is not presumed that there is any overriding need to remove these unless stated otherwise in the description and recommendations. They are for this reason not considered as being significant within the planning process. These trees will be in such a condition that any existing value would be lost within 10 years and which should in the current context be ignored or removed for reasons of sound arboricultural management. Trees within this category are:

- (i) 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;
- (ii) Trees that are dead or are showing signs of significant, immediate or irreversible overall decline;
- (iii) 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.

Species have been recorded by common and scientific name. Height has been estimated in metres and stem diameter measured in centimetres unless impractical, taken at a height of 1.5 m from the base of the tree.

In the assessment particular consideration has been given to:

- (a) The health, vigour and condition of each tree;
- (b) The presence of any structural defects in each tree and its life expectancy;
- (c) The size and form of each tree and its suitability within the context of the proposed scheme;
- (d) The location of each tree relative to existing site features, e.g. its value as a screen or as a skyline feature.

Age class is assessed according to the age class categories referred to in BS 5837.

YNG: Young trees age less than 1/3 life expectancy.

SM: Middle age trees 1/3 – 2/3 life expectancy.

M: Mature trees over 2/3 life expectancy.

OM: Over mature – declining or moribund trees of low vigour.

The overall condition of any individual tree, or group of trees, has been referred to using one of the definitions listed below. A more detailed description of condition has been noted in the Tree Schedule.

G **Good:** A sound tree or trees needing little, if any, attention

F **Fair:** A tree or trees with minor but rectifiable defects or in the early stages of stress, from which it may recover

P **Poor:** A tree or trees with major structural and physiological defects or stressed such that it would be very expensive and inappropriate to retain

D **Dead:** A tree or trees no longer alive. However, this could also apply to those trees that are dying and will be unlikely to recover, or are becoming or have become dangerous

Major defects or diseases and relevant observations have also been recorded. Dead wood has been defined as the following:

Twigs and small branch material	Up to 5 cm in diameter
Minor dead wood	5 cm to 10 cm in diameter
Major dead wood	10 cm in diameter and above

The survey was completed from ground level only. Aerial inspections were not undertaken. Evaluations of tree conditions given within this assessment apply to the date of survey and cannot be assumed to remain unchanged, and it may be necessary to review these within 24 months, in accordance with good arboricultural practice.

2.4 Site Plans & Tree schedules

The position of significant individual trees or groups of trees measured out on the site is shown within **Figure 3. *At this stage an Indicative Constraints Plan showing the RPA's of the trees has been prepared but this may require more detailed assessment once the final layout is provided in greater detail.*** Once an accurate final development plan is available a constraints plan showing the RPA and detailed protection measures will need to be prepared. A summary table providing detailed information on the trees and tree groups is included in Appendix 1. Within the summary table maximum RPA's (m²) for estimated tree diameters have been included where appropriate, as well as a calculated corresponding radius of the circle for that RPA. The Root Protection Areas are formulated as described below and assist when designing layouts in relation to trees.

2.5 Root Protection Area (RPA)

Below ground constraints to development are represented by the root plate around a tree which needs protecting in order for the tree to be incorporated into a proposed scheme, without adverse harm to the tree or structural integrity of any proposed foundation structures.

This area is calculated according to the formula set out in BS 5837 (2012) clause 4.6.1.

Single Stem Trees: RPA (m²) = (stem diameter (mm) x 12 / 1000)² x 3.142 Multiple Stem Trees: RPA (m²) = (combined stem diameters (mm) x 12 / 1000)² x 3.142 This figure should be capped to 707 m², that is, equivalent to a circle with a radius of 15 m, or a square with approximately 26 m sides
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Taken from BS5837 (2012) clause 4.6.1.

2.6 Potential For Protected Species

Potential bat roost locations are described within this report using the methodology as that recommended by the Bat Conservation Trust (BCT). Each tree of significant size assessed within this survey has also been assessed for the potential to provide roosts for bats and the table in Appendix 1 includes reference to this.

Potential	Field Signs
Roost confirmed	Confirmed bat roost in tree. Field evidence past or current presence of bats confirmed by droppings, staining or flight.
High roost potential	Splits or cracks in major limbs which develop upwards, smooth surfaces around potential entry points, dense ivy covering, woodpecker / rot holes, significant lifting bark, Artificial bat boxes. Ancient or over mature trees where the canopy cannot be fully inspected from the ground.
Medium roost potential	Some splits in branches, dense ivy covering, and small cavities visible, dense epicormic growth. Flies may be present around a potential entry point.
Low roost potential	Splits may be present in minor branches, sparse ivy cover, and some loose bark evident. Young healthy trees with good visibility to the canopy top.
No roost potential	Tree with a negligible potential to support bat roosts (not supporting any of the above features).

3. Tree Survey Findings

3.1 Survey Details

The tree inspection took the form of a walkover inspection completed by Christopher Barker dipHort, CEnv. Each individual semi-mature or mature tree of significance that could be impacted by any proposed new development within the survey area was identified, visually inspected and classified. The character of the trees at the site is shown in photographs contained within this section.

3.2 Mature and Semi-mature Trees

A total of nine individual trees and ten tree groups have been identified and assessed as part of the tree survey. The majority of the trees within the survey area are mature or semi-mature hedgerow trees, predominantly Sycamore and Ash with occasional Field Maple, Horse Chestnut and Oak. All of the trees within the survey area fall within the Pinchbeck Conservation Area.

Trees T1 – T5 along Otway House entrance road

These five broadleaved trees are divided into a group of three merging together on the south side of the access road and a pair of large trees on either side of the garden entrance. These are all large broad headed mature trees of reasonable to good quality. All five are shown as being retained within the proposed development scheme and are placed in Category B2. If the access road is upgraded some root protection may be required. It is unlikely any facilitation pruning will be needed.



Tree Group G6 and G7

Group G6 is a dense canopy dominated by Field Maple on the eastern side which merges with Cherry, Beech and Sycamore into a dense and broad, rather irregular canopy area. This is very dense and crowded. This group is placed within Category C2 due to the crowding and likely impact on the quality and longevity of the trees that will result. It is likely some or all of this tree group may need to be removed to facilitate the proposed development.

Group G7 covers an extensive area along the western boundary and extends across to the centre of the site towards T8. This linear canopy composes dense Horse Chestnut, Field Maple, Hawthorn and an occasional Purple Beech. Some of the trees within this group may be inside the margin of the adjacent garden but the density of the vegetation makes the precise location of the boundary fence difficult to distinguish. It is likely some of the trees around the margin of this group will need to be trimmed back or possibly removed. This tree group provides useful screening to the site and is placed within Category C2.



Group G6



Group G7 extending across the centre

Trees T8 – T11 and Tree Group G12

Trees T8 – T11 form a merging canopy extending a hedgerow line from the adjacent field across the centre of the southern section of the site. Tree T9 is a large Sycamore and this dominates the eastern end of this line of four trees with a large broad headed crown. Tree T8 is an Oak which is smaller but dominates the western end of the line of trees. T10 and T11 are smaller under canopy trees suppressed by the large trees. The development plan indicates the canopy in this location will be retained. Trees T8 and T9 are placed in Category B2. Tree T10 and T11 are placed in Category U due to the poor quality of the canopy. These latter could be removed to provide space and reduce shadow into the development area.



Trees T8 (right) to T11.

Tree Groups G13 and G14

Positioned in the centre of the site Group G13 comprises three Sycamore and an Oak all of roughly similar size creating a large round canopy sitting separate from the boundary trees within the interior of the field. Whilst individually these are not trees of high quality, they are reasonable and create a large canopy area that is attractive and is shown as being retained within a landscaped area of the development. Canopy lifting and removal of under canopy seedlings would improve the visual amenity of these trees in the context of residential development. The group is placed within Category B2.

To the north of this extending across the centre of the site to a pinch point where there is a small culvert supporting an access track over the drainage ditch, Group G14 comprises untrimmed Hawthorn, Elder and Sycamore crowded with dense ivy. This is an out-grown hedgerow that will require reduction and trimming to be retained within the development. Some facilitation pruning will be needed at the western end where the access road passes close by. It is placed within Category C2.



Group G13



Untrimmed hedgerow G14

Tree Group G15

Similar to G13 this is a small group of trees sitting in the centre of the northern field separate from the boundary trees. It comprises three mature Oak trees supported primarily by Cherry with some juvenile Ash and Sycamore present. The Oak are quite large mature trees merging to found a large round canopy area. These trees are shown as being retained within the development area and are placed within Category B2. From a development context some thinning and removal of lower branches may be worthwhile to improve visibility through the small copse.



Group G15 dominated by Oak



Group G15

Tree Group G16

Along the western boundary the tree line is dominated by mature Ash which are located in the adjacent land but extend low branches across the field boundary as can be seen in the photographs below.

These trees provide useful screening and canopy cover along the boundary but some facilitation pruning to remove low branches where these extend into garden areas is likely to be required.

There are no individual large mature specimens of great stature or high visual amenity value but the group as a whole provide a uniform screen along the boundary of significant height. These trees provide screening to large residential houses further west and are placed within Category B2. The extent of facilitation pruning required will need to be assessed once a more detailed development plan has been prepared.



Ash within G16



Extending branches from G16

Tree Group G17

Group G17 is an out-grown hedgerows running along the eastern boundary of the site. It is dominated by Hawthorn but contains a small number of juvenile and semi-mature Ash. There are no large mature trees and the group provides useful screening. It is placed in Category B2 and is likely to require annual trimming within the context of any planned development.



Tree Group G18 Leylandii

The tall leylandii along the northern boundary completely screen this side of the site. Where the ground is waterlogged the trees are dead or dying as can be seen from the photographs below. This group may be along the boundary of the adjacent field. If they are within the development area they should be removed and replaced with a native hedgerow. This group is placed in Category U.



Group G18 Leylandii



Tree Group G19

On the south side of the access road to Otway House lying between the field access and Spalding Road is a dense linear canopy of Elm, Horse Chestnut, Sycamore, Ash and Hawthorn with occasional Hawthorn and Blackthorn. Most of this growth is low and shrubby but individual larger trees, particularly Horse Chestnut and Ash are present creating areas of taller canopy cover. The trees are very crowded and competing for space and there are no individual mature trees of significant stature present. This group would benefit from some thinning and is placed within Category B2 as it will provide useful screening along Spalding Road for approximately 20 years.



Figure 3: Tree Location Plan

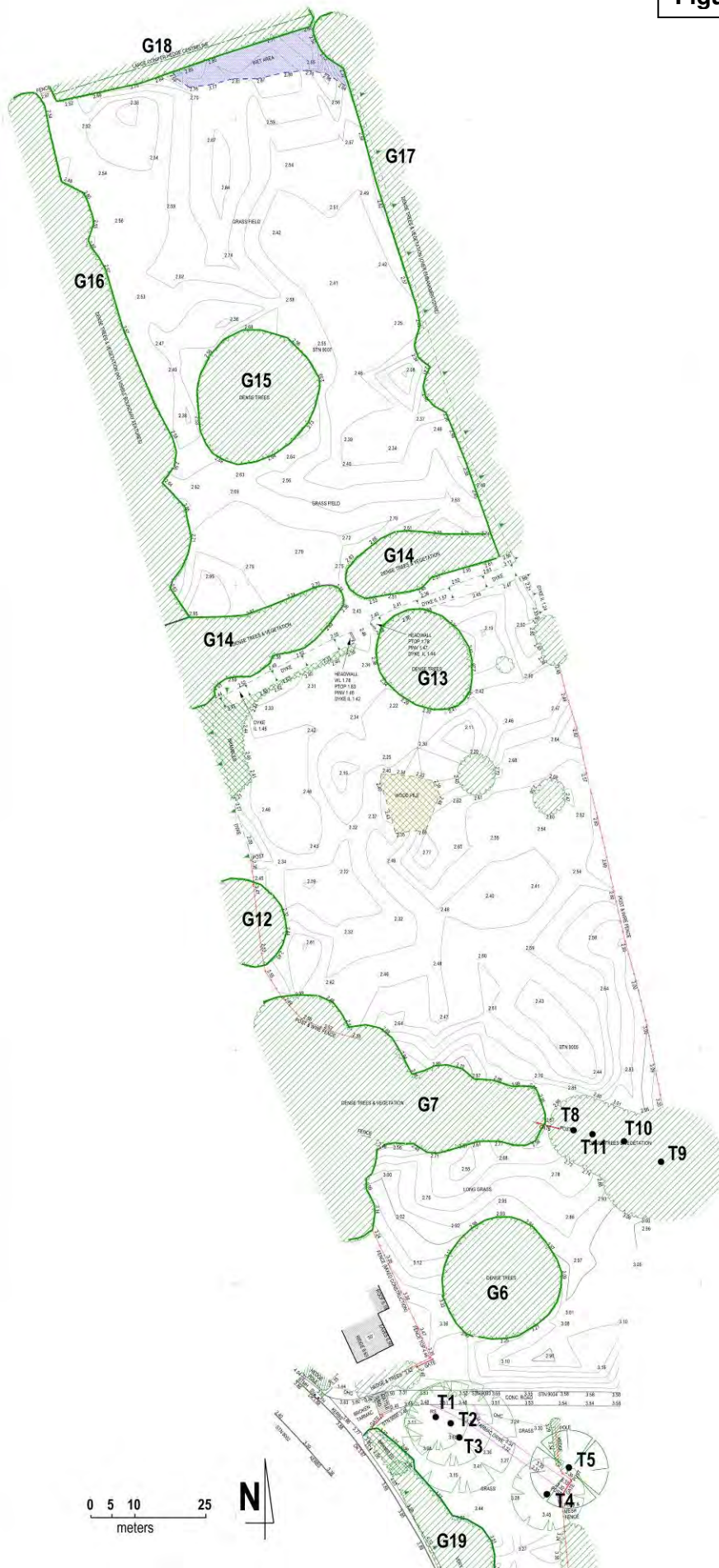
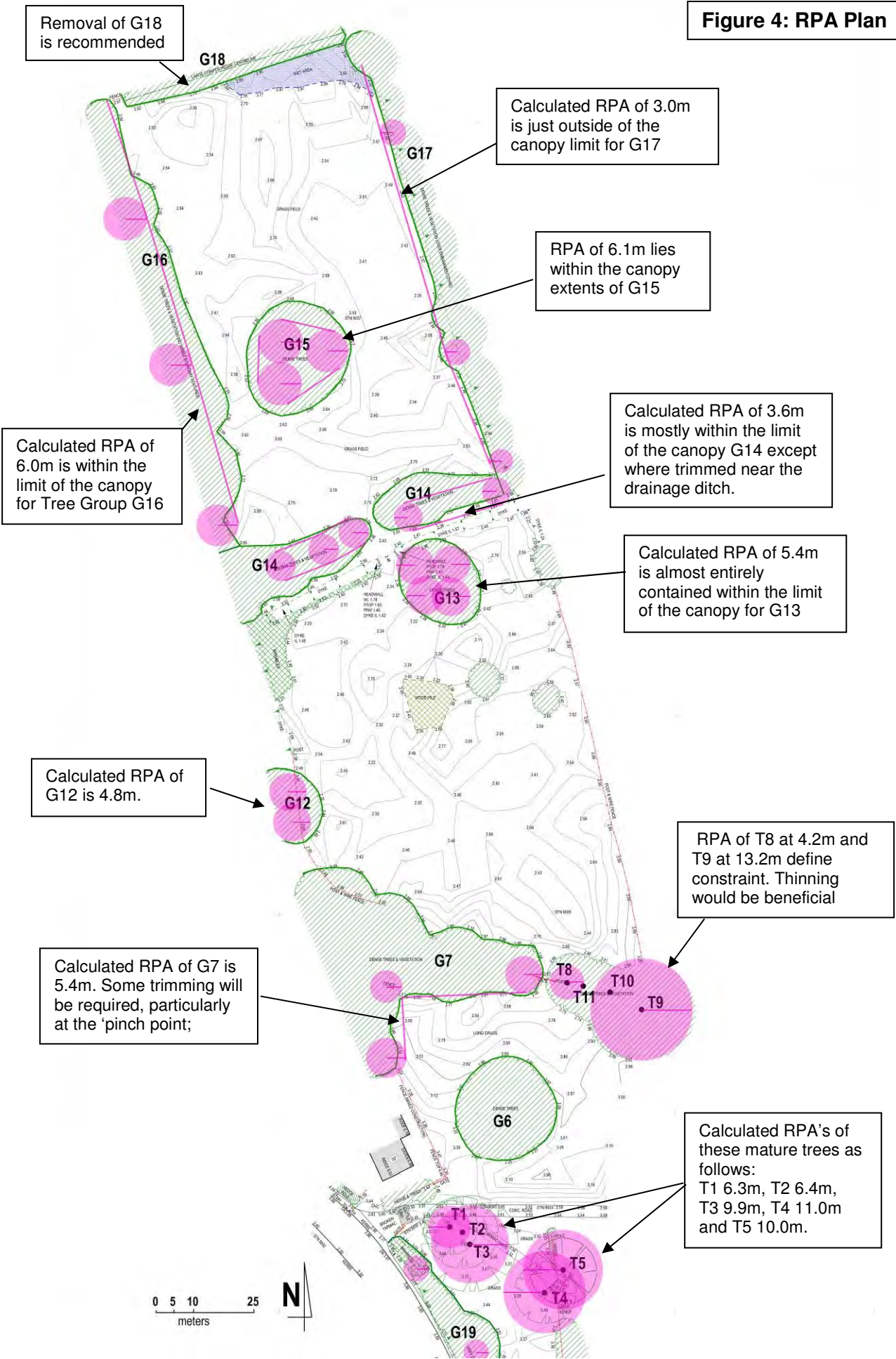


Figure 4: RPA Plan



4. Tree Management

4.1 Initial Arboricultural Assessment

Conceptual development proposals for this site have been prepared following the completion of the survey. The proposals show that a new access road will be constructed from the existing access road to Otway House on the southern edge of the development area and extending north through the centre of the site to provide access for new residential houses. The houses are clustered within the interior of the site with gardens facing the existing boundaries.

Some trimming of the trees within the centre of the site where the existing field access gates are located will be necessary and it appears that tree group G6 will be removed to improve visibility at the access road junction. The remaining trees are being retained but some trimming and thinning is likely to be required.

Tree	Category	Recommendation
T1 Sycamore <i>Acer pseudoplatanus</i>	B2	Retain adjacent to existing access road. Protect RPA during any improvement to the road. No canopy work required to facilitate development.
T2 Sycamore <i>Acer pseudoplatanus</i>	B2	Retain adjacent to existing access road. Protect RPA during any improvement to the road. Canopy balancing would be beneficial.
T3 Sycamore <i>Acer pseudoplatanus</i>	B2	Retain adjacent to existing access road. Protect RPA during any improvement to the road. No canopy work required to facilitate development.
T4 Horse Chestnut <i>Aesculus hippocastenum</i>	B2	Retain adjacent to existing access road. Protect RPA during any improvement to the road. No canopy work required to facilitate development.
T5 Sycamore <i>Acer pseudoplatanus</i>	B2	Retain adjacent to existing access road. Protect RPA during any improvement to the road. No canopy work required to facilitate development.
G6 Sycamore, Cherry. Field Maple, Beech	C2	Potentially may need to be removed to facilitate development.
G7 Horse Chestnut, Field Maple, Hawthorn, Purple Beech	C2	Likely to be retained but some removal of trees and canopy near the proposed access road and general trimming back near ground level may be required.
T8 Oak <i>Quercus petraea</i>	B2	Retained on the development boundary. Removal of ivy would be beneficial to the health of this tree.
T9 Sycamore <i>Acer pseudoplatanus</i>	C2	Retained on the development boundary. Removal of ivy would be beneficial to the health of this tree.
T10 Horse Chestnut <i>Aesculus hippocastenum</i>	U	Consider removing to lighten canopy on the south side of the development area.
T11 Field Maple <i>Acer campestre</i>	U	Consider removing to lighten canopy on the south side of the development area.
G12 Yew and Ash	B2	Minor facilitation pruning of the lower branches on the east side may be required.

G13 3 X Sycamore 1 x Oak	B2	Shown as retained within the development plan. Consider removing any under canopy growth and lower branches to provide light and space underneath.
G14 Hawthorn, Elder, Sycamore and Ivy	C2	Shown as being retained but some removal of trees and canopy near the proposed access road and general trimming back near ground level may be required.
G15 3 X Oak u/c Cherry and Ash	B2	Shown as retained within the development plan. Consider removing any under canopy growth and lower branches to provide light and space underneath.
G16 Line of 10 Ash <i>Fraxinus excelsior</i>	B2	Retained to screen the boundary. Some trimming of lower branches extending into the site area is likely to be required.
G17 Hawthorn and Ash	B2	Retained to screen eastern boundary. Consider trimming and maintaining as a tall hedgerow.
G18 Leylandii X Cupressocyparis Leylandii	U	Remove dead tree. If these trees are within the site remove and replace with a native species hedge. If outside of the site trim to maintain as a hedge.
G19 Elm, Horse Chestnut, Dying Sycamore and Horse Chestnut.	C2	If retained consider thinning and removing dense ivy growth from the larger trees. Provides valuable screening and visual amenity along the eastern side of Spalding Road.

Overall, assuming the key trees on the boundaries of the site are retained and protected during any proposed development, the impact on the canopy cover within the local landscape will be negligible. Certain trees of poor quality such as T10 and T11 could be removed to benefit better quality trees being retained within the scheme and others such as G13 and G15 may benefit from crown lifting and removal of under canopy saplings and scrub to benefit visual amenity and a sense of security within a new residential area.

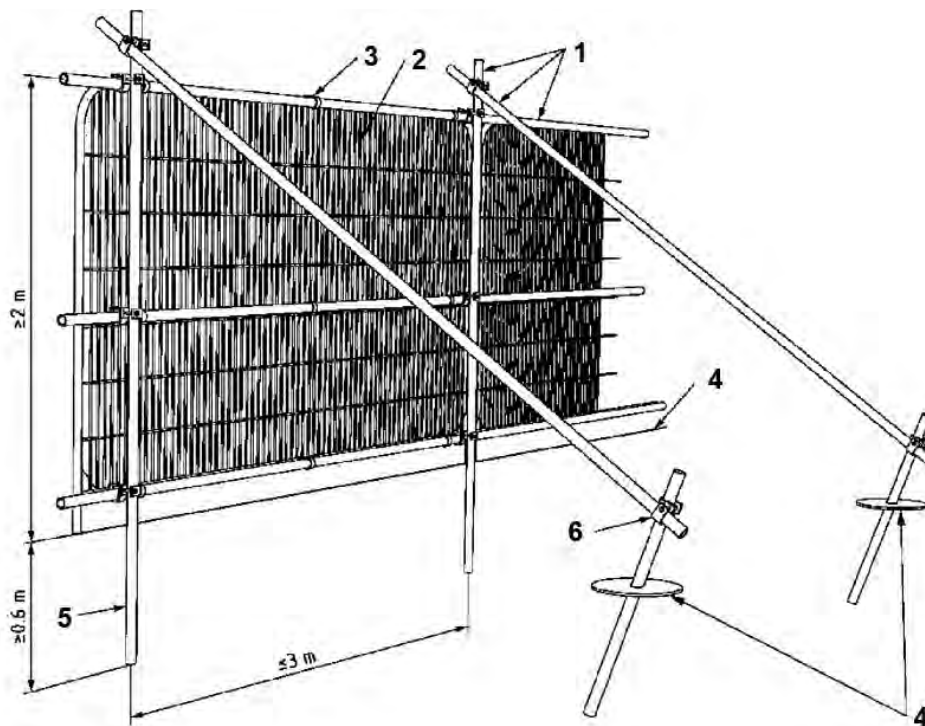


Figure 5 – Conceptual Development Plan

4.2 General Recommendations

Any trees retained and incorporated within the proposed development will need to be adequately protected during any approved development works. As a general rule at this site, measures to protect trees should follow the best practice principles set out in BS5837: Trees in Relation to Design, Development and Construction (2012). Prior to any construction or development work proceeding, the RPA's of individual trees to be retained should be marked out using the distances provided in the table within Appendix 1. Marking out should be completed by a person with arboricultural or horticultural expertise as individual trees will have root zones that may be affected by local conditions and allowances will need to be made to accommodate this. The best practice principles have been broadly summarised below.

- All trees retained adjacent to the site should be protected by barriers or ground protection around the calculated Root Protection Area (RPA) and as indicated on any Tree Constraints Plan (TCP) that may be produced in association with the assessment.
- Any fencing required should be erected prior to commencement of construction and before demolition including erection of any temporary structures. Once set up fences should not be removed or altered without prior consultation with the arboricultural advisor.



- Arrangements should be made for an arboriculturist to supervise works and tree protection where trees are particularly vulnerable or sited close to access points.
- Pre-development works may be undertaken prior to the installation of fencing with the agreement of the local planning authority.
- All tree works should follow best practice procedures as set out in BS 3998 (2010). All trees should be maintained in good condition on site and be inspected annually (where overall condition requires) or every 2 years and after any major storm events, with safety a priority.
- Fencing should be clearly visible and suitable for the location, type and proximity of construction activity.
- It may be appropriate on some sites to use temporary site offices as components of the protection barriers.
- Where it has been agreed and shown on a Tree Protection Plan, construction access may take place within the RPA if suitable ground protection measures are in place (e.g. existing surfaced car park areas). In other areas this may comprise single scaffold boards over a compressible layer laid onto geo-textile materials for pedestrian movements. Vehicular movements over the RPA will require the calculation of expected loading and may require the use of proprietary protection systems.
- Once areas around trees have been protected by fencing, any works on the remaining site area may be commenced providing activities do not impinge on protected areas. Notices should be placed on fencing to indicate that operations are not permitted within the fenced area.
- Wide or tall loads etc. should not come into contact with retained trees. Banksman should supervise transit of vehicles, jibs, booms etc. where this is in close proximity to retained trees.
- Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10m of a tree bole. No concrete mixing should be done within 10m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree.
- No fires will be lit where flames are anticipated to extend to within 5m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire.
- Notice boards, telephone cables or other services should not be attached to any part of a retained tree.
- Where it is deemed necessary to operate a wide or tall load, plant bearing booms, jibs and counterweights or other such equipment, as part of construction works, and such equipment would have potential to cause injurious contact with crown material i.e. low branches and limbs, of retained trees within the RPA fencing, it is best advised that appropriate, but limited tree surgery, be carried out beforehand to remove any obvious problem branches. This is classed as 'Facilitation Pruning' within BS 5837 (2012). Any such pruning should be undertaken in accordance with a specification prepared by an arboriculturalist.
- It is advised that a Pre-Commencement Site Meeting is held with contractors who are responsible for operating machinery, as described above. To firstly highlight the

potential for damage occurring to tree crowns and to ensure that extra care is applied when manoeuvring machinery during such operations within close proximity to retained trees to avoid any contact.

- In the event of having caused any such branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with BS 3998 (2010) Recommendations for Tree Work, to correct the damage, upon completion of development.
- All of the above precautionary measures should be applied to minimise the effect of any damage to long-term tree health and safety.

Christopher Barker CEnv dipHort

Appendix 1: BS5837 Tree Schedule

Key:	Measurements	Age – Class	Overall Condition	BS 5837 2005 : Cascade Chart for Quality Assessment/Retention Category	Symbols:
	MS – Multi-stemmed	YNG-MAT-Young Mature	G – Good	A – High	< = less than
	Ht - Height in metres	SM – Semi-mature	F – Fair	B – Moderate	~ = approximately
	Stem – Stem Diameter at 1.5m in mm	Mat – Mature	P – Poor	C – Low	> = greater than
	Crown – Crown spread in metres	OM – Over mature	D – Dead	R – Trees for Removal	
	TD - Trunk division (height in metres)	Est Yrs – estimate of years remaining (>40 years; 20 –40 years; <20 years)		Sub-categories: 1 = mainly arboricultural values 2 = mainly landscape values 3 = mainly cultural values.	

RPA = Root protection area (equivalent to a circle with a radius 12 x the stem diameter for single stem trees and 10 x the basal diameter for trees with more than one stem arising below 1.5m above ground level).

Tree No	Species	Ht (m)	Stem Diam mm@ 1.5m	Canopy Spread (m)	Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Structural condition	Recommendations	BS 5837 Category	RPA Radius (m)
T1	Sycamore <i>Acer pseudoplatanus</i>	15	525	N-5 S-3 E-1 W-6	2	M	20	F	Single trunk with acute division at 7magl into an unbalanced canopy heavier on the west side and merging into T2 Negligible roost potential due to lack of features. No obvious structural faults noted from ground level.	Retain adjacent to existing access road. Protect RPA during any improvement to the road. No canopy work required to facilitate development.	B2	6.3
T2	Sycamore <i>Acer pseudoplatanus</i>	14	540	N-7 S-5 E-3 W-4	2	M	20	F	Single trunk supporting a canopy crowded on each side and extending north and south to find space. Cable present in the canopy interior. Negligible roost potential. No obvious structural faults noted from ground level.	Retain adjacent to existing access road. Protect RPA during any improvement to the road. Canopy balancing would be beneficial.	B2	6.4
T3	Sycamore <i>Acer pseudoplatanus</i>	15	830	N-6 S-5 E-2 W-6	4	M	20	F	Single trunk dividing at 4mal into a broad headed crown heavier on the east and merging into T2 on the west side. Cable present in canopy. Negligible roost potential. No obvious structural faults noted from ground level.	Retain adjacent to existing access road. Protect RPA during any improvement to the road. No canopy work required to facilitate development.	B2	9.9
T4	Horse Chestnut <i>Aesculus hippocastenum</i>	20	920	N-3 S-5 E-5 W-5	2	M	20	G	Single trunk divides into two vertical leaders supporting an upright canopy. Negligible roost potential. No obvious structural faults noted from ground level.	Retain adjacent to existing access road. Protect RPA during any improvement to the road. No canopy work required to facilitate development.	B2	11.0

Tree No	Species	Ht (m)	Stem Diam mm@ 1.5m	Canopy Spread (m)	Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Structural condition	Recommendations	BS 5837 Category	RPA Radius (m)
T5	Sycamore Acer pseudoplatanus	19	840	N-5 S-5 E-5 W-5	3	M	20	G	Single trunk supporting an openly ascending crown with good shape. Bird box present at 4m. Cable present within canopy. Negligible roost potential. No obvious structural faults noted from ground level.	Retain adjacent to existing access road. Protect RPA during any improvement to the road. No canopy work required to facilitate development.	B2	10.0
G6	Sycamore, Cherry, Field Maple, Beech	9	<400	Varies up to 5m	0	M	10	F	Field Maple and Cherry dominate forming a dense merging canopy with the individual trees competing for space. Negligible roost potential. No obvious structural faults noted from ground level.	Potentially may need to be removed to facilitate development.	C2	4.8
G7	Horse Chestnut, Field Maple, Hawthorn, Purple Beech	8	<450	Varies up to 6m	0	M	10	F	Linear canopy of large and under canopy trees with dense ivy throughout and low spreading branches close to ground level. No significant mature trees present. Negligible roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	Likely to be retained but some removal of trees and canopy near the proposed access road and general trimming back near ground level may be required.	C2	5.4
T8	Oak Quercus petraea	8	355	N-5 S-5 E-4 W-4	2	M	20	F	Single trunk divides at 2m into an openly ascending crown with dense ivy into the canopy interior. Low roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	Retained on the development boundary. Removal of ivy would be beneficial to the health of this tree.	B2	4.2
T9	Sycamore Acer pseudoplatanus	15	1105	N-7 S-8 E-8 W-7	2	OM	10	F	Single trunk has dense ivy cover which extends into the coarsely branching canopy. Low branch extends at 2m on the south east side. Broad headed with a sparse interior. Under canopy Elder and Field Maple. Low roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	Retained on the development boundary. Removal of ivy would be beneficial to the health of this tree.	C2	13.2

Tree No	Species	Ht (m)	Stem Diam mm@ 1.5m	Canopy Spread (m)	Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Structural condition	Recommendations	BS 5837 Category	RPA Radius (m)
T10	Horse Chestnut <i>Aesculus hippocastenum</i>	8	265	N-3 S-3 E-3 W-2	1	SM	10	P	Single trunk supporting a poorly developed and suppressed canopy with poor shape Negligible roost. No obvious structural faults noted from ground level.	Consider removing to lighten canopy on the south side of the development area.	U	3.1
T11	Field Maple <i>Acer campestre</i>	8	280	N-4 S-2 E-3 W-2	1	SM	10	P	Single trunk divides into two with dense ivy cover supporting a poorly developed and suppressed canopy. Low roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	Consider removing to lighten canopy on the south side of the development area.	U	3.3
G12	Yew and Ash	10	<400	Varies up to 4m on east side	1	M	20	F	Merging Yew and Ash in the grounds of the adjacent Church. Canopy extends across field boundary. Negligible roost potential No obvious structural faults noted from ground level.	Minor facilitation pruning of the lower branches on the east side may be required.	B2	4.8
G13	3 X Sycamore 1 x Oak	10	<450	Varies up to 5m	1	M	20	G	Group of four mature trees with an Oak at the northern end merging to form one large copse. Low roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	Shown as retained within the development plan. Consider removing any under canopy growth and lower branches to provide light and space underneath.	B2	5.4
G14	Hawthorn, Elder, Sycamore and Ivy	5-8	<300	Varies up to 4m	1	OM	10	P	Over grown hedge with dense ivy throughout dominated by Hawthorn and Elder with occasional semi-mature Sycamore present. Negligible roost potential due to lack of features and low level of canopy. No obvious structural faults noted from ground level.	Shown as being retained but some removal of trees and canopy near the proposed access road and general trimming back near ground level may be required.	C2	3.6

Tree No	Species	Ht (m)	Stem Diam mm@ 1.5m	Canopy Spread (m)	Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Structural condition	Recommendations	BS 5837 Category	RPA Radius (m)
G15	3 X Oak u/c Cherry and Ash	15	515	Varies up to 8m	2	M	20	F	Large Oak dominates centre of copse and west side with smaller oak providing supporting canopy on the east and south side. Some young under canopy Ash present. Low roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	Shown as retained within the development plan. Consider removing any under canopy growth and lower branches to provide light and space underneath.	B2	6.1
G16	Line of 10 Ash <i>Fraxinus excelsior</i>	20+	<500	Varies up to 8m on east side	2	M/OM	20	F/P	Line of mature boundary trees extending broad headed canopy cover at quite low level across the edge of the field area. Low roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	Retained to screen the boundary. Some trimming of lower branches extending into the site area is likely to be required.	B2	6.0
G17	Hawthorn and Ash	4-8	<250	Varies up to 6m	0	M	20	F	Line of untrimmed Hawthorn with occasional semi-mature Ash present. No significant mature trees. Negligible roost potential due to lack of features. No obvious structural faults noted from ground level.	Retained to screen eastern boundary. Consider trimming and maintaining as a tall hedgerow.	B2	3.0
G18	Leylandii X Cupressocyparis Leylandii	8	<250	N-2 S-2 E-2 W-2	0	M	<10	P	Line of trimmed Leylandii. Trees on the eastern end are all dead due to waterlogging in the ground. Negligible roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	Remove dead tree. If these trees are within the site remove and replace with a native species hedge. If outside of the site trim to maintain as a hedge.	U	3.0
G19	Elm, Horse Chestnut, Dying Sycamore and Horse Chestnut.	6-10	<400	Varies up to 6m	0	SM/M	10+	P	Dense canopy growth of mixed broad leaved species or various ages along road screening this from view. Elm and Hawthorn dominate with some larger Ash and Horse Chestnut emerging as the top canopy. Extremely crowded and competing for space. Low roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	If retained consider thinning and removing dense ivy growth from the larger trees. Provides valuable screening and visual amenity along the eastern side of Spalding Road.	C2	4.8

BS5837:2012 Tree Survey
 Land east of Spalding Road,
 Pinchbeck
 Lincolnshire
 NGR TF 24382 25164

Survey by
 Christopher Barker CEnv dipHort ACIEEM

 smas worksafe consultant www.smasltd.com as recognised by SSIP SAFETY SCHEMES IN PROCUREMENT	Report prepared by: C Barker	Date Issued: 13 September 2016
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BS5837 Tree Survey, Land at Spalding Road, Pinchbeck

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The report and the site assessments carried out by CBE Consulting on behalf of the client in accordance with the agreed terms of contract and/or written agreement were performed with the skill and care ordinarily exercised by a reasonable Environmental Consultant at the time the Services were performed. Further, and in particular, the Services were performed by CBE Consulting taking into account the limits of the scope of works required by the client, the time scale involved and the resources agreed with the client.

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Introduction

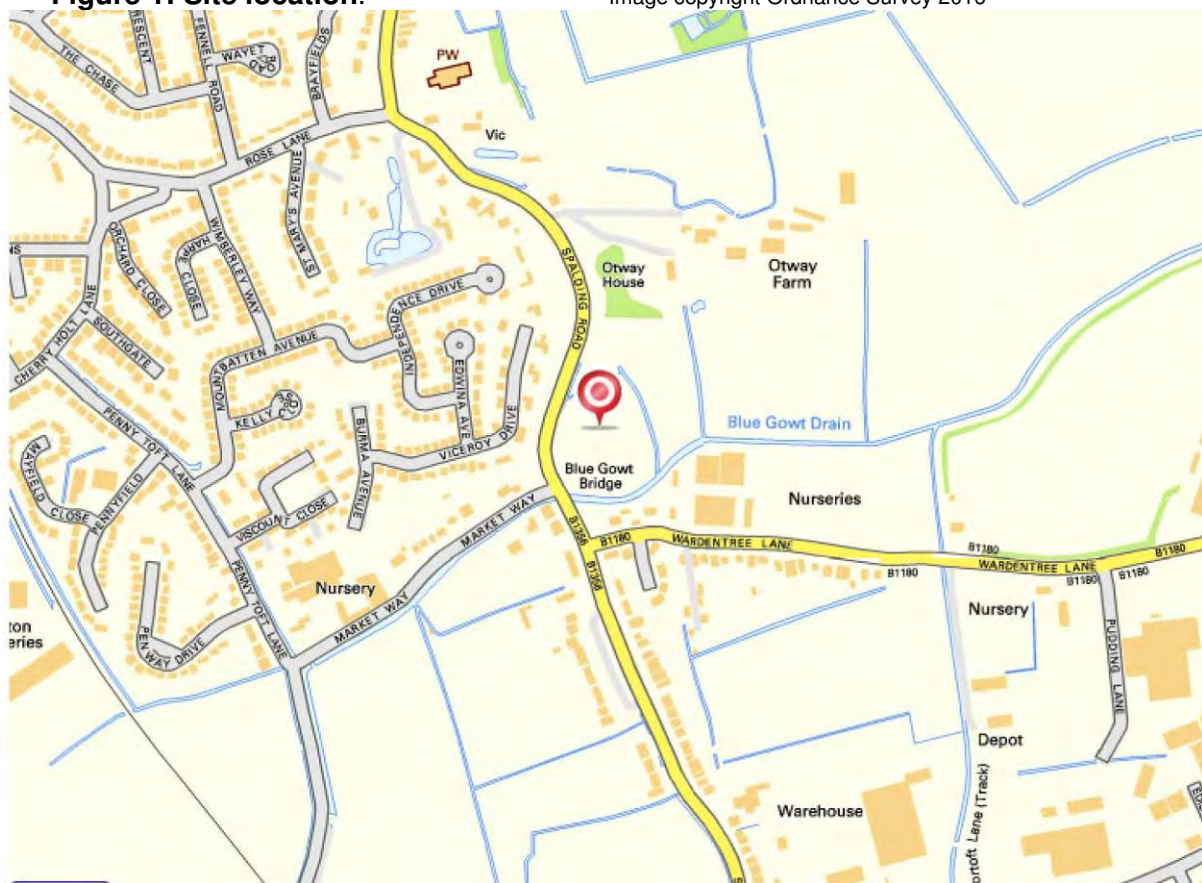
1.1 Site Description and Location

The site surveyed is a roughly triangular parcel of predominantly agricultural grazing land situated on the east side of Spalding Road south of Otway House, centered at NGR TF24382 25164. It is bounded on the west side by Spalding Road and the north by Otway House. The location of the site is shown on the plan within **Figure 1** and an aerial photograph has been provided within **Figure 2** to place the site in context.

In order to facilitate an application to obtain permission to redevelop the site area the Client has requested a BS5837 (2012) Tree Survey should be completed to assess the quality of any trees within and close to the boundary of the survey area. An inspection of the site and the immediate surrounding areas was carried out on 10 August 2016. A photographic record of the trees at the site is included within the report.

Figure 1: Site location.

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1.2 Neighbouring Land Uses and Recent Site History

The defined site area comprises a round field area laid to grassland with juvenile trees and scrub planted in the centre. It is access via a track from the north running parallel to Spalding Road. To the west, on the opposite side of Spalding Road is the village of Pinchbeck. The south boundary of the site is defined by a drain beyond which there are also residential houses. To the south east are glasshouses within a commercial nursery area. Land to the north east is within the garden of Otway House. Directly east is an area of grazing land. The location of the survey area defined by a red line is shown in the aerial photograph below.

Figure 2: Site Contextual Aerial Photograph

Image copyright Microsoft Corporation 2016



The site lies within South Holland and assessment of the site area using the South Holland District Council online mapping system confirms it is partially within the designated Pinchbeck Conservation Area. Any tree within the Conservation Area are protected under the auspices of this and no work can be carried out to these trees without the prior written approval of the Planning Authority.

In undertaking the tree survey the assessment has been carried out in accordance with the specifications contained within BS 5837 Trees in Relation to Design, Development and Construction (2012).

An inspection of the site and the immediate surrounding areas was completed in August 2016 by Christopher Barker, dipHort, CEnv, an experienced arboricultural consultant.

2. Tree Survey Appraisal Methodology

2.1 Survey Objectives

This tree survey has been carried out with the objective of:

- Identifying the individual tree species present at the site by means of visual inspection;
- To define the approximate age, condition and canopy spread of all individual mature and semi-mature trees identified and the value of these within the development context;
- To identify any trees that present a risk to existing or proposed foundations or other structures that may be constructed on the site and recommend action to remove this risk; and
- Recommend tree management / mitigation measures where appropriate.

The survey broadly assessed the condition and arboricultural value of the trees lying in or adjacent to the site area, paying particular attention to any mature individual trees present within or adjacent to the site area in order to prepare an assessment in accordance with BS 5837 Trees in Relation to Design, Development and Construction (2012).

2.2 Survey Methodology

The methodology set out below is a detailed summary of the suggested approach to tree assessment as described in British Standard 5837:2012. This report has applied the methodology to all significant individual trees or groups of trees present at or near to the site. A topographical plan has been provided by the Applicant and this has been annotated to show the location of the significant trees identified within the site area in **Figure 3**. The location of the trees is also shown within the Root Protection Area plan plotted within **Figure 4**.

2.3 Trees

Trees have been broadly assessed based on guidance set out within the British Standard BS 5837:2012 'Trees in Relation to Design, Development and Construction'. This standard provides recommendations and guidance on the principles to be applied to achieve successful integration of development with trees, shrubs and hedgerows. Where development is to occur, the standard provides guidance on the approach needed to decide which trees are appropriate for retention, and the means for protecting these trees during the development (including demolition and construction work) and the means of incorporating trees into the developed landscape.

Trees on the site have been divided into one of four categories (based on the cascade chart for tree quality assessment). These are classed as A, B, C or U (Section 4 of BS 5837) within the table in Appendix 1. This gives an indication as to the tree's importance in relation to the site, the local landscape and, also, the value and quality of the existing trees on site. This assists informal decisions concerning which trees should be removed or retained should development occur. For a tree to qualify under any given category it should fall within the scope of that category's definition (see below). Categories A, B and C cover trees that should be a material consideration in the development process, each with three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural (nature conservation) values. Category U trees may have no significant landscape value but it is not presumed that there is any overriding need to remove these unless stated otherwise in the description and recommendations. They are for this reason not considered as being significant within the planning process. In assigning trees to the A, B or C categories, and the presence of any serious disease or tree-related hazard is taken into account. If the disease is considered fatal and/or irremediable, or likely to require sanitation for the protection of other trees it may be categorised as U with a recommendation for work or even removal, even if they are otherwise of considerable value.

Category (A): Trees whose retention is most desirable and are of high quality and value. These trees are considered to be in such a condition as to be able to make a lasting contribution (a minimum of 40 years) and may comprise:

- (i) Trees which are particularly good examples of their species especially rare or unusual, or essential components of groups or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue);
- (ii) Trees, or groups of trees 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 (e.g. avenues or other arboricultural features assessed as groups);
- (iii) Trees or groups of significant conservation, historical, commemorative or other value (e.g. Veteran or wood-pasture trees).

Category (B): Trees whose retention is considered desirable and are of moderate quality and value. These trees are considered to be in such a condition as to make a significant contribution (a minimum of 20 years) and may comprise:

- (i) Trees that might be included in the high category but because of their numbers or slightly impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage), are downgraded in favour of the best individuals;
- (ii) Trees present in numbers such that they form distinct landscape features and attract a higher collective rating than they would as individuals. Individually these trees are not essential components of formal or semi-formal arboricultural features, or trees situated mainly internally to the site and have little visual impact beyond the site;
- (iii) Trees with clearly identifiable conservation or other cultural benefits.

Category (C): Trees that could be retained and are considered to be of low quality and value. These trees are in an adequate condition to remain until new planting could be established (a minimum of ten years) or are young trees with a stem diameter below 150 mm and may comprise:

- (i) Trees not qualifying in higher categories;
- (ii) 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;
- (iii) Trees with very limited conservation or other cultural benefits.

Category (U): Trees that are considered to have no significant landscape value but it is not presumed that there is any overriding need to remove these unless stated otherwise in the description and recommendations. They are for this reason not considered as being significant within the planning process. These trees will be in such a condition that any existing value would be lost within 10 years and which should in the current context be ignored or removed for reasons of sound arboricultural management. Trees within this category are:

- (i) 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;
- (ii) Trees that are dead or are showing signs of significant, immediate or irreversible overall decline;
- (iii) 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.

Species have been recorded by common and scientific name. Height has been estimated in metres and stem diameter measured in centimetres unless impractical, taken at a height of 1.5 m from the base of the tree.

In the assessment particular consideration has been given to:

- (a) The health, vigour and condition of each tree;
- (b) The presence of any structural defects in each tree and its life expectancy;
- (c) The size and form of each tree and its suitability within the context of the proposed scheme;
- (d) The location of each tree relative to existing site features, e.g. its value as a screen or as a skyline feature.

Age class is assessed according to the age class categories referred to in BS 5837.

YNG: Young trees age less than 1/3 life expectancy.

SM: Middle age trees 1/3 – 2/3 life expectancy.

M: Mature trees over 2/3 life expectancy.

OM: Over mature – declining or moribund trees of low vigour.

The overall condition of any individual tree, or group of trees, has been referred to using one of the definitions listed below. A more detailed description of condition has been noted in the Tree Schedule.

G **Good:** A sound tree or trees needing little, if any, attention

F **Fair:** A tree or trees with minor but rectifiable defects or in the early stages of stress, from which it may recover

P **Poor:** A tree or trees with major structural and physiological defects or stressed such that it would be very expensive and inappropriate to retain

D **Dead:** A tree or trees no longer alive. However, this could also apply to those trees that are dying and will be unlikely to recover, or are becoming or have become dangerous

Major defects or diseases and relevant observations have also been recorded. Dead wood has been defined as the following:

Twigs and small branch material	Up to 5 cm in diameter
Minor dead wood	5 cm to 10 cm in diameter
Major dead wood	10 cm in diameter and above

The survey was completed from ground level only. Aerial inspections were not undertaken. Evaluations of tree conditions given within this assessment apply to the date of survey and cannot be assumed to remain unchanged, and it may be necessary to review these within 24 months, in accordance with good arboricultural practice.

2.4 Site Plans & Tree schedules

The position of significant individual trees or groups of trees measured out on the site is shown within **Figure 3. *At this stage an Indicative Constraints Plan showing the RPA's of the trees has been prepared but this may require more detailed assessment once the final layout is provided in greater detail.*** Once an accurate final development plan is available a constraints plan showing the RPA and detailed protection measures will need to be prepared. A summary table providing detailed information on the trees and tree groups is included in Appendix 1. Within the summary table maximum RPA's (m²) for estimated tree diameters have been included where appropriate, as well as a calculated corresponding radius of the circle for that RPA. The Root Protection Areas are formulated as described below and assist when designing layouts in relation to trees.

2.5 Root Protection Area (RPA)

Below ground constraints to development are represented by the root plate around a tree which needs protecting in order for the tree to be incorporated into a proposed scheme, without adverse harm to the tree or structural integrity of any proposed foundation structures.

This area is calculated according to the formula set out in BS 5837 (2012) clause 4.6.1.

Single Stem Trees: RPA (m²) = (stem diameter (mm) x 12 / 1000)² x 3.142 Multiple Stem Trees: RPA (m²) = (combined stem diameters (mm) x 12 / 1000)² x 3.142 This figure should be capped to 707 m², that is, equivalent to a circle with a radius of 15 m, or a square with approximately 26 m sides
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Taken from BS5837 (2012) clause 4.6.1.

2.6 Potential For Protected Species

Potential bat roost locations are described within this report using the methodology as that recommended by the Bat Conservation Trust (BCT). Each tree of significant size assessed within this survey has also been assessed for the potential to provide roosts for bats and the table in Appendix 1 includes reference to this.

Potential	Field Signs
Roost confirmed	Confirmed bat roost in tree. Field evidence past or current presence of bats confirmed by droppings, staining or flight.
High roost potential	Splits or cracks in major limbs which develop upwards, smooth surfaces around potential entry points, dense ivy covering, woodpecker / rot holes, significant lifting bark, Artificial bat boxes. Ancient or over mature trees where the canopy cannot be fully inspected from the ground.
Medium roost potential	Some splits in branches, dense ivy covering, and small cavities visible, dense epicormic growth. Flies may be present around a potential entry point.
Low roost potential	Splits may be present in minor branches, sparse ivy cover, and some loose bark evident. Young healthy trees with good visibility to the canopy top.
No roost potential	Tree with a negligible potential to support bat roosts (not supporting any of the above features).

3. Tree Survey Findings

3.1 Survey Details

The tree inspection took the form of a walkover inspection completed by Christopher Barker dipHort, CEnv. Each individual semi-mature or mature tree of significance that could be impacted by any proposed new development within the survey area was identified, visually inspected and classified. The character of the trees at the site is shown in photographs contained within this section.

3.2 Mature and Semi-mature Trees

A total of five individual trees and four tree groups have been identified and assessed as part of the tree survey. The majority of the trees within the survey area are mature or semi-mature hedgerow trees, predominantly Oak and Ash. Some of the trees within the survey area fall within the Pinchbeck Conservation Area. Overall the site is quite open with tree canopy cover around the boundary areas.

Tree Group G1 and T2 – Along Access Road

The western side of the strip of land containing the access track is occupied by a dense canopy of Elm, Horse Chestnut, Sycamore, Ash and Hawthorn with occasional Hawthorn and Blackthorn. Most of this growth is low and shrubby but individual larger trees, particularly Horse Chestnut and Ash are present creating areas of taller canopy cover. The trees are very crowded and competing for space and there are no individual mature trees of significant stature present. This group would benefit from some thinning and is placed within Category B2 as it will provide useful screening along Spalding Road for approximately 20 years.



Dense canopy within G1



G1 and individual Sycamore T2



G1 with individual Ash t2 centre.

Sycamore T2 is situated near to the access track. This is a tall tree of poor quality with an

irregular crown shape and some dense ivy growth. There is significant dead wood and sparse areas within the crown indicating the tree is in decline. As a result this tree is placed in Category C2 as it probably only has 10 years of useful life left. However, there is an argument to be made that a tree of this poor quality in decline should not be retained adjacent to an access road.

Tree Group G3

This is a linear canopy dominated by Elm and Hawthorn with occasional Lime. It is growing as an untrimmed hedgerows providing dense screening along the western boundary adjacent to Spalding Road. If retained and maintained as a boundary screen this vegetation can provide screening for at least 10 years and the linear group is placed within Category C2.



Linear tree group G3



Linear tree group G3

Tree Group G4 and Willow T5

Group G5 comprises a large round merging canopy of Field Maple, Beech and Cherry situated on the southern edge of Otway House grounds. The Field Maple dominates this canopy and it is placed in Category B2.

Nearby is a solitary Willow tree. This remnant of a once larger tree is in poor condition. The canopy is unbalanced and irregular and the single trunk has a large wound and evidence of decay near ground level. This tree is clearly in decline and it is placed in Category U and recommended for removal.



Tree Group G4



Willow T5

Ash and Oak T6, T7 and T8 on south boundary.

These three large broad leaved trees with large broad headed crowns are situated on the southern boundary of the area being considered for development adjacent to the drainage channel along this boundary. Ash T6 is a re-grown pollard with three main trunks supporting a poorly developed canopy with dense ivy growth and significant dead wood present. This is not a

tree of high quality or high visual amenity value in its current condition. It is placed in Category C2 but if it is to be retained in a rear garden as indicated on the conceptual development plan, it would be prudent to remove the dense ivy growth and reduce the canopy to achieve a better shape and improve longevity.

Oak T7 and T8 are both veteran Oak trees with very broad trunks and large spreading crowns typical of the species. Both have some dead wood but this is common to Oak. Generally, both trees appear vigorous and in reasonable health. Given the age of these trees, it is estimated there is at least 20 years of useful life expectancy remaining and both trees are placed in Category B1. These two large trees should be a priority for retention within any development scheme.



Ash T6



Oak T7



Oak T9

Ash T9 and Tree Group G10

Along the eastern boundary, anchored by Oak T8 at the southern end, is a dense linear canopy of Elm, Hawthorn, Blackthorn and Ash. This linear canopy extends along the entire eastern boundary of the proposed development area and also extends across the centre of the site area, nearly dividing it into two parts. This linear canopy is very dense in places and in need of thinning. It provides excellent screening along this boundary and is placed in Category C2. Near the northern end of this are two Ash trees, situated close enough together to form one large merging crown as can be seen in the photograph below. These are poor quality trees that appear to be in decline. Both are placed in Category C2. If retained close to houses or gardens, pollarding of these crowns may be beneficial.



Linear canopy G10



Pair of Ash G9.

Figure 3: Tree Location Plan

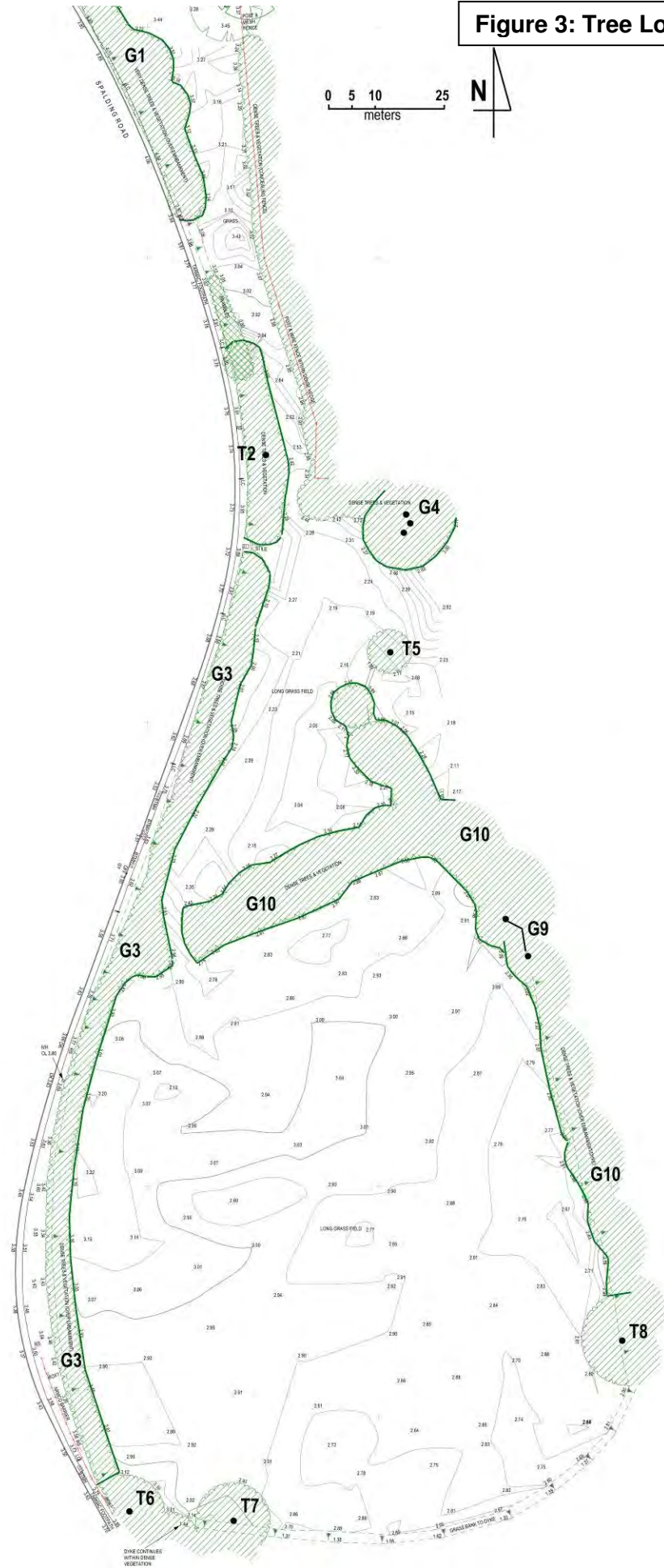
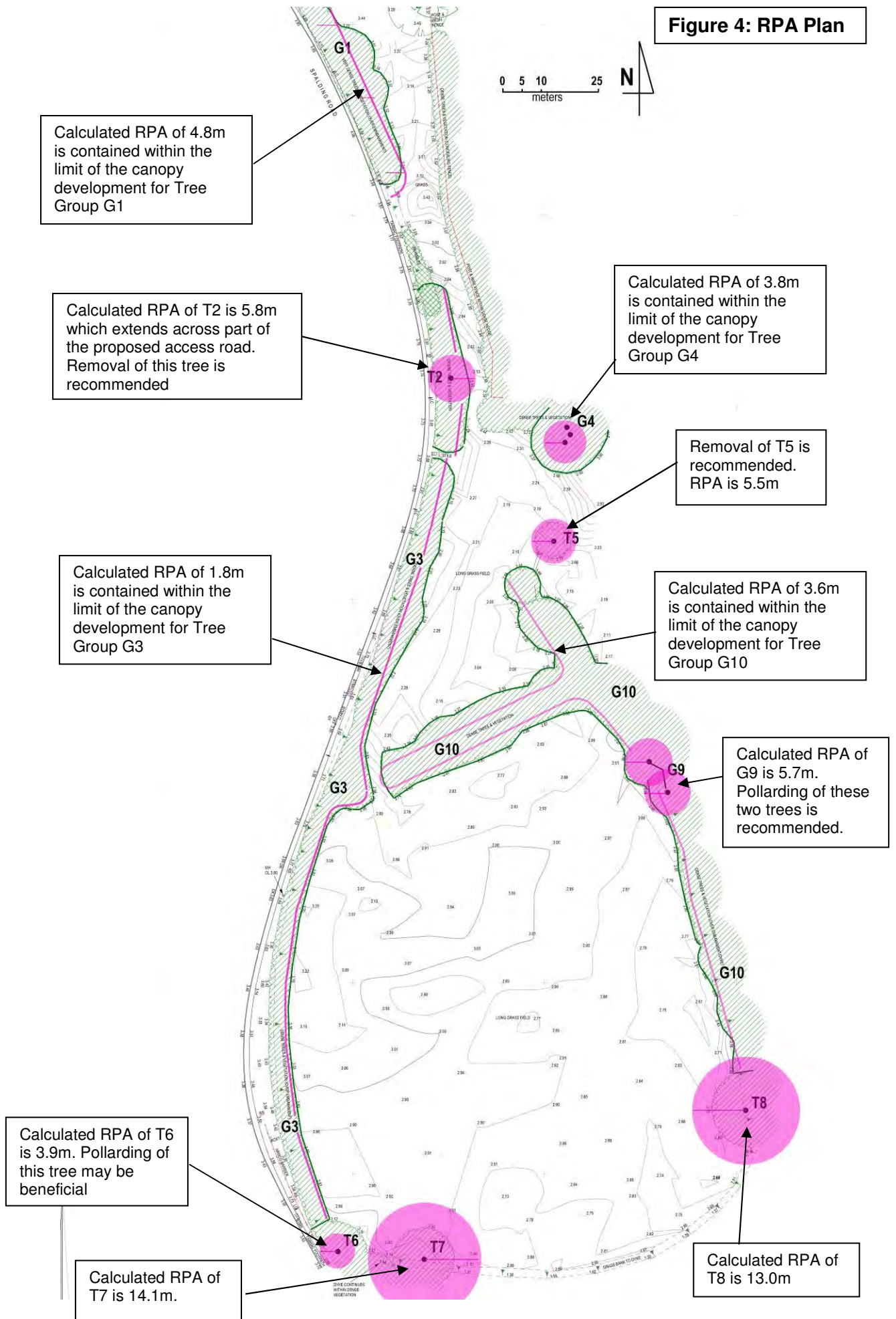


Figure 4: RPA Plan



4. Tree Management

4.1 Arboricultural Assessment

Conceptual development proposals for this site have been prepared following the completion of the survey. The proposals show that access to the development site and subsequent housing area will be via a road from the Otway House access road southwards following the existing field access track. The new access road will run close to T2 but otherwise the majority of trees will be undisturbed and retained in boundary positions facing garden areas. None of the calculated RPA appear to be disturbed.

Tree	Category	Recommendation
G1 Elm, Hawthorn Horse Chestnut, Ash	B2	Inside the Conservation Area. If retained consider thinning and removing dense ivy growth from the larger trees. Provides valuable screening and visual amenity along the eastern side of Spalding Road.
T2 Sycamore	C2	Inside the Conservation Area. In decline. Consider removing as positioned close to the proposed access road.
G3 Elm and Lime	C2	Partially inside the Conservation Area at the northern end. Retain to maintain screening along Spalding Road. Consider selective thinning to improve the health and condition of the better specimens.
G4 Beech, Cherry and Field Maple	B2	Outside of the proposed development area and sufficiently distant from the access road to avoid any direct impact. Retain.
T5 Weeping Willow	U	Outside of the proposed development area and sufficiently distant from the access road to avoid any direct impact. However, this tree is not suitable for retention near structures.
T6 Ash	C2	Adjacent to the development area. Not an ideal tree for retention within a garden area. If retained consider removing the ivy and shaping the crown to provide better balance.
T7 Oak	B1	Retain adjacent to the development and provide sufficient space to be maintained.
T8 Oak	B1	Inside the Conservation Area. Retain adjacent to the development and provide sufficient space to be maintained.
T9 2 x Ash	C2	Inside the Conservation Area. In decline and not suitable for retention near to houses and gardens. Consider removal or canopy reduction.
G10 Hawthorn, Blackthorn, Ash and Elm.	C2	Inside the Conservation Area. Dense linear canopy screening the eastern boundary. Retain. Consider thinning and thinning.

Overall, assuming the key trees on the boundaries of the site are retained and protected during any proposed development, the impact on the canopy cover within the local landscape will be negligible. Certain trees of poor quality such as T2 and T5 should be considered for removal. Others, such as T6 and T9 with poor shape and low visual amenity value should be considered for crown reduction or pollarding within the context of the development.

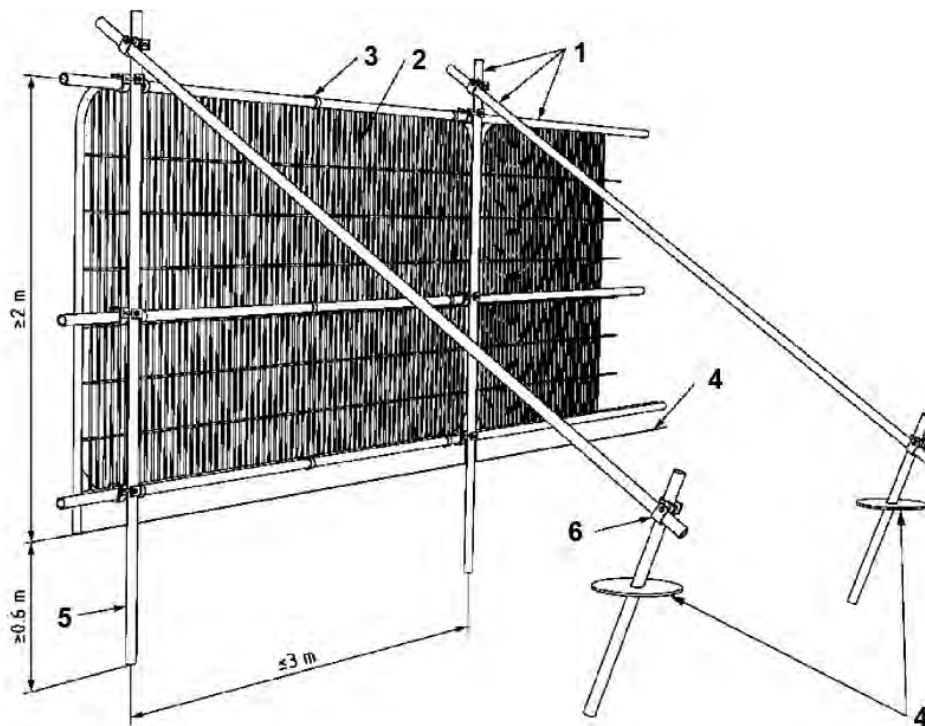


Figure 5 – Conceptual Development Plan

4.2 General Recommendations

Any trees retained and incorporated within the proposed development will need to be adequately protected during any approved development works. As a general rule at this site, measures to protect trees should follow the best practice principles set out in BS5837: Trees in Relation to Design, Development and Construction (2012). Prior to any construction or development work proceeding, the RPA's of individual trees to be retained should be marked out using the distances provided in the table within Appendix 1. Marking out should be completed by a person with arboricultural or horticultural expertise as individual trees will have root zones that may be affected by local conditions and allowances will need to be made to accommodate this. The best practice principles have been broadly summarised below.

- All trees retained adjacent to the site should be protected by barriers or ground protection around the calculated Root Protection Area (RPA) and as indicated on any Tree Constraints Plan (TCP) that may be produced in association with the assessment.
- Any fencing required should be erected prior to commencement of construction and before demolition including erection of any temporary structures. Once set up fences should not be removed or altered without prior consultation with the arboricultural advisor.



1. Standard scaffold poles
2. Heavy Gauge 2m tall galvanised tube and weld mesh infill panels
3. Panels secured to uprights and cross members with wire ties
4. Ground Level
5. Uprights driven into ground until secure (up to 0.6m)
6. Standard scaffold clamps

- Arrangements should be made for an arboriculturist to supervise works and tree protection where trees are particularly vulnerable or sited close to access points.
- Pre-development works may be undertaken prior to the installation of fencing with the agreement of the local planning authority.
- All tree works should follow best practice procedures as set out in BS 3998 (2010). All trees should be maintained in good condition on site and be inspected annually (where overall condition requires) or every 2 years and after any major storm events, with safety a priority.
- Fencing should be clearly visible and suitable for the location, type and proximity of construction activity.
- It may be appropriate on some sites to use temporary site offices as components of the protection barriers.
- Where it has been agreed and shown on a Tree Protection Plan, construction access may take place within the RPA if suitable ground protection measures are in place (e.g. existing surfaced car park areas). In other areas this may comprise single scaffold boards over a compressible layer laid onto geo-textile materials for pedestrian movements. Vehicular movements over the RPA will require the calculation of expected loading and may require the use of proprietary protection systems.
- Once areas around trees have been protected by fencing, any works on the remaining site area may be commenced providing activities do not impinge on protected areas. Notices should be placed on fencing to indicate that operations are not permitted within the fenced area.
- Wide or tall loads etc. should not come into contact with retained trees. Banksman should supervise transit of vehicles, jibs, booms etc. where this is in close proximity to retained trees.
- Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10m of a tree bole. No concrete mixing should be done within 10m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree.
- No fires will be lit where flames are anticipated to extend to within 5m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire.
- Notice boards, telephone cables or other services should not be attached to any part of a retained tree.
- Where it is deemed necessary to operate a wide or tall load, plant bearing booms, jibs and counterweights or other such equipment, as part of construction works, and such equipment would have potential to cause injurious contact with crown material i.e. low branches and limbs, of retained trees within the RPA fencing, it is best advised that appropriate, but limited tree surgery, be carried out beforehand to remove any obvious problem branches. This is classed as 'Facilitation Pruning' within BS 5837 (2012). Any such pruning should be undertaken in accordance with a specification prepared by an arboriculturalist.
- It is advised that a Pre-Commencement Site Meeting is held with contractors who are responsible for operating machinery, as described above. To firstly highlight the

potential for damage occurring to tree crowns and to ensure that extra care is applied when manoeuvring machinery during such operations within close proximity to retained trees to avoid any contact.

- In the event of having caused any such branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with BS 3998 (2010) Recommendations for Tree Work, to correct the damage, upon completion of development.
- All of the above precautionary measures should be applied to minimise the effect of any damage to long-term tree health and safety.

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Appendix 1: BS5837 Tree Schedule					
Key:	Measurements	Age – Class	Overall Condition	BS 5837 2005 : Cascade Chart for Quality Assessment/Retention Category	Symbols:
	MS – Multi-stemmed	YNG-MAT-Young Mature	G – Good	A – High	< = less than
	Ht - Height in metres	SM – Semi-mature	F – Fair	B – Moderate	~ = approximately
	Stem – Stem Diameter at 1.5m in mm	Mat – Mature	P – Poor	C – Low	> = greater than
	Crown – Crown spread in metres	OM – Over mature	D – Dead	R – Trees for Removal	
	TD - Trunk division (height in metres)	Est Yrs – estimate of years remaining (>40 years; 20 –40 years; <20 years)		Sub-categories: 1 = mainly arboricultural values 2 = mainly landscape values 3 = mainly cultural values.	
RPA = Root protection area (equivalent to a circle with a radius 12 x the stem diameter for single stem trees and 10 x the basal diameter for trees with more than one stem arising below 1.5m above ground level).					

Tree No	Species	Ht (m)	Stem Diam mm@ 1.5m	Canopy Spread (m)	Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Structural condition	Recommendations	BS 5837 Category	RPA Radius (m)
G1	Elm, Hawthorn Horse Chestnut, Ash	6-10	<400	Varies up to 5m	0	SM / M	10 - 20	F/P	Dense canopy growth of mixed broad leaved species or various ages along road screening this from view. Elm and Hawthorn dominate with some larger Ash and Horse Chestnut emerging as the top canopy. Extremely crowded and competing for space. Low roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	If retained consider thinning and removing and dense ivy growth from the larger trees. Provides valuable screening and visual amenity along the eastern side of Spalding Road.	B2	4.8
T2	Sycamore Acer pseudoplatanus	16	490	N-3 S-3 E-3 W-3	0	M	10	P	Single trunk leaning to the east supporting an unbalanced canopy with dense ivy present. Clearly in decline with under canopy Elm present. Low roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	In decline. Consider removing as positioned close to the proposed access road.	C2	5.8
G3	Elm U.procera Lime Tilia europaea	4-6	<150	N-5 S-4 E-5 W-5	1	Y	10	F	Dense juvenile Elm and occasional Lime and Sycamore along the road margin. Negligible roost potential. No obvious structural faults noted from ground level.	Retain to maintain screening along Spalding Road. Consider selective thinning to improve the health and condition of the better specimens.	C2	1.8

Tree No	Species	Ht (m)	Stem Diam mm@ 1.5m	Canopy Spread (m)	Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Structural condition	Recommendations	BS 5837 Category	RPA Radius (m)
G4	Beech, Cherry and Field Maple	9-12	<250	N-4 S-5 E-5 W-5	2	SM	20	F	Group of crowded trees merging together into a large quite compact crown within which the larger Field Maple dominates. Low roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	Outside of the proposed development area and sufficiently distant from the access road to avoid any direct impact. Retain.	B2	3.0
T5	Weeping Willow <i>Salix alba</i>	12	460	N-2 S-5 E-2 W-4	1	M	10	P	Single trunk with a large wound and decay present at the base. Irregular open canopy is pendulous and displays significant dead wood. Low roost potential due to minor features present. In decline with obvious potential faults such as fallen dead wood.	Outside of the proposed development area and sufficiently distant from the access road to avoid any direct impact. However, this tree is not suitable for retention near structures.	U	5.5
T6	Ash <i>Fraxinus excelsior</i>	7	290 / 120 / 110	N-4 S-4 E-4 W-4	2	OM	<10	P	Pollarded tree crowded by ivy with a poorly developed canopy of irregular shape. Positioned on the bank of the canal. Moderate roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	Adjacent to the development area. Not an ideal tree for retention within a garden area. If retained consider removing the ivy and shaping the crown to provide better balance.	C2	3.9
T7	Oak <i>Quercus petraea</i>	1152	1175	N-6 S-6 E-6 W-6	2	M	20+	G	Veteran Oak. Single trunk supporting a large broad headed balanced crown. Dead ivy present with some minor dead wood within the canopy interior. Low roost potential due to minor features and position adjacent to the canal. No obvious structural faults noted from ground level.	Retain adjacent to the development and provide sufficient space to be maintained.	B1	14.1
T8	Oak <i>Quercus petraea</i>	15	1085	N-7 S-8 E-8 W-8	2	M	20+	G	Veteran Oak. Single trunk supporting a large broad headed balanced crown. Dead ivy present with some minor dead wood within the canopy interior. Low roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level.	Retain adjacent to the development and provide sufficient space to be maintained.	B1	13.0

Tree No	Species	Ht (m)	Stem Diam mm@ 1.5m	Canopy Spread (m)	Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Structural condition	Recommendations	BS 5837 Category	RPA Radius (m)
G9	2 x Ash <i>Fraxinus excelsior</i>	14	475 / 395	N-5 S-5 E-5 W-5	2	M	10	P	Two merging trees choked by dense ivy with poorly developed canopies displaying significant dead wood through. Negligible roost potential due to minor features and ivy growth. No obvious structural faults noted from ground level but these trees are clearly in decline.	In decline and not suitable for retention near to houses and gardens. Consider removal or canopy reduction.	C2	5.7
G10	Hawthorn, Blackthorn, Elm, Ash	6-10	<300	Varies up to 4m	0	M	10	F	Dense linear canopy dominated by Elm and Hawthorn along the eastern boundary and extending part way across the site. Very dense in places and in need of thinning. Negligible roost potential. Crowded by no obvious structural concerns noted from ground level.	Linear screen along the eastern boundary of the site area. Dense and very crowded in places. Some thinning may be advisable to maintain canopy density and health.	C2	3.6