



TREE SURVEY, ARBORICULTURAL
IMPLICATION ASSESSMENT
and
PRELIMINARY METHOD STATEMENT &
TREE PROTECTION PLAN

Project No: **3178**

Lambs Close
Cuffley
Potters Bar
Hertfordshire
EN6 4FD

Site Visit: 31st August 2012

Report Produced: 5th September 2012

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Summary

The purpose of this report is to provide a preliminary consideration of the arboricultural implications created by proposed development. In accordance with the feasibility and planning sections of BS5837:2012 "*Trees in relation to design, demolition and construction – Recommendations*", trees deemed to be within the influencing distance of the projected construction have been evaluated for quality, longevity, and initial maintenance requirements. Where trees do not have to be removed for health and safety reasons, a detailed and objective assessment has been made of the consequences of the intended layout.

In this circumstance it is intended to It is proposed to develop the site at Lambs close through the demolition of the existing garages and hard surfaces and the construction of a single residential unit, with garaging, gardens and associated landscaped areas. As a result one hedge and twelve individual trees were inspected. The arboricultural related implications of the proposal are as follows:

- 1 **Implications on Construction** – No specialist construction techniques will be required for the main buildings, to avoid damage to retained trees however foundation design should take into account the potential effects of trees in the future. Protective fencing will be required prior to the commencement of demolition and will require realignment as the project progresses.
- 2 **Cultural Implications for Retained Trees** – Minor. One tree requires limited pruning.
- 3 **Landscape Implications** – No trees require removal as a result of the proposals.
- 4 **Post Development Implications** – The development will be affected by shading from retained trees, though the impact of this on users of the site is a matter of personal preference.
- 5 **Post Planning Permission** – Subject to achieving Planning Permission, a detailed Arboricultural Method Statement and Tree Protection Plan will be required. This will include the following: fencing type, access facilitation pruning specification, phasing and an extensive auditable monitoring schedule.

Given the above, there are no overt or overwhelming arboricultural constraints that can be reasonably cited to preclude the proposed construction.

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1.0 Introduction

1.1 Terms of Reference

- 1.1.1 Hayden's Arboricultural Consultants Limited has been commissioned by DPS Software to prepare a Tree Survey, Arboricultural Implication Assessment, Preliminary Method Statement and Preliminary Tree Protection Plan for the existing trees at Lambs Close, Cuffley, Potters Bar, Hertfordshire EN6 4FD.
- 1.1.2 The site survey was carried out by Daniel Gospel on the 31st August 2012. The relevant qualitative tree data was recorded in order to assess the condition of the existing trees, their constraints upon the prospective development and the necessary protection and construction specifications required to allow their retention as a sustainable and integral part of the completed development.
- 1.1.3 Information is given on condition, age, size and indicative positioning of all the trees both on and affecting the site, in line with British Standard 5837:2012 Trees in relation to design, demolition and construction - Recommendations.

1.2 Scope of Works

- 1.2.1 The survey of the trees, soils and any other factor is of a preliminary nature. The trees were inspected on the basis of the Visual Tree Assessment (VTA) method as developed by Mattheck and Breloer (1994). The trees were inspected from ground level with no climbing inspections undertaken. It is not always possible to access every tree and as such some measurements may have to be estimated. Trees with estimated measurements are highlighted in the schedule of trees. No samples have been removed from the site for analysis. The survey does not cover the arrangements that may be required in connection with the removal of existing underground services.
- 1.2.2 Whilst this is an arboricultural report, comments relating to non arboricultural matters are given, such as built structures and soil data. Any opinion thus expressed should be viewed as provisional and confirmation from an appropriately qualified professional sought. Such points are clearly identified within the body of the report.
- 1.2.3 An intrinsic part of tree inspection in relation to development is the assessment of risk associated with trees in close proximity to persons and property. Most human activities involve a degree of risk with such risks being commonly accepted, if the associated benefits are perceived to be commensurate. In general, risk relating to trees tends to increase with the age of the trees concerned, as do the benefits. It will be deemed to be accepted by the client that the formulation of the recommendations for all the management of the trees will be guided by the cost-benefit analysis (in terms of amenity), of the tree work that would remove all the risk of tree related damage.

2.0 The Site

2.1 Site Description

2.1.1 The site is Lambs Close, Cuffley, Hertfordshire. This is a cul-de-sac residential road which leads from the south side of Station Road, and consists of a number of apartment blocks.

2.1.2 The specific area of inspection focuses on the south-westernmost corner of Lambs Close. At this location there are trees in the rear gardens of houses on Theobalds Road and Theobalds Close, and trees and scrub vegetation along a railway line to the east. Some tree canopies overhang an area of derelict land, formerly used as garaging, but recently fire damaged which forms the body of the site.

2.1.3 The site is predominantly level with only minor undulations.

2.2 Soils

2.2.1 The soils type commonly associated with this site are slowly permeable and seasonally wet, slightly acid but base-rich loams and clays. They are of moderate fertility and mainly support seasonally wet pastures and woodlands type habitats. This soil type constitutes approximately 19.9% the total English land mass.

2.2.2 The data given was obtained from a desk top study which provides indications of likely soil types. By definition, this information is not comprehensive and therefore any decisions taken with regards the management, usage or construction on site should be based on a detailed soil analysis.

2.2.3 Further to item 2.2.2, this report provides no information on soil shrinkability. It may be necessary for practitioners in other disciplines (e.g. engineers considering foundation design) to obtain this data as required.

2.3 Statutory Tree Protection

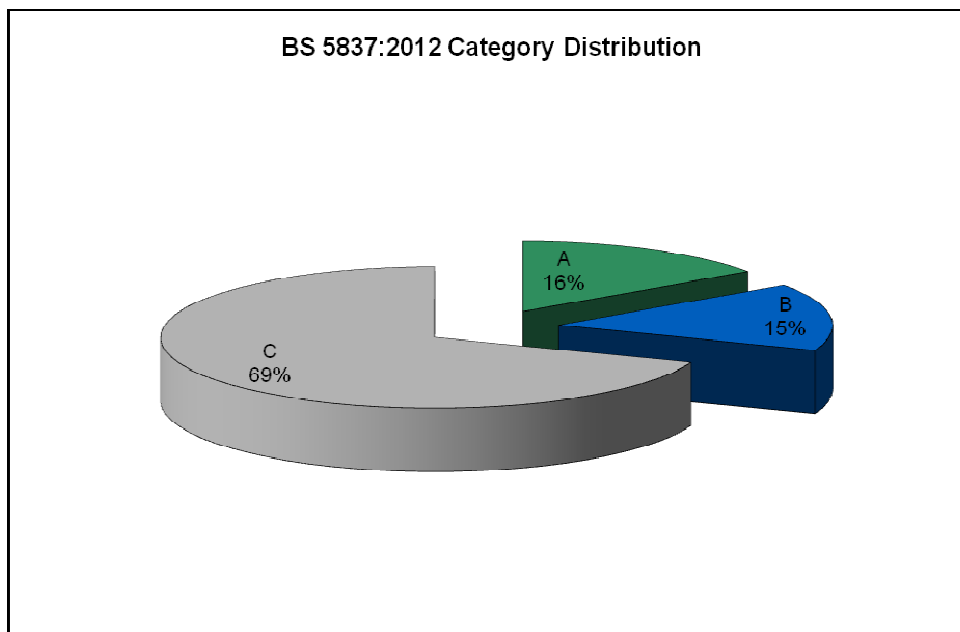
Hayden's Arboricultural Consultants Limited have been unable to ascertain whether the trees identified within this report are covered by local planning authority administered statutory tree protection. In view of this, owners, managers or any persons wishing to undertake work to any trees should contact the local planning authority Welwyn Hatfield District Council, to ensure no such protection measures exist.

3.0 Tree Survey

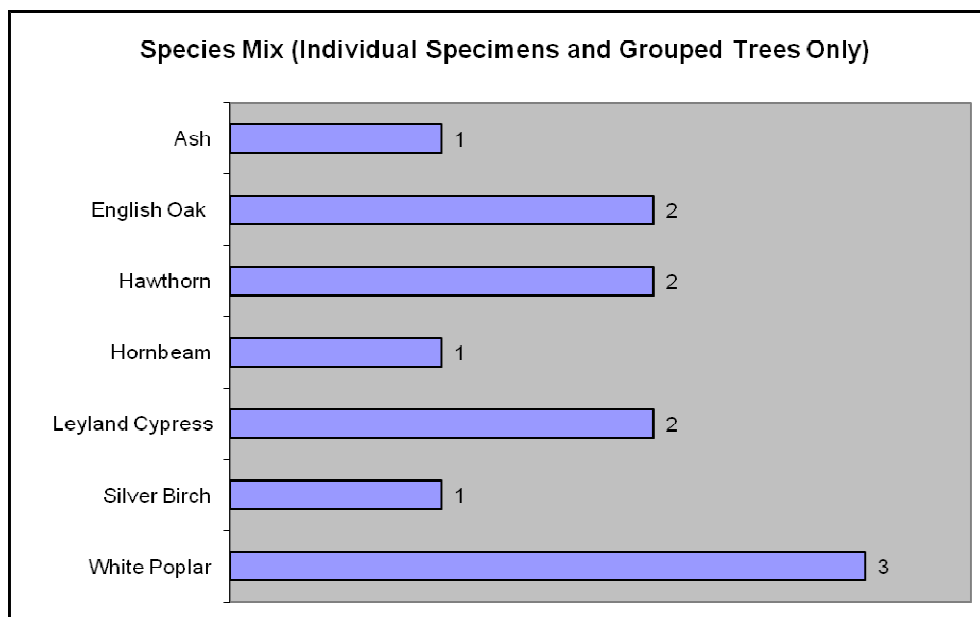
3.1 As part of this survey a total of twelve trees and one hedge have been identified and these have been numbered T001 – T012 and H001 respectively.

3.2 An accurate topographical survey was not available at the time of inspection. Therefore, the position of the trees shown on the attached drawing no. 3178-D has been estimated. Given this, the position of the trees must be considered indicative, although drawing no. 3178-D provides a fair representation of the relationship of the trees as distributed across the site.

- 3.3 In order to provide a systematic, consistent and transparent evaluation of the trees included within this survey, they have been assessed and categorised in accordance with the method detailed in item 4.3 of *BS 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations"*. For further information, please see item 9.0 below.
- 3.4 There are two BS 5837:2012 Category "A" (features of high quality) specimens or landscape features within the confines of the survey – T001 and T002.
- 3.5 There are two BS 5837:2012 Category "B" (features of modest quality) trees and landscape features on or associated with the site – T005 and H001.
- 3.6 There are nine BS 5837:2012 Category "C" (low quality or young/small features) individual specimens and landscape features on site – T003, T004, T006, T007, T008, T009, T010, T011 and T012. These items are generally evenly dispersed outside the site. They may include trees or landscape features of poor form, or specimens with no significant individual long term landscape or amenity value, but which in certain circumstances visually coalesce to provide pleasing softening, screening and habitat benefits.
- 3.7 There are no BS 5837:2012 Category "U" (unsuitable for retention) trees or landscape features on or associated with the site
- 3.8 The distribution of BS 5837:2012 specimens and landscape features by category is as shown in the chart below:



- 3.9 The mix of species present on site at the time of inspection is shown in the chart below. By necessity, this only includes individual specimens and groups, as species numbers within areas are not usually counted.



- 3.10 In accordance with item 4.2.4 (c) of BS 5837:2012, the items inspected and detailed within this report have been selected for inclusion due to the likely influence of any proposed development on the trees, rather than strictly adhering to the curtilage of the site. However, it must be understood that there may be trees beyond the site and not included in this survey which may exert an influence on the development. Where works for cultural, health and safety, quality of life, or development purposes have been recommended on trees outside the ownership of the site, these can only progress with the agreement of the owner, except where it involves portions of the trees overhanging the boundary.
- 3.11 Details of all proposed tree works together with priorities are given on the attached *Schedule of Trees* and *Schedules of Works*.

4.0 Arboricultural Implication Assessment

4.1 The Proposal

- 4.1.1 It is proposed to develop the site at Lambs Close through the demolition of the existing garages and hard surfaces and the construction of a single residential unit, with garaging, gardens and associated landscaped areas.

4.2 Access

- 4.2.1 Site access is unencumbered by the Root Protection Areas (RPA) of any trees to be retained. Therefore, and from a purely arboricultural perspective, it will not be necessary to install a proprietary temporary load bearing road to protect tree roots.

4.3. Demolition

4.3.1 Demolition of existing structures affects the theoretical RPA of one or more retained trees – T001 and T002. In order to prevent damage to these specimens works must only be completed with appropriate machinery or by hand within the calculated RPA and may only commence once protective fencing has been erected. In the proximity of the retained trees, all walls and material must be demolished inwards into the footprint of the building and away from the stems (often referred to as “top down, pull back”). Additionally, all plant and vehicles engaged in demolition should either operate outside the theoretical RPA, or should run on a temporary load bearing surface to protect the underlying soil structure. All foundations or hard surfaces within the theoretical RPA are to be broken out with extreme care, either manually or with a breaker and small mini digger (operating outside the RPA, or on the temporary load bearing surface).

4.4 Construction

4.4.1 Construction of foundations or structural supports do not encroach within the RPA of any trees to be retained. Therefore from an arboricultural perspective, no specialized construction or foundation techniques will be required. However, dependent on the soil type, species and topography, trees may have an influence on the soil beyond their calculated RPA. Given the proximity of the proposed construction to the trees to be retained, it is recommended that a structural engineer is consulted to assess the implications of the tree retention on the required foundation depth.

4.4.2 Installation of new hard surfaces does not encroach within the RPA of any retained trees. Therefore, and from a purely arboricultural perspective, it will not be necessary for these items to be of specialist design.

4.4.3 Excavations/Re-Modelling – Excavation and soil re-modeling is not shown to encroach within the RPA of any retained trees. Therefore, no adverse arboricultural implications are expected.

4.5 Implications of Sloping Ground

4.5.1 The arboricultural implications of the proposed structures are based on an assumption that level changes will not occur within the RPA of trees that are shown to be retained.

4.6 Requirement for Tree Barrier Fencing

4.6.1 immediately after the completion of the demolition within RPAs and prior to commencement of all construction activity, protective fencing will be erected on site. This must be fit for purpose (including any ground protection if necessary) in full accordance with the requirements of BS 5837:2012 and positioned as shown on the attached Preliminary Arboricultural Implication Assessment & Tree Protection drawing. Full details of fencing will be supplied by Hayden’s Arboricultural Consultants in the detailed Arboricultural Method Statement & Tree Protection Plan.

4.7 Compound

4.7.1 The site provides limited internal space to locate a construction compound outside the RPA of any trees that are to be retained. As such the project will require careful phasing to manage the storage of materials.

4.8 Phasing

4.8.1 The proposal involves the integration of a number of complex aspects that affect tree protection (e.g. – but not exclusively – access, movement of materials and the installation of services). For this reason the project must be carefully phased to ensure the highest level of protection for retained trees at all times. As part of the detailed Arboricultural Method Statement & Tree Protection Plan, Hayden’s Arboricultural Consultants will produce an in depth phasing recommendation to cover the major operations on site as they affect retained trees.

4.9 Monitoring

- 4.9.1 In accordance with item 6.3 of BS 5837:2012, the site and associated development should be monitored regularly by a competent Arboriculturalist to ensure that the arboricultural aspects of the planning permission are complied with. As part of the detailed Arboricultural Method Statement & Tree Protection Plan, Hayden's Arboricultural Consultants will produce an extensive auditable monitoring schedule to assess the progress of key site events/activities.

4.10 Cultural Implications for Retained Trees

- 4.10.1 It is necessary to undertake access facilitation pruning (AFP) which may include above and or below ground works to one tree to be retained – T005 as outlined in the Schedule of Works to Allow Development. These works are necessary to permit construction access and provide appropriate working space etc. Given the amount of pruning necessary, the locations of the works and that this is a repeat of a previous operation, the AFP is not considered likely to have a significantly adverse effect on the trees and landscape features concerned. As part of the detailed Arboricultural Method Statement & Tree Protection Plan, Hayden's Arboricultural Consultants will produce an in depth AFP specification. Other works to retained trees (not relating to development) are listed on the attached *Schedule of Works – Irrespective of Development*.

4.11 Landscape Implications

- 4.11.1 No trees or landscape features have been identified for felling for the sole purpose of achieving the proposed layout.
- 4.11.2 The successful implementation of the proposed scheme presents a realistic opportunity for landscape improvement which may not occur without the catalyst of development and the allied application of landscape related planning conditions.

4.12 Post Development Implications

- 4.12.1 The development will be affected by shading from retained trees, though the impact of this on users of the site is a matter of personal preference. As part of the detailed Arboricultural Method Statement & Tree Protection Plan, Hayden's Arboricultural Consultants will, if requested, produce an in depth and fully informed assessment of the shading from surrounding trees, a calculation has been made using the proprietary Arbor-Shadow programme. This uses a complex formula that allows for tree form and density, and sun angle throughout the year – a considerably more refined technique than the crude methodology postulated in BS 5837:2012.
- 4.12.2 Due to the dynamic nature of trees and their interaction with the environment, their health and structural integrity is liable to change over time. Because of this it is recommended that all trees on or adjacent to the site be inspected on an annual basis.
- 4.12.3 As stated in BS 5837:2012, regular maintenance of newly planted trees is of particular importance for at least three years during the critical post-planting period and might, where required by site conditions, planning requirements or legal agreement, be necessary for five years or more. Therefore, the designer of the new landscaping should, in conjunction with the landscape design proposals, prepare a detailed maintenance schedule covering this period, and appropriate arrangements made for its implementation.

5.0 Preliminary Arboricultural Method Statement & Tree Protection Plan

5.1 **Securing of Root Protection Areas (RPA)**

5.1.1 The trees to be retained will be protected by the use of stout barrier fencing erected in the positions indicated on the attached Preliminary Arboricultural Implication Assessment & Tree Protection drawing no. 3178D. This fencing will be in accordance with the requirements of BS 5837:2012.

5.1.2 All fencing provided for the safeguarding of trees will be erected prior to any demolition or development commencing on the site, therefore ensuring the maximum protection. This fencing, which must have all weather notices attached stating "Construction Exclusion Zone – No Access" will be regarded as sacrosanct and, once erected, will not be removed or altered without the prior consent of the Local Planning Authority Arboricultural Officer.

5.1.3 Where footpaths, access drives, or parking bays are constructed within the RPA of retained trees, careful attention will be paid to the type of surface treatment used in these areas, details of which are given in item 5.8, below. If possible, these should be installed as a final phase of the project, thereby protecting the RPA throughout the major construction phase of the proposed development.

5.2 **Location of Site Office, Compound and Parking**

5.2.1 The position of the office, compound and parking will be agreed in writing with the Local Planning Authority prior to commencement of any permitted development works. Any proposed re-location of these items through the various phases of development will be agreed prior to re-siting with the Arboricultural Officer.

5.3 **On Site Storage of Spoil and Building Materials**

5.3.1 Prior to and during all construction works on site, no spoil or construction materials will be stored within the RPA of any tree on, or adjacent to the site, even if the proposed development is to be within the RPA. This is to reduce to a minimum the compaction of the roots of the trees. Details of the RPA for each tree where no spoil or building materials will be stored are indicated on the attached Preliminary Arboricultural Implication Assessment & Tree Protection drawing no. 3178-D. Any encroachment within this protected area will only be with the prior agreement of the Local Planning Authority Arboricultural Officer.

5.3.2 Any facilities for the storage of oils, fuels or chemicals shall be sited on impervious bases and surrounded by impervious bund walls. The volume of the bund compound shall be at least equivalent to the capacity of the tank plus 10%. If there is a multiple tankage, the compound shall be at least equivalent to the capacity of the largest tank, or the combined capacity of interconnected tanks, plus 10%. All filling points, vents, gauges and sight glasses shall be located within the bund. The drainage system of the bund shall be sealed with no discharge to any watercourse, land or underground strata. Associated pipe-work shall be located above ground and protected from accidental damage. All filling points and tank overflow pipe outlets shall be detailed to discharge downwards into the bund.

5.3.3 All material storage facilities and work areas must consider the effects of sloping ground on the movement of potentially harmful liquid spillages towards or into protected areas.

5.4 Programme of Works

- 5.4.1 All tree surgery works, once approved by the Local Planning Authority, will be carried out prior to any other site works. Once completed, the proposed protective fencing will be erected along the lines indicated above. All of this will be carried out prior to commencement of any development works on the site. Outline details of the proposed programme are given in the Design and Construction and Tree Care flow chart attached (Appendix 1.1).

5.5 Tree Surgery

- 5.5.1 All tree work will be agreed with the Local Planning Authority and will be carried out in line with BS 3998:2010 (Recommendations for Tree Works). An arboricultural contractor approved by the Local Planning Authority will carry out the work. Any alterations to the proposed schedule of works will be agreed with the Arboricultural Officer prior to commencement of works.

5.6 Levels

- 5.6.1 No alterations to soil levels within the RPA of retained trees are envisaged. However, if it is necessary for these to occur, appropriate measures must be taken to prevent or minimise any detrimental effects on the affected root systems as detailed in 5.6.2 and 5.6.3 below.

5.6.2 If it is necessary to excavate so close to trees that roots greater than 50mm diameter are likely to be encountered, particular care will be taken to avoid damage. Excavation in these areas will be undertaken by hand or using an air spade, avoiding any damage to the bark. The roots will be surrounded with sharp sand prior to the replacing of any soil or other material in the vicinity.

- 5.6.3 If it is necessary to raise levels, it is essential that adequate supplies of water and oxygen through the soil to the trees' roots. Therefore, where necessary, a granular material will be used which will not inhibit gaseous diffusion. Possible options are no-fines gravel, cobbles or, Type 2 road-stone. All hard surfaces will be of suitable specification to allow such gaseous diffusion, e.g. brick pavers.

5.7 Services

- 5.7.1 At the time of writing this report, no details on proposed services were available. However, the following principles should be adhered to when planning for their installation.

- 5.7.2 It is proposed that all underground service runs will be placed outside the RPA of the trees on or adjacent to the site. Where it is not possible to do this, then the proposed length infringing the RPA will be hand dug 'broken trenches' (NJUG 4 paragraph 4) to ensure the maximum protection of the trees' roots. The trenches could also be excavated using an air spade, or trenchless technology could be employed if this methodology is considered appropriate by the relevant service company (thus allowing services to pass below and through the roots without the need for traditional excavation). If it is necessary to cut any small roots as part of any of these processes, they should be severed in such a way as to ensure that the final wound is as small as possible and free from ragged, torn ends.

- 5.7.3 All routes for overhead services will aim to avoid the trees. Where this is unavoidable, any tree work will be agreed prior to commencement with the Arboricultural Officer.

5.7.4 All service providers (Statutory Authorities) will be consulted prior to commencement of works with the aim of minimising the number of service runs on the site.

5.7.5 All service runs/trenches where they encroach within the RPA of retained trees will be agreed with the Local Planning Authority / Arboricultural Officer prior to commencement of works.

5.8 **Hard Surface Types & Construction within the Root Protection Area**

5.8.1 Where it is necessary to construct footpaths, driveways, non adoptable roads, and other hard surfaces within the RPA as calculated in accordance with BS 5837:2012, (item 4.6.1) it is proposed that the design will comply with the principles of the Arboricultural Advisory Information Services (AAIS) Practice Note 12 "*Through the Trees to Development*" - the only difference being that instead of a geo-grid, a geo-textile base is provided, and the no-fines road stone is incorporated in and retained by a geo-web cellular confinement system. Given the individual requirements of each site, it is essential that a specialist engineer is consulted to specify the construction detail. Where it is necessary to remove any existing hard surface, or lower the ground level within the RPA, this may expose roots. This operation must be undertaken using hand tools or an air spade. Any roots found should be treated with the greatest of care and surrounded by sharp sand to provide a level base.

5.8.2 Where it is shown that the construction of a boundary wall or dwelling encroaches within the RPA of a retained tree, the foundations of the wall or dwelling will be designed in such a manner so as to minimise the detrimental affect of the construction on the tree's roots. In these situations any excavations within the RPA of an affected tree will only be undertaken following exploration of the existing root system with an air spade and the necessary root pruning undertaken to allow excavation without unnecessary pulling and tearing of the roots to be retained. This will ensure minimal damage to tree roots where pad and beam or cantilever foundations are considered appropriate. Should a piling rig be required to create piles, any access facilitation pruning or felling necessary to allow access must be undertaken before the commencement of works and only with prior consent of the Local Planning Authority.

5.8.3 If boundary fencing is to be erected within the RPA of retained trees, it is proposed that the fence posts will be secured by the use of "Met-Posts" or similar design in order to keep the disturbance and damage of the roots of the trees to a minimum.

5.9 **Reporting and Monitoring Procedures**

5.9.1 In accordance with item 6.3 of BS 5837:2012, the site and associated development should be monitored regularly by a competent arboriculturalist to ensure that the arboricultural aspects of the planning permission (e.g. the installation and maintenance of protective measures and the supervision of specialist working techniques) are enforced. Furthermore, regular contact between the Site Manager and the Arboriculturalist allows them to effectively deal with and advise on any tree related problems that may arise during the development process. This system should be auditable. Should any issues arise during the arboricultural monitoring of the development the Arboriculturalist will contact the Local Planning Authority and appropriate action taken only with the prior permission of DPS Software and the Local Planning Authority.

6.0 Conclusions

- 6.1 The site is Lambs Close, Cuffley, Hertfordshire. This is a cul-de-sac residential road which leads from the south side of Station Road, and consists of a number of apartment blocks. The specific area of inspection focuses on the south-westernmost corner of Lambs Close. At this location there are trees in the rear gardens of houses on Theobalds Road and Theobalds Close, and trees and scrub vegetation along a railway line to the east. Some tree canopies overhang an area of derelict land, formerly used as garaging, but recently fire damaged which forms the body of the site. Within what is considered to be the influencing area of the site (i.e. the property and immediately adjacent land) a total of twelve individual trees, and one hedge have been surveyed. These were found to be of mixed condition and age providing a variety of amenity benefits. It is proposed to develop the site at Lambs close through the demolition of the existing garages and hard surfaces and the construction of a single residential unit, with garaging, gardens and associated landscaped areas.
- 6.2 It is concluded that the proposed development will not have a significant impact on the important trees associated with the site. There are two BS 5837:2012 Category "A" specimens, one BS 5837:2012 Category "B" tree and one BS 5837:2012 Category "B" Hedge on or immediately adjacent to the site. All these features will remain as an integral part of the proposed layout.
- 6.3 The successful implementation of the proposed scheme presents a realistic opportunity for landscape improvement which may not occur without the catalyst of development and the allied application of landscape related planning conditions
- 6.4 The alignment of the new dwelling does not encroach within the RPA of any trees that are to be retained. In view of this, and as assessed in accordance with BS5837:2012, no specialist foundation designs or construction techniques will be required to prevent damage to tree roots. Specialist foundations may still be required for other reasons, including mitigating the influencing distance of tree roots, subject to expert advice from a structural engineer.
- 6.5 The construction process will not require the installation of a temporary load bearing road.
- 6.6 This report recommends that specialist advice is obtained by expert practitioners in other disciplines. Such input should always be sought prior to the submission of this report in support of a planning application in order to demonstrate that the techniques and methods hereby proposed are achievable. In this particular circumstance it is necessary to contact the following:
- Structural Engineer (foundation design, item 4.4.1) (and impact on neighbouring structures, item 4.1.?)
- 6.7 All trees and landscape features that are to remain as part of the development should suffer no structural damage provided that protective fencing is erected as detailed at item 5.1 of this report.

7.0 Recommendations

- 7.1 It is recommended that in view of the siting and design of the layout, the lack of impact on trees and landscape features within the immediate vicinity, together with the detailed tree protection measures listed in this report, the trees should not be considered a constraint on the proposed development
- 7.2 Subject to achieving Planning Permission, it is recommended that a detailed Arboricultural Method Statement & Tree Protection Plan should be provided. This will include the following: fencing type, access facilitation pruning specification, project phasing and an extensive auditable monitoring schedule.
- 7.3 Tree surgery should be completed as detailed in the *Schedule of Trees*. Where this has been identified for reasons other than to permit development, this work should be completed within the advised timescales irrespective of any development proposals.
- 7.4 The tree surgery works proposed as part of this Survey are recommended to mitigate any identified problems that may be caused by trees in close proximity to the proposed development. To this end, should these recommendations be overruled, this Survey stands as the opinion of Hayden's Arboricultural Consultants Limited, and therefore any damage or injury caused by trees recommended by this practice for felling or tree surgery works, to which the proposed schedule of works has been altered or the tree has been requested to be retained by the Local Planning Authority, cannot be the responsibility of this practice.

8.0 References

British Standards Institute. (2010). *Recommendations for Tree Work BS 3998:2010* BSI, London.

British Standards Institute. (2012). *Trees in Relation to Design, Demolition and Construction – Recommendations BS5837:2012* BSI, London.

Tree Preservation Orders, A Guide to the Law and Good Practice (2005). Department for Communities and Local Government

Mattheck & Breloer H. (1994). *Research for Amenity Trees No.4: The Body Language of Trees*, HMSO, London.

NHBC Standards (2007) *Chapter 4.2 'Building Near Trees'*. National House-Building Council.

NJUG 4 Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees. Issued 16 November 2007.

9.0 Explanatory Notes

9.1 Categories

9.1.1 Below is an explanation of the categories used in the attached Tree Survey.

| | |
|------------------------------|---|
| No | Identifies the tree on the drawing. |
| Species | Common names are given to aid understanding for the wider audience. |
| BS 5837 Main Category | <p>Using this assessment (BS 5837:2012, Table 1), trees can be divided into one of the following simplified categories, and are differentiated by cross-hatching and by colour on the attached drawing:</p> <p>Category A - Those of high quality with an estimated remaining life expectancy of at least 40 years;</p> <p>Category B - Those of moderate quality with an estimated remaining life expectancy of at least 40 years;</p> <p>Category C - Those of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm;</p> <p>Category U - Those trees in such condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.</p> |
| BS 5837 Sub Category | <p>Table 1 of BS 5837:2012 also requires a sub category to be applied to the A, B, C, and U assessments. This allows for a further understanding of the determining classification as follows:</p> <p>Sub Category 1 - Mainly arboricultural qualities;</p> <p>Sub Category 2 - Mainly landscape qualities;</p> <p>Sub Category 3 - Mainly cultural values, including conservation .</p> <p>Please note that a specimen or landscape feature may fulfil the requirements of more than one Sub Category.</p> |
| DBH (mm) | Diameter of main stem in millimetres at 1.5 metres from ground level. Where the tree is a multi-stem, the diameter is calculated in accordance with item 4.6.1 of BS 5837:2012. |
| Age | <p>Recorded as one of seven categories:</p> <p>Y Young. Recently planted or establishing tree that could be transplanted without specialist equipment, i.e. less than 150 mm DBH.</p> <p>S/M Semi-mature. An established tree, but one which has not reached its prospective ultimate height..</p> <p>E/M Early-mature. A tree that is reaching its ultimate potential height, whose growth rate is slowing down but if healthy, will still increase in stem diameter and crown spread..</p> <p>M Mature. A mature specimen with limited potential for any significant increase in size, even if healthy.</p> <p>O/M Over-mature. A senescent or moribund specimen with a limited safe useful life expectancy. Possibly also containing sufficient structural defects with attendant safety and/or duty of care implications.</p> <p>V Veteran. An over-mature specimen, usually of high value due to either its age, size and/or ecological significance</p> <p>D Dead.</p> |

| | |
|----------------------------|---|
| Height | Recorded in metres, measured from the base of the tree. |
| Crown Base | Recorded in metres, the distance from ground and aspect of the lowest branch material. |
| Lowest Branch | Recorded in metres, the distance from ground and aspect of the emergence point of the lowest significant branch. |
| Life Expectancy | Relates to the prospective life expectancy of the tree and is given as 4 categories: 1 = 40 years+; 2 = 20 years+; 3 = 10 years+; 4 = less than 10 years. |
| Crown spread | Indicates the radius of the crown from the base of the tree in each of the northern, eastern, southern and western aspects. |
| Minimum distance | This is a distance equal to 12 times the diameter of the tree measured at 1.5 metres above ground level for single stemmed trees and 12 times the average diameter of the tree measured at 1.5 metres above ground level tree for multi stemmed specimens. (BS 5837:2012, section 4.6). |
| RPA | This is the Root Protection Area, measured in square metres and defined in BS5837:2012 as “a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree’s viability, and where the protection of the roots and soil structure is treated as a priority”. The RPA is shown on the drawing.. Ideally this is an area around the tree that must be kept clear of construction, level changes of construction operations. Some methods of construction can be carried out within the RPA of a retained tree but only if approved by the Local Planning Authority’s tree officer. |
| Water Demand | This gives the water demand of the species of tree when mature, as given in the NHBC Standards Chapter 4.2 “Building Near Trees”. |
| Visual | Concerns the planning and landscape contribution to the development site made by the tree, hedge or tree group, in terms of its amenity value and prominence on the skyline along with functional criteria such as the screening value, shelter provision and wildlife significance. |
| Problems/comments | May include general comments about growth characteristic, how it is affected by other trees and any previous surgery work; also, specific problems such as deadwood, pests, diseases, broken limbs, etc. |
| Work required (TS) | Identifies the necessary tree work to mitigate anticipated problems and deal with existing problems identified in the “Problems/comments” category. |
| Work required (AIA) | Identifies the tree work specifically necessary to allow a proposed development to proceed. |
| Priority | This gives a priority rating to each tree allowing the client to prioritise necessary tree works identified within the Tree Survey. 1 Urgent – works required immediately; 2 Works required within 6 months; 3 Works required within 1 year; 4 Re-inspect in 12 months, 0 Remedial works as part of implementation of planning consent. |

9.2 BS 5837:2012 Terms and Definitions

| | |
|--|--|
| Access Facilitation Pruning | One-off tree pruning operation, the nature and effects of which are without significant adverse impact on tree physiology or amenity value, which is directly necessary to provide access for operations on site. |
| Arboricultural Method Statement | Methodology for the implementation of any aspect of development that is within the root protection area, or has the potential to result in loss of or damage to a tree to be retained. |
| Arboriculturist | Person who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction. |
| Competent Person | Person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached. <i>NOTE - a competent person is expected to be able to advise on the best means by which the recommendations of this British Standard may be implemented.</i> |
| Construction | Site-based operations with the potential to affect existing trees. |
| Construction Exclusion Zone | Area based on the root protection area from which access is prohibited for the duration of a project. |
| Root Protection Area (RPA) | Layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. |
| Service | Any above or below ground structure or apparatus required for utility provision. <i>NOTE - examples include drainage, gas supplies, ground source heat pumps, CCTV and satellite communications.</i> |
| Stem | Principal above ground structural component(s) of a tree that supports its branches. |
| Structure | Manufactured object, such as a building, carriageway, path, wall, service run, and built or excavated earthwork. |
| Tree Protection Plan | Scale drawing, informed by descriptive text where necessary, based upon the finalized proposals, showing trees for retention and illustrating the tree and landscape protection measures. |
| Veteran Tree | Tree that, by recognized criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned. <i>NOTE - these characteristics might typically include a large girth, signs of crown retrenchment and hollowing of the stem.</i> |

10.0 Tree Problems

10.1 This gives a brief description of the problems identified in the attached Tree Survey.

10.2 **Deadwood**

This relates to dead branches in the crown of the tree. In the majority of cases, this is caused by the natural ageing process of the tree or its close proximity to neighbouring trees. However, in some situations, it may be related to fungal, bacterial or viral infection and for that reason, detailed monitoring should be undertaken on those trees showing signs of excessive deadwood production.

11.0 Limitations & Qualifications

Tree inspection reports are subject to the following limitations and qualifications.

General exclusions

Unless specifically mentioned, the report will only be concerned with above ground inspections. No below ground inspections will be carried out without the prior confirmation from the client that such works should be undertaken.

The validity, accuracy and findings of this report will be directly related to the accuracy of the information made available prior to and during the inspection process. No checking of independent third party data will be undertaken. Hayden's Arboricultural Consultants Limited will not be responsible for the recommendations within this report where essential data are not made available, or are inaccurate.

This report will remain valid for one year from the date of inspection, but will become invalid if any building works are carried out upon the property, soil levels altered in any way close to the property, or tree work undertaken. It must also be appreciated that recommendations proposed within this report may be superseded by extreme weather, or any other unreasonably foreseeable events.

If alterations to the property or soil levels are carried out, or tree work undertaken, it is strongly recommended that a new tree inspection be carried out.

It will be appreciated, and deemed to be accepted by the client and their insurers, that the formulation of the recommendations for the management of trees will be guided by the following:-

1. The need to avoid reasonable foreseeable damage.
2. The arboricultural considerations - Tree safety, Good Arboricultural practice (tree work) and Aesthetics.

The client and their insurers are deemed to have accepted the limitation placed on the recommendations by the sources quoted in the attached report. Where sources are limited by time constraints, or the client, this may lead to an incomplete quantification of the risk.

Daniel Gospel
Arboricultural Consultant
Hayden's Arboricultural Consultants Limited

September 2012.....

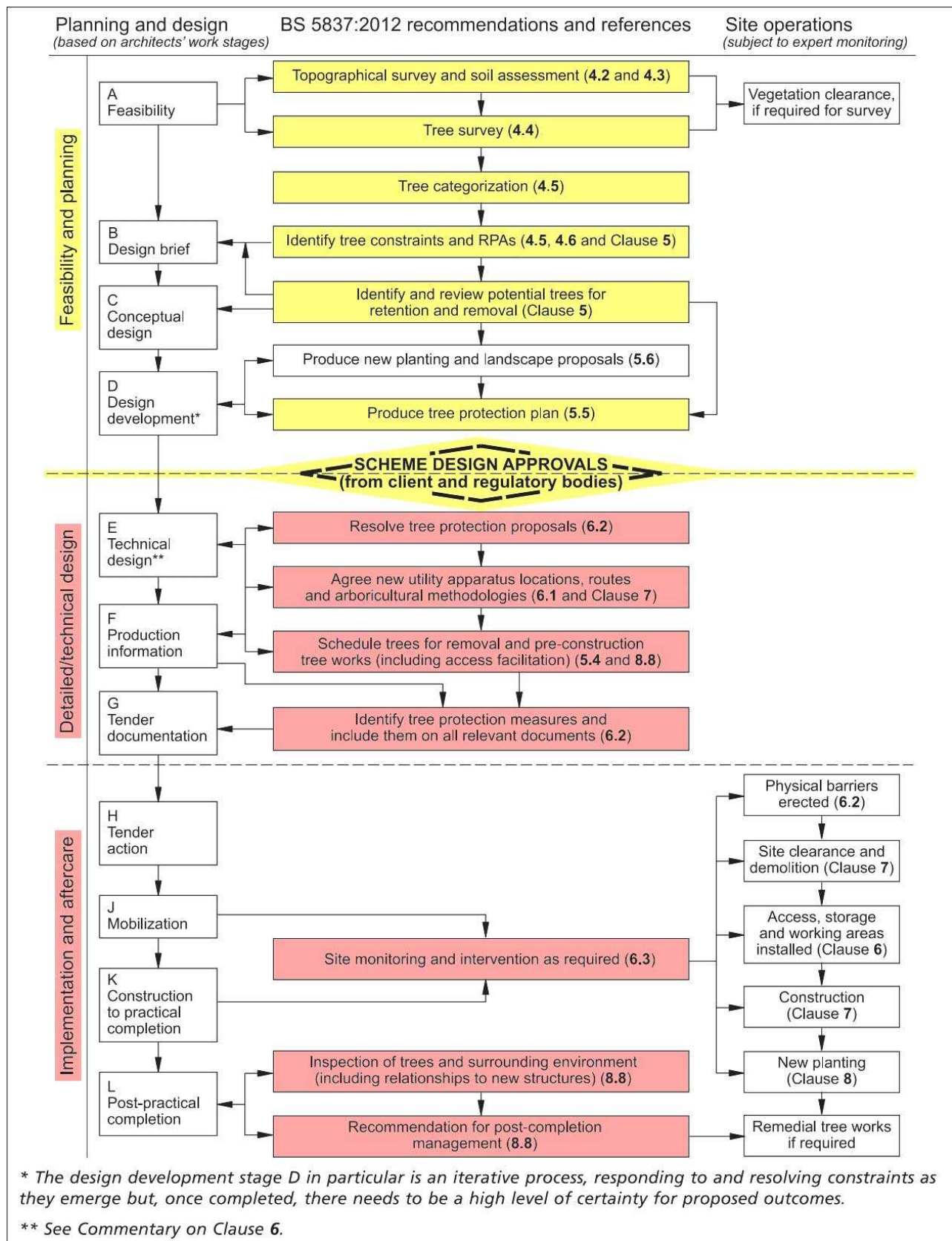
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12.0 Appendices

| | | |
|--------------|------------|--|
| Appendix No. | 1.1 | BS 5837:2012 Figure 1 Flow Chart – Design and Construction and Tree Care |
| Appendix No. | 1.2 | European Protected Species and woodland operations Decision tree to aid planning of woodland operations and protecting EPS (v.1) |
| Appendix No. | 1.3 | BS 5837:2012 Figure 2 Default specification for protective barrier |
| Appendix No. | 1.4 | BS 5837:2012 Figure 3 Examples of above-ground stabilizing systems |
| Appendix | A | Species List |
| Appendix | B | Schedule of Trees |
| Appendix | C | Schedule of Works - Irrespective of Development |
| Appendix | D | Preliminary Schedule of Works to Allow Development |
| Appendix | E | Drawing No 3178-D |

Appendix No 1.1

BS 5837:2012 Figure 1
Flow Chart – The design and construction process and Tree Care



Appendix No 1.1 - BS 5837:2012, Figure 1 –
Flow Chart - The design and construction process and Tree Care

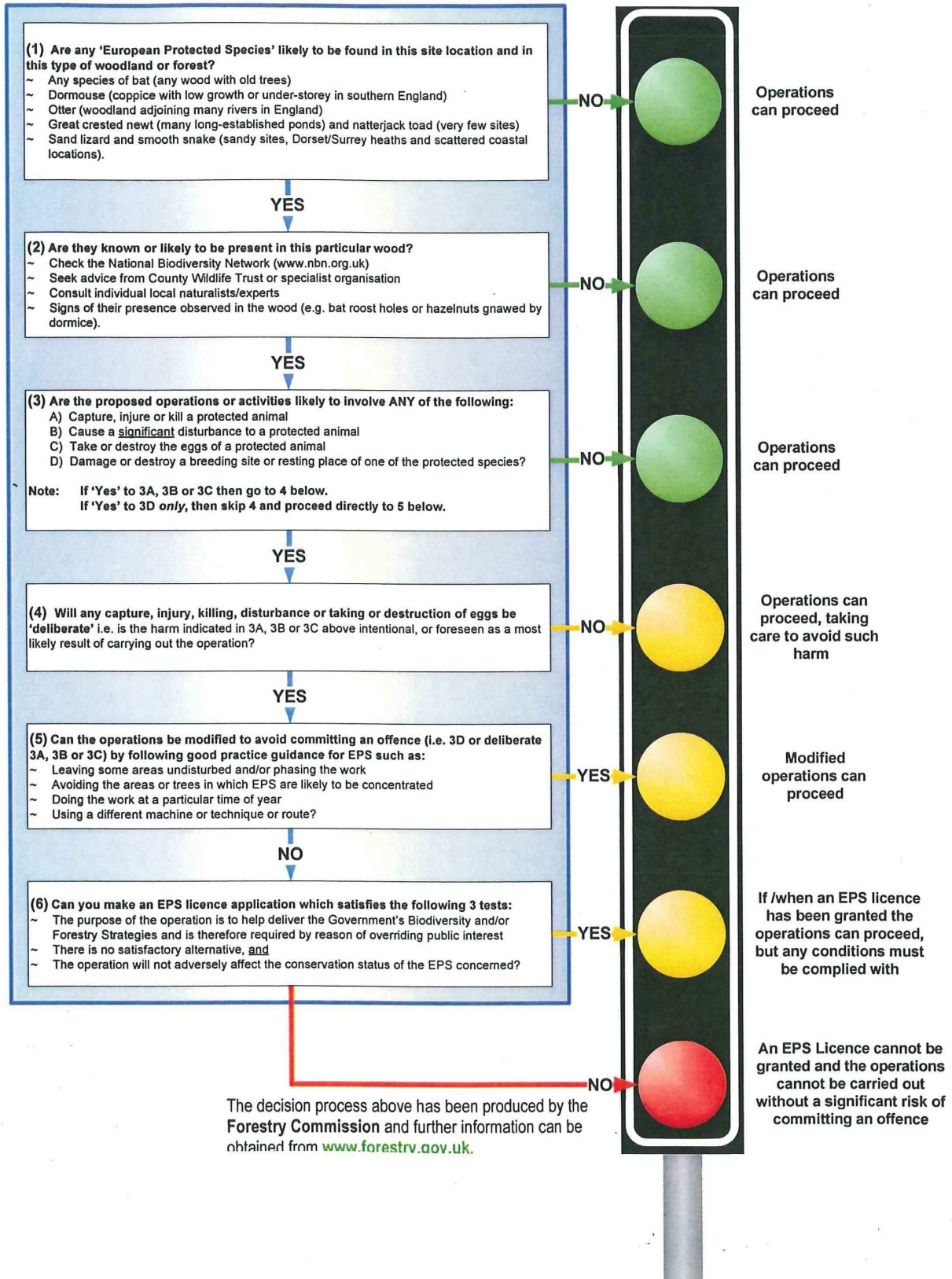
Appendix No 1.2

European Protected Species and woodland operations
Decision tree to aid planning of woodland operations and protecting EPS (v.1)

European Protected Species and woodland operations

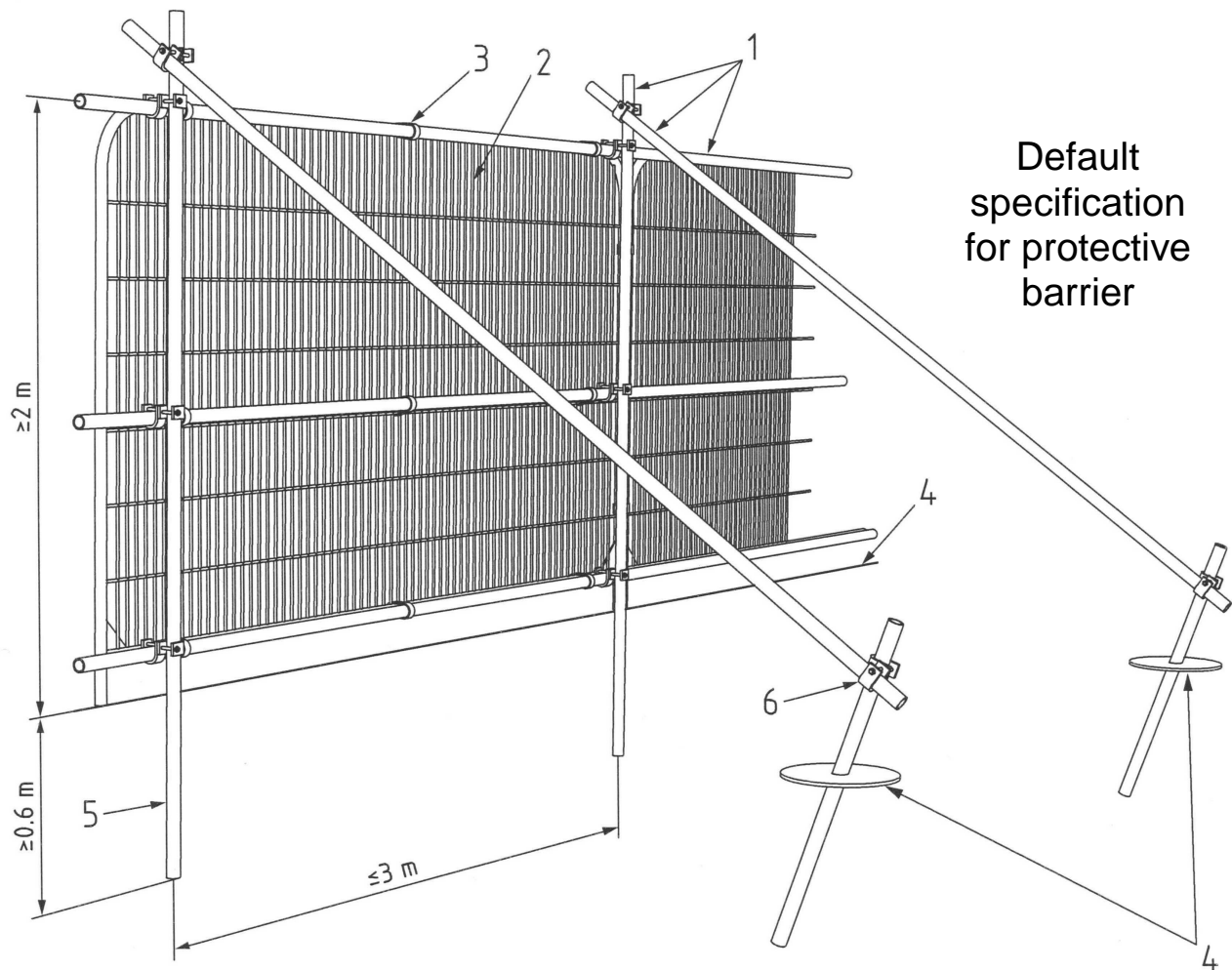
Decision tree to aid planning of woodland operations and protecting EPS (v.1)

The diagram below illustrates the questions that woodland managers and operators should consider when deciding whether they need to apply for an EPS licence. It should be noted that the diagram presents a simplified overview of the decision-making process.



Appendix No 1.3

BS 5837:2012 Figure 2: Default specification for protective barrier



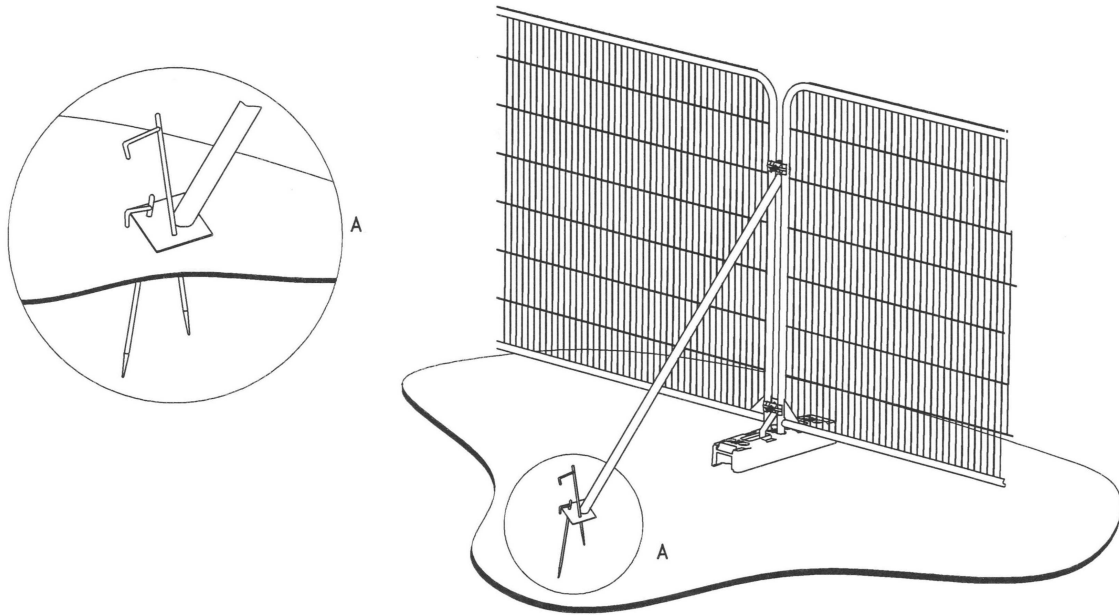
Key

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

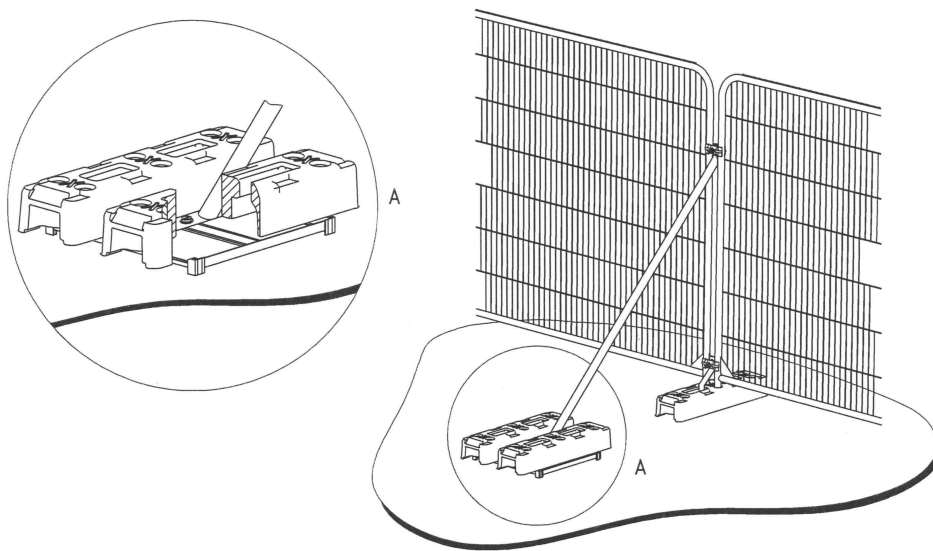
**Appendix No 1.3 - BS 5837:2012,
Figure 2 – Default specification for protective barrier**

Appendix No 1.4

BS 5837:2012 Figure 3: Examples of above-ground stabilizing systems



a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray

Appendix No 1.4 - BS 5837:2012, Figure 3
 - Examples of above-ground stabilizing systems

Appendix A

Species List

| | |
|-----------------|------------------------------------|
| Ash | <i>Fraxinus excelsior</i> |
| English Oak | <i>Quercus robur</i> |
| Hawthorn | <i>Crataegus monogyna</i> |
| Hornbeam | <i>Carpinus betulus</i> |
| Lawson Cypress | <i>Chamaecyparis lawsoniana</i> |
| Leyland Cypress | <i>x Cupressocyparis leylandii</i> |
| Silver Birch | <i>Betula pendula</i> |
| White Poplar | <i>Populus alba</i> |

Appendix B

Schedule of Trees

SCHEDULE OF TREES (AIA) Lambs Close, Cuffley, Hertfordshire

Surveyed By: Daniel Gospel Date: 31/08/2012
 Managed By: Daniel Gospel

| TreeNo On site Est.Dim | Species | DBH | Height | | Visual | Crown Spread | Problems / Comments | BS Cat | Work Required (TS) | Priority (TS) | Work Required (AIA) | Priority (AIA) |
|------------------------------|--------------------|-----------------------|---------------|------------------|----------|---------------------------|---|-----------|--|------------------|---------------------|-------------------|
| | | Min Dist | Crown Base | Lowest Branch | Age | Water Demand | | | | | | |
| | | RPA (m ²) | Aspect | Aspect | SULE | Ground Cover | | | | | | |
| H001 | Lawsons Cypress | 200 | 6 | | Moderate | N0.5, E0.5, S0.5, W0.5 | Hedgerow group located in neighbouring property to the south of the site. Provides good screening. | B2 | No works required. | 4 | | |
| No | | 2.4 | 0 | 0 | Y | High | | | | | | |
| Yes | | 18.1 | | E | 2 | 0 | | | | | | |
| T001 | English Oak | 800 | 25 | | High | N5, E9, S10, W9 | Early mature specimen located within the curtilage of the neighbouring property to which there is no access. As such all dimensions are estimates and all comments are based on that which is visible from the site. The stem has a slight, but apparently long existing lean towards the southern aspect. This appears to be the direct result of competition with the neighbouring Oak. The canopy is of asymmetric form and varying density . There are significant sections of deadwood present and the vigour appears poor. The site was re-visited on 31/08/2012, no significant changes were observed in the dimensions or condition of the tree since last surveyed. | A2 | In order to lessen the leverage on the extended limbs it is recommended that careful reductive surgery is undertaken. Also, it is recommended that the major deadwood be removed. Operation to be subject of a separate tree works application and not undertaken until written approval has been received from the local planning authority. | 3 | | |
| | | 9.6 | 4 | | E M | High | | | | | | |
| | | 289.5 | | | 1 | Grass | | | | | | |

| TreeNo | Species | DBH | Height | | Visual | Crown Spread | Problems / Comments | BS Cat | Work Required (TS) | Priority (TS) | Work Required (AIA) | Priority (AIA) |
|-------------|-----------------|-----------------------|------------|---------------|----------|-------------------|---|--------|---|---------------|--|----------------|
| | | Min Dist | Crown Base | Lowest Branch | Age | Water Demand | | | | | | |
| | | RPA (m ²) | Aspect | Aspect | SULE | Ground Cover | | | | | | |
| T002 | English Oak | 1100 | 25 | | High | N12, E12, S5, W10 | Specimen located within the curtilage of neighbouring property to which there is no access. As such, all comments are based on that which is visible from the site and all dimensions are estimates. Tree rises with a clear stem to a height of approximately 3.5 metres before diverging into three major scaffold limbs which support an asymmetric crown. On the northern, eastern and western aspects the crown has considerable extension, estimated up to 12 metres in greatest extent. There is considerable deadwood within the crown and substantial leverage present. The vigour of the specimen appears poor. The site was re-visited on 31/08/2012, no significant changes were observed in the dimensions or condition of the tree since last surveyed. | A2 | It is recommended that the lowest, most extended laterals on the northern and eastern aspects are removed back to the stem with major deadwood also being removed throughout the crown. Minor reduction should take place on the northern aspect to reduce the leverage towards the block of flats. Operation to be subject of a separate tree works application and not undertaken until written approval has been received from the local planning authority. | 3 | | |
| | | 13.2 | 1 | | E M | High | | | | | | |
| | | 547.4 | | | 1 | Bare Earth | | | | | | |
| T003 | Leyland Cypress | 200 | 7 | | Low | N1, E1, S1, W1 | Tree on neighbouring property. | C1 | No works required. | 4 | | |
| No | | 2.4 | 0 | 0 | Y | High | | | | | | |
| Yes | | 18.1 | | | 3 | Grass | | | | | | |
| T004 | Leyland Cypress | 300 | 12 | | Moderate | N1, E3, S3, W3 | Located in neighbouring property. | C1 | No works required. | 4 | | |
| No | | 3.6 | 0 | 0 | SM | High | | | | | | |
| Yes | | 40.7 | | N | 3 | Grass | | | | | | |
| T005 | Hornbeam | 350 | 10 | | Moderate | N2, E3, S3, W5 | Located in neighbouring property. Tree has been heavily pruned on northern aspect giving asymmetrical crown spread. | B2 | No works required. | 4 | Prune overhanging branches back to boundary or previous pruning points as appropriate. | 0 |
| No | | 4.2 | 0 | 0 | SM | Low | | | | | | |
| Yes | | 55.4 | | | 2 | 0.5 | | | | | | |
| T006 | Silver Birch | 350 | 11 | | Moderate | N3, E4, S3, W3 | Located in neighbouring property. | C2 | No works required. | 4 | | |
| No | | 4.2 | 0 | 1 | SM | Low | | | | | | |
| Yes | | 55.4 | | E | 3 | 1.5 | | | | | | |

| TreeNo | Species | DBH | Height | | Visual | Crown Spread | Problems / Comments | BS Cat | Work Required (TS) | Priority (TS) | Work Required (AIA) | Priority (AIA) |
|-------------|--------------|-----------------------|------------|---------------|----------|----------------|---|--------|--------------------|---------------|---------------------|----------------|
| | | Min Dist | Crown Base | Lowest Branch | Age | Water Demand | | | | | | |
| | | RPA (m ²) | Aspect | Aspect | SULE | Ground Cover | | | | | | |
| T007 | Ash | 200 | 9 | | Moderate | N1, E1, S1, W1 | Located in neighbouring property. | C2 | No works required. | 4 | | |
| No | 2.4 | 0 | 1.5 | Y | Moderate | | | | | | | |
| Yes | 18.1 | | E | 3 | 1.5 | | | | | | | |
| T008 | White Poplar | 200 | 11 | | Low | N1, E2, S3, W3 | Off site tree in area of scrub along railway lines to the east of the site. Unable to access closely due to dense vegetation. | C2 | No works required. | 4 | | |
| No | 2.4 | 3 | 3 | Y | High | | | | | | | |
| Yes | 18.1 | | S | 3 | 3 | | | | | | | |
| T009 | White Poplar | 250 | 10 | | Low | N1, E2, S2, W2 | Off site tree in area of scrub along railway lines to the east of the site. Unable to access closely due to dense vegetation. | C2 | No works required. | 4 | | |
| No | 3 | 2 | 2 | Y | High | | | | | | | |
| Yes | 28.3 | | S | 3 | 2 | | | | | | | |
| T010 | White Poplar | 200 | 10 | | Low | N2, E2, S1, W2 | Off site tree in area of scrub along railway lines to the east of the site. Unable to access closely due to dense vegetation. | C2 | No works required. | 4 | | |
| No | 2.4 | 2 | 2 | Y | High | | | | | | | |
| Yes | 18.1 | | N | 3 | 2 | | | | | | | |
| T011 | Hawthorn | 268 | 7 | | Moderate | N3, E2, S2, W2 | Off site tree in area of scrub and small trees along railway to the east of the site. Specimen displays multistem form. | C2 | No works required. | 4 | | |
| No | 3.216 | 1 | 0.5 | SM | High | | | | | | | |
| Yes | 32.5 | | N | 2 | 0.5 | | | | | | | |
| T012 | Hawthorn | 184 | 5 | | Moderate | N2, E2, S2, W2 | Off site tree in area of scrub and small trees along railway to the east of the site. Specimen displays multistem form. | C2 | No works required. | 4 | | |
| No | 2.208 | 0.5 | 0.5 | SM | High | | | | | | | |
| Yes | 15.3 | | N | 2 | 0.5 | | | | | | | |

Appendix C

Schedule of Works - Irrespective of Development

SCHEDULE OF WORK IRRESPECTIVE OF DEVELOPMENT

Lambs Close, Cuffley, Hertfordshire

Surveyed By: Daniel Gospel

Surveyed: 31/08/2012

Managed By: Daniel Gospel

| Tree No. | Species | Work required | Priority |
|-------------|-------------|---|----------|
| T001 | English Oak | In order to lessen the leverage on the extended limbs it is recommended that careful reductive surgery is undertaken. Also, it is recommended that the major deadwood be removed. Operation to be subject of a separate tree works application and not undertaken until written approval has been received from the local planning authority. | 3 |
| T002 | English Oak | It is recommended that the lowest, most extended laterals on the northern and eastern aspects are removed back to the stem with major deadwood also being removed throughout the crown. Minor reduction should take place on the northern aspect to reduce the leverage towards the block of flats. Operation to be subject of a separate tree works application and not undertaken until written approval has been received from the local planning authority. | 3 |

Appendix D

Schedule of Works to Allow Development

SCHEDULE OF WORKS (AIA)

Lambs Close, Cuffley, Hertfordshire

Surveyed By: Daniel Gospel

Surveyed: 31/08/2012

Managed By: Daniel Gospel

| Tree No. | Species | Work required | Priority |
|-------------|----------|--|----------|
| T005 | Hornbeam | Prune overhanging branches back to boundary or previous pruning points as appropriate. | 0 |

Appendix E

Hayden's Drawing