



The University of Oxford

Begbroke Science Park

Arboricultural Assessment

May 2018

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1.0 INTRODUCTION

- 1.1 This report has been prepared by FPCR Environment and Design Limited on behalf of the Chancellor, Masters and Scholars of the University of Oxford ('the University of Oxford'), the Applicant and owners of the Science Park, to present the findings of an Arboricultural Assessment and survey of trees located at Begbroke Science Park (hereafter referred to as the site), OS Grid Ref SP 478 135 as shown on the Assessment Boundary Plan. The survey was carried out on Thursday 8th March 2018.
- 1.2 The tree survey and assessment of existing trees has been carried out in accordance with guidance contained within British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations*' (hereafter referred to as BS5837). The guidelines set out a structured assessment methodology to assist in determining which trees would be deemed either as being suitable or unsuitable for retention.
- 1.3 The guidance also provides recommendations for considering the relationship between existing trees and how those trees may integrate into designs for development; demolition operations and future construction processes so that a harmonious and sustainable relationship between any retained trees and built structures can be achieved.
- 1.4 The purpose of the report is therefore to firstly, present the results of an assessment of the existing trees' arboricultural value, based on their current condition and quality and to secondly, provide an assessment of impact arising from the proposed development of the site.
- 1.5 This report has been produced to accompany a planning application, on behalf of the University of Oxford, for further development at Begbroke Science Park (BSP), which lies to the east of the A44, to the north-west of Oxford within Cherwell District Council's administrative area and has included an assessment of any impact to the tree cover.
- 1.6 The survey has therefore focused on any trees present within or bordering the site that may potentially be affected by the future proposals or will pose a constraint to any proposed development.

Site description

- 1.7 The site of the Begbroke Science Park comprised a small area of land which housed a number of built structures and included a 17th century Jacobean farmhouse, positioned centrally within the site, sensitively restored that now houses offices and conference facilities, accompanied by a historic walled garden and lawned area. Enveloping the outer peripheries of the farmhouse and walled gardens are a number of purpose built features including Technology Centre and University facilities buildings, research centres, associated outbuildings and the Centre for Innovation & Enterprise, as well as areas of car parking and pedestrianised areas.
- 1.8 Overall the site contained a moderate amount of tree cover of mixed ages, general conditions and quality of which were considered typical of their environment.
- 1.9 The presence of any Tree Preservation Orders or Conservation Area designations that may affect the site has yet to be confirmed by Cherwell District Council. Once this information has been received, the report will be updated accordingly. The site is not situated within a

Conservation Area. Before any tree works are undertaken confirmation of the presence of the statutory constraints should be sought from the Local Authority.

2.0 METHODOLOGY

- 2.1 The survey of trees has been carried out in accordance with the criteria set out in Chapter 4 of BS5837. The survey has been undertaken by a suitably qualified and experienced arboriculturalist and has recorded information relating to all those trees within the site and those adjacent to the site which may be of influence to any proposals. Trees were assessed for their arboricultural quality and benefits within the context of the proposed development in a transparent, understandable and systematic way.
- 2.2 Trees have been assessed as groups where it has been determined appropriate. The term group has been applied where trees form cohesive arboricultural features either aerodynamically, visually or culturally including biodiversity or habitat potential for example parkland or wood pasture. An assessment of individual trees within groups has been made where a clear need to differentiate between them, for example, in order to highlight significant variation between attributes including physiological or structural condition or where a potential conflict may arise.
- 2.3 Trees have been divided into one of four categories based on Table 1 of BS5837, '*Cascade chart for tree quality assessment*'. For a tree to qualify under any given category it should fall within the scope of that category's definition (see below). Category U trees are those which would be lost in the short term for reasons connected with their physiology or structural condition. They are, for this reason not considered in the planning process on arboricultural grounds. Categories A, B and C are applied to trees that should be material considerations in the development process. Each category also having one of three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural or conservation values accordingly.
- 2.4 **Category (U) – (Red):** Trees which are unsuitable for retention and are in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years. Trees within this category are:
- Trees that have a serious irremediable structural defect such that their early loss is expected due to collapse and includes trees that will become unviable after removal of other category U trees.
 - Trees that are dead or are showing signs of significant, immediate or irreversible overall decline.
 - Trees that are infected with pathogens of significance to the health and/ or safety of other nearby trees or are very low quality trees suppressing adjacent trees of better quality.
 - Certain category U trees can have existing or potential conservation value which may make it desirable to preserve.
- 2.5 **Category (A) – (Green):** Trees that are considered for retention and are of high quality with an estimated remaining life expectancy of at least 40 years with potential to make a lasting contribution. Such trees may comprise:
- Sub category (i) trees that are particularly good examples of their species, especially if rare or unusual, or are essential components of groups such as formal or semi-formal arboricultural features for example the dominant and/or principal trees within an avenue.

- Sub category (ii) trees, groups or woodlands of particular visual importance as arboricultural and / or landscape features.
- Sub category (iii) trees, groups or woodlands of significant conservation, historical, commemorative, or other value, for example veteran or wood pasture.

2.6 **Category (B) – (Blue):** Trees that are considered for retention and are of moderate quality with an estimated remaining life expectancy of at least 20 years with potential to make a significant contribution. Such trees may comprise:

- Sub category (i) trees that might be included in category A but are downgraded because of impaired condition for example the presence of significant though remediable defects, including unsympathetic past management and storm damage.
- Sub category (ii) trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals or trees occurring as collectives but situated so as to make little visual contribution to the wider locality.
- Sub category (iii) trees with material conservation or other cultural value.

2.7 **Category (C) – (Grey):** Trees that are considered for retention and are of low quality with an estimated remaining life expectancy of at least 10 years or young trees with a stem diameter below 150mm. Such trees may comprise:

- Sub category (i) unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.
- Sub category (ii) trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value or trees offering low or only temporary / transient screening benefits.
- Sub category (iii) trees with no material conservation or other cultural value.

Tree Schedule

2.8 Appendix A presents details of any individual trees, groups and hedgerows found during the assessment including heights, diameters at breast height, crown spread (given as a radial measurement from the stem), age class, comments as to the overall condition at the time of inspection, BS5837 category of quality and suitability for retention and the root protection area.

2.9 General observations particularly of structural and physiological condition for example the presence of any decay and physical defect and preliminary management recommendations have also been recorded where appropriate.

Hedgerows

2.10 For the purposes of this assessment, a hedgerow is described as any boundary line of trees or shrubs less than 5m wide at the base and are managed under a regular pruning regime. Hedgerows and substantial internal or boundary hedges (including evergreen screens) have been recorded including lateral spread, height and stem diameter(s). Where trees are present within a hedgerow that are significantly different in character from the remainder, these have been identified and recorded separately.

- 2.11 A tree survey in accordance with BS5837 does not assess hedgerows against the Hedgerow Regulations 1997 or specifically from an ecological perspective, and is outside the scope of this assessment.

Other Considerations

- 2.12 It may be necessary during detailed design to undertake further assessment and accurate positioning of woody species within hedgerows and tree groups to assist structural calculations for foundation design of structures in accordance with current Building Regulations. Knowledge of soil type was not known at the time of this tree assessment. If a current soil survey of the site has taken place then it must be read in conjunction with the results of the tree survey.
- 2.13 The exact position of individual trees or species included as part of a tree group, hedgerow or woodland should be checked and verified on site prior to any decisions for foundation design, tree operations or construction activity being undertaken. Further survey work would be required for calculating foundation depths in accordance with NHBC Chapter 4.2 Building near Trees.

Conditions of Tree Survey

- 2.14 The survey was completed from ground level only and from within the boundary of the site. Aerial tree inspections or the internal condition of the stem/s or branches were not undertaken at this stage as this level of survey is beyond the scope of the initial assessment. Evaluation of tree condition given within this assessment applies to the date of survey and cannot be assumed to remain unchanged. It may be necessary to review these within 12 months, in accordance with sound arboricultural practice.

Site Plans

- 2.15 The individual positions of trees and groups have been shown on the Tree Survey Plan. The positions of trees are based on a topographical / land survey, as far as possible, supplied by the client. Where topographical information has not identified the position of trees and hedgerows, their relation to any existing surrounding features has been plotted using a global positioning system and aerial photography to provide approximate locations. The crown spread, root protection area and shade pattern (where appropriate) are also indicated on this plan.
- 2.16 As part of this assessment, a Tree Retention Plan has been prepared to show the proposed layout in relation to the existing tree cover allowing an assessment of any potential conflicts. The plan also identifies which trees would be required to be removed or retained as part of the proposed development.

Tree Constraints and Root Protection Areas

- 2.17 Below ground constraints to future development are represented by the area surrounding the tree containing sufficient rooting volume for the specimen to have the best chance of survival in the long term which is identified as the root protection area (RPA). The RPA has been calculated in accordance with section 4.6 of BS5837 and requires suitable protection in order for the tree to be successfully incorporated into any future scheme.

- 2.18 Where applicable the shape of the Root Protection Area has been modified to take into account the presence of any nearby obstacles (existing or past) which may have restricted root growth and the likely root distribution i.e. the presence of hard standing, structures and underground apparatus.
- 2.19 Where groups of trees have been assessed, the Root Protection Area has been shown based on the maximum sized tree in any one group and so may exceed the Root Protection Area required for some of the individual specimens within the group. Further detailed inspection of the individual trees forming a group may be required where development impacts upon the group.
- 2.20 Above ground constraints such as the current crown spread of the trees and an illustration of the shade pattern (where appropriate) have been considered and identified within the Tree Survey Plan and Tree Retention Plan indicates their potential area of shading influence.

3.0 RESULTS

- 3.1 A total of twenty-eight individual trees, twenty-one groups of trees and six hedgerows were surveyed as part of the Arboricultural Assessment. Trees were surveyed as individual trees and groups of trees where examples are clearly present as per the description. Refer to the Tree Survey Plan and Appendix A – Tree Schedule for full details of the trees included in this assessment.
- 3.2 The table below summarises the trees assessed. Several of the trees have been discussed in more detail following the table, owing to their physical condition or arboricultural significance.

Results Summary

Table 1: Summary of Trees by Retention Category

	Individual Trees	Total	Groups of Trees	Total
Category U - Unsuitable		0		0
Category A (High Quality / Value)	T11, T14, T26	3		0
Category B (Moderate Quality / Value)	T1, T3, T4, T12, T15, T16, T17, T18, T19, T20, T21, T22, T23, T25, T28	15	G1, G3, G4, G5, G6, G8, G9, G12, G13, G14, G16, G17, G20, H1, H2, H3, H4, H6	18
Category C (Low Quality / Value)	T2, T5, T6, T7, T8, T9, T10, T13, T24, T27	10	G2, G7, G10, G11, G15, G18, G19, G21, H5	9

- 3.3 Three individual trees were regarded as offering a high arboricultural quality (category A) namely trees T11, T14 and T26. T11 presented a mature English oak *Quercus robur* which stood within a grassed verge providing separation between an area of car parking and the looping access road. T14, a mature beech *Fagus sylvatica* was recorded within the walled Jacobean garden and was devoid of any significant defects. It formed a prominent landscape feature within the context of its setting. T26, a sliver birch *Betula pendula* which had been retained within an area of hard landscaping, again was considered to provide significant landscape contribution by virtue of its visual prominence.

- 3.4 A significant proportion of the assessed tree cover was categorized as being of a moderate arboricultural quality (category B). In the most part, this was represented by collections of mixed specimen tree cover which had likely been planted in the last circa. 20-60 years and considered characteristic of municipal tree planting often observed on sites of a similar context to BSP. Regularly managed through the application of targeted tree management, often resulting in a sterile tree devoid of any habitat value, the trees were largely devoid of any significant or inhibiting defects.
- 3.5 Trees T20 and T21 were the largest of those category B trees assessed. Comprising two mature Austrian pine *Pinus nigra var. nigra* each had attained heights of 22m, thus by virtue of their mature proportions, presented prominent focal features from numerous viewpoints across the Science Park. As such, the two trees warranted a higher grade despite the presence of several, albeit remediable, defects. T20 had the least defects of the two trees and offered a slightly better form to its close neighbour T21. T21 by comparison had a naturally smaller crown form which had established with a higher crown producing fewer laterals.
- 3.6 Species diversity was provided in the form of a Silk-tassel bush *Garrya elliptica*, considered large and well established for its species, rarely observed in such great proportions, as well as a number of Sweet Gum *Liquidambar styraciflua*, observed in a number of locations across the site.
- 3.7 A total of ten individual trees were categorised as offering low arboricultural quality (category C). Generally, this category is reserved for mature trees which either have established from an early age with irremediable defects or, upon maturity, were beginning to develop age related defects, namely crown die back, large quantities of dead wood or sparse / thinning crown growth.
- 3.8 This contrast was more notable upon comparison of trees T7 and T10. T7, a mature and broadly established ash *Fraxinus excelsior* housed defects characteristic of trees close to over maturity, namely multiple branch socket cavities, dead branches, albeit in this case found to be in smaller proportions and lower amounts as a result of proactive tree management, evident from the pruning wounds noted through the tree's sparse crown. T10 by comparison presented an early mature to mature multi-stemmed Norway maple *Acer platanoides* which, by way of its multi-stemmed form, had developed a number of tight / included unions which are irremediable irrespective of the application of future management. Wet wood and exudates were observed on the lower region of the northern most facing stem. Furthermore, multiple pruning wounds, considered poor by arboricultural pruning standards, were also evident.
- 3.9 Tree group G18 was regarded as offering a low arboricultural quality, in the most part due to the poor overall condition of a significant majority of the trees in the group, many of which were dead / dying and had failed at circa. 8m leaving remnant dead stubs. The larger trees, some extending to heights of 23m, presented crowns which hosted significant volumes of mistletoe.

4.0 ARBORICULTURAL IMPACT ASSESSMENT

- 4.1 The following paragraphs present a summary of the tree survey and discussion of particular trees and groups recorded in the context of any proposed development in the form of an Arboricultural Impact Assessment in accordance with section 5.4 of BS5837. Any final tree retentions will need to be reconciled with the advice contained within this report.
- 4.2 The AIA has been based upon the Framework Plan (drwg.no. TRI001/015 Rev A) and seeks to outline the relationship between the proposals and the existing trees and hedgerows. The drawing shows the proposals for two separate proposed new Employment Areas (Zones B and C). At this outline stage precise details of the development proposals within each of the zones are not available and thus cannot be commented upon in respect of more accurate arboricultural impacts. As such the following paragraphs have provided commentary on the potential impacts.
- 4.3 An overlay of the above layout has been incorporated in the Tree Retention Plan to assist in identifying the relationship and any potential conflicts between the proposals and the existing trees and hedgerows.
- 4.4 From an assessment of the proposals, for any arboricultural impacts, it appears that the layout is able to retain all of the existing trees. The two zones which are subject to new development are confined to areas devoid of any arboriculturally significant tree cover. As such the potential impact would be viewed as minimal and in general confined to lower quality tree cover.
- 4.5 In order to facilitate development in Zones B and C a small number of the assessed individual trees and groups of trees would need to be removed, namely the entirety of groups G9, G10 and G11 along with trees T6, T8 and T9.
- 4.6 The remainder of the assessed tree cover shall be retained and will function as an effective screen from the development to the surrounding area retaining the local landscape character.
- 4.7 In the context of BS5837 classification, the most significant loss of tree cover required to facilitate the proposals would be the loss of G9, a mixed species group of early mature to mature tree cover which had been planted at 3-5m intervals circa. 40-60 years ago, exhibiting a fair overall condition at the time of assessment and considered collectively to be of moderate quality and value (category B). It should be emphasised that if the component trees within G9 had been assessed individually however, they may not have all been considered to offer a moderate quality. This is especially the case for the centrally positioned trees within the group.
- 4.8 At present the trees are positioned within an area of incidental open space adjoining a car park. In order to create room to allow for the design and integration of a feasible layout, these trees would require removal with their loss being appropriately mitigated through the securing of new structured tree planting as part of a supporting landscape scheme. It would be recommended that suitable replacement planting is provided in the form of tree species which are more appropriate and suited to the intended future usage of the site, focussing on those trees which are small to medium upon maturity where space is restricted.

New Tree Planting

- 4.9 The success of any landscaping scheme relies on an adequate provision of a high quality rooting environment within which trees can thrive and reach their full potential. Planting trees with due care and consideration can, in the long term, provide a greater return on a scheme's green investment and ensure trees remain healthy and grow to mature proportions. Healthy mature trees integrate well into the built environment; increase the maturity of the landscape; and help provide a natural green and leafy urban environment in which people would want to reside whilst also benefiting local wildlife.
- 4.10 The planting of trees within confined urban environments should consider the use of appropriately designed planting pits specifically engineered to promote tree health and longevity. The rooting environment will need to provide an adequate volume of quality soil for roots to suitably develop by calculating the amount of available soil volumes needed and selecting species whose mature size is compatible with the site. This is an integral component of the planning stage (Lindsey & Bassuk, 1991).
- 4.11 Wherever possible, following discussions with the client, consultant team, developer and utility companies, common service trenches should be specified to minimise land take associated with underground service provision and facilitation access for future maintenance.
- 4.12 The landscaping scheme should consider the use of both native tree species (for their low maintenance requirements and nature conservation value) and ornamental species (for their contribution to urban design and amenity value). Species choices should be selected on the basis of their suitability for the final site use. Furthermore, during the design process consultation should be made with the Local Planning Authority to obtain information on their tree strategy and integrate the planting proposals with any local policies and initiatives and/or Biodiversity Action Plans (BAP).
- 4.13 Careful consideration would need to be given to the following: ultimate height and canopy spread, form, habit, density of crown, potential shading effect, colour, water demand, soil type and maintenance requirements in relation to both the built form of the new development and existing properties. Through careful species selection, the landscape scheme shall reduce the risk of trees being removed in the future on the grounds of nuisance. Nuisance can be perceived in a number of ways and vary from person to person however most commonly, within the context of trees, low overhanging branches, excessive shading, seasonal leaf fall and the misinformed perception that trees close to buildings cause damage.
- 4.14 Tree planting should be avoided where they may obstruct overhead power lines or cables. Any underground apparatus should be ducted or otherwise protected at the time of construction to enable trees to be planted without resulting in future conflicts.

Tree Management

- 4.15 The layout of the development is currently reserved for subsequent approval. In the course of a reserved matters application pursuant to layout, a review of the relationship between the layout and the retained trees should be undertaken by a qualified arboriculturalist to assess the existing tree cover and prepare a schedule of tree works.

- 4.16 All retained trees should be subjected to sound arboricultural management as recommended within section 8.8.3 of BS5837 *Post Development Management of Existing Trees*, where there is a potential for public access in order to satisfy the landowner's duty of care. Additionally, inspections annually and following major storms should be carried out by an experienced arboriculturalist or arborist to identify any potential public safety risks and to agree remedial works as required.
- 4.17 All tree works undertaken should comply with British Standard 3998:2010 and should therefore be carried out by skilled tree surgeons. It would be recommended that quotations for such work be obtained from Arboricultural Association Approved Contractors as this is the recognised authority for certification of tree work contractors.
- 4.18 All vegetation and, particularly, woody vegetation proposed for clearance should be removed outside of the bird-breeding season (March - September inclusive) as all birds are protected under the Wildlife and Countryside Act, 1981 (as amended) whilst on the nest. Where this is not possible, vegetation should be checked for the presence of nesting birds prior to removal by an experienced ecologist.

General Design Principles in Relation to Retained Trees

- 4.19 The use of "no-dig" construction methods should be considered prior to decisions being made as to the removal of each tree concerned, where conflicts between trees identified for retention and the layout arise. Such methods of construction and the use of industry led specialist engineering solutions i.e. three dimensional "load bearing" cellular confinement systems can be used particularly in the case of carriageways, footways and driveways in order to avoid unnecessary losses of trees.
- 4.20 As recommended by the guidance given in section 7.7 of BS5837 services, where possible, should not encroach within the Root Protection Areas of retained trees. If below-ground services are proposed within a Root Protection Area, modifications to the alignment of the service route may need to be made in order to minimise adverse effects on root stability and overall tree health.
- 4.21 Consideration may also need to be given to the potential for tree roots of newly planted trees and hedgerows to affect or compromise the future services. As far as feasible, it would be preferable that proposed services near both the existing and any new planting should be ducted for ease of access and maintenance and grouped together to minimise any future disturbance.

5.0 TREE PROTECTION MEASURES

- 5.1 Retained trees will be adequately protected during works ensuring that the calculated root protection area for all retained trees can be appropriately protected through the erection of the requisite tree protection barriers. Measures to protect trees should follow the guidance in BS5837 and will be applied where necessary for the purpose of protecting trees within the site whilst allowing sufficient access for the implementation of the proposed layout. These have been broadly summarised below.

General Information and Recommendations

- 5.2 All trees retained on site will be protected by suitable barriers or ground protection measures around the calculated RPA, crown spread of the tree or other defined constraints of this assessment as detailed by section 6 and 7 of BS5837.
- 5.3 Barriers will be erected prior to commencement of any construction work and before demolition including erection of any temporary structures. Once installed, the area protected by fencing or other barriers will be regarded as a construction exclusion zone. Fencing and barriers will not be removed or altered without prior consultation with the Project Arboriculturalist.
- 5.4 Any trees that are not to be retained as part of the proposals should be felled prior to the erection of protective barriers. Particular attention needs to be given by site contractors to minimise damage or disturbance to retained specimens.
- 5.5 Where it has been agreed, construction access may take place within the root protection area if suitable ground protection measures are in place. This may comprise single scaffold boards over a compressible layer laid onto a geo-textile membrane for pedestrian movements. Vehicular movements over the root protection area will require the calculation of expected loading and the use of proprietary protection systems.
- 5.6 Confirmation that tree protective fencing or other barriers have been set out correctly should be gained prior to the commencement of site activity.

Tree Protection Barriers

- 5.7 Tree protection fencing should be fit for the purpose of excluding any type of construction activity and suitable for the degree and proximity of works to retained trees. Barriers must be maintained to ensure that they remain rigid and complete for the duration of construction activities on site.
- 5.8 In most situations, fencing should comprise typical construction fencing panels attached to scaffold poles driven vertically into the ground. For particular areas where construction activity is anticipated to be of a more intense nature, supporting struts, acting as a brace should be added and fixed into position through the application of metal pins driven into the ground to offer additional resistance against impacts. Where site circumstances and the risk to retained trees do not necessitate the default level of protection an alternative will be specified appropriate to the level / nature of anticipated construction activity. The recommended methods of fencing specifications for this site have been illustrated in Appendix B.
- 5.9 It may be appropriate on some sites to use temporary site offices, hoardings and lower level barrier protection as components of the tree protection barriers.

- 5.10 Details of the specific protection barriers for the site can be provided should the application be approved, as part of a site specific Arboricultural Method Statement in accordance with the guidance contained within BS5837. This can be covered by a suitably worded planning condition upon approval of outline planning for the proposed development.

Protection outside the exclusion zone

- 5.11 Once the areas around trees have been protected by the barriers, any works on the remaining site area may be commenced providing activities do not impinge on protected areas.
- 5.12 All weather notices should be attached to the protective fencing to indicate that construction activities are not permitted within the fenced area. The area within the protective barriers will then remain a construction exclusion zone throughout the duration of the construction phase of the proposed development. Protection fencing signs can be provided upon request.
- 5.13 Wide or tall loads etc should not come into contact with retained trees. Banksman should supervise transit of vehicles where they are in close proximity to retained trees.
- 5.14 Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10m of a tree stem. No concrete should be mixed within 10m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree.
- 5.15 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.
- 5.16 Notice boards, telephone cables or other services should not be attached to any part of a retained tree.
- 5.17 Any trees which need to be felled adjacent to or are present within a continuous canopy of retained trees, must be removed with due care (it may be necessary to remove such trees in sections).

Protection of Trees Close to the Site

- 5.18 A number of trees were located on the boundaries of the site and therefore the root protection area and crown spread of these trees will need to be protected in the same way as all the retained trees within the site. All trees located outside the boundaries of the assessment site yet within close proximity to works should be adequately protected during the course of the development by barriers or ground protection around the calculated root protection area.
- 5.19 Any trees which are to be retained and whose Root Protection Areas may be affected by the development should be monitored, during and after construction, to identify any alterations in quality with time and to assess and undertake any remedial works required as a result.

Protection for Aerial Parts of Retained Trees








- 5.20 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 the construction works it is best advised that appropriate, but limited tree surgery, be carried out beforehand to remove any obstructive branches. Any such equipment would have potential to cause damage to parts of the crown material, i.e. low branches and limbs, of retained trees within the protective barriers.

This is termed as 'access facilitation pruning' within BS5837. Any such pruning should be undertaken in accordance with a specification prepared by an arboriculturalist.

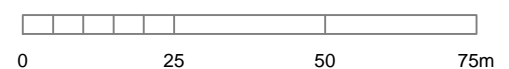
- 5.21 A pre-commencement site meeting with contractors who are responsible for operating machinery will be required, as described above, to firstly highlight the potential for damage occurring to tree crowns and to ensure that extra care is applied when manoeuvring machinery during such operations within close proximity to retained trees to avoid any contact.
- 5.22 In the event of having caused any branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with British Standard 3998:2010 and in agreement with the Local Planning Authority prior to correcting the damage, upon completion of development.



KEY

-  Category A - Trees / Groups of High Quality (BS 5837:2012)
-  Category B - Trees / Groups of Moderate Quality (BS 5837:2012)
-  Category C - Trees / Groups of Low Quality (BS 5837:2012)
-  Hedgerow (Colour indicates BS5837:2012 Category)
-  Root Protection Area (The RPA has been altered where appropriate to reflect underground constraints)
-  Individual / Group Number and BS5837:2012 Category
-  Indicative Shade Pattern (in accordance with BS5837:2012 where appropriate)

Scale 1:1250 @ A3



NOTES

All dimensions to be verified on site. Do not scale this drawing, use figured dimensions only. All discrepancies to be clarified with project Arboriculturalist. Drawing to be read in conjunction with Arboricultural Assessment and Appendix A - Tree Schedule.

Drawing has been produced in colour and is based on digital information in .dwg format, aerial images and/or GPS location where appropriate. A monochrome copy should not be relied upon. The exact position of individual trees or species included as part of a tree group, woodland or hedgerow should be checked and verified on site prior to any decisions for foundation design, tree operations or construction activity being undertaken. Further survey work would be required for calculating foundation depths.

Trees are living organisms that change over time, the condition of all trees illustrated herein, are to be checked by the project Arboriculturalist should works commence 12 months after the date of this survey.

SOME TREES MAY BE SUBJECT TO STATUTORY CONSTRAINTS. IT IS THEREFORE ADVISED THAT NO WORKS SHOULD BE UNDERTAKEN TO ANY TREES ILLUSTRATED HEREIN WITHOUT FIRST OBTAINING THE RELEVANT AUTHORISATION TO DO SO UNLESS AGREED AS PER THE APPROVED PLANS THROUGH PLANNING CONSENT.

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University of Oxford

project
**Begbroke Science Park
Begbroke**

drawing title
TREE SURVEY PLAN

scale	drawn	date
1:1250 @ A3	CTT	March 2018








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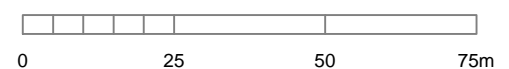




KEY

-  Tree/Group to be Retained
-  Tree/Group to be removed to facilitate the proposals
-  Category U - Unsuitable for retention on arboricultural grounds
-  Hedgerow Proposed to be Retained and Incorporated into the New Development
-  Hedgerow Proposed to be Removed to Facilitate the Development upon Approval of the Application
-  Root Protection Area (Shown for retained trees only)
-  Root Protection Area (The RPA has been altered where appropriate to reflect underground constraints)
-  Individual / Group Number and BS5837:2012 Category
-  Indicative Shade Pattern (in accordance with BS5837:2012 where appropriate)

Scale 1:1250 @ A3



NOTES

All dimensions to be verified on site. Do not scale this drawing, use figured dimensions only. All discrepancies to be clarified with project Arboriculturalist. Drawing to be read in conjunction with Arboricultural Assessment and Appendix A - Tree Schedule.

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**Begbroke Science Park
Begbroke**

drawing title
TREE RETENTION PLAN

scale
1:1250 @ A3

drawn
CTT

date
March 2018

drawing number
8296-T-03

rev
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Appendix A - Tree Schedule

Measurements	Age Class	Overall Condition	Root Protection Area (RPA)
Height - Measured using a digital laser clinometer (m)	YNG: Young trees up to ten years of age	G - Good: Trees with only a few minor defects and in good overall health needing little, if any attention	<ul style="list-style-type: none"> The RPA Radius column provides the extent of an equivalent circle from the centre of the stem (m). The RPA is calculated using the formulae described in paragraph 4.6.1 of British Standard 5837: 2012 and is indicative of the rooting area required for a tree to be successfully retained. Tree roots extend beyond the calculated RPA in many cases and where possible a greater distance should be protected. Where veteran trees have been identified the RPA has been calculated in accordance with Natural England guidance i.e. 15x the stem diameter, uncapped.
Stem Dia. - Diameter measured (mm) in accordance with Annex C of the BS5837	SM: Semi-mature trees less than 1/3 life expectancy	F - Fair: Trees with minor rectifiable defects or in the early stages of stress from which it may recover	
Crown Radius - Measured using a digital laser clinometer radially from the main stem (m)	EM: Early mature trees 1/3 – 2/3 life expectancy	P - Poor: Trees with major structural and/or physiological defects such that it is unlikely the tree will recover in the long term	
Abbreviations est - Estimated stem diameter avg - Average stem diameter for multiple stems upto - Maximum stem diameter of a group	M: Mature trees over 2/3 life expectancy	D - Dead: This could also apply to trees in an advanced state of decline and unlikely to recover	
	OM: Over mature declining or moribund trees of low vigour	The BS category particular consideration has been given to the following <ul style="list-style-type: none"> The health, vigour and condition of each tree The presence of any structural defects in each tree/group and its future life expectancy The size and form of each tree/group and its suitability within the context of a proposed development The location of each tree relative to existing site features e.g. its screening value or landscape features Age class and life expectancy 	
	V: Veteran tree possessing certain attributes relating to veteran trees		

Structural Condition
The following is an example of considerations when inspecting structural condition: <ul style="list-style-type: none"> The presence of fungal fruiting bodies around the base of the tree or on the stem, as they could possibly indicate the presence of possible internal decay Soil cracks and any heaving of the soil around the base Any abrupt bends in branches and limbs resulting from past pruning Tight or weak 'V' shaped forks and co-dominant stems Hazard beam formations and other such biomechanical related defects (as described by Claus Mattheck, Body Language of Trees HMSO Research for Amenity Trees No. 4 1994) Cavities as a result of limb losses or past pruning Broken branches or storm damage Damage to roots Basal, stem or branch / limb cavities Crown die-back or abnormal foliage size and colour

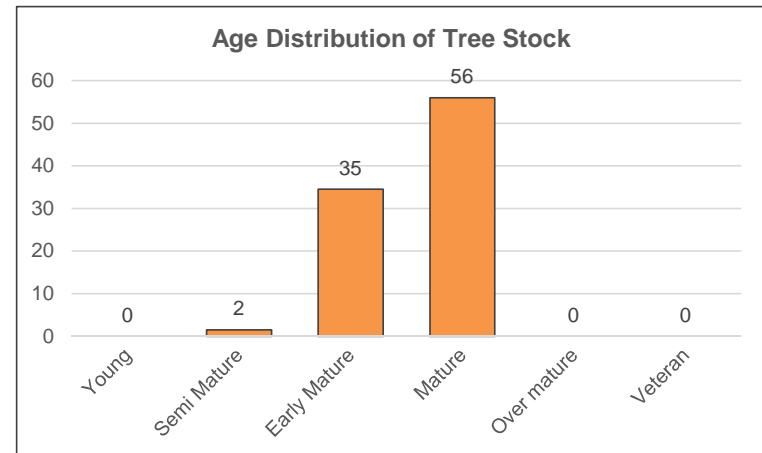
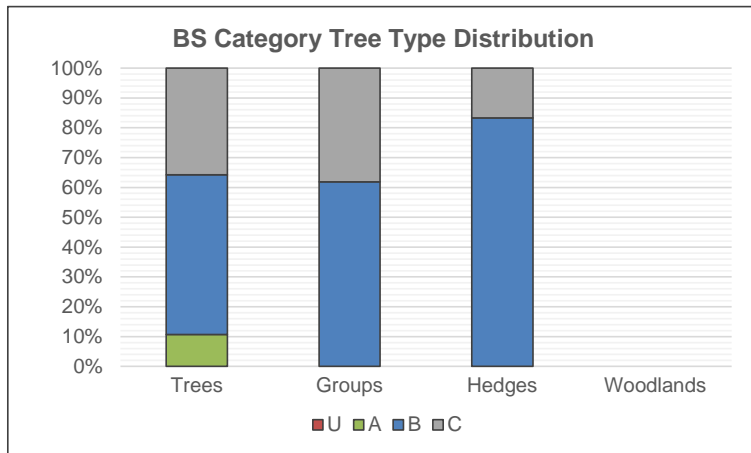
Quality Assessment of BS Category
Category U - Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.
Category A - Trees of high quality with an estimated remaining life expectancy of at least 40 years.
Category B - Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
Category C - Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.
Sub-categories: (i) - Mainly arboricultural value (ii) - Mainly landscape value (iii) - Mainly cultural or conservation value

Appendix Summary

	Individual Trees	Totals	Tree Groups and Hedgerows	Totals
Category U		0		0
Category A	T11, T14, T26	3		0
Category B	T1, T3, T4, T12, T15, T16, T17, T18, T19, T20, T21, T22, T23, T25, T28	15	G1, G3, G4, G5, G6, G8, G9, G12, G13, G14, G16, G17, G20, H1, H2, H3, H4, H6	18
Category C	T2, T5, T6, T7, T8, T9, T10, T13, T24, T27	10	G2, G7, G10, G11, G15, G18, G19, G21, H5	9
	Total	28	Total	27

BS Category Tree Type Distribution displays the proportion of trees assessed in each type to enable a better understanding of the category distribution.

Age Distribution of Tree Stock shows the number of trees in each age category across the tree stock allowing assessment of their longevity to be made.



Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
INDIVIDUAL TREES										
T1	Leyland Cypress Cupressocyparis leylandii	14	680 580 360 340	6	M	F	Characteristic for species Low crown form Multi leadered form Multi stemmed from base No major defects were noted Possible bundle planting	472	12.3	B (i)
T2	Weeping Ash Fraxinus excelsior Pendula	7	320	3	EM	F	Bark wounds noted Limited future potential Minor dead wood evident in the crown (<75mm) Pruning wounds noted Suppressed crown form	46	3.8	C (i)
T3	English Oak Quercus robur	10	315	4.5	EM	F	Branch stubs evident Characteristic for species Compacted ground at the base Minor dead wood evident in the crown (<75mm) No major defects were noted Pruning wounds noted Small and squat tree Hard standing to east	45	3.8	B (i)
T4	English Oak Quercus robur	6	200	3	EM	G	Characteristic for species Low crown form Multi leadered form No major defects were noted Memorial tree	18	2.4	B (i)
T5	Lombardy Poplar Populus nigra 'Italica'	22	582	N - 5 S - 1 E - 4 W - 4	M	F	Bark wounds noted Major dead wood evident in the crown (>75mm) Minor dead wood evident in the crown (<75mm) Asymmetrical crown form	153	7.0	C (i)
T6	Scots Pine Pinus sylvestris	13.5	720	4	EM / M	F	Branch stubs evident Compacted ground at the base Limited future potential Low crown form Minor dead wood evident in the crown (<75mm) Multi leadered form Stem bifurcated at 2m	235	8.6	C (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T7	Ash Fraxinus excelsior	18	550 595	8	M	F	Bark wounds noted Branch socket cavities observed Compacted ground at the base Epicormic growth evident within the crown Minor dead wood evident in the crown (<75mm) Pruning wounds noted Sparse crown Bird box on main stem - east Open and spreading form	297	9.7	C (i)
T8	Rowan Sorbus aucuparia	6.5	200 100 110	3	EM	G	Characteristic for species Low crown form Multi stemmed from base No major defects were noted	28	3.0	C (i)
T9	English Oak Quercus robur	7	205	N - 3 S - 3 E - 5 W - 2	SM / EM	F	Compacted ground at the base Limited future potential Low crown form Minor dead wood evident in the crown (<75mm) No major defects were noted Growing through fence Edge of hard standing Small and squat form	19	2.5	C (i)
T10	Norway Maple Acer platanoides	10.5	485 450 510 240	6	M	F	Bark wounds noted Compacted ground at the base Delaminating bark on main stem Epicormic growth evident within the crown Low crown form Minor dead wood evident in the crown (<75mm) Multi stemmed from base Pruning wounds noted Poor past pruning Single stem cut at 2m Wetwood and exudates on main stem of northern most stem	342	10.4	C (i)
T11	English Oak Quercus robur	14	675	6.5	EM / M	G	Characteristic for species Compacted ground at the base Epicormic growth evident within the crown No major defects were noted Pruning wounds noted Car park and road within 3m of stem	206	8.1	A (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T12	Scots Pine Pinus sylvestris	11.5	508	5	EM / M	F / G	Bark wounds noted Characteristic for species Compacted ground at the base Minor dead wood evident in the crown (<75mm) No major defects were noted Garden tree	117	6.1	B (i)
T13	Laburnum Laburnum anagyroides	6	170	3	EM	F / G	Bark wounds noted Branch stubs evident Epicormic growth evident within the crown Limited future potential Low crown form Minor dead wood evident in the crown (<75mm)	13	2.0	C (i)
T14	Beech Fagus sylvatica	14	580	8	M	G	Characteristic for species Epicormic growth evident within the crown Low crown form No major defects were noted	152	7.0	A (i)
T15	Lawson Cypress Chamaecyparis lawsoniana	8.5	est 400	2	EM	G	Characteristic for species	72	4.8	B (i)
T16	Garrya elliptica	6	11x 100	3	M	G	Characteristic for species Multi stemmed from base No major defects were noted Pruning wounds noted	50	4.0	B (i)
T17	Apple Malus domestica	6	210	N - 4 S - 2 E - 2 W - 2	SM / EM	G	Characteristic for species	20	2.5	B (i)
T18	Lawson Cypress Chamaecyparis lawsoniana	14	est 205 200 180 210	3	EM	G	Characteristic for species No major defects were noted	90	5.3	B (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T19	Austrian Pine Pinus nigra ssp. Nigra	16.5	640	5	M	F	Branch stubs evident Characteristic for species Minor dead wood evident in the crown (<75mm) No major defects were noted Pruning wounds noted Storm damage present	185	7.7	B (i)
T20	Austrian Pine Pinus nigra ssp. Nigra	22	820	N - 4 S - 9 E - 6 W - 4	M	F	Bark wounds noted Branch stubs evident Characteristic for species Minor dead wood evident in the crown (<75mm) No major defects were noted Pruning wounds noted Storm damage present	304	9.8	B (i)
T21	Austrian Pine Pinus nigra ssp. Nigra	22	910	N - 6 S - 6 E - 3 W - 5	M	F	Bark wounds noted Branch stubs evident Characteristic for species Minor dead wood evident in the crown (<75mm) No major defects were noted Pruning wounds noted Storm damage present Sparse crown due to loss of primary laterals Bird box on stem	375	10.9	B (i)
T22	Yew Taxus baccata	9	485	4	M	F / G	Characteristic for species Multi leadered form No major defects were noted Pruning wounds noted	106	5.8	B (i)
T23	Scots Pine Pinus sylvestris	12	375	3	EM	G	Bark wounds noted Branch stubs evident Characteristic for species Minor dead wood evident in the crown (<75mm) No major defects were noted	64	4.5	B (i)
T24	Scots Pine Pinus sylvestris	8	390	N - 5 S - 2 E - 3 W - 3	EM	G	Bark wounds noted Branch stubs evident Characteristic for species Compacted ground at the base Minor dead wood evident in the crown (<75mm) No major defects were noted Suppressed crown form	69	4.7	C (i)

Tree No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
T25	Common Walnut Juglans regia	9	est 350	5	EM / M	G	Characteristic for species Low crown form No major defects were noted Pruning wounds noted	55	4.2	B (i)
T26	Silver Birch Betula pendula	13	560	7	M	G	Bark wounds noted Epicormic growth evident within the crown Minor dead wood evident in the crown (<75mm) Multi leadered form No major defects were noted Retained around hard landscaping	142	6.7	A (i)
T27	Wild Cherry Prunus avium	10	310 240	4	EM	F	Epicormic growth evident within the crown Included bark union Low crown form Pruning wounds noted	70	4.7	C (i)
T28	Sweet Gum Liquidambar styraciflua	8	180	3	SM / EM	G	Bark wounds noted Low crown form Multi leadered form No major defects were noted	15	2.2	B (i)

Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
GROUPS OF TREES										
G1	Hornbeam Carpinus betulus	13	upto 590	5	EM / M	G	Branch stubs evident Characteristic for species Low crown form Multi leaedered form No major defects were noted Pruning wounds noted Trees have been tagged	157	7.1	B (ii)
G2	Silver Birch Betula pendula Lawson Cypress Chamaecyparis lawsoniana	13.5	upto 740	3	EM / M	F	Bark wounds noted Branch stubs evident Characteristic for species Crossing and rubbing branches Minor dead wood evident in the crown (<75mm) Multi leaedered form Multi stemmed from base Pruning wounds noted Several heavily crossing and rubbing branches in upper crown	248	8.9	C (ii)
G3	Silver Birch Betula pendula	12	avg 328	4	EM / M	F / G	Bark wounds noted Characteristic for species Low crown form No major defects were noted	49	3.9	B (ii)
G4	Ash Fraxinus excelsior Crack Willow Salix fragilis Alder Alnus glutinosa	10	avg 150	2	SM / EM	F / G	Characteristic for species Epicormic growth evident within the crown Minor dead wood evident in the crown (<75mm) Multi leaedered form Multi stemmed from base No major defects were noted	10	1.8	B (ii)
G5	Hybrid Black Poplar Populus x canadensis	23	upto 760	4	M	F	Bark wounds noted Branch stubs evident Characteristic for species Epicormic growth evident within the crown Minor dead wood evident in the crown (<75mm) No major defects were noted Row of evenly spaced trees	261	9.1	B (ii)

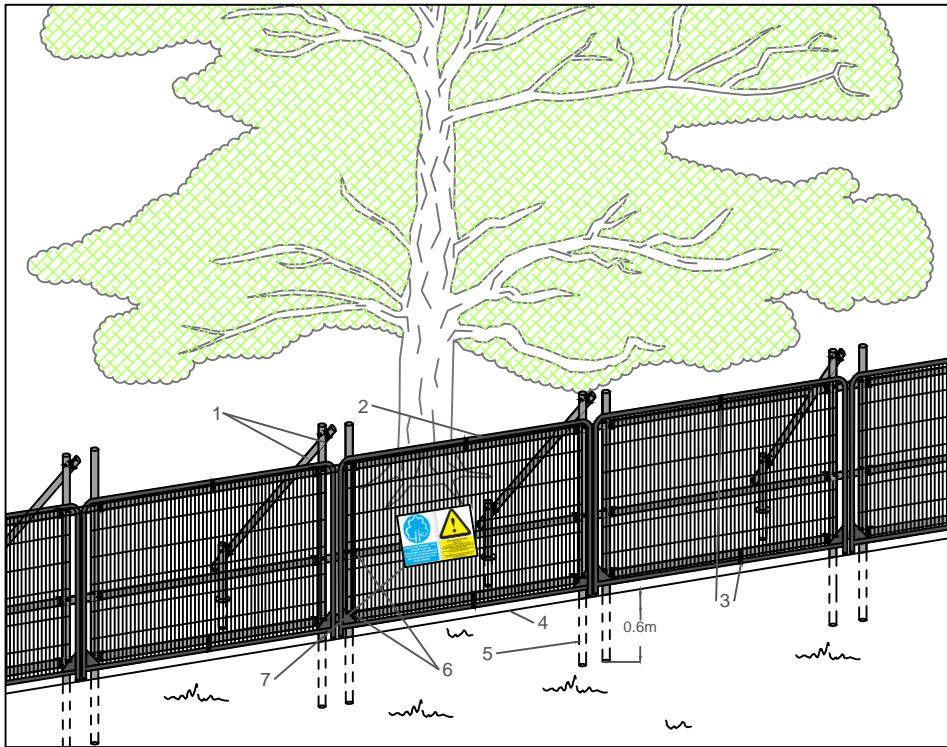
Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
G6	Common Lime <i>Tilia x europaea</i>	7	upto 320	3.5	EM	G	Low crown form Multi leaedered form No major defects were noted Pruning wounds noted	46	3.8	B (ii)
G7	Lombardy Poplar <i>Populus nigra 'Italica'</i>	20	upto 745	4	M	F	Bark wounds noted Characteristic for species Compacted ground at the base Major dead wood evident in the crown (>75mm) Minor dead wood evident in the crown (<75mm) Multi leaedered form No major defects were noted	251	8.9	C (ii)
G8	English Oak <i>Quercus robur</i> Alder <i>Alnus glutinosa</i> Crab Apple <i>Malus sylvestris</i> Scots Pine <i>Pinus sylvestris</i>	14	upto 430	5	EM / M	F	Bark wounds noted Branch socket cavities observed Branch stubs evident Epicormic growth evident within the crown Low crown form Minor dead wood evident in the crown (<75mm) Multi stemmed from base No major defects were noted Mixed specimen tree cover along boundary	84	5.2	B (ii)
G9	Common Lime <i>Tilia x europaea</i> Field Maple <i>Acer campestre</i> Lombardy Poplar <i>Populus nigra 'Italica'</i> Austrian Pine <i>Pinus nigra ssp. Nigra</i> Scots Pine <i>Pinus sylvestris</i>	22	avg 380	5	EM / M	F	Bark wounds noted Branch stubs evident Characteristic for species Dieback of the crown observed Epicormic growth evident within the crown Low crown form Major dead wood evident in the crown (>75mm) Minor dead wood evident in the crown (<75mm) Multi leaedered form Multi stemmed from base Pruning wounds noted Mixed specimen tree cover Lombardy poplar larger of the trees in group Benefit from remedial management	65	4.6	B (ii)

Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
G10	Alder Alnus glutinosa Apple Malus domestica	10	upto 500	6	M	F	Bark wounds noted Branch socket cavities observed Branch stubs evident Crossing and rubbing branches Epicormic growth evident within the crown Low crown form Minor dead wood evident in the crown (<75mm) Multi leadered form Multi stemmed from base Woodpecker holes observed Linear tree group on edge of car parking	113	6.0	C (ii)
G11	Syringa vulgaris	6	7x 80	3	EM / M	P	Limited future potential Low crown form Multi stemmed from base Check species	20	2.5	C (ii)
G12	Beech Fagus sylvatica English Oak Quercus robur Field Maple Acer campestre Wild Cherry Prunus avium Alder Alnus glutinosa Hazel Corylus avellana Holly Ilex aquifolium Dogwood Cornus sanguinea	9	avg 160	2	SM / EM	G	Characteristic for species Etiolated form Interlocking crowns Low crown form Multi leadered form Multi stemmed from base No major defects were noted Landscape buffer planting	12	1.9	B (ii)

Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
G13	Beech Fagus sylvatica Crack Willow Salix fragilis English Oak Quercus robur Field Maple Acer campestre Wild Cherry Prunus avium Alder Alnus glutinosa Hazel Corylus avellana Holly Ilex aquifolium Dogwood Cornus sanguinea	7	avg 160	2	SM / EM	G	Characteristic for species Etiolated form Interlocking crowns Low crown form Multi leaded form Multi stemmed from base No major defects were noted Landscape buffer planting	12	1.9	B (ii)
G14	Swedish Whitebeam Sorbus intermedia Sweet Gum Liquidambar styraciflua	7	upto 210	2	SM / EM	G	Characteristic for species Epicormic growth evident within the crown Low crown form No major defects were noted	20	2.5	B (ii)
G15	Wild Cherry Prunus avium Variegated holly	4	210 180 100 150	3	EM	G	Multi stemmed from base No major defects were noted Pruning wounds noted Landscape planting	49	4.0	C (ii)
G16	Irish Yew Taxus baccata 'Fastigiata'	12	upto 6x 180	3	M	G	Characteristic for species Low crown form Minor dead wood evident in the crown (<75mm) Multi leaded form No major defects were noted	88	5.3	B (ii)

Group No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
G17	Irish Yew Taxus baccata 'Fastigiata' Lawson Cypress Chamaecyparis lawsoniana Leyland Cypress Cupressocyparis leylandii	11	avg 200	3	EM	G	Characteristic for species Low crown form Multi leaedered form Multi stemmed from base Landscape planting in garden	18	2.4	B (ii)
G18	Hybrid Black Poplar Populus x canadensis	17.5	avg 650	5	M	F	Bark wounds noted Branch stubs evident Broken branches evident Compacted ground at the base Crown had been heavily reduced Epicormic growth evident within the crown Minor dead wood evident in the crown (<75mm) Multi leaedered form Sparse crown Situating in road verge	191	7.8	C (ii)
G19	Leyland Cypress Cupressocyparis leylandii	9	avg 200	3	EM	F / G	Characteristic for species Low crown form Multi leaedered form Multi stemmed from base Landscape planting	18	2.4	C (ii)
G20	Beech Fagus sylvatica Apple Malus domestica Whitebeam Sorbus aria	12	upto 495	5	EM / M	F / G	Branch stubs evident Characteristic for species Low crown form No major defects were noted Pruning wounds noted	111	5.9	B (ii)
G21	Balsam Poplar Populus balsamifera	23	upto 650	6	M	P / F	Bark wounds noted Branch stubs evident Dead trees noted Dense undergrowth at the base Epicormic growth evident within the crown Limited future potential Major dead wood evident in the crown (>75mm) Minor dead wood evident in the crown (<75mm) Mistletoe in crowns	191	7.8	C (ii)

Hedge No	Species	Height	Stem Dia.	Crown Radius	Age Class	Overall Condition	Structural Condition	RPA	RPA Radius	BS5837 Cat
HEDGEROWS										
H1	Beech Fagus sylvatica	2.5	avg 60	0.5	EM	G	Maintained hedgerow	2	0.7	B (ii)
H2	Beech Fagus sylvatica	2.5	avg 100	0.5	EM	G	Maintained hedgerow	5	1.2	B (ii)
H3	Beech Fagus sylvatica	2.5	avg 100	0.5	EM	G	Maintained hedgerow	5	1.2	B (ii)
H4	Beech Fagus sylvatica	2.5	avg 100	0.5	EM	G	Maintained hedgerow	5	1.2	B (ii)
H5	Hawthorn Crataegus monogyna	0.5	avg 50	0.5	SM	G	Maintained hedgerow	1	0.6	C (ii)
H6	Beech Fagus sylvatica	2.5	avg 100	0.5	EM	G	Maintained hedgerow	5	1.2	B (ii)



Standard specification for protective barrier

1. Standard scaffold poles
2. Heavy gauge 2m tall galvanized tube and welded mesh infill panels
3. Panels secured to scaffold frame with wire ties
4. Ground level
5. Uprights driven into the ground until secure (min depth of 0.6m)
6. Standard scaffold clamps
7. Construction Exclusion Zone signs



Above ground stabilising systems

1. Stabiliser strut with base plate secured with ground pins
2. Feet blocks secured with ground pins
3. Construction Exclusion Zone signs

NOTES

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APPENDIX B PROTECTIVE FENCING SPECIFICATIONS

CAD file: S:\Arb resources\Basic Templates\Tree Protection\Appendix B - Protective Fencing A4.dwg