

Arboricultural Impact Assessment
&
BS5837 Tree Survey
at
Chalcot, York Road, Netley
for
Mr and Mrs Wilkinson



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1 **Instruction**

To inspect the trees on and adjacent to the site in relation to British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations (BS5837). To give recommendations to reduce the impact of such development where feasible.

I have been instructed due to my qualifications and experience in Arboriculture. I am a qualified member of the Institute of Chartered Foresters, Royal Institute of Chartered Surveyors, a Chartered Environmentalist and have a Professional Diploma in Arboriculture awarded by the Royal Forestry Society, Technicians' Certificate awarded by the Arboricultural Association, HNC in Forestry and a member of the Arboricultural Association, International Society of Arboriculture and the Royal Forestry Society. I started in the industry as a forestry contractor in 1995, progressing to the surveying and management of arboricultural contracts for a national forestry company, the running of the arboricultural part of a horticultural business overseas. From 2000 I worked in Local Government, initially at a Borough Council and subsequently at Hampshire County Council. Since August 2006 I have been practicing as an independent Arboricultural Association Registered Consultant; providing arboricultural advice to private individuals, companies, developers, architects, structural engineers, landscape architects and local authorities.

1a *Revision A, this document, addresses the Planning Inspectorate Appeal decision APP/W1715/W/20/3265379 and relates to the discharge of conditions 6, 8, 9, and 10. Revisions are in italics to differentiate between original comments and revisions with respect to the Appeal Decision.*

2 **Site survey**

The survey of the trees was of a preliminary nature carried out from ground level. Detailed investigations were not carried out and no tree climbed. The conclusions are based on my own observations, qualifications and experience in arboriculture. All dimensions recorded are estimated. No soil assessments have been undertaken.

The trees have been categorised in accordance with British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations (BS5837) (see Appendix 3 for further details).

3 **Site details**

The site is to the south and west of Manchester Road, Netley with the seashore providing the opposite site boundary further to the southwest of the site. There are a number of trees within the site and immediately outside the site to the south east and north west. The site has a gentle aspect to the south west and cliff edge down on the southwest boundary to the shoreline.

4 **Proposals**

Demolition of existing dwelling and garage and replacement with new dwelling and associated car parking / garage.

5 Drawings

Drawings were produced by John Dale Architect Limited and received on the 11th July 2019 and Green Grid Systems and received on the 19th June 2020. The drawings have been provided by the client for the purposes of this assessment and they are:

Elevations, JD-022 ELEV01 Revision B, June 2019

Floor plans, JD-022 FP01 Revision B, June 2019

Site layout, JD-022 SL01 Revision B, June 2019

Sunlight penetration diagram, JD-022 SS01 Revision D, July 2019

RootBridge foundation system, beam and pile, GGS-260897 revision A

Additional documents provided following Appeal decision APP/W1715/W/20/3265379:

Substructure plan, SHNBR 001 by GWPS Design

Part No: 76-S-A-1, Revision A, by Ultimate Screw Piling

Ground floor plan, SHNBR 002 by GWPS Design

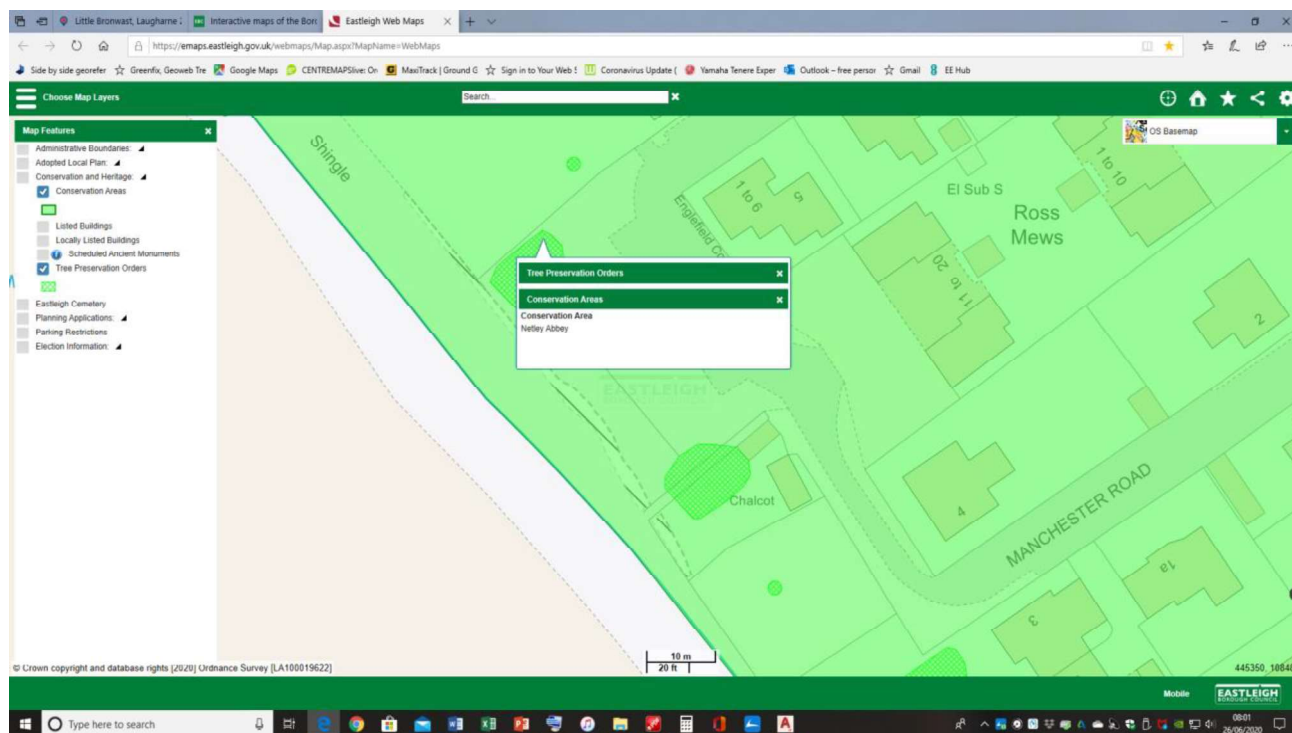
Construction Environmental Management Plan (CEMP)

Proposed Drainage Layout Plan and Details, 23194_201 by The Civil Engineering Practice

Landscape Plan 359_PN_01 – REVD by New Enclosure

6 Tree Preservation Orders and Conservation Areas

The online mapping tool provided by Eastleigh Borough Council (EBC) (accessed 26th June 2020) identifies that the site is within a Conservation Area and subject to TPO. See image below:



Currently EBC does not provide specific details of Tree Preservation Orders (TPO) as part of their interactive mapping process.

This impact assessment has been carried out to assess which trees are worthy of retention and how the proposed scheme may affect them. Appendix 2 BS5837 Tree Survey provides further information in this regard.

7 **Summary**

The main arboricultural feature of the site and locality is the trees within and immediately adjacent to the site. These trees are to be retained (with the exception of T2U) and industry standard construction methods and tree protection methods (tree protection barriers, ground protection, above ground construction, site monitoring) must be used to reduce the impact of the works upon them.

Due to the small size of the site and the extent of anticipated tree root colonisation throughout the site, significant measures to minimise the impact upon the retained trees must be implemented to enable the redevelopment of the site.

Due to the condition of T2U Oak, it is recommended to be removed regardless of the development of the site. However, its removal will allow the proposed development to occur and its replacement can be planted as part of the landscaping for the redevelopment of the site.

Provided the trees to be retained are protected throughout the development in accordance with this Arboricultural Impact Assessment and Appendix 1: Method Statement the impact upon the retained trees is likely to be insignificant. As the impact upon the trees is likely to be insignificant, there is unlikely to be any arboricultural impact upon the character of the local area.

8 Findings

Please see Appendix 2: BS5837 Tree Survey Sheet for specific details.

8.1 Tree constraints

There are trees within and immediately adjacent to the site which have overlapping root protection areas (RPA) within the site effectively meaning that the entire site is colonised by tree roots. Therefore, any construction must account for the retention of tree roots where feasible.

8.2 The above ground constraints relate to the position of the tree stems and their canopies. The majority of tree canopies are outside the site, but the design of the proposals will need to ensure that the proposed redevelopment aids the retention of the tree canopies and causes the least amount of pruning.

8.3 The majority of the trees are outside the site and are to be retained.

8.4 T2U Oak is in poor condition and therefore is recommended to be removed regardless of the redevelopment of the site.

8.5 Proposed demolition

Tree works are to be the first task to enable the demolition of the existing structures. These works are identified in Appendix 2: Tree Survey.

8.6 Due to the tree constraints, the removal of the existing dwelling and garage will need to be carried out from ground protection installed to allow a small machine, working beneath the canopy of the adjacent trees, to work their way into site demolishing the buildings in a 'top down, pull back' manner. Due to the access point for the work the ground protection will need to be progressive to enable all the existing structures to be removed. Due to the tree constraints, it is necessary for the demolition works to be carried out under the direct supervision of an Arboricultural Consultant to ensure that the ground protection and any other tree protection measures they deem necessary are implemented to avoid unnecessary damage to the adjacent retained trees. *Refer to CEMP for additional information.*

8.7 The concrete base to the existing garage is to be broken up and, if deemed beneficial to the adjacent trees, removed. Otherwise the slab can be left in place in a broken form to allow percolation of air and water through to the roots beneath to aid colonisation by tree roots within that area. *CEMP details garage slab to be retained as temporary storage until the construction of the dwelling slab.*

8.8 Once the site is cleared, the tree protection measures for the construction phase can be installed.

8.9 Proposed development

The proposed redevelopment of the site will need to be carried out using above ground construction (suspended slab) for the foundations of the building. Drawing RootBridge foundation system, beam and pile, GGS-260897 revision A demonstrates the system anticipated and principals to be used. This above ground construction is also identified in drawings *Elevations*, ELEV01 Revision B and Sunlight penetration diagram, SS01 Revision D.

- 8.10 On drawing SS01 Revision D the highest existing ground level is 8.81 with the final internal wearing course at 9.26 and therefore there is 0.45m between the final wearing course and the existing ground level to allow for the construction of the suspended slab and the air gap beneath. Further away from this highest point the gaps increase.
- 8.10 *Drawing SHNBR 002 identifies three finished floor levels.*
- a
- 8.10 *The first is 09.260 in the Hall. This position is approximately at a current level of 9.09 of the decking / structure. This demonstrates that there is a difference of 0.17m between the finished floor level and decking. The nearest current ground level is 8.81. Therefore, following the removal of the existing decking / structure, there is anticipated to be c0.45m between current ground level and the finished floor level.*
- b
- 8.10 *The second is 09.040 in the Living. This position is approximately at a current ground level of 8.63. This demonstrates that there is a difference of 0.41m between the finished floor level and existing ground level.*
- c
- 8.10 *The third is 08.890 in the Garage. This position is approximately at a current level of 8.66. This demonstrates that there is a difference of 0.23m between the finished floor level and existing ground level.*
- d
- 8.10 *Therefore, there is sufficient space for the installation of the screw piles (Part No: 76-S-A-1, Revision A and SHNBR 001) and construction of the above ground ring beam (SHNBR 001).*
- e
- 8.11 The use of a suspended slab minimises excavation through the use of screw piles and the construction of the slab above ground level. Installation of the screw piles can be carried out by specialised equipment (for instance a piling rig with a remote power unit which has less weight on the ground at the point of piling) and / or working from a work platform / piling mat protecting the ground (for instance <http://www.ground-guards.co.uk/products/multitrack/> or similar). The piling mat reduces the impact upon the RPA of retained trees thereby reducing the potential harm to the retained trees.
- 8.12 An air gap beneath the suspended structure allows the free exchange of air to the soil. Rainfall captured by the roof of the proposed dwelling must be routed back under the suspended slab through a c50mm diameter perforated pipe set to run underneath the centre slab. The discharge of the rainwater ought to start at the highest point and, in a series of turns run back and forth along the ground contours at 1m separation. Through flow of rain water beneath the proposed dwelling will occur and the routing of the rainfall under the proposed dwelling will maintain the free flow of air and water beneath the structure. In summary, the benefits of a suspended slab include:
- minimal excavation for the screw piles which can be hand dug to 0.5m to avoid significant tree roots
 - minimised compaction through use of specialised equipment and ground protection / work platform / piling mat
 - maintenance of access to water by the tree roots through either routing the rainwater under the structure or via through flow from adjacent soil and
 - maintenance of access to air through utilising a suspended slab with air gap between the ground level and the underside of the slab.

- 8.12 *Proposed Drainage Layout Plan details the discharge of rainwater beneath the structure of the permitted dwelling. Rainwater will be discharge via a perforated pipe into voided subbase material for infiltration to soil beneath. This voided subbase allows for the infiltration of the water into the soil for continued tree root growth and respiration.*
- 8.13 To prevent the perforated pipe beneath the suspended slab from silting up an above ground or in-line self-cleaning trap (for instance <https://www.3pttechnik.co.uk/garden/downpipe-filters-diverters/rainus/> or similar) can to be installed.
- 8.13 *Proposed Drainage Layout Plan details the Back inlet gully and shallow inspection chambers for maintenance and cleaning.*
- 8.14 The car parking (and patio at a future point) can also to be constructed using the same or similar suspended system to avoid unnecessary disturbance to tree roots. The car parking access can utilise a bar grate system for the final wearing course so that rainwater can pass through the structure without impediment. For aesthetic reasons the gaps between the bar grating can be filled with pea shingle or other porous granular fill. Rainwater from the car port and garage can also be routed beneath the structure for the benefit of the adjacent trees.
- 8.15 To enable the transition of the vehicles from Manchester Road to the car parking spaces and pedestrian traffic to the front door, there will need to be a limited amount of excavation adjacent to Manchester Road tapering upwards into the site. This excavation will need to be carried out under the direct supervision of the Arboricultural Consultant to ensure that the excavation works are carried out in the appropriate manner and to address any issues that may arise. The construction is to be a cellular confinement system (for instance <https://greenfix.co.uk/geoweb/geoweb-tree-root-protection.html> or similar) and will need to use a porous final wearing course to retain the area beneath the structure available for tree root colonisation.
- 8.16 As the construction within the RPA of adjacent trees is essentially limited to the installation of the screw piles, the anticipated impact upon the tree roots is likely to be negligible. As such, the “overriding justification” for encroachment within the RPA ought to be considered in relation to the existing use of the site and anticipated negligible impact upon the retained trees.
- 8.17 Due to the height of the tree canopies there is unlikely to be any significant tree works to the retained trees. For instance, the building is less than 6m above existing ground level and the adjacent trees T3B Beech has first primary branching towards the proposed replacement dwelling at 7m. Therefore, if necessary, small diameter branches can be pruned to achieve a reasonable clearance from the dwelling by 1.5 to 2m. The intention is to retain the trees to the north west, north east and south east to screen the replacement dwelling.
- 8.18 Services
Existing foul and water services are to be used. The design of the proposals has retained the existing manhole cover and service position for the foul to discharge from the site.
- 8.18 *Proposed Drainage Layout Plan identifies the route of the foul drain in Proposed Drainage a Layout Plan and its position suspended beneath the above ground slab in Section A-A.*

- 8.19 No gas service is proposed.
- 8.20 Electricity and telecommunications can be brought in by an aerial service avoiding the need for excavation within the RPA of retained trees.
- 8.21 If this is not possible then the services must be designed by an Engineer in consultation with the Arboricultural Consultant (NQF level 4 or higher in Arboriculture) and written approval from the local planning authority (LPA) Arboricultural Officer prior to installation. Further advice is available in Appendix 1: Method Statement and NJUG Volume 4 "Guidance for the planning, installation and maintenance of utility services in proximity of trees".
- 8.22 Site monitoring and tree protection measures
BS5837:2012 Trees in relation to design, demolition and construction - Recommendations states in paragraph 6.3:
- Wherever trees on or adjacent to a site have been identified within the tree protection plan for protective measures, there should be an auditable system of arboricultural site monitoring. This should extend to arboricultural supervision whenever construction and development activity is to take place within or adjacent to any RPA.*
- 8.23 Therefore, due to the tree constraints, it is essential for site monitoring by an Arboricultural Consultant (qualified in Arboriculture to NQF Level 4 or higher) to occur for the proposed works. Details of the occasions and frequency of site monitoring will be given in Appendix 1: Method Statement, Arboricultural Method Statement Summary table: Timing of operations. Direct supervision of the tree works, demolition works, and installation of the suspended slabs is necessary for the initial part of these works to ensure that they are carried out in the appropriate manner.
- 8.23 Arboricultural Consultant site supervision will occur at the following occasions:
- a
- Site clearance
 - Piling mat installation and piling
 - Foul drain installation
 - Rainwater discharge system installation
 - Dwelling slab, garage slab, and vehicle access installation
 - Vehicular access cellular confinement excavation works
- 8.23 Site monitoring notes to be issued to the Site Forman to evidence implementation in accordance with the permitted development. These site notes are subsequently to be issued to the planning authority to aid discharge of planning conditions.
- b
- 8.24 Tree protection measures are necessary to aid the retention of the trees. The details of these tree protection measures are specified in Appendix 1: Method Statement and Tree Protection Plan.
- 8.25 Construction design and implementation will need to carefully consider how the above ground structure is to be brought into site and installed without having a negative impact upon the tree constraints. As such, an Arboricultural Consultant will need to be part of the construction design team to ensure that the structure is feasible and implementable without impacting on the retained trees.

8.25 *The CEMP details site access and phasing.*

a

8.26 Site compound

The space available for site materials is restricted and therefore it is anticipated that an offsite compound is necessary and only the materials to be used each day is brought to site for use from the delivery vehicle. *Refer to the CEMP paragraph 4.4 page 6 for further details.*

8.27 Soft landscaping

Within the RPA of retained trees there must be no changes of grade (up or down) and the amount of new planting limited to reduce the impact upon the retained trees through severance or damage to tree roots.

8.27 *Levels changes within the rear garden are necessary to manage excess rainfall and detailed by Proposed Drainage Layout Plan, see "Typical section through garden and voided subbase" and "Proposed Drainage Layout Plan". Due to the aerated and voided subbase and sandy soils found within the site, no significant impact upon the adjacent trees is anticipated.*

8.27 *Landscaping works as detailed in the Landscape Plan identify to the proposed landscaping works. Works are commensurate with domestic gardening works and therefore no significant impact upon the adjacent trees is anticipated.*

8.28 Post development relationship

The proposals are for a replacement dwelling and therefore there is an existing relationship between the existing dwelling and the trees. The proposals seek to replace the existing dwelling.

8.29 Falling debris is a regular maintenance issue and should be treated as such. A routine of tree survey and inspection will identify foreseeable failures allowing them to be resolved prior to them becoming an issue.

8.30 Falling debris (leaves, seed, needles) is a regular maintenance issue and should be treated as such. If desired, then www.suraflo.co.uk (which prevents debris falling in the gutter through the coanda effect), mesh (www.guttergrid.co.uk or similar) or 'hedgehog' (www.hedgehoggutterbrush.com or similar) inserts can be used to filter out tree debris. Down pipes can also be installed with traps (for instance <https://www.3pttechnik.co.uk/garden/downpipe-filters-diverters/rainus/> or similar) that are easily cleaned or chains used as the down pipe (which requires no cleaning). As the structure is a flat roof, there must be access to the roof to enable the removal of tree debris, for instance ladder rest points.

8.31 Soils

In the event of shrinkable soils being found on the site, it will be for an engineer to design the foundations in accordance with the current industry guidance to reduce any potential risk of tree related subsidence to an acceptable level.

8.32 Other trees

This report considers the trees that may significantly be affected by the proposed development. Any trees not mentioned or not surveyed are sufficiently distant that the proposed works are unlikely to have an influence upon them.

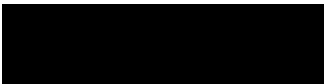
9 **Conclusion**

The main arboricultural features of the site are to be retained and tree protective measures must be utilised to minimise the impact of the proposals upon the trees.

The principles and details of the Arboricultural Impact Assessment and Appendix 1: Method Statement and Tree Protection Plan must be followed to reduce the impact upon the retained trees.

10 **Recommendations**

That, following any permission from the Local Planning Authority, the principles and details of the Arboricultural Impact Assessment and Appendix 1: Method Statement and Tree Protection Plan are followed to reduce the potential for harm to the retained trees during development.



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Appendix 1: Method Statement (for protection of trees during development) and Tree Protection Plan

Method Statement Summary / Timing of operations

	Activity	Date complete
01	Development of the construction plan with input from the appointed Arboricultural Consultant to ensure feasibility of construction.	
02	Pre-commencement meeting with Local Authority Arboricultural Officer, appointed Arboricultural Consultant (NQF Level 4 or higher in Arboriculture) and Site Manager prior to tree works, installation of tree protection measures, demolition works and construction works to discuss the tree protection measures.	
03	Tree works to facilitate development under direct supervision of Arboricultural Consultant.	
04	Installation of tree protection measures (barriers / ground protection) to facilitate demolition and subsequent demolition works with initial supervision by the Arboricultural Consultant.	
05	Reconfiguration of tree protection measures for construction with written approval by the appointed Arboricultural Consultant of the correct installation of the Tree Protection measures to allow development.	
06	Construction of the suspended slabs with Arboricultural Consultant site monitoring: ○ Site clearance ○ Piling mat installation and piling ○ Foul drain installation ○ Rainwater discharge system installation ○ Dwelling slab, garage slab, and vehicle access installation ○ Vehicular access cellular confinement excavation works	
07	Written approval by the appointed Arboricultural Consultant for the removal of the Tree Protection Measures following the completion of the construction and hard landscaping to allow soft landscaping.	
08	Soft landscaping works	
09	Tree survey for remedial works	
10	Remedial tree works	
11	Occupancy	

Appendix 2: BS5837 tree survey

BS5837 Tree Survey Data

Site Chalcot, Manchester Road, Netley
 Date of survey 21st May 2019
 Job reference J1187.02
 Surveyor Ben Abbatt

Designation	Reference number	BS 5837 Category	Species	Height (m)	Single stem diameter (mm at	N Canopy spread (m)	E Canopy spread (m)	S Canopy spread (m)	W Canopy spread (m)	Canopy height (m)	Canopy height cardinal point	Age class	Physiological condition	Structural condition	Condition notes
T	1	C1	Oak <i>Quercus robur</i>	8	300	3	3	3	3	3	NW	Middle aged	Good	Fair	Offsite. Cliff edge.
T	2	U	Oak	18	560, 420, 260							Mature	Poor		Severe base.
T	3	B1	Beech <i>Fagus sylvatica</i>	23	1200	10	12	12	10	7	NW	Mature	Good	Fair	Offsite. Two stems through.
T	4	C1	Oak	16	640	3	8	2	1	4	NE	Mature	Good	Fair	Stem diameter pipe as.
T	5	B1	Oak	13	505	6	7	3	3	4	E	Middle aged	Good	Good	Offsite.
T	6	B1	Beech	13	500	7	5	4	5	2	~	Middle aged	Good	Good	Offsite.
G	7	C1	Holly <i>Ilex aquifolium</i> , Laurel <i>Prunus lauroceracus</i> , Hawthorn <i>Crataegus monogyna</i>	6								Middle aged	Good		
G	8	C1	Holly, Rhododendron, Sycamore <i>Acer pseudoplatanus</i> , Birch <i>Betula pubescens</i>	6								Middle aged	Good		Sycamore

General notes

The tree survey is not a "Tree Hazard Survey" and must not be relied upon in this regard. Such a survey is to be carried out, on the instruction of the Site Manager as detailed on the Tree Protection Plan, Timing of operations.

We have not checked whether the site is within a Conservation Area or whether the trees are under Tree Preservation Order (TPO). Prior to any tree works confirmation of whether these legal restrictions apply to the site or trees ought to be sought from the Local Planning Authority (LPA). If the trees stand within a Conservation Area designated under the Town and Country Planning Act the LPA will normally require 6 weeks notice of intention to carry out any tree works as detailed in the survey. If the trees are under TPO then the LPA will normally require an application for any tree works. Some tree works are exempt, for instance if the trees are dead or dangerous, and certain works can be carried out without application. It is necessary to give the LPA at least five days notice prior to carrying out any of these tree works under these exemptions. This survey, with recommendations, can be used to support any such application or notice.

Wildlife issues are of significant concern to the general public. A balance has to be found between the protection of wildlife and the need for safety when managing trees. The Wildlife and Countryside Act (1980) and Countryside Rights of Way Act (2000) give statutory protection to wild birds, bats, mammals, some invertebrates and plants. It is important to ensure that this legislation is properly considered when carrying out any works to trees.

Bird nests were not identified whilst on site. However, any Arborist carrying out the tree works should ensure that there is no disturbance to nesting birds prior to the works being carried out. Further guidance upon the appropriate timing of the works can be sought from DEFRA, if necessary. Where nesting birds are found, further information should be sought from DEFRA 08459 33 55 77 or helpline@defra.gsi.gov.uk. Prior to any works being implemented the tree contractor must identify whether there are any bats or birds using the tree as roost or nest. If such habitation is identified, then the tree contractor must obtain the necessary licence from Natural England (0845 601 4523 www.naturalengland.org.uk) to carry out the works.

In this instance, considering the size of the trees, their location and features I believe that there is a medium potential of bats using the mature trees as a roost site. A bat survey prior to tree works is not recommended as it would be difficult to determine the location of any exit point from the roost within the tree by a bat survey and also confusion may also arise from bats travelling from other roosts. Any such exit could more easily identified by a competent tree worker. During the tree works the contractor should carry out the tree works with bats as an active consideration and follow the current industry best practice, e.g. Arboricultural Association Guidance Note 1 Bats in the context of tree work operations 2011, which a competent tree contractor should be familiar with.

Typical significant defects that are to be identified can be referred to in "Hazards from Trees, a general guide", "Principles of tree hazard assessment and management" both by David Lonsdale and "The body language of trees" by Claus Mattheck published by the Forestry Commission and the Department of the Environment respectively.

Trees are dynamic structures and as such their condition and health may change in a short period of time, particularly in relation to changes in their immediate environment and circumstances, as such the survey relates to the visible condition found on the day of the survey.

All tree works to be carried out to BS3998: Recommendations for Tree Works (including the biosecurity measures). Biosecurity measures: To minimise to potential for contamination of the tree from other tree works it is appropriate to sterilise tools to be used before and after the works are implemented. Appropriate disinfectant includes Propellar or Cleankill Sanitizing spray. Loose debris is to be brushed off prior to treating with disinfectant to ensure appropriate application. See [http://www.forestry.gov.uk/pdf/FCMS028-guidance.pdf/\\$file/FCMS028-guidance.pdf](http://www.forestry.gov.uk/pdf/FCMS028-guidance.pdf/$file/FCMS028-guidance.pdf) for further information on Biosecurity and <http://www.forestry.gov.uk/forestry/infid-9fjd2d> for disinfectant information.

Appendix 3: Key to BS5837 tree survey

No	Tree number.	
Species	Species of tree.	
Height	Height measured in metres and rounded to the nearest metre.	
Stem Ø	Stem diameter at 1.5metres following normal Forestry conventions or immediately above the root flare for multiple stemmed trees, in millimetres.	
Canopy spread	Canopy spread in metres is taken at the four cardinal points to derive a reasonable representation of the canopy shape in plan view.	
Height of crown	Height in metres of crown clearance above adjacent ground level.	
Age class	Young	A tree considered to be less than approximately 20 years old.
	Middle aged	A tree in approximately the first 1/5th of its normal life span with apical dominance (rapidly growing with a clear main leader) and not yet fully at its environmental potential full height.
	Mature	A tree in its 2/5ths to 5/5ths of its normal life span with apical dominance lost and at its environmental potential full height.
	Veteran	A tree of interest biologically, aesthetically or culturally because of its age and is old relative to others of the same species. Refer to Natural England definition.
Condition (Physiological and Structural)	Good	A tree of typical physiological and structural condition that requires only general tree works to facilitate its retention in the landscape.
	Fair	A tree of impaired physiological and / or structural condition that may require remedial and general tree works to facilitate its retention in the landscape.
	Poor	A tree of significantly impaired physiological and / or structural condition that will require remedial and general tree works to facilitate its retention in the landscape if feasible.
Preliminary management recommendations	As per BS3998: 2010 Recommendations for Tree Works.	
Category grading	See below: Table 1.	
Estimated remaining contribution (years)	Estimated remaining contribution in years (e.g. < 10, 10+, 20+, 40+).	
Root protection area	See below: Extract from BS5837:2012.	

All measurements in metres are approximate and rounded to the nearest metre.

Table 1 - Cascade chart for tree quality assessment, BS5837: 2012 Trees in relation to construction - Recommendations

TREES UNSUITABLE FOR RETENTION			
CATEGORY AND DEFINITIONS	CRITERIA		
Category U Those 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 that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning). • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline. • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low-quality trees suppressing adjacent trees of better quality. <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5 of BS5837:2012</i>		
TREES TO BE CONSIDERED FOR RETENTION			
CATEGORY AND DEFINITIONS	CRITERIA - SUBCATEGORIES		
	1 Mainly arboricultural values	2 Mainly landscape values	3 Mainly cultural values, including conservation
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue).	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features.	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation.	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.	Trees with material conservation or other cultural value
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 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits.	Trees with no material conservation or other cultural value.

Root protection area (RPA)

Extract from BS5837:2012.

4.6.1 For single stem trees, the RPA (see **3.7**) should be calculated as an area equivalent to a circle with a radius 12 times the stem diameter. For trees with more than one stem, one of the two calculation methods below should be used. In all cases, the stem diameter(s) should be measured in accordance with Annex C, and the RPA should be determined from Annex D. The calculated RPA for each tree should be capped to 707 m².

a) For trees with two to five stems, the combined stem diameter should be calculated as follows:

$$\sqrt{(\text{stem diameter } 1)^2 + (\text{stem diameter } 2)^2 \dots + (\text{stem diameter } 5)^2}$$

b) For trees with more than five stems (not illustrated in Annex C), the combined stem diameter should be calculated as follows:

$$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$$

4.6.2 The RPA for each tree should initially be plotted as a circle centred on the base of the stem. Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution.

4.6.3 Any deviation in the RPA from the original circular plot should take account of the following factors whilst still providing adequate protection for the root system:

- a) the morphology and disposition of the roots, when influenced by past or existing site conditions (e.g. the presence of roads, structures and underground apparatus);
- b) topography and drainage;
- c) the soil type and structure;
- d) the likely tolerance of the tree to root disturbance or damage.



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