

**Arboricultural Impact Assessment**  
**&**  
**BS5837 Tree Survey**  
**at**  
**Land south of Maddoxford Lane, Boorley Green**  
**for**  
**Foreman Homes Limited**



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Reference: J1127 06 P2 73 Revision A  
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1 **Instruction**

To survey the trees on and adjacent to the site in relation to British Standard 5837:2012 Trees in relation to design, demolition and construction - Recommendations. 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.

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.

3 **Site details**

The site is south of Maddoxford Lane. The site has a gentle south westerly aspect and has mature trees are principally along the western edge with occasional trees along the eastern edge. An easement outside and along the western edge of the site has been recently installed.

4 **Proposals**

Development of 73 dwellings with access from Maddoxford Lane, site infrastructure, open space and associated landscaping as detailed in drawing Site Plan 18.093.02 Revision C and in RM/19/84879.

5 **Drawings**

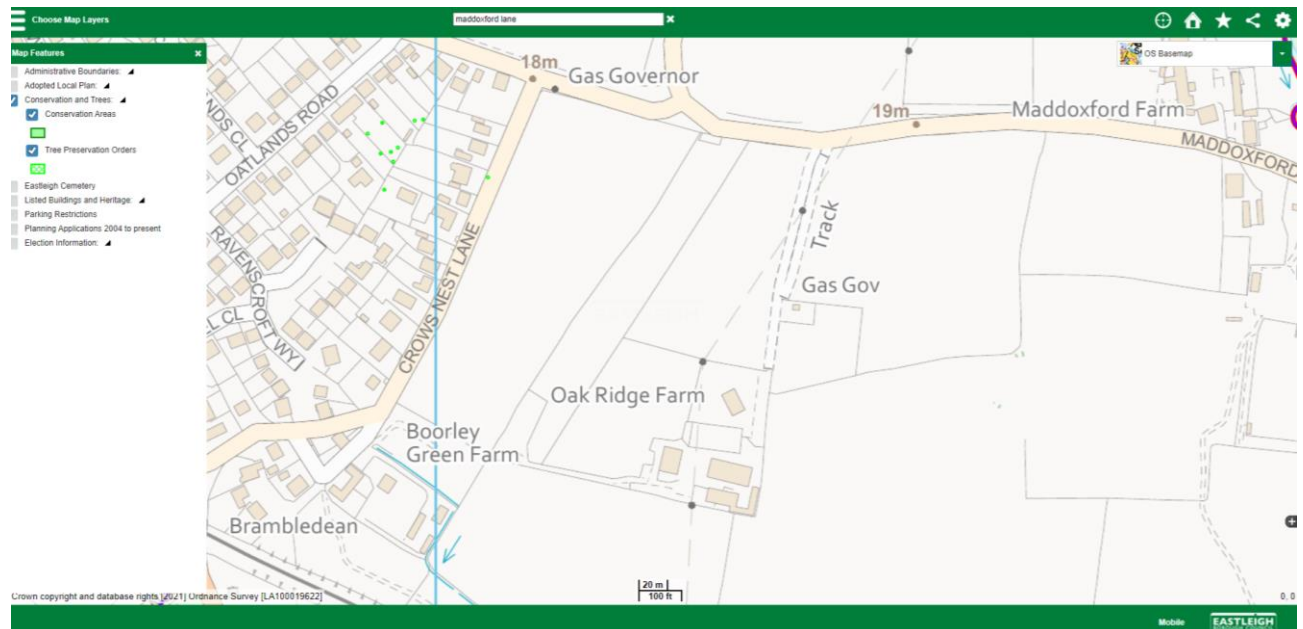
Site layout drawings were produced by HGP Architects received on the 13<sup>th</sup> May 2021 and Ridge 26<sup>th</sup> October 2022 in DWG and PDF format relating to the site layout and to be used for the purpose of producing this Arboricultural Impact Assessment and associated documents.

Site Plan 18.093.02 Revision E.

Proposed root protection zone sections, 1170 Revision P02.

## 6 Tree Preservation Orders and Conservation Areas

No details have been sought from the planning authority on whether the trees on or adjacent to the site are protected by Tree Preservation Order (TPO) or within a Conservation Area. The interactive mapping (see image below) provided by Eastleigh Borough Council (accessed 9<sup>th</sup> June 2021) does not identify any TPOs or Conservation Areas relating to the site.



<https://emaps.eastleigh.gov.uk/webmaps/Map.aspx?MapName=WebMaps>

This impact assessment has been carried out to assess which trees are worthy of retention and how the proposed scheme may affect them.

## 7 Summary

The main arboricultural feature of the site and locality are the mature trees and hedges around the perimeter of the site, particularly on the western side. These trees are to be retained and industry standard construction methods and tree protection methods (tree protection barriers, above ground construction of footway, site monitoring) should be used to reduce the impact of the works upon them.

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 Proposed site layout

The proposed site layout is distant from the retained trees on the western boundary and, therefore, there is unlikely to be any significant impact upon these trees.

8.2 To create and maintain a reasonable relationship between the retained trees and the proposed development it is appropriate to reduce public access and prevent mower compaction of the soil between the access road and the retained trees along the western edge. Therefore, a 300 mm high mound of top soil is to be installed to impede vehicle. This exclusion of mowers will reduce potential ground compaction and, as the herbaceous layer can be cut once a year, the annual vegetation will deter public access as well. This will retain the continued growing environment for the trees into the foreseeable future.

8.3 The trees on the eastern boundary are adjacent to the existing farm track and / or within the farm compound. The removal of the existing hard standing adjacent to these trees will need to be carried out in accordance with Appendix 1: Method Statement and Tree Protection Plan specifically "Method statement for the removal of the existing hard surfaces" to avoid unnecessary harm to these trees. The hard-standing removal works must be carried out under the supervision of the appointed Arboricultural Consultant. As this hard standing is to be removed and replaced with natural, weed free, aerobic top soil with good crumb structure, the growing circumstances of these trees are likely to improve and therefore this can be considered a benefit of the proposed development.

### 8.4 Proposed footways along the western boundary

Where the footways are within the root protection area (RPA) of retained trees an above ground no dig cellular confinement system (CCS) (for instance <https://greenfix.co.uk/geoweb/geoweb-tree-root-protection.html> or similar), an industry standard special surface construction, is to be installed to minimise the impact upon the retained trees. The CCS is to be laid out on top of the existing ground following removal of the herbaceous layer. The entire final wearing course within the RPA must be load bearing and porous to allow the free exchange of air and water, for instance:

- large particle resin bonded surfaces  
[www.green-tech.co.uk/store/product\\_info.php?products\\_id=476](http://www.green-tech.co.uk/store/product_info.php?products_id=476)
- gravel surfacing  
[www.ced.ltd.uk/documents/4.pdf](http://www.ced.ltd.uk/documents/4.pdf)  
[www.geosyn.co.uk/brochures/DuoBlock\\_02.pdf](http://www.geosyn.co.uk/brochures/DuoBlock_02.pdf)  
[www.netlon.co.uk/turfsystems/prod-netpave50.htm](http://www.netlon.co.uk/turfsystems/prod-netpave50.htm)

8.5 Other suppliers and materials may be used so long as they do not cause contamination, excessive compaction and maintain the free exchange of air and water.

8.6 The thickness of the CCS structures may vary due to their different uses. Therefore, as the footway is for pedestrian use, the thickness of the CCS must be >75mm with the final porous wearing course on top (>75mm) for a full depth of >150mm. Guidance from the manufacturer in this matter is essential to ensure that the correct thickness of CCS is used for the specified use. It is important that the depth of the CCS material is specified by the manufacturer with data provided from the site manager on the soils identified on site beneath the structure. This will allow the manufacturer to identify the extent of deformation of the CCS and to

demonstrate that the ground beneath the CCS will remain available for tree root colonisation through looking at the specific soil bulk density and the California Bearing Ratio (CBR) before and after the installation of the CCS. These details are to be submitted to the appointed Arboricultural Consultant for their approval.

- 8.7 Prior to the CCS footway construction the area must be protected by tree protective fencing to prevent damage to retained tree roots. Immediately prior to construction of the CCS a site meeting between the Site Manager and the appointed Arboricultural Consultant is necessary to agree access through the tree protective fencing to allow construction of the CCS. Written agreement from the local planning authority (LPA) must be obtained prior to the construction footway access through the tree protective fencing.

8.8 Poplars

The group, G27C on the western side of the site, of Poplars propagates through sending roots through the soil to create new trees distant from the parent tree. As such, this is an invasive plant and can disrupt infrastructure and it is appropriate to remove these trees and treat their stumps to prevent regrowth and sucker growth. Appropriate hedge and tree planting ought to be implemented to maintain the character of the area.

8.9 Vehicular access on east side

Due to the gentle western aspect and the highway requirements for slopes, it is necessary to excavation partially within the RPA of retained trees, G45B, on the eastern side of the site (see Proposed root protection zone sections, 1170 Revision P02). To aid the retention of the trees and the potential impact upon them, the excavation works must be carried out in accordance with Appendix 1 Method Statement and Tree protection Plan and under Arboricultural Consultant supervision. Arboricultural supervision of excavation works is necessary to address the potential for tree root damage and to identify remedial works, with timescales, that may be necessary. To minimise the extent of excavation a vertical narrow retaining wall is to be installed. To mitigate the potential impact, the existing access is to be removed, in accordance with Appendix 1 Method Statement and Tree protection Plan, and natural, weed free, aerobic topsoil used to replace the lost hard standing. These works will improve the growing conditions of the trees closer to the tree canopy.

8.10 Vehicular link to the site to the west

Where the access road vehicular link to the development to the west and the pedestrian footway link to the west of the site traverse the ditch along the boundary, the construction of these structures will need to be above ground cast concrete slabs on mini or screw piles. Such above ground structures minimise the impact upon the RPAs of adjacent retained trees. Due to the canopies of the retained trees the use of normal piling equipment is not feasible and piling equipment and pile to a maximum height of 5m (to fit beneath the canopy of adjacent retained trees) must be used. The thickness of the cast concrete access road and footway will need to be determined by an Engineer and allow for a c60mm air gap beneath to avoid excavation and compaction and to allow the free exchange of air and water. As the impact is limited to the excavation necessary for the steel sleeved concrete filled mini piles or the screw piles, then the potential impact is minimal and ought to not reasonably be included in the nominal 20% encroachment of hard standing within the RPA of retained trees as detailed in BS5837. Due to the levels of the site, the access road and footway will need to be lifted above the ditch to avoid excavation damage to the roots within the adjacent ground. Where the adjacent access road and footway construction meet the above ground slabs, there will need to be ramps up to the slabs. Such ramps must be constructed outside

the RPA of adjacent trees or constructed using a cellular confinement system (see paragraphs 8.4 to 8.7) to avoid unnecessary damage to the adjacent trees. Depth of the construction will need to be greater due to the increased loading. Advice must be sought from the product provider in this regard.

8.11 Services

New services must avoid the RPAs of retained trees. 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). 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”. Any route which encroaches within the canopy spread, RPA or measures to protect the trees during construction will need written acceptance from the LPA prior to installation.

8.12 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.*

8.13 Therefore, it is necessary 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.

8.14 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.

8.15 Site compound

The site compound can be located within the site and distant (>1m) from tree protection measures. If there is insufficient space within the site for storage materials will need to be delivered to site on an ‘as required basis’ and the use of an offsite storage compound may be necessary.

8.16 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.

8.17 Post development

Due to the design of the site layout, there is no significant adverse post development pressures anticipated.

- 8.18 Falling branch 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.
- 8.19 Falling leaves, seed and needles debris is a regular maintenance issue and should be treated as such. If desired, then [www.suraflow.co.uk](http://www.suraflow.co.uk) (which prevents debris falling in the gutter through the coanda effect), mesh ([www.guttergrid.co.uk](http://www.guttergrid.co.uk) or similar) or 'hedgehog' ([www.hedgehoggutterbrush.com](http://www.hedgehoggutterbrush.com) or similar) inserts can be used to filter out tree debris. Down pipes can also be installed with traps that are easily cleaned or chains used as the down pipe (which requires no cleaning).
- 8.20 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.
- 8.21 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 should 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**

1. A pre-commencement meeting prior to the start of any works between the Local Planning Authority (LPA) Arboricultural Officer, appointed Arboricultural Consultant and Site Manager must take place to clarify any additional protection measures required.

confirm the position of the tree protective fencing and / or ground protection on site;  
discuss any potential conflict with the tree protection measures and identify acceptable solutions;  
understand the timeframe for the site clearance, demolition and construction phases;  
identify and agree the frequency of Arboricultural site monitoring, recording process and reporting procedure to the Local Planning Authority to aid discharge of relevant planning conditions (appointed Arboricultural Consultant to issue written report to Site Manager and Local Planning Authority discussing findings from site monitoring).

2. Tree works may be required in the interest of good arboricultural practice and to facilitate the use of the site once development is complete. These works are listed in the recommendations of Appendix 2: BS 5837 Tree Survey. All tree works should be carried out according to BS3998: 2010 'Recommendations for tree works' and carried out by an appropriately competent, experienced, qualified and insured arboricultural contractor and preferably under the supervision of the Arboricultural Consultant.

The protective barriers and guard protection must be erected according to drawings "Tree protection plan" and Appendix 2. B55837 survey sheet which is based upon the guidelines in B55837: 2012 "Trees in relation to construction". Barriers must be fit for the purpose of excluding construction activity and must be erected in such a way that the trees are protected from construction activities. On all sites, special attention must be paid to ensure that the barriers remain rigid and complete. Barriers must consist of a 1.8 high scaffold framework comprising a vertical and horizontal framework, well-braced to resist impacts, with vertical tubes spaced at a maximum interval of 3m. Onto this 1.8m high weldmesh panels should be securely fixed with wire or scaffold clamps. Weldmesh panels on rubber or concrete feet are not resistant to impact and must not be used. If an alternative specification is preferred then it must be agreed in writing with the Local Planning Authority prior to installation.

Ground protection for wheeled or tracked construction traffic movements within the root protection area (RPA) must be designed by an engineer and Agricultural Consultant to accommodate the likely loading and may involve the use of proprietary systems (for instance [www.evetrakway.co.uk](http://www.evetrakway.co.uk)) or reinforced concrete slabs or a series of railway sleepers pinned together or other suitable system to ensure that the bulk density of the soil remains lower than 1.5g/cm3. If an alternative specification is preferred then it must be agreed in writing with the Local Planning Authority prior to installation.

Any encroachment within the RPA or breaches of the tree protection measures must be reported to the appointed Arboricultural Consultant to enable them to provide recommendations to mitigate the encroachment / breach and to allow the issue and mitigation to be reported to the Local Planning Authority for their written approval.

5. Once the construction exclusion zone has been protected by barriers then construction work can commence. All weather notices should be erected on the barriers with words such as "Construction exclusion zone - keep out" (see recommended sign on the Tree Protection Plan).

6. Care should be taken when planning site operations to ensure that wide or tall loads or plant with booms, lifts and counterweights can operate without coming into contact with retained trees. Such contact can result in serious damage to the equipment and retained trees, and might make the safe retention of the retained trees impossible. Consequently, any transit or transverse of plant in close proximity to trees should be conducted under the supervision of a banksman to ensure that adequate clearance from trees is maintained at all times. In some circumstances it may be impossible to maintain adequate clearance thus requiring tree works to clear the necessary access.

Material which will contaminate the soil, e.g. concrete (dry or mixed), diesel, oil, vehicle washings, etc. must not be discharged within the root protection area. It is essential that an allowance should be made for the slope of the ground so that damaging materials such as concrete washings, mortar, diesel or oil cannot run towards the trees.

Notice boards, telephone cables or other services must not be attached to any part of the tree.

7. The advice of the appointed Arboricultural Consultant must be sought where underground structures present within the RPA are / will become redundant. In general it is preferable to seal these off as this avoids the need for significant excavation.

8. Any excavations in proximity of retained trees will require certain precautions to avoid unnecessary damage to trees to be retained, and should be undertaken as follows:

- All excavations should avoid damage to the protective bark covering larger roots. Roots, whilst exposed, should be wrapped in dry, clean hessian to prevent desiccation (drying) and to protect from temperature changes.
- Roots smaller than 25mm diameter may be pruned back, preferably to a side branch, using a proprietary clean cutting tool such as bypass secateurs or hand saw.
- Roots larger than 25mm diameter should only be severed following consultation with the appointed Arboricultural Consultant, as the roots may be essential to the tree's health and stability.
- Prior to backfilling, any hessian wrapping should be removed and retained roots should be surrounded by sharp sand (builder's sand should not be used because of its high salt content) to a depth of 100mm, before any material is replaced. This material, e.g. general purpose grade topsoil to BS3882, should be free of contaminants and other foreign objects potentially injurious to tree roots.
- Further details are available in NJUG Volume 4 'Guidance for the planning, installation and maintenance of utility services in proximity of trees'.
- Any excavation within the RPA of retained trees must be subject to Arboricultural Consultant supervision.

9. There are no services to be installed within the RPA of the retained trees, other than as described in the Arboricultural Impact Assessment or shown on the Tree Protection Plan.

11. Following completion of the construction and hard landscaping works a site meeting between the Local Planning Authority Arboricultural Officer, appointed Arboricultural Consultant and Site Manager must take place to assess whether the 'Protective barriers' and ground protection can be removed to allow soft landscaping works.

12. Following the completion of the soft landscaping works a tree survey must be undertaken to identify whether additional tree works are required for the safe use of the site and adjacent land users.

RPA refers to the Root Protection Area as detailed in Appendix 2: BS5837 Tree Survey

- The existing hard surface should be broken up, lifted and removed from the RPA from outside the RPA where feasible, or from existing hard surfaces within the RPA.
  - The excavation of the hard surface must not extend into the soil underneath unless specifically determined by the Arboricultural Consultant. In reality this would mean that the 'toothless' excavator bucket should be kept horizontal so that any disturbance to the soils kept to a minimum. When the hard surface is thin or close to the soil level, the works must be carried out by hand to prevent avoidable unnecessary damage to the tree roots.
  - All material, once lifted, must be transported to outside the RPA to prevent compaction or contamination of the tree roots. No material should be stored within the RPA.
- Due care and attention must be undertaken to ensure that machinery or other operations do not cause damage to the above ground parts of the tree.
- Where an existing hard surface is removed and replaced with soil the infill material must be a good quality, weed free aerobic natural topsoil with good crumb structure. Man made soils are not acceptable. Soil samples must be issued to the Arboricultural Consultant for written approval prior to delivery on site where the soil is to be installed within the RPA of retained trees.

Above ground cast concrete slab supported by mini piles or screw piles

Installation of 300 mm mound along the line of the tree protective fencing to impede parking access. This is to protect the soil to retain the growing environment for retained tree root growth. Soil mound to be installed as part of the soft landscaping following removal of the tree protective fencing.

Removal of hard-standing within root protection area of G45 only to be carried out under the direct supervision of the appointed Arboricultural Consultant.

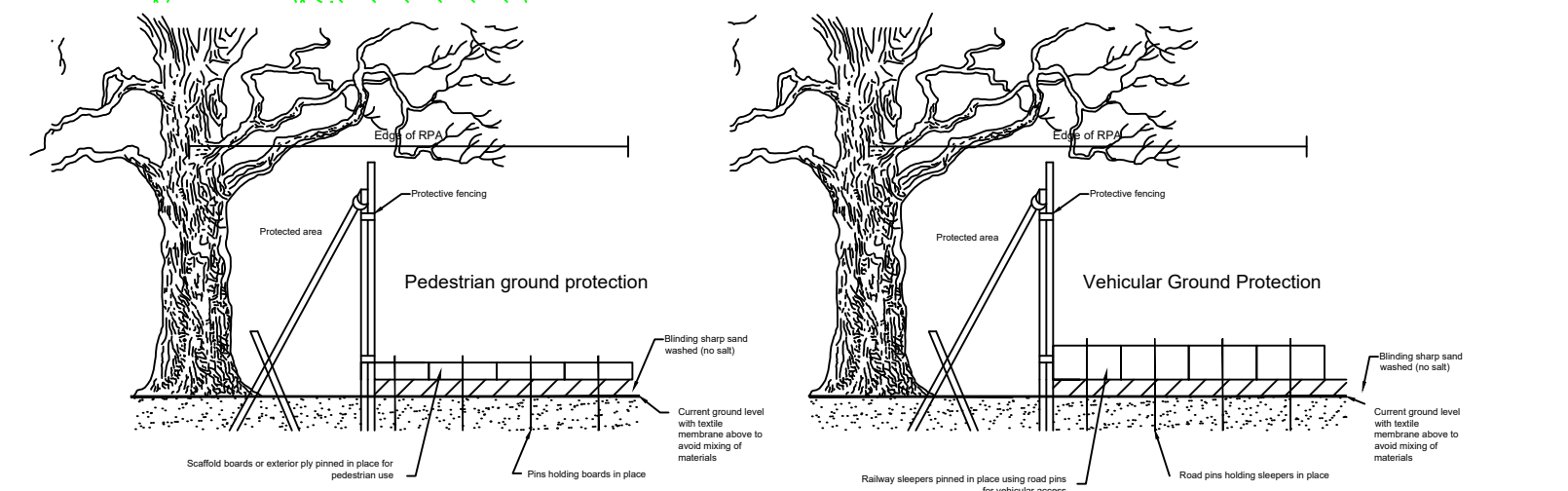
Excavation works must be carried out in accordance with Appendix 1 Method Statement and Tree protection Plan and under Arboricultural Consultant supervision. Arboricultural Consultant supervision of excavation works is necessary to address the the potential for tree root damage and to identify remedial works, with timescales, that may be necessary.

Installation of 300 mm mound along the line of the tree protective fencing to impede parking access. This is to protect the soil to retain the growing environment for retained tree root growth. Soil mound to be installed as part of the soft landscaping following removal of the tree protective fencing.

The diagram illustrates a tree protection barrier system. It features a series of vertical scaffold poles (1) connected by horizontal back bracing. Upright poles (2) are driven into the ground, and panels or barriers (3) are attached to the scaffold poles using wire or clips. The barrier is shown surrounding a tree, with a dashed line indicating the protected area.

Tree protection barriers

1. Scaffold poles including back bracing
2. Upright to be driven into ground c300 to 600mm
3. Panels or barriers to be fixed to scaffold poles with wire or clips



- |                         |                                                                                       |                                                                                                                                                           |                                                                                                                                                                                                                                                                          |                             |
|-------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>General / Key:</b>   | <b>Site:</b> Land at Maddoxford Lane                                                  | <b>Drawing title:</b>                                                                                                                                     | <br><b>sapling</b><br><b>arboriculture limited</b><br>registered in england: 5414238<br>T: 01420 550 160<br>E: enquires@saplingarboriculture.com<br>W: www.saplingarboriculture.com |                             |
| Root protection area    |  | <b>Data:</b> Site layout and survey data provided by Client. Ordnance survey data provided under licence 200022432. Crown copyright. All rights reserved. |                                                                                                                                                                                                                                                                          | <b>Tree protection plan</b> |
| Indicative canopy       |  | <b>Drawing reference:</b> J1127.06                                                                                                                        |                                                                                                                                                                                                                                                                          |                             |
| Barrier fencing         |  | <b>Revision:</b><br>A - excavation works adj G45B                                                                                                         |                                                                                                                                                                                                                                                                          |                             |
| Ground protection       |  | <b>Date:</b><br>June 2021                                                                                                                                 |                                                                                                                                                                                                                                                                          |                             |
| Special surface         |  | <b>Scale:</b><br>1:500 on A1 (site layout only)                                                                                                           |                                                                                                                                                                                                                                                                          |                             |
| Specialist construction |  | <b>Sheet:</b><br>1 of 1                                                                                                                                   |                                                                                                                                                                                                                                                                          |                             |
| Excavation in RPA       |  |                                                                                                                                                           |                                                                                                                                                                                                                                                                          |                             |
| Removed tree            |  |                                                                                                                                                           |                                                                                                                                                                                                                                                                          |                             |

## **Appendix 2: BS5837 tree survey**



## BS5837 Tree Survey Data Collection Form

Site Maddoxfod Lane P2 73  
 Date of survey 11th June 2018 and 22nd August 2018  
 Job reference J1127.06  
 Surveyor Ben Abbatt

| Designation | Reference number | BS 5837 Category | Species                        | Height (m) | Single stem diameter (mm at) | Age class         | Physiological condition | Structural condition | Condition notes                                                                                                                                               | Anticipated remaining life | Root Protection Area - Radius (m) | Root Protection Area - Area (sqm) | Development related tree works                                                                                                                                                                                                              | Development related mitigation                                                                        |
|-------------|------------------|------------------|--------------------------------|------------|------------------------------|-------------------|-------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| T           | 25               | C2               | Oak                            | 17         | 750                          | Mature            | Fair                    | Fair                 | Sparse canopy. Occasional moderate deadwood. On edge of ditch. Survey impeded by vegetation.                                                                  | 20+                        | 9.0                               | 254.6                             | No tree works required.                                                                                                                                                                                                                     | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 26               | U                | Oak                            | 16         | 1000                         | Mature            | Poor                    | Fair                 | Severe decline. Large and moderate moderate deadwood throughout. On edge of ditch. Survey impeded by vegetation                                               | <10                        | 12.0                              | 452.6                             | Remove.                                                                                                                                                                                                                                     | Plant replacement tree as part of the soft landscaping works.                                         |
| G           | 27               | C2               | Poplar and Willow <i>Salix</i> | 18         | 350                          | Middle aged       | Good                    | Fair                 | Poplar is from sucker growth and therefore etiolated and close grown. Willow is multiple stems from the base. On edge of ditch. Survey impeded by vegetation. | 20+                        | 4.2                               | 55.4                              | Remove Poplar and treat to prevent regrowth. Reason: species characteristic to colonise through sucker growth. Coppice Willow. Reason: to aid retention of the Willow within the landscape whilst minimising failure from base or branches. | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 28               | C1               | Oak                            | 16         | 1100                         | Potential veteran | Poor                    | Fair                 | Sparse foliage. Occasional large and moderate deadwood throughout. On edge of ditch. Survey impeded by vegetation.                                            | 10+                        | 13.2                              | 547.6                             | Remove deadwood more than 25mm diameter.                                                                                                                                                                                                    | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 29               | A2               | Oak                            | 20         | 1200                         | Potential veteran | Good                    | Good                 | Occasional large and moderate deadwood throughout. On edge of ditch. Survey impeded by vegetation.                                                            | 40+                        | 14.4                              | 651.7                             | Remove deadwood more than 25mm diameter.                                                                                                                                                                                                    | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 30               | A2               | Oak                            | 20         | 1100                         | Potential veteran | Good                    | Good                 | Occasional large and moderate deadwood throughout. On edge of ditch. Survey impeded by vegetation.                                                            | 40+                        | 13.2                              | 547.6                             | Remove deadwood more than 25mm diameter.                                                                                                                                                                                                    | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 31               | A2               | Oak                            | 20         | 1100                         | Potential veteran | Good                    | Good                 | Occasional large and moderate deadwood throughout. On edge of ditch. Survey impeded by vegetation.                                                            | 40+                        | 13.2                              | 547.6                             | Remove deadwood more than 25mm diameter.                                                                                                                                                                                                    | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 32               | A2               | Oak                            | 20         | 900                          | Mature            | Good                    | Good                 | Occasional large and moderate deadwood throughout. On edge of ditch. Survey impeded by vegetation.                                                            | 40+                        | 10.8                              | 366.6                             | Remove deadwood more than 25mm diameter.                                                                                                                                                                                                    | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |

| Designation | Reference number | BS 5837 Category | Species                                                              | Height (m) | Single stem diameter (mm at | Age class         | Physiological condition | Structural condition | Condition notes                                                                                                                                                | Anticipated remaining life | Root Protection Area - Radius (m) | Root Protection Area - Area (sqm) | Development related tree works                                                                                                                                                                                                                                                 | Development related mitigation                                                                        |
|-------------|------------------|------------------|----------------------------------------------------------------------|------------|-----------------------------|-------------------|-------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| T           | 33               | A2               | Oak                                                                  | 18         | 900                         | Mature            | Good                    | Good                 | Occasional large and moderate deadwood throughout. On edge of ditch. Survey impeded by vegetation.                                                             | 40+                        | 10.8                              | 366.6                             | Remove deadwood more than 25mm diameter.                                                                                                                                                                                                                                       | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 34               | A2               | Oak                                                                  | 18         | 1000                        | Potential veteran | Good                    | Good                 | Occasional large and moderate deadwood throughout. On edge of ditch. Survey impeded by vegetation.                                                             | 40+                        | 12.0                              | 452.6                             | Remove deadwood more than 25mm diameter.                                                                                                                                                                                                                                       | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 35               | B2               | Oak                                                                  | 18         | 1200                        | Potential veteran | Fair                    | Good                 | Slight sparse foliage. Occasional large and moderate deadwood throughout. On edge of ditch. Survey impeded by vegetation.                                      | 20+                        | 14.4                              | 651.7                             | Remove deadwood more than 25mm diameter.                                                                                                                                                                                                                                       | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 36               | A2               | Oak                                                                  | 20         | 900                         | Mature            | Good                    | Good                 | Occasional large and moderate deadwood throughout. On edge of ditch. Survey impeded by vegetation.                                                             | 40+                        | 10.8                              | 366.6                             | Remove deadwood more than 25mm diameter.                                                                                                                                                                                                                                       | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 37               | A2               | Oak                                                                  | 18         | 800                         | Mature            | Good                    | Good                 | Occasional large and moderate deadwood throughout. On edge of ditch. Survey impeded by vegetation.                                                             | 40+                        | 9.6                               | 289.6                             | Remove deadwood more than 25mm diameter.                                                                                                                                                                                                                                       | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 38               | U                | Oak                                                                  | 18         | 900                         | Mature            | Poor                    | Good                 | Severe decline. On edge of ditch. Survey impeded by vegetation.                                                                                                | 40+                        | 10.8                              | 366.6                             | Remove.                                                                                                                                                                                                                                                                        | Plant replacement tree as part of the soft landscaping works.                                         |
| T           | 39               | A2               | Oak                                                                  | 18         | 800                         | Mature            | Good                    | Good                 | Occasional large and moderate deadwood throughout. On edge of ditch. Survey impeded by vegetation.                                                             | 40+                        | 9.6                               | 289.6                             | Remove deadwood more than 25mm diameter.                                                                                                                                                                                                                                       | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 40               | C2               | Hazel <i>Corylus avelana</i>                                         | 5          |                             | Mature            | Good                    | Good                 | Multiple stems from the base. Nominal value for the RPA.                                                                                                       | 40+                        | 3.0                               | 28.3                              | No tree works required.                                                                                                                                                                                                                                                        | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| G           | 42               | C2               | Ash, Oak, Elder, Hawthorn, Holly, Buckthorn<br><i>Prunus spinosa</i> | 5          |                             |                   | Good                    | Fair                 | Understorey and hedge along the eastern side of the site and beneath the tree canopies of T25 to T39. Survey impeded by vegetation. Nominal value for the RPA. | 40+                        | 3.0                               | 28.3                              | Cut back and manage as hedge 3m wide and 3m high. Remove section of group to allow footway and vehicle access to the development site to the west. Clearance to be 1m either side of the footway and vehicle access and to be 3m above the footway and 5m over vehicle access. | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |

| Designation | Reference number | BS 5837 Category | Species     | Height (m) | Single stem diameter (mm at | Age class | Physiological condition | Structural condition | Condition notes                                                                                                                 | Anticipated remaining life | Root Protection Area - Radius (m) | Root Protection Area - Area (sqm) | Development related tree works                                                                                         | Development related mitigation                                                                        |
|-------------|------------------|------------------|-------------|------------|-----------------------------|-----------|-------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| T           | 43               | C2               | Oak         | 9          | 400                         | Mature    | Good                    | Fair                 | Stem diameter approximated. Canopy reduced on the east side due to powerlines.                                                  | 40+                        | 4.8                               | 72.4                              | No tree works required.                                                                                                | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| T           | 44               | C2               | Oak         | 9          | 400                         | Mature    | Good                    | Fair                 | Stem diameter approximated. Canopy reduced on the east side due to powerlines.                                                  | 40+                        | 4.8                               | 72.4                              | No tree works required.                                                                                                | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| G           | 45               | B2               | Oak         | 20         |                             |           |                         |                      | See individual tree details below.                                                                                              |                            | 0.0                               | 0.0                               | No tree works required.                                                                                                | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| G           | 45.1             | B2               | Oak         | 20         | 700                         | Mature    | Good                    | Fair                 | Stem diameter approximated. Previously topped at 8m with mature regrowth. Typical deadwood. Broken branch over the access road. | 40+                        | 8.4                               | 221.8                             | Remove deadwood more than 25mm diameter. Remove broken branch. Crown lift to 5m with a maximum wound diameter of 75mm. | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| G           | 45.2             | B2               | Oak         | 20         | 700                         | Mature    | Good                    | Fair                 | Stem diameter approximated. Previously topped at 8m with mature regrowth. Typical deadwood.                                     | 40+                        | 8.4                               | 221.8                             | Remove deadwood more than 25mm diameter. Crown lift to 5m with a maximum wound diameter of 75mm.                       | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| G           | 45.3             | B2               | Oak         | 20         | 800                         | Mature    | Good                    | Fair                 | Stem diameter approximated. Ivy impedes survey. Typical deadwood.                                                               | 40+                        | 9.6                               | 289.6                             | Remove deadwood more than 25mm diameter. Crown lift to 5m with a maximum wound diameter of 75mm.                       | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| G           | 45.4             | B2               | Oak         | 20         | 900                         | Mature    | Good                    | Fair                 | Stem diameter approximated. Typical deadwood. Three stems from the base.                                                        | 40+                        | 10.8                              | 366.6                             | Remove deadwood more than 25mm diameter. Crown lift to 5m with a maximum wound diameter of 75mm.                       | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| G           | 45.5             | C2               | Oak         | 20         | 500                         | Mature    | Fair                    | Good                 | Stem diameter approximated. Sparse canopy.                                                                                      | 10+                        | 6.0                               | 113.1                             | No tree works required.                                                                                                | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |
| G           | 46               |                  | Unsurveyed. |            |                             |           |                         |                      | Within compound area of the farm.                                                                                               |                            | 0.0                               | 0.0                               | Crown lift to 5m.                                                                                                      | Install tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. |

## General notes

The BS5837 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.

The tree survey can only be an assessment of the tree at the time of the survey and the tree(s) should be re-surveyed on a regular basis. An appropriate time period between surveys may be up to 5 years depending upon the condition of the trees, their maturity and the target(s). The default period, if none provided, is 1 year.

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.

As trees are dynamic structures their condition and health may change in a short period of time, particularly in relation to changes in their immediate environment and circumstances. Therefore, the survey is an assessment of the trees at the time of the survey only. If there is a significant change in the immediate environment and circumstances, then this should be brought to the attention of the Arboricultural Consultant so that they may advise accordingly.

I 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](mailto: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](http://www.naturalengland.org.uk)) to carry out the works.

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. BS8596 Micro guide to surveying for bats in trees and woodland <https://shop.bsigroup.com/upload/273444/BSI-Bat-Microguide-UK-EN.pdf>.

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/infod-9fjd2d> for disinfectant information.

### Appendix 3: Key to BS5837 tree survey

|                                                    |                                                                                                                                                  |                                                                                                                                                                                                |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>No</b>                                          | Tree number.                                                                                                                                     |                                                                                                                                                                                                |
| <b>Species</b>                                     | Species of tree.                                                                                                                                 |                                                                                                                                                                                                |
| <b>Height</b>                                      | Height measured in metres and rounded to the nearest metre.                                                                                      |                                                                                                                                                                                                |
| <b>Stem Ø</b>                                      | Stem diameter at 1.5metres following normal Forestry conventions or immediately above the root flare for multiple stemmed trees, in millimetres. |                                                                                                                                                                                                |
| <b>Canopy spread</b>                               | Canopy spread in metres is taken at the four cardinal points to derive a reasonable representation of the canopy shape in plan view.             |                                                                                                                                                                                                |
| <b>Height of crown</b>                             | Height in metres of crown clearance above adjacent ground level.                                                                                 |                                                                                                                                                                                                |
| <b>Age class</b>                                   | <b>Young</b>                                                                                                                                     | A tree considered to be less than approximately 20 years old.                                                                                                                                  |
|                                                    | <b>Middle aged</b>                                                                                                                               | 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. |
|                                                    | <b>Mature</b>                                                                                                                                    | 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.                                                              |
| <b>Condition</b><br>(Physiological and Structural) | <b>Good</b>                                                                                                                                      | A tree of typical physiological and structural condition that requires only general tree works to facilitate its retention in the landscape.                                                   |
|                                                    | <b>Fair</b>                                                                                                                                      | A tree of impaired physiological and / or structural condition that may require remedial and general tree works to facilitate its retention in the landscape.                                  |
|                                                    | <b>Poor</b>                                                                                                                                      | 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.       |
| <b>Preliminary management recommendations</b>      | As per BS3998: 2010 Recommendations for Tree Works.                                                                                              |                                                                                                                                                                                                |
| <b>Category grading</b>                            | See below: Table 1.                                                                                                                              |                                                                                                                                                                                                |
| <b>Estimated remaining contribution (years)</b>    | Estimated remaining contribution in years (e.g. < 10, 10+, 20+, 40+).                                                                            |                                                                                                                                                                                                |
| <b>Root protection area</b>                        | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                    |                                                                                                                                       |
| <b>Category U</b><br><br>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 | <ul style="list-style-type: none"><li>• 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).</li><li>• Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline.</li><li>• 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.</li></ul> <p><i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see <b>4.5 of BS5837:2012</b></i></p> |                                                                                                                                                                                                                                                                    |                                                                                                                                       |
| 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                                                                                      |
| <b>Category A</b><br><b>Trees of high quality</b><br>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) |
| <b>Category B</b><br><b>Trees of moderate quality</b><br>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                                                                              |
| <b>Category C</b><br><b>Trees of low quality</b><br>with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below150 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 m<sup>2</sup>.

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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