

Arboricultural Impact Assessment
&
BS5837 Tree Survey
at
Proposed bungalow, St Johns Road, Hedge End
for
Lynda Robinson



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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. To give recommendations to reduce the impact of such development where feasible with respect to permitted development F/18/82592 and X/20/89516.

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.

Original survey carried out November 2017. A resurvey of the trees was carried out on the 27th April 2021.

3 Site details

The site is on the south-east side of St Johns Road. The site has a south easterly aspect and is accessed from St Johns Road from the north.

4 Proposals

The proposals are to construct a new bungalow with garage and car parking, reconstructing the existing access.

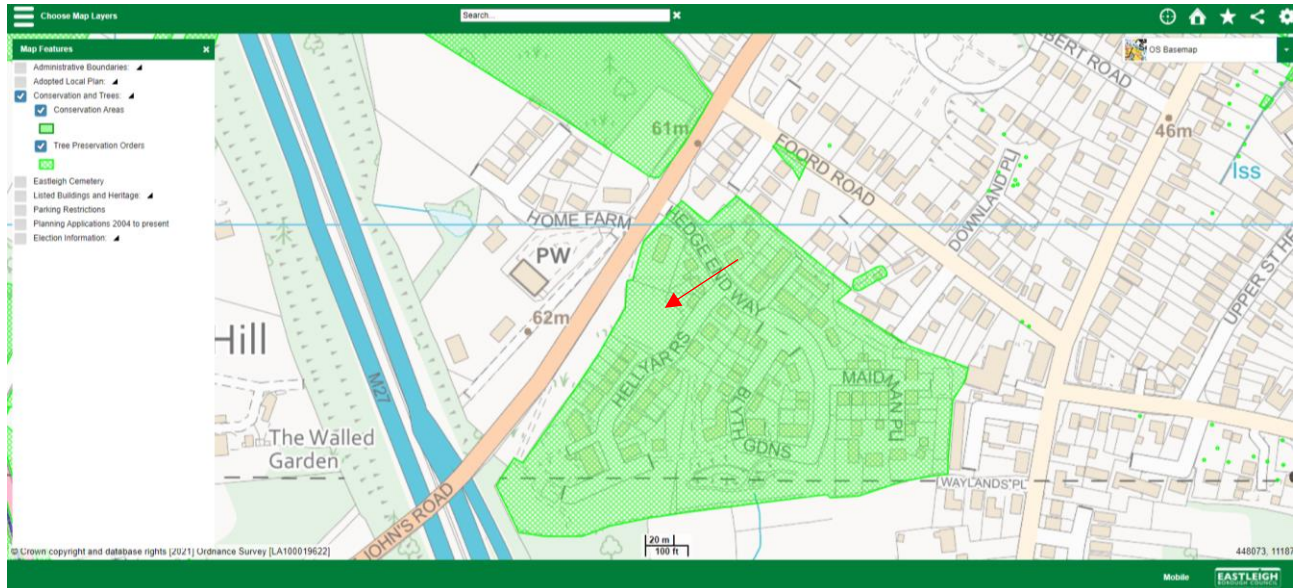
5 Drawings

Drawings were produced by HGP Architects and received on the 24th October 2023. The drawings have been provided by the client for the purposes of this assessment and they are:

Location and site plan, 17.096.15.02 Revision P

6 Tree Preservation Orders and Conservation Areas

It is understood that the trees within the site are subject to Tree Preservation Order (TPO) 741 Land south of St Johns Road Hedge End 2012 dated 27th July 2012. As this is an 'Area' order, no specific consideration of the individual or group merits of the trees subject to the Area TPO have been carried out. Consequently, the merits of the individual trees and group are considered as part of this Arboricultural Impact Assessment in the categorisation of the trees in accordance with BS5837: 2012 Trees in relation to design, demolition and construction – Recommendations.



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

(Site identified by red arrow)

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.

Summary

The main arboricultural feature of the site and locality is the mature Oak T14B outside the site adjacent to the existing access road and the group of trees to the south east of the site. T14B and other trees are to be retained and industry standard construction methods and tree protection methods (tree protection barriers, use of special surface construction for the reconstruction of the access road and site monitoring) are to be used to reduce the impact of the works upon them.

Trees to be removed are T1B Birch (removed), T2U Willow (removed), and T12U Willow (removed). The loss of these trees is unlikely to have a significant impact upon the character of the local area and additional replacement tree planting can be carried out to mitigate their loss.

Other collapsed trees (willow and apple adjacent to T4C oak) are to be removed due to their condition.

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 Existing access road

The existing access road will need to be upgraded to be suitable for residential access. To minimise the impact upon the adjacent tree, T14B Oak, a special surface construction (see Appendix 4: Special Surface Construction for additional details) is to be used. Normal access construction techniques would damage the tree roots by excavations severing roots, compacting soil (which would then restrict air flow and water infiltration) and possibly contaminating the soil within the root protection area (RPA) of the trees. As the existing access is within the RPA of retained trees then a cellular confinement system (CCS) (for instance <https://www.geosyn.co.uk/product/cellweb-tree-root-protection> or similar) as part of an industry standard special surface construction is to be installed within the site. The CCS is to be laid out on top of the existing access road. 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, gravel surfacing, or block paving. 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.

8.2 To further minimise the impact on T14B, at the lower part of the site, where there is less existing hard standing, a geocellular structure (for instance <https://www.polypipe.com/civils/arborraft-trd> or similar) is to be used for the base layer construction to maintain the area beneath as ground for continued tree root development. This is also a load spreading structure to remain permanently porous. Channel drainage (for instance <https://www.plastics-express.co.uk/channel-drainage> or similar) can be installed within the final wearing course to enable air and water flow through to the ground beneath.

8.3 The relative extents of coverage within the RPA of T14B are 9.3% cellular confinement system (although this is construction above an existing hard standing) and 4.7% geocellular (also partially within existing hard standing). As the constructions are partially within the existing hard standing, the current BS5837 of 20% coverage within the RPA does not apply. The extent of additional coverage within the RPA consequently falls within the existing BS5837 recommendations.

8.4 The thickness of the cellular and geocellular structures may vary due to their different uses. Therefore, as the access is for vehicular use, the thickness of the structures must be >100mm with the final porous wearing course on top (>100mm) for a full depth of >200mm. Guidance from the manufacturer in this matter is essential to ensure that the correct thickness of structure is used for the specified use. It is important that the depth of the structural 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 structure and to demonstrate that the ground beneath the structure 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 base layer structure.

8.5 Prior to the reconstruction and construction of the access and hard standing, the area must be protected by ground protection (for instance <https://www.buyjustrite.eu/en/tufftrak-r-st-ttst-checkers-ground-protection-mats-for-heavy-equipment-ttst.html> or similar) to prevent damage to retained tree roots. Immediately prior to reconstruction and construction of the hard standing, a site meeting between the Site Manager and the appointed Arboricultural

Consultant is necessary to agree the removal of the ground protection to allow construction of the CCS.

- 8.6 As the final wearing course is unlikely to be installed until the end of the construction works, the base layer may suffer damage and not perform to its full design potential until the full 200mm depth of construction is achieved. Therefore, there must be an additional load spreading surface installed to support construction traffic until the full depth of construction is achieved. This can be created by either laying an additional 100mm layer of cellular confinement system or ground protection) or other appropriate method. Until the area to be subject to reconstruction/ construction is built the area must be protected with ground protection to ensure that the potential for harm does not occur to the tree roots beneath.
- 8.7 The thickness of the construction will have a bearing upon the relationship to areas of the access not made from a specialised structure, for instance the link to the existing access road construction. Excavation will be required at this point, beyond the root protection area (RPA), to taper the above ground construction down to the existing hard standing access road. As the excavation is outside the RPA, then normal excavation techniques can be used.
- 8.8 Due to the slope of the access road the cellular confinement system may need additional pinning in place to prevent slippage. Guidance from the manufacture on the type and spacing of the pins must be sought prior to installation and their recommendations followed.
- 8.9 Tree works to T14B Oak are appropriate to maintain vehicular access along the existing and reconstructed access. These works are to crown lift to 5m above the access road and are detailed in Appendix 2: BS5837 Tree Survey. The works are typical of the existing use and unlikely to have a significant impact upon the condition of the tree (due to the small amount of photosynthetic material to be removed) or the visual amenity that the tree presents (as the tree works are below the height of the trees and shrubs on the embankment to St Johns Road and therefore unlikely to be visible to the passing public).
- 8.10 Site layout
The proposed site layout has been designed to retain the main tree features. However, the proposed development will require the loss of T1B Birch (removed), T2U Willow (removed), and T12U Willow (removed). The loss of these trees is unlikely to have a significant impact upon the character of the local area and additional replacement tree planting can be carried out to mitigate their loss.
- 8.11 The proposed bungalow, garage, and car parking are outside from the canopy spread and RPA of retained trees and therefore no impact is anticipated.
- 8.12 The bungalow is distant from the retained trees and therefore the relationship between the existing trees and the proposed dwelling is a reasonable relationship. I believe that any future unreasonable applications to prune or remove the retained trees can be reasonably refused by the planning authority. In the advent of an appeal against the planning authority I believe that the appeal is more likely to be dismissed than upheld due to the reasonable distance between the existing retained trees and the proposals.

8.13 Services

New services should 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) and agreed in writing with the Local Planning Authority Tree 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".

8.14 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.

8.15 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.

8.16 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.

8.17 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.

8.18 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.

8.19 Post development

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

8.20 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.

8.21 Falling leaves, seed and needles debris 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 or 'hedgehog' inserts can be used to filter out tree debris. Down pipes can also be installed with traps

(<https://www.3ptechnik.co.uk/garden/downpipe-filters-diverters/rainus/> or similar) that are easily cleaned or chains used as the down pipe (which requires no cleaning).

8.22 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.

8.23 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.

Replacement tree planting is appropriate to mitigate the removal of trees to enable development of the site.

10 **Recommendations**

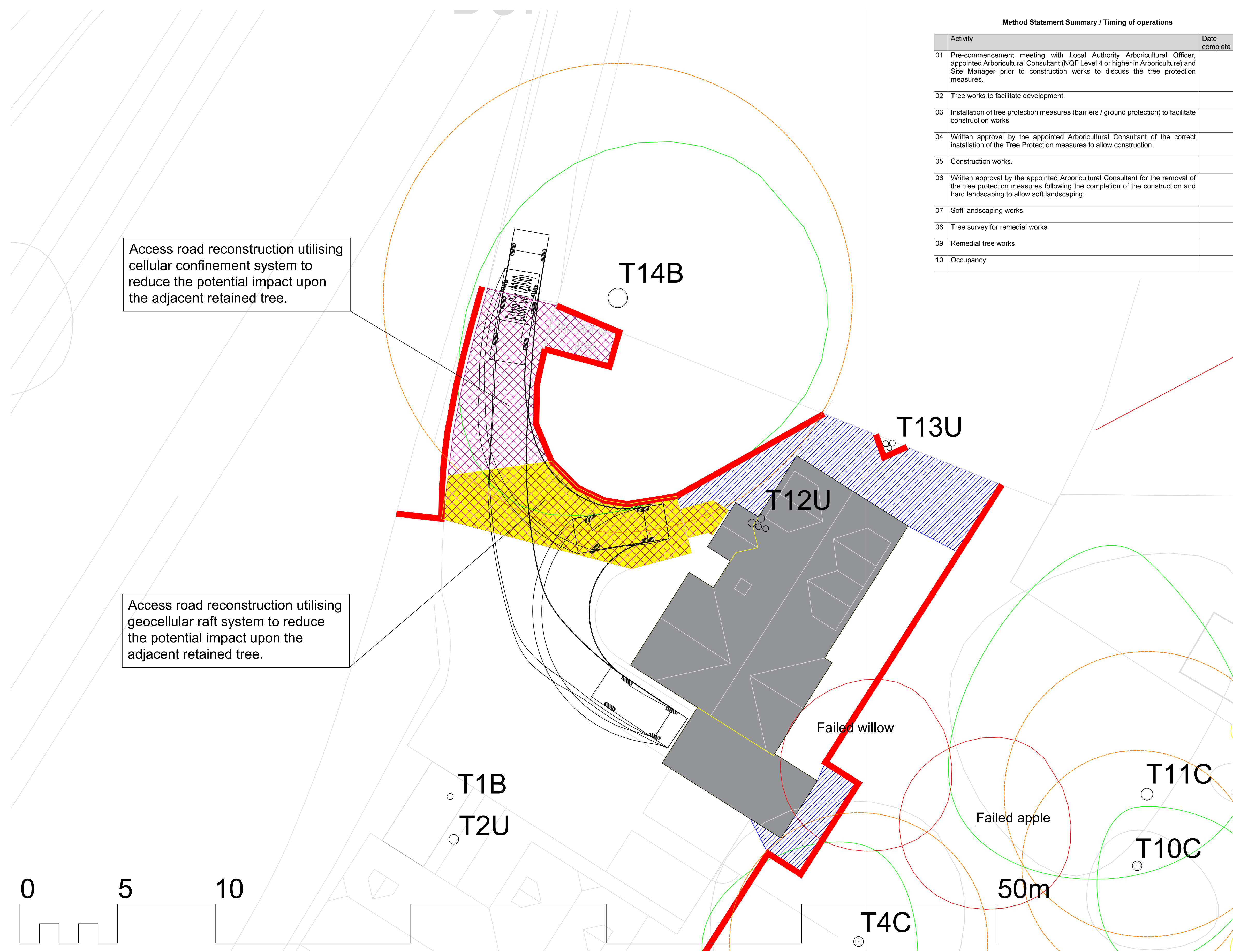
That, following any permission from the planning authority, the principles and details of the Arboricultural Impact Assessment and Appendix 1: Method Statement and Tree Protection Plan are followed to reduce the potential for harm to the retained trees during development.

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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	Pre-commencement meeting with Local Authority Arboricultural Officer, appointed Arboricultural Consultant (NQF Level 4 or higher in Arboriculture) and Site Manager prior to construction works to discuss the tree protection measures.	
02	Tree works to facilitate development.	
03	Installation of tree protection measures (barriers / ground protection) to facilitate construction works.	
04	Written approval by the appointed Arboricultural Consultant of the correct installation of the Tree Protection measures to allow construction.	
05	Construction works.	
06	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.	
07	Soft landscaping works	
08	Tree survey for remedial works	
09	Remedial tree works	
10	Occupancy	

Appendix 1: Method Statement

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.

The purpose of the pre-commencement site meeting is to:

- 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).

To aid the site clearance, demolition and construction phase for the development of the site an Arboricultural Consultant (NQF Level 4 or higher in Arboriculture) must be appointed to inspect and monitor the site at the start of the works and on an as required basis throughout the construction works to ensure that the protection procedures are adhered to and to assist with addressing further arboricultural issues that may arise.

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 BS5838: 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.

3. The protective measures, as shown on the drawing "Tree protection plan" must be erected after the tree works and prior to any demolition or construction works. Once erected, barriers and ground protection must be considered sacrosanct, and must not be removed or altered without prior recommendation by the appointed Arboricultural Consultant and written approval by the LPA.

The protective barriers and ground protection must be erected according to drawings "Tree protection plan" and Appendix 2: BS5837 survey sheet which is based upon the guidelines in BS5837: 2012 'Trees in relation to construction'. Tree protective fencing and ground protection positions to be identified at the pre-commencement site meeting. Scaling from the tree protection plan should not be used.

Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained trees. On all sites, special attention should 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 pedestrian movements (and scaffolding activities) within the root protection area (RPA) must be a single thickness of scaffold boards on top of a compressible layer (for instance bark mulch) laid onto a geotextile membrane, or supported by scaffold (see drawing on Tree Protection Plan). 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 Arboricultural Consultant to accommodate the likely loading and may involve the use of proprietary systems (for instance 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.

These tree protective measures shall be identified and marked on the 'Tree protection plan' and all the approved engineering drawings to be used on site.

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.

4. All site personnel must be briefed by the Site Manager or the Arboriculturalist on the importance of the trees to be retained and the protective measures implemented to aid their retention into the future. The Site Manager is responsible for the implementation of all tree protection measures.

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, jibs 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.

There must be no fires on the site.

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 sacking 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 handsaw.
- 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 which is toxic to roots), or other loose granular fill, before soil or other 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.

10. There should be no changes in grade within the RPA without prior recommendation by the appointed Arboricultural Consultant and approval of the LPA.

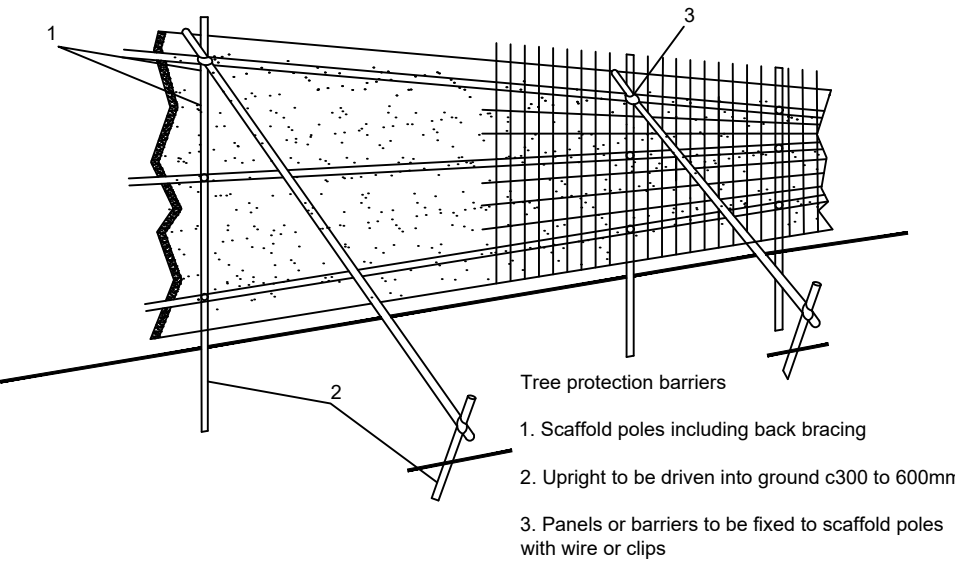
11. Following completion of the construction and hard landscaping works a site meeting between the Local Planning Authority Arboricultural Officer, appointed Arboricultural Consultant and Site Manager must take place to assess whether the protective barriers and ground protection can be removed to allow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

Method statement for the removal of the existing hard surfaces.

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 exiting 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 soil is 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 soppis 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.



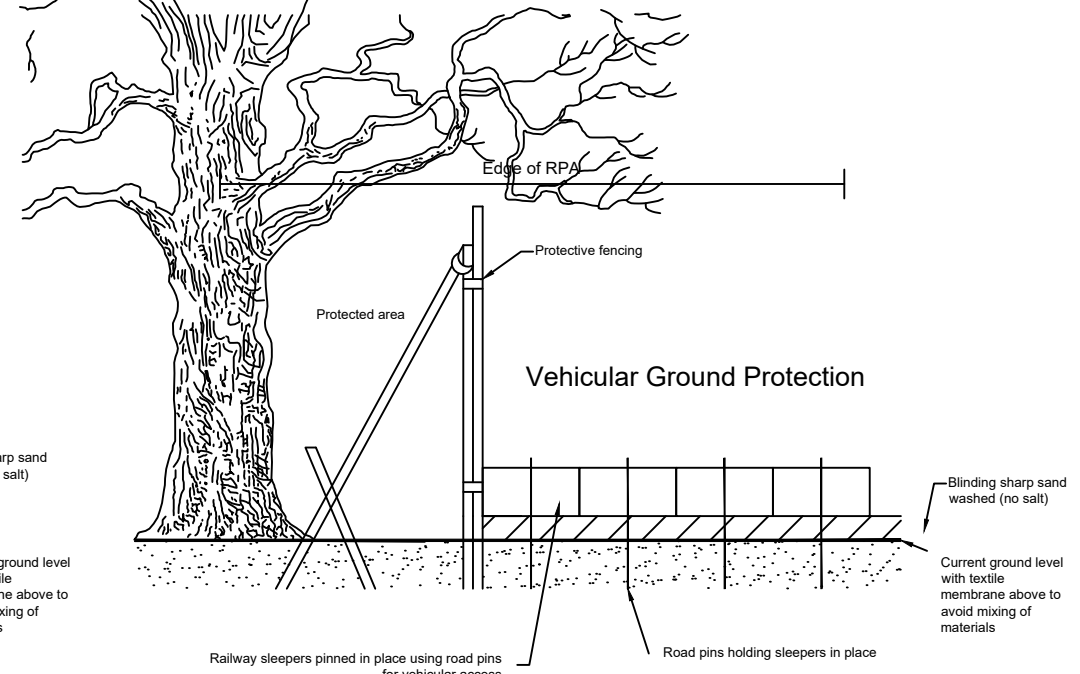
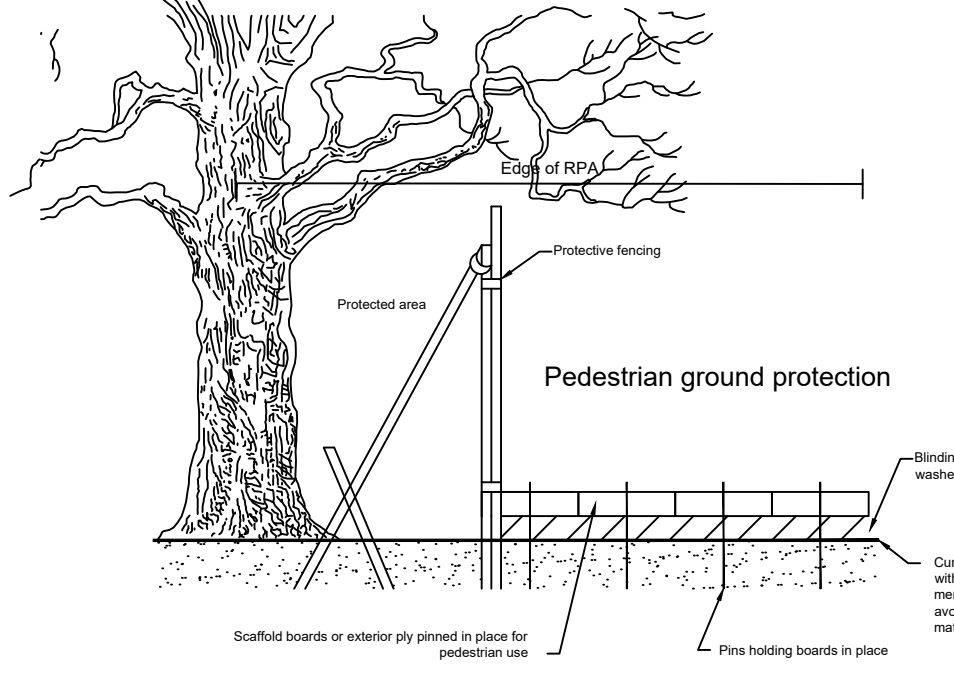
CONSTRUCTION EXCLUSION ZONE
KEEP OUT!

THE FOLLOWING MUST BE OBSERVED BY ALL PERSONS:

- THE PROTECTIVE FENCING MUST NOT BE MOVED
- NO PERSON SHALL ENTER THE PROTECTED AREA
- NO MACHINE OR PLANT SHALL ENTER THE PROTECTED AREA
- NO MATERIALS SHALL BE STORED IN THE PROTECTED AREA
- NO SPOIL SHALL BE DEPOSITED IN THE PROTECTED AREA
- NO EXCAVATION SHALL OCCUR IN THE PROTECTED AREA

ANY ACCESS INTO THE PROTECTED AREA MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY

A3 sign on laminated all weather material at 1.8m on the protective fencing every 10m.



General / Key:

Root protection area

Indicative canopy

Barrier fencing

Ground protection

Cellular confinement

Geocellular raft

Tree to be removed

Site: Proposed bungalow, St Johns Road, Hedge End

Data: Site layout and survey data provided by Client. ©Crown Copyright and database rights 2023 OS Licence no. 100022252

This drawing is produced in colour. Please ensure that you use a colour printing to ensure that the drawing is correctly interpreted.

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Item reference (T/G/H/W)
Item number (1, 2, etc.)
BS5837 category (A/B/C/U)
For instance: T1C

Drawing title:

Tree protection plan

Drawing reference:

J947.01.23 Revision B

Revision:

Revision B - revised bungalow position

Date:

24th October 2023

Scale:

1 to 100 on A1 (site layout only)

Sheet:

1 of 1

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Appendix 2: BS5837 tree survey

Designation	Reference number	BS 5837 Category	Species	Height (m)	Single stem diameter (mm at 1.5m)	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	Anticipated remaining life span	Root Protection Area - Radius (m)	Development related tree works	Development related mitigation for retained trees
T	1	B	Birch	~	~	~	~	~	~	~	~	~	~	~	Removed.	~	~	No tree works required for development.	Plant appropriate replacement tree with sufficient space to grow to full size.
T	2	U	Willow	~	~	~	~	~	~	~	~	~	~	~	Removed.	~	~	No tree works required for development.	Plant appropriate replacement tree with sufficient space to grow to full size.
T	4	C	Oak	15	553	5	3	7	8	3	~	Mature	Good	Fair	Bark loss on main stem to west at 4 m.	10+	6.6	Crown lift to 4m. Clear proposed building by 3m retaining overhanging branches outside this distance.	Installation of tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan.
T	10	U	Scots Pine	16	491	3	6	5	2	4	E	Mature	Good	Fair	Lean to east. Unsuitable for retention due to adjacent land use within falling distance.	20+	5.9	No tree works required for development.	Installation of tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan.
T	11	U	Oak	15	619	14	5	4	10	3	S	Mature	Good	Poor	Lean to the north west c24 degrees at 1.2 m. Unsuitable for retention due to adjacent land use within falling distance.	20+	7.4	No tree works required for development.	Installation of tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan.
T	12	U	Willow	~	-	~	~	~	~	~	~	~	~	~	Removed.	~	~	No tree works required for development.	Plant appropriate replacement tree with sufficient space to grow to full size.
T	13	U	Willow	~	~	~	~	~	~	~	~	~	~	~	Removed.	~	~	No tree works required for development.	Plant appropriate replacement tree with sufficient space to grow to full size.
T	14	B	Oak	16	1000	8	8	11	8	4	SW	Mature	Good	Fair	Offsite.	20+	12.0	Crown lift to 5m over access.	Installation of tree protection measures as detailed in Appendix 1 Method Statement and Tree Protection Plan. Use of cellular confinement system and porous final wearing and geocellular raft system with porous final wearing course or percolation ‘strips’ to reconstruct existing access and to maintain access for tree roots to air and water.

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. 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.

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/infd-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.
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 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 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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