



BS5837 tree survey and Arboricultural Impact Assessment

at

**Land at Nightingale Avenue, Eastleigh, SO50 9JA
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Client

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1 **Instruction**

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

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

2 **Site survey**

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

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

I have relied upon the topographical survey by Baypoint Surveys for the tree positions and canopy spread of the trees surveyed.

Trees have been designated and number referenced to aid correlation between the Arboricultural Impact Assessment, BS5837 tree survey and the tree protection plan. The position on the tree protection plan and the details within the BS5837 tree survey are to be used on site to identify the position of the individual trees on site.

3 **Site details**

The site is to the south of Nightingale Road within a residential area and has been subject to previous construction activity with outbuildings and cast concrete slabs. The site is effectively flat (small easterly aspect from 14.23 to 13.61 over 24m) and, at the time of the survey, was not subject to active management with significant debris and weed growth limiting access.

There is a single tree within the site, T1U, and four trees outside the site to the west, T2C, T3C, and T4C within the adjacent garden and T5C to the north on the far side of the access road which forms the northern and eastern boundary to the site.

4 **Proposals**

The proposal is to demolish the outbuildings present on site and construct 4 new dwellings with associated car parking.

5 **Drawings**

Drawings were provided by Doswell Projects and received on 5th April 2023 The drawings have been provided by the client for the purposes of this assessment and they are:

Topographical survey, 3227-SV-1 by Baypoint Surveys

Proposed site plan ground floor layout, 22206 P01 by OSP

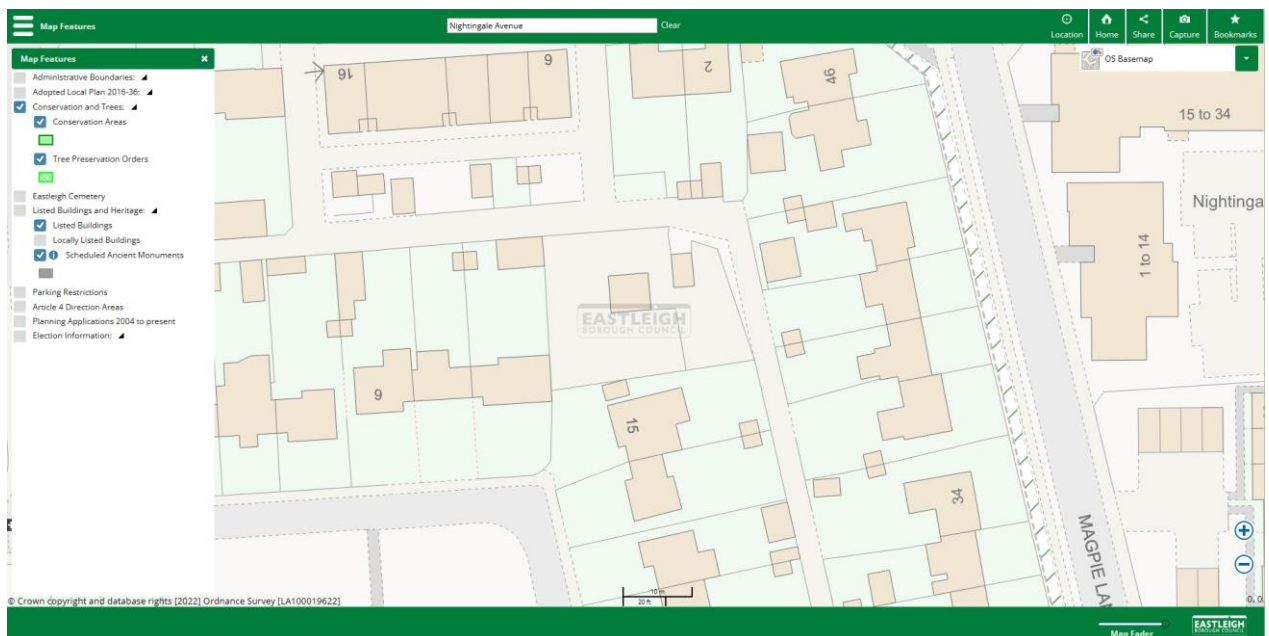
Proposed site plan roof layout, 22206 P02 by OSP

Proposed site plan street scene An and B, 22206 P03 by OSP

Proposed plans and elevations Plots 1-4, 22206 P10 by OSP

6 **Tree Preservation Orders and Conservation Areas**

The online mapping tool provided by Eastleigh Borough Council, accessed on 12th April 2023, identifies that the neither the site nor adjacent properties are subject to Conservation Area or Tree Preservation Order (TPO). See image SAL1:



SAL1 Image taken from council website¹

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.

¹ <https://emaps.eastleigh.gov.uk/webmaps/Map.aspx?MapName=WebMaps>

7 **Summary**

The main arboricultural features of the site are the trees outside the site, T2C, T3C, and T4C in the adjacent garden to the west. T5C is distant from the site and is unlikely to be affected by the proposed development. These trees are to be retained and industry standard construction methods and tree protection methods (barriers, ground protection, special surface construction, above ground cast concrete slab, site monitoring) ought to be used to reduce the impact of the works upon them.

A single tree, T1U, will need to be removed to allow the development of the site. The loss of this tree will be mitigated through replacement tree and shrub planting within the site.

Provided the trees to be retained are protected throughout the development in accordance with this Arboricultural Impact Assessment and Appendix 1: Method Statement and Tree Protection Plan, 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 Discussion

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

8.1 Proposed demolition

The tree protection measures (tree protective fencing annotated on the Tree Protection Plan as a thick red line and ground protection annotated as a blue diagonal hatch) as detailed in Appendix 1 Method Statement and Tree Protection Plan will need to be installed prior to demolition works. Once the tree protection measures are installed, the tree works to implement the development of the site can be carried out and demolition works subsequently implemented.

8.2 The loss of tree (annotated on the Tree Protection Plan as a thin red line) T1C is necessary to allow the development of the site. T1C is visible from public points of view. However, due to its small size, the loss of this tree is likely to be insignificant especially when considering the replacement tree planting to be implemented as part of the landscaping proposals. Further, tree T1U has a poor form due to multiple stems from the base and is likely to have been self-set. Due to the condition of the tree and the prevalence of ash dieback², the retention of the tree is unsuitable regardless of the potential development of the site. Accepting the above, the loss of T1U is reasonable and the loss of the tree can be mitigated through replacement tree planting.

8.3 The main arboricultural feature of the site is the trees outside the site, T2C, T3C, and T4C in the adjacent garden to the west. These three trees are 'unremarkable' and therefore merit 'C' category in BS5837:2012. As such, these trees do not merit amendment to the proposals due to their low level of categorisation.

8.4 The footway to access the rear gardens is partially within the root protection area (RPA) of these trees, T2C, T3C, and T4C. To avoid a significant impact upon these trees, an above ground special surface / cellular confinement construction³ (annotated on the Tree Protection Plan as a purple cross hatch) for the base course with a final porous wearing course⁴ can be used to reduce the impact upon the adjacent trees by avoiding the need for excavation. Temporary access will be necessary within the tree protection measures to allow the footpath construction.

8.5 The bin and cycle stores are partially within the RPA of T2C and T4C. Due to the lower 'C' categorisation of the trees, it is acceptable for the construction of the bin and cycle store to be installed partially within the RPA of the trees. This encroachment can be mitigated by the additional area outside the RPA retained for tree root growth and constructing the foundation raft using an above ground cast concrete slab (annotated on the Tree Protection Plan as a yellow solid hatch) to avoid excavation leading to potential tree root severance. An impermeable membrane beneath the slab will be necessary to avoid the cement contaminating the local soils. Temporary access will be necessary within the tree protection measures to allow their construction.

8.6 Proposed 1.8m high fencing is within the root protection area of the retained trees T2C, T3C, and T4C. To minimise the impact upon these adjacent trees, the fence posts will be

² <https://www.forestresearch.gov.uk/tools-and-resources/fthr/pest-and-disease-resources/ash-dieback-hymenoscyphus-fraxineus/>

³ For instance, <https://www.geosyn.co.uk/product/cellweb-tree-root-protection> or similar

⁴ For instance, <https://www.marshalls.co.uk/commercial/popular-searches/porous-paving> or similar

set in a hole c30 cm diameter to c 40 cm depth and the hole lined with an impermeable membrane to prevent localised soil contamination from the supporting concrete foundation. I anticipate spacing will be 2.7 m between posts, 1.8 m out of the ground to support the garden fences. Tree roots will be able to colonise the area between and beyond the fence line reducing the potential impact upon the retained trees. Temporary access will be necessary within the tree protection measures to allow the fence construction.

- 8.7 Tree works will be necessary to remove the lower branches over the gardens and pedestrian access. It is also appropriate to prune the branches to clear the proposed dwellings by 3m. These works are detailed in Appendix 2 BS5837 Tree Survey and are to aid the long term management of the site and allow for a reasonable use of the gardens.

8.8 Services

All 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) and written approval from the planning authority Arboricultural Officer prior to installation. Further advice is available in Appendix 1: Method Statement and Tree Protection Plan and NJUG Volume 4 "Guidance for the planning, installation and maintenance of utility services in proximity of trees".

8.9 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."

- 8.10 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 and Tree Protection Plan, Arboricultural Method Statement Summary table: Timing of operations.

- 8.11 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.

8.12 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 of materials will need to be delivered to site on an 'as required' basis and the use of an offsite storage compound may be necessary.

8.13 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.

8.14 Post development relationship

Due to the nature of the use of the site, the existing relationship with the trees and the proposed layout, there is no significant adverse post development pressures anticipated. Tree management will be necessary to maintain a reasonable relationship and this is likely to be a c3 year cyclic basis typical of many residential gardens where tree branches trespass outside the boundary of the tree owners property. Pruning in such circumstances is normal and typically considered common law⁵.

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

8.16 Falling debris (leaves, seed, needles) is a regular maintenance issue and should be treated as such. If desired, then www.suraflow.co.uk (which prevents debris falling in the gutter through the coanda effect), or other suitable method can be installed to manage this concern. Down pipes can also be installed with traps (<https://www.3pttechnik.co.uk/garden/downpipe-filters-diverters/rainus/> or similar) that are easily cleaned or chains used as the down pipe (which requires no cleaning).

8.17 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.

8.18 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.

⁵ <https://www.rhs.org.uk/plants/types/trees/the-law>

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 these trees.

Tree protection measures are necessary to aid the retention of the retained trees.

Replacement tree planting to mitigate the loss of tree T1U is to be detailed in the landscaping proposals.

The principles and details of the Arboricultural Impact Assessment and Appendix 1: Method Statement and Tree Protection Plan are to 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.

Ben Abbatt

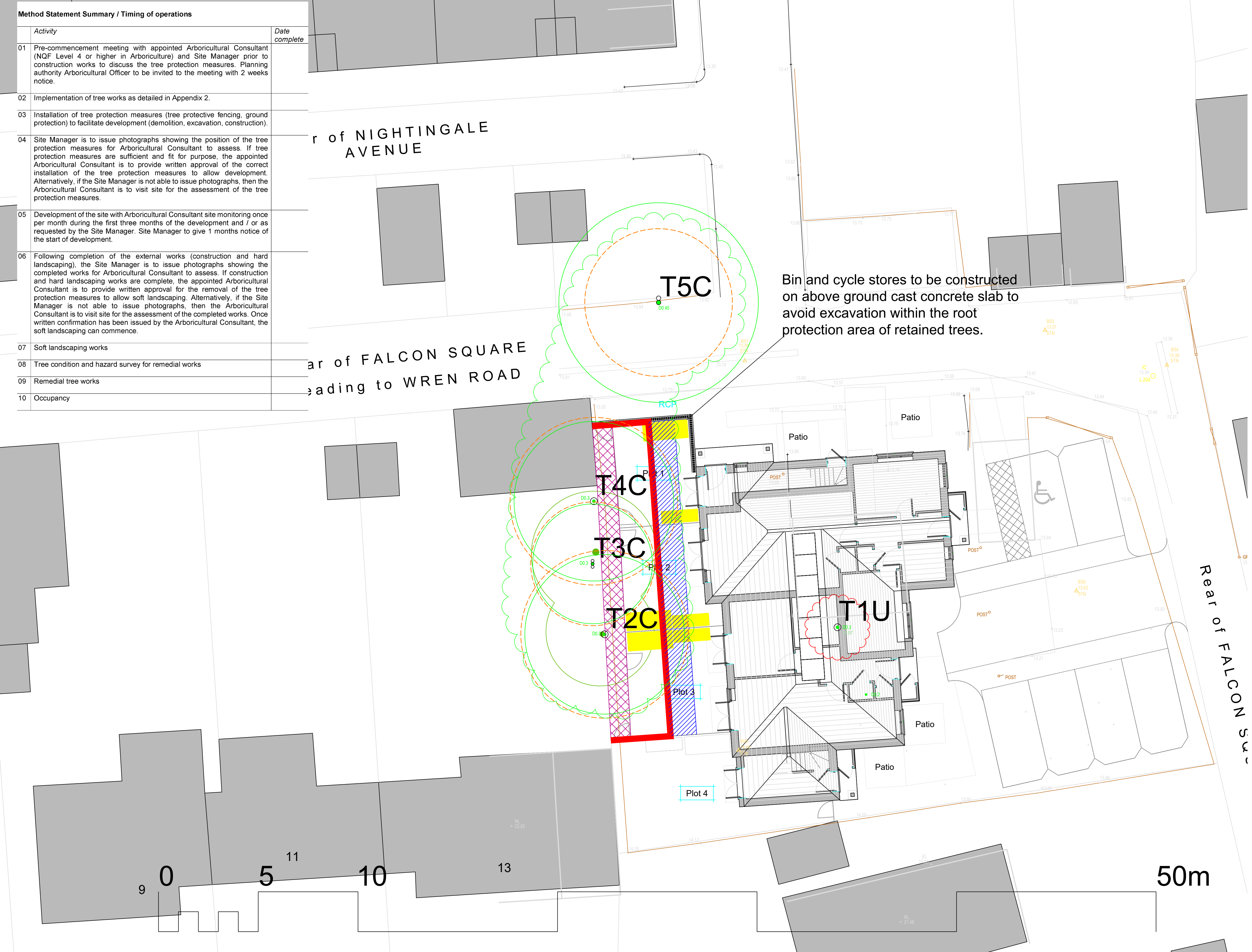
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Appendices

Appendix 1: Method Statement and Tree Protection Plan

Method Statement Summary / Timing of operations		
	Activity	Date complete
01	Pre-commencement meeting with appointed Arboricultural Consultant (NQF Level 4 or higher in Arboriculture) and Site Manager prior to construction works to discuss the tree protection measures. Planning authority Arboricultural Officer to be invited to the meeting with 2 weeks notice.	
02	Implementation of tree works as detailed in Appendix 2.	
03	Installation of tree protection measures (tree protective fencing, ground protection) to facilitate development (demolition, excavation, construction).	
04	Site Manager is to issue photographs showing the position of the tree protection measures for Arboricultural Consultant to assess. If tree protection measures are sufficient and fit for purpose, the appointed Arboricultural Consultant is to provide written approval of the correct installation of the tree protection measures to allow development. Alternatively, if the Site Manager is not able to issue photographs, then the Arboricultural Consultant is to visit site for the assessment of the tree protection measures.	
05	Development of the site with Arboricultural Consultant site monitoring once per month during the first three months of the development and / or as requested by the Site Manager. Site Manager to give 1 months notice of the start of development.	
06	Following completion of the external works (construction and hard landscaping), the Site Manager is to issue photographs showing the completed works for Arboricultural Consultant to assess. If construction and hard landscaping works are complete, the appointed Arboricultural Consultant is to provide written approval for the removal of the tree protection measures to allow soft landscaping. Alternatively, if the Site Manager is not able to issue photographs, then the Arboricultural Consultant is to visit site for the assessment of the completed works. Once written confirmation has been issued by the Arboricultural Consultant, the soft landscaping can commence.	
07	Soft landscaping works	
08	Tree condition and hazard 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 BS5998: 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 tree 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.

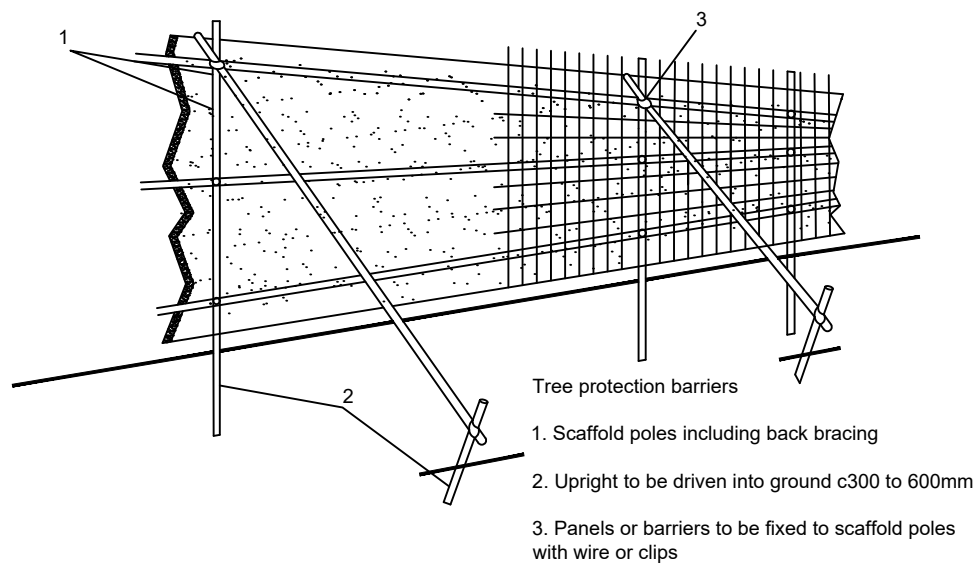
11. Following completion of the construction and hard landscaping works a site meeting between the Local Planning Authority Arboricultural Officer, appointed Arboricultural Consultant and Site Manager must take place to assess whether the protective barriers and ground protection can be removed to allow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

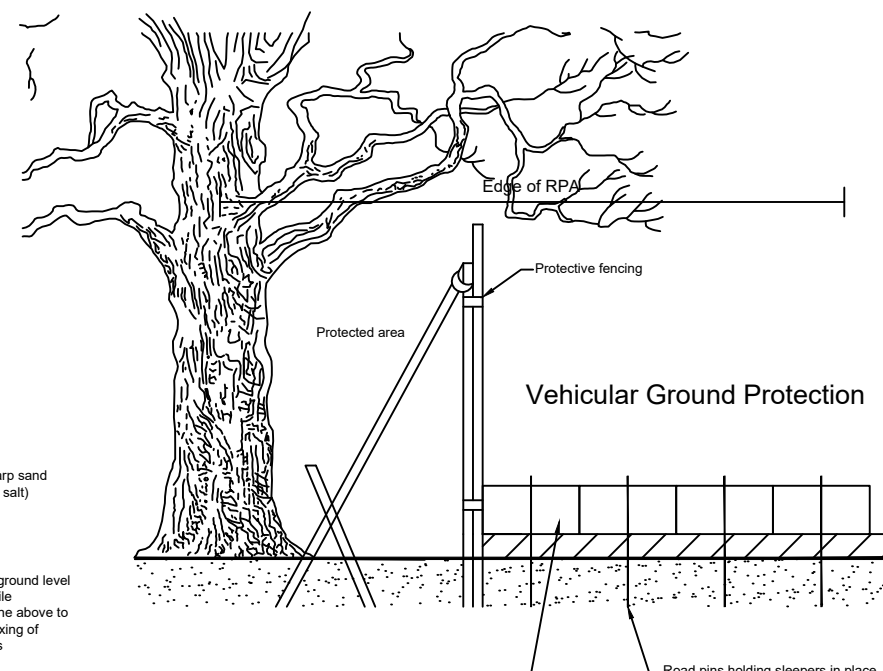
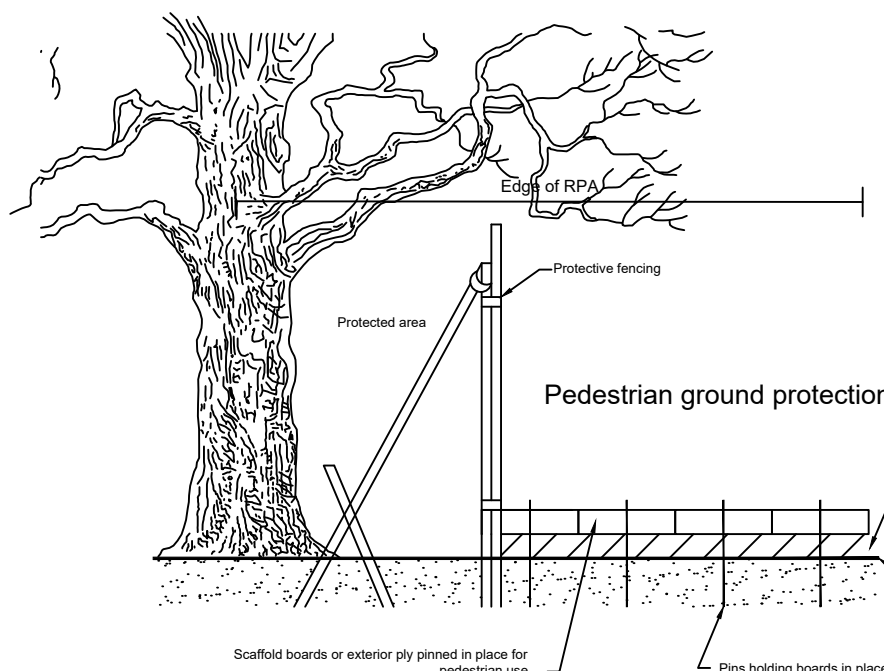
RPA refers to the Root Protection Area as detailed in Appendix 2: BS5837 Tree Survey.

- 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.

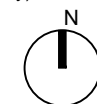


General / Key:		Site: Land at Nightingale Avenue, Eastleigh SO50 9JA	Drawing title:
Root protection area		Data: Site layout and survey data provided by Client. ©Crown Copyright and database rights 2022 OS Licence no. 100022452	Tree protection plan
Indicative canopy		This drawing is produced in colour. Please ensure that you use a colour printing to ensure that the drawing is correctly interpreted.	Drawing reference: J1377.02
Barrier fencing		This drawing is copyright of Sapling Arboriculture Limited and may not be copied, altered or reproduced in any way without written authority from Sapling Arboriculture Limited.	Revision:
Ground protection		Item reference (T/G/H/W) Item number (1, 2, etc.) BS5837 category (A/B/C/U) For instance: T1C	Date: 12th April 2023
Special surface			Scale: 1 to 100 on A1 (site layout only)
Above ground slab			Sheet: 1 of 1
Tree to be removed			

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Appendix 2: BS5837 tree survey

Designation	Reference number	BS 5837 Category	Species	Height (m)	Single stem diameter (mm at	N Canopy spread (m)	E Canopy spread (m)	S Canopy spread (m)	W Canopy spread (m)	Canopy height (m)	Canopy height cardinal point	Age class	Physiological condition	Structural condition	Condition notes	Anticipated remaining life	Root Protection Area - Radius (m)	Root Protection Area - Area (sqm)	Development related tree works	Development related mitigation
T	1	U	Ash <i>Fraxinus excelsior</i>	9	~	3	3	3	3	0	~	Young	Good	Fair	Multiple stems from the base. Self set. Species susceptibility to ash dieback.	<10	4.0	50.3	Remove.	None.
T	2	C1	Birch <i>Betula pendula</i>	14	350	4	4	4	4	2	E	Mature	Good	Fair	Offsite. Planted immediately adjacent to the boundary. Stem diameter approximated.	10+	4.2	55.4	Crown lift to 5m within the site. Clear proposed building by 3m.	Install cellular confinement system for footpath. Install tree protective fencing and ground protection as detailed in Appendix 1: Method Statement and Tree Protection Plan. Install bin store as above ground cast concrete slab.
T	3	C1	Laurel <i>Prunus laurocerasus</i>	8	3# 150	3	3	3	3	2	E	Mature	Good	Fair	Offsite. Planted immediately adjacent to the boundary. Stem diameter approximated.	10+	3.1	30.2	Crown lift to 5m within the site. Clear proposed building by 3m.	Install cellular confinement system for footpath. Install tree protective fencing and ground protection as detailed in Appendix 1: Method Statement and Tree Protection Plan. Install bin store as above ground cast concrete slab.
T	4	C1	Cherry <i>Prunus avium</i>	10	350	4	4	4	4	2	E	Middle aged	Good	Fair	Offsite. Planted immediately adjacent to the boundary. Stem diameter approximated.	10+	4.2	55.4	Crown lift to 5m within the site. Clear proposed building by 3m.	Install cellular confinement system for footpath. Install tree protective fencing and ground protection as detailed in Appendix 1: Method Statement and Tree Protection Plan. Install bin store as above ground cast concrete slab.
T	5	C1	Birch <i>Betula pendula</i>	10	2# 220	5	5	5	5	1	~	Mature	Good	Fair	Offsite. Self set in fence line. Two stems from the base.	10+	3.7	43.0	No works required. Advise Highways Authority of low branches to enable appropriate crown lifting works.	None.

General notes

The BS5837 tree survey is not a “Tree Condition / 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.

Typical significant defects that are identified are referred to in Lonsdale, D., “Hazards from Trees, a general guide” (FCPG13) published in 2000 by the Forestry Commission, Lonsdale, D., “Principles of tree hazard assessment and management” published in 1999 and 2001 and reprinted in 2013 by the Forestry Commission, and Mattheck, C., “The body language of trees” published in 1994 by the Department of the Environment and 2015 by Karlsruhe Institute of Technology.

Reasonable access around the base of the tree is required to carry out a tree survey. Where this is not feasible, these parts of the tree may not be fully assessed. If a view of the entire structure of the tree(s) is limited, for instance by the properties in private ownership or obscured by vegetation, this is a limitation to the tree survey and some parts of the tree may not be able to be fully surveyed.

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.

This 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, the tree species, the use of the environment within which the tree stands, and how often the area is used. The default period, if none provided, is 1 year.

I have not checked whether the site is within a Conservation Area or whether the trees are under Tree Preservation Order (TPO) specifically with the planning authority. Prior to any tree works confirmation of whether these legal restrictions apply to the site or trees ought to be sought from the planning authority. If the trees stand within a Conservation Area designated under the Town and Country Planning Act the planning authority 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 planning authority 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 planning authority 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(s) at 1.5metres following normal Forestry conventions or immediately above the root flare for multiple stemmed trees where appropriate, 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 or canopy spread.
	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 and canopy spread.
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.	
BS5837 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. NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5 of BS5837:2012		
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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