WADEY TREES
CHARTERED CONSULTANCY

Arboricultural Impact and Mitigation Statement for Development Proposals at:

150 Bouverie Avenue South
Salisbury
SP2 8EB

Proposal: Erection of a new dwelling, hard and soft landscaping and associated works.

Prepared for: Ms B Bresland

Report Ref: WT 057-23 AIA
Report Date: 26 June 2023

Prepared by:
Mark Wadey NDArb CUEW MArborA RCArborA MICFor
Arboricultural Consultant

AA Registered CONSULTANT trees.org.uk

Institute of Chartered Foresters
Registered Consultant

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Summary table: Overall impact on trees

Impact	Reason	High/moderate quality trees		Low/unretainable quality trees	
		A	B	C	U
Trees to be removed	Construction activities	None	**T003**	**H002 (part), T004, T005, T006, T007, T008**	None
Trees to be removed	Risk management	None	None	None	None
Changes within RPAs	Construction activities	None	**T009, T010**	None	None
Retained trees to be pruned	Space for development	None	**T009**	None	None
	Future occupancy	None	**T009**	None	None

1. INTRODUCTION

1.1 **Instruction:** This report was instructed by Ms Becci Bresland to prepare relevant information to accompany the planning submission for erection of a new dwelling, hard and soft landscaping and associated works at 150 Bouverie Avenue South, Salisbury, SP2 8EB. The report details all trees that are associated with the siting of the proposed development and their positions are illustrated on the separately provided tree protection plan attachment WTP1.

1.2 **Site visit:** The site visit was undertaken on 20th June 2023. The trees were surveyed visually, externally and from ground level only. No detailed investigations were undertaken, samples, or internal decay detection readings taken for further analysis. All dimensions have been estimated unless stated otherwise. Weather conditions at the time of the survey were clear, still and dry, with good visibility.

1.3 **Statutory tree protection:** After investigating the local planning authority (LPA) online mapping system, it was established that there are no tree preservation orders (TPOs) protecting the trees on or surrounding the site and it is not within a Conservation Area.

1.4 **Felling Licences:** Section 9 of the Forestry Act 1967 requires that a Felling Licence is required for the felling of up to 5 cubic metres of timber in any one calendar quarter. Trees in orchards, gardens, churchyards and open spaces are exempt. There are also other exemptions that apply such as trees that may be dead, dangerous or those affected by ash dieback disease. In this instance, a felling licence is not required because the site is within a garden.

1.5 **Limitations of this report:** The following limitations apply to this report:

1.5.1 **Archaeology:** Although trees can grow in archaeologically sensitive locations, I have no specialist expertise in this discipline and this report does not consider this aspect.

1.5.2 **Ecology:** The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000, provides statutory protection to birds, bats and other species that inhabit trees. These could impose significant constraints on the use and timing of access to the site in addition to any of the tree constraints set out in this report. These issues are beyond my area of expertise, and I advise that you seek the advice from an ecologist on whether any such constraints apply to this site.

1.5.3 **Tree assessment and management advice:** The comments made about the health and stability of the trees within this report were correct at the time of inspection. It should be recognized that trees are dynamic structures that can never be completely predictable and may become unstable or partially unstable even in average weather conditions. Changes can occur not only to environmental triggers but also in response to biological or mechanical events. For these reasons, the tree assessment advice only remains valid for one year from the date that the trees were last inspected. No tree is ever safe due to the unpredictable laws and forces of nature.

The inspection was carried out from ground level. Where there was restricted access to the base of a tree, its attributes were assessed from the nearest point of access. Binoculars were used to observe features higher in the canopies such as foliage, extension growth and/or bud proliferation. No soil or tissue samples were taken during this inspection and no invasive diagnostic equipment was used to detect decay. If ivy covered, I probed and tapped the wood from ground level to establish if there were any obscured features that were relevant to the assessment. This did not extend to removing all the ivy or probing beyond what could be reached from ground level. Where trees have thick ivy, it would be impractical in every case to remove it or climb into the crown to have a closer look. However, where I suspect there are obvious visible significant outward health problems or structural defects visible under the ivy, I may recommend its removal for a further assessment.

1.5.4 **Soil assessment:** British Standard (BS) 5837:2012 Trees in relation to design, demolition and construction – Recommendations advocates that a soil assessment should be carried out to inform decisions relating to Root Protection Areas (RPAs), tree protection, new planting and foundation design. I have consulted the British Geological Survey (BGS) website and their Geology Viewer, and this advises that the bedrock geology for the site is Culver Chalk Formation. I did not undertake any excavations on site to confirm this and a full geotechnical site investigation may need to be undertaken to provide a more in-depth level of information regarding soil type for the site.

1.6 **Technical references:** This arboricultural impact assessment and arboricultural method statement is based on the following primary technical references:

- British Standards Institution (2012) BS 5837: Trees in relation to design, demolition and construction – Recommendations
- National Planning Policy Framework (NPPF) revised on 20 July 2021 setting out the Governments planning policies for England and how these should be applied.

1.7 **Drawings and documents provided:** Several plans and documents were provided as part of the current planning proposal. My drawing and report have been developed in context with the following provided information:

- Land survey reference ADS-0747, received by email on 14th June 2023
- Layout, reference 20-3287-300- Proposed Site Plan, received by email on14th June 2023

1.8 **Qualifications and experience:** This report is based on my site observations and the provided information, interpreted in the context of my experience. I have experience and qualifications in arboriculture that can be reviewed at https://wadeytrees.co.uk/wp-content/uploads/2020/03/CV-Mark-J-Wadey-2.pdf.

2. SITE VISIT AND COLLECTION OF DATA

2.1 **Brief description of site and surrounding tree cover:** The proposal is located within the rear garden of an existing detached dwelling on Bouverie Avenue South. There are a variety of deciduous and coniferous trees scattered throughout the site, and around the site boundaries. Although they are not individually prominent, they offer some wider visual amenity to the surrounding area (Image 1).

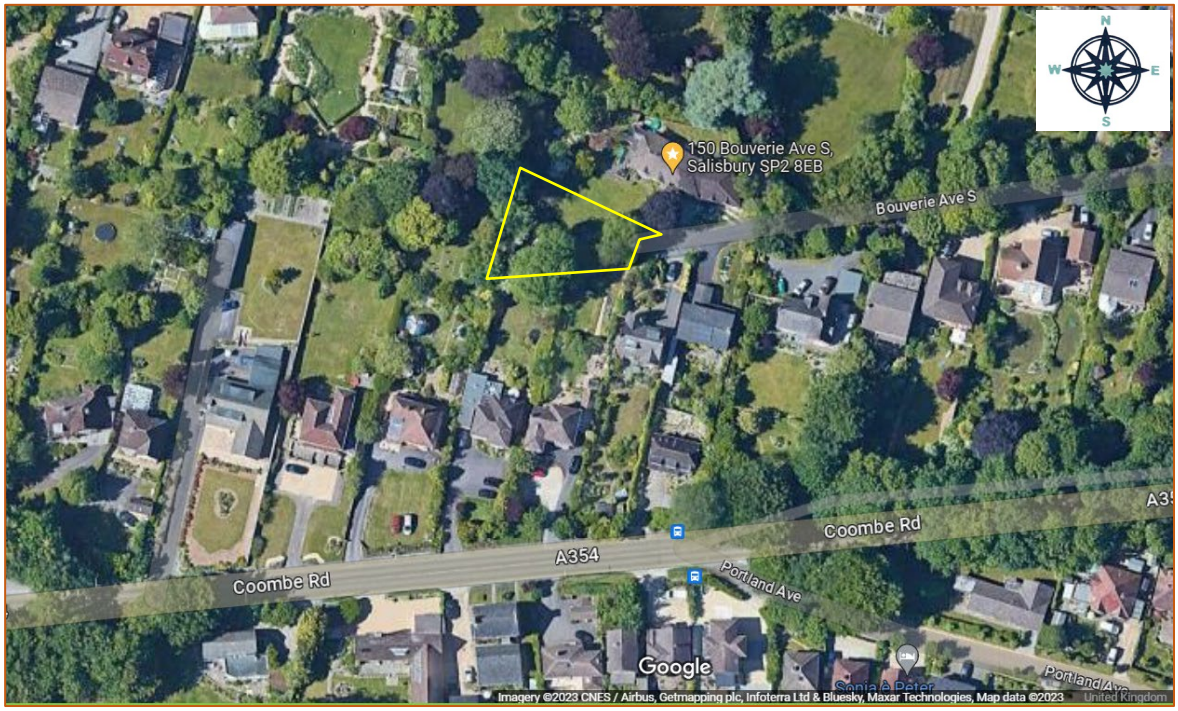


Image 1: The site boundaries are approximately indicated by the yellow outline

2.2 **Tree assessment method:** The existing tree stock has been identified and graded in line with the current British Standard BS 5837 2012: Trees in relation to design, demolition and construction - Recommendations to enable informed decisions to be made regarding tree retention. The report also details methods of protection to be implemented to safeguard the retained trees.

2.3 **Independent assessment of trees:** I inspected each tree and have indicated the numbering on the tree protection plan (WTP1) in Appendix 1. For each tree, I collected information on species, height, diameter, maturity and potential for contribution to amenity in a development context. As advocated in BS 5837, each tree was then allocated to one of four categories which reflected its suitability as a material constraint on development:

- Category A: Trees of high quality and value
- Category B: Trees of moderate quality and value
- Category C: Trees of low quality and value
- Category U: Trees unsuitable for retention, usually to be removed

This information is recorded in the tree schedule included as Appendix 2, with further explanatory notes.

2.4 **The root protection areas and location of tree protection:** BS5837:2012 paragraph 4.6.1 gives recommendations for the areas of root protection to be the equivalent to the area of a circle centred on the single stem tree with a radius of at least 12 times the trunk diameter. For trees with more than one stem, the recommended formulas were used to arrive at the combined stem diameter calculation. The calculated RPA for each tree was capped to 707m². This distance is given for guidance to each tree or group in the schedule. In practice, the siting of the specific protection measures may be different. The implication of this notional root protection area (RPA) is that no significant disturbance should occur within it if the trees are to be successfully retained. As advocated in in paragraph 4.6.3 of that document, where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon or equivalent area has been produced. Any modifications to the shape of the RPA have reflected our interpretation of a reasonable and likely root distribution.

3. WORKING WITH THE DESIGN PROPOSAL

General background

3.1 **Tree constraints as part of the design layout:** As recommended in section 5 of BS5837, the constraints posed by existing trees were identified to inform the site layout design. The collected information was used to provide relevant guidance to the architect so that when moderate/higher quality (category A and B) trees were recognised, their retention was given greater weight than the lower quality (category C) trees, which have less importance to the site and its surroundings. This helps to avoid misplaced tree retentions and provide opportunities for new trees that may bring about future enhancements for the site. The below ground (RPAs) and above ground (canopy) constraints have been considered as part of the design process by the architect to arrive at the submitted design.

3.2 **Previous planning approval and new application design enhancements:** Planning permission has been recently granted on the site for a similar residential development. The architects have reviewed the design of the approved scheme and the proposed changes are required to improve the functionality of the proposed development, as well as provide enhancements to the surrounding landscape by planting more trees and shrubs along the southern boundary. This report has been prepared on behalf of the client to support these changes.

3.3 **Relevant Planning Policy taken account during the design stage:** The requirements of the British Standard 5837 and National Planning Policy Framework (NPPF) can be met using planning conditions to require the mitigation measures set out in this report. These proposals comply with the NPPF in terms of achieving sustainable development, good design and conserving the natural environment by retaining all of the important trees adjacent the site. Paragraphs 54 and 55 of the NPPF deal with planning conditions. In this respect, sufficient detail has been provided so an enforceable planning condition requiring the trees to be protected can be based on the accompanying arboricultural method statement (AMS) and associated tree protection plan WTP1.

4. DEVELOPMENT INFLUENCE ON TREE COVER AND PROPOSED MITIGATION

Specific issues on this site

4.1 **Tree protection plan WTP1:** Plan WTP1 in Appendix 1 has been prepared based on the latest layout and is intended to provide a preliminary indication of the tree issues. It shows the existing trees numbered, with their assessed categories in the respective colours as set out in paragraph 2.3 above. Trees to be removed are highlighted with a red crown outline. A preliminary location for protective fencing is illustrated with black post and rail annotation and the RPA to be protected behind is shown with the black diagonal hatching. Any ground protection is shown with a blue cross hatch annotation and any precautionary areas are shown with a yellow fill. I stress that this plan is intended to provide an overview of how the tree protection will work and may require more detailed adjustments for the final submission in the context of any feedback.

4.2 **B Category tree proposed for removal:** One moderate category tree (T003) will need to be removed to facilitate the new access/parking arrangement. Although it is partly visible from the road, and there will be some short-term visual impact, it is not a particularly special or outstanding individual. With the retention of T1, and the new planting along the southern boundary, its loss will be easily buffered so there will be no significant adverse visual impact on the locality.

4.3 **C category trees proposed for removal:** Part of one hedge (H002) and five trees (T004, T005, T006, T007 and T008) proposed for removal are low quality and do not offer any significant amenity when viewed from outside the site. The proposal offers sufficient space for new landscaping along the southern boundary which could include trees or shrubs that will easily mitigate these losses. If required, it would be appropriate for the precise detail to be agreed with the LPA through a planning condition.

4.4 **Tree pruning to facilitate access/working space:** Implementation of the proposed house will require some of the lower and side branches on the ash tree (T009) to be pruned to ensure that there is sufficient clearance from the building for working space, and to prevent future damage to either building or tree. However, this is only necessary on small secondary and tertiary branches on the side of the tree that are not visible from any public vantage points. Also, once T012 has been removed, (which is growing under the canopy of T009), extra space will be created so only the smaller, higher branch ends will need to be pruned back which will be easily occluded by the tree (Image 2) Provided the work is carried out in accordance with BS3998: 2010 *'Tree Work Recommendations'*, it is unlikely to have a detrimental impact on the health or amenity value of the tree.

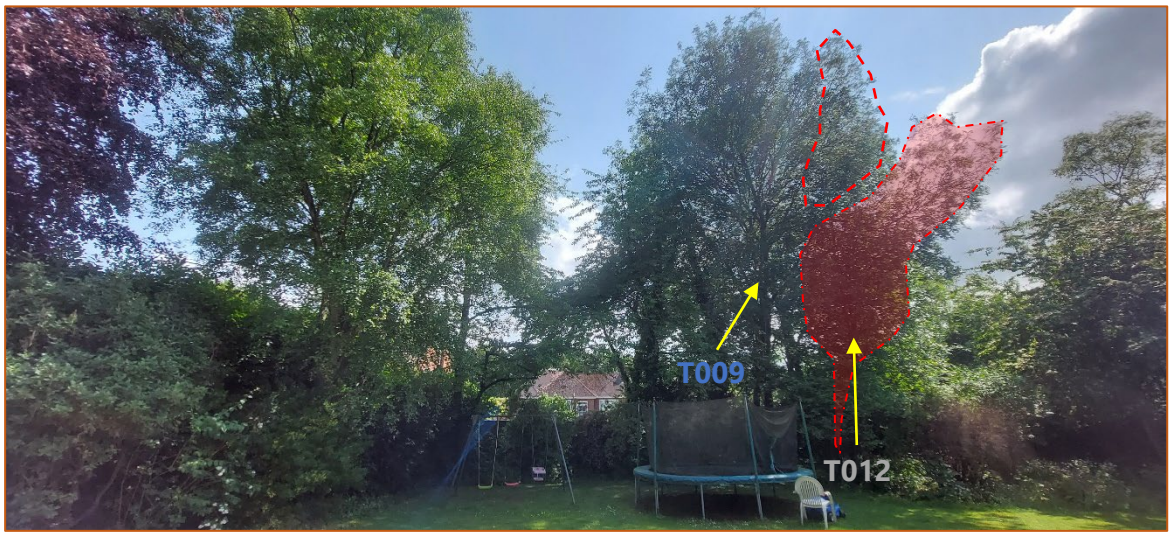


Image 2: A small amount of pruning is only necessary on the side of T009 that is not visible from any public vantage points (red dotted line). T0012 will be removed so space will be created under the canopy once it has gone (red filled annotation).

4.5 **Site access:** The existing road surface close to T001 can be retained and utilised for ground protection over the RPA of this tree to minimise harm to roots. The front section of the laurel hedge (H002) can be retained either side of the access to maintain screening, and all other retained trees do not unduly affect construction access (Image 3). Provided that protective fencing and ground protection is installed/retained correctly, there is unlikely to be any adverse effects on trees from construction traffic moving in and out of the site.



Image 3: Access will be gained by removing part of the existing laurel hedge and utilising the existing road surface past T001.

4.6 **Proposed building**: The footprint of the proposed building side extension encroaches into the root protection area of both ash trees along the southern boundary (T009 and T010). However, as supported by BS5837:2012 paragraph 7.5.3 this minor encroachment is less than 20% of their overall RPAs and therefore unlikely to adversely impact on their health or stability. To further minimise harm, the utility room section can be constructed on a pile and beam type construction, without the need for significant excavation, and the posts for the car port can be installed using careful hand digging techniques. These methods will be

in line with the recommendations in BS5837:2012 relating to structures (clauses 7.5.1 to 7.5.5) and hand digging clauses (7.2.1 to 7.2.4).

4.7 **Ground protection:** The protective barriers around trees T009 and T010 will need to be set back to allow sufficient room for the positioning of scaffolding and to provide suitable space for the movement of materials and personnel around the new building during its construction. The protective barrier positions around trees are shown on the plan in Appendix 1. The RPAs that are outside of the barriers will be covered in ground protection and this will be installed after the erection of the barriers, but before any clearance or construction work starts on site. The provision of ground protection to allow pedestrian access within RPAs is supported in paragraph 6.2.3 of BS 5837:2012 and I do not perceive this to be a particular problem provided it is implemented correctly and remains in situ during the construction phase of the project.

4.8 **Storage and movement of materials:** Materials can be delivered to site using the vehicular access and stored on the frontage outside the fenced areas. It is entirely feasible to move materials to the working areas by hand or using small low ground-effect plant, with no significant harm to trees.

4.9 **Drainage and other services:** Drainage runs, soakaways and the installation of other services can cause disruption to RPAs and result in important trees being damaged. I advise that these matters are considered at an early stage and agreed with the LPA prior to the development phase commencing.

4.10 **Post occupancy pressures on trees:** The location and character of the proposal has been achieved in consideration of all the site factors, including the presence of trees. In reference to BS5837:2012 recommendations paragraph 5.3.4 and its sub paragraphs, any issues relating to shading, privacy and screening, direct damage, future pressure for removal and seasonal nuisance have been factored into the design to minimise any post occupancy pressure on trees. In this case, the main occupation of the proposed house position is similar to that of the recently approved dwelling layout, albeit with some additional provision for a car port and utility/entrance area. Although this means the building footprint has increased slightly, it has been designed so there will be no permanent occupancy on this side of the house. The structure and the roof will also provide added protection for cars which will help reduce canopy overhang and potential debris fall concerns (Image 4). The main living areas have been designed with windows looking out into the rear garden so the residents can look out and enjoy the natural beauty and ambience created by the presence of the trees and vegetation and after discussions with the architect, it was confirmed there is sufficient space within the internal design and rear garden areas to allow the occupants normal and reasonable access to daylight (Image 5).

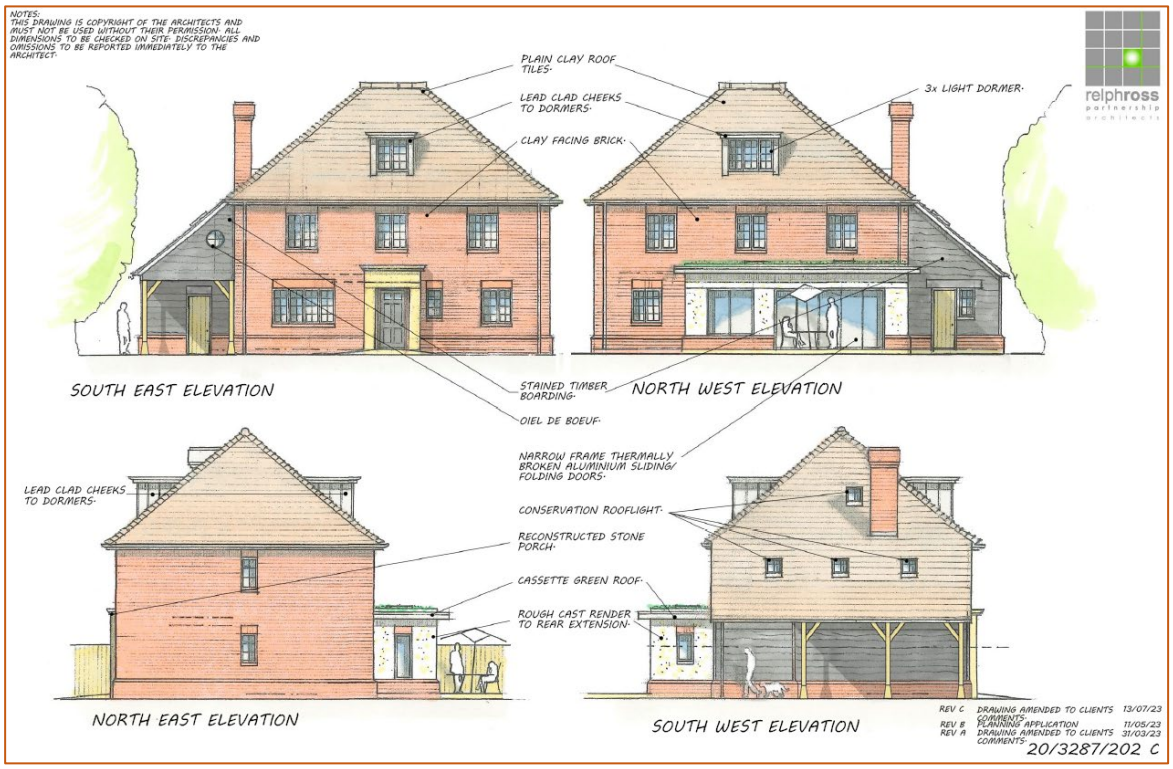


Image 4: the building has been designed so there will be no permanent occupancy close to trees. The structure and the roof will also provide added protection for cars which will help reduce canopy overhang and potential debris fall concerns.

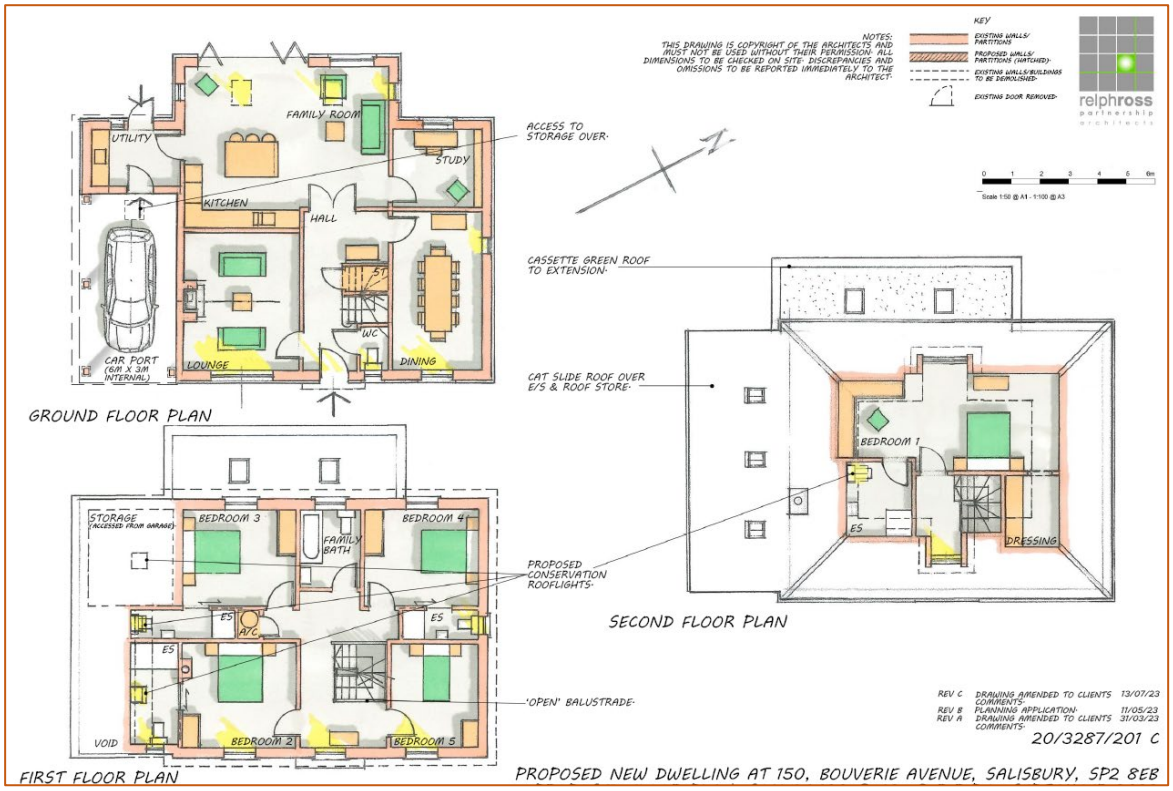


Image 5: The main living areas have been designed with windows looking out into the rear garden so the residents can look out and enjoy the natural beauty and ambience created by the presence of the trees and vegetation.

In taking a balanced approach, I believe these trees will also provide some shaded areas that will give refuge to occupiers in the hot summer months, providing more of a benefit to them than an inconvenience and it will be in the interests of new occupants to retain the boundary trees and any new planting for seclusion and privacy. In the context of the above points, I believe that this proposal is unlikely to bring new pressures on trees.

5. CONCLUSIONS

5.1 **Overall summary:** The table (on page 1) provides a summary of the relevant changes and potential impacts arising from this development proposal. This layout retains the significant trees adjacent to the site, with sufficient scope to protect them during development. If adequate precautions to protect the retained trees are implemented as recommended in this report, and as may reasonably be required by consent conditions, the overall impact of the proposal on local amenity will be low and limited to the short term only. To mitigate the loss of any existing trees, it has been agreed that planting along the southern boundary is achievable, which could include significant new trees and shrubs. The proposal takes proper account of potential pressures for pruning and felling post-occupancy. This submission has demonstrated that it is reasonably practicable to develop the scheme without significant harm to retained trees. Any additional information required for reassurance, can be provided by way of conditions attached to the planning permission. The scheme accords with the principles set out in the National Planning Policy Framework and it is also technically compliant with BS5837:2012 and the way in which that Standard has been applied. Any deviations from its recommendations have been properly justified with appropriate actions. Therefore, I do not believe there are supportable or reasonable grounds for refusing permission in terms of the trees.

6. RECOMMENDATIONS TO PROTECT TREES DURING DEVELOPMENT

6.1 **Arboricultural method statement:** The successful retention of trees depends on the quality of the protection and the administrative procedures to ensure those protective measures remain in place whilst there is a realistic risk of damage. An effective means of doing this would be through the arboricultural method statement, set out in Appendix 3, that can be specifically referred to in a planning condition. The details of this arboricultural method statement should be made available to the builders and its guidance followed to ensure that the trees are fully protected during the construction works. If appropriate, the builder should instruct an arboriculturist to comply with any necessary planning conditions relating to pre-commencement meetings and/or agree protection with ongoing supervision requirements sanctioned by the LPA.

6.2 **Provision of a construction method statement:** The recommendation in BS5837:2012 paragraph 5.5.6 is that any construction information that may directly influence tree protection requirements should be provided at the earliest stages of development. A construction method statement is a description of how operations that may affect trees will be carried out to minimise any adverse impact on them. The details of how the site will be managed are construction and contractual matters that can only be finalised once the post-consent detailed planning begins. For that reason, at this stage in the planning process, it is only possible to list a summary of the issues that will require more detailed consideration once consent is issued. The issues that may require further clarification on this site include:

- site construction access
- the intensity and nature of the construction activity
- contractors' car parking
- phasing of construction works
- the space needed for foundation excavations and construction works
- the availability of special construction techniques
- the location and space needed for all temporary and permanent apparatus and service runs, including foul and surface water drains, land drains, soakaways, gas, oil, water, electricity, telephone, television, or other communication cables
- all changes in ground level, including the location of retaining walls, steps and making adequate allowance for foundations of such walls and back fillings
- working space for plant, scaffolding, and access during works
- space for site huts, temporary toilet facilities (including their drainage) and other temporary structures
- space for storing (whether temporary or long-term) materials, spoil and fuel and the mixing of cement and concrete.

Note: It is not my role as an arboricultural consultant to detail the timing and implementation of these measures, although I can input into the process and will need to confirm that the final proposals will not adversely affect retained trees. *Attention is drawn to the Construction (Design and Management) Regulations 2007 [5] and the Construction (Design and Management) Regulations (Northern Ireland) 2007 [6].*

7. RECOMMENDATIONS TO ENHANCE TREE COVER

7.1 **New tree planting strategy and enhancement landscaping opportunities:** In the context of the loss of trees, new planting along the southern boundary is achievable, which could include new trees and shrubs to be planted next to the fence line in sustainable locations. It would be appropriate for the precise detail to be agreed with the LPA through a planning condition.

7.2 **New trees – size at planting and other detailed specifications:** If instant impact on landscaping is required, the new trees will be as large as possible for the planting space available. The supply, planting and maintenance of all new trees will need to be in accordance with BS 8545, with an expectation that any planning conditions will secure the provision of appropriate maintenance and replacement in the event of any trees not surviving to independence in the landscape.

7.3 **Tree establishment and care:** For further advice on young tree establishment, a useful introductory guide has been produced by the Arboricultural Association which can be found at https://www.trees.org.uk/Help-Advice/Guide-to-Young-Tree-Establishment. This sets out the principles of good tree choice, planting practice and aftercare.

Mark Wadey **NDArb CUEW MArborA RCArborA MICFor**

Arboricultural Consultant

Institute of Chartered Foresters
Registered Consultant

Appendices:

1 The tree protection plan WTP1

2 Data collection – Tree schedule & explanatory notes

3 Arboricultural Method Statement

Appendix 1 – The Tree Protection Plan: Illustrating tree protection and management proposals – WTP1

Content: 1 x A2 plan @ scale 1:200

Tree Protection Advice (TPA2)
Ground Protection Guidance

In all cases, the objective should be to avoid compaction of the soil from the constant foot traffic heavy vehicles, especially in wet conditions, so that tree root functions remain unimpaired. New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.

Where construction working space or temporary construction access is justified within the RPA, this should be facilitated by a set-back in the alignment of the tree protection barrier. In such areas, suitable existing hard surfacing that is not proposed for re-use as part of the finished design should be retained to act as temporary ground protection during construction, rather than being removed during demolition. The suitability of such surfacing for this purpose should be evaluated by the project arboriculturist and an engineer as appropriate.

Ground protection examples:

Image 1: Mulch underneath plyboards can be adequate protection for foot traffic purposes.

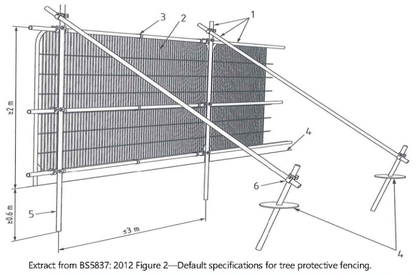


Image 2: Bespoke boards designed to fit around the build area are sturdy and useful where small extensions are being installed.



Tree Protection Advice (TPA1)
Examples of Standard Barriers

Protective barriers are not to be moved without written consent from the Local Planning Authority (LPA) and any adjustments should be under direct supervision of the project Arboriculturist to maintain the Root Protection Area (RPA) of each tree. No materials, chemicals, machinery or vehicles must be stored within the protected area as defined on the Tree Protection Plan.



KEY

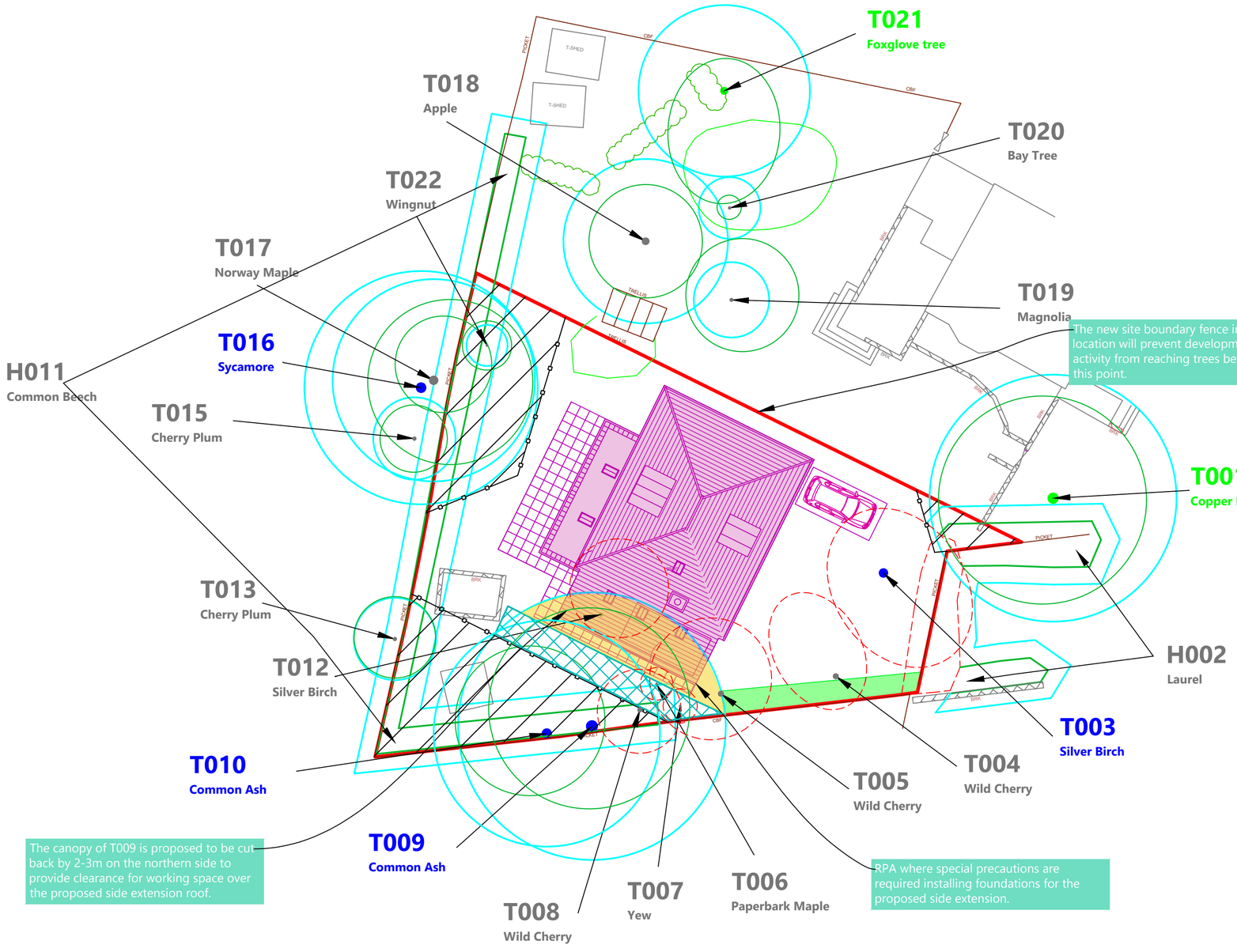
1. Standard scaffold poles
2. Heavy gauge 2m tall galvanised tube and welded mesh infill panels
3. Panels secured to uprights and cross-members with wire ties
4. Ground level
5. Uprights driven into the ground until secure (minimum depth 0.6m)
6. Standard scaffold clamps

Extract from BS5837: 2012 Figure 2—Default specifications for tree protective fencing.



Image 1: Scaffold and Heras panels can provide standard protection that is fit for purpose.

IMPORTANT NOTE:
A pre-commencement meeting must be held on site before works begin. The methods of tree protection outlined in the approved Arboricultural report and illustrated on this plan should be fully discussed with the designated Site Manager and Arboricultural Consultant involved with the project at the time of implementation. Any clarifications or modifications should be recorded and circulated to all parties in writing.



Key:

- T001 — Trees - colour coded by BS 5837category
- BS category **A** Trees of high quality
- BS category **B** Trees of moderate quality
- BS category **C** Trees of low quality
- BS category **U** Trees unsuitable for retention
- RPA boundaries
- Trees to be removed
- Tree canopies
- Existing layout
- Proposed layout
- Construction exclusion zone (CEZ) to be protected by fencing
- Ground protection
- Site boundary
- Precautionary area
- Area along the Southern boundary available for new trees and shrubs

For further information, refer to the WT tree schedule. Do not scale from this drawing (unless for planning purposes), please check all dimensions on site, and notify us of any discrepancies. Wadey Trees Ltd cannot be held responsible for inaccuracies in the topographical plan on which this drawing is based. © Wadey Trees Ltd 2020.
This drawing is designed to reflect only the principles of layout and/or design insofar as these relate to the protection of trees to be retained, and should NOT be read as a definitive engineering or construction method statement. Reference should be made to the architect or structural engineer, as appropriate, over any matters of construction detail or specification, or any engineering standards or regulatory requirements relating to proposed structures, hard surfaces or underground services.

Wadey Trees Ltd
Plum Tree Cottage
50 Durweston
Blandford DT11 0QA
07544 375950
www.wadeytrees.co.uk

CLIENT: Rivendale Developments

ARCHITECT: Relph Ross Partnership

DRAWN:	CHECKED:	DATE:	REVISION:
EJS	MJW	24 July 23	

LOCATION OF TREES, CATEGORISATION & DEVELOPMENT AT: 150 Bouverie Avenue South, Salisbury, SP2 8EB

DRAWING NO: WTP1

SCALE:	SHEET SIZE:	SHEET NO:
1:200	A2	

WT PROJECT NO:	STATUS:
WT 057-23	PUBLISHED

CLIENT PROVIDED PLAN REF: ADS-0747 and 20-3287-300- A - Proposed Site Plan

Appendix 2 – Data Collection: (In accordance with BS 5837 (2012), all tree schedule data has been collected based on the recommendations set out in subsection 4.4 of BS 5837)

NOTE: Colour annotation is A trees green background; B trees blue background; C trees grey background; U trees red background

Tree No.	Species	Height (m)	Stem diameter(s) (mm)	Spread	Phys Cond	Str Cond	Life Stage	Survey Notes	Rem. Contrib.	Retention Category	RPA	Recommendations
T001	Copper Beech *(Fagus sylvatica purpurea)*	18	600		Good	Good	Mature	There are no obvious visible signs of poor health or structural/instability problems that would ordinarily indicate there is a significant risk associated with the tree.	40+ Years	A1,2	Radius: 7.2m. Area: 163 sq m.	
H002	Laurel *(Laurus sp.)*	5	100		Good	Fair	Semi Mature	Provides useful boundary cover.	20+ Years	C1,2	Area: 105 sq m.	Fell (part) for development
T003	Silver Birch *(Betula pendula)*	10	500		Good	Good	Mature	There are no obvious visible signs of poor health or structural/instability problems that would ordinarily indicate there is a significant risk associated with the tree.	20+ Years	B1,2	Radius: 6.0m. Area: 113 sq m.	Fell for development
T004	Wild Cherry *(Prunus avium)*	10	300		Fair	Fair	Early Mature	Suppressed by adjacent trees. Poor crown canopy density.	10+ Years	C1,2	Radius: 3.6m. Area: 41 sq m.	Fell for development
T005	Wild Cherry *(Prunus avium)*	9	300		Fair	Fair	Early Mature	Suppressed by adjacent trees. Poor crown canopy density. Restrictions to access: Dense ivy present over trunk	10+ Years	C1,2	Radius: 3.6m. Area: 41 sq m.	Fell for development
T006	Paperbark Maple *(Acer griseum)*	6	100		Fair	Fair	Young	Poorly developed tree, with low future potential.	10+ Years	C1,2	Radius: 1.2m. Area: 5 sq m.	Fell for development
T007	Yew *(Taxus sp.)*	4	50	N:1 E:1 S:1 W:1	Good	Good	Young	Small tree with future potential.	30+ Years	C1,2	Radius: 0.6m. Area: 1 sq m.	Fell for development

Appendix 2 – Data Collection: (In accordance with BS 5837 (2012), all tree schedule data has been collected based on the recommendations set out in subsection 4.4 of BS 5837)

Tree No.	Species	Height (m)	Stem diameter(s) (mm)	Spread	Phys Cond	Str Cond	Life Stage	Survey Notes	Rem. Contrib.	Retention Category	RPA	Recommendations
T008	Wild Cherry *(Prunus avium)*	10	250		Fair	Fair	Early Mature	Suppressed by adjacent trees. Poor crown canopy density. Restrictions to access: Dense ivy present over trunk	10+ Years	C1,2	Radius: 3.0m. Area: 28 sq m.	Fell for development
T009	Common Ash *(Fraxinus excelsior)*	18	650		Good	Good	Mature	There are no obvious visible signs of poor health or structural/instability problems that would ordinarily indicate there is a significant risk associated with the tree. Some sparse foliage in places, which may be indicating early signs of ash dieback but this is not conclusive at this stage.	20+ Years	B1,2	Radius: 7.8m. Area: 191 sq m.	Prune back secondary and tertiary lateral branches by 2-3m on the northern side of the crown
T010	Common Ash *(Fraxinus excelsior)*	16	550		Good	Good	Mature	There are no obvious visible signs of poor health or structural/instability problems that would ordinarily indicate there is a significant risk associated with the tree. Some sparse foliage in places, which may be indicating early signs of ash dieback but this is not conclusive at this stage.	20+ Years	B1,2	Radius: 6.6m. Area: 137 sq m.	
T011	Common Beech *(Fagus sylvatica)*	3	50		Good	Fair	Young	Provides useful boundary cover.	30+ Years	C1,2	Area: 172 sq m.	
T012	Silver Birch *(Betula pendula)*	8	200		Good	Fair	Early Mature	Suppressed by adjacent trees. Stem unions with bark inclusions present	10+ Years	C1,2	Radius: 2.4m. Area: 18 sq m.	

Appendix 2 – Data Collection: (In accordance with BS 5837 (2012), all tree schedule data has been collected based on the recommendations set out in subsection 4.4 of BS 5837)

Tree No.	Species	Height (m)	Stem diameter(s) (mm)	Spread	Phys Cond	Str Cond	Life Stage	Survey Notes	Rem. Contrib.	Retention Category	RPA	Recommendations
T013	Cherry Plum *(Prunus cerasifera)*	7	200		Good	Fair	Early Mature	Restrictions to access: Dense ivy present over trunk Poorly developed tree, with low future potential.	20+ Years	C1,2	Radius: 2.4m. Area: 18 sq m.	
T014	Cotoneaster *(Cotoneaster sp.)*	9	3 stems: 100,150,150		Good	Fair	Early Mature	Poorly developed tree, with low future visual amenity potential.	20+ Years	C1,2	Radius: 2.8m. Area: 25 sq m.	
T015	Cherry Plum *(Prunus cerasifera)*	7	200		Good	Fair	Early Mature	Poorly developed tree, with low future potential. Suppressed by adjacent trees.	20+ Years	C1,2	Radius: 2.4m. Area: 18 sq m.	
T016	Sycamore *(Acer pseudoplatanus)*	16	3 stems: 350,400,200		Good	Good	Early Mature	There are no obvious visible signs of poor health or structural/instability problems that would ordinarily indicate there is a significant risk associated with the tree. Suppressed by adjacent trees on eastern side.	30+ Years	B1,2	Radius: 6.8m. Area: 145 sq m.	
T017	Norway Maple *(Acer platanoides)*	10	3 stems: 300,300,250		Fair	Fair	Early Mature	Significant trunk damage and dead patches of bark present, indicating signs of stress and possibly fungal infection.	10+ Years	C1,2	Radius: 5.9m. Area: 109 sq m.	
T018	Apple *(Malus sp.)*	8	400		Good	Fair	Mature	Pruning history - reduced in the past with new regrowth forming at old pruning points.	30+ Years	C1,2	Radius: 4.8m. Area: 72 sq m.	

Appendix 2 – Data Collection: (In accordance with BS 5837 (2012), all tree schedule data has been collected based on the recommendations set out in subsection 4.4 of BS 5837)

Tree No.	Species	Height (m)	Stem diameter(s) (mm)	Spread	Phys Cond	Str Cond	Life Stage	Survey Notes	Rem. Contrib.	Retention Category	RPA	Recommendations
T019	Magnolia *(Magnolia sp.)*	8	2 stems: 100,150		Good	Good	Early Mature	Small tree not easily seen from public viewpoints.	20+ Years	C1,2	Radius: 2.2m. Area: 15 sq m.	
T020	Bay Tree *(Laurus nobilis)*	5	150				Early Mature	Poorly developed tree, with low future potential.	10+ Years	C1,2	Radius: 1.8m. Area: 10 sq m.	
T021	Foxglove tree *(Paulownia tomentosa)*	10	420		Good	Good	Early Mature	There are no obvious visible signs of poor health or structural/instability problems that would ordinarily indicate there is a significant risk associated with the tree.	30+ Years	A1,2	Radius: 5.0m. Area: 79 sq m.	
T022	Wingnut *(Pterocarya fraxinifolia)*	5	100		Fair	Fair	Young	Poorly developed tree, with low future potential.	10+ Years	C1,2	Radius: 1.2m. Area: 5 sq m.	

Appendix 2 - Data Collection Cont'd: Explanatory notes

The site data columns and abbreviations: The relevant tree data was collected and recorded as described in the table below:

Tree no/feature: The following categories are assigned appropriately to each landscape feature: T=(tree); G=(group); H=(hedge); C=(coppiced); M=(multi-stemmed); P=(pollard); Sh=(shrubs); S=(stump) or W=(woodland).

Species: Species identification is based on visual observations. Where there is some doubt over tree identity, sp is noted after the genus name in the botanical names section to indicate that the species cannot be reliably identified at the time of the survey. Where there is more than one species in a group, only the most frequent are noted and not all the species present, may be listed. The tree botanical names surveyed on this site are listed in column 2.

Height: Height is estimated to provide an indication of the size of the tree.

Stem diameter: Stem or trunk diameter is estimated or measured and recorded in 2.5cm increments as advised in BS 5837 Table D1. It is measured with a diameter tape unless access is restricted, direct measurement is not possible because of ivy on the trunk or the tree is assessed as poor quality. The point of measurement and the adjustments for stem variations are as advised in Figure C1 of BS 5837. The RPAs given below have been used for single stem trees and the equivalent resultant combined stem diameter for multi-stemmed trees.

Branch height and crown spreads: Where crown accuracy varies from site observations and the original topographical survey, new measurements of the crown may be taken and illustrated on the plan as a crown amendment. These are taken in the context of the development proposal where it is considered there may be encroachment from the development. For example, it may only be necessary to record the measurement of one side of the canopy where it overhangs the site, or where there is likely to be some kind of impact to branches/crown of the tree from development proposals. If there are any significant trees missing from the original topographical survey, their positions are estimated and branch spread is taken as a minimum at the four cardinal points, to derive a representation of the crown. Also, where it is considered appropriate, existing height above ground level of: 1) first significant branch and direction of growth (e.g. 2.4-N); 2) canopy will be recorded to inform on ground clearance where access issues may be a concern.

Tree condition: The tree condition is represented by the surveyor's initial visual observations of its health and/or structural integrity. These are separated into the following subcategories:

Physiological condition (P)	Description
Good	Appears to be healthy and have good vitality.
Fair	Generally, in good health but with visible signs of decline or reduced vitality.
Poor	Obviously in poor health and significant decline.
Dead	Dead, or very little live growth.

Appendix 2 - Data Collection Cont'd: Explanatory notes

Structural condition (S)	**Description**
Good	No significant structural defects/weaknesses.
Fair	Some visible defects but no significant hazards/weaknesses.
Poor	Significant defects/weaknesses or dangerous/potentially dangerous condition.

Life stage: For the purposes of this report the following life stages are recorded as one of seven categories below. Age class is indicative and will vary between species:

LIFE STAGE	DEFINITION
Newly planted	Very young, newly planted trees at least within the last 5 years.
Young	Small establishing tree in its youngest years that could be transplanted with specialist equipment, i.e. less than 150mm in diameter at 1.5m.
Semi-mature	An established tree, but with some growth to make before reaching its potential maximum size. A tree within its first third of lifespan.
Early mature	A tree that is reaching its ultimate potential height, whose growth rate is slowing down but if healthy, will still increase in stem diameter and crown spread. A tree in the second third of life span.
Mature	A mature specimen with limited potential for any significant increase in size, even if healthy. A tree within its final third of expected lifespan.
Over mature	A senescent (declining/degradation) or moribund specimen of low vigour within its final third of expected lifespan. Possibly also containing sufficient structural defects with safety and/or duty of care implications.
Veteran	Specimens exhibiting features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.
Ancient	A tree which is remarkably old for its species.

General observations: Only relevant features such as tree physiology, structural condition, decay and crown or branch structure that may impact on the proposed development are recorded. If there are no notes, then the presumption should be that no relevant features were observed.

Remaining contribution: This is broadly interpreted as <10 years, 10+ years, 20+ years, or 40+ years to provide some indication of a tree's potential for future contribution to its locality.

BS retention category: Each tree is placed into a relevant coloured category based on their quality and contribution they offer in terms of their arboricultural, landscape or cultural values. This assessment is based on the BS5837 Table 1 cascade chart for tree quality assessment which is summarised in paragraph 2.3 of this report.

Appendix 2 - Data Collection Cont'd: Explanatory notes

RPA measurements: For single stem trees, the RPA is 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 set out in paragraph 4.6 of BS5837 recommendations will be used. In all cases, the stem diameter(s) will be measured in accordance with Annex C and Annex D of that document. The calculated RPA for each tree will be capped to 707 m2.

Recommendations: Any necessary work requirements to implement the development proposal or for safety concerns are recorded in this column.

Future tree safety inspections: My assessment of the trees was carried out on the basis that a re-inspection would be carried out within a year of the assessment visit and my advice on tree condition must be reviewed annually from the date of that visit.

Tree work considerations

1. **Tree works:** The inspection of all trees was of a preliminary nature and only defects visible from the ground have been identified. Each individual tree may not have been inspected closely because of access difficulties and only defects visible from the inspection point have been noted. In addition to tree removals for development and management reasons, further works are listed to reduce the threats from retained trees. All trees on the site should be checked by the contractor at the time of carrying out the main tree works to deal with any emerging safety issues in the context of the consented development.
2. **Reporting during work operations:** In the context of the preliminary nature of the tree inspection, any defects that may affect tree safety discovered by the contractor when carrying out the work recommendations should be reported to the supervising officer. Modification to the schedule of works may be required because of these reports. The contractor should be specifically instructed on this point.
3. **Implementation of works:** All tree works should be carried out to BS 3998 *Recommendations for Tree Work* as modified by more recent research. It is advisable to select a contractor from the local authority list and preferably one approved by the Arboricultural Association. Their Register of Contractors is available free from The Malthouse, Stroud Green, Standish, Stonehouse, Gloucestershire GL10 3DL; phone 01242 522152; website www.trees.org.uk.
4. **Statutory wildlife obligations:** The Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000 provides statutory protection to birds, bats and other species that inhabit trees. All tree work operations are covered by these provisions and advice from an ecologist must be obtained before undertaking any works that might constitute an offence.

Appendix 3 – Arboricultural Method Statement

1. **Introduction**

1.1 **Purpose of this Arboricultural Method Statement:** This Arboricultural Method Statement (AMS) has been produced in line with the British Standard (BS) 5837:2012 Trees in relation to design, demolition and construction – Recommendations to aid the successful retention of the trees adjacent to the proposed development at 150 Bouverie Avenue South, Salisbury, SP2 8EB.

1.2 **Scope of statement:** This document sets out the methodology for all proposed works that affect trees on and adjacent to the site. Compliance with this method statement will be a requirement of all relevant contracts associated with the development proposals. Copies of this document will be available on site for inspection.

1.3 **Relevant plan information:** For details of the trees to be retained and location and types of special protection methods, reference should be made to the tree protection plan WTP1. A copy of which should be displayed prominently on site.

1.4 **Planning, communication and preliminary timing of events:** It is not unusual for the details of timing of operations that could impact on important trees to only be finalised once planning consent has been given. Site managers, clearance and construction teams and other important personnel are normally only appointed at this stage and it is these people who will be crucial in delivering the tree protection detailed in this report. My experience is that the pre commencement site meeting is critical in terms of avoiding damage to trees and this particular aspect, along with tree protection issues can be specifically referenced in a suitably worded planning condition imposed by the council. In the intervening time, I propose the following preliminary cascading timetable of events to help minimise risk of impact on important trees. However, the following schedule may be modified at the pre-commencement meeting, subject to discussion with all parties and agreement with the LPA:

1. Pre-commencement site meeting
2. Extent of any arboricultural supervision agreed
3. Tree works undertaken
4. Protective barriers erected before any clearance or construction activities occur on site and notification to the LPA that this is in place
5. Ground protection installed before any clearance or construction activities occur on site and notification to the LPA that this is in place
6. Installation of new structures
7. Tree protection only removed at the end of the construction phase when there is no longer any risk to trees

2. **Supervision and monitoring**

2.1 **Responsibilities:** It will be the Project Manager/builder's responsibility to ensure that the details of this method statement are known and understood by all site personnel. A copy must be always kept on site and the site manager must brief all personnel who could have an impact on the specific tree protection requirements. This should be a part of the site induction procedures and written into appropriate site management documents. If appropriate, the builder should instruct an arboriculturist to comply with any necessary planning conditions relating to pre-commencement meetings and/or agree protection with ongoing supervision requirements sanctioned by the LPA.

2.2 **Phase 1 (Establishment of tree protection measures):** A pre-commencement meeting must be held on site before any of the site clearance or construction works start. This should be attended by the contractor's site manager or agent, the project arboriculturist and (if available) the tree officer. The methods of tree protection outlined in this report must be fully discussed at this meeting so that all aspects of their implementation and sequencing are made clear to all parties. Any clarifications or modifications must be recorded and circulated to all parties in writing (see section 4.2 below). It may be appropriate for the tree surgery contractor to attend this meeting.

2.3 **Phase 2 (special precautions during construction):** All the retained trees will be protected from damage using barriers (fencing and ground protection). Additionally, in the precautionary areas shown on the tree protection plan, special precautions relating to their management will be required. All these protective measures are shown on the plan WTP1 and explained within the examples provided in the tree protection guidance section below.

3. **Specific tree protection issues on this site**

3.1 **Tree pruning or removals:** All works to trees identified to facilitate the development proposal (as set out in Appendix 2 of the tree schedule) will be undertaken before the construction works commence on site.

3.2 **Protective fencing:** Temporary tree protective fencing is proposed for the retained trees. It will be to the BS5837:2012 section 6.2 recommendations i.e. braced preformed galvanised steel mesh panels (Heras' or similar). It will be installed prior to the commencement of any development related activity and retained at the locations shown on plan WTP1 until construction is completed. It may only be moved or removed with consent from the LPA or project arboriculturist. Provided that the fencing is properly specified, installed and maintained, there is unlikely to be any significant adverse effects on the health or amenity value of these trees.

3.3 **Tree protective guidance notes:** The specific tree protection requirements set out below are necessary to minimise harm to retained trees. These must be informed by the following tree protection guidance notes below if tree harm is to be minimised.

3.4 **Ground protection measures:** Where the positioning of tree protection barriers is not feasible due to the need for construction access, then ground protection measures will be

needed to safeguard RPAs. The position of ground protection is shown on the plan WTP1 included in Appendix 1, with guidance for ground protection design included in Appendix 3 and an installation video for proprietary ground protection available to view at https://tinyurl.com/3nk2c3cw. The ground protection will be installed before any materials or machinery are brought onto the site and before any clearance or construction activities occur. Again, once the ground protection has been positioned, it will stay in situ for the duration of the construction phase, unless previously agreed with the project arboricultural consultant or LPA Tree Officer.

3.5 **Structures within RPAs:** Any work in the RPAs of T009 and T010 must be done with care. The new house will be constructed on a pile and beam foundation raised above ground level, without the need for excavation into soil levels below a depth of 100mm. The design principles of such foundations are set out within the BS5837:20212 recommendations in relation to structures (clauses 7.5.1 to 7.5.5) and the tree protection guidance notes below.

3.6 **Hand digging precautions:** Any work in the RPAs of T009 and T010 must be done in accordance with the BS5837:2012 recommendations in relation to hand digging (clauses 7.2.1- 7.2.4) and the tree protection guidance notes below. The following hand digging guidance should be followed when installing the structure to minimise harm to the adjacent trees:

a) All excavation in RPAs must be supervised and carried out carefully using hand tools, taking care not to damage the bark and wood of any roots. Specialist tools for removing soil around roots using compressed air may be an appropriate alternative to hand digging, if available.
b) All soil removal must be undertaken with care to minimise the disturbance of roots beyond the immediate area of excavation. Where possible, flexible clumps of smaller roots, including fibrous roots, should be retained if they can be displaced temporarily or permanently beyond the excavation without damage.
c) A fork should be used to loosen the soil and help locate any substantial roots. Once roots have been located, the trowel should be used to clear the soil away from them without damaging the bark.
d) Roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in clumps. Roots occurring in clumps or over 25 mm diameter should be severed only following consultation with the project arboriculturist, as such roots might be essential to the tree's health and stability.
e) Prior to backfilling, retained roots should be surrounded with topsoil or uncompacted sharp sand (builders' sand should not be used because of its high salt content, which is toxic to tree roots), or other loose inert granular fill, before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.

3.7 **Storage areas outside the RPAs:** Before construction begins on site, it is important to identify the exact areas outside the RPA that minimise chemical pollution and damage from construction materials. On this site, a provisional location for materials and machinery are to be stored close to the front of the house, outside the RPAs. Materials should not be handled or stored within the RPAs of retained trees; the load exerted can result in soil compaction and leachate from spill can be toxic to trees.

3.8 **Services:** Any new service installation works are anticipated outside the RPAs of retained trees. However, if minor encroachment is required, the works must be undertaken following the guidance notes below. If this changes for any reason, I advise that these matters are considered at an early stage and agreed with the LPA prior to the work commencing.

3.9 **Reinstatement/landscaping works:** No heavy machinery should be driven over unprotected ground and materials must be stored outside RPAs. The tree protective fencing can only be removed with the agreement of the project arboriculturist and may have to be reinstalled during a break in operations. Any soil removal or replacement, excavations for hard landscaping or installation of any structures including lighting, water, electric gates etc must be approved by the project arboriculturist. Unwanted vegetation can be removed using handheld tools to avoid damage to the stems of retained trees. Planting holes for new trees or shrubs shall be dug by hand and will be repositioned if woody roots are encountered. For further advice, refer to the tree protection guidance notes below.

4. Summary of important arboricultural considerations

4.1 **Review of main requirements:** The following general responsibilities should be known to all parties involved with working on site to ensure that important retained trees on site are sufficiently protected:

- All tree protection details set out on the approved tree protection plan should be agreed at the pre-commencement meeting and recorded by the project arboriculturist for all parties to consider.
- Protective barriers must be regarded as sacrosanct and must only be moved under direct supervision of the LPA or project arboriculturist to enable the undertaking of works within the RPA of the trees, as set out in this AMS, and approved in writing by the LPA. It is of paramount importance the fencing is repositioned correctly after any agreed operations.
- All construction machinery engaged in site clearance work should work from outside the RPAs.
- No materials, chemicals, machinery or vehicles must be stored within the RPAs as defined on the tree protection plan WTP1 and identified on site by protective fencing and above ground root protection.
- Ground protection must not be lifted or removed without prior consultation with the LPA or project arboriculturist.

- Damage caused to protective fencing or ground protection must be reported to the site supervisor and the project arboriculturist to ensure appropriate repair.
- Any damage to retained trees must be reported without delay to the site supervisor, the LPA and the project arboriculturist so appropriate remedial work can take place without delay.
- No fires will be lit on site.
- Notice boards, telephone cables or any other signage or services are not to be attached to any part of retained trees.

4.2 **Site monitoring checklist:** The recommendation in BS5837:2012 is that 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 monitoring. This should extend to arboricultural supervision whenever construction and development is to take place within or adjacent to any RPA. On this basis, the following site monitoring checklist has been produced and is available to use for all pre-commencement and site supervision visits. After each visit, it should be circulated to all relevant parties and kept as a record to demonstrate that all site operations have been compliant with the approved tree protection requirements, and to satisfy the discharge of planning conditions.

Appendix 3 – Arboricultural Method Statement

Pre-commencement checklist/supervision visits			
Site address		**Date**	
		Planning reference	
PRESENT		**REPRESENTING**	

Pre-commencement	**Compliant Y/N**	**Action** (If appropriate refer to additional notes)
Acceptable demolition/site clearance works		
Tree works undertaken/additional requirements		
Method statement/tree protection plan available on site		
Suitable locations for welfare and material storage etc		
Suitable space available for vehicle access etc		
Services/soakaway locations agreed		
Tree protection/precautions	**Compliant Y/N**	**Action** (If appropriate refer to additional notes)
Protective fencing		
Ground protection		
Temporary surfacing		
New surfacing/reinstatement of existing		
Structures in RPAs		
Excavations/level changes in RPAs		
Soft/hard landscaping		
Soil amelioration requirements		

Outcome of meeting	Y/N	**Action** (If appropriate refer to additional notes)
Can the development lawfully start/continue?		
Are changes required on site to comply with approved tree protection plan?		

	Name	Signature	Position
Date: / /			

Additional notes	Agreed actions

Tree protection guidance

Objective: This guidance sets out the general principles that must be followed when working in Root Protection Areas (RPAs). Before work starts on site, the purpose of this guidance is to demonstrate to the LPA that tree protection issues have been properly considered and to provide a written record of how they will be implemented. Once the site works start, this guidance is specifically for the site personnel to help them understand what has been agreed and explain what is required to fully meet their obligations to protect trees. All personnel working in RPAs must be properly briefed about their responsibilities towards important trees based on this guidance.

RPA description: RPAs are the areas surrounding important trees where disturbance must be minimised if they are to be successfully retained. All RPAs close to the construction area are illustrated on the tree protection plans accompanying this advice. Damage to roots or degradation of the soil through compaction and/or excavation within RPAs is likely to cause serious damage. Any work operations within RPAs must be carried out with great care if trees are to be successfully retained.

Use of this guidance: Anyone working within an RPA must follow this guidance if important trees are to remain unharmed. They must take care to minimise excavation into existing soil levels and limit any fill or covering that may affect soil permeability.

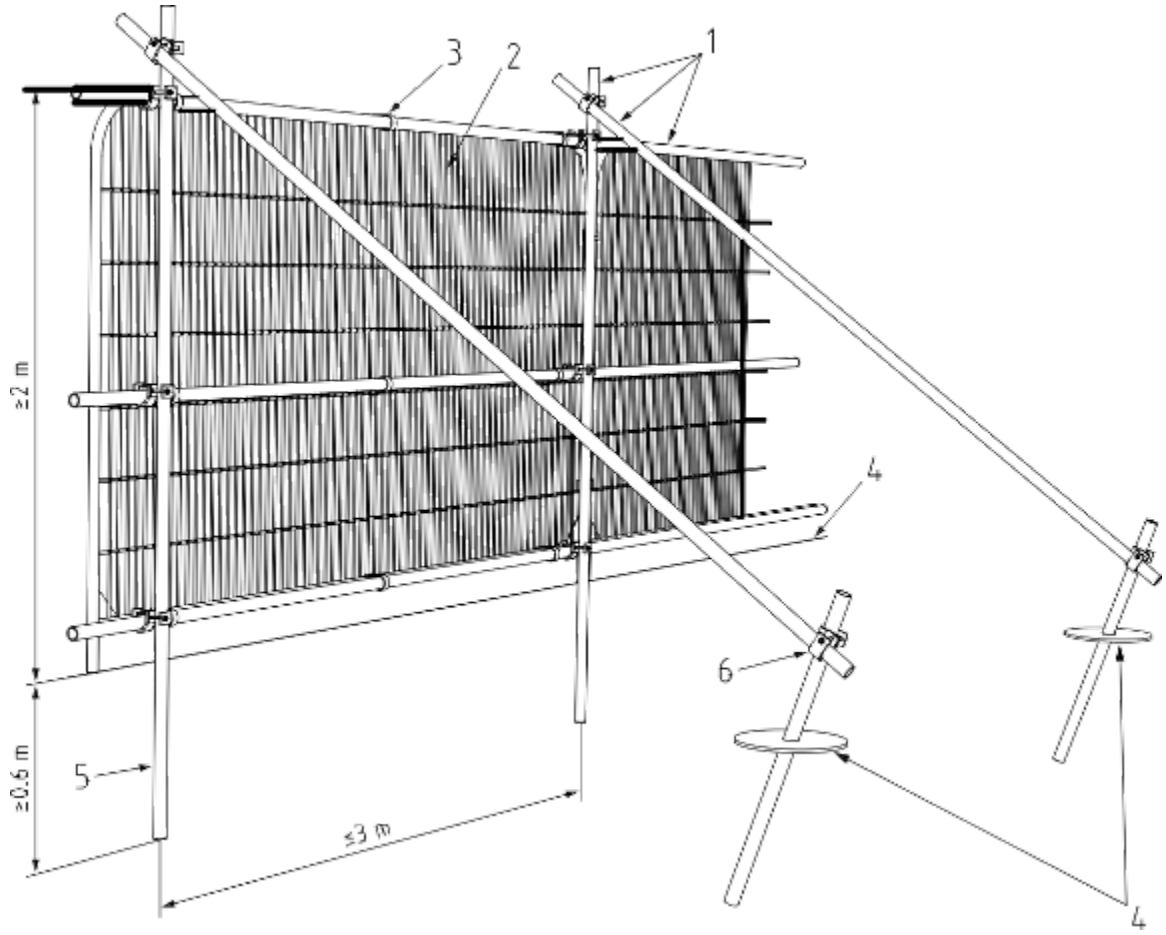
This advice should always be read in conjunction with the tree protection plan (TPP) illustrating the areas where specific precautions are necessary. Each area where precautions are required is annotated on the plans as identified on their keys. All plans are illustrative and intended to be interpreted in the context of the site conditions when the work is started. All protective measures should be installed according to the prevailing site conditions and agreed as satisfactory by the appropriate supervising officer before any demolition or construction work starts.

Preventing adverse impact to the RPA: Any part of the RPA beyond the agreed work area must be isolated from the work operations by protective barriers or ground protection to at least the minimum standard described in BS 5837 for the duration of the work. Any further precautions required to minimise harm to trees should be undertaken using the relevant tree protection guidance in the following pages.

Arboricultural supervision: Qualified arboricultural supervision is essential to minimise the risk of harm to trees. Ongoing work must be inspected regularly and, on completion, must be signed off by the arboriculturist to confirm compliance by the contractor and to sign of relevant Planning Conditions. In the context of this guidance, an appropriate supervising officer would normally be an arboriculturist.

Tree protective barriers

Installing Barriers: Tree Protective barriers must be fit for purpose, and once installed must not be moved or removed without consent from the LPA or project arboriculturist. If it is absolutely necessary for any adjustments, they should be under direct supervision of the project Arboriculturist to maintain the Root Protection Area (RPA) of each tree. No materials, chemicals, machinery or vehicles must be stored within the protected area as defined on the Tree Protection Plan. On this site, all exposed rooting areas should be protected by barriers (while vulnerable to damage), in accordance with BS 5837 figures 2 and 3 below until there is no risk of damage from the development activity. This work should be subject to arboricultural supervision.



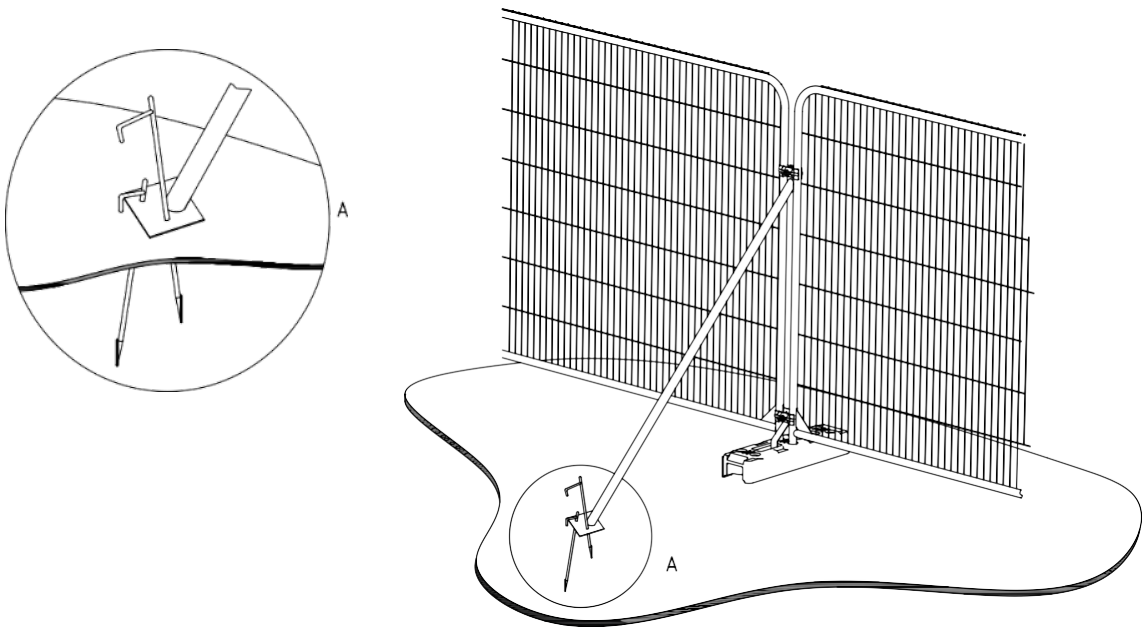
Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

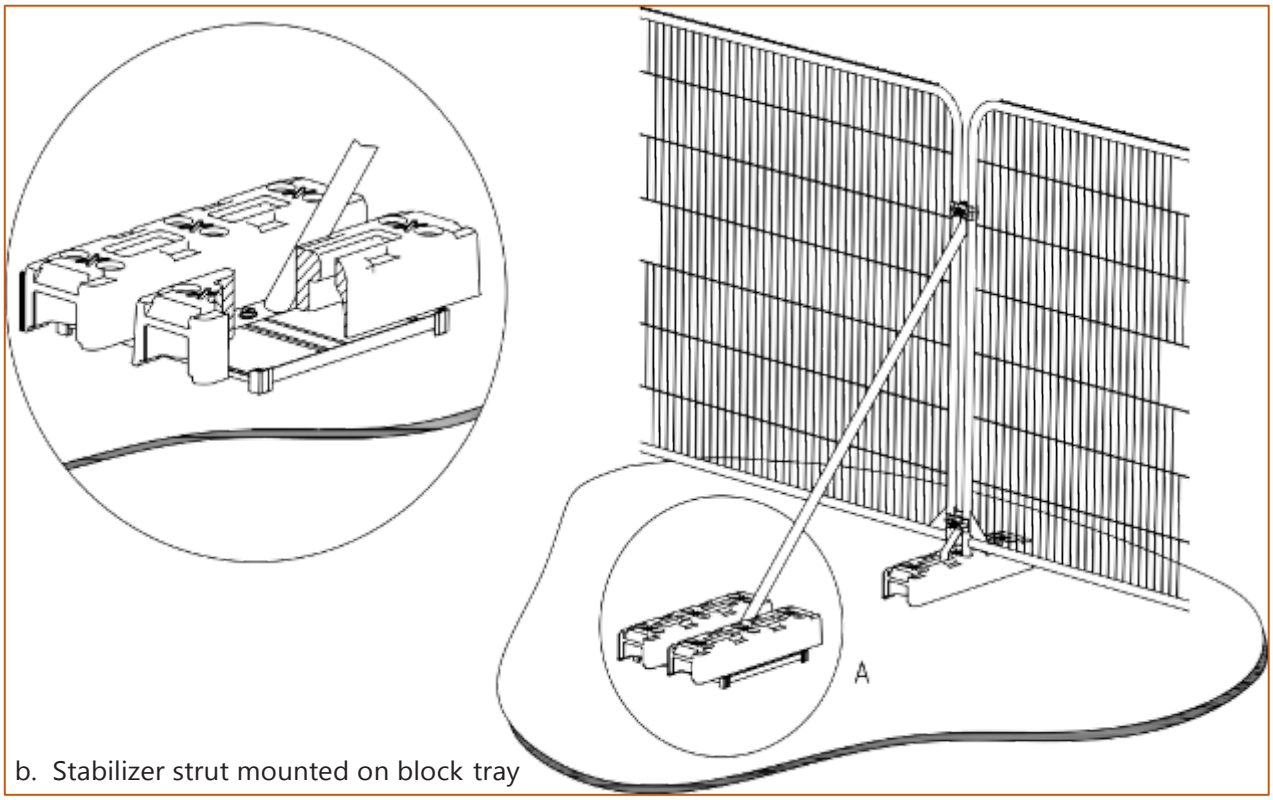
Extract from BS5837: 2012 Figure 2: Example of above-ground stabilizing systems

Examples of tailored protective barriers: A range of methods can be used to protect the trunks and underlying soil bit whatever the choice of method, the end result must be fit for purpose to prevent the protected area from being breached by the construction activities.

Extract from BS5837: 2012 Figure 3: Example of above-ground stabilizing systems



a. Stabilizer strut with base plate secured with ground pins



b. Stabilizer strut mounted on block tray



Picture 1: All barriers should be labelled to keep working activities outside the Construction Exclusion Zones (CEZs).



Picture 2: Scaffolding supports and board coverings erected around the trunks of trees can provide suitable protection against traffic turning into the site.



Picture 3: Temporary barriers are useful around individual trees where construction activities only occur during a short period.





Pictures 4 & 5: Wooden boards carefully secured around the trunks can provide good protection where access is limited.

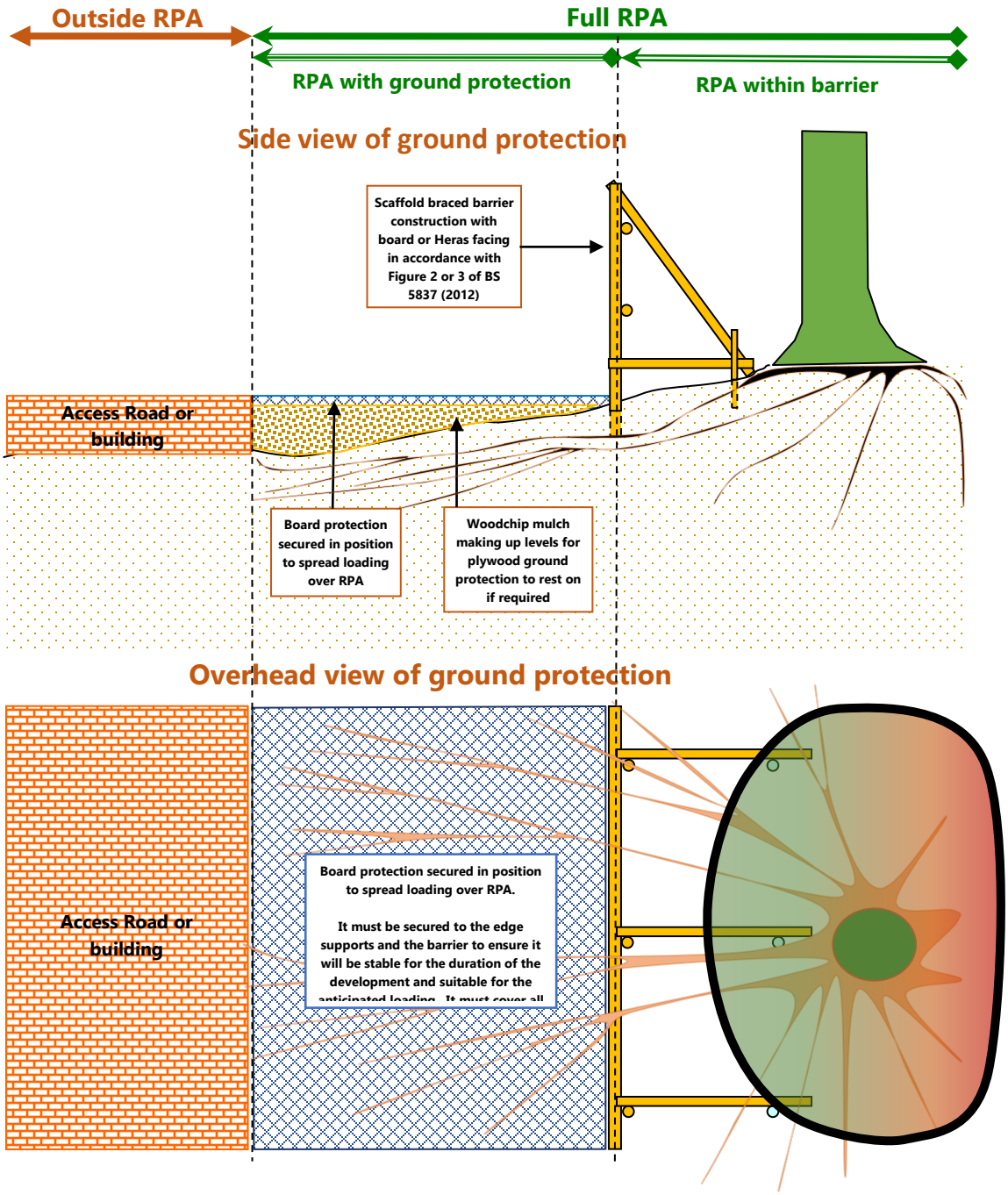


Picture 6: Where trees are off site, or public access is required through the work zone, boxing around the tree may be feasible.

Ground protection

Protecting the ground: Where it is not practical to protect the trees using a vertical barrier, the soil can be protected with ground protection. This allows improved access next to trees, preventing damage to the roots outside the protection of the barrier. The following illustration and examples provide some guidance but ultimately any protection must be fit for purpose.

Illustration 1 - Ground protection in RPAs



Examples of tailored ground protection: Many methods can be used, including the retention of existing surfacing or structures that already protect the soil, installing new protection, or a combination of both. Whatever the choice of method, the end result must be fit for purpose to protect the underlying soil (rooting environment).





Pictures 1 and 2: Mulch applied underneath plyboards can provide good protection for foot traffic. Where ground protection is required to fit around light structures or new extensions, this can be constructed using plyboard cut to size





Pictures 3 and 4: Ground protection can be erected on scaffold platforms or with temporary ground mats that can be easily lifted once the development has been completed

Structures

Installation and removal principles: New structures in RPAs are potentially damaging to trees because they may disturb the soil and disrupt the existing exchange of water and gases in and out of it. Mature and over-mature trees are much more prone to suffer because of these changes than young and maturing trees. Adverse impact on trees can be reduced by minimising the extent of these changes in RPAs. This can be done by constructing the main structures above ground level on piled supports and redirecting water to where it is needed. The detailed design and specification of such structures is an engineering issue that should be informed and guided by tree expertise. Where work is required around existing and new structures, the RPAs exposed by the work must be protected as set out in BS 5837 until there is no risk of damage from the development activity. Removing existing structures is a high-risk activity for any adjacent roots and the following guidance **must** be observed:

a. Appropriate tools for manually removing debris may include a pneumatic breaker, crowbar, sledgehammer, pick, mattock, shovel, spade, trowel, fork and wheelbarrow. Secateurs and a handsaw must also be available to deal with any exposed roots that have to be cut.

b. Machines with a long reach may be used if they can work from outside RPAs or from protected areas within RPAs. They must not encroach onto unprotected soil in RPAs.

c. Debris to be removed from RPAs manually must be moved across existing hard surfacing or temporary ground protection in a way that prevents compaction of soil. Alternatively, it can be lifted out by machines provided this does not disturb RPAs.

d. Great care must be taken throughout these operations not to damage roots as set out above.

NB: If appropriate, leaving structures in place should be considered if its removal may cause excessive root disturbance.

Small light structures: Bin stores, sheds and other light structures do not normally require substantial foundations and can have permeable bases. Ideally, their bases should be of a no-dig, load-spreading construction set directly on to the soil surface. They require a flat base and so an undulating site will need levelling to provide a suitable surface. Excavation of any high points by up to 50mm and filling depressions with permeable fill to provide a flat base will normally be acceptable provided no roots greater than 25mm in diameter need to be cut. If large roots are found, the preferred course of action would be to raise the base level of the structure by filling rather than cutting roots. However, if this is not practical and large roots have to be cut, the situation should be discussed with the supervising officer before a final decision is made. Above the base, there will often be a protective covering fixed onto a frame that can rise directly from the base or be fixed to supports either banged into the ground or set in carefully dug holes. Provided the supports are well spaced, i.e. greater than 150mm apart, and of a relatively narrow diameter, i.e. not in excess of 150mm, it is unlikely they will cause any significant disturbance to RPAs.





Larger structures on new foundations: Conventional strip foundations in RPAs for any significant structure may cause excessive root loss and are unlikely to be acceptable. However, disturbance can be significantly reduced by supporting the above ground part of the structures on small diameter piles and beams or cast floor slabs set above ground level. The design should be sufficiently flexible to allow the piles to be moved if significant roots are encountered in the preferred locations.

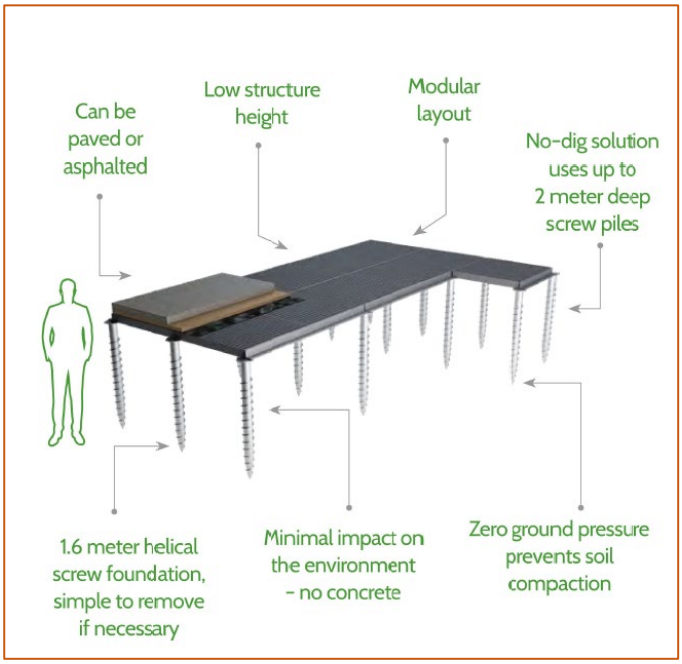


Before the actual installation of the new structure starts, all RPAs that may be affected should be covered with temporary ground protection as set out in BS 5837. Gaps in the ground protection should be left where it is expected to install the piles or dig the holes for gate piers. Pile locations should be initially hand dug to a depth of 750mm to establish if there are any significant roots over 25mm in diameter that could be

damaged. If significant roots are found, then the pile location must be moved slightly, and a new exploratory hole dug. Once the piles have been installed, the lowest points of the supporting beams for the structure must be above the ground level between the piles and there should not be any further excavation. The beams between the piles can be pre-cast and imported to the site ready to fix or can be cast in position using shuttering for the sides and a biodegradable void-former for the base. Gate piers generally require larger holes and have less flexibility for relocation if large roots are found. Localised loss of roots may be unavoidable so each situation should be assessed on its own merits by an appropriate supervising officer once the careful excavations have been completed. Any roots found should be dealt with as set out in above. When installing any of these structures, the ground protection must remain in place until the construction is completed and there is no risk of damage to RPAs.

Root bridge systems

Factory modular load supporting systems are available from specialist manufacturers that can integrate into many customised situations with trees. These usually consist of adaptable steel lattice constructions, supported on a foundation of screw piles, and can be carefully positioned between the main roots in the RPA. With a low structure height, the system can be implemented with minimal impact and loads of up to 57kN are then absorbed by the structure rather than the roots. Further guidance and information is available from GreenGrid Systems at www.greengridsystems.com. They can also be contacted by email info@greengridsystems.com or by telephone 01962 433460 for further help and guidance.



Using existing foundations: A free-standing wall on an existing foundation is unlikely to require any additional excavation and so its construction should have no adverse impact on RPAs if the appropriate protection is in place. However, replacing walls that retain the soil of RPAs normally requires some limited excavation back into the exposed soil face to provide a working space of at least 100–200mm behind the inside wall face. This should be done carefully and limited to no more than required to construct the new wall. Any roots found should be dealt with as set out in above.

Hand digging operations

Excavations within RPAs: All excavation must be carried out carefully using hand tools, taking care not to damage the bark and wood of any roots. Specialist tools for removing soil around roots using compressed air may be an appropriate alternative to hand digging, such as an air spade excavator (Image below), if available.



All soil removal must be undertaken with care to minimise the disturbance of roots beyond the immediate area of excavation. Where possible, fibrous roots should be retained or displaced temporarily beyond the excavation without damage.

Where excavations are required within RPAs, the advice below **must** be followed:

Advice for digging trenches

a. All work within RPAs must be carried out by hand under close and recorded arboricultural supervision.

b. Machines should not enter protective zones unless there is a suitable existing hard standing.

c. Excavation of open trenches by machine is unacceptable within the protective zone. Wherever possible, trenchless techniques should be used.



d. For trenchless installation of services, the pit excavations for starting and receiving machinery should be located outside the protective zone. The depth of run should be below 600mm. Techniques involving external mole lubrication with materials other than water should be avoided unless precautions are taken to ensure that there is no soil contamination within 600mm of the surface.



e. The broken trench technique combines hand dug sections of trench with trenchless techniques. The open trench is dug by hand with the same precautions as for continuous trenching described below. Open sections of trench should be kept as short as possible and only long enough to allow access for linking to the next section.

f. Continuous trenches should only be used where it is not possible to use either of the above techniques. The objective is to dig by hand and to retain as many roots as possible. Hand digging must be undertaken with great care to retain all roots greater than 25mm and to prevent damage to those retained.



g. Hand tools such as a fork should be used to loosen the soil and help locate any substantial roots. Once roots have been located, a trowel and brush should be used to clear the soil away from them without damaging the bark. Any roots that need to be removed should be cut cleanly with sharp saw or secateurs 100–200mm behind the final face of the excavation

h. Backfilling should be carried out carefully to avoid direct damage to roots and excessive compaction of the soil around them. Where the finished surface will be hard standing, the backfill material around roots should be a mixture of top soil and a granular fill such as sharp sand to reduce excessive compaction and to secure a local aerated zone. On sites away from hard standing, backfill only with excavated soil.



i. Exposed roots should remain protected from drying out and extremes of temperature by insulating covering such as sacking.

Services: Excavation to upgrade existing services or install new services in RPAs may damage retained trees and should only be chosen as a last resort. In the event that excavation emerges as the preferred option, the decision should be reviewed by the supervising officer before any work is carried out. If excavation is agreed, all digging should be done carefully and follow the guidance set out above.

Advice for hand digging post holes

a. All excavation in RPAs must be carried out carefully using hand tools, taking care not to damage the bark and wood of any roots. Specialist tools for removing soil around roots using compressed air may be an appropriate alternative to hand digging, if available.

b. All soil removal must be undertaken with care to minimise the disturbance of roots beyond the immediate area of excavation. Where possible, flexible clumps of smaller roots, including fibrous roots, should be retained if they can be displaced temporarily or permanently beyond the excavation without damage.

c. If digging by hand, a fork should be used to loosen the soil and help locate any substantial roots. Once roots have been located, the trowel should be used to clear the soil away from them without damaging the bark.



d. Exposed roots to be removed should be cut cleanly with a sharp saw or secateurs 10–20cm behind the final face of the excavation.

e. Roots temporarily exposed must be protected from direct sunlight, drying out and extremes of temperature by appropriate covering such as hessian sacking or boards.

f. Roots greater than 2.5cm in diameter should be retained where possible. Roots 2.5–10cm in diameter should only be cut in exceptional circumstances. Roots greater than 10cm in diameter should only be cut after consultation with the appropriate supervisory officer.

g. The design should be sufficiently flexible to allow the hole-locations to be moved slightly if roots greater than 2.5cm in diameter are found in the preferred locations.

Material storage and pollution control

Loose building materials, chemicals and other pollutants that can contaminate the soil must be stored in locations outside the RPAs. If space around the site is limited, materials must be ordered in smaller/less frequent amounts to minimise excessive build-up of unused building materials. Where liquids or powder/granule products are required, precautionary measures of bunding or sealed frameworks should be sufficient to prevent contamination and must be designed so they are fit for purpose. If spillage or leakage occurs, there should be immediate procedures put in place to reduce further risk to the surrounding RPAs. All contributing contaminants must be moved away from the affected RPAs in a way that minimises harm to tree roots and the surrounding soil.



The following points must be adhered to:

Minimising harm from storage of pollutants

a. The storage of fuels or toxic materials must be kept outside RPAs

b. Emergency spillage kits must be available on site at all times to reduce the risk of accidents to the environment

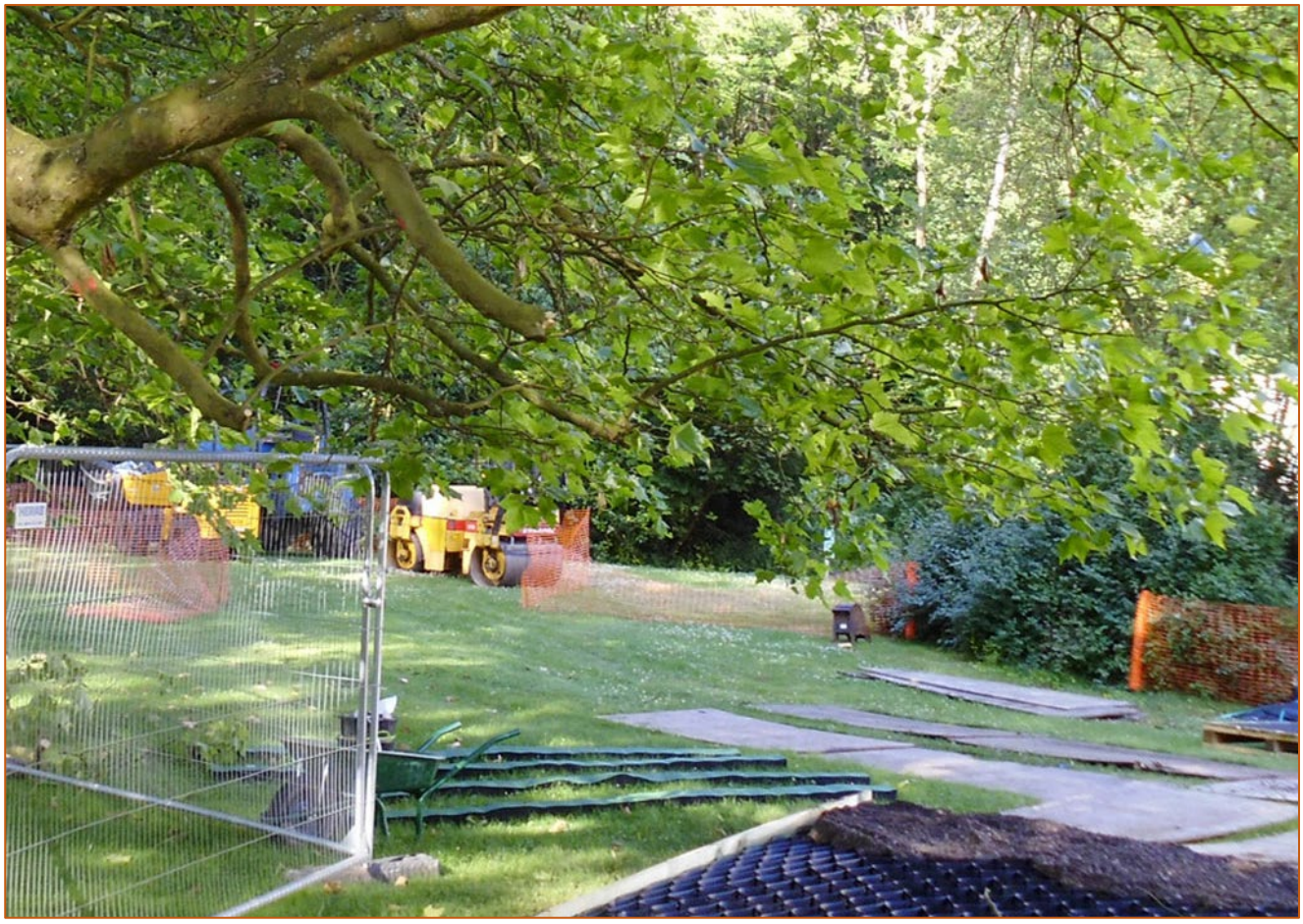
c. Where space is limited, contaminants must be kept safe using tailored containment systems fit for purpose.

d. Cement washings must be contained to prevent leaching into the soil within RPAs

e. Concrete pouring must be done in a way that ensures all RPAs within influencing distance are adequately protected. Liners should also be used where possible to prevent contamination.



Reinstatement works or landscaping around trees



Reinstatement works or landscaping in RPAs: Reinstatement works, or landscaping is usually the last stage of works and often the most important to minimise harm within RPAs. The re-profiling of existing soil levels and covering the soil surface with new plants or an organic covering (mulch). It does not include the installation of solid structures or compacted surfacing. Soft landscaping activity after construction can be extremely damaging to trees.

Minimising harm from works

a. No significant excavation or cultivation, especially by rotovators, should occur within RPAs.

b. Where new designs require levels to be increased to tie in with new structures or the removal of an existing structure has left a void below the surrounding ground level, good quality and relatively permeable top soil should be used for the fill.

c. It should be firmed into place but not over compacted in preparation for turfing or careful shrub planting.

d. Ideally, all areas close to tree trunks should be kept at the original ground level and have a mulched finish rather than grass to reduce the risk of mowing damage.

e. All installations of light systems or other garden improvements that involve trenching works must be undertaken following the hand digging guidance above.

WADEY TREES
CHARTERED CONSULTANCY



Plum Tree Cottage, 50 Milton Lane, Durweston, Blandford, DT11 0QA
Tel: 07544 375950/07824 703741 email: mailto:mark@wadeytrees.co.uk / emma@wadeytrees.co.uk www.wadeytrees.co.uk
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