

**PROPOSED TREE PROTECTION PLAN AND ARBORICULTURAL METHOD STATEMENTS FOR TREES AT THE WALLTOWN CRAGGS VISITORS CENTRE.**

**September 2014**

3923 Walltown Craggs  
R01 Tree protection plan  
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## A SUMMARY

E3 Ecology Ltd was commissioned by Cundall to create a Tree Protection Plan (TPP) with relevant arboricultural method statements (AMS), for trees to the rear of the Walltown Craggs visitors centre, Northumberland. A pre-development Tree Constraints Assessment (TCA) was conducted by E3 Ecology Ltd on the 3rd September 2014, the results of which inform this TPP.

Current development proposals include the extension of the rear and the eastern side of the current building to create a covered picnic area and utensil washing area. A two storey/ stacked 'eco-cabin' will be positioned temporarily to the rear of the building.

Of the ten trees surveyed, we recommend that three low value young to semi-mature trees and a number of young naturally recruited trees are removed to facilitate the new development (Appendix 1: Figure 2, Appendix 2: Table 1).

- Trees T6, T7 & T8 will need to be removed to allow for positioning of the eco-cabin offices to the rear of the building.

Consultation with the Northumberland National Park Authority, Forestry and Landscapes officer, highlighted that the trees are not within a Conservation Area and that currently no specific tree preservation orders have been served on any of the trees within the site.

At the time of survey, there were no further ecological constraints on the trees to be removed. If trees are to be removed during the bird breeding season (March to August inclusive) and support nesting birds, they will have to be retained for the duration of the nesting period or until it could be shown that the any young had fledged. This will add an additional timing constraint to the development.

The roots and crowns of trees to be retained will be protected in accordance with the prescriptions of this TPP and future site management. According to the AIA (Appendix 3), all the trees to be retained are of low to moderate ecological, landscape and arboricultural value to the site, with safe use life expectancies of between 20 and 40 years.

Specific tree details are in the annexed TCA (E3 Ecology report: 3923 R02 Walltown Craggs TCA). Further recommendations for tree works are covered in section D. Arboricultural method statements for contractors are provided in Appendices 4 and 5.

*E<sup>3</sup> Ecology Ltd accepts no responsibility for injury that may occur as a result of incorrectly interpreting this report. Trees are living organisms whose health and condition can change rapidly as a result of environmental changes. All trees, even healthy ones, are at risk from unpredictable climatic and man-made events. The assessment of risk for these trees is based upon factors evident at the time of the inspection, the potential an individual tree has for survival, and the interpretation of those factors by the inspector. The health, condition and safety of these trees should be checked on a basis commensurate with the level of risk as specified in this report.*

*If works are not likely to start within 12 months of this report, it is recommended that an updating survey is undertaken to ascertain any changes which may have occurred to trees surveyed, where failure to carry out the prescribed works within the specified time frames has occurred.*

*If you are assessing this report for a local planning authority and have any difficulties interpreting plans and figures from a scanned version of the report, E<sup>3</sup> Ecology Ltd would be happy to email a PDF copy to you. Please contact us on 01434 230982.*

## **B INTRODUCTION**

### **B.1 Background**

E3 Ecology Ltd was commissioned by Cundall to create a TPP with relevant arboricultural method statements (AMS's), for trees to the rear of the Walltown Craggs visitors centre, Northumberland.

A TCA is the subject of a separate report (E3 Ecology report: 3923 R02 Walltown Craggs TCA). The current plans for the site are provided in figure 1 (B.4, below).

### **B.2 Objectives of the TPP**

The objectives of the Tree Protection Plan (TPP) are as follows:

- To confirm the trees that are to be retained on site.
- To confirm the extent of the root protection areas (RPAs) required for the trees to be retained.
- Propose an acceptable location for the installation of fencing to create a construction exclusion zone or root protection zone.
- To specify the nature, design and extent of the protective fencing required.
- Propose proactive tree care methods which will be of benefit to the trees, to prolong their safe use life expectancy and their future contribution to the site.
- To provide appropriate method statements for the implementation of the tree protection plan, acknowledging the need to co-ordinate and synchronise the timings with the development activities.

### **B.3 Land survey**

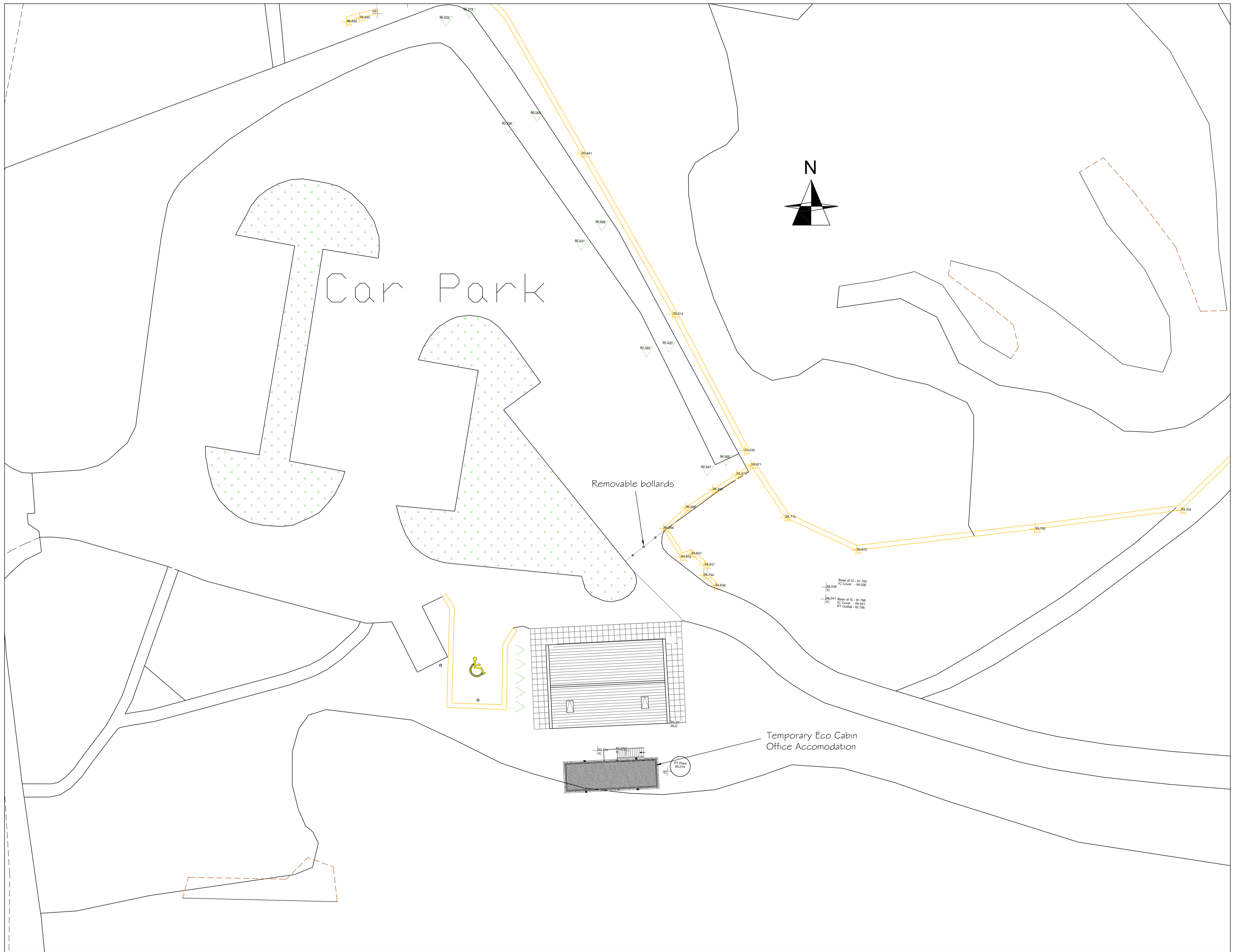
The visitors centre and café is located to the south of the Walltown Craggs car park. There is a small copse of cultivated tree species which have been planted on the slope behind the building as a screen from a public footpath. These trees link to a greater area of plantation woodland growing to the south and to the east. The woodland is isolated within large areas of pasture which dominate the landscape within this area.

### **B.4 Proposed site/ development plan**

Current development proposals include the extension of the rear and the eastern side of the current building to create a covered picnic area and utensil washing area. A two storey/ stacked 'eco-cabin' will be positioned temporarily to the rear of the building.

Figure 1. Proposed development plan. (Tims Morris: Proposed site; 03 rev C: Pr Site plan).  
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The contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before commencing work. This drawing is to be read with and checked against structural and specialist drawings provided for the work. The contractor is to comply in all respects with the current Building Regulations whether specifically stated on the drawings or not. This drawing and the building works depicted are the copyright of Tims Morris Ltd and may not be reproduced except by permission.



Rev C 16.9.14: Storage tank & Disposal point removed from design scheme.  
 Rev B 15.9.14: Amendments to design scheme following client discussion.  
 Rev A 12.9.14: Relocation of disposal point following tree survey.

Client.	Northumberland National Park Authority
Project.	Walltown Craggs Centre
Drawing Title.	Proposed Site Plan

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Scale	1:200	Drawn By	KM	Drwg No.	140040-03
Date	Aug '14	Revision	B		

A1



## **C TREE PROTECTION PLAN ASSESSMENT CRITERIA**

The constraints imposed by trees, both above and below ground, will inform the site layout design and working methods. The following are the main criteria which have been taken into account within this report:

### **C.1 Below ground constraints**

The main aim of this protection plan is to protect roots from excavation or similar activities during construction and landscaping activities. The level of impact on trees is based on:

- The proximity of proposed foundations to root systems of trees to determine whether trees can be retained.
- The extent of root plate areas around retained trees to ensure there are no or limited impacts to such features.
- Protection measures required to designate the root protection zones of retained trees.

### **C.2 Ground level constraints**

Within the root protection zone, adequate provision must be given for the protection of the trees during both construction and landscaping activities. Potential Impacts which need to be assessed and where necessary mitigated include:

- Root compaction.
- Surface level changes.
- Chemical spillages.
- Physical damage through excavation.

### **C.3 Above ground constraints**

Above ground impacts may be within or outside of the root protection zone, but generally involving tree canopies, crown spreads and anticipated growth. Impacts which will be taken into account include:

- The movements of high clearance vehicles within the proximity of trees.
- The proximity of new buildings to the trees and how the trees and buildings will affect one another in the short, medium and long term.

### **C.4 Additional Considerations**

The following factors are to be taken into consideration, to provide adequate protection for the root system:

- The likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and presence of other trees;
- The morphology and disposition of the roots, when known to be influenced by past or existing site conditions (e.g. the presence of roads, structures and underground services);
- The soil type and structure;
- Topography and drainage;
- Where any significant part of a tree's crown overhangs the provisional position of tree protection barriers, these parts may sustain damage during the construction period. In such cases, it may be necessary to increase the extent of the tree protection barriers to contain and thereby protect the spread of the crown. This can be mitigated by facilitation (branch end) pruning (Appendix 5. I.1.).

Values stated in Table; 'Trees to be retained' (Appendix 3), are the absolute values as calculated for that tree and remain as minimum guidance as to the actual root protection zone.

## **D RECOMMENDATIONS**

### **D.1 Works to trees and mitigation measures**

Trees to be removed and works to trees are fully described in Appendix 1 (figure 2) and Appendix 2 & 3 (tables 1 & 2).

### **D.2 Protected trees**

There are no protected trees within the site boundary.

### **D.3 Recommendations for tree work**

All remedial and terminal works to trees, as specified, are to be carried out in accordance with BS 3998:2010 (Tree work recommendations), Appendix 5.

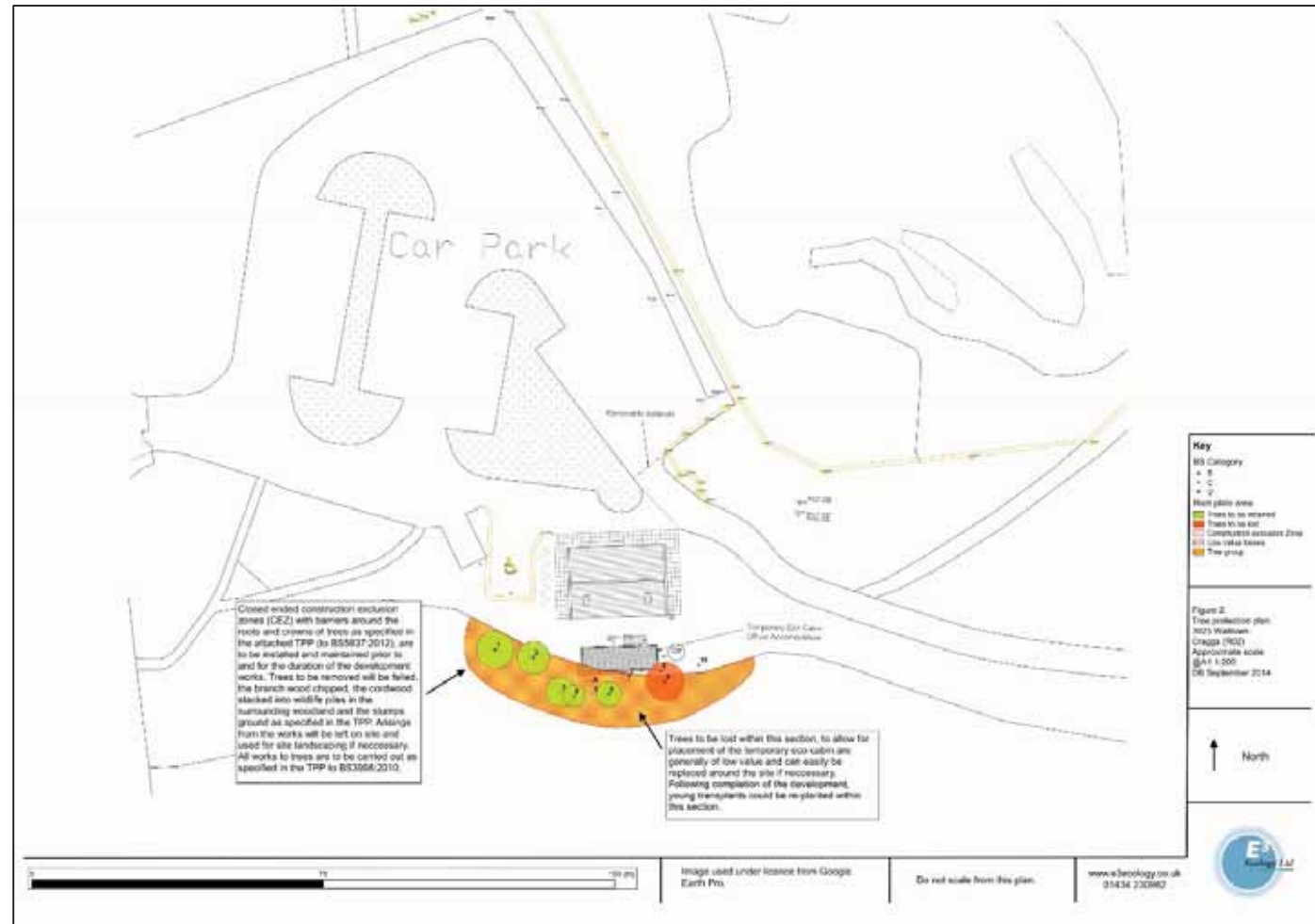
- 1) Low value trees to be removed will be felled in such a manner as to prevent damage to the crown and roots of adjacent trees. Stumps will be 'ground' to the extent of the structural roots (Appendix 5 (I.3)).
- 2) All cordwood will remain on the site and left in the surrounding woodland in habitat piles. Branch wood will be chipped to as greater diameter as is possible. These arisings will be utilised on site as part of the general landscaping scheme.
- 3) All works to trees will be conducted outside the bird breeding season (March to August inclusive) unless prior inspection is made by the project ecologist and active nests are confirmed to be absent (Appendix 7).

### **D.4 Recommendations for trees to be retained**

- 1) All works will follow the method statement provided (Appendix 4).
- 2) For the trees that are being retained, protection measures and barriers will be installed prior to the development, either around the root protection areas of each of the trees or around each group of trees as illustrated in figure 2 (Appendix 4 H.1 BS5837:2012 – Recommendations; The Construction Exclusion Zone (CEZ): barriers and ground protection).
- 3) These barriers will be maintained for the duration of the development period, with the CEZ strictly enforced by the site manager.
- 4) The CEZ will be enclosed at the ends, to prevent incursion into the RPAs of the retained trees, to prevent root compaction and any other long term structural damage.

## E APPENDIX 1. TREE PROTECTION PLAN

Figure 2– Tree Protection Plan  
(High resolution figure attached)



3923 Walltown Craggs  
R01 Tree protection plan  
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**F APPENDIX 2.TREES TO BE REMOVED/ WORKS TO TREES.**

Key:

<b>Arboricultural implications assessment (AIA)</b>							
<b>Key</b>				<b>Age class</b>			
<b>St dia:</b>	Stem diameter in mm 1.5m from adjacent ground level			<b>Y- Young</b>			
<b>Cr Rad:</b>	Estimated crown radius to compass points (m) North, East, South, West.			<b>SM- semi-mature</b> (1st 1/3 of life expectancy)			
<b>Cr clearance:</b>	Crown clearance in metres (lowest point from the ground)			<b>EM - early mature</b>			
<b>Est cont:</b>	Estimated remaining contribution in years			<b>M - Mature</b> (final 1/3 of life expectancy)			
<b>Rad RPA:</b>	Radial root protection area in sq metres from stem area			<b>OM -Over Mature</b> (beyond life-expectancy/declining naturally)			
<b>RP</b>	Reinspection period (months)	<b>Time frame:</b> Timing of proposed works		<b>V - Veteran</b> (of great age and potential conservation value)			
<b>Condition:</b>	<b>P</b> - Physiological (Poor= significant ill health, Fair= symptoms of ill health that can be remediated, Good= No significant health problems)						
	<b>S</b> - Structural (Poor= significant weakness, Fair= symptoms of weakness that can be remediated, Good= 'normal' structure)						
<b>BS cat:</b>	British Standard (5837:2012) tree quality category of retention: U- removal A(1-3)- high quality value B(1-3)-moderate quality value C(1-3)- low quality value						
<b>Phenological stage (tree ref):</b>	<b>D</b> = dormant,	<b>I</b> = in bud,	<b>L</b> = in leaf	<b>F</b> = flowering	<b>Fr</b> = Fruiting	<b>LD</b> = Leaf drop	<b>Nwr</b> - No Work Required

For multi-stemmed trees, the RPA is calculated from the square root of the (combined stem diameters) <sup>2</sup>.

**Table 1: Trees to be removed**

Tree ref. No.	Tag Number	English Name	Scientific Name	Phenological Stage	Height (m)	St dia. at 1.5m (mm)	Cr Rad.(m) N	Cr Rad.(m)E	Cr Rad.(m) S	Cr Rad.(m) W	Cr. Clearance (m)	Age (yrs.)	Est cont	Physiological Structure (+ve/-ve features)	Structural condition (+ve/-ve features)	Management recommendations	Time frame (months)	RP	Rad RPA (m2)	RPA Radius (m)	BS cat
T6	382	Sessile Oak	<i>Quercus petraea</i>	Leaf	9.3	133	3	3	1	3	1	Y	40+	Good	Good	Fell to ground level, chip and leave cordwood on site to allow for positioning of the eco-cabin.	6	0	8.00	1.6	U
T7	0	Weeping Midland hawthorn	<i>Crataegus laevigata 'pendula'</i>	Leaf	0	0	0	0	0	0	0	Y	40+	Good	Good	Fell to ground level, chip and leave cordwood on site to allow for positioning of the eco-cabin.	6	0	0.00	0.0	U
T8	0	Hazel	<i>Corylus avellana</i>	Leaf	0	0	0	0	0	0	0	Y	40+	Good	Good. Young hazel coppice.	Fell to ground level, chip and leave cordwood on site to allow for positioning of the eco-cabin.	6	0	0.00	0.0	U

G APPENDIX 3.

Table 2: Trees to be retained																					
Tree ref. No.	Tag Number	English Name	Scientific Name	Phenological Stage	Height (m)	St dia. at 1.5m (mm)	Cr Rad.(m) N	Cr Rad.(m)E	Cr Rad.(m) S	Cr Rad.(m) W	Cr. Clearance (m)	Age (yrs.)	Est cont	Physiological Structure (+ve/-ve features)	Structural condition (+ve/-ve features)	Management recommendations	Time frame (months)	RP	Rad RPA (m2)	RPA Radius (m)	BS cat
T1	378	Grey poplar	<i>Populus canescens</i>	Leaf	13	198	4	5	2	4	2	SM	40+	Good	Good. Some soil subsidence from around the base.	Nwr	0	36	17.74	2.4	B1
T2	379	Grey poplar	<i>Populus canescens</i>	Leaf	13	173	6	5	4	4	2	SM	40+	Good	Good	Nwr	0	36	13.54	2.1	B1
T3	380	Field Maple	<i>Acer campestre</i>	Leaf	5.4	159	4	3	3	4	1	SM	40+	Good	Good	Nwr	0	36	11.44	1.9	C1
T4	381	Rowan	<i>Sorbus acuparia</i>	Leaf	8.3	117	1	1	1	1	1	SM	40+	Good	Good	Nwr	0	36	6.19	1.4	C1
T5	0	Hazel	<i>Corylus avellana</i>	Leaf	0	0	0	0	0	0	0	Y	40+	Good	Good. Young hazel coppice.	Nwr	0	36	0.00	0.0	C1
T9	383	Goat willow	<i>Salix caprea</i>	Leaf	7.9	211	4	4	4	4	4	SM	40+	Good	Good. Self-seeded tree.	Nwr	0	36	20.14	2.5	C1
T10	0	Hawthorn	<i>Crataegus monogyna</i>	Leaf	0	0	0	0	0	0	0	Y	40+	Good	Good	Nwr	0	36	0.00	0.0	C1

## **H APPENDIX 4: ARBORICULTURAL METHODS STATEMENT: ROOT PLATE AREA PROTECTIVE BARRIERS**

(The following extracts are taken from the BS5837:2012: Trees in relation to design, demolition and construction – Recommendations)

### **H.1 The construction exclusion zone: barriers and ground protection**

#### General

- All trees which are being retained on site should be protected by barriers and or ground protection.
- Vertical barriers should be erected and ground protection installed before any materials or machinery are brought onto the site and before any demolition, development or stripping of soil commences.
- Areas of new or retained structure planting should be similarly protected, based on the extent of the soft landscaping as shown on the approved drawings. Once erected, barriers and ground protection should be regarded as sacrosanct, and should not be removed or altered without prior recommendation by an arboriculturalist and approval of the local planning authority.
- In the case of particularly vulnerable trees or trees sited close to the construction access, the owner or developer should make arrangements for an arboriculturalist to supervise necessary works and the erection of protection before the handover of land to the contractor. Pre-development tree work may be undertaken before the installation of tree protection, where required, with the agreement of the local planning authority.

#### Barriers

- 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 tree(s). On all sites, special attention should be paid to ensuring that barriers remain rigid and complete.
- In most cases, barriers should consist of a scaffold framework in accordance with Figure 3 and 4 (below) comprising a vertical and horizontal framework, well braced to resist impacts, with vertical tubes spaced at a maximum interval of 3m. Onto this, Weldmesh panels should be securely fixed with wire or scaffold clamps. Weldmesh panels on rubber or concrete feet are not resistant to impact and should not be used.
- NOTE: The above is preferred because it is readily available, resistant to impact, can be re-used and enables inspection of the protected area.

#### Ground protection

- The position of the barrier may be shown within the RPA at the edge of the agreed working zone but the soil structure beyond the barrier to the edge of the RPA should be protected with ground protection. For pedestrian movements within the RPA the installation of ground protection in the form of a single thickness of scaffold boards on top of a compressible layer laid onto a geotextile, or supported by scaffold, may be acceptable (see Figure 5 below).

Figure 3 - Default specification for protective barrier

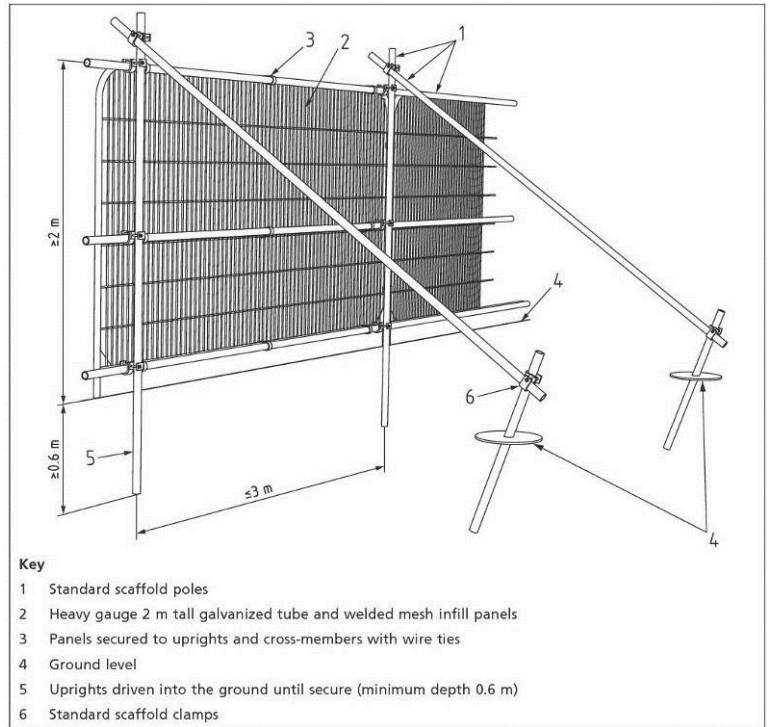
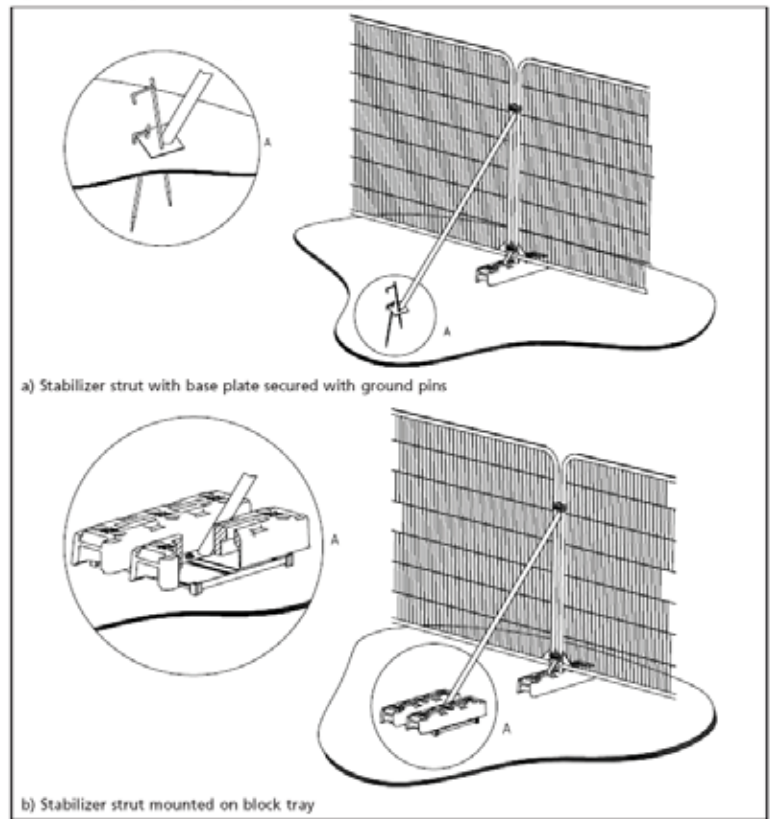


Figure 4 - Examples of above ground stabilising systems.





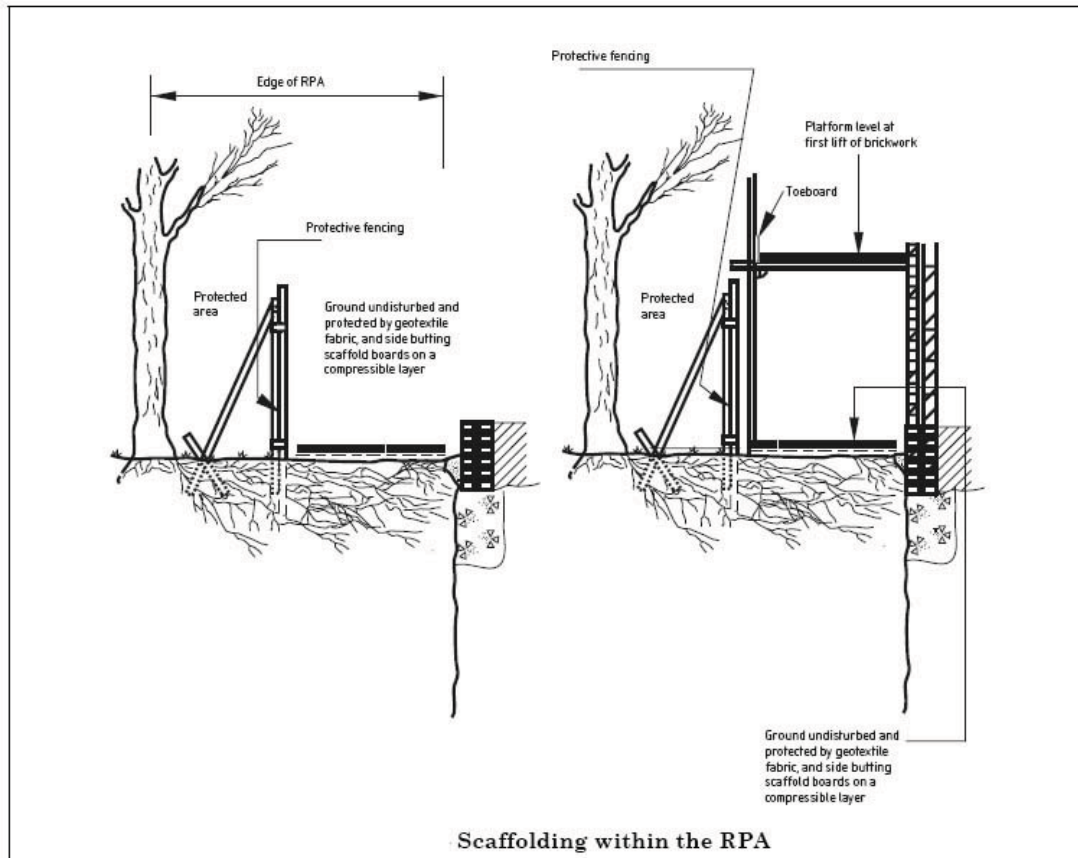


Figure 5- Use of scaffolding within the RPA

#### Additional precautions outside the exclusion zone

- Once the exclusion zone has been protected by barriers and/or ground protection, construction work can commence. All-weather notices should be erected on the barrier with words such as:

**“Construction exclusion zone — Keep out”.**

In addition the following should be addressed or avoided:

- 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 them and might make their safe retention impossible.
- Consequently, any transit or traverse 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 necessitating access facilitation pruning.
- Material which will contaminate the soil, e.g. concrete mixings, diesel oil and vehicle washings, should not be discharged within 10m of the tree stem.
- Fires should not be lit in a position where their flames can extend to within 5m of foliage, branches or trunk. This will depend on the size of the fire and the wind direction.
- Notice boards, telephone cables or other services should not be attached to any part of the tree.

It is essential that allowance should be made for the slope of the ground so that damaging materials such as concrete washings, mortar or diesel oil cannot run towards trees.

## H.2 Avoiding the damage of structures by trees

### General

- Buildings should be constructed to allow for future growth of planted or self-sown trees.
- In some situations, trees and vegetation can adversely affect structures either by direct action, or by indirect action causing shrinkage or swelling of a clay subsoil.
- Even if no trees exist at the time of construction, they may be planted in the future or self-seeded. Consideration should be given to this possibility by having foundations in accordance with Table 3, which will allow for reasonable future vegetation, or to an engineered design.

### Direct damage by trees to structures

Trees can cause direct damage to structures by:

- a. The disruption of underground services and pipelines;
- b. Displacement, lifting or distorting;
- c. The impact of branches with the superstructure;
- d. Structural failure of the tree.

The potential for direct damage should be taken into consideration throughout the design and construction process, as detailed below:

- The growth of the base of the stem or of roots near the surface exerts relatively small forces. Whilst paving slabs or low boundary walls can be lifted or pushed aside easily, heavier or stronger structures are more likely to withstand these forces without damage, as the root distorts around the obstruction before damage occurs. The greatest risk of direct damage occurs close to the tree from the incremental growth of the main stem and secondary thickening of the roots, and diminishes rapidly with distance.
- New tree planting should be kept at distances from structures of at least those in Table 3.
- In the case of established trees where construction work is to take place near to the main stem and roots, the following precautions should be taken to allow for future tree growth in order to protect the structure:
  - a. Foundations should be reinforced to resist lateral thrust; or
  - b. Walls or structural slabs should bridge over roots allowing sufficient clearance for secondary thickening or be designed to distort without cracking; or
  - c. Pavings and other surfaces should be laid on a flexible base to allow movement and to facilitate relaying if distortion becomes excessive.
- Water leaking from damaged drains, sewers or water mains encourages localized root growth. Roots are then likely to enter a drain or sewer through the defect and proliferate, causing blockage and an enlarging of the initial defect. Provided they are further from trees than distances stipulated in Table 3, intact drains are not likely to suffer direct damage and will not attract roots. Damage to drains and sewers can be avoided by the following:
  - a. Re-routing services to conform to Table 3;

- b. Ensuring watertight joints;
  - c. In clay soils, use of flexible materials and/or joints to accommodate movement;
  - d. Not using perforated land drains near trees.
- Allowance should be made for the swaying of stems and branches during storm conditions. Branches which are liable to strike the structure should be pruned back to a suitable branching point. Trees in a condition that renders them liable to collapse should not be retained near structures.

**Minimum distance (m) between young trees or new planting and structure to avoid direct damage to a structure from future tree growth**

Type of structure	Diameter of stem at 1.5 m above ground level at maturity		
	<30 cm	(30-60) cm	>60 cm
Buildings and heavily loaded structures	—	0.5	1.2
Lightly loaded structures such as garages, porches etc.	—	0.7	1.5
Drains and underground services			
<1 m deep	0.5	1.5	3.0
>1 m deep	—	1.0	2.0
Masonry boundary walls <sup>a</sup>	—	0.5	1.0
	—	(1.0)	(2.0)
In situ concrete paths and drives <sup>a</sup>	—	0.5	1.5
	(0.5)	(1.0)	(2.5)
Paths and drives with flexible surfaces or paving slabs <sup>a</sup>	—	0.5	1.0
	(0.7)	(1.5)	(3.0)

<sup>a</sup> These distances assume that some movement and minor damage might occur. Guidance on distances which will generally avoid all damage is given in brackets.

Table 3: Minimum distances from new plantings to structures.

### H.3 Principles for avoiding tree root damage during construction

- Prior to the installation of a new ground surface, existing ground cover vegetation (e.g. grass sward) should be killed using an appropriate herbicide. Herbicides that can leach through the soil, e.g. products containing sodium chlorate, should not be used. Specialist advice should be sought in order to determine the most suitable herbicide treatment.
- The soil surface should not be skimmed to establish new paving or other surfaces at the former ground level. Loose organic matter and/or turf should be removed carefully using hand tools. The new surface should then be established above the former ground level, using a granular fill, where required.
- If ground levels are to be raised within the RPA this should be achieved by use of a granular material which does not inhibit vertical gaseous diffusion. Examples of suitable granular materials include, no-fines gravel, washed aggregate, or cobbles. Depending on the California Bearing Ratio (CBR) of the soil, it may be necessary to install a load suspension layer such as a cellular confinement system.
- In concentration carbon dioxide is detrimental to tree root function. Because this gas principally diffuses vertically through the soil, new impermeable surfacing within the RPA should be restricted to a maximum width of 3m and situated tangentially to one side of a tree only, or confined to an area no greater than 20% of the root protection area, whichever is the smaller.
- Any excavations which have to be undertaken within the root protection area should be carried out carefully by hand, avoiding damage to the protective bark covering larger roots. Roots, whilst exposed, should be wrapped in dry, clean hessian sacking to prevent desiccation and to protect from rapid temperature changes. Roots smaller than

25mm diameter may be pruned back, preferably to a side branch, using a proprietary cutting tool such as bypass secateurs or handsaws. Roots larger than 25mm should only be severed following consultation with an arboriculturist, as they 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 with sharp sand (builders' 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 should be free of contaminants and other foreign objects potentially injurious to tree roots.

#### **H.4 Provision for water and oxygen**

- It is essential to maintain adequate supplies of water and oxygen for trees through the soil. Porosity is important particularly where the new hard surface covers an area of previously unmade ground, under which tree roots may have developed preferentially. New impermeable surfacing should not cover more than 20 % of the root protection area.
- No-fines granular materials should be used wherever fill or a sub-base is required to help to ensure adequate gaseous diffusion. Due to the need to avoid excavation, and thereby root severance, within the RPA such sub-bases should be formed using a cellular confinement system such as a load suspension layer laid at ground level.
- Excess water in the root protection area should be avoided, particularly on clay soils where water-logging can occur. In these cases, the hard surface should slope away from the tree to avoid ponding. Provided surface water is not liable to be contaminated by salt or toxic run-off from oil or petrol, a permeable surface should be employed. If contamination is likely to be a problem, an impermeable surface may be used to prevent entry of toxic material.
- If excess water is likely to be a problem, consideration should be given to the provision of suitable land drainage. Such drains should not be located within root protection areas.

#### **H.5 Allowance for future growth**

- Future growth can lift paths or distort light structures such as walls. Where such structures, including surfaces, are unavoidable near to trees, design and construction specification should take account of future growth.
- If it is necessary to build a wall or similar structure over a root greater than 50mm diameter, provision should be made for future diameter growth by surrounding the root with un-compacted sharp sand, void-formers, or other flexible fill materials, and by laying an adequately reinforced lintel or raft over the surface.

#### **H.6 Foundations within the RPA**

The insertion of structures within root protection areas may be justified if this allows the retention of a good quality tree (category A or B). However, it is essential that careful consideration is given to foundation design. In such cases, the use of traditional strip footings, in particular those constructed tangentially across the root zone, can result in severe damage to tree roots and should be avoided.

Root damage can be minimised by using a combination of the following:

- Piles or radial strip footings both of which should be located to avoid major tree roots;
- Beams, slabs, suspended floors, where all should be laid at or above ground level, and cantilevered as necessary to avoid tree roots.

In order to arrive at a suitable solution, site specific and specialist advice regarding foundation design should be sought from an arboriculturist and an engineer.

Where piling is to be installed near to trees, the smallest practical pile diameter should be used as this reduces the possibility of striking major tree roots, and reduces the size of the rig required to sink the piles. The latter is particularly important where piling within the branch spread is proposed, as mini-rigs reduce the need for access facilitation pruning. Sheathed piles protect the soil and adjacent roots from the potential toxic effects of concrete.

### H.7 Underground and above ground services

Trenching for the installation of underground services severs any roots present and may change the local soil hydrology in a way that adversely affects the health of the tree. For this reason particular care should be taken in the routing and methods of installation of all underground services. Wherever possible, they should be kept together and trenchless techniques used. At all times where services are to pass within the RPA, detailed plans showing the proposed routing should be drawn up in conjunction with an arboriculturist. Such plans should also show the levels and access space needed for installing the services and be accompanied by arboricultural method statements (AMS).

As an alternative to trenchless techniques, a possible solution is to hand excavate a narrow trench passing directly towards a tree along a radius to not closer than 1m from the trunk, tunnel straight beneath the tree, preferably not less than 750mm deep, and exit on the opposite side along another radius (see Figure 6). Provided the trench is kept as narrow as possible, the amount of root severance will be minimal, and will be far less than if a trench passes close beside the tree. It may be necessary to make provision to facilitate future servicing and repair without further damage to the tree roots.

Consideration should be given to the routing of above ground services in order to avoid the need for detrimental and repetitive pruning. In this regard the current and future crown size of the tree should be assessed. Tree branches can be pruned back with care to provide space.

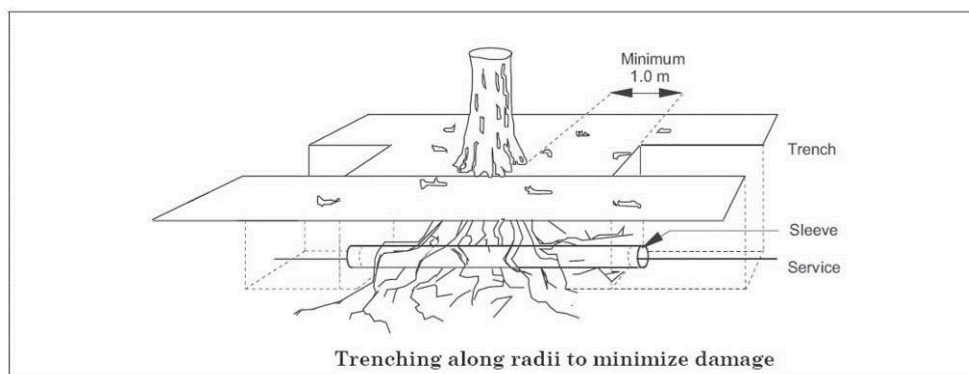


Figure 6 Trenching in proximity to roots.

### H.8 Low-invasive vehicular access in proximity to trees

Where the construction of hard surface access cannot be avoided within the root protection area, a no-dig design should be used to avoid root loss due to excavation. In addition the structure of the hard surface should be designed to avoid localized compaction, by evenly

distributing the carried weight over the track width and wheelbase of any vehicles that will use the access. Such designs might include the use of a three dimensional cellular confinement system as an integral component of the sub-base, to act as a load suspension layer. Driveways and roadways constructed according to this principle can be designed to be suitable for most types of traffic. Where this type of access is proposed, site-specific and specialist advice should be sought from an engineer and an arboriculturalist in order to ensure that it is fit for purpose.

## I APPENDIX 5: RECOMMENDATIONS FOR TREE WORK

(The following extracts are taken from the BS3998:2010: Tree work recommendations).

### I.1 Pruning

- Pruning cuts should be made to trees being retained as specified above. Removal of sections of limbs before the final target cut at the branch bark ridge will prevent harmful 'tear-offs' down the stem, especially when pruning heavy branches back to the stem.

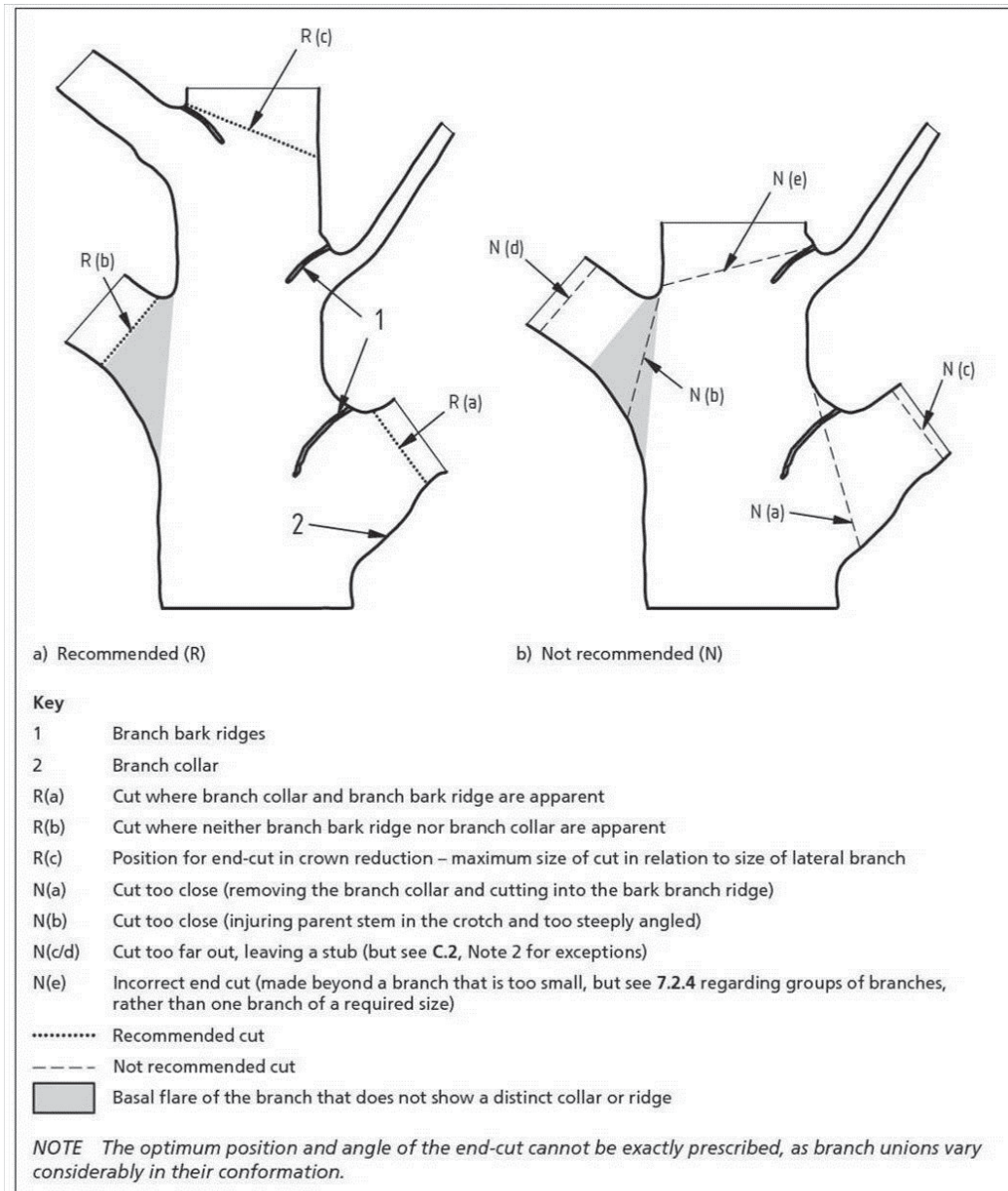


Figure 7 - Branch and target pruning

- Figure 7. Indicates the correct methodology for branch and target pruning, where the degree of wounding should be controlled according to the ability of the species to react defensively against wounding. Therefore in order to ensure that the potentially adverse effects of pruning are avoided as far as possible, the cross-sectional area of the cuts individually and in total should be minimized.

- Ideally the diameter of the final cut should generally not exceed one-third of that of the parent stem or branch. The maximum diameter of cuts should decline as the age of the tree increases to allow or a slower rate of wound occlusion.
- If a stem or branch union is to be shortened, the cut should be made distal to a union or group of unions where one or more healthy lateral branches bear enough foliage to sustain the parent stem or branch. If there is only one such union near the intended cut, the lateral branch should have as large a diameter as possible (i.e. at least one-third and preferable more than half that of the removed portion).

Size of cut (Ømm).	Maximum recommended approximate number of cuts, for each size in the left hand column (on this basis, no cuts of any other size could be created)
50	48
100	12
150	5
200	3

## **I.2 Tree felling**

Trees should only be felled if their removal or coppicing is assessed as providing the best solution in the circumstances. In making this assessment, account should be taken of:

- 1) The potential impact of exposing retained trees
- 2) The potential for indirect damage, e.g. to underground services or to built structures including archaeological features
- 3) The destabilization of slopes due to removal of support from the roots
- 4) The potential for direct damage caused by either tree felling or stump removal
- 5) The potential for tree failure

Consents might be required from the relevant authority before trees are felled; particularly for protected trees.

A tree should be felled in one piece only when there is no significant risk of damage to people, property or protected species. Where restrictions (e.g. lack of space, buildings, other features, land ownership or use, or other trees which are to be retained) cannot be overcome, trees should be dismantled in sections.

## **I.3 Stumps**

If owing to its location, a stump is considered to be a significant trip hazard or source of a pathogen that could affect retained trees, it should be either removed or destroyed. If there is a delay between felling and stump removal, the stump should meanwhile be left in a condition that leaves the site safe. Destruction of the stump by burning is not recommended.

The reason for grinding the stump should be ascertained and the appropriate depth of operation agreed. Stump grinding should normally extend through the base of the stump leaving the major roots disconnected if the intention is to reduce the potential for the spread of honey fungus. The grinding residue should be treated as arisings.

Note: mechanical destruction of the stump is less disruptive to the site than digging out



## J APPENDIX 6: GENERAL LEGISLATION

### J.1 Trees and the law

#### J.1.1 General

Trees in any location may be protected by legislation. Where development is proposed, additional legal protection may be appropriate and can be enforced by the local authority. Attention is drawn to legal controls and liabilities under common law for consideration at the earliest stages of potential site development.

#### J.1.2 Legal protection for trees

The Town and Country Planning Act 1990 (as amended) and the Town and Country (Tree Preservation) (England) Regulations 2012 requires that, except in certain circumstances, “no work shall be carried out which will affect trees over a certain size which are situated in **conservation areas**”. Six weeks’ notice of intent has to be given to the local authority before the work is carried out. This provides an opportunity for the local authority to make a tree preservation order (TPO), under this Act, to protect the trees.

Under section 211 of the Act, anyone proposing to cut down or carry out work on a tree in a Conservation Area is required to give the Local Authority, six weeks prior notice (a section 211 notice). These can be completed online at:

[www.planningportal.gov.uk/planning/applications/howtoapply/permissiontypes#Notificationofproposedworkstotreesinconservationareas](http://www.planningportal.gov.uk/planning/applications/howtoapply/permissiontypes#Notificationofproposedworkstotreesinconservationareas)

The Section 211 notice must set out clearly what work is proposed. A proposal just to ‘top’ or ‘lop’ a tree would not be acceptable because there are many different ways to ‘top’ or ‘lop’ a tree. If there are many trees on the site, it is usual to provide a scaled plan of the site including the extent of any proposed development constraints (if applicable).

Further guidance is available at:

<http://planningguidance.planningportal.gov.uk/blog/guidance/tree-preservation-orders/how-are-trees-protected-in-conservation-areas/what-is-the-decision-making-process-for-tree-protection-in-conservation-areas/what-form-should-a-section-211-notice-take/>

People are not required to submit a section 211 notice to the local planning authority for:

- The cutting down, topping, lopping of a tree whose diameter does not exceed 75mm; or
- The cutting down or uprooting of a tree, whose diameter does not exceed 100mm, for the sole purpose of improving the growth of other tree.

Tree preservation orders allow for trees to be protected either as individuals, groups, areas or woodlands. The orders have the effect of preventing the cutting down, topping, lopping, uprooting, willful damage or willful destruction of trees, except in certain circumstances, other than with consent of the local authority.

Even when no specific legal protection exists, it may be necessary to obtain a felling license. These apply if the volume of timber exceeds specified amounts; site clearance, even of small areas, before detailed planning permission has been granted could exceed the felling license quota. The Forestry Commission, under the Forestry Act 1967 (as amended) administers felling licenses.

### J.1.3 Legal protection for trees on development sites

Section 197 of the Town and Country Planning Act 1990 states “it shall be the duty of the local planning authority to ensure, whenever it is appropriate, that in granting planning permission for any development adequate provision is made, by the imposition of conditions, for the preservation or planting of trees”. It also states that “it shall be the duty of the local planning authority to make such orders under section 198 [of the Act] as appear to the authority to be necessary in connection with the grant of such permission.”

It is usually appropriate for a tree preservation order to be placed on trees that are in amenity situation and structurally sound. The effect of proposed development on trees protected by tree preservation order ranks as a material consideration, which should be considered by the local authority, when determining a planning application under section 70 of the Town and Country Planning Act 1990.

Where a tree preservation order exists prior to planning permission being granted it should not normally be a block to effective use of a site. It serves to deter damage to or clearance of trees prior to planning permission being granted and provides a means of enforcing their protection during development work.

When planning permission is granted, planning conditions may be imposed to provide for the erection of protective fencing and other measures for ensuring the well-being of trees during development.

**NOTE It is considered inappropriate for planning conditions to be used to provide long-term protection to trees when tree preservation orders are available as a specific provision for this purpose.**

Where circumstances require it, local authorities should apply a planning condition requiring the developer to appoint an arboriculturist to oversee the project. This person has a duty to monitor and confirm the implementation and maintenance of tree protection measures, as agreed with the local authority. Planning conditions may be imposed requiring tree planting to be undertaken as part of a project, and a tree preservation order can be made to apply to such trees once they have been planted so as to achieve their long term protection.

The consent of the local authority is not needed to carry out work on trees required to enable a person to implement a planning permission. Felling and further works cannot be said to be required when planning permission has been given on an outline application only, nor when development is exempt from planning control.

### J.1.4 Enforcement of protection during development

- The effectiveness of measures to protect trees and ensure their healthy survival through development depends on co-operation between site owners, developers, contractors, arboriculturists and local authorities.
- If the local authority considers that there has been a breach of planning conditions that provide for the protection of trees, it can serve an “enforcement notice”; if necessary this can be followed by a “stop notice” (Town and Country Planning Act 1990, sections 172, 183, 184);
- *Planning policy guidance note 18*
- *Enforcing planning control* [19]; *DoE Circular 10/97— enforcing planning control: Legislative provisions and procedural requirements*). When considering the need for such enforcement, local authorities should consider that trees can be damaged very

easily and that survival of trees is most likely to be achieved by maintenance of protection at all times.

## **J.2 Common law claims and litigation concerning trees**

### **J.2.1 General**

Problems caused by trees on development sites can result in disputes giving rise to common law claims and litigation. Such problems are particularly likely where trees grow across boundaries between properties and cause damage to the property of a third party. For instance, root activity can affect structures other than those on the development site. The crowns, stems and roots of trees may have structural weaknesses, which if they fail, could result in damage to property or injury to people. Leaves and fruit falling from trees, obstruction of light and problems of poisonous plants have all been considered by the courts. Legal advice should be sought where trees may become a problem.

Careful planning and design should minimize the possibility of litigation after completion of the development.

### **J.2.2 Planting adjacent to boundaries**

Problems with trees on or close to boundaries have resulted in litigation on many occasions, and the rights and responsibilities of tree owners and their neighbors are, in this respect, well documented in law. The government has published guidance on high hedges (*Hedge height and light loss* — ODPM, 2002) which advises on reasonable standards for evergreen hedges in domestic gardens. Careful consideration of new planting to anticipate both the likely encroachment of roots or overhang of branches of the fully grown tree relative to the site boundary can prevent potential future conflict, while the possibility of direct mechanical damage to boundary fences and walls can be avoided by allowing room for growth and movement.

## **K APPENDIX 7: PROTECTED SPECIES AND TREES**

### **J.3 Wildlife and Habitat Considerations**

The Government's National Planning Policy Framework (NPPF) states the following:

- Plan policies and planning decisions should be based upon up-to-date information about the natural environment (Paragraph 158 and 165).
- Plan policies should promote the preservation, restoration and recreation of priority habitats, ecological networks and the recovery of priority species (Paragraph 117).
- Local planning authorities should set out a strategic approach in their Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure. (Paragraph 114).
- When determining planning applications in accordance with the Local Plan and the presumption in favour of sustainable development local planning authorities should aim to conserve and enhance biodiversity by applying a number of principles, including if significant harm resulting from a development cannot be avoided, adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused. (Paragraph 118).

Where bats are found to be present consultation needs to be carried out with the Statutory Nature Conservation Organization i.e. Natural England.

### **J.4 Bats in trees**

Trees provide habitat for bats in the form of roost sites, maternity roost sites and hibernacula. As a habitat, trees provide foraging for bats, being a medium for invertebrates, and provide three dimensional feeding corridors to and from roosting sites.

None of the trees surveyed were assessed as having a moderate or high risk of roosting bats. However as the trees age, in particular the mature beech, oak and Scots pine on site, their value as roost sites will become more significant.

The following should be considered when carrying out any works to the trees.

All bat species are specially protected under the Conservation of Habitats and Species Regulations (2010) and under Schedule 5 of the Wildlife and Countryside Act of (1981) (as amended).

As a result it is illegal to:

- Deliberately kill, injure or capture bats.
- Deliberately or recklessly disturb bats.
- Deliberately or recklessly obstruct access to a bat roost.
- Damage or destroy a bat roost.

Fines of up to £5000 *per bat* affected and confiscation of vehicles used can be imposed for deliberate or reckless disturbance of bats or damage to a roost site.

If works risk recklessly harming bats then the police can order all construction/renovation work to cease until the issue is properly addressed.

If bats are found at any time during the work E3 Ecology (01434 230982) should be contacted immediately.

### **J.5 Nesting/ Breeding Birds**

Habitats on site are likely to provide a suitable nesting and foraging resource for birds.

- The early mature to mature trees on site are almost all suitable as nest sites.
- Ornamental planting in conjunction with the trees may provide foraging opportunities in the form of berries and invertebrates.

Under the provisions of the Wildlife and Countryside Act of (1981) (as amended) it is illegal to knowingly disturb any nesting bird during the breeding season.

### **J.6 Nesting/ breeding mammals**

Trees provide vital nesting sites for native arboreal mammals (such as red squirrel and wood mouse), with a contiguous canopy providing an aerial highway to and from foraging sites, providing cover from predators. These factors need to be considered in any landscape design.

Red squirrel are protected under the provisions of the Wildlife and Countryside Act of (1981) (as amended).

