



**BS 5837:2012  
Arboricultural Impact Assessment  
Arboricultural Method Statement  
and  
Tree Protection Plan**

**Date of the Inspection**

15<sup>th</sup> May 2020

**Site**

The Granary  
Hesketh Lane  
Chipping  
PR3 2TH

**Description**

The extension of an existing out building into an American stable barn

**Instructed By**

**Farm Plus**

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## Executive Summary

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Treestyle Consultancy was commissioned to complete a survey to specifications set out in British Standard 5837:2012 *Trees in relation to design, demolition & construction - Recommendations*. This document is an Arboricultural Impact Assessment (AIA) which explains the Arboricultural Method Statement (AMS) and Tree Protection Plan (TPP). The proposal is for the conversion and extension of an existing building into a timber framed American barn.

**The Tree Survey** recorded trees and groups of trees within the boundaries of the grounds as well any that are potentially within influencing distance of the proposed development. A mature pin oak, a beech and two birch trees are in close proximity to the proposed structure, the most desirable for retention being the oak which is the largest and with the greatest potential longevity. The trees to the south have good essential visual aesthetics screening from neighbouring residential properties.

A total of four trees and one group of trees were recorded for the purpose of this report. The pin oak has been categorised as **high quality and value with 40 plus years**, category **B medium quality with 20 years life potential** comprise of a early mature beech and a birch. Another birch and the remaining green infrastructure which can be seen next to the existing structure have been categorised as low quality with 10 years life potential. These are predominately located too close to the existing structure with limited life potential, although they currently provide partial screening. The tree categorisation listed below is in accordance with BS 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*. The green infrastructure within the proposed area can only be viewed from the surrounding neighbouring residential properties with no visuals from the wider public domain.

All trees with the exception of G5 have been recommended for retention, a couple of beech require crown raising and a row of conifer require maintaining as a hedge.

The trees to the south of the proposed development will experience the greatest impact due to their above and below ground constraints. The development will have an adverse effect on the Root Protection Area (RPA's) of three trees, one of which is the category A pin oak. To protect the trees roots a temporary surface must be installed around the construction creating a work area so to avoid any compaction of the trees Root Protection Areas (RPA's) which the Heras fencing should rest upon. This will allow for a work area whilst the demolition of the existing concrete surface can take place. Several piling holes are required to be inserted into the RPA's of these trees. Test holes are to be carried out prior to construction to ascertain that no roots greater than 25mm will be damaged. Where the trees RPA crossover impacts with the development the surface must be covered with a non permeable membrane preventing soil contamination and root damage. The specially designed temporary surface will remain beneath the Heras fencing for the duration of the demolition and the building construction work.

The greatest threat to the green infrastructure is with the potential soil contamination and compaction. This is especially important with the potential for tree roots being located beneath the existing structure and proposed developments. A careful method statement and a well managed site will allow the proposed garage and green infrastructure to coexist for years to come.

### **The Proposed Demolition and Development**

- The demolition of the existing structure and sections of the drystone wall.
- The removal of the existing concrete surface
- The construction of the proposed development on the RPA of several trees.

### **The Arboricultural Impact Assessment (AIA)**

- The crown raising of the trees from above the proposed development will removed any future pruning requirements and is recommended for practical reasons.
- The demolition of the existing concrete surface and parts of the dry stone wall within the RPA of these trees.
- The installation of eight concrete holes for building support, some of which fall within the RPA's of these trees.
- The construction of a new concrete surface on the RPA of these trees.

### **Tree Protection Plan (TPP)**

- Prior to commencement of the demolition or construction the protection of the surface between the proposed development and the trees stems should be with a specialised temporary surface. Heras fencing can therefore rest upon these exposed RPA's and allow for a work area.
- The Root Protection Areas (RPA's) of the retained trees are a Construction Exclusion Zone (CEZ). The CEZ will contain tree roots, hand tools only can be used to excavate any existing surfaces during any pre site preparation.
- Hand tools only allowed within the RPA where excavation is require for the piling holes.
- A non permeable membrane should line the piling holes and the remaining RPA's prior to installing any concrete.
- Compaction must be avoided at all times.
- The prevention of contamination through the spillage of building materials into the soil profile is also discussed within this report.

### **The Arboricultural Method Statement (AMS)**

- Will require approval by the Local Planning Authority (LPA).
- See the recommended tree work carried out in accordance to [Appendix A - Tree Schedule](#).
- Instalment of the tree protection measures involving the specialised temporary surfacing and the Heras fencing.
- Pre commencement meeting to confirm all recommended protection is adequate.
- Construction of the developments.
- Removal of the tree protection.

It is important that the caveats and limitations of this report are understood, these can be read in Section 11.0 of this document.

## 1.0 Introductions

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- 1.1 Under instruction from Farm Plus an arboricultural report has been prepared to accompany a planning application for the demolition of an existing building with the development of a timber framed American barn. This report details the arboricultural impact on the site, subsequent mitigation recommendations and protective measures. The latter part of the report explains how the construction of the new surface will take place with regards to the protection of the trees to be retained.
- 1.2 The assessment was carried out in 15th July 2020 by Andrew Mcloughlin of Treestyle Consultancy. This assessment was carried out from the ground in accordance with BS 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*. The categorisation method identifies the quality and value of the existing green infrastructure.
- 1.3 Drawings of the existing and the proposed developments has been supplied, this information has been included when mapping the existing tree population. An appropriate Tree Protection Plan (TPP) has been drafted and revised as necessary from this Arboricultural Impact Assessment (AIA).
- 1.4 It should be noted that neither soil samples or soil maps have been used to make decisions on this report. Therefore there is the possibility of minor soil movement due to tree root activity. Prior to the undertaking of foundation depths calculations of any estimated tree locations should be resolved. If there are any discrepancies with trees locations or queries relating to their location or species within the group, then Treestyle Consultancy should be contacted prior to planning submission.
- 1.5 A total of four trees and a group of small trees were recorded for the purpose of this report. These can be viewed in [Appendix A – Tree Schedule](#) and [Drawings 1, Tree Numbering & Categorisation, Drawing 2 - The Proposed Development, Tree Removal, Root Protection Areas and Protective Fencing](#).
- 1.6 This report provides the results of the survey and includes the following;
- A schedule of all tree and hedges located on or within influencing distance of the proposed development site ([Appendix A – Tree Schedule](#)).
  - An assessment based on BS 5837:2012 of trees in terms of their potential value within any future development. On the basis of this assessment trees have been categorised into one of four categories: High, medium, low or not worthy of retention (A, B, C or U). See Appendix D - BS 5837:2012 Cascade Chart for Tree Quality Assessment.
  - Advice on removal, retention and management of these trees and hedges can be read in Sections 5 & 7 of this report.
  - A Tree Constraints Plan detailing tree quality categories, canopy spread (N, E, S & W), Root Protection Areas (RPA's), life span, Diameter at Breast Height (DBH), RPA m2, tree height, condition for all of the trees surveyed.
  - A Tree Removal and Protection Plan detailing the development proposals alongside trees to be retained and removed and any temporary protection measures.

## 2.0 Site and Surroundings

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### The Grounds

- 2.1 The grounds of the proposed development are located at the far end of an area of hard standing surface, upon an existing barn and extending out into a grassed area.

### Surrounding land

- 2.2 The area of land for the proposed is located in the rear garden area of The Granary which backs onto the Forest of Bowland. Partially surrounded by open fields to the east there are also existing residential properties to the north and south within viewing distance of the proposed development.

### Topography

- 2.3 The topography of the land is relatively flat with no undulating factors.

## 3.0 Statutory Protection and Guidance

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### National Planning Policy Framework (NPPF)

- 3.1 The NPPF assumes protection of all ancient woodland and veteran trees unless it can be clearly demonstrated that the need for, or benefits of, development outweigh the loss. In this respect ancient woodland is defined as an area which has been wooded continuously since at least 1600 AD and a veteran as a tree of exceptional value for wildlife, in the landscape, or culturally because of its great age, size or condition.
- 3.2 On this site there are no ancient woodland or veteran trees.

### Tree Preservation Orders & Conservation Area Designations

- 3.3 Local authorities reserve the right to create Tree Preservation Orders (TPO) to protect the amenity value conferred to a location by a tree or group of trees. Where a TPO is in place the lopping, topping, felling, uprooting or wilful damage is prohibited. Failure to comply may lead to prosecution or large fines. Work on a TPO'd tree requires permission from the local authority.
- 3.4 Section 211 of The Town and Country Planning Act 1990 (TCPA) relates to the preservation of trees in Conservation Areas. Under Section 211 anyone proposing to remove, uproot or destroy any tree within a Conservation Area is required to give the local planning authority six weeks' prior notice (a "section 211 notice"). During this period the Council may consider serving a Tree Preservation Order to prevent the proposed work from being undertaken

### Bats as a Protected Species

- 3.5 It is not uncommon for a mature tree with cavities or hollows to be a habitat for roosting bats. Bats are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), as well as under Schedule 2 of the Conservation of Species and Habitats Regulations 2010 and it is therefore an offence to cause damage to a bat roost.

- 3.6 A preliminary ground level appraisal of the wildlife habitat value of each tree was undertaken as part of the arboricultural survey and no trees were observed as having feature to support roosting bats.
- 3.7 Should the presence of a bat roost be suspected whilst undertaking works on site then all operations must cease until a licensed bat handler or ecologist can provide advice.

#### **Birds as a Protected Species**

- 3.8 Nesting birds frequently use trees for nesting. They are protected under the Wildlife and Countryside act 1981 (as amended). This makes it an offence to intentionally or recklessly damage or destroy an active birds nest.
- 3.9 It is recommended that all tree work is carried out outside the bird nesting season which is March to August. If this is not possible then a detailed inspection of each tree should be undertaken by a suitably qualified ecologist prior to any tree work. Should an active nest be found then any work likely to affect the nest must be halted until the nest becomes inactive.

## **4.0 Tree Population**

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- 4.1 The tree and hedge population varies in this category recognition under BS 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*. The below chart does not allow for a true representation of the tree population. This is because much of this data has been collected from small to medium sized trees with predominately overgrown hedges dominating the landscape.



**Figure 1. Breakdown of BS5837 categorisation of all trees surveyed. Category**

- 4.2 One pin oak has been categorised as high quality and value. A birch and a beech has been categorised as medium quality and around the western boundary of the existing structure are a row of small planted trees. Trees with the greatest retention are located to the south of the proposed development on a grassed permeable surface. The breakdown of quantities for each retention category are also shown below in [Figure 1](#). A cascade chart explaining the process used to reach these categorisations can be found in [Appendix D – Tree Categorisation Chart](#).

4.4 A summary of the trees in each of the four categories is given below in **Table 1**, for ease of reference.

Tree Category	Trees Numbers
A	T1
B	T2, T3
C	T4, G5
U	-

## 5.0 Impacts of the Proposed Development

5.1 A row of small young trees along the western boundary of the existing structure are to be removed in order to facilitate the development proposals. All remaining vegetation within proximity to the development will be retained. However, there are above and below ground constraints which will be required to be addressed.

5.2 Table 1 shows the effects of the proposal on the trees of the BS 5837 quality categorisation.

**Table 1. Summary of trees to be retained and removed.**

Tree Category	Trees to be retained	Trees to be removed
A	T1	-
B	T2, T3	-
C	T4	G5
U	-	-

5.3 The impact of the trees on the proposed development of the new structure can be seen to have above and below ground constraints. The trees require crown raising to accommodate the new structure will prevent any further need for tree pruning. The RPA of these trees will require protection throughout the demolition and development of the proposed structure. Where the RPA's and the hard surfacing crossover will be a CEZ where hand tools only will be permitted.



## 6.0 Tree Protection Requirements

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- 6.1 The following information sets out the primary consideration for determining the requirement for tree protective measures and with the assessment impact of the demolition and development. The trees highlighted for retention will be protected by Heras fencing which will rest upon a specialised temporary surface where the ground is permeable and an RPA, this will create a work area. The greatest threat to the green infrastructure is with soil contamination, compaction and spillages from building materials and soil compaction.

### Root Protection Areas

- 6.2 The BS5837:2012 RPA is calculated using the trees Diameter at Breast Height (DBH) at 1.5m and represents the minimum area around each tree that must be left undisturbed to ensure its longevity. Tree roots can be found twice the width of the crown and beyond depending on the tree species and its environment. Most tree roots are found in the top 600mm of soil and most fine roots that absorb water and nutrients are located at the top horizon of soil profile. These near surface tree roots allow the tree to breath and oxygenate. The tree roots can extend well beyond the recommend distances within BS5837:2012 and they may not follow the typical circular area centred from the trees stem.

There maybe the presence of tree roots beneath the existing concrete surface, additionally the installation of undergrounds supports for the timber framed American barn fall within this RPA. This is a CEZ and permits hand tools only for the excavation of the soil. The installation of the piling will require test holes to ascertain that no roots greatly than 25mm will be damaged. The application of a specialised non permeable membrane will prevent the leaching of cement into the RPA, this will be require to line the holes dug for its supports.

### Ground Contamination

- 6.3 Storage areas for liquids such as fuels, oil or paint should not be located within 10m of any tree due to the risk of soil contamination caused by accidental spillage. Particular care must be taken when working on or close to sloping ground to avoid unintentional runoff into the RPA of trees to be retained.

### Underground Utilities

- 6.4 Detailed drawing have been provided and therefore the position of tree roots can be gauged, however no information on the location of new services has been provided. Where the installation of services within the RPA of retained trees is unavoidable, appropriate methods will be required to ensure the safe long term longevity of the trees. This process will require additional consultation with a suitably qualified and experienced Arboricultural Consultant

### Ground Level Changes

- 6.5 Any changes to the landscape and its levels can have major implication on the longevity and health of a tree. It is essential the trees are allowed to have a breathable surface allowing for the continuous gaseous exchange of the trees root system.

- 6.6 The instalment of the cellular confinement system will require several lower tiers cut into the trees RPA, therefore a level surface can then be built. This excavation must not exceed 100mm deep and should be carried out with hand tools only. Additionally and shallow layer of hardcore maybe used to help create a multiple level layered system and again no greater than 100mm thick can be added. This change of surfacing will see the cellular confinement to rest on a level surface and allow for the continuous gaseous exchange of the trees roots.

#### **Drainage & Storm Water Run-off Issues**

- 6.7 Drainage and storm water run-off requires due consideration to prevent excessive and/or polluted run-off into the rooting area of trees to be retained.

#### **Soil Compaction**

- 6.8 It is imperative the surface of the soil be protected from compaction from plant machinery and/or machinery. This can create a capping effect on the surface which can stop the tree root from oxygenating and preventing any precipitation.

### **7.0 Recommendations**

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- 7.1 The trees located south of the proposed development provide a good level of screening and their retention is required for their continued visual amenity value. These trees do however have above and below ground constraints. Whilst the above constraints can easily be reduced by the removal of small branches, the below ground rooting areas require protection for the duration of the demolition and construction. The crossover between the construction and the trees RPA requires a well managed method statement which will see the careful excavation of the RPA's to ascertain that roots will not be damaged. These exposed root areas must then be protected with a specialised membrane preventing the contamination of the soil profile from building materials such as cement. The permeable surface between the existing building and the trees requires additional protection from soil compaction and contamination in the form of specially designed flooring solutions.
- 7.2 The mapping of the RPA's shown in *Drawing 2 - The Proposed Development, Tree Removal, Root Protection Areas and Protective Fencing* suggest that tree roots have the potential to be very close to the development. A work area is required around the proposed development which could crossover onto the tree RPA's, these roots require protection from building materials such as cement and from soil compaction from machinery. The installation of a temporary ground protection such as <https://www.ground-guards.co.uk/solutions/tree-root-protection/>, this will see the installation of the protective fencing on top of this temporary surface.
- 7.3 All tree work must adhere to BS3998 2010 Tree Work - Recommendations. This must be carried out by qualified, experienced and insured Arborists.

## 8.0 Tree Protection Plan

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- 8.1 Firstly the tree work as recommended in [Appendix A – Tree Schedule](#) would see the crown raising of T1, T2 and T3 with the removal of small branches only. The demolition of the existing concrete surface and the drystone wall within the RPA can only be carried out with hand tools. The RPA of the trees to be retained are to be measured up and marked out, these are CEZ and are no dig areas. The installation of the temporary surface should be laid out beyond the hard surface to create the work area required for the duration of the construction. This will then allow the fencing to rest upon a specially designed temporary surface creating a CEZ. The careful excavation for the piling is with hand tools, this should reveal minimal roots due to the previous hard standing surface. No roots greater than 25mm can be damaged in this process. The mapping and distances can be seen in [Drawing 2 - The Proposed Development, Tree Removal, Root Protection Areas and Protective Fencing](#).
- 8.2 Additional protection would be from building materials, specifically cement. This leaches through the soil profile potentially contaminating the growing medium for existing, future plantings and pollution of the waterways. The trees and hedges to be retained will require protection, this will require the storage of cement and other such pollutants off site and away from the water courses. If pesticides are to be used in the clearing of vegetation from the soil profile, then these must be species specific so as not to damage the trees and hedges to be retained. This may help to highlight the RPA's of the trees (Drip line) so that they maybe marked out prior to work the commencement of construction and machinery.
- 8.3 If pesticides are to be used in the clearing of vegetation from the soil profile, then these must be species specific so as not to damage the trees and hedges to be retained. This may help to highlight the RPA's of the trees (Drip line) so that they maybe marked out prior to the commencement of th construction and machinery work.

## 9.0 Tree Constraints

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- 9.1 All of the trees south of the proposed development have above and below ground constraints which need to be addressed with regards to preventing any direct damage through soil compaction, root severance or soil contamination. There is a 5.7m RPA around T1 pin oak, a 3.2m RPA around T2 beech and T3 birch, these have the greatest below ground constraints and are CEZ. Only hand tools can be used in these areas until adequate protection is in place.
- The RPA of T1, T2 and T3 have potential roots beneath the proposed development.
  - Protection from building materials leaching into the soil area all along the boundaries must be carried out prior to any demolition or construction.
- 9.2 The current site has ample room to house construction materials and could be used for storage. This is the greatest threat to the remaining trees and hedges through the leaching of building material such as cement. Normally a minimum of 10m distance from vegetation is required and will increase if on an upper surface such as this.
- 9.3 No underground services can pass through the RPA of any of the trees or hedges that are to be retained.

## 10.0 Arboricultural Method Statement (AMS)

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- 10.1 The AMS has been written as guidance on how the construction has to be carried out with regards to the protection of the green infrastructure. It is imperative that this is carried out correctly.

### **An overview of Sequence of Operations**

- 10.2 In overview, it is necessary to undertake the following sequence of operations in relation to arboricultural input for development operations.

1. Method Statement approved by the LPA.
2. Undertake tree works as recommended in *Appendix A - Tree Schedule*.
3. Instalment of the tree protection measures involving the specialised temporary surfacing and the Heras fencing.
4. Pre Commencement meeting confirming the fencing to specification.
5. Demolition and construction of the development.
6. Removal of tree protection.

### **Specific Sequence of Operations**

- 10.3 The following timeline table informs the key principles for development operations proceeding in relation to arboricultural requirements conditioned as part of this method statement. The action and timescales within this table must be adhered to in order to discharge the arboricultural method statement planning condition for this site.

The precise time and order of some of the development operations may need to be changed due to site specific operational requirements, yet any operations that may affect the trees on the site must be done so under arboricultural supervision by a suitably qualified and experience arboricultural consultant.

- 10.4 This should be read in conjunction with the Arboricultural Implications Assessment (AIS) and the Tree Protection Plan.

*Please refer to this link for guidance on any of the above;*  
<https://www.barrelltreecare.co.uk/resources/technical-guidance/>

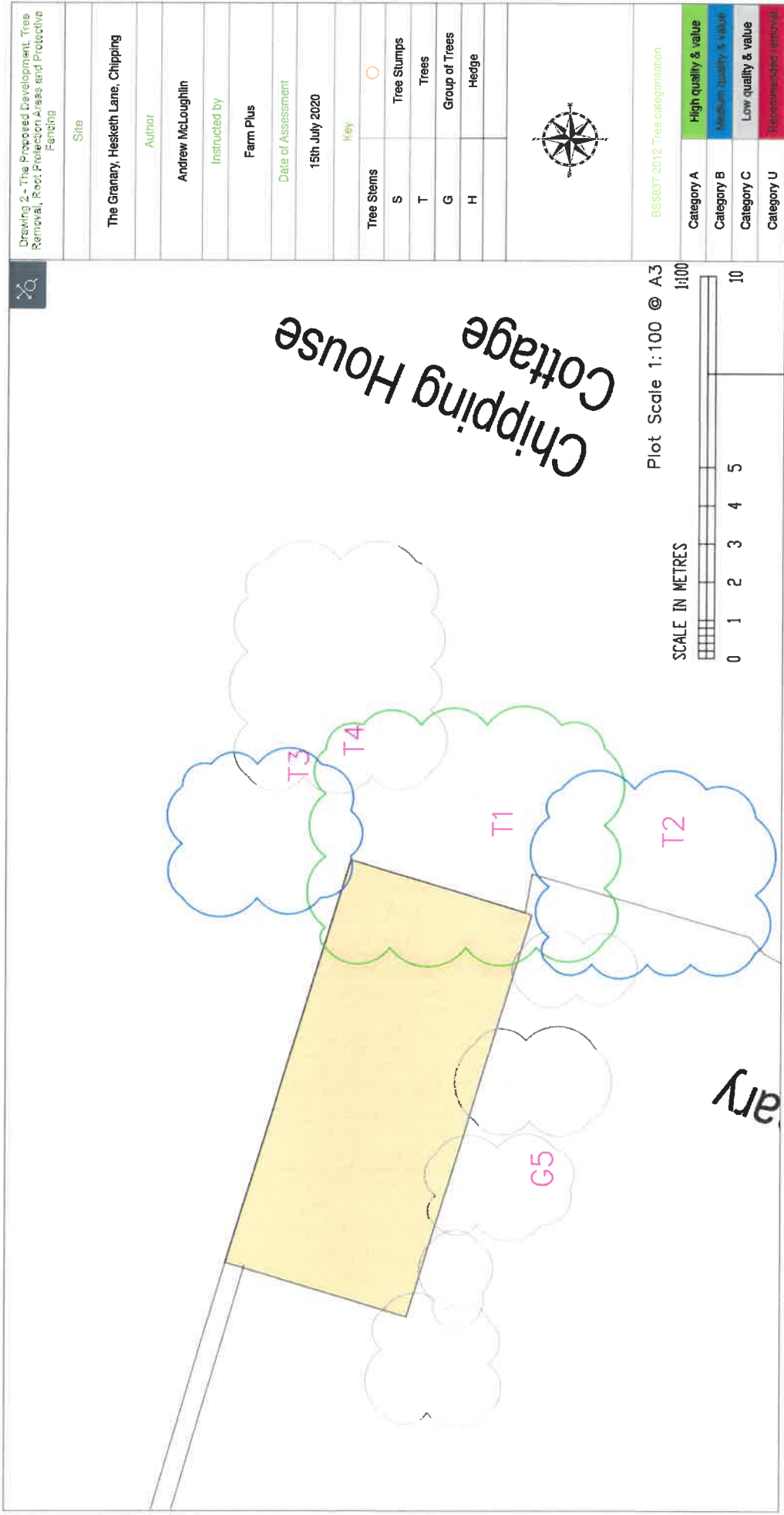
<b>Sequence of Operations</b>		
<b>Stages</b>	<b>Action</b>	<b>Arboricultural Input</b>
<b>1 Approval</b>	This AMS is submitted to and approved in writing by the LPA	If necessary, liaise with contractor and LPA to discuss methodologies detailed
<b>2 Tree Works</b>	The tree removal should be carried out as the first operation on site and in accordance with Appendix A - Tree Schedule	Review the tree work requirements with the tree contractor. If necessary liaise with the contractor on site during tree work
<b>3 Tree Protection</b>	Installing the tree protective measures will take place prior to any storage of plant, materials and machinery	If necessary, liaise with contractor installing the protective fencing and the specialised temporary surfacing until completed to the standard specified in Appendix E - Fencing
<b>4 Site Meeting</b>	Following installation of tree protective measures, the LPA shall be invited to inspect the fencing and discuss any other site operations that have implication for the trees	Meeting with the representative of the LPA and the site manager. Alternatively, contractor can confirm the fencing and tree works are as specified by taking photographs of the tree protection measures
<b>5 Construction</b>	Undertake the construction of the new development	If necessary liaise with the local authority and the site foreman to ensure any issues are adequately resolved
<b>6 Site Finishing</b>	Removal of the tree protection measures must only be undertaken when all site traffic and machinery has left the site	If acceptable to the LPA the contractor can take photos of the site to give to the LPA to gain approval for the removal of protective fencing

## 11.0 Caveats and Limitations

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- 11.1 This survey was carried out from ground level. No aerial inspection was undertaken and, as such, this report can only identify defects clearly visible from the ground. A VTA (Visual Tree Assessment) is a level two arboricultural tree survey. This normally involves a full 360 degree visual of the buttress, stem and crown of the tree. While every attempt has been made to provide a realistic and accurate assessment of the trees' condition at the time of inspection, it may have not been appropriate, or possible, to view all parts or all sides of every tree to fulfil the assessment criteria of a risk assessment.
- 11.2 No tree is entirely safe given the possibility that exceptionally strong winds could damage or uproot even a mechanically 'perfect' specimen. It is therefore usually accepted that hazards are only recognisable from distinct defects or from other failure-prone characteristics of the tree or the site.
- 11.3 Underground services were not confirmed around any of the trees surveyed. The potential influences of trees upon building or other structures resulting from the effects of trees upon shrinkable load-bearing soils or the effect of incremental root growth are specifically excluded from this report.
- 11.4 The report reflects the tree stock as found on the day surveyed. Change of ground levels, soil conditions, surrounding tree cover or land use, or any ground works within the root zone of any tree may invalidate the content of this report. No root zone excavation was undertaken.
- 11.5 Change of circumstance as a result of unusual weather conditions may invalidate the content of this report. It is recommended that trees should be reassessed after strong gale, 39 – 46 mph wind Beaufort scale 8.
- 11.6 The content of this report is valid for 12 months from the cover date. Any works recommended for beyond this time period are based on expectations rather than in response to currently identified defects. Trees should have their condition re-inspected by a qualified arboricultural consultant within three years of this report being written.

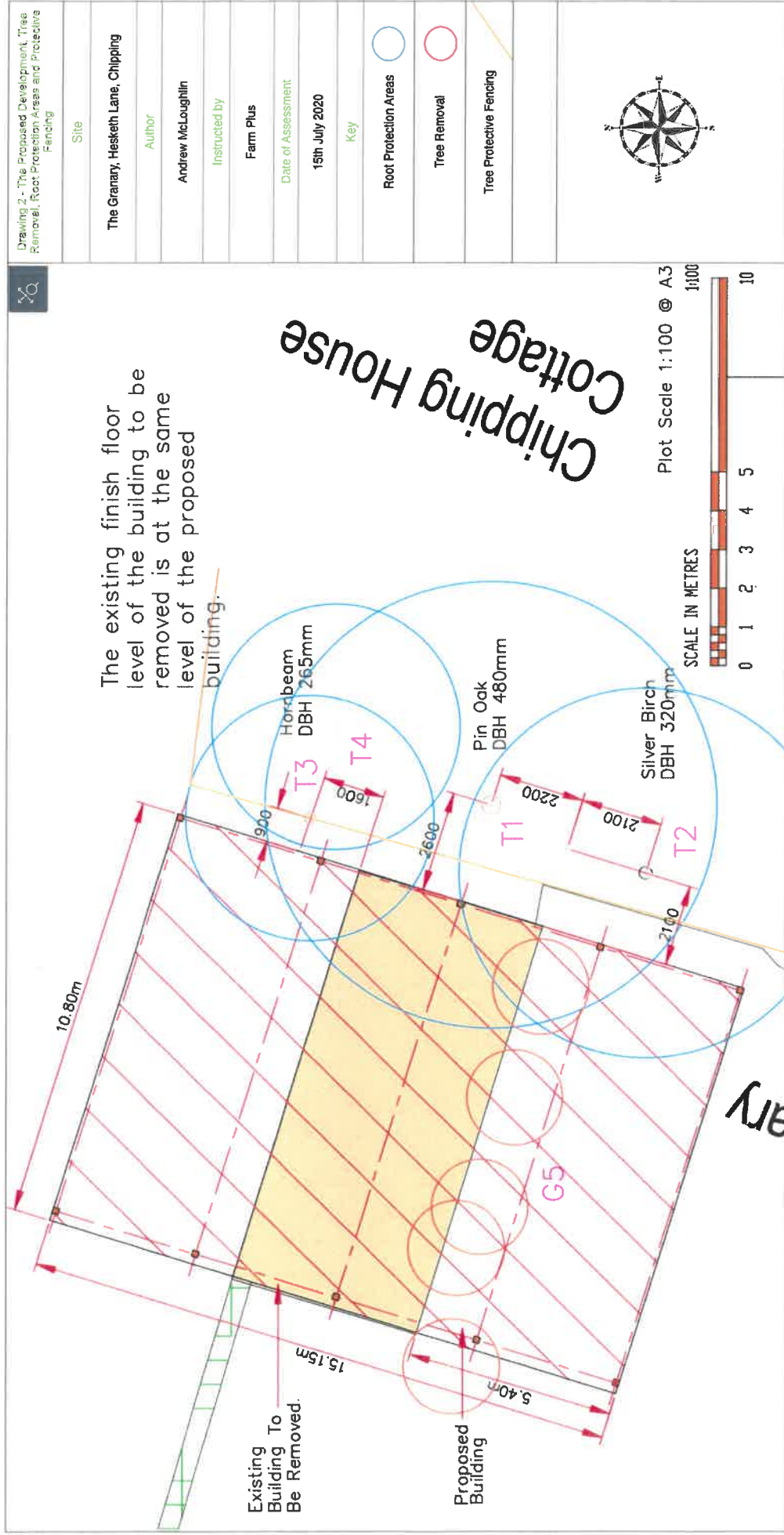
**Drawing 1 - Tree Numbering and Categorisation**







Drawing 2 - The Proposed Development, Tree Removal, Root Protection Areas and Protective Fencing





Appendix B - Tree Schedule

Tree number	Basic Information				BS5837 data				Basic				BS5837 data				
	Tree species	Age	DBH mm	Branch N E S W	Spread W	Height	Condition	Comments	Management recommendations	RPA m's	Life span	Catg ory	Sub cat	RPA DBH	RPA m2		
T1	Pin oak	Mature	480	4	3	2	3	9	Good	Good retention value, form and longevity, providing good screening of the proposed. Both above and below ground constraints	Crown raise over existing building removing only small branches no greater than 50mm. Hand tools only within the RPA and with heras fencing and a temporary ground protection	5.76	40	A	2	480	21.312
T2	Beech	Early maturity	265	2	2	2	3	4	Good	Crown raise over existing building removing only small branches no greater than 50mm. Hand tools only within the RPA and with heras fencing and a temporary ground protection	Crown raise over existing building removing only small branches no greater than 50mm. Hand tools only within the RPA and with heras fencing and a temporary ground protection	3.18	20	B	2	265	11.766
T3	Birch	Mature	265	2	2	2	2	8	Good	Crown raise over existing building removing only small branches no greater than 50mm. Hand tools only within the RPA and with heras fencing and a temporary ground protection	Crown raise over existing building removing only small branches no greater than 50mm. Hand tools only within the RPA and with heras fencing and a temporary ground protection	3.18	20	B	2	265	11.766
T4	Birch	Early	265	1	2	3	2	8	Fair	Suppressed by neighbouring trees	Protected by other trees from development	3.18	10	C	2	265	11.766
G5	Hawthorn, cherry, horse chestnut	Young	50	1	1	1	1	4	Fair	Planting made too close to the existing, these are restricting the proposed development	Low retention value, remove to accommodate development	0.6	5	C	2	50	2.22

Key; Green text Is High Quality and Value, Blue Is Medium, Grey Is Low and Red Is Remove, see Appendix D - for Tree Categorisation Chart, DBH Diameter at Breast Height. Life expect of 40 suggests 40 years plus





**NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

**Volume 4**

**NJUG GUIDELINES FOR THE PLANNING, INSTALLATION AND MAINTENANCE OF UTILITY APPARATUS IN PROXIMITY TO TREES**

**PLEASE ENSURE THAT YOU READ THE LEGAL NOTICE AND DISCLAIMER WHICH APPEARS IN APPENDIX B OF THIS PUBLICATION**

**Issue 2: 16<sup>th</sup> November 2007**

**NJUG has a vision for street works, this vision is simply:**

- **Safety is the number one priority**
- **Damage to underground assets is avoided**
- **Utilities work together and in partnership with local authorities to minimise disruption**
- **Utilities deliver consistent high quality**
- **Utilities maximise the use of sustainable methods and materials**
- **Street Works in the U.K. are regarded as world class**

**This document forms part of that vision.**

**Mark Ostheimer  
Director, Safety and Policy**



## NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

The following volumes constitute the NJUG Publications. They are living documents and may be amended from time to time. There is no attempt to describe any specific industry process as each utility has its own specifications and procedures. Not all the publications will necessarily be available at one time as individual volumes will be published when available.

<b>NJUG PUBLICATIONS</b>	
<i>Current</i>	<i>Previous</i>
<b>VOLUME 1</b>	
NJUG Guidelines on the Positioning and Colour Coding of Underground Utilities' Apparatus	NJUG 4 & 7
<b>VOLUME 2</b>	
NJUG Guidelines on the Positioning of Underground Utilities Apparatus for New Development Sites	NJUG 2, 5 & 6
<b>VOLUME 3</b>	
NJUG Guidelines on the Management of Third Party Cable Ducting	New
<b>VOLUME 4</b>	
NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees	NJUG 10
<b>VOLUME 5</b>	
NJUG Guidelines on Environmental Good Practice	New
<b>VOLUME 6</b>	
Legislation & Bibliography	NJUG 1

The following NJUG publications have not been reviewed and have been completely withdrawn:

- NJUG 3 – Cable Locating Devices
- NJUG 8 – Performance Guide for the Assessment of Metallic Pipe and Cable Locators
- NJUG 9 – Recommendations for the Exchange of Records of Apparatus between Utilities
- NJUG 11 – Proposed Data Exchange Format for Utility Map Data
- NJUG 12 – NJUG Specification for the Digitisation of Large Scale OS Maps
- NJUG 13 – Quality Control Procedure for Large Scale OS Maps Digitised to OS 1988
- NJUG 15 – NJUG/Ordnance Survey Service Level Agreement (Technical) for Digital Map Products and Services



## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

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**In this document the word ‘apparatus’ is used to describe both the distribution mains and also the lateral apparatus to properties. The words ‘plant’ or ‘services’ are also used to collectively describe this and other equipment.**





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## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

This volume supersedes NJUG 10 'Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees' and has been drafted by NJUG members and arboriculturists.

### **Background**

The statutory right of undertakers (utilities) to carry out works within the public highway in order to provide and maintain their apparatus dates from the mid - 19th century. There are no statutory obligations governing the position or depth at which apparatus should be laid within the highway. The following guidelines should therefore be adhered to wherever practicable.

The New Roads and Street Works Act 1991, as amended by the Transport Act 2000, the Traffic Management Act 2004, the Transport (Scotland) Act 2005 together with the Street Works (Northern Ireland) Order 1995, sets down the legislative requirements to be adopted during the installation, repair and maintenance of apparatus in roads and streets (see **Volume 6 – 'Legislation and Bibliography'**).

### **Scope**

(i) Trees (including shrubs and hedges) play an essential role in the environment and visual amenity of both rural and urban landscapes. They may take decades to grow, but can be destroyed in minutes. Wherever they are growing, whether in public footpaths, private gardens, rural verges or elsewhere, they require space for the adequate development of their root systems and to allow the branches to develop an attractive and natural shape.

(ii) Modern society expects a multiplicity of apparatus (electricity, gas, water, sewage, telecommunications and cable television) each of which requires an extensive distribution network, both above and below ground. These networks also need space, and they are frequently under tight constraints regarding their alignment.

(iii) The space available for both trees and apparatus is often very restricted, and they are frequently forced to share the available space, both above and below ground. Where they are in close proximity, there is the potential for either the tree or the apparatus to be subject to damage. To successfully co-exist precautions should be taken to minimise the risk of damage to both trees and apparatus based upon technical guidance obtained from this document and where appropriate further advice from local authority arboriculturists.



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## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

(iv) Legislative mechanisms for ensuring that existing trees (including shrubs and hedges) are safeguarded already exist (see sub-section 7 – 'Legislation'). References to legislation relate to the whole of the United Kingdom (UK) but variations between countries may occur. They seek to provide constructive advice on how to minimise damage to trees by undertakers (utilities) and to utility apparatus by trees and will be helpful to utility companies, contractors, arboriculturists, highway engineers, developers and planners. The guidelines have been prepared in collaboration between representatives of the utilities, the arboricultural and urban forestry professions and the Department for Communities and Local Government. As with all guidelines, their interpretation and application should be complimented at all times by common sense. However, expert guidance on specific instances should be sought from the appropriate utility, local authority or arboriculturist. The emphasis throughout this document is on the need for local liaison and communication.

(v) Certain trees are subject to Tree Preservation Orders (TPOs). Trees protected by a TPO must not be willfully damaged or destroyed and cannot be cut down, uprooted, topped or lopped without the local planning authority consent.

(vi) These guidelines are applicable to all apparatus (underground and overhead) and to trees in any location (public or private, rural or urban). They should be considered when new apparatus is planned to be constructed adjacent to existing trees, when new trees are to be planted adjacent to existing apparatus and where apparatus is to be maintained or repaired and trees are to be managed (e.g. pruning, removal or replacement).

(vii) Site surveys should be undertaken appropriate to the scale of the planned works. These surveys will identify the presence of trees which could impact on works. Advice should then be sought from a local authority tree officer. However, on major projects, a consultant arboriculturist may be employed to liaise with the local authority tree officer. Site surveys should be carried out according to the recommendations within BS 5837 (see sub-section 8 – 'Other Useful Publications').

(viii) The principles set out in these guidelines also have relevance in respect of work carried out to highways near trees (e.g. kerbing, footway reinstatement).



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## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

### **1. HOW TREES ARE DAMAGED**

Trees are complex living organisms, which are susceptible to damage from a wide range of physical agents or activities. Trees do not heal, damage caused to a tree will remain for the rest of its life. Even minor damage may set up circumstances leading to serious long term decay.

Contrary to popular belief, the root system of a tree is not a mirror image of the branches, nor is there usually a 'tap root'. The majority of the root system of any tree is in the surface 600mm of soil, extending radially in any direction for distances frequently in excess of the tree's height. Excavation or other works within this area are liable to damage the roots.

#### **1.1 The Root System**

The base of a trunk typically flares out in buttresses extending into the main lateral structural roots. These rapidly subdivide into the mass of smaller roots which serve to anchor the tree into the soil and transport water and nutrients. Even at a short distance (3m) from a large mature tree, most roots will be less than 10mm in diameter, but these may extend to well beyond the branch spread of the tree. A mass of fine roots, less than 1 mm in diameter, develop off all parts of this root system. These fine roots also absorb the water and nutrients, which are essential for the growth of the tree.





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The main structural roots (close to the trunk) develop as the tree grows in response to the need for physical stability. Beyond these major roots growth is influenced by the availability of water, air and nutrients in the soil. Disturbance of soil provides ideal conditions for root growth. Apparatus is often cooler than the surrounding soil encouraging moisture within the soil to condense on its surface stimulating root growth close to the apparatus. For all these reasons root growth is often most prolific within the backfilled trench and in the soil around the apparatus.

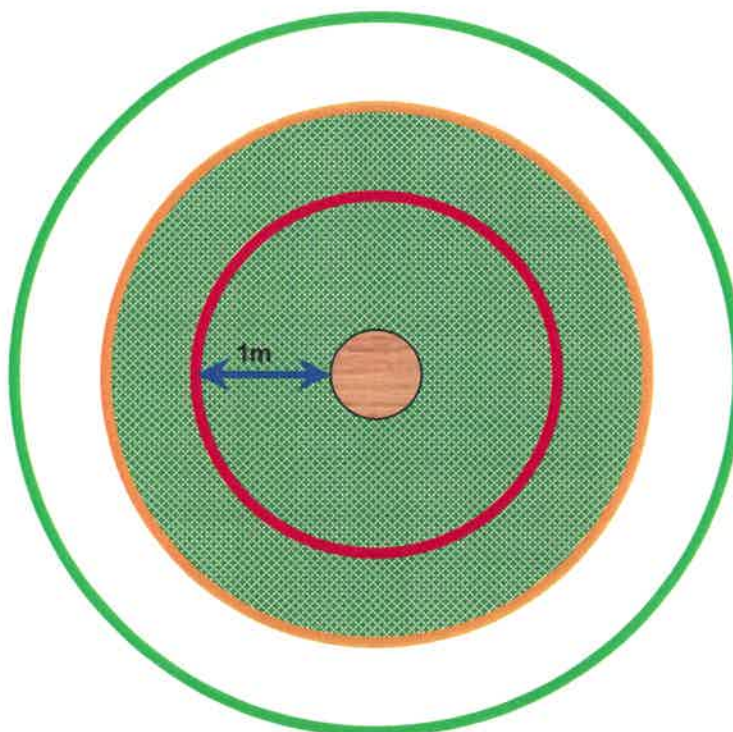
There are certain areas around trees, illustrated in Figure 1 – 'Tree Protection Zone', where excavation either must not be undertaken or only undertaken under strict conditions in order to avoid or minimise any damage to a tree's root system.






For the purposes of this guideline document they are called zones;

- the Prohibited Zone (1m from the trunk)
- the Precautionary Zone (4 x the tree circumference)
- the Permitted Zone (outside of the Precautionary Zone)

**NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

**FIGURE 1 – Tree Protection Zone**



- Key**
-  Trunk of tree
  -  Canopy or branch spread
  -  **PROHIBITED ZONE – 1m from trunk.** Excavations of any kind must not be undertaken within this zone unless full consultation with the local authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.
  -  **PRECAUTIONARY ZONE – 4 x tree circumference.** Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with the local authority Tree Officer if in any doubt.
  -  **PERMITTED ZONE – outside of the precautionary zone.** Excavation works may be undertaken within this zone, however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.



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### **1.2 Below Ground**

#### **1.2.1 Root systems can be damaged by;**

- the severance of a root, for example by trenching will destroy all parts of the root beyond that point. Even roots less than 10mm in diameter may be serving the fine roots over a wide area. The larger the root severed, the greater the impact on the tree.



**Typical root damage caused by excavation works**

- damage to the bark on the root. The bark protects the root from decay and is also essential for further root growth. It is loosely attached and easily damaged. If damage to the bark extends around the whole circumference the root beyond that point will be killed.
- damage to surface roots. Care must be taken when using mechanical plant. Materials and vehicles must never be stored within the Prohibited Zone and ideally should not be stored within the Precautionary Zone.

## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

- compaction of the soil. Incidental compaction may occur from storage of materials and / or the passing of heavy equipment over the roots. This can restrict or even prevent gaseous diffusion through the soil, and thereby asphyxiate the roots. The roots must have oxygen for survival, growth and effective functioning.



### **Poor site management within the Precautionary Zone**

- alterations in soil level. Lowering the level will strip out the mass of roots near the surface. Raising levels will have the same effect as soil compaction.
- the application of herbicide - frequently used to clear weed growth on operational land (e.g. substations). The wide-ranging root system of a tree may extend into the operational land and absorb herbicides, which have been applied to the ground. Herbicide absorbed in one part of the root system can kill the whole tree.

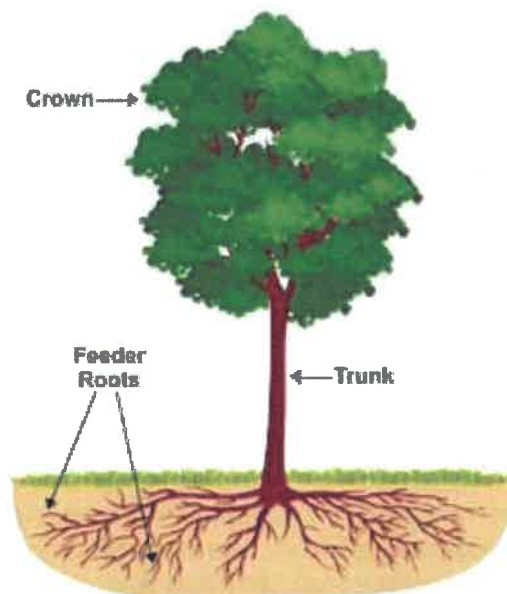
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*NOTE: The selection and application of herbicides must be undertaken by a competent person in accordance with Control of Substances Hazardous to Health (COSHH) regulations.*

- spillage of oils or other materials (e.g. diesel oil, cement, resins). Spillage can permeate into the soil and damage root systems (see sub-section 4.3 – ‘Chemical Damage to Trees’).

### 1.2.2 If roots are damaged;

- close to the trunk. The anchorage and stability of the tree may be adversely affected rendering the tree immediately hazardous.
- anywhere along their length. The distal portion including the fine roots they serve, will be destroyed. Damage to fine roots by severance of a main root, or by compaction or alteration of ground levels, will prevent fine roots from absorbing the water and nutrients which are essential for the well-being, growth and anchorage of the tree.
- by successive excavations. Multi-utility excavations close to a tree can cumulatively damage a root system.



**Figure 2 - Typical Tree Structure**



## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

### **1.2.3 Symptoms**

Trees with damage may not show any immediate symptoms. Such symptoms may range from minor branch dieback to deterioration and ultimate death and collapse of the tree dependent on the severity of damage and the ability of the roots to regenerate.

If a root of 25mm diameter or over is severed, as a precautionary measure, a local authority tree officer / arboricultural officer should be contacted immediately.

### **1.3 Above Ground**

Trees have a single or multi-stemmed trunk supporting a framework of branches and twigs. These structures are protected by a layer of bark, the purpose of which is to protect the functional tissues immediately beneath.

#### **Trees can be damaged by:**

- Direct impact by plant or machinery
- Fire and scorching.
- Poor pruning
- Abrasion by overhead apparatus
- Chemicals and fuel oils
- Storage of materials within the Prohibited and Precautionary Zones

#### **1.3.1 Abrasion**

The tree may be damaged by abrasion with overhead apparatus. Initially this only removes the outer bark. If the abrasion continues it can expose the underlying wood which may increase the risk of fire or eventual collapse of the branch or the tree.

If trees are growing in proximity to overhead apparatus it should be possible to prevent the development of problems by timely pruning and tree management. This requires knowledge of the growth pattern of the many different species of tree, consideration of the effects of the pruning on the appearance of the tree and application of the correct pruning techniques. All pruning should be in accordance with BS 3998 (see sub-section 8 – ‘Other Useful Publications’). All operatives should be authorised and competent.

For all works other than emergency or urgent works, notification and consultation with all interested parties is necessary before work commences (see section 5 – ‘How to Avoid Damage to Apparatus by Trees’).



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### **1.3.2 Permissions / Notifications**

Any work to trees adjacent to an area of operations that extends beyond what is absolutely necessary for operational requirements may require either written permission from the local planning authority (in respect to tree preservation orders) or six weeks' notification to the local planning authority (in respect to trees in conservation areas)(see also section 6 – 'Sites with Designated Status').

## **2. HOW APPARATUS IS DAMAGED**

The positioning and type of underground apparatus are detailed in NJUG publication **Volume 1 – 'NJUG Guidelines on the Positioning and Colour Coding of Underground Utilities' Apparatus**.

Construction methods and utility service materials are subject to change and any cluster of utility services is likely to consist of a variety of historic and modern materials constructed to various specifications. In general utility apparatus includes the following:

- Pipes
- Cables
- Ducts
- Chambers
- Poles/Towers/Masts/Satellite dishes
- Above ground installations

### **2.1 Below Ground**

Underground apparatus (especially those less than 600mm deep) may be affected by tree roots. The risk will depend on the ability of the apparatus, in particular any joints, to resist or tolerate distortion.

#### **2.1.1 Direct damage**

Direct damage is caused by the annual increase in root thickness resulting in eventual contact with apparatus. However, it is usually either the root or the adjacent soil that will distort rather than the apparatus itself. The potential for damage depends on how much the root thickens and is greatest in the main structural roots within 3 metres of the tree. Roots may grow around an apparatus to form a sheath but this will rarely exert sufficient pressure to cause any damage. Surface wrappings inadequately attached to an apparatus, if non-toxic, may be colonised by roots and eventually lifted off.



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### **2.1.2 Indirect damage**

Indirect damage is restricted to shrinkable soils, mainly clays but also peat and some silts. Such soils shrink as they dry with the potential to distort any apparatus supported by the soil. Vegetation growing within the same area of soil may increase the drying effect.

The degree of the shrinkability of the soil will affect the amount of movement caused by drying and thus the potential for damage to occur. In situations where apparatus passes from a shrinkable soil into a rigid structure there is the possibility of extreme distortion taking place. Regular seasonal movement can also cause damage even in the absence of roots, particularly with short segmented pipes (see sub-section 3.1.4 – ‘Shrinkable Soils’).

### **2.1.3 Root incursion**

Intact apparatus will not generally be penetrated by roots. However roots can exploit existing defects such as;

- defective pipe joints
- cracks in foul or surface water drains
- inadequate or degraded pointing of inspection chambers.

Where internal conditions are moist and aerated and therefore most conducive to root growth, root proliferation may occur and ultimately block the apparatus. If root thickening occurs where it passes into apparatus, root related enlargement of a defect may occur. This is unlikely at distances 3 metres or more from the trunk.

### **2.1.4 Trees and Wind Movement.**

The potential for damage to apparatus close to a tree may increase due to movement of the lower trunk and a structural root as the tree sways in strong winds. Such movement may result in direct pressure being applied to the apparatus. Furthermore, if a tree is uprooted, any apparatus passing across or through the disturbed root plate may also be displaced. Such events are unlikely and are restricted to situations where apparatus is in close proximity to the trunk of the tree, but the potential may be increased if other structural roots are severed. Encasing apparatus in lean mix or course concrete can exacerbate this problem as fine roots may penetrate the material providing a greater ‘hold’ on the apparatus unless an appropriate root barrier material is used to separate the apparatus from the root system.



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### **2.1.5 Mechanical Removal of Trees and Stumps**

The mechanical removal of tree stumps by grinding or grubbing may disturb or damage apparatus passing across or through the root plate of the tree. Using a mechanical digger to uproot a tree scheduled for removal is very likely to damage apparatus within and also close to the Prohibited or Precautionary Zones as the roots will apply pressure to the apparatus as they are uprooted.

### **2.2 Above Ground**

If overhead apparatus come into contact with trees they may be damaged as a result of:

- Abrasion when the tree and / or apparatus move in the wind bringing them into contact. The resultant abrasion can damage wires affecting their efficiency, strength and causing interference or loss of supply.
- The collapse of a branch or a whole tree which could bring down overhead lines.

## **3. PLANNING OF WORKS**

The inherently variable nature of trees, and also the generally low incidence of damage to underground apparatus, makes it neither practical nor justifiable to impose absolute limits on the proximity of trees to apparatus. Therefore site specific liaison and agreement between the asset owner and other interested parties is essential.

With respect to overhead apparatus there are minimum established clearances which must be maintained. Details of these clearances can be obtained from the utility network operator.

Before new trees are planted the advice of a local authority tree officer or arboriculturist should be obtained.

### **3.1 Special Considerations when Planning the Installation of Underground Apparatus**

#### **3.1.1 New / Renewal of Apparatus - New Trees**

In considering the location of new or renewed apparatus in conjunction with a new tree planting scheme early consultation is essential between the relevant



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professional organizations e.g. local authorities, utility companies, developers and landowners

### **3.1.2 New / Renewal of Apparatus - Existing Trees**

When planning the installation or renewal of apparatus the position of existing trees should be considered as one of the primary factors which could affect the siting, depth, method of installation and future maintenance of that apparatus.

Consultation with the relevant interested parties will identify any conflict and consideration should be given to apparatus diversion or felling and re-planting. This decision should be influenced by the value of the tree and the extent of the additional diversionary works.

### **3.1.3 Existing Apparatus - New Trees**

Early consultation with utilities should take place before any tree work, including planting, is undertaken to ascertain the position of existing apparatus. Records of underground apparatus should be obtained from utilities and used in conjunction with on site apparatus detection techniques. The guidance contained within Health and Safety Executive guidance note HSG47 – 'Avoiding Danger from Underground Services' should be followed when excavating. In addition, when planning new tree planting, there should be liaison with the utilities, local authority and landowner so that the risks trees may pose to utility apparatus in the future are minimised.

### **3.1.4 Shrinkable Soils**

Apparatus laid in clay or peat should be constructed to tolerate movements of the subsoil caused by root activity. Special precautions for differential movement should be incorporated where apparatus joins rigid structures founded at a different depth to the apparatus (e.g. pipe connections to chambers). See sub-section 2.1.2 'Indirect Damage'.

## **3.2 Precautions when Repairing Existing Apparatus**

Where apparatus requires repair the location of the excavation is often defined by the location of the fault. The nature of the work usually requires open excavation. Excavation within the Prohibited and Precautionary Zones should be in accordance with sub-section 4.1 'Below Ground' except for emergency or urgent works.

Where emergency or urgent works may have caused damage to roots with a diameter in excess of 25mm, interested parties should be informed immediately. They may choose to consult a local authority tree officer or arboriculturist regarding whether remedial treatment to the tree is necessary.



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If roots have grown into a drain or duct and proliferated so as to cause a blockage, the removal of the root mass from within the drain or duct will only provide temporary relief. If the root, which originally penetrated the drain, is still present it will regenerate and recreate the same problem. Roots of other plants may have a similar effect. Permanent relief can only be obtained by the proper repair of the original defect e.g. by replacement or refurbishment.

Utility apparatus may be refurbished by the use of pre-fabricated, slip lined or cured-in-place lining systems or pipes. Pre-fabricated and slip lined systems and pipes are generally resistant to root growth / intrusion, but cured-in-place linings may deform and ultimately collapse from the incursion of root growth. Following pre-survey (e.g. CCTV), it is essential that any roots are removed from the bore of the apparatus as far as practicable prior to lining, by the use of proprietary root removal systems (e.g. high-pressure water, flails, or rotating blade cutters).

### **3.3 Special Considerations when Planning the Installation of Above Ground Apparatus**

The aerial parts of a tree are constantly growing larger and are prone to bend and flex in windy conditions. As a result parts of a tree may come close to or into contact with above ground apparatus.

#### **3.3.1 Electricity**

The overhead apparatus belonging to the electricity supply industry is subject to minimum clearances from adjacent trees and other structures. This is to ensure the safety of the public and protect against flashover and loss of supply. Local conditions may require an increase in the clearances specified in current electricity industry standards.

Part IV of The Electricity Supply Regulations covers the construction of power lines above ground. Schedule 4(9) of the Electricity Act 1989 enables electricity companies to require the felling or lopping of trees which obstruct or interfere with the working of their lines or constitute an unacceptable source of danger.

In addition to the above reference should be made to the Energy Networks Association (ENA) document Engineering Recommendation G55/1- Safe Tree Working in Proximity to Overhead Electric Lines (see section 8).

#### **3.3.2 Communications**

Communication operators run their systems under the Telecommunications Act 1984 (as amended by the Communications Act 2003) in accordance with The



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Telecommunications Code (Schedule 2). Paragraph 19 of the Telecommunications Code enables operators to require the lopping of trees which overhang the street and obstruct or interfere with the working of their lines.

### **4. HOW TO AVOID DAMAGE TO TREES**

This section gives general guidance on methods of work to minimise damage to trees. The local authority (or for privately owned trees, the owner or their agent), should be consulted at an early stage prior to the commencement of any works. This will reduce the potential for future conflict between trees and apparatus.

#### **4.1 Below Ground**

Wherever trees are present, precautions should be taken to minimise damage to their root systems. As the shape of the root system is unpredictable, there should be control and supervision of any works, particularly if this involves excavating through the surface 600mm, where the majority of roots develop.

##### **4.1.1 Fine Roots**

Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them e.g. frost and extremes of heat. It is therefore important to protect exposed roots where a trench is to be left open overnight where there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled.

##### **4.1.2 Precautions**

The precautions referred to in this section are applicable to any excavations or other works occurring within the Prohibited or Precautionary Zones as illustrated in Figure 1 – 'Tree Protection Zone'.

##### **4.1.3 Realignment**

Whenever possible apparatus should always be diverted or re-aligned outside the Prohibited or Precautionary Zones. Under no circumstances can machinery be used to excavate open trenches within the Prohibited Zone.



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The appropriate method of working within the Precautionary Zone should be determined in consultation with the local authority (or for privately owned trees the owner or their agent) and may depend on the following circumstances;

- the scope of the works (e.g. one-off repair or part of an extensive operation)
- degree of urgency (e.g. for restoration of supplies)
- knowledge of location of other apparatus
- soil conditions
- age, condition, quality and life expectancy of the tree

Where works are required for the laying or maintenance of any apparatus within the Prohibited or Precautionary Zones there are various techniques available to minimise damage.

Acceptable techniques in order of preference are;

### **a ) Trenchless**

Wherever possible trenchless techniques should be used. The launch and reception pits should be located outside the Prohibited or Precautionary Zones. In order to avoid damage to roots by percussive boring techniques it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the equipment with materials other than water (e.g. oil, bentonite, etc.) must not be used when working within the Prohibited Zone. Lubricating materials other than water may be used within the Precautionary Zone following consultation and by agreement.

### **b) Broken Trench - Hand-dug**

This technique combines hand dug trench sections with trenchless techniques if excavation is unavoidable. Excavation should be limited to where there is clear access around and below the roots. The trench is excavated by hand with precautions taken as for continuous trenching as in (c) below. Open sections of the trench should only be long enough to allow access for linking to the next section. The length of sections will be determined by local conditions, especially soil texture and cohesiveness, as well as the practical needs for access. In all cases the open sections should be kept as short as possible and outside of the Prohibited Zone.



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### **c) Continuous Trench - Hand-dug**

The use of this method must be considered only as a last resort if works are to be undertaken by agreement within the Prohibited Zone. The objective being to retain as many undamaged roots as possible.

Hand digging within the Prohibited or Precautionary zones must be undertaken with great care requiring closer supervision than normal operations.

After careful removal of the hard surface material digging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Throughout the excavation works great care should be taken to protect the bark around the roots.

All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed without first consulting the owner of the tree or the local authority tree officer / arboriculturist. If after consultation severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound.

### **4.1.5 Backfilling**

- Any reinstatement of street works in the United Kingdom must comply with the relevant national legislation (see: **Volume 6 – ‘Legislation and Bibliography’**). In England this relates to the requirements of the code of practice – ‘Specification for the Reinstatement of Openings in Highways’ approved under the New Roads and Street Works Act 1991. Without prejudice to the requirements relating to the specification of materials and the standards of workmanship, backfilling should be carefully carried out to avoid direct damage to roots and excessive compaction of the soil around them.
- The backfill should, where possible, include the placement of an inert granular material mixed with top soil or sharp sand (not builder's sand) around the roots. This should allow the soil to be compacted for resurfacing without damage to the roots securing a local aerated zone enabling the root to survive in the longer term.
- Backfilling outside the constructed highway limits should be carried out using the excavated soil. This should not be compacted but lightly “tamped” and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.



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### **4.1.6 Additional Precautions near Trees**

- Movement of heavy mechanical plant (excavators etc.) must not be undertaken within the Prohibited Zone and should be avoided within the Precautionary Zone, except on existing hard surfaces, in order to prevent unnecessary compaction of the soil. This is particularly important on soils with a high proportion of clay. Spoil or material must not be stored within the Prohibited Zone and should be avoided within the Precautionary Zone.
- Where it is absolutely necessary to use mechanical plant within the Precautionary Zone care should be taken to avoid impact damage to the trunk and branches. A tree must not be used as an end-stop for paving slabs or other materials nor for security chaining of mechanical plant. If the trunk or branches of a tree are damaged in any way advice should be sought from the local authority tree officer / arboriculturist.

See TABLE 1 –‘Prevention of Damage to Trees Below Ground’ below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

## NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

**TABLE 1 - Prevention of Damage to Trees Below Ground**

Causes of Damage	Type of Damage	Implications to Tree	Precautions
Trenching, mechanical digging etc.	Root severance	<ul style="list-style-type: none"> <li>The tree may fall over</li> <li>Death of the root beyond the point of damage</li> <li>Potential risk of infection of the tree</li> </ul> <p>The larger the root the greater the impact on the tree.</p>	Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm in diameter use a sharp tool and make a clean cut leaving as small a wound as possible.
Trenching, mechanical digging, top soil surface removal etc.	Root bark damage	<ul style="list-style-type: none"> <li>The tree may fall over</li> <li>If the damage circles the root it will cause the death of the root beyond that point</li> <li>Potential risk of infection of the tree</li> </ul> <p>The larger the root the greater the impact on the tree.</p>	Do not use mechanical machinery to strip the top soil within the Precautionary Zone. Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm use a sharp tool and make a clean cut leaving as small a wound as possible.
Vehicle movement and plant use. Material storage within the precautionary area.	Soil compaction & water saturation	Restricts or prevents passage of gaseous diffusion through soil, the roots are asphyxiated and killed affecting the whole tree.	Prevent all vehicle movement, plant use or material storage within the Precautionary Zone.
Top-soil scouring, excavation or banking up.	Alterations in soil level causing compaction or exposure of roots.	Lowering levels strips out the mass of roots over a wide area. Raising soil levels asphyxiates roots and has the same effect as soil compaction.	Avoid altering or disturbing soil levels within the Precautionary Zone.
Use of herbicides.	Poisoning of the tree via root absorption	<ul style="list-style-type: none"> <li>Death of the whole tree</li> <li>Death of individual branches</li> </ul> <p>Damage to leaves and shoots.</p>	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.
Spillage of oils or other materials.	Contamination of soil	Toxic and asphyxiation effects of chemicals, oils, building materials (cement, plaster, additives etc.) on the root system can kill the tree.	Never store oils, chemicals or building materials within the Precautionary Zone or within the branch spread of a tree, which ever is the greater.
Placement or replacement of underground apparatus.	Various	Death of all or part of the tree.	Effective planning and liaison with local authority tree officer, taking into consideration the position of trees, and their future growth potential and management



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## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

### **4.2 Above Ground**

#### **4.2.1 Damage by Pruning**

Trees (including shrubs and hedges) can be damaged by inappropriate or excessive pruning. Reference should be made to the Energy Networks Association (ENA) document "Engineering Technical Report 136 Vegetation Management near Electricity Equipment – Principles of Good Practice" (see section 8 – 'Other Useful Publications') or appropriate company specific documentation for guidance on pruning.

See TABLE 2 – 'Prevention of Damage to Trees Above Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.



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## NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

**TABLE 2 - Prevention of Damage to Trees Above Ground**

<b>Causes of Damage</b>	<b>Type of Damage</b>	<b>Implications for the Tree</b>	<b>Precautions</b>
<p>Impact by vehicle or plant</p> <p>Physical attachment of signs or hoardings to the trunk</p> <p>Storage of materials at base of tree</p> <p>Rubbing by winch or pulling cables</p>	<p>Bark bruising, bark removal, damage to the wood, damage to buttress roots, abrasion to trunk</p>	<p>Wounding with the potential for infection ultimately resulting in death of all or part of the tree.</p> <p>Structural failure of the tree</p>	<p>Surround the trunk with protective free-standing barrier. Exclude vehicles, plant or material storage from the Precautionary Zone. Ensure sufficient clearance of cables or ropes.</p>
<p>Impact by vehicle or plant</p> <p>Rubbing by overhead cables</p>	<p>Bark damage to branches, breakage and splitting of branches, abrasion to branches</p>	<p>Structural failure of the branch.</p> <p>Wounding or loss of a branch with the potential for infection ultimately resulting in death of all or part of the branch or tree.</p>	<p>Exclude vehicles, plant or material storage from the Precautionary Zone. Ensure sufficient clearance of cables or ropes.</p> <p>All pruning should be carried out in accordance with BS3998 (<i>prune affected branches to give appropriate clearance from cables</i>)</p>
<p>Inappropriate siting of overhead apparatus, such as CCTV, lighting fixtures and communications masts and dishes.</p>	<p>Inappropriate pruning, unnecessary tree removal</p>	<p>Severely pruning tree to acquire line of sight signal for communications dish etc.</p>	<p>Effective planning and liaison with local authority tree officer / arboriculturist, taking into consideration the position of trees, and their future growth potential and management.</p>
<p>Lack of forethought in design and location of apparatus and services entries on new developments</p>	<p>Complete tree removal</p>	<p>The tree is removed unnecessarily</p>	<p>Agree the location and installation of services at the design stage. Consideration should be given to the creation of dedicated service routes wherever possible.</p>
<p>Use of herbicides</p>	<p>Poisoning of the tree via absorption through bark, leaves and shoots</p>	<p>Death of the whole tree, death of individual branches, damage to leaves and shoots</p>	<p>The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.</p>



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## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

### **4.3 Chemical Damage to Trees**

Chemical damage to trees adjacent to utility premises and operational land can be avoided if;

- the risk is identified when planning any work involving herbicides or other chemicals ensuring that only appropriate chemicals are used. Particular care should be exercised when considering the use of herbicides recommended for “non crop areas” as many of these also specify “do not use where there may be roots of desirable plants”,
- herbicides are applied only at the rate and in the manner recommended by the manufacturer,
- follow-up applications are not undertaken until weeds reappear on the operational land,
- alternative methods of weed control are considered.

## **5. HOW TO AVOID DAMAGE TO APPARATUS BY TREES**

### **5.1 Consultation with Utilities**

The potential for future conflict between trees and above-ground apparatus can be reduced by appropriate planning. Early consultation with utilities should therefore take place before any tree work including planting is undertaken to ascertain the position of existing apparatus. Records of underground apparatus should be obtained from utilities and used in conjunction with on site apparatus detection techniques. Specific care must be taken when removing the stumps of existing trees. In addition when planning new tree planting there should be liaison with the utilities, local authority and landowner so that the risks trees may pose in the future are minimised.

### **5.2 Precautions during Planting**

Every possible precaution should be taken to ensure that the existing apparatus is not damaged during excavation works. Health and Safety Executive guidance note HSG47 – ‘Avoiding Danger from Underground Services’ and any specific guidance issued by the apparatus owner should be followed at all stages of the work.



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### **5.2.1 Below Ground**

Before any excavation work begins, trial holes should be undertaken to validate the results of any detection surveys undertaken to confirm the actual position and depth of the apparatus.

### **5.2.2 Above Ground**

Consideration should be given to the presence of satellite dishes and masts on commercial properties, poles and drop wires, as future tree growth may cause operational problems.

Reference should also be made to Energy Networks Association (ENA) document 'Engineering Technical Report 136 Vegetation Management near Electricity Equipment – Principles of Good Practice' (see section 8 – 'Other Useful Publications') or appropriate company specific documentation.

*NOTE: In all cases where definitive clearances are required, contact must be made with the appropriate electricity or communication company who will determine the clearance to be adopted.*

See also sub-section 3.3 – 'Special Considerations when Planning the Installation of Above Ground Apparatus'.

## **6. SITES WITH DESIGNATED STATUS**

Certain sites may be specifically designated and will require consultation and / or permission from the relevant authority prior to undertaking any works. These sites include:

- Sites of Special Scientific Interest
- English Heritage Sites
- English Nature / Natural England
- National Trust Land
- Nature Reserves
- Conservation Areas
- Scottish Natural Heritage
- Areas of Outstanding Natural Beauty
- Countryside Council for Wales
- Historic Scotland
- Northern Ireland Environment and Heritage Service
- Cadw (Welsh Historic Monuments)



## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

### **6.1 Tree Preservation Orders and Trees in Conservation Areas**

Section 198 of the Town and Country Planning Act 1990 (the Act) gives local planning authorities powers to make trees and woodlands the subject of tree preservation orders (TPOs) in the interests of amenity. Trees protected by a TPO may not be willfully damaged or destroyed and cannot be cut down, uprooted, topped or lopped without the local planning authority's consent.

Additionally, under section 211 of the Act, anyone proposing to cut down, uproot, top, lop etc. a tree in a conservation area is required to give the local planning authority six weeks' notice before doing so. This gives the authority an opportunity of making a TPO in respect of the tree.

Certain statutory obligations imposed by Acts of Parliament may allow for the limited felling, topping or lopping of trees protected by a TPO in order to supply and maintain service. This does not preclude the requirement to consult with the owner.

See also: **Volume 5 – 'NJUG Guidelines on Environmental Good Practice'**

## **7. LEGISLATION**

Reference should also be made to **Volume 6 – 'Legislation & Bibliography'**.

### **7.1 Primary Legislation**

National Parks and Access to the Countryside Act 1949\*  
Health and Safety at Work Act 1974  
Highways Act 1980\*\*  
Telecommunications Act 1984  
Gas Act 1986  
Electricity Act 1989  
Town and Country Planning Act 1990 (Section 198 Tree Preservation Orders).  
Water Industry Act 1991  
The New Roads and Street Works Act 1991 (NRSWA)  
The Streets Works (Northern Ireland) Order 1995  
Communications Act 2003  
Traffic Management Act 2004  
Transport (Scotland) Act 2005  
The Streets Works (Northern Ireland) (Amendment) Order 2007

\* Under the National Parks and Access to the Countryside Act 1949 local authorities are given a general power to plant trees.





## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

\*\* Under the Highways Act 1980 highway authorities may plant trees in the highway, or license others to do so. They need to ensure that trees do not overhang or cause a danger to roads or footpaths, and are given powers to prevent this from happening.

The above list is not exhaustive.

### **7.2 Secondary Legislation**

Each Act of parliament in 7.1 will have various associated regulations that should be referred to.

### **8. OTHER USEFUL PUBLICATIONS**

This is not an exhaustive list of available publications and is only valid at the time of issue.

#### **BS 3998 Recommendations for Tree Work**

- Provides general recommendations for tree surgery and other tree work.

#### **BS 5837 Trees in Relation to Construction**

- Gives advice on the integration of new development amongst trees.

#### **Codes of Practice approved under the New Roads and Street Works Act 1991**

- Co-ordination of Street Works and Works for Road Purposes and Related Matters
- Specification for the Reinstatement of Openings in Highways
- Safety at Street Works and Road Works
- Measures Necessary where Apparatus is Affected by Major Works (Diversionary Works)
- Inspections

#### **Energy Networks Association publications:**

- Engineering Technical Report 136 'Vegetation Management Near Electricity Equipment – Principles of Good Practice'
- Engineering Recommendation G55/1 – 'Safe Tree Working in Proximity to Overhead Electric Lines'
- ENA-TS 40-80 – ENA Technical Standard for Overhead Line Clearances
- Engineering Recommendation G70 – Vegetation Control near Overhead Lines



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- ETR 132 – Improving Network Performance (under abnormal weather conditions by the use of a risk based approach to vegetation management near electric overhead lines)
- MNT/004 – UK Distribution Policy for the Inspection and Maintenance of Overhead Lines

HSE Arboriculture and Forestry Advisory Group publications

- AFAG 804 Electricity at work: Forestry and arboriculture
- AFAG 404 Electrical utility arboriculture

Manual for Streets (supercedes Design Bulletin 32 and Places, Streets and Movement)

- The Department for Transport and the Department for Communities and Local Government (DCLG), with support from the Commission for Architecture and the Built Environment (CABE), commissioned WSP , TRL , Llewellyn Davies Yeang and Phil Jones Associates to develop a Manual for Streets to give guidance to a range of practitioners on effective street design.

National House Building Council (NHBC) Standards Chapter 4.2. Building near trees

- Gives information on the design of new foundations in proximity to trees on shrinkable clay soils.

## **9. OTHER REFERENCES**

### **9.1 Arboricultural**

Arboricultural advice may be sought from the:

- Arboricultural Advisory and Information Service
- Arboricultural Association
- Arboriculture and Forestry Advisory Group
- International Society of Arboriculture
- Local authority Arboricultural Officer
- The Tree Advice Trust

### **9.2. Herbicides**

Information on herbicides and their application may be obtained from the:

- British Agrochemicals Association

### **9.3 Utilities**

Utility advice may be sought from the local utility contact or NJUG.



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## NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

### GLOSSARY

<b>Apparatus</b>	Equipment such as valves, stopcocks, chambers, cabinets, transformer chambers etc and includes any structure for the lodging of apparatus.
<b>Arboriculturist</b>	A professional who cultivates and manages trees, hedgerows and shrubs and provides information and advice on specific tree related issues.
<b>Carriageway</b>	A way constituting or comprised in a highway, being a way (other than a cycle track) over which the public have a right of way for the passage of vehicles.
<b>Cycle track</b>	A way constituting or comprised in a highway over which the public have a right of way on pedal cycles with or without a right of way on foot.
<b>Desiccation</b>	The state of extreme dryness, the drying out of roots.
<b>Distal</b>	Situated farthest from the centre.
<b>Drop wires</b>	Overhead wire from telegraph pole to customer premises.
<b>Duct / ducting</b>	Structure (usually cylindrical) used to convey and protect apparatus.
<b>Fibre optic</b>	The use of very thin glass or plastic fibres through which light can be transmitted to carry information from a source to a receiver, especially for telecommunication, television and information technology systems.
<b>Footpath</b>	A highway over which the public have a right of way on foot only, not being a footway.
<b>Footway</b>	A way comprised in a highway which also comprises a carriageway, being a way over which the public have a right of way on foot only.
<b>GRP</b>	Glass Reinforced Plastic
<b>Herbicide</b>	A chemical that destroys plants.
<b>Main</b>	Structure (usually cylindrical) used to convey water or gas or oil generally greater than 50mm in diameter.
<b>NJUG</b>	National Joint Utilities Group Limited.
<b>Pipe</b>	Longitudinal structure (usually cylindrical) used to convey water, gas or oil.
<b>Root plate</b>	Formed just below the soil surface when shallow lateral growing roots predominate over the development of a deep taproot.



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<b>Service strip</b>	A strip of designated land alongside a carriageway or footway used to convey services.
<b>Sub-duct</b>	Longitudinal structure (usually cylindrical) laid inside ducts used to carry smaller diameter cables such as fibre optic.
<b>Tiles</b>	Impact resistant cover constructed of earthenware, concrete or polyethylene for protecting underground cables
<b>Utility</b>	An undertaker by statute that has a legal right to provide customer services (e.g. communications, electricity, gas, water)
<b>Verge</b>	A strip of land which may form part of the public highway alongside a carriageway or footway, which may contain services.



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### **APPENDIX A**

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## Appendix C - Glossary

Abbreviation	Term	Explanation
DBH	Diameter at Breast Height	The diameter of the tree trunk in question, 'breast height' is taken to be 1.3 metres above ground level. Multi-stem trees have their stems measured separately and indicated as so in the tree schedule. Trees with abnormal growths, branch unions or other obstructions at 1.3 m will have their measurements taken immediately below said obstructions.
RPA	Root Protection Area	The area in metres squared of the potential underground rooting constraints
AMS	Arboricultural Method Statement	This dictates the procedure for works to be carried out around the protected trees
RPA	Root Protection Area	Circular area surrounding tree with a radius based on the DBH of the tree, as calculated in BS 5837:2012. RPA Radius = 12 x DBH
AIA	Arboricultural Impact Assessment	What will the impact be on the trees with the proposed development
VTA	Visual Tree Assessment	A system of tree inspection devised by Claus Mattheck using visual signs to read the body language of trees & aid with the diagnosis of potential defects.
TPP	Tree Protection Plan	This describes the process on how the work is to be carried out around the trees
BS5837 2012	British Standards	British Standard 5837:2012 <i>Trees in relation to design, demolition &amp; construction - Recommendations.</i>
	Codominant stem	Two stems on a tree which can suggest a weakened union
	V union with bark inclusion	Usually with a codominant stem, as above but with up to an additional 42% weak union
Y	Young	Tree which has not yet established a significant rooting structure in the ground & has not developed a significant branching structure - its form is largely 'whip' like in nature & it could normally be easily transplanted or replaced.
EM	Early Mature	Tree which has established a significant rooting structure & has developed a noticeable internal scaffold structure, it differs from a mature version of its species only in size but not in relative proportions of its structure. Trees in this age class will still be developing significantly in height & spread.
M	Mature	Tree which has established a significant root-plate & which is over 50% of the way through its usual life expectancy. Trees in this age class will still be developing significantly in spread but less significantly in height.
OM	Over Mature	Tree which has fully established & will no longer be able to continue increasing in size due to its age, it may be showing signs of decline such as localised dieback but does not need to do so by definition. However it should be expected that signs of structural deterioration will soon become apparent.
Notable	Notable	A tree is usually very large but might not qualify as ancient or veteran. Mature and often magnificent, standing out locally.
Veteran	Veteran	Tree which is showing veteran tree characteristics such as very significant crown retrenchment, extensive internal cavitation & possess significant cultural, ecological &/or historical value. Size is a common indicator of these characteristics but is not an essential requirement, for example, ancient coppices may possess veteran tree characteristics but may have a stunted form. Age is a stronger indicator but again not essential as veteran characteristics can be encouraged in younger trees.
Ancient	Ancient	A tree that represents a small percentage of a population in the upper age range. To be remarkably old for its species and this can vary dramatically depending on species.
Retrenchment	Retrenchment	Retrenchment: progressive reduction in the size of the crown of an old tree, by means of the dieback or breakage of twigs and small branches, accompanied by the enhanced development of the lower or inner parts of the crown.





## Appendix D: BS 5837:2012 Cascade Chart for Tree Quality Assessment

		ID on plan
<b>Table 1 Cascade chart for tree quality assessment</b>		
<b>Category and definition</b>	<b>Criteria (including subcategories where appropriate)</b>	
<b>Trees unsuitable for retention (see Note)</b>		
<p><b>Category U</b></p> <p>Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.</p>	<ul style="list-style-type: none"> <li>- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other U category trees i.e. where, for whatever reasons, the loss of companion shelter cannot be mitigated by pruning)</li> <li>- Trees that are dead or are showing signs of significant, immediate and irreversible overall decline</li> <li>- Trees infected with pathogens or significance to health and/or safety of other trees nearby (e.g. Dutch elm disease, or very low quality trees suppressing adjacent trees of better quality)</li> </ul> <p style="text-align: center;"><i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve: see 4.5.7.</i></p>	<b>RED</b>
<b>Trees to be considered for retention</b>		
	<b>1 Mainly arboricultural values</b>	<b>2 Mainly landscape values</b>
<p><b>Category A</b></p> <p>Those of a high quality with an estimated remaining life expectancy of at least 40 years</p>	<p>Trees that are particularly good examples of their species, especially if rare or unusual, or those that are essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)</p>	<p>Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features</p>
<p><b>Category B</b></p> <p>Those of moderate quality with an estimated remaining life expectancy of at least 20 years</p>	<p>Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation</p>	<p>Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality</p>
<p><b>Category C</b></p> <p>Those of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm</p>	<p>Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories</p>	<p>Trees with material conservation or other cultural value</p> <p>Trees with no material conservation or other cultural value</p>
		<b>3 Mainly cultural values, inc. conservation</b>
		<b>GREEN</b>
		<b>BLUE</b>
		<b>GREY</b>



CONSTRUCTION EXCLUSION ZONE

**KEEP OUT**

RESTRICTED ACCESS  
NO VEHICLES  
NO STORAGE OF MATERIALS

REPORT ANY TREE DAMAGE TO  
TREESTYLE CONSULTANCY  
ON

07872 064 313



## Appendix E - General Tree Protection Considerations

Any tree retained within the design will require protection in accordance with BS 5837, regardless of its initial retention category. This protection will require tree to be fenced off in areas equal to the RPAs plotted on the attached Tree Constraints Plan, located in [Appendix A](#).

A protective fence will be erected prior to the commencement of any site works e.g. before any materials are brought on site. The fence will have signs attached to it stating:

### ‘CONSTRUCTION EXCLUSION ZONE – NO ACCESS’

The protected fence may only be removed following completion of all construction works.

The fence is required to be sited in accordance with the Tree Constraints Plan enclosed with this method statement as [Appendix A](#). They must ideally be constructed as per figure 2 in BS 5837 and be fit for the purpose of excluding any construction activity (see diagram below). Any other fence/barrier used must be fit for the purpose (as decided by the project arborist).

Once erected all protective fencing will be regarded as sacrosanct, and will not be removed or altered without prior recommendation by the project arborist and approval by the local planning authority.

The diagram below demonstrates the required fence specifications of BS 5837 figure 2.

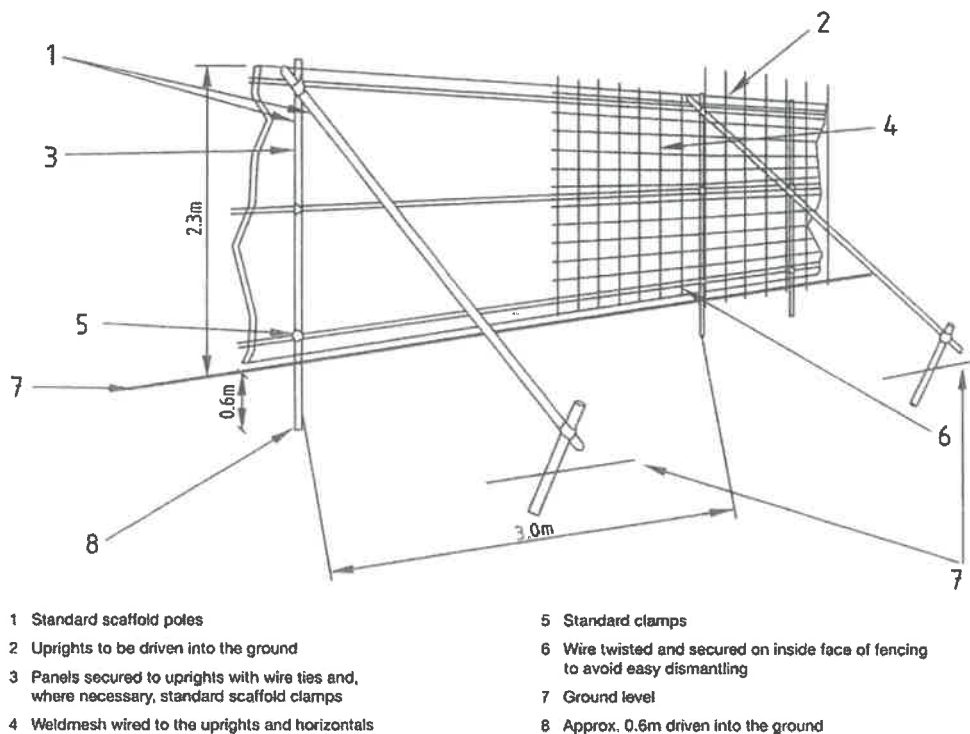


Figure 2. – Protective fencing for RPA

## Appendix E - General Tree Protection Considerations (Cont.)

Should scaffolding be required to be erected within the RPA of any retained trees (so that building works may be carried out outside the extent of the RPA), this should be carried out to the following specifications:

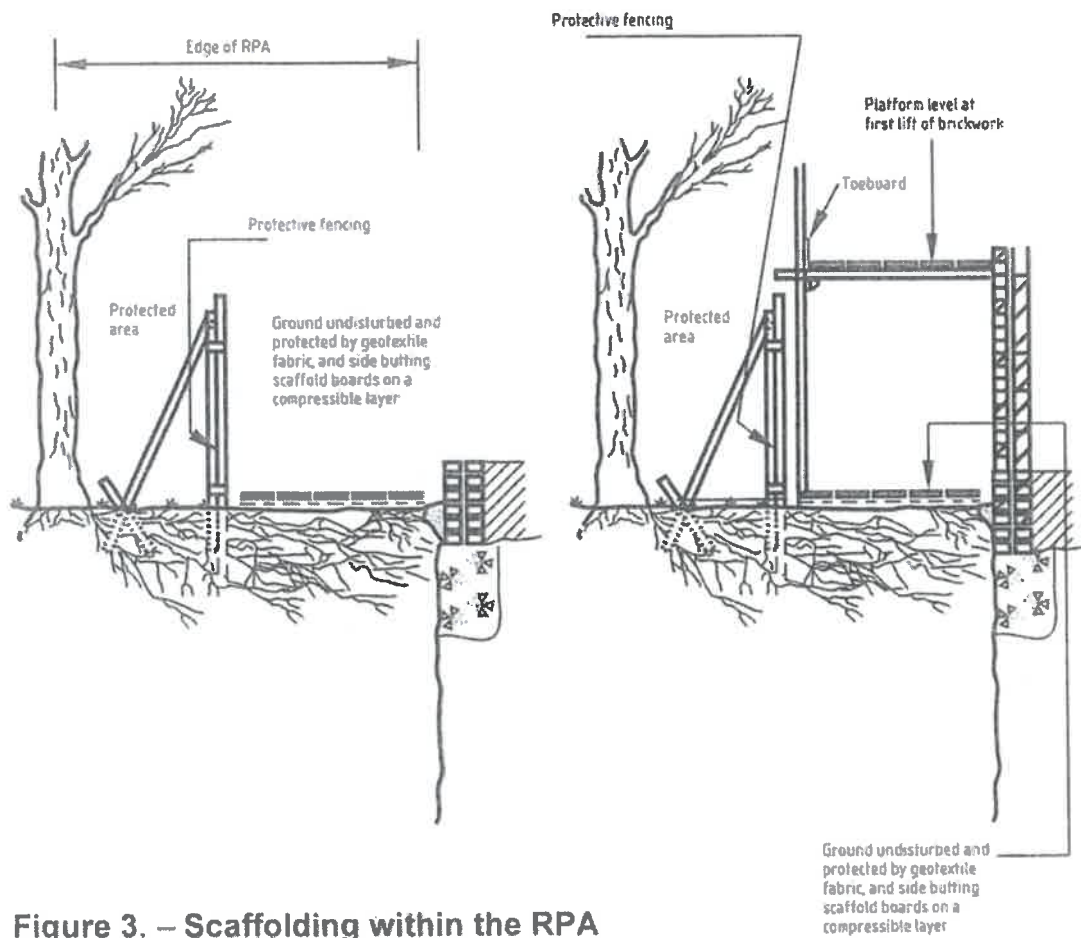


Figure 3. – Scaffolding within the RPA