

Development Management

Trees & Utilities

Guidance on Working Practices



Contents

	Page
1. Introduction	3
2. Tree ownership and policy protection	4
2.1 Council owned trees	
2.2 Privately owned trees	
2.3 Protected trees	
3. What type of damage occurs?	6
3.1 Above the ground	
3.2 Below the ground	
3.3 Examples of damage caused recently in Newcastle upon Tyne	
4. Method of working	11
4.1 Code of practice for Utility operators	
4.2 Working around trees – summary of guidance	
5. Planning work, coordination and communication with Newcastle City Council	14
5.1 Planned work	
5.2 Emergency work	
5.3 What to do when there is damage to trees as a result of work	
6. Training	18
7. Contact details for Newcastle City Council	19
8. Relevant documents and further reading	20

Appendix 1 – NJUG Guidelines for Planning, installation and maintenance of apparatus in the proximity to trees – issue 2

Appendix 2 – Contact details for Newcastle City Council Highway Control Assistants

1. Introduction

Trees are important. They provide many benefits: to our health, our environment and have social and economic value. The residents of Newcastle and the City Council continue to invest time and money into the planting and care of its stock of trees. Whether the trees are owned publicly or privately there is often no need for damage to be caused by excavations for the installation and maintenance of utilities.

Over the past years there have been several instances of work within the highway and on grass verges leading to extensive root damage to trees. This has caused a loss in vigour and eventual death of trees. As services tend to run in straight lines, as do roadside tree planting, whole streets of trees can be affected and later lost by one scheme. Trees which take decades to grow can be destroyed in minutes.



Trenching operations beside trees can lead to loss of large numbers of street trees by cutting the roots completely along one side of the trunk.

At best this will damage a tree's ability to take in water and nutrients, slowly killing the tree, and at worst, it will make it unstable. In pavements this is more serious as the trees are already growing with a constrained root system.

The purpose of this leaflet is to set out the issues of concern and agree methods of working between the relevant parties.

2. Tree ownership and policy protection

Trees are the property of the landowner and in the same way that a landowner would be aggrieved if someone came onto their land and damaged their house; they would also be aggrieved if their other property, including their tree, was damaged.

2.1 Council owned trees

Trees on Council land, including those growing in the highway, are owned and managed by Newcastle City Council. They are seldom the subject of Tree Preservation Orders because the Council has its own policies within its Tree Strategy – Trees Newcastle - which protect them.



The Tree Strategy Policy states:

‘Healthy trees, hedges and woodlands will be protected, retained and enhanced. No tree will be felled or pruned without good reason’

2.2 Privately owned trees

Work on Council land adjacent to private land such as gardens, can affect the roots of trees which are privately owned and growing in those gardens. The presence of a wall may limit the number of roots crossing on to the highway, but they may not, and fences and similar barriers do not limit root growth. In addition it is often necessary for utility contractors to excavate within private property to reach their services. There are implications for householders if their trees are damaged or made unsafe and unstable by these operations.

2.3 Protected trees

In addition to ownership issues, some trees are protected by Tree Preservation Orders (TPOs) or due to their presence in a Conservation Area. Trees which are protected by a TPO have special value and having been threatened in the past (through development for example) have now been protected. These trees are legally protected to maintain their contribution to visual amenity. Usually any person or organisation can be prosecuted if damage is caused to the tree without prior approval of the Planning Authority.

2.4 Statutory Undertakers

Statutory Undertakers are obliged to inform the Council of planned works within the adopted highway. The notice period is related to the estimated length of time the job will take and the statutory guidance is as follows:

Estimated job length	Notice period required
3 days or less	3 days
10 days or less	10 days
More than 10 days	3 months

This includes work which may involve a tree protected by a TPO or within a Conservation Area. Statutory undertakers have deemed consent for the limited felling, topping or lopping of trees protected by a TPO in order to supply and maintain service in the following circumstances:

- (1) In the interests of safety.
- (2) When inspecting, repairing or renewing their mains, pipes, cables and other apparatus.
- (3) When carrying out their permitted development rights under the Town and Country (General Permitted Development) Order 1995.

Due to this exemption, it is in the interests of all concerned to enter into an early dialogue concerning potential damage to trees.

On non-highway land, for example within green space, a wayleave for work is required. This is issued by Newcastle City Council Head of Strategic Property and Asset Management. A fee is agreed between the parties and each case is assessed separately depending on a number of factors including the route the wayleave will take, whether any strategic land is involved and who will benefit from the required works (i.e. an individual company or the public). Should any damage be caused to Council land, property or agriculture as a result of the works being carried out, then the wayleave will allow the Council to be fully indemnified and contain provisions for reinstatement and compensation.

3. What type of damage occurs?

Damage to trees from any type of construction work may be above or below ground.

3.1 Above the ground

These are the leaves, branches and trunk. When damage occurs, this shows the most obvious signs of damage. The leaves are where the tree makes food. The trunk and branches are protected by bark which stops disease entering the tree. Bark protects the water and feeding tubes that run up the inside of the trunk.

3.2 Below the ground

These are the roots and soil around the roots. The roots are one of the most vital parts of the tree. They are needed for uptake of nutrients and water, to store energy and to anchor the plant. They are also covered with bark and damage to this bark results in the same problems as damaging branches - disease and pathogens can enter, attack and kill the tree. Roots need to breathe. This is why they are found mainly in the top 600mm of the soil where air spaces can be found. If there is no air, roots will die. If roots die, it has the same effect as cutting them.

Figure 1 shows the pattern of root growth in a typical tree. 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 outwards in any direction for distances frequently greater than the tree's height.

Damage to the roots is generally much more serious than damage to the parts of the tree above the ground.

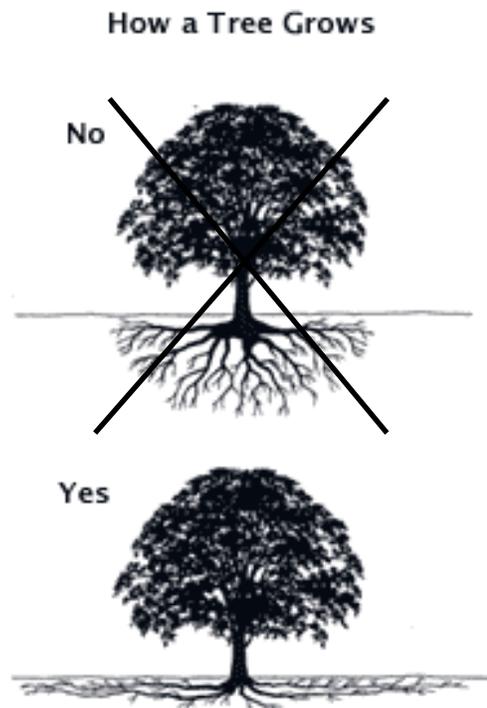


Figure 1

The following table gives examples of the types of operations which can cause damage, the parts of the trees affected and the likely result.

Operation	Part of tree affected	Result
Trenching	Cutting major roots	Links to all smaller roots. The bigger the root, the more the damage. Tree can become unstable.
Trenching	Cutting medium to smaller roots	Roots as small as 10mm diameter feed fine roots over a wide area. Tree becomes stressed and more vulnerable to disease.
Trenching	Cutting fine roots	Tree becomes stressed and more vulnerable to disease.
Scraping during trenching or back-filling	Scraping bark off roots	Disease and pathogens can enter roots. If the bark is removed from the whole circumference all roots beyond this point will die.
Tree hit by machinery or materials propped up against trees	Scraping bark off trunk	The flow of food and water can be stopped and disease can enter the tree. Also affects visual amenity.
Hit by machinery	Bark on branches	Disease can enter tree. Affects visual amenity.
Compaction by vehicles and storage of materials	Roots	Has same effect as cutting the fine roots. Cuts off food and water and tree can die.
Lowering soil level	Roots	Same effect as cutting the roots
Raising soil level	Roots	Same effect as compaction
Herbicides applied to surrounding vegetation	Whole tree	Herbicide may be taken in by fine roots and poison the tree.
Oil and other chemicals spilling	Whole tree	Chemicals taken up by fine roots may poison the tree.

3.3 Examples of damage caused recently to trees in Newcastle



Stacking materials around the tree causes compaction of the soil. This decreases the amount of air in the soil and suffocates the roots.



As can be seen in both of these examples, large roots have been cut during trenching. If the trench is deeper than 600mm most of the roots along the trench line will be lost leading to loss of function and tree instability.



In this example the contractor has tried to retain some of the roots. Unfortunately, those which have not been cut have dried out. Again, this damages the roots and can kill them.



Storing excavated soil around the tree trunk causes damage as air circulation is cut off and moisture and nutrients cannot reach the tree roots. In some cases drainage is reduced and the tree roots die due to waterlogging.



Trenching cuts through all of the roots on one side of the tree. This not only stops the roots taking up water and nutrients, but when it is as close as this example, it can make the tree unstable.



This photograph shows bark damage to one of the top branches due to collision with a construction vehicle. The damaged area will be open to disease and attack by pests. This could lead to loss of a major branch and decreased visual amenity value.

4. Method of working – coordination and communication

4.1 Code of Practice for Utility Operators

Newcastle City Council recommends use of guidance given by NJUG (National Joint Utilities Group) in all work by utilities contractors around trees. In 1995 the National Joint Utilities Group (NJUG) published guidelines on how utility operators and water or sewerage undertakers should follow good practice guidelines when they need to work around trees to install and maintain their services. All the utility operators have committed to implementing the guidelines.

On 19th November 2007 an updated version of this guidance was published and the two following documents are available free of charge on-line:

Volume 4: NJUG Guidelines for The Planning, Installation And Maintenance Of Utility Apparatus In Proximity To Trees (Issue 2) – Operatives Handbook

Volume 4: NJUG Guidelines for The Planning, Installation And Maintenance Of Utility Apparatus In Proximity To Trees (Issue 2)

This excerpt from the contents page of the guidance covers the following topics:

1. HOW TREES ARE DAMAGED

1.1 The Root System

1.2 Below Ground

1.3 Above Ground

2. HOW APPARATUS IS DAMAGED

2.1 Below Ground

2.2 Above Ground

3. PLANNING OF WORKS

3.1 Special Considerations when Planning the Installation of Underground Apparatus

3.2 Precautions when Repairing Existing Apparatus

3.3 Special Considerations when Planning the Installation of Above Ground Apparatus

4. HOW TO AVOID DAMAGE TO TREES

4.1 Below Ground

4.2 Above Ground

4.3 Chemical Damage to Trees

5. HOW TO AVOID DAMAGE TO APPARATUS BY TREES

5.1 Consultation with Utilities

5.2 Precautions during Planting

6. SITES WITH DESIGNATED STATUS

6.1 Tree Preservation Orders and Trees in Conservation Areas

7. LEGISLATION

7.1 Primary Legislation

7.2 Secondary Legislation

4.2 Working around trees – summary of guidance

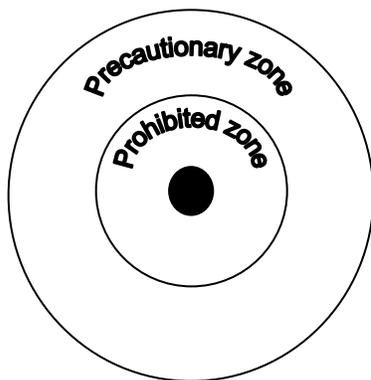
Virtually all of a tree's roots are in the top 600mm of soil with the main feeder roots in the top 250mm of soil. It is sometimes suggested that you should avoid any roots within the drip-line of the tree; however, many roots grow beyond this point particularly if the tree roots are constrained by something such as a footpath: care should therefore still be taken outside this area.

As a rough calculation, most of the roots will be within a circle with a radius which can be calculated as follows:

$$\frac{\text{CIRCUMFERENCE OF TREE (meters)}}{\text{MEASURED AT 1.5m ABOVE THE GROUND}} \times 4$$

This gives a similar result to the formula used in BS5837:2012 Trees in relation to construction, Annex C and D, pages 39 and 40 which is calculated as follows:

$$\frac{\text{DIAMETER OF TREE STEM (meters)}}{\text{MEASURED AT 1.5m ABOVE THE GROUND}} \times 12$$

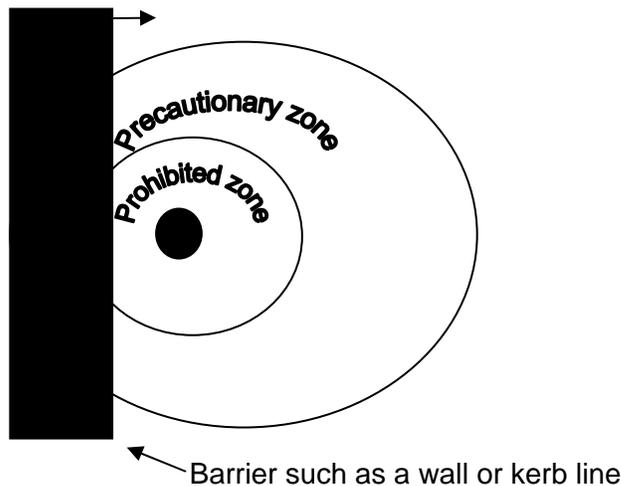


This will give you an area around the tree where precautions need to be taken to prevent damage to roots (the Precautionary Zone referred to in NJUG Guidelines).

The smaller circle shows what the NJUG guidance calls the Prohibited Zone which is 1m from the trunk. No work should take place here.

The shape of the root system is unpredictable, and if there is a barrier on one side of the tree (such as a wall, road or other structure) roots are likely to grow less on the side with the barrier and more on the opposite side. This precautionary zone may therefore need to be off-set to keep the area for the roots the same.

FIGURE 2 - off set roots



This is particularly true of urban trees which are growing around many underground obstacles.

It is sometimes possible to move/divert services outside the precautionary zone and this is the preferred option.

- **Excavation of open trenches by machine is totally unacceptable within the prohibited and precautionary area.**
- **If possible it is better to re-align or plan services outside the precautionary or prohibited zones.**
- **If this is not possible then special working practices will be needed.**

The NJUG guidance gives details of several techniques which can be used to minimise the damage caused by excavation near to trees. These are:

- Trenchless
- Broken trench – hand dug
- Continuous trench – hand dug

5. Planning work and communication with Newcastle City Council

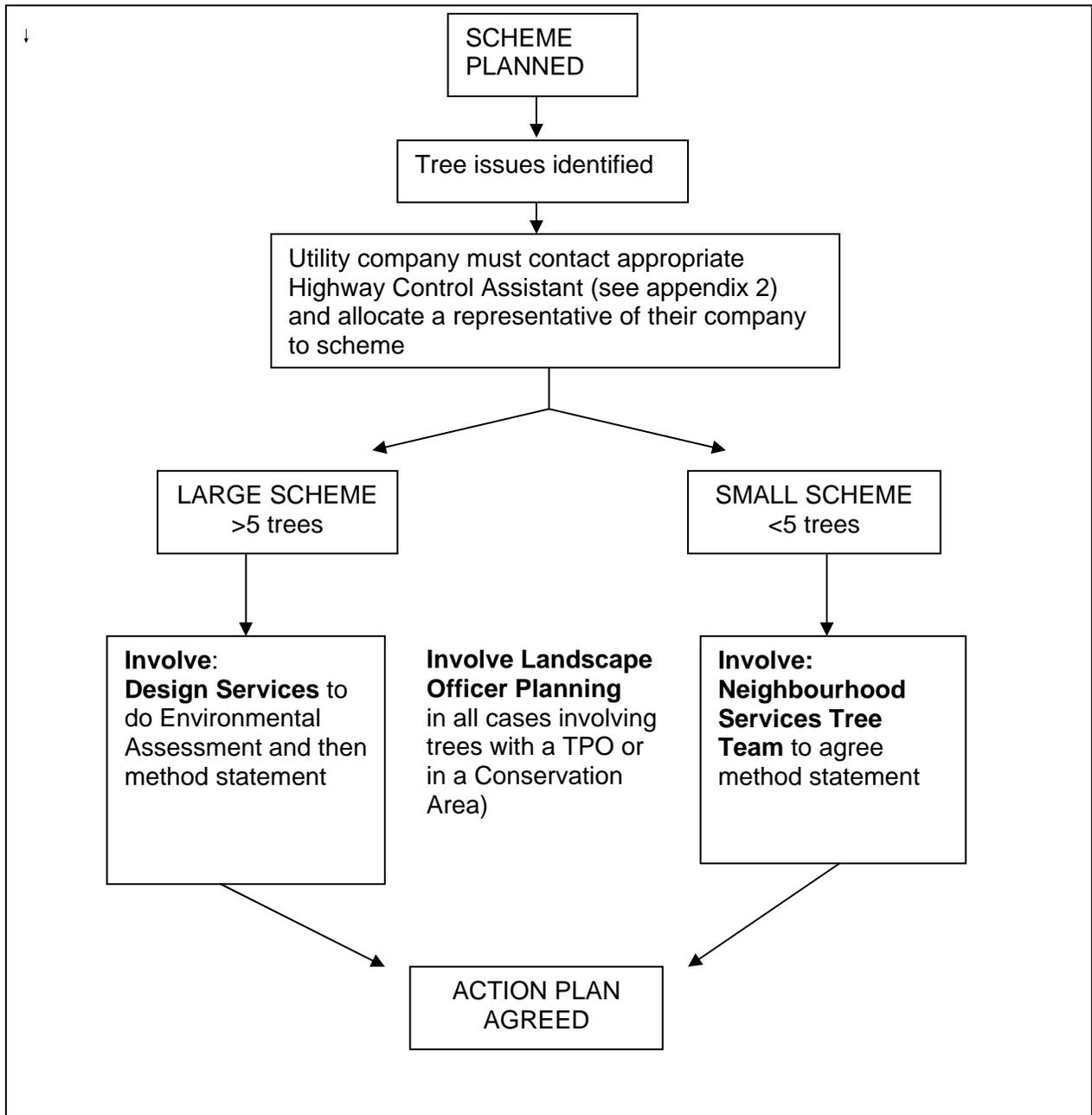
The NJUG guidelines emphasise the importance of regular contact between utility operators and the Local Council. In Newcastle upon Tyne this is done in two main ways:

1. Via quarterly coordination meetings between the utility companies and Newcastle City Council's Highway Inspection and Control Team. These meetings consider the extent of the works, plan and agree special working arrangements and identify the need to involve other officers such as tree officers, as required.
2. Via the North East Highways Authorities and Utilities Committee which meets quarterly to discuss issues and policy relating to joint work between the North East Councils and the utility companies to ensure a consistent approach.

5.1 Planned Work

The City Council requires all contractors working in the highway to understand the effects that their works will have on the local environment. Loss of roots often leads to the death of a tree – not immediately, but usually five to ten years after the event.

To minimise this the working practice shown in the following flow chart will be followed.



Permission for work will not be unreasonably withheld but it will only be given on the basis that if trees are damaged then the contractor will be charged for the replanting and establishment of a replacement.

The following points are important:

- To ensure that unnecessary damage is prevented a named person must be in control of the work and that person must be competent in their understanding of the impact of excavations on trees.
- All excavations must be planned in advance (other than emergency works) and this planning must take into account the presence of trees.
- Use guidance given in Section 4.3 of this document to calculate the Rooting Zone of the tree.
- No excavations must be carried out within the rooting zone of any tree unless a detailed method statement has been agreed in advance by the City Council. The method statement should identify the least damaging method of working.

5.2 Emergency or urgent work

Emergency or urgent work, by its nature needs to be carried out without prior consultation. If these works involve damage to roots with a diameter more than 25mm, the utility company must contact the Highway Control Assistant as soon as possible so that an inspection can be carried out before back-filling takes place. This will allow a decision on whether any remedial treatment of the tree is necessary and to assess if the tree is still safe.

5.3 What to do when there is damage to trees as a result of work

If trees are damaged as a result of work the following should occur.

- i). If roots greater than 25mm are encountered excavation should stop and the roots should not be cut. Excavation should continue with hand digging avoiding the roots. If trenches are to remain open over-night, the roots should be covered with hessian sacking or other suitable absorbent cloth to stop them drying out and dying.
- ii). If roots are accidentally cut, the Highway Control Assistant should be told as soon as is possible. No further roots should be cut and any exposed roots should be covered as above.

- iii). Contact the relevant Highway Control Assistant who will assess and record the damage. The inspector may then seek further assessment from Neighbourhood Services Tree Team.
- iv). If the damage is assessed as minor, no action will be needed.
- v). If damage is more severe, it may be necessary to carry out remedial pruning to roots or branches depending upon the type of damage.
- vi). If the tree is deemed unsafe, particularly due to root damage, it will be felled.

5.4 Reimbursement of costs

If the trees require remedial work the costs will be recoverable from the company involved. This will include the following cost items:

- Inspection by Newcastle City Council Tree Team
- Felling existing tree
- Removal of remains and stump
- Disposal of remains
- Ground preparation as set out in BS3998:1989 and Newcastle City Council Street Tree Planting Guidance
- Establishment as set out in BS3998:1989 and Newcastle City Council Street Tree Planting Guidance.

Current costs are available upon request and vary depending upon whether the tree is in the highway or open ground.

6. Training

Newcastle City Council Highway Control Assistants have received preliminary training on issues associated with excavation around trees. It is suggested that the utility companies also provide training for their staff and copies of the Newcastle City Council presentation can be used if required. It is suggested that toolbox talks and staff inductions are used as an opportunity to deliver this.

7. Contact details

For work to trees in the Highway contact Newcastle City Council's Highway Inspection and Control Team - see Appendix 2.

For work to other Council trees contact Newcastle City Council Tree Team - Mark Lamb (Neighbourhood Services Tree Team Manager) – 0191 278 1999.

To find out if a tree is protected or for advice on protected trees contact Newcastle City Council Landscape and Ecology Section - Edwina Symmons (Landscape Officer, Planning) contact 277 8950.

9. Relevant documents and further reading

Newcastle City Council Tree Strategy – Trees Newcastle

<http://www.newcastle.gov.uk/environment/conservation-heritage-and-urban-design/tree-strategy>

BS5837:2005 – Trees in relation to construction – Recommendations, BSi

<http://shop.bsigroup.com/en/ProductDetail/?pid=000000000030139494>

BS3998:1989 – Tree work, BSi

NJUG Publication Volume 4: Issue 2: 16/11/2007 - NJUG Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees. NJUG Ltd.

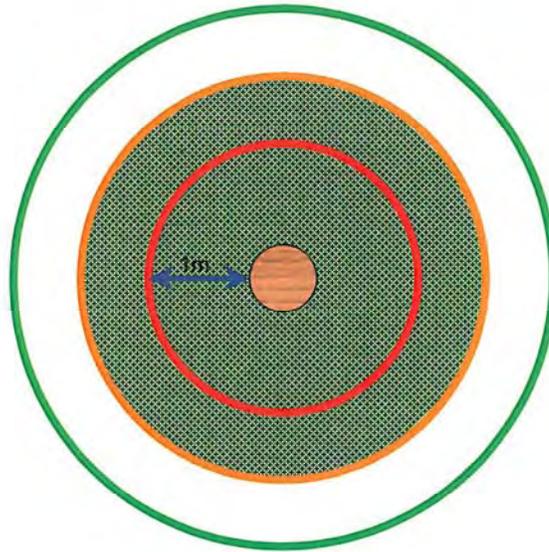
<http://www.njug.org.uk/publication/52>

Appendix 1 - NJUG Guidelines for Planning, installation and maintenance of apparatus in the proximity to trees – issue 2

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TREE PROTECTION ZONE

Key to Diagram



Trunk of Tree



Spread of canopy or branches



PROHIBITED ZONE – 1m from trunk. Excavations of any kind must not be undertaken within this zone unless full consultation with 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 Local Authority Tree Officer if in any doubt.



PERMITTED ZONE – outside of 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.

PROTECTING ROOTS - DO'S and DON'TS

THE PROHIBITED ZONE

Don't excavate within this zone.

Don't use any form of mechanical plant within this zone

Don't store materials, plant or equipment within this zone.

Don't move plant or vehicles within this zone.

Don't lean materials against, or chain plant to, the trunk.

Do contact the local authority tree officer or owner of the tree if excavation within this zone is unavoidable.

Do protect any exposed roots uncovered within this zone with dry sacking.

Do backfill with a suitable inert granular and top soil material mix as soon as possible on completion of works.

Do notify the local authority tree officer or the tree's owner of any damage.

THE PRECAUTIONARY ZONE

Don't excavate with machinery. Where excavation is unavoidable within this zone excavate only by hand or use trenchless techniques.

Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

Don't repeatedly move / use heavy mechanical plant except on hard standing.

Don't store spoil or building material, including chemicals and fuels, within this zone.

Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

Do backfill the trench with an inert granular material and top soil mix. Compact the backfill with care around the retained roots. On non highway sites backfill only with excavated soil.

Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.

Do notify the local authority tree officer or the tree's owner of any damage.

THE PERMITTED ZONE

Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

Do use caution if it is absolutely necessary to operate mechanical plant within this zone.

Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.

Do notify the local authority tree officer or the tree's owner of any damage.

**TECHNICAL SERVICES
HIGHWAY CONTACTS FOR UTILITY COMPANIES**

Outer West
 Mobile: 07989517864
 Benwell & Scotswood
 Blakelaw
 Castle
 Denton
 Fenham
 Lemington
 Newburn
 Westerhope
 Woolsington

City Centre and East
 Mobile: 07989517859
 Byker
 Dene
 North Heaton
 Ouseburn
 South Heaton
 Walker
 Walkergate
 Westgate

Central and North
 Mobile: 07850704473
 East Gosforth
 Elswick
 Fawdon
 Kenton
 North Jesmond
 Parklands
 South Jesmond
 West Gosforth
 Wingrove



