

Trees and Development

Finalised Supplementary Guidance SG06

August 2014



Falkirk Council
Development Services

Supplementary Guidance

A suite of supplementary guidance (SGs) is currently being produced by the Council. Most of these SGs are updated versions of previous Supplementary Planning Guidance (SPG) whilst others cover new topic areas (*denotes new SGs). There are 16 SGs in the series, all of which seek to provide more detailed guidance on how particular local development plan policies should be applied in practice.

These SGs form a statutory supplement to the Local Development Plan, and are intended to expand upon planning policies and proposals contained in the proposed plan.

A full list of the supplementary guidance available in this series is found below.

- SG01 Development in the Countryside ***
- SG02 Neighbourhood Design**
- SG03 House Extensions and Alterations**
- SG04 Shopfronts**
- SG05 Biodiversity and Development**
- SG06 Trees and Development**
- SG07 Frontiers of the Roman Empire (Antonine Wall) World Heritage Site**
- SG08 Local Nature Conservation and Geodiversity Sites ***
- SG09 Landscape Character Assessment and Landscape Designations ***
- SG10 Education and New Housing Development**
- SG11 Healthcare and New Housing Development ***
- SG12 Affordable Housing**
- SG13 Open Space and New Development**
- SG14 Spatial Framework and Guidance for Wind Energy Development**
- SG15 Low and Zero Carbon Development ***
- SG16 Design Guidance for Buildings in Conservation Areas ***

Trees and Development

1. Introduction



2. Statutory and Non-Statutory Protection



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1. Introduction

The Value of Trees

- 1.1 Healthy, open grown trees are objects of great beauty and their value to the landscape is almost universally accepted. The character of many of the finest towns and cities is defined by mature trees in avenues, parks, along streets and in urban woodlands and their presence not only adds value to property but creates a sense of place and adds greatly to quality of life. More than that, they are an essential component of the environment; they provide protection, remove pollutants from the air, fix carbon, reduce noise, produce oxygen and provide shelter for wildlife. There is great public concern about trees and, quite rightly so, many people take pleasure in seeing trees being planted and will strongly object to their unnecessary removal.

Despite this many developers and householders regard trees as a nuisance; they get in the way of development, 'waste space' that could be built upon, block sunlight and drop leaves that block gutters and make paths slippery. In addition, many people do not understand or appreciate what conditions are required for healthy tree growth. This can lead to so much damage unwittingly being caused to trees that are supposed to be retained that they then have to be removed on safety grounds.

Purpose of Guidance Note

- 1.2 The purpose of this Guidance Note is to,
- Encourage developers, through the Development Management process, to effectively safeguard and protect existing trees and woodlands within development and to
 - Provide the right conditions for new trees on construction sites.

By doing these, trees should thrive and grow to maturity, be safe, and cause minimal and acceptable 'disruption' to everyday life. Such trees will not only benefit those who use the site but the wider population as a whole, local wildlife and the environment for many years after the development has been completed.

This document is for guidance only and is not a legally binding interpretation of legislation.



2. Statutory and Non-Statutory Protection

- 2.1 Falkirk Council actively encourages tree planting and management and this position is supported by legislation, and national and local planning policy.

Legislation

The Town and Country Planning (Scotland) Act 1997, as amended by Planning etc (Scotland) Act 2006

Under Section 159 of this Act Scottish Ministers and the planning authority are specifically charged to:

“Ensure, whenever it is appropriate, that in granting planning permission for any development adequate provision is made, by the imposition of conditions, for the preservation or planting of trees”.

And Section 160: gives Falkirk Council the power to apply Tree Preservation Orders (TPOs)

“A planning authority may”..... “if it appears to them that the requirements of subsection (1A) are met, make an order specifying any trees, groups of trees or woodlands in their district and providing for their preservation”

Before any work is carried out to trees you should check with Council staff whether or not they are protected by a Tree Preservation Order or Conservation Area designation, are within the curtilage of a listed building or are subject to a condition of planning permission. (see 9.1 “Permissions” for contact details)

Nature Conservation (Scotland) Act 2004

Section 1(1) of the Act states:

“It is the duty of every public body and office-holder, in exercising any functions, to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions”.

The Wildlife and Countryside Act 1981 Nature Conservation (Scotland) Act 2004

“Trees can provide an important habitat for many species, and larger mature trees may support bat roosts and be used by nesting birds. It is an offence under the Wildlife & Countryside Act 1981 (as amended) and the Conservation (Natural Habitats &c.) Regulations 1994, to deliberately disturb a bat roost, or nesting birds. As bats are European protected species it is important that any tree work which may affect them or their roosts is adequately assessed by a recognised bat expert prior to works commencing.”

Sites of Scientific Interest (SSSI) are designated under these acts. Permission must be obtained from Scottish Natural Heritage if treeworks are listed by them in the SSSI notification package as operations requiring consent.

For further information consult Scottish Natural Heritage website. (see 6.3 Other Organisations)

The Conservation (Natural Habitats etc) Regulations 1994 also provide protection for certain animal and plant species.

The Council will look at proposals and determine if these further the conservation of biodiversity. Further details are given in Falkirk Council Supplementary Guidance, ‘Biodiversity and Development’.

2. Statutory and Non-Statutory Protection

Forestry Act 1967, as amended

A felling licence is required from the Forestry Commission if more than 5 cubic metres is felled within any calendar quarter. There are certain exemptions which may apply, and the Forestry Commission should be contacted to confirm whether or not a licence is required before you start any tree felling.

Where full planning permission authorises the felling of trees on a development site, no further consent is required under the Forestry Act 1967 (as amended), however, the approved planning permission must **expressly specify tree felling** and should also be recorded on the map/plan.

Forestry Commission Scotland (FCS) is also responsible for administering the Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999.

Some types of forestry project are likely to have a significant impact on the environment. For such projects, FCS might have to give formal consent for the work to take place and an Environmental Impact Assessment is used to determine whether consent should be given.

For further information consult the Forestry Commission Scotland (see 6.3 “Other Organizations”)

Ancient Monuments and Archaeological Areas Act 1979

Many historic sites are designated “scheduled monuments” and are legally protected under the above Act. If a site is scheduled monument consult with Historic Scotland before felling trees or removing scrub.

For further information contact Historic Scotland.
(see 6.3 Other Organisations)

High Hedges (Scotland) Act 2013

The High Hedges Act aims to provide a solution to the problem of high hedges, where neighbours have not been able to resolve the issue amicably, by providing an effective means of resolving disputes over the effects of high hedges which interfere with the reasonable enjoyment of domestic property. A high hedge is defined by the Act as a hedge that is formed wholly or mainly by a row of two or more trees or shrubs, is over two metres in height and forms a barrier to light.

The act gives homeowners and occupiers the right to apply to their local council for a high hedge notice and empowers the authority to enforce decisions made in relation to high hedges in their local area.

For further information contact Falkirk Council (see 6.1 Permissions).



2. Statutory and Non-Statutory Protection

National Planning Policy

- 2.2 Scottish Planning Policy (SPP) provides a statement of Government policy on nationally important land use and other planning matters.

‘Trees and Woodland’ states,

“Ancient semi-natural woodland is an irreplaceable resource and, along with other woodlands, hedgerows and individual trees, especially veteran trees of high nature conservation and landscape value, should be protected from adverse impacts resulting from development. Tree Preservation Orders ^[91] can be used to protect individual trees and groups of trees considered important for amenity or their cultural or historic interest.

Where appropriate, planning authorities should seek opportunities to create new woodland and plant native trees in association with development. If a development would result in the severing or impairment of connectivity between important woodland habitats, workable mitigation measures should be identified and implemented, preferably linked to a wider green network (see also the section on green infrastructure).

The Scottish Government’s Control of Woodland Removal Policy ^[92] includes a presumption in favour of protecting woodland. Removal should only be permitted where it would achieve significant and clearly defined additional public benefits. Where woodland is removed in association with development, developers will generally be expected to provide compensatory planting. The criteria for determining the acceptability of woodland removal and further information on the implementation of the policy is explained in the Control of Woodland Removal Policy, and this should be taken into account when preparing development plans and determining planning applications.”



2. Statutory and Non-Statutory Protection

Local Development Plan (LDP) Policy

2.3 In the current Local Development Plan (LDP) the following principles are laid out in Policy GN04 Trees, Woodland and Hedgerows

The Council recognises the ecological, landscape, economic and recreational importance of trees, woodland and hedgerows. Accordingly,

- Felling detrimental to landscape, amenity, nature conservation or recreational interests will be discouraged. In particular ancient, long established and semi-natural woodlands will be protected as a habitat resource of irreplaceable value;
- In an area covered by a Tree Preservation Order (TPO) or a Conservation Area, development will not be permitted unless it can be proven that the proposal will not adversely affect the longevity, stability or appearance of the trees. Where necessary, endangered trees and woodlands will be protected through the designation of further TPOs;
- Development which is likely to affect trees should comply with this guidance, including the preparation of a Tree Survey, Constraints Plan, and Tree Protection Plan. Where development is permitted which will involve the loss of trees or hedgerows of amenity value, the Council will normally require replacement planting appropriate in terms of number, size, species and position;
- The enhancement and management of existing woodland and hedgerows will be encouraged. Where the retention of a woodland area is integral to a development proposal, developers will normally be required to prepare and implement an appropriate Management Plan;
- There will be a preference for the use of appropriate local native species in new and replacement planting schemes, or non-native species which are integral to the historic landscape character.

2.4 Policy D02 Sustainable Design Principles of the LDP sets out the key principles of design which development proposals should accord with. Of particular relevance to trees on development sites are,

1. Natural & Built Heritage

Existing natural, built or cultural heritage features should be identified, conserved, enhanced and integrated sensitively into development;

2. Urban and Landscape Design

The scale, siting and design of new development should respond positively and sympathetically to the site's surroundings, and create buildings and spaces that are attractive, distinctive, welcoming, adaptable, safe and easy to use.

6. Maintenance

Proposals should demonstrate that provision will be made for the satisfactory future management and maintenance of all public areas, landscaping and infrastructure.

The policy also states,

“Masterplans will be required for significant development proposals requiring a co-ordinated approach to design and infrastructure, and should demonstrate how the above principles have been incorporated into the proposals. Masterplans should be informed by a development framework or brief where relevant.”

2. Statutory and Non-Statutory Protection

Non-Statutory Protection

- 2.5 Proposed developments that affect the following will be subject to close scrutiny and developers and builders will be expected to prepare appropriate management plans to minimise any adverse impacts.

Ancient Woodlands

Area of Great Landscape Value/Special Landscape Area

Wildlife Sites

Sites of Importance for Nature Conservation

Trees on or adjacent to Scheduled Ancient Monuments e.g.

Antonine Wall

Trees adjacent to Listed Buildings

Greenbelt

Sites listed in the “Inventory of Gardens & Designed Landscapes in Scotland”



3. Pre-Planning Procedures and Survey Information

Preliminary meetings With Council Staff

- 3.1** It is important that developers and householders discuss their proposals with Council staff early in the development process to determine if they comply with planning policy and if trees or woodlands affected are protected.

If there are trees on or adjacent to the development site a tree survey should be carried out before any proposals for development are prepared.

Provision of a sketch layout of the proposed development, including access roads, car parking, and site compound in relation to all trees on the site will help in preliminary discussions. Any trees on the boundary of the site, or close to it in adjacent properties which may be affected by the proposed development should also be shown.

Preparation of a tree survey at the outset or at an early stage allows for proper consideration to be given to which trees are to be retained, which can be felled and what will need to be replanted early in the design and planning process. This can eliminate unnecessary work and expense at later stages. It can also avoid unnecessary damage to trees which are to be retained and which can be expensive to rectify once a development is underway or complete.

Requirements

- 3.2** In many places the Falkirk area is already well provided with a wide range of trees and woodlands of different size, age and species and these make a significant contribution to the landscape of its towns, villages and countryside. The Council's principal aim is to maintain and extend the tree cover throughout the Falkirk area and to encourage a diverse landscape in which trees and woodlands are a major element. It will do this in accordance with the Scottish Government's Control of Woodland Removal Policy and by:
- Requiring retention of mature trees and woodland within a development site if they are capable of making a long term contribution to the amenity of the area.
 - Requiring new planting within a development, either to replace trees that are felled or where there are no trees at present.
 - Seeking a contribution to off-site planting where there is insufficient space on a development site for new tree planting.
 - Encouraging management which will result in the presence of a range of species of different ages from young saplings through to mature trees being present and thereby ensuring continual tree cover over the long term.

Removal of Existing Trees

- 3.3** Council staff try to take a pragmatic view when it comes to retention of existing trees, tree surgery and planting of new ones and will not insist on trees being retained if so doing would be inappropriate in design terms and on grounds of safety. Staff also accept that felling mature trees and replacing these with young stock is a valid and necessary part of long term management. Indeed this is essential if a state of continuous tree cover is to be achieved over the long term. However it cannot be presumed that permission for the removal of trees will always be given even if the developer, or householder, is willing to plant replacements. The Council will need to be satisfied that trees are being removed for the right reasons and will require evidence in the form of tree survey prepared by qualified and experienced arboriculturalists to substantiate claims that trees need to be removed.

Tree Survey Data

- 3.4** An accurate tree survey, based on the site survey, is an essential tool when it comes to discussing site layout and determining the likely impact of the proposed development on existing trees. The survey should be undertaken by a qualified arboriculturist and be in accordance with BS5537:2012. Where tall, mature trees are involved an arboriculturalist should climb the trees to check crown health and to identify any decay organisms that may be present in the crown which are not visible from ground level.

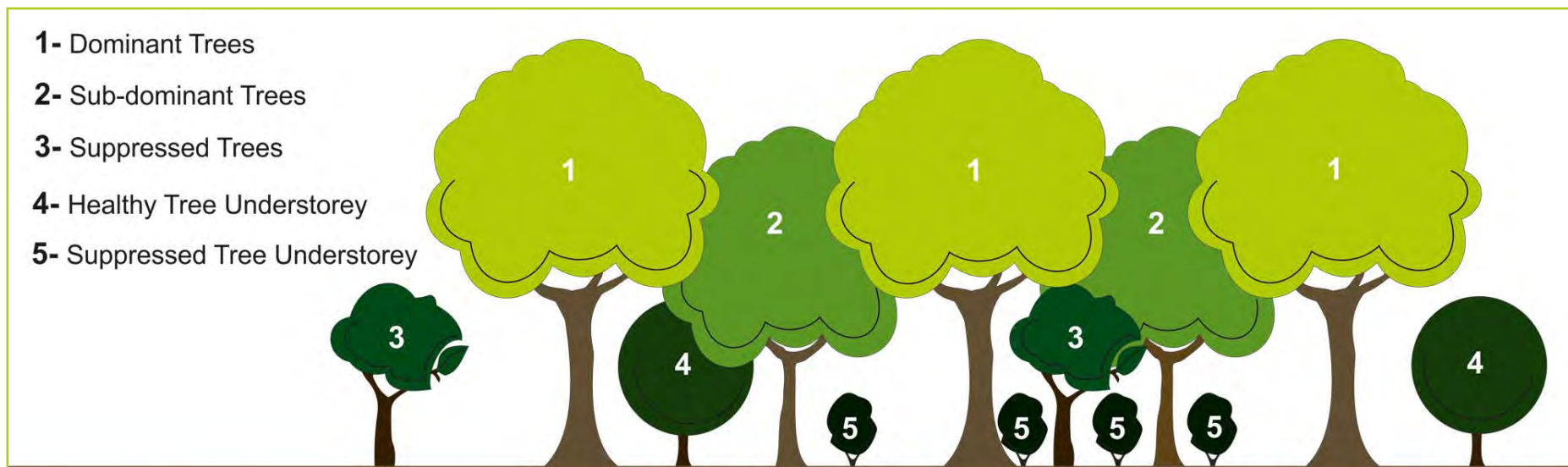
Tree surveys should:

- Clearly identify the whole site for which planning permission is being sought.
- Include all trees on the site irrespective of whether a master plan already exists for the site.
- Include the location of any trees on adjacent land that may be affected by the proposed development.
- Be based on a plan drawn at a minimum scale of 1:500 for sites over 2 hectares, 1:100 or 1:200 for smaller sites.
- Be overlain onto a full topographical survey which gives accurate spot heights, contours, (preferably at 0.5m intervals) and features such as walls, fences, services, overhead wires and watercourses. This will form the basis of the tree survey plan.

3. Pre-Planning Procedures and Survey Information

- Accurately plot the location of all trees including those in groups or woodlands. The following should be recorded in a schedule for each tree: species, height in metres, stem diameter (in millimetres) at 1.5m height above ground level, branch spread in metres taken at the four cardinal points to derive an accurate representation of the crown spread, height in metres of crown clearance above adjacent ground level, and age.
- Give each tree a unique reference number which is identified on site with a corresponding tag.
- Make a statement on the legal or conservation status of the trees, e.g. protected by Tree Preservation Order, in a Conservation Area, Ancient Woodland Site etc.
- Record ground level at the base of each tree.
- Record the ground levels around the edge of the group or woodland.
- Where a large number of trees are growing close together it may be impracticable to survey each tree individually. In such cases the extent of the group and total canopy spread should be plotted along with notes on species, condition, age, health, girth and height. Information about required management such as thinning, scrub removal, pruning or selective felling should also be provided. The approximate number of trees in the group or woodland should be recorded.
- If the trees are in a group or woodland the position of each tree in the group or woodland should be categorised as being: dominant, sub-dominant, suppressed, healthy understorey/healthy young trees and suppressed understorey/suppressed young trees. Each tree should be given a unique reference number and identified on site with a corresponding tag or label. The approximate number of trees in the group or woodland should be recorded.
(See Figure 1 - Woodland Structure below)
- Record the physical condition of each tree in terms of the presence of dead or decaying timber, broken branches, holes, cavities or stem damage should be assessed. The presence of fungi or other decay organisms, and any signs of insect attack should also be noted.
- Preliminary management recommendations, e.g. tree surgery to remove damaged branches or further investigation of suspected defects, disease, pest or pathogens.
- The conservation, heritage and landscape value of the trees should also be recorded.

3.5 Figure 1: Woodland Structure



3. Pre-Planning Procedures and Survey Information

- Assess the wildlife value of individual trees, groups of trees or woodlands. For example, many mature trees are used as bat roosts in summer, and ivy on a tree provides valuable cover for birds and insects. It is an offence under the Wildlife and Countryside Act 1981 and the Conservation (Natural Habitats &c.) Regulations 1994 to deliberately disturb a bat roost, or nesting birds. Further information can be found in SG05 Biodiversity and Development.
- As bats are a European Protected Species it is important that any tree work which may affect them or their roosts is recorded in the tree survey and adequately assessed by a recognised bat expert prior to works commencing.
- The Council strongly recommends that appropriately qualified professionals are employed to carry out survey work. For example a qualified arboriculturalist will be able to carry out a comprehensive survey which accurately assesses tree health and an ecologist will be able to advise on the likely presence of bats or other protected species. For further information consult Scottish Natural Heritage website (see 9.3 Other Organisations).

Further details on tree surveys are given :- BS5837:2012 "Trees in relation to design, demolition and construction - Recommendations". Tree Survey information will help you decide which trees should be removed or retained. Categorise the trees as follows:

Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years

Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years

Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm

Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

Visual Impact

- 3.6 In addition to physical condition make an assessment of the visual impact of the trees. Consider how these may:

screen surrounding properties and block undesirable views,

shelter the development from the wind,

filter noise

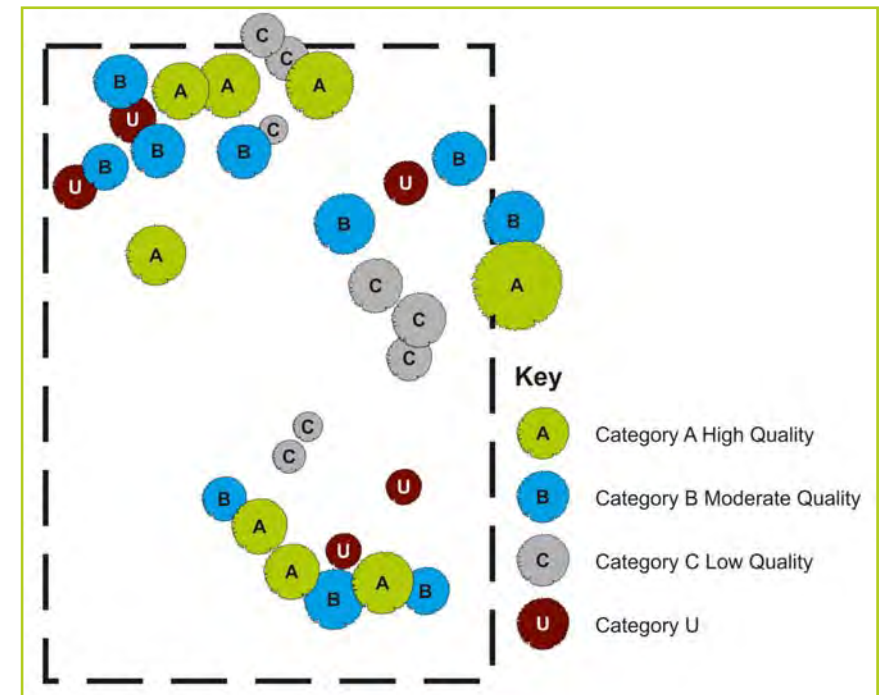
reduce the visual impact of the development,

add value to the development.

Once this information has been gathered assess the value of the trees and decide which trees should be removed or retained. This assessment should be as objective as possible and will be checked and verified by Council staff.

Tree Survey Plan

- 3.7 **Figure 1: Tree Survey Plan**



3. Pre-Planning Procedures and Survey Information

Example of a Tree Survey Table

3.8 Table 1: Example of a Tree Survey Table

Tag Number	Species	Girth	Canopy Spread	Height	Canopy Height	Life Stage	Estimated Remaining Contribution in Years	BS Category	Comments
368	Common Lime	1.50m	10m	19m	5m	M	> 40	A	Minor deadwood throughout; basal epicormic growth
369	Holly, variegated	0.25m	3m	7m	1m	M-A	> 15	C1	Canopy suppressed, poor crown form
370	Oak	0.95m	12m	20m	2m	M-A	> 40	A1	
371	Beech	0.55m	8m	14m	4m	M	> 40	A1	Minor dead wood (<50mm dia)
372	Cherry	0.50m	5m	10m	4m	M	> 35	B1	Damaged hanging branch
373	Wellingtonia	1.50m	4m	22m	3m	M	> 40	A1	
374	Cherry Laurel	0.25m	5m	4m		M-A	> 10	U	Canopy 1 sided. Poor crown form



4. Design and Construction Phases

Design Considerations

- 4.1 Once the tree survey has been completed it should be assessed along with the preliminary site layout. Decisions can then be made on how to site the proposed buildings, roads, car parks, service runs or wayleaves, paths etc. relative to the trees and woodland to be retained and a layout plan prepared.

The position of the site compound during the construction phase of the works must also be considered early in the development process. It should not be located close to or under mature trees that are to be retained. - see section 5.5 "Constraints Plan"

For sites with trees of significance the information contained in the tree survey should play a major role in influencing preliminary site layouts.

Trees on Development Sites

- 4.2 Trees on development sites suffer because:

- The development - buildings, roads, walls, service trenches, the site compound etc. have been sited too close to existing trees and
- There is inadequate protection during construction.

Damage is usually caused by:

- Changes in ground level resulting in a reduction of soil available for the tree to root into, or building soil up around the tree stem and causing the bark to rot.
- Changes in ground level can also result in changes to soil hydrology and trees becoming waterlogged or suffering from lack of water.
- Cutting or physical removal of roots and the tree becoming unstable.
- Soil contamination from spillage of fuel oil or other toxic materials.
- Soil compaction by heavy machinery and storage of materials under the tree canopy.



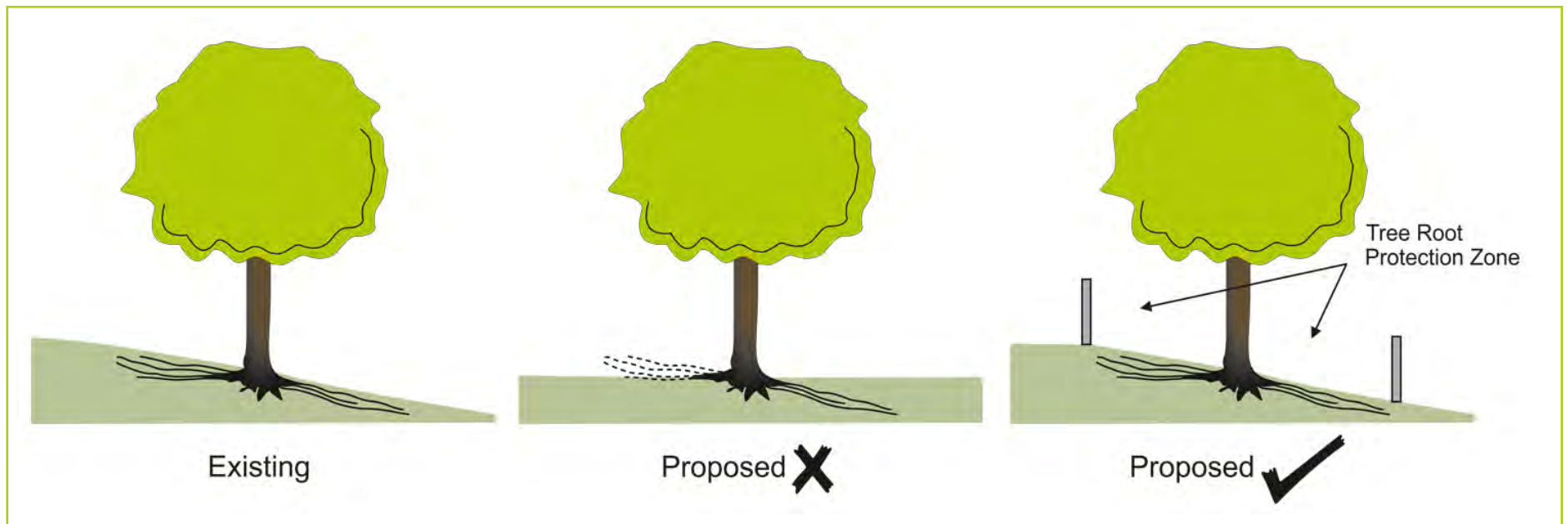
4. Design and Construction Phases

Levels

- 4.3** One area regularly overlooked by developers and householders is that of levels, and in particular change of levels during the construction phase. There is no point in designing a layout that takes account of mature trees on paper, only to find that once excavation works start on site the trees are perched way above a new building or their stems have to be buried to accommodate a new road. It must be remembered that trees, especially mature trees, cannot adapt to significant changes in ground level, or to changes in the level of the ground water table in their vicinity. The use of drawn sections through a site showing levels before and after construction are invaluable in showing how the ground will be altered with respect to trees to be retained. Where trees are to be retained there should be no change to ground level within the root protection area (see section 4.6). Changes around this area should be gradual rather than abrupt.

Changes to landform and level must be clearly indicated on the application drawings.

4.4 Figure 3: Level Changes



4. Design and Construction Phases

Soil - Don't Treat Soil Like Dirt!

- 4.5** The nature and quality of the soil that trees root into is the most important factor in determining long term tree growth and health. It is a complex living system and is the medium from which trees absorb water and minerals and into which roots grow and provide anchorage for the trees.

Soils on development sites are often subject to a variety of disturbances that greatly alter their nature. Building and landscape operations frequently require stripping of topsoil and reshaping terrain (unfortunately referred to as 'muck shifting') storage of the soil in large bings, and respreading either on site or at another location. Such soils inevitably become greatly mixed and their structure will have been substantially destroyed.

Wherever possible topsoil that is to be used for tree planting should be handled as little possible, should be moved when it is dry and must be protected from contamination with toxic compounds such as diesel and cement. Amelioration of the soil with compost and fertiliser will almost certainly be required. BS3882: 'Specification for topsoil and requirement for use' sets out requirements for topsoil handling.

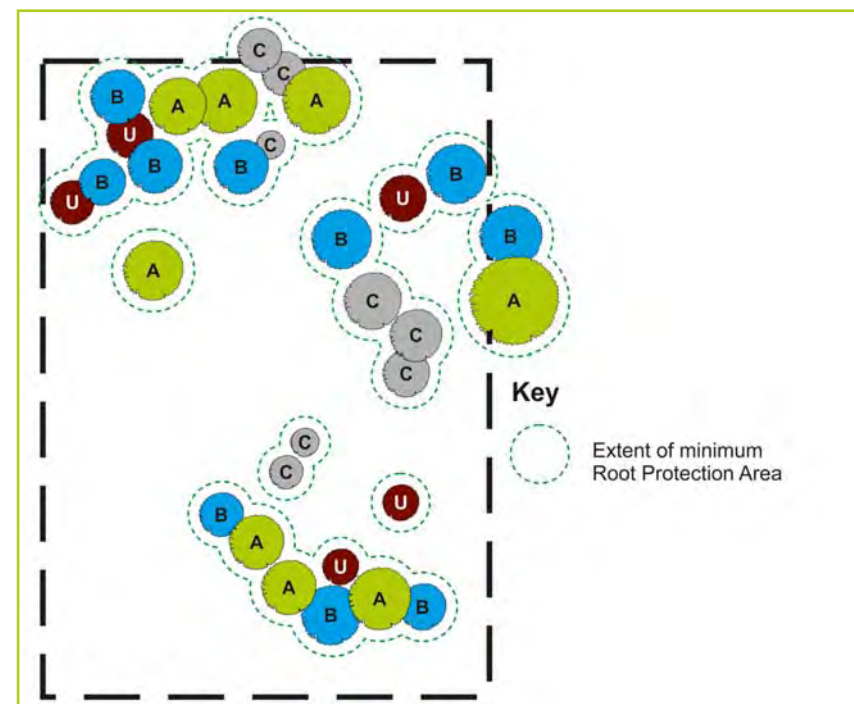
Woodland areas that are to be planted after construction work is complete must be protected as far as possible from the passage of construction machinery. Compaction of soils results in a loss of pore space between soil particles through which roots can penetrate. This can lead to a lack of air and water in the soil. If excluding machinery is unavoidable, once construction work is complete, all compacted soil (subsoil and topsoil) must be removed, the ground ripped to open up for free drainage and relieve compaction and new topsoil imported into the area for planting. Research has shown a common cause of tree death, both in new woodlands and for individual specimen trees is waterlogging.

Constraints Plan

- 4.6** The tree survey plan will be used as the basis for the constraints plan and this will show the area under and around the trees that should be protected from development and construction operations. In order to avoid damage to the roots or rooting environment of retained trees a root protection area should be plotted around each tree. This is a minimum area in m² which should be left undisturbed around each retained tree. The root protection area is an area equivalent to a circle with a radius 12 times the stem diameter (at 1.5m height above ground level) for single stem trees, and 10 times basal diameter (measured immediately above the root flare) for trees with more than one stem arising below 1.5m above ground level. The calculated root protection area should be capped at 707m² which is equivalent to a circle with a radius of 15m. (See Figure 4)

Where there are young trees on a site the constraints plan should also take into account the anticipated mature height and spread of trees. Proposed buildings and structures should be positioned to avoid future issues from arising with relating to leaf fall, overhanging branches and shading.

- 4.7** **Figure 4: Tree Constraints Plan**



4. Design and Construction Phases

Tree Protection Plan

4.8 A tree may take a couple of centuries to reach maturity but can be extensively and irreversibly damaged in just a few minutes. Irreparable damage is frequently done to trees during the first few days of site works. Early erection of tree protection around the edge of the root protection area before works commence on site is essential and is the only way to prevent damage being caused to retained trees by operations in their vicinity. It is essential for those involved with the development works to appreciate the need for maintaining this exclusion zone. Any incursion into this area can quickly destroy all of the time, effort and expense which has gone into the retention of the trees.

Trees are retained on construction sites to enhance the completed development and give it an air of maturity that cannot be achieved with young planting. However, all too frequently existing trees are damaged during construction operations and are seriously disfigured or die. Such damage is often unnecessary and can be avoided if all concerned appreciate the importance of the trees from the outset.

Once the layout proposals for the development have been finalised, a tree protection plan should be prepared containing the following information: (See Figure 5)

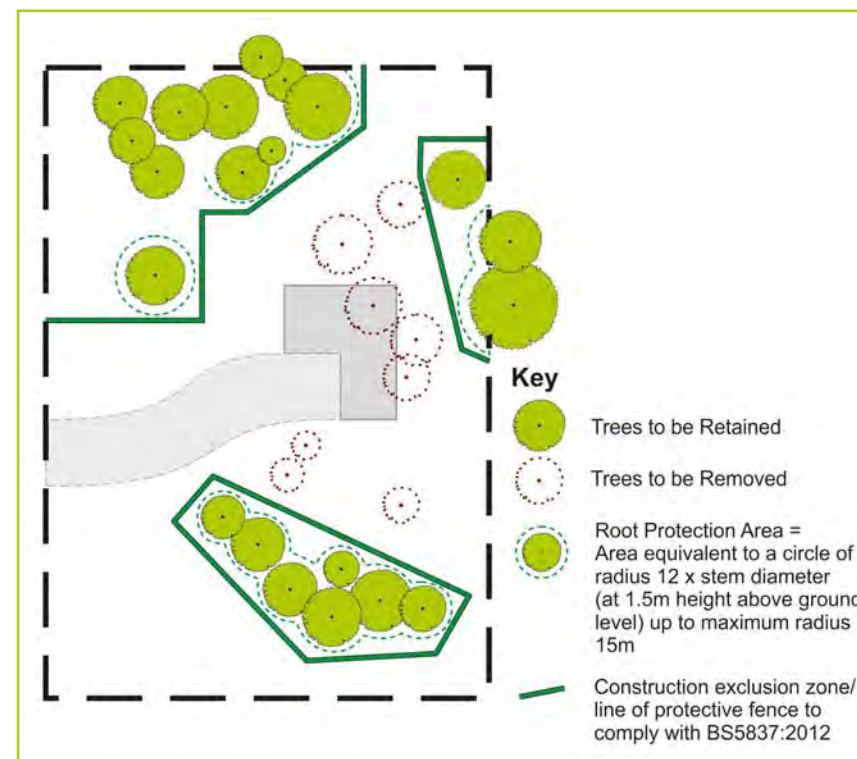
- Trees to be removed.
- Trees requiring surgery. Care should be taken during tree removal or remedial work that damage to retained trees and to the ground within the root protection area is minimised. Work to the trees should be carried out in accordance with BS 3998: Recommendations for Tree Work, and Arboriculture and Forestry Advisory Group guidelines.
- Trees To Be Retained.
- The precise location for protective barriers to form a construction exclusion zone at least as extensive as the root protection zone.
- Design details of the proposed physical means of protection. Barriers should be rigid and be well braced to resist impact. Fences must be well maintained throughout the course of site development and should not be breached at any time. Signs should be attached to the fence, at regular intervals, warning site personnel that the area is protected and to keep out.
- Any development facilitation pruning.
- Areas of future woodland planting to be protected from construction operations to prevent soil structure being damaged or contaminated.

Ensure that boundary trees and those on adjoining land are also considered - their roots and branches may extend into the development site.

In order to avoid disturbance to the protective barriers forming the construction exclusion zone it is essential to consider all construction operations that will take place on the site. It is important to remember that the construction exclusion zone is just that - an exclusion zone - and it will not be acceptable to use the area, for example, for car parking, storage of materials, locating site buildings, or as an access etc.

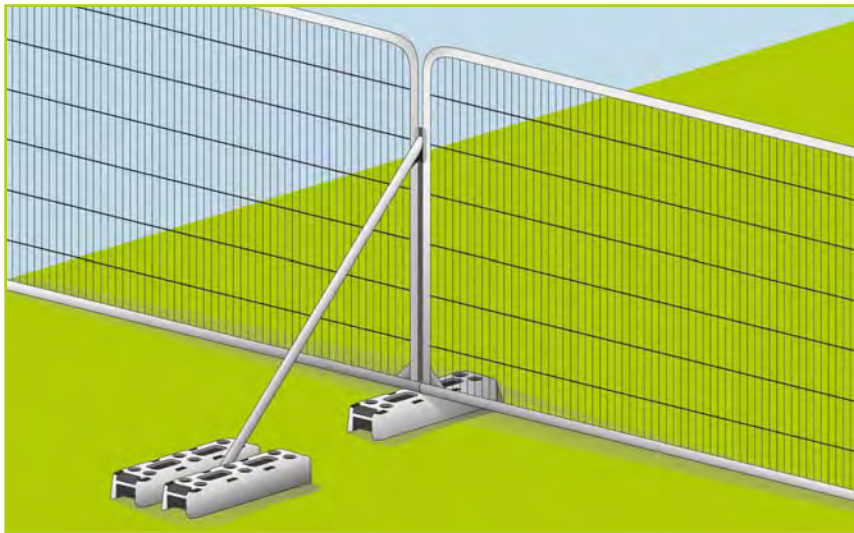
BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations' should be adhered to on all development sites.

4.9 Figure 5: Tree Protection Plan



4. Design and Construction Phases

4.10 Figure 6: Example of Protective Barrier



Damage to Underground Services

4.11 Contrary to popular belief tree roots do not ‘search’ out sewers or storm water pipes as a source of water. However they do follow water gradients in the soil and will move towards wetter soil once moisture has been encountered. Due to the granular nature of the backfill around pipes the service trench can act as a drainage route for ground water. This can lead to roots growing into the trench and around the pipe.

It is generally accepted that roots do not break or force their way into pipes but it is possible that in very confined spaces root growth may displace pipes or exert sufficient pressure to cause these to break.

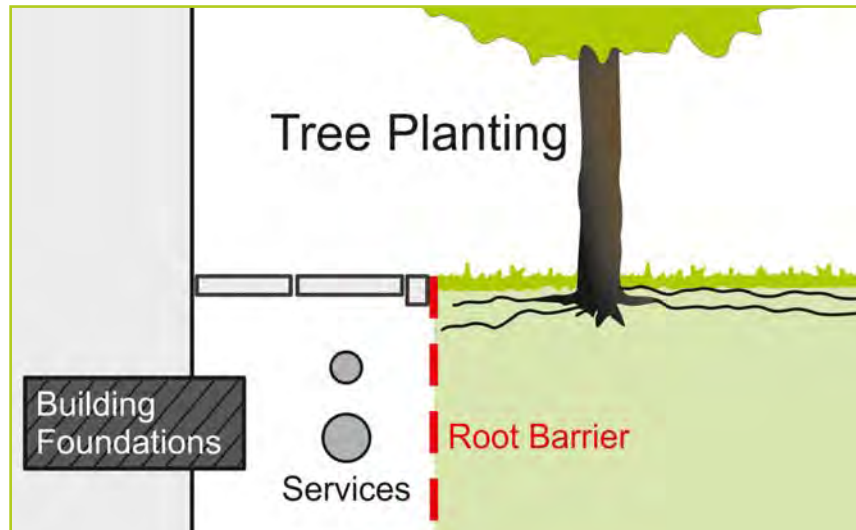
Tree roots can also physically disrupt pipes and cause them to rupture by pulling them up, or by crushing them. As the crown and upper parts of the stem of a tree flex in the wind a considerable amount of the strain is transferred to the root system. This can then be transferred to pipes in contact with larger roots. Those growing under a pipe can lift the pipe, those growing above it could bear down on it and crush it. As the tree increases in size and the wind load increases root size and the likelihood of pipe damage also increases.

The basic principle for locating service trenches is that they should be located outside the root protection area. If placing them under the tree canopy is unavoidable use trenchless installation or excavate trenches by hand so that disruption to roots is minimised. Trenches should be located as far away from the main stem as possible to avoid problems with roots crushing or lifting pipes. A root barrier should also be installed to prevent roots penetrating pipe joints. (see Figure 7)

If feasible keep underground services together in one trench.

4. Design and Construction Phases

4.12 Figure 7: Root Barrier



Overhead Services

- 4.13 If overhead services are being installed these should not run through or be close to tree crowns. If these are being installed in an area of young trees the final tree height and crown spread should determine the location of the cables relative to the trees.

Damage to Pavements and Low Rise Structures

- 4.14 Damage to pavements and kerbs by tree roots is a common occurrence, especially in urban settings. Damage can be caused by roots lifting lightly loaded structures, such as pavements, roads or low walls, or by pushing structures over when roots or stems come into direct contact with these.

Displacement occurs as roots growing beneath the pavement or structure thicken with age. As the roots grow outwards they exert pressure on surrounding materials and can exert sufficient force to crack tarmac and to lift paving slabs. However, even though root systems can be extensive the majority of damage occurs close to the base of the tree where the expansion of the trunk and adjacent roots is greatest. Designs must take into consideration future growth.

Damage to Buildings

- 4.15 Tree roots can damage buildings and other structures both directly and indirectly. Direct action includes damage as a result of the pressures exerted by radial growth of roots. It occurs most often close to the tree and is caused by growth of the main trunk and larger roots, but diminishes rapidly with distance from the tree.

Indirect damage usually means the problems associated with the shrinkage and swelling of subsoils. Basically, as the subsoil becomes wetter it expands, and as it dries it shrinks. Such movement can result in a cyclical pattern of heave and settlement which can cause structures to lift and settle. Such subsidence related damage is generally restricted to expansive clay soils which are relatively uncommon in Scotland, though it can happen in any soil that has a high clay content. A structural engineer will be able to advise on soil suitability for building.

4. Design and Construction Phases

Tall Trees and Buildings

- 4.16** One common area for concern is the damage trees can cause if blown over, or if large branches come off. Council staff regularly receive requests for trees to be removed because they are deemed to be too tall and therefore must be dangerous. Obviously a mature tree can dominate a building and in a strong wind its movement can worry occupants. Other common complaints are leaves blocking gutters and drains and light restriction when branches cast shade on windows or gardens.

Obviously by keeping trees further away from a structure than the fall height of the tree this problem can be avoided. However it is not always practicable, or desirable to do so. Even in a relatively low density development application of such a standard could result in no trees being planted, or existing ones not being retained, which the Council would not find acceptable in urban design terms. There are many examples in and around the Falkirk area where tall trees grow very close to buildings without causing problems.

The key to having tall, mature trees within and around a development or building is regular assessment of the trees' health by a qualified and experienced arboriculturalist. He/she will be able to advise on the presence of disease, insect attack or decay organisms, the extent of work needed and the remaining useful life of the tree.



Avoiding Damage Caused by Trees

- 4.17** Problems caused by root damage to pipes, pavements and structures largely can be avoided by careful design, allowing for future growth and by:

- Ensuring pipes are laid properly and joints are completely watertight.
- Locating service trenches outside the root protection area.
- Planting trees far enough away from pipes so that roots are unlikely to come in contact with them. Determination of the extent of the likely root protection area once a tree is mature will give a guide to planting distance.
- Installation of root barriers to stop further root growth or deflect it away from pipes, pavements and structures.
- Planting trees at least 3m away from pavements, kerbs and other structures and in ground that is being used for other amenity purposes.
- Plant trees in a continuous trench filled with improved topsoil, within a tree pit / pavement support system where they are to be planted close to a pavement or structure. This trench should be as long and as wide as practicable. Install a root barrier.
- Keeping individual planting holes as long and as wide as possible.

The rooting characteristics of different species should also be considered. Cherry, ash, poplar and willow have extensive, shallow root systems, whereas rowans, birch and beech appear to cause fewer problems to structures. However it must be remembered that root systems will adapt to ground conditions and the extent of tree root systems can vary greatly depending on ground conditions and the presence of obstacles in the soil.

5. Design and Maintenance Considerations

Design of New Planting

- 5.1** The purpose of new planting within a development should be determined at the start of the design process so that appropriate species, location and grouping of individual trees or woodland can be determined. Design advice should be provided by an experienced Chartered Landscape Architect.

Trees, either as individuals or in a woodland block, can perform a variety

- Provide shelter.
- Filter noise and dust.
- Reduce air pollution.
- Form a visual barrier to screen an unwanted view or to provide privacy.
- Provide character and create a sense of place.
- Provide natural beauty within a built environment.
- Divide a space, frame views, define routes.
- Contribute to nature conservation, biodiversity and carbon sequestration.
- Provide shade.
- Control erosion.

All new tree planting should be an integral part of the design from the outset, and not tacked on at the end to fill the spaces that are left over. As trees generally are the dominant elements of the long term landscape structure of a site their ultimate height and spread, root spread, form, habit, colour, density of foliage and maintenance requirements have to be considered. In particular the possible effect on the structural integrity of buildings, pavements, services and their effect on neighbouring land must be taken into account.

Try to plant indigenous species where possible, particularly in woodland blocks. However the Council will not insist on native species being planted in all situations and will welcome the use of non-native species selected for their form and appearance, e.g. attractive bark, flower or leaf colour where appropriate.

Try and link new planting to existing nearby tree groups around the edge of the site. This could help form valuable wildlife corridors through the site.

Useful Tree Life

- 5.2** 'Useful life' is also an important concept to consider. An oak tree, under normal conditions, can live for many hundreds of years and will dieback and decay very slowly. Under urban conditions it would not be acceptable to allow such a tree to deteriorate in such a way either aesthetically or because of the danger of falling branches or being blown over. In such a situation, if sequential pruning is not appropriate, it would be preferable to remove the tree entirely before dieback becomes significant and plant a new one. If a tree lined road is being substantially upgraded and improved it may be prudent in management terms to replace the trees at the same time thereby avoiding problems in the future. The Council will look favourably upon such a management regime if it considers it to be appropriate and there are good reasons for the trees to be removed.



5. Design and Maintenance Considerations

Distances Between Trees and Structures

- 5.3 BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations'** gives advisable minimum distances that should be maintained between young trees and new planting and structures to avoid direct damage by trees. For trees over 60cm diameter at 1.5m above ground level at maturity the figures are as follows:

5.4 Table 2: Minimum Distances

Type of Structure	Min. Distance (m) between young trees or new planting and structure		
	Stem dia. <300mm ¹	Stem dia. 300mm to 600mm ¹	Stem dia >600mm ¹
Buildings & Heavy Loaded Structures	-	0.5m	1.2m
Lightly Loaded Structures, e.g. Garages, porches	-	0.7m	1.5m
Underground Services <1m deep	0.5m	1.5m	3.0m
>1m deep	-	1.0m	2.0m
Masonry Boundary Walls	-	1.0m	2.0m
In situ concrete paths and drives	0.5m	1.0m	2.5m
Paths and drives with flexible surfaces or paving slabs	0.7m	1.5m	3.0m
¹ Diameter of stem at 1.5m about ground at maturity			

However these figures do not take into account the benefits that root barriers can have and if installed properly trees can be planted successfully within paved areas without roots causing disruption to adjoining surfaces.

From an aesthetic and practical point there seems little point in planting trees that will be allowed to reach full height and maturity any closer than 6m to a house or large building.

Where trees are growing close to a house and they have outgrown their situation the Council will look favourably at proposals for removal if there are proposals to replace these with young trees. The Council will also support proposals for tree management by pruning and reducing the size of the tree crown if it means the life of the tree can be extended usefully.

New Woodlands and Development

- 5.5** Woodland structure planting in and around new developments can make a significant contribution to the amenity of an area. It can provide a visual screen, filter noise and dust, provide valuable wildlife habitat or act as a link between otherwise disconnected habitats. There is also increasing evidence that access to woodlands improves health and wellbeing.

The Council works very closely with Central Scotland Green Network Trust and together have developed the Falkirk Greenspace Initiative. Through this initiative the Council will work in partnership with organisations like the Trust to create new woodland in appropriate locations. It will require developers to contribute to such improvements (Local Development Plan Policy INF02, Developer Contributions to Community Infrastructure). The Council will encourage any proposals to establish areas of woodland within new developments, particularly if these are accessible and there is good inter-connectivity with other public places.

The criteria outlined in section 5.1 regarding planting individual trees also apply to woodland. However two features of woodland must be given additional and careful consideration, security and shading. Woodlands are, or are perceived to be, locations where anti-social activity takes place. Where feasible route paths through open and preferably well lit areas, and if possible have at least a few houses overlooking the woodland. Development proposals should create a safe and secure environment, (Local Development Plan Policy D02 "Sustainable Design Principles")

Similarly problems with shading caused by blocks of trees can be avoided by careful siting and keeping an area of open ground between the woodland and properties.

5. Design and Maintenance Considerations

Maintenance

- 5.6** Once new trees in a development, or in a newly planted woodland, have been planted these need to be maintained on a regular basis until fully established. All trees must be checked regularly for the following:

Stability - Can the trees withstand strong winds or are they prone to being blown over? If they are unstable the soil around them should be re-firmed, topped up as required if settlement has occurred, and stakes either re-firmed or installed.

Damaged and Broken Shoots - Damaged and broken shoots can look untidy and become the point of entry for disease and decay organisms. These should be removed as soon as possible and all pruning work carried out in accordance with good horticultural practice and to **BS3998:1989** “**Recommendations for tree works**”

Weed Growth - Weed species such as grasses compete very vigorously with newly planted trees for water and nutrients. It is essential that a circle of at least 1 metre diameter is kept weed free for at least three years after planting.

Water - In prolonged periods of dry weather the soil around tree roots can dry out very quickly. Water stress is the most frequent cause of dieback in amenity trees and accounts for around 50% of all deaths. Provision must be made for regular watering during such conditions to avoid drying out of soil. It should also be remembered that the larger the tree planted the greater the stress it under and the greater will be its water requirement. After planting and whilst the soil is wet, and weed free, application of a mulch can be beneficial to moisture retention. Mulches can be organic, such as partially composted woodchip or tree bark, naturally inert such as gravel, or inorganic like synthetic mats and landscape fabrics.

Shelters and Protection - Establishment of broadleaved species is helped by the use of individual tree shelters which can also protect the plants from rabbit, deer and vole damage. These must be fixed securely and weed growth around the base regularly treated with herbicide to avoid problems of excessive weed growth within the shelter.

The Council will require full details of how newly planted trees, areas of amenity shrub planting and woodland are to be maintained and by whom before planning permission is given for a development.

Enforcement

- 5.7** The Council will treat seriously any damage to trees in the following categories:

Trees protected by Tree Preservation Order (TPO) or Conservation Area status: Unauthorised felling or other damage to protected trees is a criminal offence and could result in those responsible being reported to the Procurator Fiscal. Substantial fines can be imposed by the courts for serious and persistent offenders. Under planning legislation the planning authority can also require that replacement trees are planted.

Trees On Development Sites: Where trees are not already covered by statutory protection, conditions may be included within the planning permission requiring their protection. Failure to comply could result in the planning authority taking enforcement action to remedy the breach, and could involve stopping all work on site until the situation is remedied.



6. Permissions and Contacts

Permissions

6.1 Tree Works Consent

Tree works consent is required where work to tree/s protected by a Tree Preservation Order or Conservation Area is to be carried out.

Contact:

Planning Officer (Landscape)
Planning & Environment Unit,
Development Services,
Abbotsford House,
David's Loan,
Falkirk
FK2 7YZ

Tel 01324 504950

Email : planenv@falkirk.gov.uk

Planning Permission

Development Management Unit
At the address & telephone number above
Email : dc@falkirk.gov.uk

Other Council Contacts

6.2 Planning history relating to trees contact:

Development Management Unit
At the address & telephone number above
Email : dc@falkirk.gov.uk

Trees and roads or footpaths contact:

Design and Development Services,
at the address & telephone number above
Email: roads@falkirk.gov.uk

High Hedges contact:

Development Management Unit
At the address & telephone number above
Email : dc@falkirk.gov.uk

Trees on Council owned land:

Estates Management
Corporate & Neighbourhood Services
Falkirk Council
Earls Road
Grangemouth
FK3 8XD
Tel 01324 501104/501103
Email : contactcentre@falkirk.gov.uk

6. Permissions and Contacts

Other Organisations

6.3 Felling Licences contact:

Forestry Commission
Central Scotland Conservancy
Bothwell House
Hamilton Business Park,
Caird Park
Hamilton ML 0QA
Tel: 01698 368530
Email: centralscotland.cons@forestry.gsi.gov.uk
www.forestry.gov.uk

Trees within Sites of Special Scientific Interest (SSSI) and where treeworks may affect protected species contact:

Scottish Natural Heritage
Silvan House
3rd Floor East
213 Corstorphine Road
Edinburgh
EH12 7AT
Tel 0131 316 2600
Email: forth@snh.gov.uk
www.snh.gov.uk

Trees on Scheduled Monuments or on a site listed in the Inventory of Gardens and Designed Landscapes in Scotland

Historic Scotland
Longmore House
Salisbury Place
Edinburgh
EH9 1SH
Tel 0131 668 8600
www.historic-scotland.gov.uk

Central Scotland Green Network Trust (from 04/14)
Hillhouseridge
Shottskirk Road
Shotts
ML7 4JS
Tel 01501 824190
Email: supportunit@centralscotlandgreennetwork.org
www.centralscotlandgreennetwork.org

Arboriculturists

Arboricultural Association
The Malthouse,
Stroud Green,
Stonehouse,
Gloucestershire,
GL10 3DL
Tel 01242 522152
Email: admin@trees.org.uk
www.trees.org.uk

Landscape Architects

Landscape Institute
12 Roger Street
London
WC1N 2JU
Tel 020 7685 2640
www.landscapeinstitute.co.uk

Foresters

Institute of Chartered Foresters
59 George Street
Edinburgh
EH2 2JG
Tel: 0131 240 1425
Email: icf@charteredforesters.org
www.charteredforesters.org

Further Reading

6.4 “Tree Roots in the Built Environment”

Roberts, Jackson & Smith; TSO 2006

BS 3998:2010 Tree work. Recommendations

BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations

This guidance is part of a series of Supplementary Guidance booklets produced by the Planning & Environment Unit. See page opposite Contents.

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