

**Urban
Forest
Strategy**

**Supplementary Planning Guidance
Trees on Development Sites**

**May 2001
Updated October 2012**



**Nottingham
City Council**

INTRODUCTION.

Trees make an important contribution to our environment. Trees absorb carbon dioxide, and emit oxygen. A mature tree in one growing season emits as much oxygen as ten people inhale in a year. Trees and the urban forest benefit the city in numerous ways, including:

- creating a more pleasant environment in which to live and work
- providing positive health and well-being benefits
- screening and softening of hard landscapes
- assisting in urban regeneration
- mitigating the impact of climate change and helping adaptation
- intercepting and slowing storm water runoff
- providing habitat and connectivity for wildlife.

These are summarised in appendix 2 and explained in more detail in the Council's **Urban Forest Strategy**.

The National Planning Policy Framework (2012) identifies natural environment as one of three dimensions to sustainable development that must be supported by the planning system, and makes clear that local planning authorities should plan for the enhancement and management of networks of green infrastructure. Recognising the importance of the urban forest the Council developed this **Supplementary Planning Guidance – Trees on Development Sites**, an integral part of the Urban Forest Strategy to be applied in accordance with the strategy's aims and principles.

The vision for Nottingham's urban forest is:

“Create an urban forest that is designed and sustainably managed for the benefits of Nottingham's communities.”

To achieve this, the city has set the target of increasing the urban forests canopy cover from its current level of 14% to 20% by 2030. Delivery is guided by the Urban Forest Strategy's 12 principles (core policies). The Supplementary Planning Guidance is part of the Council's response to Principle 10 in particular, though all 12 are relevant in any consultation and decision making:

“Respond to planning applications in a manner which ensures a sustainable and high quality tree and wood population is retained.”

The aims and principles of the Urban forest strategy are set out in appendix 1. More details can be found in the Strategy, available on the Council's website.

The retention of mature, healthy trees on a new development can greatly enhance the appearance of the development, providing instant maturity and embedding green infrastructure. Trees are, however, delicate organisms which are extremely vulnerable to damage during construction works. It is essential that suitable precautions are taken to provide adequate space for trees and to protect trees from damage on development sites.

The, often massive structure of a mature tree above ground, consisting of its trunk, branches, twigs, and foliage (leaves, flowers and fruit), uses and stores solar energy and gases from the

atmosphere. Below ground the, far less obvious, extensive roots are equally efficient in absorbing the water and minerals. Together the above and below ground parts of the tree combine to produce the materials and compounds needed to sustain a healthy long lived organism. This Supplementary Planning Guidance sets out ways in which developers and the Council can work together to achieve this.

The benefits and values of trees in the urban environment mostly relate to that which can be seen above ground. However, it is the ability of roots to function in the urban soil, often hostile to tree growth, that is crucial to growing and maintaining healthy trees. It is the roots system which is frequently ignored and damaged by peoples activities (such as excavation, construction and compaction), though it is also the roots, rather than the aerial parts of the tree that play biggest part in damaging adjacent infrastructure (lifting pavements or subsidence).

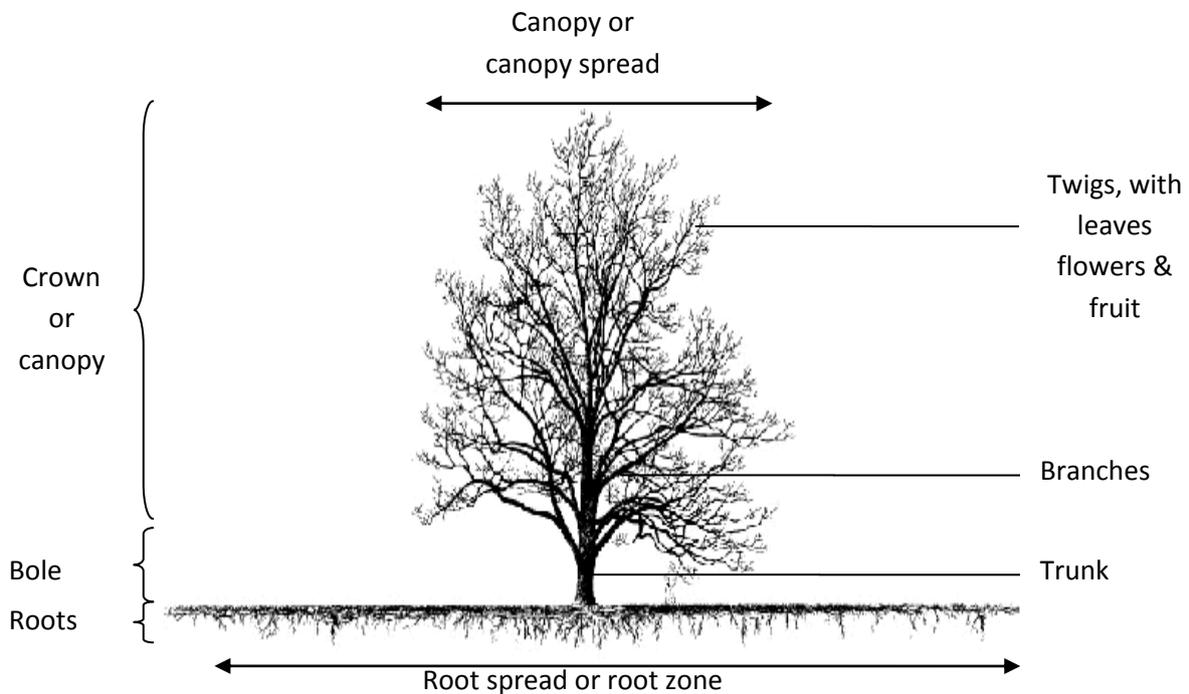


Diagram 1: Parts of the Tree

Despite their appearance of solidity and longevity, trees are easily damaged, and require all parts, both above and below ground to survive. For most trees under normal conditions, the root-shoot ratio is approximately 1:5; the top is 5 times heavier than the roots. If it were not for the weight of the trunk and structural branches, though, the top and roots would weigh about the same and of equal importance to the tree. The above diagram gives an indication of how a tree grows, the roots will spread out in a broad horizontal plane, just below the soil surface (they need oxygen to survive so grow above the permanent ground water table, with the vast majority in the top 600mm of the soil).

1. THE LEGAL AND POLICY FRAMEWORK

The Town and Country Planning Act 1990 makes it a duty of the Local Planning Authority to ensure in granting planning permission that adequate provision is made for the protection and planting of trees, both through the use of planning conditions and of Tree Preservation Orders.

Additionally, the Nottingham Local Plan 2005, which is the current adopted Local Plan for the City of Nottingham, includes a number of policies that relate to trees. The most important of these is policy NE5 which states that the Council will seek to protect existing trees and secure the planting of new trees.

Additionally, policy BE5 states that the council will seek to ensure that an appropriate scheme of landscaping, incorporating or complementing established features within the site or vicinity.

The Local Plan is further supported by Ambitious For Wildlife Biodiversity Statement (2011), The Urban Forest Strategy (2012) and Breathing Space Open Space Strategy (2011).

This Supplementary Planning Guidance is intended to offer additional guidance to developers as to how these policies will be applied by the City Council and what will be required of developers seeking planning permission for developments that may affect trees.

2. HOW TREES ARE DAMAGED

2.1. Damage to roots

Potentially the biggest threat to a tree on a development site is through damage to the roots and this type of damage is all the more worrying as it can take several years to become evident. Tree roots generally consist of a mass of rapidly subdividing fibrous (feeding) roots, with a few larger structural (supportive) roots. The roots are likely to extend to at least the edge of the canopy and the vast majority of them will be found in the top 600mm of soil.

The smaller, fibrous roots provide moisture to the tree and are vital for tree health. These roots require oxygen in order to survive, which they find in the tiny pockets that exist throughout the upper layers of aerated soil. Compaction of the soil, whether by passing construction traffic and machinery over it or by increasing soil levels, will remove much of the oxygen from the soil and is likely to kill fibrous roots.

Any changes in level within the canopy area of a tree can have a seriously damaging effect on the tree's future health.

Cutting of larger roots will not only kill the fibrous roots connected to them but can affect the stability of the tree and may result in the tree having to be removed on safety grounds. This can happen during excavation for footings, service trenches or for regrading.

2.2. Impact Damage

Trees on development sites can often be damaged directly by physical impact with construction machinery. Being reversed into by delivery vehicles or having digger buckets entangled in the branches are amongst the most common problems.

Any damage to tree bark can create an environment in which fungi are able to infect the tree and cause decay.

2.3. Poisoning

Many of the materials used on development sites are toxic to trees and must not be allowed to come into contact with either the tree itself or the ground. Such materials include cement, bitumen, diesel and hydraulic fluid. Safe storage of such materials is not just important for the protection of trees but may also be a legal obligation under other legislation.

3. WHAT YOU NEED TO DO.

3.1. The Design Process

The best way to ensure appropriate trees are retained in a healthy state is to make sure the design process takes account of the need of trees. The first step is to commission land and tree surveys.

3.1.1. Land Survey

First of all a detailed land survey should be undertaken plotting the site as it is at present, with levels being taken through out the site. This survey should include the location of all the trees on the site, any trees whose canopy overhangs the site or would do if it had not been pruned, or any tree within a distance from the site boundary of less than half its own height. It is important that the location of trees is accurately plotted (to within 1m).

3.1.2. Tree Survey

A competent arboriculturist or suitable other professional with experience in the protection of trees on development sites should carry out the tree survey in accordance with BS 5837: 2012 Trees in relation to design, demolition and construction: Recommendations. It is desirable to retain category A and category B trees. For householder applications it will be sufficient to submit stem diameter measurements for plotted trees.

3.1.3. Design Considerations

Once the tree survey has been completed it will be clear which trees should be retained on the site and which may be removed. Having established which trees will be retained the design team is in a position to account for the needs of trees - in the design.

The following points will need to be considered

Position of Buildings

- Substantial excavation must take place outside the protected zone of trees, bearing in mind that some space will be necessary for working.
- It is advisable to keep buildings at least 1m from the edge of the canopy of mature trees to avoid direct damage to the building from tree branches. For younger trees greater allowance should be made for future growth.

Greater distances may be required if the tree is near a window of a habitable room, especially on the south side.

- When building near trees it is important to consider the design of the foundations to avoid possible subsidence problems in future. This will depend on the type and size of tree and the nature of the soils. Guidelines can be found in
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NHBC Chapter 4.2

Levels

- Level changes within the protected zone of a tree should be limited in scope and informed by arboricultural advice.
- Changes in levels close to a protected zone may require retaining walls.

Access

- The location of roads, driveways and access points should avoid the root protection zone (RPA) of the tree as far as possible.
- Whilst it may be possible to construct surfaces for light traffic within the RPA this will have to be done without excavation and where necessary to an adoptable standard.

Services

- The location of service ducts, drainage runs and septic tanks etc should be clear of trees' protected zones.
- Where possible, keep all services together and avoid surrounding a tree with trenches.
- If running a service duct underneath a tree canopy is unavoidable it must be hand dug, retaining roots above 25mm in diameter, or thrust bored.
- Service runs must be shown on submitted plans, in relation to position and canopy spread of trees to be retained.

3.2. Submitting your plans

In order to process your application the Council will require the following additional plans and documents:

- A layout plan with trees to be removed clearly marked in red and those to be retained marked in green.
- A tree survey in accordance with BS5837 (2012) ***Trees in relation to design, demolition and construction – Recommendations.***

The Council will then require an arboricultural method statement (AMS) in accordance with BS5837 by pre-commencement condition. This will comprise some of the following:

- A plan showing the location of protective fencing around the retained trees together with the following details:
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- The location of all service trenches, drainage runs, septic tanks and other buried apparatus.
- The location of materials storage areas and construction traffic access points. Storage areas should not come within 5m of any tree trunk or main stem.
- Existing and proposed levels within the protected zones of trees.
- A method statement clearly indicating how the protection of trees on the site is to be ensured. This should include at least the following:
 - When the protective fencing will be put in place. This should be prior to any work, whether demolition, excavation or construction, taking place and the fencing should stay in place until all work is completed.
 - Design of protective fencing. BS5837:2012 gives useful guidelines but the council will consider the merits of alternative suggestions. Fencing must be both sturdy and not readily moved.
 - Statement to the effect that no operations will take place within the protective fencing. Notices should be attached to the fencing at regular intervals to this effect.
 - Statement to the effect that all materials will be stored in the designated storage area.
 - Statements about the location relative to trees of any fires to be lit on site - no flames should be allowed within 5m of any foliage.
 - Details of the means of constructing any hard surfaces that come within the canopy of a tree.
 - Details of the method of excavation of any service trenches, drainage runs etc that come under the canopy of a tree. NJUG Vol 4 gives useful guidance but the council will consider the merits of alternative suggestions.
- On more sensitive sites the Council may ask you to arrange for supervision and regular inspection of tree protection measures to be undertaken by a competent arboriculturist.

If this is the case you should include details of your arrangements for arboricultural supervision.

It will usually be possible to combine some of the information required onto the same plans.

3.3. On Site

On site you should do exactly as you have said you will do in your Method Statement and accompanying plans

Where the tree survey has identified the need for tree surgery this should be included in the AMS along with other required pruning in the submitted AMS and will usually be carried out prior to any development works commencing.

Development plans rarely stay the same throughout the whole development process - problems come to light which require slight changes to the original plans.

Where this happens you must contact the City Council to gain their agreement before continuing with work.

4. CHECKLIST

Before you submit your scheme please make sure it:

- Includes a tree survey
 - Includes details of which trees are to be retained and which to be removed
 - Includes details of existing and proposed levels near trees
 - Includes details of all existing and proposed hard surfacing within a tree's protected zone
 - Includes details of the location of any proposed or existing underground service runs
 - Avoids locating any temporary or permanent features which might injure trees within the protected zone
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5. FURTHER INFORMATION

BS3998:2010 *Recommendations for Tree work* British Standards Institute

BS5837:2012 *Trees in relation to design, demolition and construction - Recommendations* British Standards Institute

NJUG Vol 4 *Guidelines for the planning, installation and maintenance of utility services in proximity to trees* National Joint Utilities Group, November 2007

NHBC Chapter 4.2 *Buildings near trees* National House Building Council

Nottingham Local Plan Development Department, Nottingham City Council
Nottingham City Council (2005)

Urban Forest Strategy Department of Leisure and Culture, Nottingham City Council
Nottingham City Council (2012, consultation draft)

Ambitious for Wildlife: Biodiversity Statement Department of Leisure and Culture
Nottingham City Council (2011)

Breathing Space Open Space Strategy Department of Leisure and Culture
Nottingham City Council (2011)

APPENDIX 1: SUMMARY OF AIMS AND PRINCIPLES.

The aims and principles of Nottingham’s Urban Forest Strategy are summarised into its vision:

**“CREATE AN URBAN FOREST THAT IS DESIGNED AND MANAGED SUSTAINABLY,
FOR THE BENEFITS OF NOTTINGHAM’S COMMUNITIES.”**

To achieve the vision two aims have evolved, to create Nottingham’s urban forest, each with its own guiding principles:

- **AIM 1: TO DESIGN A SUSTAINABLE URBAN FOREST**
- **AIM 2: TO MANAGE A SUSTAINABLE URBAN FOREST.**

Decision making involves many factors, which sometimes can appear contradictory. These are set out below as the principles which will guide the decision making that will enable the city to achieve its vision and target.

- **PRINCIPLE 1: ENSURE THAT THE TREE AND WOOD POPULATIONS ARE PROTECTED, ENHANCED AND, WHERE APPROPRIATE EXPANDED**
 - **PRINCIPLE 2: MAINTAIN TREES AND WOODS IN ACCORDANCE WITH LANDOWNERS OBLIGATIONS, WITH PARTICULAR ATTENTION FOR THE SAFETY OF PEOPLE AND PROPERTY**
 - **PRINCIPLE 3: MANAGE TREES AND WOODS IN A MANNER WHICH BENEFITS LOCAL COMMUNITIES, WHILST ENSURING PROBLEMS ARE PROMPTLY AND APPROPRIATELY DEALT WITH.**
 - **PRINCIPLE 4: ENCOURAGE NEW AND REPLACEMENT TREE AND WOOD PLANTING, USING APPROPRIATE TREE SPECIES**
 - **PRINCIPLE 5: THE REMOVAL OF TREES AND WOODS SHALL BE RESISTED, UNLESS THERE ARE SOUND ARBORICULTURAL OR OTHER REASONS TO INDICATE OTHERWISE.**
 - **PRINCIPLE 6: MANAGE ITS WOODS IN A FULLY SUSTAINABLE MANNER.**
 - **PRINCIPLE 7: ALL TREE AND WOODLAND MANAGEMENT DECISIONS WILL TAKE APPROPRIATE ACCOUNT OF CLIMATE CHANGE, AND NATURAL ENVIRONMENT PROTECTION**
 - **PRINCIPLE 8: PROVIDE A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION TO INDUSTRY AND PEER BEST PRACTICE STANDARDS AND ACT AS AN EXAMPLE FOR OTHERS TO FOLLOW.**
 - **PRINCIPLE 9: RESPOND TO TREE WORK APPLICATIONS IN A MANNER WHICH ENSURES A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION IS RETAINED.**
 - **PRINCIPLE 10: RESPOND TO PLANNING APPLICATIONS IN A MANNER WHICH ENSURES A SUSTAINABLE AND HIGH QUALITY TREE AND WOOD POPULATION IS RETAINED.**
 - **PRINCIPLE 11: APPLY RESOURCES IN A CONSIDERED MANNER TO ENSURE GREATEST COMMUNITY BENEFIT AND TO MEET ITS OBLIGATIONS**
 - **PRINCIPLE 12: ENCOURAGE AND ENABLE GREATER AWARENESS AND BETTER UNDERSTANDING OF TREE AND WOOD MANAGEMENT, IN ORDER THAT COMMUNITY CONSULTATION AND INVOLVEMENT IS ENCOURAGED.**
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APPENDIX 2: BENEFITS OF THE URBAN FOREST

Trees have long been held a valued place in the urban environment, though, as greater pressure is being exerted on using urban land, space available to trees is becoming more limited. Early planting in the city would have been to improve the visual landscape, disguise some of the uglier parts of a busy industrious city. The city's forebears recognised the restorative value of trees, and their benefits to people's well-being. Since then research has been able to substantiate, the observations of these early visionaries, as well as many other, important benefits of trees in a modern urban environment.

The urban forest helps to define the character of Nottingham just as much as the architecture and fabric of particular communities will, for example the London planes in the Boulevards, the Park Estate and Mapperley Park. Now recognised for their breadth of benefits, trees in the urban environment continue to be relevant and an important component of a sustainable city. Though it is also recognised that care and maintenance is needed if trees are to fulfil their role without becoming a nuisance to neighbours, or a potential hazard

Trees and People

- Beautiful in their own right, providing colour and form to the landscape, also helping to mark the change of seasons.
- Create more pleasant environments, which have positive effects on people's behaviour, bringing about stronger and more stable communities
- For recreation, the urban forest, offers benefits to children, allowing creativity of mind, encourages exploration and adventure, promotes physical activity, builds resilience and enhances experiential learning.

Health Benefits of Trees

- Positive effects on people's wellbeing and can encourage hospital patient recoveries, reducing the amount of time spent in hospital.
- Tree and woods are now promoted as "nature's health service". The restorative effects are greatest for those who actively interact in the natural environment, but even just viewing trees and nature through window can have psychological benefits.
- The canopy formed by trees has indirect human health benefits, their shade during hot summer days to a reduce heat related illnesses.

Trees and Noise

- Often it is not possible to provide effective barriers to noise, in these instances trees may be able to provide a visual screen between the source of noise and hearer. Whilst the sound reduction is negligible the lack of direct view creates the impression of greater noise reduction.
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Trees and Urban Regeneration

- Trees help improve the environmental performance of buildings – increasing tree cover in a well planned development can lower heating and cooling costs by 20%
- Tree canopies and root systems play a key role in mitigating flood levels during extreme events and have the ability to lower storm water flows into the existing drainage infrastructure and so reducing the risk of damage
- Tourism and city marketing can be boosted by a good quality urban forest as recognised by “Green Flag” awards. Green Flag urban parks can be marketed as city attractions and will provide attractive settings for various events and activities which will boost the local economy.
- Tree planting in streets has been shown to directly enhance and improve the neighbourhood aesthetics and may increase property values by 7 – 15%

Effects of Climate Change

Climate change is now recognised as one of the most serious challenges facing us today and its potential impacts for trees and forests are well documented. The UK climate change scenarios indicate average annual temperature increases could be 4.5°C by 2080. However, these scenarios do not take urban surfaces into account, which have the potential to further increase these predicted temperatures due to the urban heat island effect.

- the urban forest helps to mitigate the Urban Heat Island effect by; transpiration (helping to reduce day and night-time temperatures in cities, especially during summer), canopy shade (canopies provide shade for buildings, streets and footpaths and reflection (leaves reflect and absorb sunlight, minimising the heat absorbed by the built environment during the day).
- During photosynthesis trees convert carbon dioxide and water into sugar and oxygen and then sequester (store) the carbon, making a significant contribution toward absorbing carbon from the atmosphere, and emit the oxygen we all breath.
- The urban forest helps urban areas adapt to the impact of climatic change regardless of whether they are in parks, private gardens or street trees, but the space, size, quality and vegetation type and proportion of coverage all influence the level of impact. Open space within towns and cities, rather than as a green belt, might be more effective in helping adaptation.
- Atmospheric particulates (emissions from industry and vehicles have been linked to increased incidences of illness in people (eg asthma and allergies). Trees have an important role in combatting (mitigating) these effects. Some are absorbed and used as part of the trees growth processes, other, larger particulates are filtered from the atmosphere by attaching themselves to leaves. The closer trees (and greater their canopy) are to the sources of pollution the greater their contribution and benefits

Trees and Storm Water

Urbanization changes many attributes of the land that is developed and built upon. One of these is a reduction in the permeability of surfaces leading to changes in patterns of runoff and increased loads of pollutants entering water courses.

- Tree canopies and root systems reduce storm water flows and nutrient loads that might otherwise end up in our waterways. Broad canopies intercept and mitigate the impact of heavy rainfalls and healthy, fibrous, tree roots help reduce the nitrogen, phosphorus and heavy metal content in storm water

Trees and the Natural Environment

- A healthy and sustainable urban forest will increase biodiversity in the city, becoming a home or roost to a wide range of species; even endangered animals and other biological species of high conservation value.
- All trees support a range of other wildlife which either feeds directly on the tree itself, or indirectly on something else which is feeding on the tree, even the smallest sapling

More detail of the benefits from the urban forest, and the Council's approach to managing it for the benefits of Nottingham's citizens and visitors can be found in the **Urban Forest Strategy** available at the Council's website. To provide these benefits, trees need space above and below ground to grow, and to be properly cared for.
