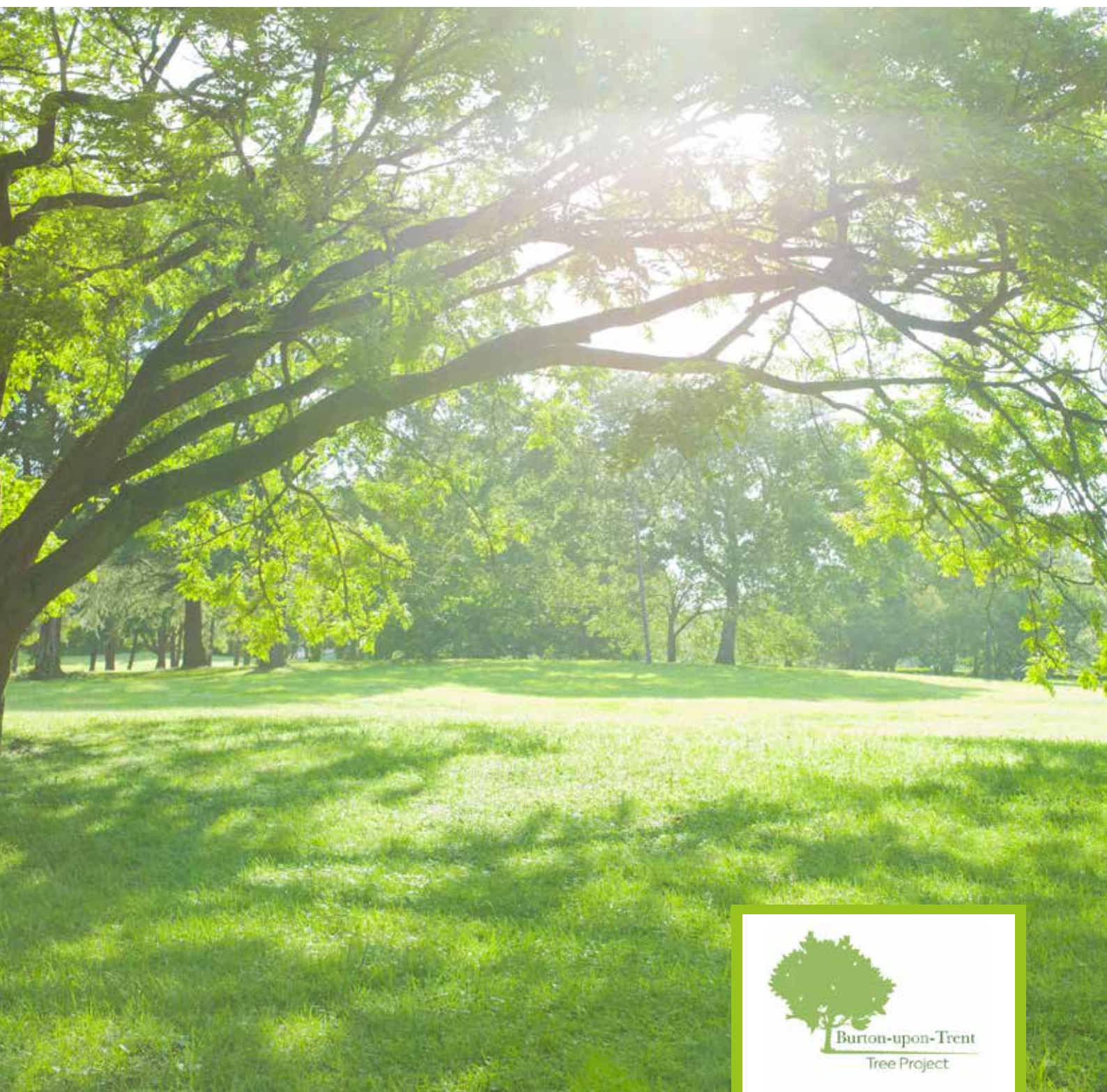


STAFFORDSHIRE DEVELOPERS AND PUBLIC BODIES
TOOLKIT FOR DESIGNING,
PLANTING AND MANAGING
PUBLIC REALM TREES



Burton-upon-Trent
Tree Project

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INTRODUCTION

Trees can provide multiple benefits to local communities. This includes reducing the impact of climate change, enhancing health, biodiversity and sustainability. In addition trees can also provide individual benefits such as increased property values and improved environmental performance of buildings. Public realm trees play a critical role as they are accessible to all, and shape spaces and places used on an everyday basis.

This Toolkit provides a set of key principles, actions, references and checklists to assist with the planning, design, selection, planting and management of public realm trees across Staffordshire.

It is specifically aimed at:

- Developers and their design and contractor teams as they develop proposals from initial concepts to implementation.
- Development control officers as they advise prospective applicants, determine applications and monitor implementation.
- Highway engineers and public realm designers, as they develop streetscape projects.

This toolkit is supported by three checklists which have been designed specifically for developers, development control officers and highways project managers to put the principles identified in this toolkit into practice. These can be found on Staffordshire County Council website:

www.staffordshire.gov.uk/PublicRealmTrees



WHY PLANT AND MAINTAIN TREES IN THE PUBLIC REALM?

Trees and other plants offer a number of benefits that improve the visual and environmental quality of the public realm. Opportunities for introducing new trees often stem from new developments or regeneration projects, where trees are not the primary goal of the investment. In these situations, trees can sometimes be overlooked or become vulnerable to cuts.

Trees and other ornamental planting within urban environments can offer a number of benefits that improve the visual and environmental quality of the public realm. A few examples that trees can provide are:

- A sense of place
- A focal point or framing of a focal point or view
- Demarcation of routes and highlight key transport corridors through the use of boulevards and avenues
- Improvement in the scale and proportion of very wide streets and spaces
- Shelter from wind, rain and sunlight
- Improved air quality
- A more diverse urban ecosystem by support for a variety of wildlife
- A screen, or to filter views.

There is a lot to be gained by including trees in the public realm, more specifically:

For a developer

Good public realm tree planting can improve the attractiveness, provide a sense of place and help demonstrate the quality of the proposed development to enhance marketability.

For local planning authorities

Local planning authorities have a statutory duty to consider the effect of proposed developments on existing trees, and to ensure that provision is made for planting new trees. Local authorities have a large number of national priorities and duties to deliver against, such as public health, local regeneration, adaptation to climate change and biodiversity. Trees can have a positive influence on all of these.

For highway authorities

Trees can make positive contributions to road safety and traffic calming, encourage active travel and provide sustainable drainage, especially in a town centre context or in residential streets.

THE STAFFORDSHIRE CONTEXT: BURTON TREE PROJECT



The tree population across Staffordshire isn't known. However, data is available for Burton-Upon-Trent, where an i-Tree Eco assessment¹ was conducted in 2016.

The assessment showed that Burton has an estimated 9.4% tree cover, which is lower than the average 14% found in other UK towns and cities where similar studies have been conducted. This, together with the low age and species profile of the tree population limits the benefits the urban forest brings to the area. Increasing the tree cover as well as the species and age diversity are priorities to maximise the contribution trees provide to the community and environment.

The role of new developments in Staffordshire - the policy framework

New developments are a major source of rapid change across Staffordshire. Local planning policies and guidance help to set a framework to ensure new developments incorporate the retention and planting of trees, and should be referred to when planning a new development.

As an example, policies in the East Staffordshire Local Plan (2012-2031)² require development proposals to:

- Maximise the healthy retention of existing trees and minimise conflicts between trees and buildings through the design, layout and construction of the development (Detailed policy 8).
- Provide new tree planting, including street trees, urban woodlands, and National Forest planting where applicable (Strategic policy 23).
- Design plantings to deliver a range of benefits, such as wildlife habitat improvement and provision, landscape enhancement and informal recreation, as well as whenever possible, stormwater management. Street trees are among the suggested landscape features to be used to deliver Sustainable Drainage Systems (Strategic policy 27).
- For developments falling within the National Forest, follow the National Forest Company's Guide for Developers and Planners³ (Strategic policy 26).

Developments within the National Forest

Parts of East Staffordshire and Lichfield District Councils fall within the National Forest. New developments within the National Forest are to follow the National Forest Company's Guide for Developers and Planners, which includes site specific woodland planting and landscaping targets:

Development Type	Threshold	Proportion of site to be woodland planting and landscaping
Residential	Between 0.5ha and 10ha	20%
Industrial, commercial and leisure	Between 1ha and 10 ha	20%
All development	Over 10 ha	30%

¹Staffordshire County Council (2017). Putting a Value on the Urban Forest. Burton-upon-Trent Tree Project. Found at: www.staffordshire.gov.uk/environment/Burton-Tree-Project/Burton-Tree-Project.aspx

²Adopted 2015. Available at www.eaststaffsbc.gov.uk/planning/planning-policy/local-plan-2012-2031

³Found at: www.nationalforest.org/woodlands/woodlandcreation/development/

HOW TO PLAN, DESIGN, AND SELECT THE RIGHT TREES FOR THE RIGHT PLACE

In order to ensure that tree planting in Staffordshire's public realm is appropriate and sustainable, there are eight principles that need to be addressed.

PRINCIPLE 1: UNDERSTANDING THE SITE

Get an early understanding of the existing trees, landscape character and below ground constraints.

ACTION	WHY	FURTHER GUIDANCE
<p>Seek to retain healthy mature trees and identify those with protection.</p>	<p>Mature trees provide the greatest amount of environmental, social and economic benefits. Their retention is a priority in local policy and a material consideration in planning consent determination.</p> <p>Some trees may have additional protection requirements such as Tree Preservation Orders and being located in Conservation Areas.</p>	<ul style="list-style-type: none"> • BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations (BSI, 2012) – Paragraphs 4.4 to 5.2. • Development and trees (Staffordshire County Council).
<p>Provide the design team with information on soils and any existing utilities.</p>	<p>Accurate upfront information on site constraints affecting potential new planting is needed to produce cost effective and realistic planting proposals and building layouts.</p>	<ul style="list-style-type: none"> • Construction code for the sustainable use of soils on construction sites (DEFRA, 2011). • BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations (BSI, 2014) - Paragraph 6.3 and Annex B2. • The SuDS manual (CIRIA, 2015) - Chapter 25. • PAS 128:2014 Specification for underground utility detection, verification and location (BSI, 2014).
<p>Gather information on the local landscape and urban built character, including the tree species and planting style(s) found in the local area.</p>	<p>A well thought out design which respects the local character is more likely to be accepted by the local community.</p>	<ul style="list-style-type: none"> • Staffordshire landscape character assessment (Staffordshire County Council, 2000). • Urban landscape studies specific to the area, such as the Burton public realm implementation plan.



Retaining established trees helps to provide a setting for new development.

Moira, Leicestershire

Image: The National Forest Company

PRINCIPLE 2: MAKE TREE FRIENDLY PLACES

Create places where trees have space to thrive and deliver their full range of benefits without causing a nuisance.

ACTION	WHY	FURTHER GUIDANCE
Seek to incorporate long lived, large growing trees.	Larger trees provide greater environmental benefits.	<ul style="list-style-type: none"> • The benefits of large species trees in urban landscapes (CIRIA, 2012), Part A.
Promote the use of shared service trenches.	Shared trenches free up space for planting and healthy tree root growth while allowing future access to and maintenance of utilities.	<ul style="list-style-type: none"> • Streetworks publication volume 4: Guidelines for the planning, installation and maintenance of utility apparatus in the proximity of trees (Streetworks, formerly NJUG, 2007).
In areas with clay soils prone to subsidence, consider pile and beam foundations over trench fill foundations.	Pile and beam foundations are often more cost effective and provide greater opportunity for buildings and trees to safely coexist.	<ul style="list-style-type: none"> • NHBC Standards (NHBC, 2018) - parts 4.1 and 4.2 • The benefits of large species trees in urban landscapes (CIRIA, 2012), Part B, paragraph 7.2.3.
Consider the needs of other services such as lighting, CCTV, commercial signs or shop window visibility early on to identify mutually agreeable solutions.	Site specific dialogue (preferably also carried onsite) can create more creative solutions for integration of trees.	<ul style="list-style-type: none"> • Trees in hard landscapes: A guide for delivery (TDAG, 2014) Paragraphs 2.3.2 and 2.3.3.
Take a context sensitive approach to resolve potential conflicts with highway visibility splays.	In built-up areas, increasing forward visibility for vehicles can lead to speeding. Occasional obstacles found within visibility splays, such as trees, can be acceptable.	<ul style="list-style-type: none"> • Manual for streets 2 (Department of Transport, 2010) - Paragraph 10.7.7.
Where the tree planting area is restricted, review carriageway dimensions and consider alternative tree positioning options.	Carriageways can sometimes be over designed. Planting within the car parking lane, on only one side of the street, or in front gardens can provide effective alternatives to footpath planting.	<ul style="list-style-type: none"> • Trees in hard landscapes: A guide for delivery (TDAG, 2014) - Paragraphs 2.1.1.
Ensure existing trees and proposed planting have sufficient space to grow and reach maturity.	Trees should be able to reach maturity naturally without impacting on, or being impacted on by development.	
Where anti-social behaviour is likely, seek to maintain clear lines of sight.	To maintain lines of sight the tree canopy should be raised to 3m and shrub species that grow higher than 1m in height are not encouraged.	



Trees help create well defined and attractive streets while also contributing to stormwater management and providing food and habitat for wildlife. Derwenthorpe, Yorkshire.

Image: Studio Partington.

PRINCIPLE 3: USE TREES TO REINFORCE PROJECT BENEFITS

Maximise the value trees have for the project.

ACTION	WHY	FURTHER GUIDANCE
<p>Identify how trees can support the vision and provide solutions to the issues identified.</p>	<p>A well thought out design where trees have a clear set of functions will be more widely accepted, more cost effective and therefore more sustainable.</p>	<ul style="list-style-type: none"> • Trees in hard landscapes: A guide for delivery (TDAG, 2014). Detailed paragraph references are: <ul style="list-style-type: none"> - Quality of place (2.1.3-2.1.5). - Economic potential (2.3.2). - Encouraging walking and cycling (2.2.4). - Other health and wellbeing (2.5.1-2.5.3). - Nature conservation and habitat connectivity (2.5.5). - Traffic calming (2.2.3). - Stormwater management (2.4 and 3.5). - Temperature and wind control (2.5.4).

PRINCIPLE 4: SELECT THE RIGHT TREES

Select and use trees appropriate for the local environment.

ACTION	WHY	FURTHER GUIDANCE
<p>Seek competent professional advice for tree selection.</p>	<p>Poor species choice for the site is one of the most common sources of tree failure.</p>	<ul style="list-style-type: none"> • Species selection for green infrastructure: A guide for specifiers (TDAG, 2018).
<ol style="list-style-type: none"> 1 Select tree species that are adapted to the local environmental conditions (soils, climate etc). 2 Fine tune the selection informed by other constraints (such as available space, proximity to structures, biodiversity aims, future management, budget). 3 Consider aesthetic aspirations. 	<p>The chosen specie(s) needs to be able to thrive in its environment so that planting is sustainable.</p>	



Combining species that have different growth rates is a good strategy to provide instant impact. Along this new street, the fast growing willows (*Salix alba*) will be removed within 20 to 25 years and the alders (*Alnus glutinosa*) within 40 to 60 years. By then, the oaks (*Quercus frainetto*) will have grown to buffer these losses. Sathonay, Greater Lyon, France. Image: Anne Jaluzot.

PRINCIPLE 5: PROCURE HEALTHY STOCK

Plant healthy, vigorous and adequately conditioned trees for their environment.

ACTION	WHY	FURTHER GUIDANCE
Understand size trade-offs.	Older, semi-mature trees deliver greater instant impact, they also have more complex requirements than younger trees to establish well.	<ul style="list-style-type: none"> • BS 3936-1:1992 Nursery stock. Specification for trees and shrubs (BSI, 1992). • Trees in hard landscapes: A guide for delivery (TDAG, 2014) - Paragraph 2.1.4.
Understand the different nursery production systems.	Bare root, root-balled and containerised each have advantages and disadvantages and call for different specifications to achieve best practice.	<ul style="list-style-type: none"> • BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations (BSI, 2014) - Annex D3 and Table D2.
Use specifications to get healthier, nursery grown trees.	Combined with a nursery visit, specifications are the only tool the buyer has to ensure the product bought will be fit for purpose.	<ul style="list-style-type: none"> • Trees in hard landscapes: A guide for delivery (TDAG, 2014) - Paragraph 4.5. • BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations (BSI, 2014) - Annex D.
Liaise with the nursery at design stage.	Nurseries hold a limited stock range, but almost any specification can be met if the nursery is given adequate time to source material. Reliance on the availability of particular tree stock at short notice can result in design or other requirements having to be compromised.	<ul style="list-style-type: none"> • BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations (BSI, 2014) - Annex D5.
Arrange a nursery visit.	A visit to the nursery is the best way to ensure the nursery adheres to good practice, specifications are met and the chosen trees can be tagged.	<ul style="list-style-type: none"> • BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations (BSI, 2014) - Paragraph 8.5.2, Figure D13.

PRINCIPLE 6: SPECIFY FIT FOR PURPOSE TREE PLANTING DETAILS

Ensure trees have access to the nutrients, oxygen and water as well as adequate protection and early support.

ACTION	WHY	FURTHER GUIDANCE
Ensure roots have access to oxygen and adequate rooting volume.	Soil aeration and adequate rooting volume are essential for trees to perform well in the built environment.	<ul style="list-style-type: none"> • Trees in hard landscapes: A guide for delivery (TDAG, 2014) - Paragraph 3.1.3.
Ensure enough water can reach the root ball of the tree and provide drainage to prevent waterlogging.	Both too little and too much water can kill a tree.	<ul style="list-style-type: none"> • Trees in hard landscapes: A guide for delivery (TDAG, 2014) - Paragraph 3.1.5. • BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations (BSI, 2014) - Paragraph 11.3, Annexes B2.4 and G2.
Re-use in situ soils as much as possible to backfill the planting hole.	Soil re-use helps limit changes in texture around the root ball of the new tree allowing similar drainage to the surrounding soils and maximising successful establishment.	<ul style="list-style-type: none"> • BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations (BSI, 2014) - Paragraphs 6.3 and 10.2.5 to 10.2.6. • Construction code for the sustainable use of soils on construction sites (DEFRA, 2011).
Where surfaces around the tree need to accommodate significant load, a cycle path, car parking and/or vehicular traffic, use engineered rooting media.	Engineered (ie load bearing) rooting media such as structural soils, raft systems and crate systems alleviate the tree growing media from compaction while providing adequate support for hard surfaces.	<ul style="list-style-type: none"> • Trees in hard landscapes: A guide for delivery (TDAG, 2014) - Paragraph 3.2. • BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations (BSI, 2014) - Paragraph 10.2.9 and Annex F1.3.
Provide trees with support and protection from potential injuries.	Without protection or support, young tree can easily be toppled and/or injured and fail.	<ul style="list-style-type: none"> • Trees in hard landscapes: A guide for delivery (TDAG, 2014) - Paragraph 3.1.6. • BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations (BSI, 2014) - Paragraph 10.3.1-10.3.6. and Annex F2.1.

PRINCIPLE 7: ANTICIPATE AND REDUCE MAINTENANCE NEEDS

Incorporate post-planting care and long term maintenance requirements in capital budget and design decisions.

ACTION	WHY	FURTHER GUIDANCE
Identify long term management arrangements early enough to inform design.	Design of new streets to be adopted by Staffordshire County Council will need to adhere to the Staffordshire Residents Design Guide 2000. For the refurbishment of existing public realm, seeking feedback from the maintenance team on the proposed design will help determine whether the option being pursued is practical.	<ul style="list-style-type: none"> • Staffordshire residential design guide 2000, Staffordshire County Council - Appendix D. • Trees in hard landscapes: A guide for delivery (TDAG, 2014) - Paragraph 1.2.4.
Budget for a minimum of five years of post-planting care as part of the capital expenditure.	Post-planting care is an integral part of the installation process.	<ul style="list-style-type: none"> • BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations (BSI, 2014) - Paragraph 11.2 and Annex G.
When developing an Open Space Management Plan consider incorporating long term tree management.	Identifying tree management requirements in the Plan will help to secure the appropriate long term management for the trees.	<ul style="list-style-type: none"> • BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations (BSI, 2014) - Paragraph 11.2 and Annex G. • There may be local guidance such as East Staffordshire Open space SPD.



OCEAN ROAD - Before and during refurbishment.

The refurbishment of the shopfront lined Ocean Road used trees as a key focal point. The design team agreed a continuous trench fitted with a load bearing tree rooting media and an aeration system would offer best chance for long term success.

This combined with underground guying (for tree support) and simple tree grates, ensured the full width of the pavement would be usable and easy to clean. But it was through careful installation, with civil contractors working closely with arboricultural supervision that the ambitions set for the project were realised.

PRINCIPLE 8: ACHIEVE QUALITY DELIVERY

Ensure that what was agreed on plan gets delivered on the ground.

ACTION	WHY	FURTHER GUIDANCE
Address foreseeable risks to retained trees through keeping the tree protection plan and arboricultural method statement updated as construction details become available.	Tree retention can only be successfully achieved if adequately planned for. Sources of risks include site access, demolition site clearance, excavation and construction.	<ul style="list-style-type: none"> • BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations (BSI, 2012) – Paragraphs 5.3-5.1 and 6.1.
Arrange effective handover of tree protection and planting information from the planning/design team to the construction team.	A pre-commencement meeting and site visit before construction starts will allow requirements to be discussed and fully understood.	<ul style="list-style-type: none"> • BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations (BSI, 2012).
Use adequately trained or supervised individuals for tree handling and planting.	Tree handling and planting require skills and knowledge to avoid damage and failure.	<ul style="list-style-type: none"> • BS 8545:2014 Trees: from nursery to independence in the landscape. Recommendations (BSI, 2014) – Paragraphs 9.5 and 10.5.
If the works encroach upon the root protection area of retained trees, secure qualified arboricultural supervision.	On-site presence of a tree specialist working closely with the construction site manager can make a big difference to achieving successful tree retention and provide reassurance to the Local Planning Authority.	<ul style="list-style-type: none"> • BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations (BSI, 2012) – Paragraph 6.3.
Use planning conditions as appropriate.	Planning conditions ensure that existing trees and proposed planting are protected during the construction phase.	<ul style="list-style-type: none"> • National planning policy guidance.



OCEAN ROAD - After refurbishment.

Images: South Tyneside Council

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