

Part 5 Consultation Draft Landscaping and Trees

Technical Guidance and Standards



Stockton-on-Tees
BOROUGH COUNCIL

Contents

Introduction	3	3 Tree Planting Specification for Hard and Soft Landscapes	25
1 Existing Trees	5	Introduction	26
Introduction	6	Purchase of Trees	26
How To Design Around Existing Trees	7	Trees In Soft Landscaped Areas	28
Design Considerations Near Existing Trees	12	Trees In Hard Landscape Areas	32
2 Landscape Proposals for New Developments	15		
Introduction	16		
Landscape Requirements of a Planning Submission	17		
Soft Landscape Proposals	18		
Local Provenance	19		
Biosecurity	19		
Tree Planting	20		
Shrubs, Whips Hedges and Ornamental Planting	22		
Bulb Planting	23		
Grassed Areas	23		
Landscaping Within The Adopted Highway	24		
Landscape Maintenance and Management Plans	24		

Introduction

Introduction

This technical guidance and standards document has been developed to cover all stages of the design process from working with what's already on a site to ensuring appropriate aftercare so that the delivered landscape proposals are able to sustain. The document has been split into three sections:

- Section 1- Existing Trees
- Section 2- Landscape Proposals for New Developments
- Section 3- Tree Planting Specification for Hard and Soft Landscapes

Adherence to guidance and standards within this document must be demonstrated through planning applications.

1 Existing Trees

Introduction

All existing trees on a development site or within 10m of the boundary must be assessed during early stages of the planning and design process and included in pre-site development surveys. 'Trees' should normally include single specimen trees, small groups of trees, areas of woodland, landscape buffers, hedgerows and other significant vegetation.

Developments that seek to retain and accommodate higher quality trees within proposed design layouts will generally be supported. However, any proposed design layouts that are likely to result in loss, damage or conflict with important trees or woodland are unlikely to receive planning consent. New developments should therefore seek to optimise the retention of higher quality trees, ensure they are compatible with all new buildings & infrastructure and otherwise support sustainable tree cover.

Planning Conditions and Tree Preservation Orders (TPO'S) will also be used where appropriate to safeguard important trees and vegetation.

How To Design Around Existing Trees

The British Standard 5837 (2012) - Trees in Relation to Design, Demolition and Construction provides detailed guidance on the protection of trees during the development process and will be the main point of reference for the Council when determining applications. Stockton Borough Council will be closely guided by this document therefore it is recommended that all information relating to trees be submitted in the same format to include the following:

- Tree Survey and Tree Quality Assessment;
- Tree Constraints Plan (TCP);
- Arboricultural Impact Assessment (AIA);
- Arboricultural Method Statement (AMS);
- Tree Protection Plan (TPP).

Tree Surveys and Tree Quality Assessment

Tree surveys should be undertaken by a suitably qualified arboriculturist and should include all trees on the proposed development site and any significant trees located within 10m of the site boundary.

The tree survey should collect the relevant information specified in the British Standard 5837:2012. For example, trees should be individually numbered and plotted on a site plan, show the full extent of existing canopy spreads and submitted with an accompanying schedule that relates to the site plan.

Trees should be categorised in accordance with the British Standard, ranging from trees of higher quality to those of lower quality and value, assigning categories of either A, B, C or U and clearly indicated on the accompanying drawings.

Root Protection Areas (RPA's) should be calculated and plotted for all trees to identify the minimum exclusion zones required to ensure they are adequately protected throughout all phases of site development (i.e. to indicate the locations of protective fencing and/or ground protection).

Tree Constraints Plan

The preparation of a 'Tree Constraints Plan' should be used as a design tool to illustrate potential constraints in relation to trees. For example, showing the relative retention value of all the trees present on the site, their current and potential size & spread, tree root protection areas (RPA's), potential shadow patterns in relation to buildings.

The plan will enable a visual appraisal of the site constraints to help consider the best use of available space for new development. For example, consideration should be given to assigning space for all main aspects of the development, including the following:

- Building Footprints, Layout and Orientation;
- Roads, driveways, footpaths and other surface treatments;
- Construction zones required, including all vehicle/machine access; all compound and storage areas;
- Location of all Utility installations;
- Exclusion zones around existing trees and minimum root protection areas; and
- Current and future landscaping.

The British Standard also advises developers to consider possible future effects of trees as a potential design constraint with specific regard to their future size and growth characteristics. For example, some of the existing trees may become much larger in future and incur property maintenance issues, increased nuisance factor, shade, leaf fall etc

Arboricultural Impact Assessment (AIA)

This is required to outline the potential impacts on trees affected by the proposed development and should be used to review and finalise a suitable layout design which will seek to prevent or minimise any adverse impacts to trees. The Council will therefore consider the overall impact of the proposed development on existing trees when determining planning applications

There are many issues to be considered to ensure that trees, buildings and other infrastructure are compatible and that any possible conflicts are resolved through appropriate design and construction methods. Factors that need to be considered include the following:

- Potential need to remove or prune trees
- Tree sizes, position & future growth;
- Tree protection & associated management /maintenance requirements;
- Proximity of trees to buildings, structures and surfacing;
- Possible changes in site levels;
- Types of surfacing to be used;
- Installation and layout of services;
- Demolition of buildings, structures including foundations, hard surfacing;
- Construction site access and site layout including temporary offices, parking, material storage;
- Sunlight and shading; and
- Site visibility, sightlines and street lighting.

Please note, where removal of significant trees is proposed, replacement planting on the site will normally be required. In certain circumstances where it is proposed to remove trees of higher quality, replacement planting with mature specimen trees will be necessary

Arboricultural Method Statement (AMS)

This is required to provide details of all proposed works to trees, recommended tree protection measures to ensure trees are not damaged, as well as appropriate design and construction methods to ensure all trees being retained are compatible and sustainable in future. The method statement must cover all aspects of demolition, design and construction.

Where potential impacts cannot be avoided by the design and layout of the scheme, specific measures such as the use of special materials and construction techniques will be required.

The method statement should inform the final design and construction methods to be used which should be reflected in all drawings submitted to the Council, and should address the following issues:

- Methods for tree protection during all stages of demolition and construction, e.g. protective fencing/ground protection/ other on-site control measures;
- Planning of all construction operations to prevent damage to trees;
- Site supervision of all operatives, subcontractors, utility companies;
- Details of alternative design & construction methods and materials for preventing damage to trees;
- Compatibility of new structures and surface treatments adjacent to existing trees;
- Installation of services below and above ground close to trees.
- Foundation design of all buildings and associated structures.

Tree Protection Plan

A Tree Protection Plan should be superimposed on a layout plan to illustrate the precise location of protective barriers around trees, ground protection to be installed and any other measures to ensure adequate protection of RPAs and aerial parts of trees. These must be marked as construction exclusion zones on the site plan.

Specification for Tree Works

A full specification for tree works must be given to outline management requirements for all trees. This must include a schedule to detail the full nature and extent of any works to trees, for example;

- Works required for 'development purposes' e.g. to allow construction activities, site access; other pruning works to accommodate the new development;
- works required for 'arboricultural purposes' e.g. remedial works for tree health and safety purposes.

All trees, either to be retained or removed should be illustrated on a site plan to enable a visual appraisal of the proposed tree work. For example, using dotted lines or colour coding to show trees to be retained or be removed.

Design Considerations Near Existing Trees

The following points describe some common issues encountered when building near existing mature trees, and provides examples of design solutions. This aims to ensure that trees and new developments are compatible, retention of trees is sustainable. This will ultimately prevent future damage to infrastructure, minimise nuisance factors with neighbours and other land users, and ensure trees are a positive asset in the landscape

Shade from Existing Trees

Trees in close proximity to a site will cause shade to fall across the development which may impact upon the amenity of the development and its external spaces. Design of all developments should consider future shading, but particularly residential properties, where excessive shading could impact upon the enjoyment of a private garden, and therefore lead to pressure for tree removals in the future.

Shading effects from areas of woodland, tree groups or landscape buffers will have a greater impact than single specimen trees. Trees located to the south of a development will cause greater shading effects across a site.

Where shading impacts are identified, a tree shading study may be requested as part of the planning submission to identify the estimated shade implications at different times throughout the day, and also throughout the year. A development is unlikely to be supported where shade impacts upon a residential property for a high proportion of the day during the summer months. Shading studies can help to guide a development layout and minimise this problem for future residents.

Foundation Design

Existing and proposed new tree planting may also cause impacts upon new and existing building foundations. Special measures such as root barriers or alternative foundation designs must be considered to ensure compatibility and sustainability of trees and built structures. Where new or existing trees are to be located close to buildings, advice should be sought from a qualified Structural Engineer, and designed in accordance with NHBC Guidance section 4.2 Building Near Trees

Root Barrier	Root Director	Surface Utilising No-dig Construction Methods	Flexible Surfacing	Walled Boundary Thorough the RPA
<p>Root barriers shall be used to protect shallow services and paving construction from potential damage by tree roots.</p>	<p>Use of a root director prevents root circling and diverts root growth down and out to protect paving construction from future damage by tree roots.</p>	<p>Surfacing within root protection areas should utilise a no-dig or low impact construction method which minimises direct damage to tree roots, prevents soil compaction and maintains good aeration and drainage around tree roots</p>	<p>Surfacing around trees which is flexible and highly porous will also reduce the likelihood of shallow rooting that can often cause infrastructure damage and will flex to accommodate the tree as it grows.</p>	<p>Where a fenced solution is not appropriate, specialist construction methods such as piling, or use of a bridging lintel may be necessary to minimise disturbance of the RPA and prevent the tree causing damage in future.</p>

Consideration(s)

- Are there trees on the site or within 10m of the site boundary
- Are the trees protected by a Tree Preservation Order, or within a conservation area?
- Do the trees have a stem diameter greater than 10cm?



YES

Response Commission a Tree Survey and Arboricultural Assessment by a qualified arborist



Consideration(s)

- Are trees on or close to the site affected by the proposals?
- Can the development proposals be modified or changed to remove any conflicts with trees and their roots or minimise the impacts?
- If trees are not directly affected by the proposed development layout, will the construction activities on the site come within 10m of trees or directly affect RPAs?



YES

Response Commission an Arboricultural Method Statement and Tree Protection Plan?



Consideration(s)

- Is it likely that existing trees on or close to the site will cause shade to fall across the development plot?



YES

Response Commission a Tree Shade Study



Consideration(s)

- Are existing trees located near any new structures or buildings?



YES

Response See advice from an architect or structural engineer to detail up foundations etc

2 Landscape Proposals for New Developments

Introduction

Landscape proposals will be required for most developments, ranging from individual dwellings to large scale housing schemes, commercial and mixed-use sites. Landscaping schemes are especially important on sites in prominent locations such as along main road frontages, important transport corridors, redevelopment sites and areas of high townscape or landscape quality.

The details required for a landscape scheme will vary according to the type and location of a development and applicants are advised to employ a suitably qualified person to advise from the outset, especially for large and complex sites.

It is essential that Landscape Architect or suitably qualified person should be involved in the whole life of the project, from initial preparation of a design, through implementation including supervision of works on site. During the establishment phase it is essential that this relationship is continued to ensure the success of the landscape scheme.

Stockton Borough Council takes a coordinated approach to the planning process to ensure that any landscape scheme that is proposed is of an acceptable quality, that it is sustainable and most importantly achievable. This process includes contributions from a wide range of design disciplines including, Landscape Architects, Urban Designers, Arboriculturalists, Green Space Officers, Highway Engineers (Design, and Adoption including Street Lighting), Sustainability and Flood Risk Management Officers

Landscape Requirements of a Planning Submission

To avoid delays in the planning process, the preparation of landscape proposals must be considered at the outset of a development. As these guidelines can only provide broad principles, applicants are encouraged to have pre-planning discussions with the Planning Officer prior to submission of an application.

Relevant British Standards and Codes of Practice must be adhered to when designing all landscape schemes

Typical Landscape Requirements of a Planning Submission

- Tree Survey, Arboricultural Impact Assessment, Method Statement and Tree Protection Plan where necessary (please refer to section 1 for details);
- Details of hard landscaping materials, including specification, colour size and extent of surfacing materials;
- Details for the setting out of public open space including play areas;
- Information on the proposed levels, demonstrated by contours, spot levels and typical cross sections;
- Full details of boundary treatments and retaining walls, including a plan showing their location, details of each boundary type, height, materials etc;
- Details of proposed street lighting, including a location plan coordinated with tree planting schemes to minimise future conflicts;
- Full details of proposed street furniture, including style, materials, and location plan. This shall include all seating, litter bins, bollards, cycle parking, planters etc;
- Full details of soft landscaping including a plan showing the location of all trees, shrubs and seed mixes, a specification detailing the species size and density of planting. Proposals must consider the location of underground services and any required easements;
- A detailed planting specification (to cover work from ground preparation, to planting the trees and shrubs and seeding methods) shall also be submitted in support of the application including root barrier membranes etc (please refer to section 3 for details); and
- A detailed maintenance and management specification for soft landscaping for a period of 25 years, and maintenance and management of public open space and play equipment.

The required information shall be illustrated on site plans where possible, at a scale appropriate to the level of detail, and where suitable, information shall also be provided in concise and clear written reports

Soft Landscape Proposals

Sites to be Title Transferred to the Council

Title transfer of sites to the Council has become less common, however where a developer considers that this may be appropriate, discussions must be implemented at an early stage in the planning application process. It should be noted that this process differs from highway land which is to be adopted by the local authority. For any open space that is to be transferred to the Council it will be required must be in a manner/design which is acceptable to the Council.

Soft landscape proposals should be carefully considered and designed to meet the needs of their specific location and the planned future maintenance regime. All planting proposals should be laid out with reference to the latest service drawings, to ensure planting is feasible and sustainable.

Relevant British Standards and Codes of Practice must be adhered to when designing soft landscape schemes and particular attention is drawn to the following standards

- BS 3882:2015 Specification for Topsoil;
- BS 8601:2013 Specification for subsoil and requirements for use;
- BS 8545:2014 Trees: from nursery to independence in the landscape – Recommendations;
- BS 5837:2012 Trees in relation to demolition, design, and construction – Recommendations;
- BS3998:2010 Tree Work Recommendations
- BS 7370-4:1993 Grounds maintenance;
- BS 3936 Nursery Stock Series;

- BS 4428:1989 Code of practice for general landscaping operations (excluding hard surfaces);
- BS 4043:1989 Recommendations for Transplanting root-balled trees;
- BS 3969:1998 Recommendations for Turf for General Purposes; and
- NJUG Volume 4 Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue 2) – Operatives Handbook 19th November 2007 -Tree planting schemes should also adhere to recommended best practices adjacent to utilities.

For further information on retention and protection of existing trees the developer should consult section 1 – Existing Trees

Local Provenance

Wherever possible nursery stock and seed mixes of local provenance should be used. Choice of individual species and design of plant mixes should be informed by assessing any existing, important woodland planting in the locality such as Local Wildlife Sites

Biosecurity

Biosecurity refers to measures that aim to prevent the introduction and/or spread of harmful organisms to plants and animals. When designing a scheme, it is therefore important to ensure that selected suppliers of all trees and plants are able to demonstrate adequate biosecurity control measures are being implemented and that all planting stock is pest and disease free. This includes providing details of nursery production, origin/import, pest and disease control programmes and an audit trail for all stock supplied (see www.forestry.gov.uk/biosecurity and www.fera.defra.gov.uk for further guidance).

The design or management plan should also take care not to specify plants that breach legal restrictions such as importing or moving certain species that are known to have pest and disease issues or currently subject to a Plant Health Notice under the Forestry Act 1967 (e.g. Ash trees)

It is also good practice to avoid specifying large numbers from one plant family, genus or variety to reduce the possible impact of a harmful pest or disease outbreak

Tree Planting

Tree planting schemes must follow up to date best practice to ensure good design, species selection and use of suitable planting methods. This is essential to provide optimal growing conditions for trees that will ensure their successful establishment and long-term sustainability in the landscape. Good design principles are also essential to prevent future conflict between trees and their surroundings, e.g. surfacing, built structures, street lighting and other utility services. In some cases, tree planting specifications may need to include the use of specialist materials below ground such as structural cells, root deflectors or use alternative tree pit designs to increase soil volumes beneath hard surfaced areas, e.g. use of continuous /linked tree pits.

Positions of proposed trees should be shown accurately on the submitted landscape plans, noting the species, size and type of planting stock, e.g. Beech (*Fagus sylvatica*), rootballed, extra heavy standard, 14-16cm girth. Advanced /larger sized nursery stock is preferred for amenity tree planting and will be essential in urban areas to reduce the risk of vandalism.

A specification must be provided for the planting and establishment of all trees, providing full details of all planting methods, materials and essential aftercare:

Section 3 - Tree Planting Specification for Hard & Soft Landscapes provides a minimum standard that should be adhered to when planting standard and semi-mature trees in both hard and soft landscaped areas

Tree Species Selection Guidance

It is recommended that tree species selection follows guidance set out in the 'Tree Species Selection for Green Infrastructure: A Guide for Specifiers' written by Trees and Design Action Group. Tree Species Selection for Green Infrastructure - Trees and Design Action Group (tdag.org.uk):

- Tree selection must consider the intended purpose of the planting scheme, for example;
- Use of single specimen trees to provide a focal point or enhance visual amenity in built spaces; use of trees with interesting form or features such as bark, foliage, flowers or autumn colour to provide aesthetic value;
- An avenue of trees where regularity of form would be desirable to reinforce landscape structure or to provide a prominent landscape feature.
- Planting of trees in groups to provide screening, shelter, visual amenity or wider environmental benefits

Species selected need to be suitable for the site conditions and local environment where they are to be planted and make a positive contribution to local landscape quality and character:

- Locally native species should be used in natural green spaces, wildlife corridors and rural countryside areas to help support local biodiversity, but can also be included in formal urban settings where appropriate;
- Non-native trees can be used within less naturalised urban landscapes where they function as specimen ornamental features or have growth characteristics and adaptations making them more suited to urban environments, e.g. tolerance to dry or wet conditions, shallow soils etc; Use of native and non-native trees also increases species diversity within the urban tree population which enhances resilience to climate change impacts.
- Different tree species have different preferred growing conditions and natural adaptations and tolerances to certain environments, therefore selection of

suitable tree species should take into account physical and environmental factors such as local soil conditions, exposure, surface treatments, site drainage and water requirements, pollution tolerance, light conditions etc;

- It is also important to consider the ultimate size, spread and growth characteristics of the tree species in relation to the available space where they are to be planted. For example, factors such as tree form (e.g. upright/weeping/spreading) and any potentially negative characteristics of the species such as fruit production, sap or twig shedding, heavy shade etc;
- Use of single species 'monocultures' is undesirable due to the potential impact from harmful, often introduced pests and diseases, therefore species diversity is encouraged to enhance the future resilience and sustainability of new tree planting schemes

Structure Planting

For structure planting (woodland) the trees should normally be planted as whips or transplants, preferably using cell grown stock. Young trees must be protected from trampling, grazing and mammal damage. Planting density or spacing of structure planting should be indicated on the landscape plan with full details of species mixes and stock sizes:

Shrubs, Whips Hedges and Ornamental Planting

Planting beds shall be clearly indicated on the submitted plans. The stock size, type and density of planting should be stated in a schedule (given as the species and number of plants per square metre). The association of one plant species to another will generally not be required at the application stage providing sufficient space is identified for the proposed planting. However, where these details are not provided a condition will be attached to any planning consent stating that a detailed landscaping scheme must be submitted and approved before development commences.

Shrubs Species Selection

In selecting a plant the designer should ensure its planting characteristics are suited to the site characteristics and its use within a scheme. For example, in areas of open space likely to be used for informal 'kick about', plants chosen should be robust, non-prickly, tolerant of vandalism and establish quickly. Within the borough soils are predominantly heavy clay which can be problematic to some species.

In many urban areas planting up to 1m high in conjunction with semi-mature trees with a clear stem height up to 1.8m is recommended to maintain sight lines and the perceived safety for pedestrians. Shrubs likely to reach a height of more than 60cm shall not be planted within highway visibility splays at road junctions

Generally the following plant sizes and densities shall be used:

Size (Height)	Number per m ²	Planting Centres
60 - 90cm	3	60cm
45 - 60cm	4	50cm
Under 45cm	7	40cm

Consideration could be given to planting specimen shrubs of larger sizes (e.g. 7ltr or 15ltr container) to give an instant impact. In these instances, planting densities can be reduced. All shrubs should be planted in beds formed with a minimum depth of 400mm topsoil

Grassed Areas

Hedgerows, Herbaceous Perennials and Grasses for Use in Landscape Projects, and Bulb Planting

Hedgerows	Herbaceous Perennials and Grasses for Use in Landscape Projects	Bulb Planting
<p>Hedgerows shall be used to define spaces and integrate developments into the landscape. Native species mixes shall be used where appropriate, although in urban areas non-natives such as laurel may be appropriate.</p> <p>Hedgerows shall be planted as a double staggered row with a minimum of 6 plants per linear metre, and include hedgerow trees where possible.</p>	<p>Due to their habit of dying back in the winter there is a limited use for herbaceous planting.</p> <p>Similarly the use of ornamental grasses should only be incorporated where higher maintenance requirements can be met. In areas to be title transferred herbaceous planting will not be accepted.</p>	<p>All spring flowering bulbs planted in ornamental grassland must flower no later than the end of April to prevent disruption to the grass-cutting programme.</p> <p>The most suitable flowering bulbs for planting in large drifts in grassed areas are Crocuses and early flowering Narcissus species.</p>

For all seeded areas, grass seed mixes and rates of application shall be clearly stated. A low maintenance mix is strongly recommended, particularly if the scheme will be adopted by the Council. Small awkwardly shaped areas, or slopes steeper than 1:5 are difficult to mow, and shrubs are often a better form of ground cover in these locations.

Where grass seeding is proposed in SUDS features, selection of a seed mix must consider the future operation and maintenance of the basin, as well as the designed level of flooding. For example a basin designed to hold a 1:30 year storm will flood far less frequently than one designed to hold a 1:1 year storm, and therefore different seed mixes will be necessary. Landscaping of SuDS features should be developed in close association with the Lead Local Flood Authority

Landscaping Within The Adopted Highway

The Council as Highway Authority will accept tree planting, and occasionally shrub planting within the adopted highway, but this must meet the Council's approved specifications and will be subject to a commuted lump sum

Landscape Maintenance and Management Plans

New landscaping must be adequately maintained to ensure successful establishment. All landscaped areas with the exception of private domestic gardens must be supported by a landscape management and maintenance plan. It is essential that Landscape Architect or suitably qualified person should continue to be involved during the establishment phase to guarantee the success of the landscape scheme, and a maintenance regime must be in place from completion of planting and seeding works until handover to the Council or landscape management company.

The applicant must provide this as part of the planning application to outline how all establishment maintenance operations will be undertaken. Landscape maintenance shall be detailed for an initial 5 year period from the date of completion, followed by a long-term management plan for a period of 20 years. The landscape management plan shall be carried out as approved.

- A soft landscape management plan shall include the following information:
- long term design objectives;
- management responsibilities and maintenance schedules for all landscape areas/ retained vegetation;
- replacement planting programme for all landscaped areas where planting dies, is damaged or diseased including pre-existing retained vegetation;
- maintenance access routes to demonstrate operations can be undertaken from publicly accessible land;
- special measures required relating to the time of year such as protected species and their habitat; and
- management of trees within proximity of private properties etc.

An example of management tasks specifically relating to tree planting is included in Section 3 - Tree Planting Specification for Hard & Soft Landscapes.

3 Tree Planting Specification for Hard and Soft Landscapes

Introduction

Trees shall be planted in accordance with current good practice and BS 8545: 2014 Trees – from nursery to independence in the landscape – recommendations.

Where trees are located within adopted areas or areas to be title transferred to the Council, evidence of compliance with this guidance may be required

Purchase of Trees

The Contractor shall arrange for all purchase, delivery, handling, storage and transportation of trees. It may be useful to visit the tree nursery to secure and tag trees for certain development sites, for example where form and symmetry is important and to check stock quality. Selected tree suppliers must be able to demonstrate adequate biosecurity control measures are being implemented to ensure all tree stock is pest and disease free, indicating details of nursery production, origin/import, pest and disease control programme and an audit trail for all stock supplied (see www.forestry.gov.uk/biosecurity and www.fera.defra.gov.uk guidance).

Tree stock will typically include extra heavy standard trees e.g. 10-12cm to 16-18cm girth, air pot, containerised or root balled as specified. All trees should be quality checked to ensure the following:

- Species is true to name/description, no substitutes without prior agreement;
- Straight single central leaders/balanced branch framework typical of species;
- Proportionate crown ratio relative to tree height which has been formatively pruned or trained to required form;

- Clearly defined stem taper (height/diameter ratio) and self-supporting, without canes;
- Free from structural defects/weakness, signs of physical damage, poor bud or graft unions;
- Free from pests, diseases, and physiological disorders such as branch die back, epicormic/basal shoots, elongations/lesions, discoloration etc;
- Rootball diameter/container size must be proportionate to stem girth (see table D.5 in BS8545) and root ball must not move independently from central stem;
- Trees must have healthy fibrous root systems with good lateral root development; and
- Root collar/root flare must be evident at the correct depth, at the top of the rootball, with no signs of root circling/girdling or other defects, e.g. evidence of delayed/poor transplanting methods.

All trees should be handled carefully at all stages from collection, storage, transporting to planting site to prevent any direct damage, impacts, exposure to frosts, desiccation etc.

Underground Service Checks

Proposed planting sites must be fully service checked in advance to ensure all new planting is located sufficiently far away from any underground or above ground services. Operational staff are also advised to manually CATSCAN before any tree pit excavation work is undertaken and undertake adequate level of risk management in accordance with health and safety requirements.

Trees Near Highway

Where new tree planting is proposed in soft landscaped areas close to the adopted highway, a root barrier membrane is required to protect the highway from future damage by tree roots. A root deflector or root barrier membrane (e.g. Reroot 1000) will be required alongside the highway or footway kerb where trees are proposed for planting within 2m of the adopted highway in both private gardens, highway verges and areas of public open space.

Trees In Soft Landscaped Areas



The following tree planting method is recommended for soft landscaped areas to ensure the successful establishment and protection of young trees. This method comprises 3no. timber stakes and a mesh cage with added compost and mulch around the base of each tree.

Materials required are listed here.

Soft Landscaped Area - Tree Pit Materials List

- Tree Stakes – 3 no. pointed treated timber stakes (e.g.1500mm) *
- Tree Guard – wire mesh protection to tree stem and canopy
- Tree Ties - tie wrap/belt and nails as required
- Approved Compost - e.g. organic manure or equivalent
- Mulch - approved bark/woodchip mulch
- Additional /Optional Soil Ameliorants - e.g. Biochar

Planting Pit Preparation

For tree planting within soft landscaped areas a pit of 1m x 1m x 0.5m (minimum 0.5m depth or equivalent to root ball depth) shall be excavated. Pits must be completely dug out and soil broken up and mixed with compost, a minimum of 50 litres per pit to be mixed thoroughly with existing topsoil before being backfilled.

Tree Planting

Release all tied up branches, loosen or remove canes and remedial prune any weak or damaged branches before positioning the tree. Trees must be planted upright at the correct depth to ensure the root collar at the base of the stem is at the same as it was in the nursery – check the planting depth is correct using a straight stick, level or tree stake. It is important not to plant trees too deep as this can initiate root circling or girdling which can lead to premature tree failure. On wet sites trees can be planted slightly higher, e.g. with root collar 25mm above surrounding ground level

Edges of containerised root balls should be 'shaved' lightly, e.g. with spade to stimulate fibrous root development into surrounding soil. Once tree is placed in the tree pit correctly and tree stakes placed in the correct position (see below), backfill soil can then be added. This should be worked well around the rootball to ensure good root to soil contact and to minimise post planting settlement. Soil should be backfilled just below the top of the rootball but no higher, allowing for the addition of mulch.

Tree Stakes and Ties

Stakes should be positioned just outside the 'rootball' of the tree and must not damage roots. Stakes should be driven in firmly once aligned, evenly spaced and upright. These must remain secure with no 'play' once ties and cages have been attached. Tree stakes should extend up to approximately 1/3 tree height to ensure adequate support of the tree and mesh cage once installed.

Standard tree tie or belt (min 25mm size) should be used to secure tree to each stake at required stem height – no blocks, wires, boards etc to be used as these may cause damage to the tree as the stem girth increases.

Tree Protection using Mesh Cage

Where specified, wire mesh cages should be firmly secured neatly around tree stakes (e.g. 0.5m diameter), leaving a small gap at ground level. The top height of the cage should aim to protect tree stems or branches from being snapped or broken (e.g. up to 1.6-1.8m in height).

Figure 1:
Example of tree planting
with protective mesh cage
(16-18 cm girth Hornbeam)



Mulch

Bark mulch should be placed around the base of each tree at approximately 75mm/ 3 inch deep and 1m/3 ft diameter. Mulch must not directly cover the base of the tree stem above the root collar but should leave a small gap (i.e. no volcano mulching) and should also extend outside the cage.

Tree Watering

All tree rootballs should be soaked prior to planting to ensure adequate moisture is present inside the rootball and also watered immediately after being planted to ensure the soil backfill is fully soaked and settled around the tree's rootball.

Aftercare / Establishment Maintenance

A full maintenance programme for all soft landscaping must be prepared and submitted as part of any planning application. This shall cover maintenance for the first 25 years of any planting scheme. The following schedule provides an example of the maintenance to be implemented during the first 5 years following completion. The following operations shall be undertaken from completion of planting until the end of the defects liability period and recorded in writing for monitoring purposes.

Tree Pruning/Removal/Replacement

Trees should be subject to formative pruning where necessary during the maintenance period: this may include pruning of damaged/dead or poorly formed branches, minor crown lifting. Any trees that have failed due to natural causes or poor stock quality must be replaced using the same size and species of tree and planted to original specification. Trees that have been vandalised will either require remedial pruning to try and retain them or complete removal depending on the severity of damage.

Tree Support Systems

All tree stakes, ties and caging shall be kept secure and tended to as and when required, e.g. retying/staking loose stakes, fixing or replacing damaged caging/making safe any exposed wires. Leaning trees must be correctly repositioned upright, if the rootball has 'rotated' it must be carefully replanted upright into the correct position and not forced straight with tree ties.

Tree Watering

Trees must be watered at suitable frequency during growing season from April to September as conditions dictate, especially during prolonged dry periods. This may require weekly watering during hot dry spells: Root balls must be thoroughly soaked on each occasion using a fine rose or sprinkler (or via irrigation pipe where fitted) until the full depth of topsoil is saturated. Arrangements for watering schedule must be specified in advance detailing watering frequency, methods, quantities and monitoring procedures.

Mulch

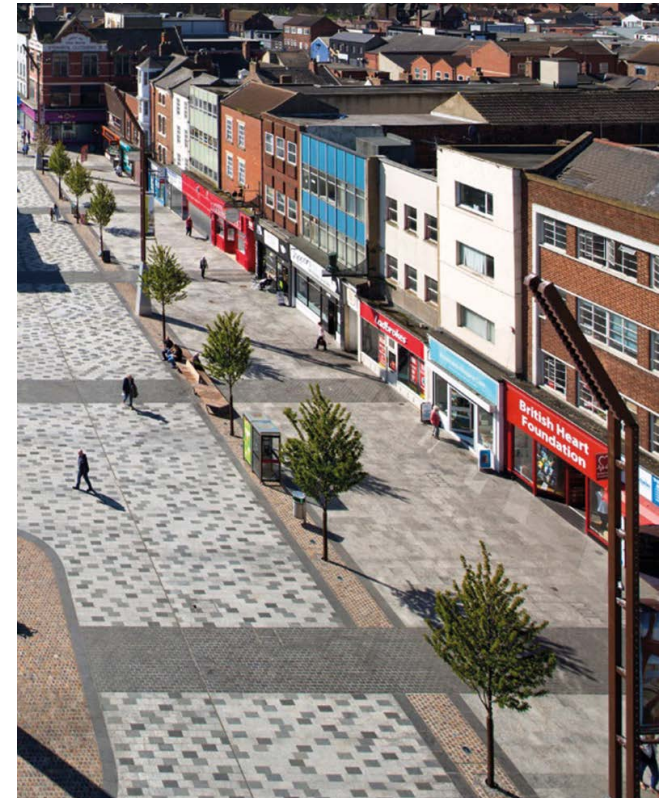
Mulch must be topped up to specified depth/radius annually (75mm deep x 1m diameter). The base of trees shall be kept clear of weeds by cultivating prior to adding mulch. Herbicides must not be used around young trees.

Completion Of Maintenance Period

Stakes and cages shall be removed after 3/5 years, together with final addition of bark mulch as per specification. Grilles and Guards may be kept beyond establishment/maintenance period to be removed 5 years+ after planting by client when deemed necessary.

Where planting is to be title transferred to the Council, a designated SBC Officer will inspect all new planting and specify any replacements and other remedial treatments that need to be implemented before approval is given

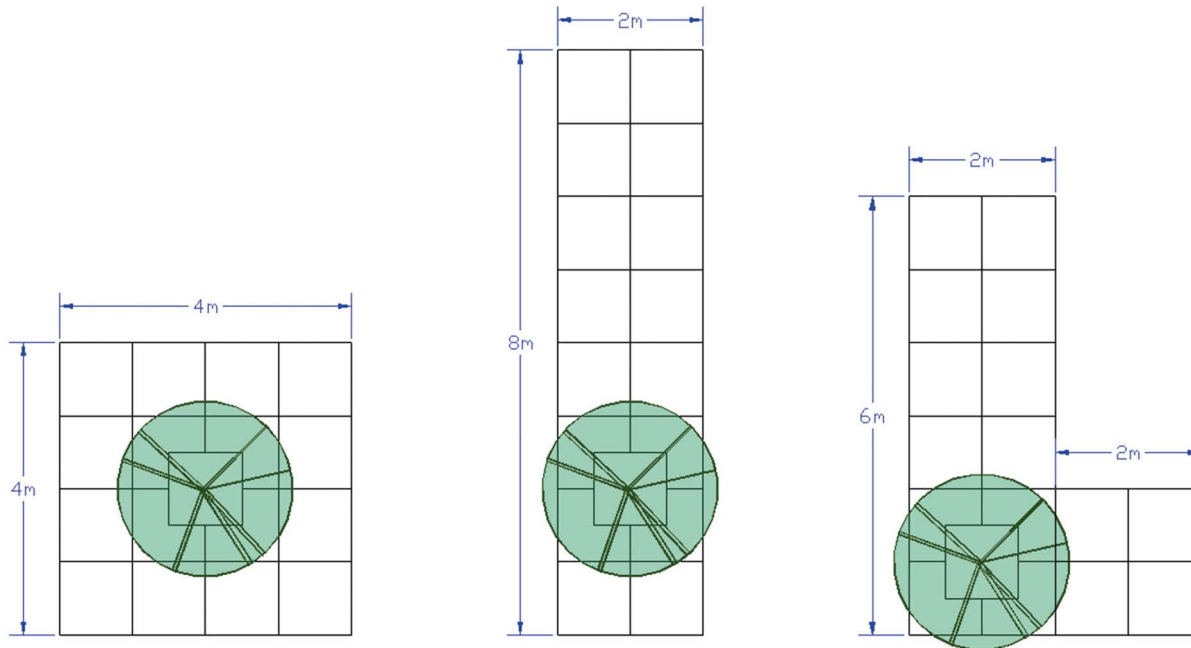
Trees In Hard Landscaped Areas



Planting Pit Preparation

Trees planted in hard landscaped areas should have a tree pit of sufficient size to allow for the future growth of the tree. Tree pits may be individual per tree or interconnected/continuous trench shared between a number of trees. They can also be different shapes, extended or asymmetric in order to optimise the available soil volumes for trees.

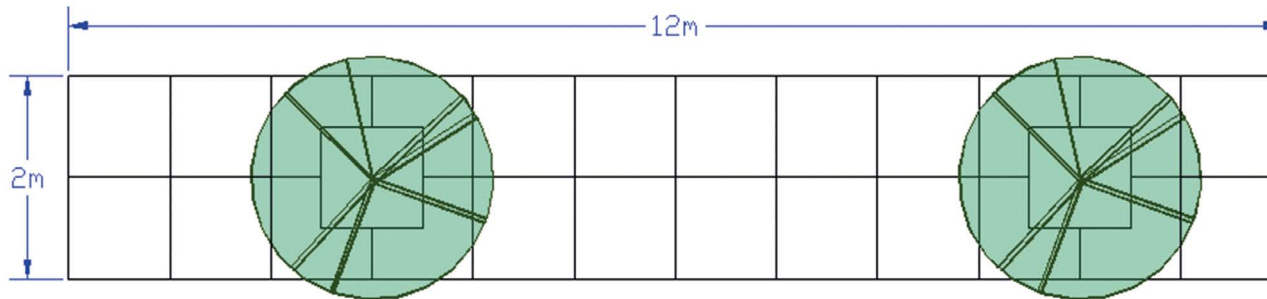
Figure 3: Tree pit examples for medium sized trees



The optimum tree soil volumes using root cell systems should be as suggested in the table below. Tree pit design must ensure sufficient overall soil volume, depth and soil quality to ensure future healthy tree growth. Trees planted in a lower volume of soil than that calculated will not reach their full growth potential and have a shorter life span. A lower soil volume will not be accepted unless there is an overriding justification or special circumstances.

Tree Size	Target Soil Volume	Species Examples
Small species Canopy 3m-5m diameter	5-9 m ³ (Pit Dimensions 3m x 3m x 1m)	Amelanchier arborea / Malus hupehensis Prunus 'Pandora'
Medium species Canopy 5m-8m diameter	12-16 m ³ (Pit Dimensions 4m x 4m x 1m)	Pyrus calleryana / Sorbus intermedia Betula ermanii
Large species Canopy 8m+ diameter	25-30 m ³ (Pit Dimensions 5m x 5m x 1m)	Acer platanoides / Quercus palustris Tilia cordata

Figure 4: Tree pit examples for medium sized trees with shared rooting volume



There are several different manufacturers who provide tree pit systems. Planting pits shall be prepared in accordance with the recommendations of the pit system manufacturer. A list of the materials typically required is included below.

Hard Landscaped Area - Tree Pit Materials List

- Root Cell System – e.g. Rootspace or Strata Cell underground cell system by GreenBlue Urban.
- Rootbarriers – e.g. Reroot by GreenBlue Urban to be used where appropriate to protect adjacent surfaces and services.
- Geotextiles – e.g. fibertex porous geotextile membrane by geosynthetics.
- Anchor System – e.g. Platipus strapped anchor system or concrete deadman system.
- Irrigation System - e.g. Rootrain Precinct irrigation system with watering inlet by GreenBlue Urban.
- Backfilling Material - pit to backfilled with imported sandy loam topsoil to BS3882 or similar approved.
- Tree Grille – e.g. 1200x1200mm tree grille frame filled with Arboresin/Flexipave.
- Tree Guard - e.g. 1800mm high vertical steel circular tree guard.

Tree Planting Method

The planting method for trees in hard landscaped areas is essentially the same as in softscape areas, but with alternative planting pit preparation allowing for the installation of root cell systems in accordance with the manufacturer's instructions, and other materials e.g. tree support anchoring systems, final surface treatments.

Where used, anchor systems shall be installed as per manufacturer guidelines, and backfill soils must be worked well around the rootball to ensure good root to soil contact, and to minimise settlement and movement of the rootball after planting. Surfacing and any additional materials to be installed carefully as per manufacturer guidelines without damaging the trees.

A good quality soil is essential to support healthy root growth and to ensure successful tree establishment. It should have good structure and composition in order that it provides good drainage, aeration and essential nutrients to support plant growth. Care must be taken to prevent compaction or disturbance of the soil in all new areas to be planted.

Specifications must include details of soils to be used and ensure they are appropriate for the site and depth of tree pit. For example, organic matter or compost should only be incorporated into the upper soil layers of the planting pit, whereas sub soils with minimal organic content must be specified for lower soil layers to prevent anaerobic conditions at the base of the tree pit. In some circumstances it may also be appropriate to use specialist manufactured soils such as Amsterdam Tree Sand or structural soils such as Stockholm Tree Soil.

Surface Materials

The exposed area around the tree may be covered with a proprietary tree grille, preformed tree surround (stone or resin), or a material such as Flexipave. An expansion gap must be retained around tree root collars, e.g. 75mm to allow for future growth of the stem. The use of mulch or other loose fill in tree opening must be kept below final surface level to prevent spillage onto surrounding surfacing.

Aftercare

The aftercare for trees in hard landscaped areas is essentially the same as in softscape areas, for example watering, formative pruning and maintenance of furniture. Trees should be monitored in accordance with the maintenance and management plan. This may require additional tasks, to manage tree openings and other furniture. For example, where a tree grille is installed, sections should be removed as the tree stem increases in size. The opening surrounding the stem shall be infilled with a suitable loose material such as bark mulch or horticultural sand and regularly topped up as required.

Similarly, where a tree guard is installed, this should be removed once the tree is well established and is constraining the trees natural form and growth

