

Part 5 Landscaping and Trees

Technical Guidance and Standards



Stockton-on-Tees
BOROUGH COUNCIL

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1.0 Introduction

Landscape proposals are an important placemaking element of new developments, playing a crucial role in how the place will look and feel. Landscape proposals will be required for most developments and are especially important on major developments, sites in highly prominent locations, infill / redevelopment sites and areas of high townscape or landscape quality.

The details required for a landscape scheme will vary according to the proposal and applicants must ensure that suitably qualified people are involved throughout the design and implementation stages. It is essential that maintenance is considered throughout the design and future maintenance plans are prepared and delivered upon. Relevant British Standards and Codes of Practice must be adhered to throughout the survey, design, and implementation of the scheme (see Reference list).

2.0 Core Requirements and Surveys

All development proposals must consider the contribution of existing landscape features and the impact of the development on the local area at the beginning of a project.

Landscape Character and Visual Impact

For some development proposals a Landscape and Visual Impact Assessment (LVIA) may be required to provide an appraisal of the impacts of a development on landscape character and visual amenity. This will be required for the majority of EIA projects, large scale developments and those in sensitive locations. Where an LVIA is required viewpoint selection should be discussed with Officers prior to commencement of any survey work.

Pre-Development Surveys

With respect to existing site trees, the following surveys may be required and should be prepared in accordance with BS5837:2012.

- Tree Survey and Quality Assessment – identifies the characteristics of all trees on and within 10m of the site, including details of species, root protection areas, canopy spread, and quality.
- Tree Constraints Plan (TCP) - provides a visual representation of the tree survey and illustrates site constraints created by the presence of trees, including shade. This will inform the best use of available space for the layout and orientation of the development.
- Arboricultural Impact Assessment (AIA) - outlines the potential impacts of the proposals on trees and should be used to review and finalise a suitable scheme which aims to prevent or minimise any adverse impacts to trees.
- Shade Study – may be required where existing trees or woodlands are located in close proximity to development and may affect the future enjoyment of outdoor spaces.

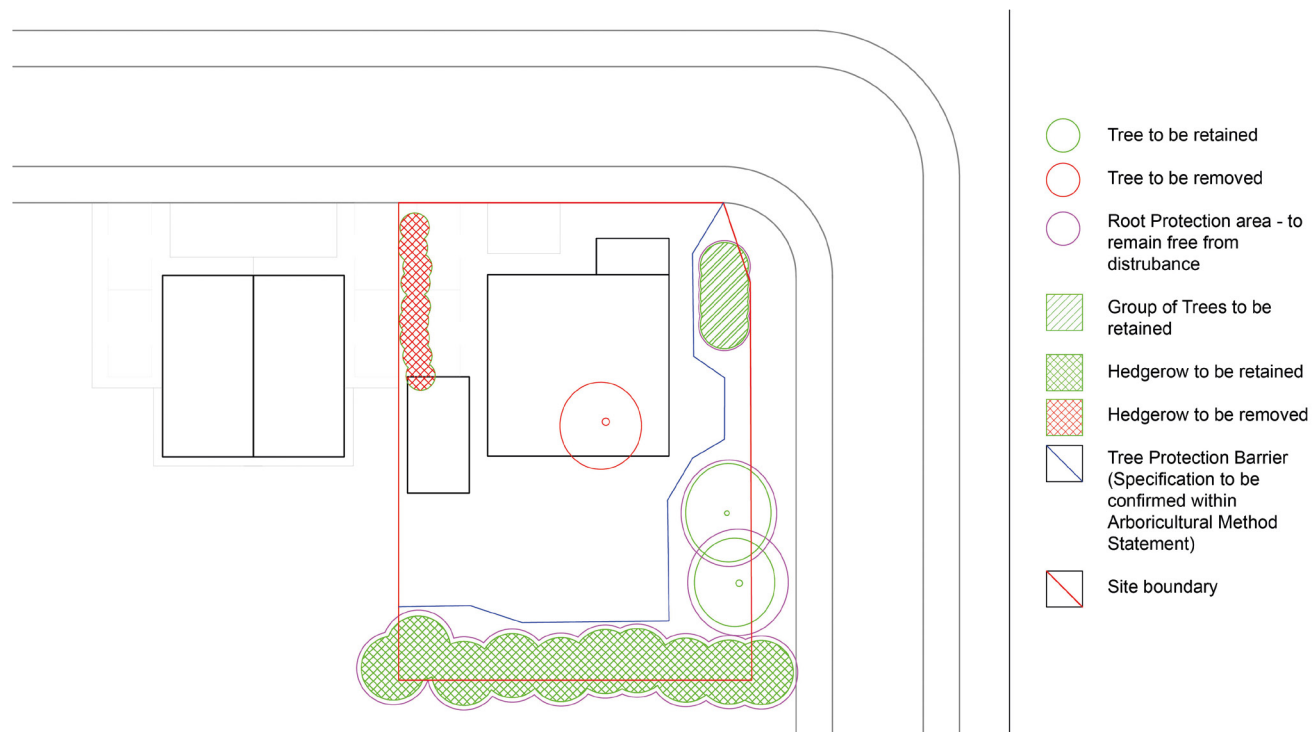
Arboricultural Information

- Arboricultural Method Statement (AMS) – details all proposed works to trees, recommended tree protection measures, and details of appropriate design and construction methods and materials to be used, to ensure trees are protected for the duration of the construction process.
- Tree Protection Plan (TPP) – illustrates the location of tree protection measures (such as fencing and ground protection) to ensure adequate protection of trees and their roots during construction. Figure 1 provides an example of a Tree Protection Plan.
- Specification for Tree Works – should accompany the submission and be annotated on the TPP to provide full details of the works that are required for ‘development purposes’ (e.g. to allow construction) and those required for arboricultural purposes (e.g. remedial management or safety purposes).

Figure 1 - Example Tree Protection Plan

The impact of new development on all existing trees and proposed landscaping must be assessed during the early stages of the planning and design process. Developments that retain and accommodate existing trees within proposed design layouts will generally be supported, whilst proposals that would result in loss, damage or conflict with important trees or woodland are unlikely to receive planning consent. New developments should be designed around retained trees to ensure compatibility with all new buildings and infrastructure. This will deliver sustainable tree cover that is a positive asset in the landscape and avoids damage to buildings or infrastructure or impacts on the amenity of existing and future occupants of buildings and land.

As well as having regard to existing trees affected by the proposal, consideration should also be given to how the development integrates visually within the landscape. Typically, the Council will require a proposal to be accompanied by the following landscape details.



Landscape Design Requirements

- Detailed Plans indicating the layout, hard and soft landscaped areas, s, public open space, street furniture and play equipment along with proposed levels and typical cross sections;
- Hard Landscaping Plan and Specification identifying the colour, size and extent of surfacing materials, as well as details of the location, height, and materials of boundary treatments and any retaining walls;
- Soft Landscape Plan and Specification identifying the location of all trees, shrubs and seed mixes in relation to street lighting, underground services and easements, as well as specific details of the species, size and density of planting;
- Planting Specification covering work from ground preparation, to planting the trees and shrubs and seeding methods; and
- Maintenance and Management Plans specifying actions for maintenance of public open space, play equipment and soft landscaping for a period of 25 years.

3.0 Design of Landscape Schemes

Soft landscape proposals should be carefully considered and designed to meet the needs of the specific location and the planned future maintenance regime, to ensure planting is feasible and sustainable. Relevant British Standards and Codes of Practice must be adhered to when designing soft landscape schemes. Individual species and design of plant mixes should be selected having regard to important local habitats and features such as Local Wildlife Sites.

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.

Where possible seed mixes, trees and plants of local provenance should be used for landscaping schemes. These plants are adapted to local conditions, such as weather and soils, and will establish well, and also preserve local varieties and species mixes.

Grassed Areas

For all grass seeded areas, mixes and rates of application shall be clearly stated, with a low maintenance mix strongly recommended, especially when the developer seeks adoption by the Council. On small awkwardly shaped areas, or slopes steeper than 1:5 that are difficult to mow, shrubs are often a better form of ground cover. Landscaping and grass seed mix in SuDS features should be developed in close association with Drainage Engineers and guidance from the Lead Local Flood Authority having regard to the designed level and frequency of flooding and future maintenance of features.

Shrubs, Whips, Hedges and Ornamental Planting

Areas of planting shall be clearly indicated on the submitted plans and be accompanied by a planting schedule detailing the stock, size, type and density of planting (given as the species and number of plants per square metre). Where plans identify sufficient space for proposed planting, details of the association of one plant species to another will not normally be required at the application stage. However, any planning permission will be conditional on the submission and approval of a detailed landscaping scheme before development commences.

Shrub Species Selection

Designers should ensure that when selecting plants they are suited to the ground conditions, which in Stockton-on-Tees Borough are often predominantly heavy clay, as well as being compatible with land uses in the area. This is of particular importance near areas of open space where plants should be robust, non-prickly, tolerant of vandalism and quick to establish.

The need to maintain sight lines in the interest of traffic and perceived pedestrian safety will also influence species selection. Species likely to reach a height of 60cm+ will not be planted within visibility splays at road junctions, whilst planting alongside semi-mature trees (with a clear stem up to 1.8m high) should not exceed a height of 1m. As a general rule 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

All shrubs should be planted in beds formed with a minimum depth of 400mm topsoil. 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.

Hedgerows

Native hedgerow species shall be used to define spaces and integrate developments into the landscape. Although, in urban areas non-native species such as laurel may be appropriate. Hedgerows shall be planted as a double staggered row with a minimum of 6 plants per linear metre, and include hedgerow trees where possible.

Herbaceous Perennials and Grasses for Use in Landscape Projects

Due to their habit of dying back in the winter there is a limited use for herbaceous planting. 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.

Bulb Planting

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. The most suitable flowering bulbs for planting in large drifts in grassed areas are Crocuses and early flowering Narcissus species. Whilst machine planting is recommended, when areas are constrained by site levels and available space, lifting and replacing turf to allow hand planting will be acceptable.

Tree Planting

Positions of proposed trees should be shown accurately on a landscape plan, noting the species, size and type of planting stock. Advanced / larger sized nursery stock is preferred for amenity tree planting. A specification must be provided for the planting and establishment of all trees, providing full details of all planting methods, materials and essential aftercare.

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. Appropriate siting of trees, use of correct species and design of tree pits are essential to prevent future conflict between trees and their surroundings.

When determining applications, Stockton-on-Tees Borough Council will use planning conditions and Tree Preservation Orders (TPOs) to safeguard important trees and vegetation.

Tree Selection and Location

New trees must 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. At the outset, designers will consider the purpose of the landscape feature having regard to broad design principles within this SPD.

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.

Species diversity is encouraged to enhance the future resilience and sustainability of new tree planting schemes, avoiding single species 'monocultures' that are vulnerable to pests and diseases. Locally native species should be used in natural green spaces, wildlife corridors and rural countryside areas to help support local biodiversity. Use of native and non-native trees may be suitable in an urban setting and will enhance resilience to climate change through increased diversity

in the urban tree population. In an urban context, non-native species can function as ornamental features, or because they have characteristics and adaptations more suited to that environment.

Different tree species prefer different conditions and have natural adaptations and tolerances to certain environments. It is therefore important to consider factors including soil condition, exposure, surface treatments, site drainage and water requirements, pollution tolerance, light conditions. 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. Factors include tree form and any potentially negative characteristics of the species such as fruit production, sap or twig shedding, heavy shade etc.

Established trees 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 from existing and proposed trees. Excessive shading could impact on the amenity of buildings and land, especially dwellings and their gardens. This situation could lead to pressure for tree removal 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 required to identify the estimated shade implications at different times throughout the day and season. 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.

Avoiding Conflict Between Trees Buildings and Infrastructure

The close proximity of a development to existing and proposed trees may cause impacts on the tree itself, as well as the foundations of buildings and any underground utilities. For example, all soft landscape schemes in close proximity to the adopted highway must introduce root barrier membranes to prevent damage. Schemes within 2m of the adopted highway will be required to install both root deflectors and root barriers

The following design solutions can be used to enable trees and built structures to co-exist:

- Special Foundations - Where new or existing trees are near proposed buildings, advice should be sought from a qualified Structural Engineer, and foundations designed in accordance with current guidance, including NHBC Guidance section 4.2 Building Near Trees.
- Root Barriers - used to protect shallow services and paving from potential damage.
- Root Directors - prevent root circling and divert root growth down and out to protect paving construction from future damage by tree roots.
- No-dig and Low Impact Construction Methods - within root protection areas a no-dig or low impact construction method should be adopted to minimise direct damage to tree roots, prevent soil compaction, and maintain good aeration and drainage.
- Flexible Surfacing – introduce a surface around trees which is highly porous and flexible, so that it accommodates the tree and its roots as it grows. This will reduce the likelihood of shallow rooting that can often cause infrastructure damage.
- Walled Boundary through the Root Protection Area - where a fenced boundary 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.

4.0 Implementation

The developer may benefit from a visit to the tree nursery to secure and tag good quality specimens that are suitable for the development. They will also arrange for purchase, delivery, handling, storage and transportation of trees, which will typically include extra heavy standard trees as specified in the scheme

Pre-commencement quality checklist

- 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 of pests, diseases, and physiological disorders such as branch die back, epicormic/ basal shoots, elongations/lesions, discoloration etc;t; 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.

To prevent the introduction or spread of harmful organisms it is important to ensure that selected suppliers of all trees and plants are able to demonstrate that adequate biosecurity control measures are in place, and that all plant stock is pest and disease free. Details of nursery production methods and an audit trail for all stock should be available where required.

Trees will be planted in accordance with British Standards, with evidence of compliance required for any trees planted in the adopted highway, council land or areas to be title transferred to the Council. 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.

Planting Pits

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.

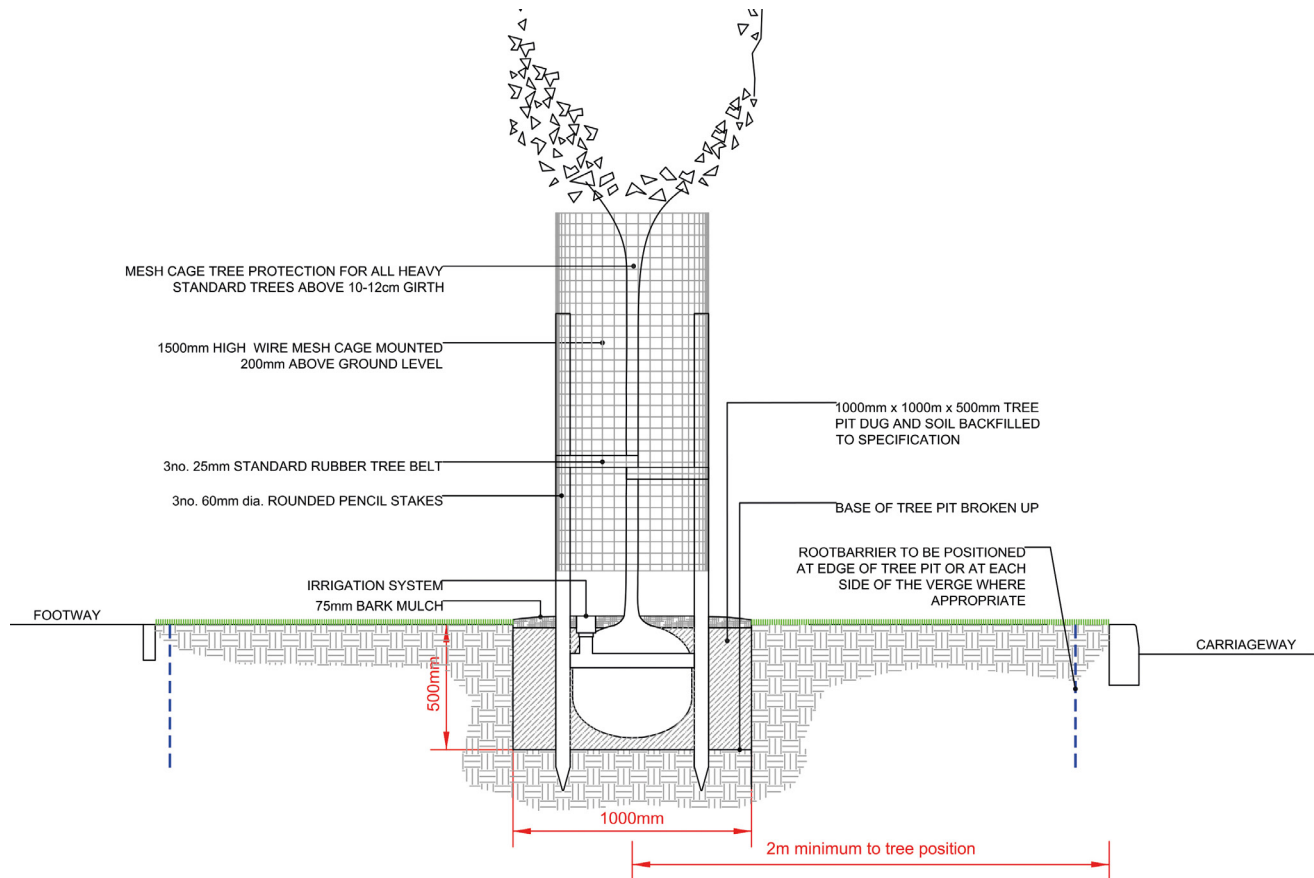
Tree pit design must ensure sufficient overall soil volume, depth and soil quality to ensure future healthy tree growth. The optimum tree soil volumes using root cell systems should be as suggested in the table below. Trees planted in a lower volume of soil than that calculated will not reach their full 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	Canopy Diameter	Pit Dimensions	Target Soil Volume	Species Examples
Small species	3m - 5m	3m x 3m x 1m	5-9 m ³	Amelanchier arborea / Malus hupehensis Prunus 'Pandora'
Medium species	5m - 8m	4m x 4m x 1m	12-16 m ³	Pyrus calleryana / Sorbus intermedia Betula ermanii
Large species	8m+	5m x 5m x 1m)	25-30 m ³	Acer platanoides / Quercus palustris Tilia cordata

Tree pit systems that are suitable for hard landscaped areas are available from multiple manufacturers. Planting pits shall be prepared in accordance with the recommendations of the pit system manufacturer.

Tree Planting in Soft Landscaped Areas

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 with the soil broken up. Excavated topsoil should be mixed with a minimum of 50 litres of compost per pit before being backfilled.



DETAIL FOR TREE IN SOFT VERGE AREAS

Figure 2 - An example tree pit arrangement for soft landscape

Soft Landscaped Area – Tree Materials List

- Tree Stakes – 3 no. pointed treated timber stakes (e.g.1.5m) *
- Tree Cage – 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



Tree Planting in Hard Landscaped Areas

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 provided for individual specimens or interconnected/continuous trench shared between a number of trees. They can also be different shapes as identified in figure 3 to optimise the available soil volume for each tree

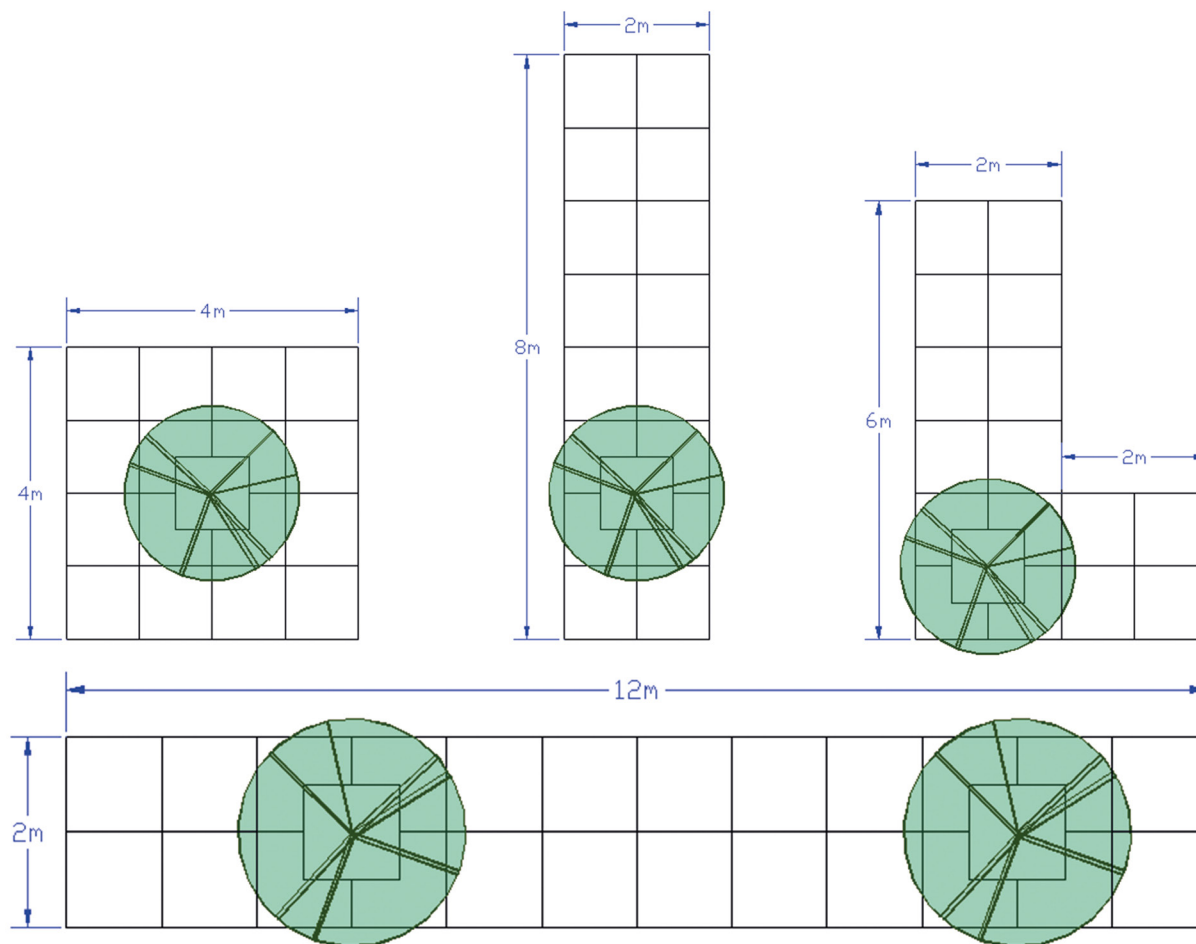
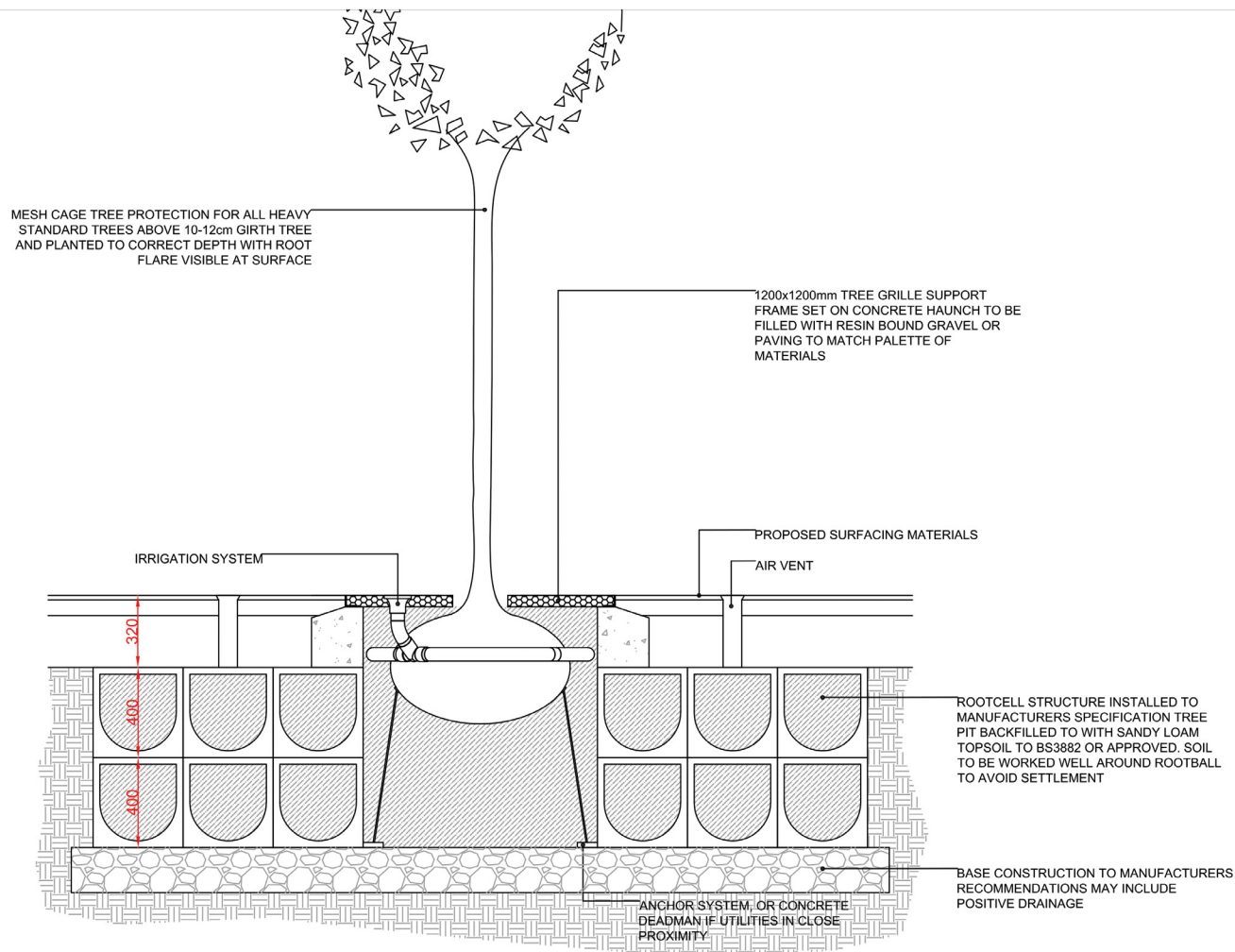


Figure 3 - Examples of various tree pit shapes within hard landscapes





DETAIL FOR TREE IN HARD LANDSCAPE AREAS

Figure 4 - An example tree pit arrangement for hard landscape

Hard Landscaping – Tree Pit Materials List

- Root Cell System – underground cell system appropriate to tree size and location.
- Rootbarriers – to protect adjacent surfaces and services.
- Geotextiles – geotextile membrane to protect construction layers
- Anchor System – strapped anchor system or concrete deadman system.
- Irrigation and Aeration System
- Backfilling Material – using imported sandy loam topsoil to BS3882 or similar approved.
- Tree Grille – to suit conditions, typically 1.2mx1.2m tree grille frame filled.
- Tree Guard – to suit conditions, typically 1.8m high vertical steel circular tree guard.

Tree Planting

Before positioning the tree, all tied up branches will be released, canes will be loosened or removed and remedial pruning of weak or damaged branches will take place. Edges of containerised root balls should be 'shaved' lightly with a spade edge to stimulate fibrous root development into surrounding soil. Trees must be planted upright at the correct depth to ensure the root collar at the base of the stem is the same depth as it was in the nursery. 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.

Once the tree is placed in the tree pit correctly and tree stakes placed in the correct position backfill soil can then be added as specified above. 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. 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.

In hard landscaped areas, where tree pits require root cell systems, anchor systems and surface materials, they shall be installed carefully in accordance with the manufacturer's instructions to prevent damage to the tree. When anchor systems are used 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

Tree Watering and Mulch

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. Bark mulch should be placed around the base of each tree at approximately 0.75m deep and 1m 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 of the tree cage.

Tree Support Systems

Stakes should be positioned just outside the 'rootball' of the tree to prevent damage to roots and be evenly spaced and upright. They must be driven in firmly and 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.

A standard tree tie or belt (min 25mm size) should be used to secure the tree to each stake at required stem height. No blocks, wires, or boards should be used as they may damage the tree as the stem girth increases. Where specified, wire mesh cages should be installed, To protect tree stems or branches from being damaged. A cage comprises a sheet of galvanised steel mesh, wrapped and nailed around the three stakes, to form a protective, cylindrical cage around the tree. A small gap should be left at ground level to enable the removal of litter and weeds. the top height of the cage should normally be 1.6 - 1.8m high.

In hard landscaping schemes appropriate surface materials may be used at the exposed area around the tree. Materials may include a proprietary tree grille, preformed tree surround (stone or resin), or a flexible gravel material. An expansion gap must be retained around tree root collars 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.

5.0 Maintenance and Management

All landscaped areas must be adequately maintained to ensure successful establishment. Proposals must be supported by a landscape management and maintenance plan setting out a detailed approach for an initial 5-year period from the date of completion, followed by a long-term management plan for a period of 25 years. Planning permissions will be subject to conditions that require the plan to be implemented

Maintenance and Management Plans will set out:

- long term design objectives for all landscape areas/ retained vegetation;
- management responsibilities and maintenance schedules for all landscape areas;
- replacement planting programme to be implemented when planting dies or is damaged;
- access routes to ensure maintenance operations can be undertaken without trespass;
- any specific measures to manage protected species and their habitat; and
- management of trees within proximity of private properties etc.

Within the initial 5-year period following completion of the planting scheme the following actions will be specified in the maintenance plan.

Pruning / Removal / Replacement

Trees and shrubs will be subject to formative pruning to remove damaged, dead or poorly formed branches. When plants have failed due to severe vandalism, natural causes, or poor stock quality they must be replaced with a comparable specimen planted to the original specification.

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. 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 the establishment/maintenance period to be removed 5 years+ after planting by client when deemed necessary.

Mulch and Watering

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

Trees and shrubs 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.

Title Transfer

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.

Reference list

- BS5837:2012 BS 5837:2012 Trees in Relation to Design, Demolition and Construction
- 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
- 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
- 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)
- NHBC Guidance section 4.2 Building Near Trees
- www.forestry.gov.uk/biosecurity
- www.fera.defra.gov.uk

