



## Universal Services Directorate

# Technical Guidance Note TG15 – Trees, Landscape & Ecology

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*Amendments are indicated by a bar in the left hand margin*

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## 1. Policy / approach

- 1.1. Trees and other soft landscaping form an important part of the network of highways that make our communities sustainable, enjoyable and inclusive. The landscape element of a new development can be a valuable asset to the overall scheme. There is well documented evidence that it improves the wellbeing of residents and the success of the local economy.

*“Good-quality landscape is highly cost effective. It is a relatively low-cost part of any development scheme and pays dividends in added sales values, increased rates of sales and positive customer perceptions” Mark Clare, Group Chief Executive Barratt Developments plc*

*“The impacts on mental wellbeing, social networks and sustainable communities probably work through a variety of mechanisms and it’s in these areas that the strongest evidence is emerging that urban green space can improve the public’s health” Public Health England 2016*

- 1.2. However, poorly designed landscapes can create long term problems, detrimental to local communities, the Developer and the Highway Authority. Good design and forward planning mean many of these issues can be avoided.
- 1.3. The landscape elements of any scheme can provide benefits to individuals and to society as a whole: green infrastructure can contribute to the character and distinctiveness of an area and help soften the urban environment. Its role in helping to adapt urban areas to the effects of climate change is becoming increasingly recognised, for instance, trees provide shade, reduce temperatures and green infrastructure slows the rate at which rainfall enters the drainage system. Trees play an important role in any landscape scheme and historically, are an intrinsic part of our towns and villages bringing multiple benefits to microclimate, wildlife, air quality and indeed to quality of life. However, they can also create an expensive on-going maintenance burden, sometimes leading to property damage and nuisance.
- 1.4. To ensure that trees are an asset rather than a liability, the right species has to be planted in the right place with adequate root space for the tree at maturity. To minimise the risks as the trees mature, they need to be planned from the outset during the early design stages; this should then enable their adoption as part of the Highway.
- 1.5. The benefits of trees are proportionate to their eventual size; large, long lived species provide more benefit than those that are small and short lived. Hampshire County Council therefore encourages planting of large tree species in appropriate places within the Highway. It may be preferable to use fewer, larger, long lived trees in certain situations, rather than large numbers of smaller, short lived, ornamental trees.

- 1.6. It is essential that tree planting is considered in detail at the early stages of the design process when the initial concept layout is formed. This is because a tree is a growing structure. When it matures it will be many times bigger, needing much more space both above and below ground than it did when it was planted or when the landscaping was first designed. Tree canopy size and soil volume requirements at maturity are often overlooked at both the design and construction phase, regularly resulting in poor vitality and short life span. This in turn leads to a reduction in visual amenity, an increase in maintenance costs and the premature removal of trees. An initial design concept which includes tree lined boulevards can be decimated at the detailed design stage when the reality of their spatial requirements is considered in detail. It is therefore essential that the initial layout design recognises and provides space for the eventual size of mature trees.
- 1.7. Landscape architects will be required to consider the design effects of individual trees to determine whether avenues, or groups of trees are appropriate for the location and streetscape character area. This has to be done in liaison with an arboriculturist who will advise on species selection and whether the design intention is achievable in arboricultural terms particularly given the ground conditions. Input from ecologists may also be required to assess the ecological interest of areas to be planted, and in the choice of species where the project is in or adjacent to an area of biodiversity interest.
- 1.8. It is crucial that street lighting design layouts are considered at the outset of any landscape/tree proposals so that maturing canopies do not obscure or reduce the effectiveness of lamps. Refer to [Technical Guidance Note TG13 – Street Lighting](#).
- 1.9. Appropriate landscape and arboricultural advice should be sought and included in the design from an early stage. Hampshire County Council will not accept adoption unless the proposals and implementation meet the County's requirements, are aligned with the County's [Tree Strategy 2020](#) and are resilient to future climate conditions as well as pests and diseases. Hampshire County Council will adopt trees and landscaping which at the time of completion of the S278/S38 maintenance period, show good vitality (leaf size/leaf colour/ leaf canopy density/extension growth/incremental girth development/stem taper development) and structure. Spot checks will be carried out throughout the construction and maintenance periods and Developers will be prompted to take remedial action if required.
- 1.10. Tendering documents are to include specifications relating to installation and post planting maintenance of trees to ensure contractors are adequately trained and experienced. We encourage discussions with council officers/engineers in relevant teams (for example, for trees, highways, lighting, road safety, drainage, urban design) in the early stages of the design. For external Developers and their Consultants, this should be through the County's Highway Development Agreements team (HDA).

1.11. Hampshire County Council needs to see evidence of the criteria, guidance and methods within the following documents being incorporated into the project:

- Manual for Streets
- BS 8545 Trees: From nursery to independence in the landscape – Recommendations
- BS 5837 Trees in relation to design, demolition and construction – Recommendations
- BS 3998 Tree Work – Recommendations
- BS 3936-1 Nursery stock Part 1: Specification for trees and shrubs
- BS 4428 Code of Practice for general landscape operations
- BS 5489-1 Code of Practice for lighting of roads and public amenity areas
- BS 3882 Topsoil
- BS 8601 Subsoil
- Code of practice for the Sustainable Use of Soils on Construction Sites
- Trees in Hard Landscapes – A Guide for Delivery (Trees & Design Action Group)
- NJUG Volume 4 Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees (National Joint Utilities Group)
- Building Near Trees - NHBC Standards Chapter 4.2 (National House Building Council)

Note: For undated documents, the current edition including any amendments apply)

## 2. Definitions & abbreviations

<b>CAVAT</b>	Capital Asset Value for Amenity Trees
<b>CIEEM</b>	Chartered Institute of Ecology and Environmental Management
<b>CPSE</b>	Committee for Plant Supply and Establishment
<b>DEFRA</b>	Department for Environment, Food & Rural Affairs
<b>EclA</b>	Ecological Impact Assessment
<b>HDA</b>	Highway Development Agreements team in Hampshire County Council
<b>Herbaceous plants</b>	Plant with no persistent woody stem above the ground. Includes grasses.
<b>HTA</b>	Horticultural Trades Association
<b>LPA</b>	Local Planning Authority
<b>MfS</b>	Manual for Streets
<b>NBS</b>	National Building Specification
<b>NHBC</b>	National House Building Council
<b>NJUG</b>	National Joint Utilities Group
<b>Planter</b>	An above-ground decorative container in-excess of 1m <sup>3</sup> for the planting of flowers/small shrubs
<b>Root deflectors</b> (also referred to as root barriers)	<p>Deflectors are physical impediments to root growth. They function by redirecting root growth away from infrastructure with initial lateral root growth is deflected downward when roots come into contact with the barrier.</p> <p>Root deflectors are only permitted if agreed by Hampshire County Council Arboriculture on a site-specific basis. Such use will only be considered if the root deflector is used to protect features such as utilities rather than constraining the root growth of a tree as it matures (for example, by lining a tree pit).</p>
<b>RPA</b>	Root Protection Area. The area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree.

<b>Shrub</b>	Plant with persistent multiple woody stems. They are generally less than 2m in height.
<b>SINC</b>	Sites of Importance for Nature Conservation
<b>SSSI</b>	Sites of Special Scientific Interest
<b>TDAG</b>	Tree Design Action Group
<b>TPO</b>	Tree Preservation Order
<b>Tree</b>	A plant with a persistent woody stem or trunk, normally greater than 2m in height at full maturity. They tend to have a single stem.
<b>Tree pit</b>	The surface treatment and below ground rooting volume of soil available to each tree
<b>RVEI</b>	Road Verges of Ecological Importance
<b>Ultimate height</b>	The predicted maximum height of the tree or shrub based on industry guidance (such as the TDAG guidance "Species selection for Green Infrastructure") and as is reasonable, based on real life examples of the same species.
<b>Ultimate spread</b>	The predicted maximum spread or diameter of the tree/shrub canopy based on industry guidance (such as the TDAG guidance "Species selection for Green Infrastructure") and as is reasonable, based on real life examples of the same species.

### 3. Technical requirements

#### 3.1. Surveys and preliminary constraints

- 3.1.1. All topographical surveys shall follow the requirement of BS 5837:2012 Clause 4.2. The details shall record but not be limited to those set out in Clause 4.2.4.

#### 3.2. Soil assessment

- 3.2.1. A soil assessment shall be undertaken by a competent person to inform any decisions relating to:
- the root protection area (RPA)
  - tree protection
  - new planting design
  - structure and foundation design to take account of retained, removed and new trees.
- 3.2.2. The assessment shall determine whether the soil is shrinkable, such as a shrinkable clay. Where a clay soil is present, trees and other vegetation have the potential to cause indirect damage to structures, reference BS 5837 Annex A and NHBC Standards Chapter 4.2.
- 3.2.3. Soil structure, composition and pH are to be included in the assessment for the purpose of designing new planting and landscape proposals.

#### 3.3. Tree survey

- 3.3.1. A tree survey shall be carried out if there are any existing trees within or close to the extent of the highway works. This includes where the tree canopy and/or the root protection area (as determined by BS 5837 Section 4.6) is likely to be impacted. The survey shall comply with the requirements of BS 5837.

#### 3.4. Ecology

- 3.4.1. Any trees, shrubs, hedgerows or other habitat proposed for removal or which may be impacted on should be assessed for its biodiversity value, including protected species such as bat roosts and dormice, and for nesting birds. Surveys and subsequent appropriate actions should follow BS 42020 and [CIEEM good practice guidance on ecological impact assessment \(EclA\)](#). Refer also to Technical Guidance Note [TG13 - Street Lighting](#) regarding measures that may be incorporated to the lighting to minimise impact on protected species.

### 3.5. General provisions

- 3.5.1. It may be that the design of buildings, the provision of green roofs, generous balconies and roof gardens or shrub and other smaller scale planting in private spaces at frontages can, in high density development, provide greenery and contact with nature where street trees cannot be accommodated. Trees of any scale may be included in squares and perhaps at junctions (outside of visibility splays), whilst large tree species may be provided along the wider streets, where buildings are set back from the Highway, or within gardens.
- 3.5.2. The width of individual building frontages also has implications for street tree provision where on street parking is proposed. Wider individual buildings allow more flexibility to include street trees between parking bays and are characteristic of some of Hampshire's country towns.
- 3.5.3. As recommended in Manual for Streets (p38 para 3.9. and p127 para 11.1.2), close liaison at an early stage of design should take place between those preparing development briefs, design codes, or outline applications, and the Highway Authority to achieve tree planting proposals acceptable for Highway adoption. Production of a tree planting strategy, indicating species, and their spatial allocation within particular street profiles, is recommended for larger scale developments at the outline stage. All such development briefs, design codes or outline applications shall consider any proposed tree planting in relation to Highway visibility, street lighting and utilities (Refer to [Technical Guidance Notes TG3 – Stopping Sight Distances and Visibility Splays](#), [TG13 – Street Lighting](#) and [TG20 - Utilities](#)).
- 3.5.4. Clarity regarding the location of the proposed Highway boundary and private or open space boundaries is required. This information is required to identify the future maintenance responsibilities (and therefore the design parameters to be applied) for tree/shrub planting and other infrastructure. Outline planning application drawings should show these boundaries clearly including the intentions for future maintenance arrangements of open spaces and streets. Detailed planning and design drawings are also to show such information.
- 3.5.5. The choice of shrub or tree species should be carefully considered following a thorough study of the area. The distances detailed in 3.7, 3.8 and 3.9 shall be adhered to during the design. The majority of the new plants should be within the range of species occurring naturally nearby. They should be tolerant of a range of climatic conditions to allow for their healthy growth in the event of anticipated climate change. The wildlife value of planting is to be taken into account.
- 3.5.6. Developers should discuss with the Highway Authority at an early stage the adoption of hard landscape features and planting. For those amenity areas not to be adopted by the Highway Authority, the Developer should discuss their adoption and future maintenance arrangements with the Local Planning Authority.

- 3.5.7. It is important that any soft planting areas in or adjoining the Highway should be an integral part of the overall landscape scheme. The landscape layout design and planting proposals are to be prepared by a qualified landscape architect. Tree surveys and any proposals for works to, or the protection of, existing trees are to be prepared by an appropriately qualified arboriculturist. It is expected that development layouts will include proposals for tree planting on a mix of privately owned, public open space and adopted highway land, to secure a shared community responsibility for long term tree cover. In rural areas, where it is most important to use naturally and locally occurring species, smaller planting sizes may be more appropriate.
- 3.5.8. Special consideration should be given to trees when designing foundations of adjacent walls and buildings. These foundations should be designed to take into account the growth of existing and proposed trees, and their impact on soil conditions and proposed structures, especially in clay soils. Refer to the NHBC Standards Part 4.2.
- 3.5.9. Planters may only be installed in the Highway where the district or parish council has agreed to maintain the planter and its contents in perpetuity and has entered into an agreement with Hampshire County Council under Part VIIA of the Highways Act 1980 for the enhancement of the highway amenity. **Trees will not be permitted in planters in the highway.** For Developer-led schemes, the Developer is responsible for obtaining the district/parish's agreement in principle to enter into such an agreement with Hampshire County Council; this must be obtained prior to the start of construction. The Agreement between the district/parish and the County Council must be in place prior to adoption.
- 3.6. Retaining existing trees**
- 3.6.1. To give existing trees the greatest chance of survival, it is essential to follow the recommendations set out in BS 5837.
- 3.6.2. A realistic assessment of tree condition is required, arboricultural advice should be sought and a report provided. Trees are to be in good order prior to adoption by the Highway Authority and any damage during construction addressed prior to adoption.
- 3.6.3. Prime consideration should be given to the well-being of trees to be retained. Any consideration for encroaching into a Root Protection Area (RPA) should be discussed with the Arboriculturist and any such works shall be agreed with Hampshire County Council. Tree removal and the compensation for those trees removed (using the Capital Asset Value for Amenity Trees (CAVAT) methodology) may be required if substantial root loss is likely following advice from a qualified Arboriculturist.
- 3.6.4. Sufficient space should be allowed to retain the existing root system and canopies without undue cutting. New underground services should not be laid within root protection zones. Where this can't be avoided, services should be laid beneath root systems in ducts provided by the Developer

and in accordance with National Joint Utilities Group Guidelines Volume 4 “Guidelines for the planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees”. Where new roads or footways are proposed in close proximity to existing trees, it is likely that special measures for the accommodation of roots will be necessary – advice should be sought from the County’s Arboriculture Team at an early stage in the design.

- 3.6.5. As far as possible the existing ground levels within the Root Protection Area of existing trees should not be altered although it is accepted that any new road or footway may need to be raised over existing roots. Excavations within the root protection area of retained highway trees should be avoided where possible. In situations where excavations cannot be avoided hand digging will be required following advice from the Arboriculturist.
- 3.6.6. Root barriers (deflectors) may be acceptable for adoption in some cases but only with approval of Hampshire County Council prior to installation (also refer to 3.10.11).
- 3.6.7. The protection of trees and hedges during site construction is essential; Developers shall refer to BS 5837 - recommendations, and any site specific Arboricultural Method Statement prepared for the development.
- 3.6.8. Where highway trees are proposed for removal to facilitate development (S278 and/or S38), the County will require compensation for the loss of highway tree assets. Hampshire County Council will require a CAVAT assessment using the current published methodology (Capital Asset Value of Amenity Trees - <https://www.ltoa.org.uk/resources/cavat> ) to establish the value of compensation due for the loss of highway trees. Compensation for the value of lost highway trees shall be paid to Hampshire County Council **prior to their removal**. Where trees are lost outside the Highway, the Developer should agree with the local planning authority the method of assessment to calculate the value of compensation required for the trees lost. Refer to the [Road Agreement Policy for the Protection of Highway Trees affected by New Development](#).
- 3.6.9. The County Council’s Arboriculture Team can carry out the assessment and valuation of the trees on behalf of Developers at the Developers’ cost. Should you wish to enquire about this service, please contact [Arboriculture.Section@hants.gov.uk](mailto:Arboriculture.Section@hants.gov.uk). Alternatively, developers may use their own arboriculture specialists, in which case, the CAVAT assessment will be reviewed by the County Council’s Arboriculture Team. In the event of any valuation disagreement, the County Council’s valuation will be final.
- 3.6.10. Where highway hedgerows are proposed for removal, the County Council may require their replacement in accordance with Section 3.7, to maintain highway landscape character and enhance biodiversity value.

### **3.7. Hedgerow provision design issues**

- 3.7.1. Replacement/new hedgerows are to comprise a mix of native species trees and shrubs, reflect the character of the local area and add to the biodiversity of the site unless agreed otherwise by the County Council. However, blackthorn (*Prunus spinosa*) is unlikely to be accepted for use on highway land.
- 3.7.2. The ultimate spread of hedgerows shall not obstruct the stopping sight distance, full overtaking sight distance (where relevant) or visibility splays at junctions (refer to [Technical Guidance Note TG3 – Stopping Sight Distances and Visibility Splays](#)).
- 3.7.3. Hedgerow trees should be spaced no closer than 10m centres, and should be at least 2m from the adjacent carriageway/footway/drainage elements unless agreed otherwise by the County Council.
- 3.7.4. Hedgerow shrubs should normally be planted in a double staggered row, 5 per metre. The ultimate spread shall be no closer than 0.5m from the adjacent carriageway/footway/drainage element. However, please also refer to [Technical Guidance Note TG20 - Utilities](#) regarding service margins which must also be allowed for. The ultimate spread of the hedgerow should not encroach into the service margin.
- 3.7.5. Plant in a compost enriched trench, at least 300mm wide by 600mm deep, and allow for protection of plants from herbivores if appropriate.
- 3.7.6. Establishment maintenance should ensure weed control, watering and pruning for at least 3 years with replacement of any plant that fails to thrive, each planting season within that period.
- 3.7.7. Other provisions of the tree and shrub clauses also apply namely: 3.8.5 (lighting), 3.10.2 (handling), 3.10.9 (mulch), 3.10.15 (maintenance) and 3.10.16 (commuted sums).

### **3.8. Tree provision design issues**

- 3.8.1. It is essential that adequate space be allocated, as part of the initial design of layouts, to provide for the scale of tree canopies and roots at maturity. Where street trees are proposed, a realistic understanding of their eventual canopy size is a fundamental guide to the selection of appropriate species, and the provision of space on the ground required to accommodate them. Design drawings showing proximity of trees to buildings and visibility splays, including projected mature canopy sizes are to be submitted to HCC. Trees shall be shown at their anticipated 'ultimate spread' based on industry guidance and as is reasonable, based on real life examples of the same species (refer to the TDAG guidance "Species selection for Green Infrastructure"). Drawings supplied to the LPA at the planning stages should also contain such information to enable the Highway Authority to comment fully at the planning stage.
- 3.8.2. No tree shall be planted with a stem/trunk less than 2 metres from any adoptable footway, footway/cycleway, cycle track, carriageway or

drainage features (such as soakaways or swales) unless the additional measures have been incorporated into the design to ensure the protection of the tree and the highway feature. Refer also to 3.10.

- 3.8.3. The location should reflect species choice and size at maturity to ensure a suitable vertical clearance between the road and the lowest branches of the crown can be maintained, without the need for extensive pruning works at tree maturity. Some allowances may be made dependent on location and tree species. The development of a crown shape suitable for highways begins in the nursery but needs to be further progressed during post planting maintenance when the tree is still young and semi-mature. Street trees should have a clear stem to 2.0m when planted; feathered stems may only be suitable in wide verges. Tree canopies should be at least 2m above ground level (min 2.4m where the tree is located adjacent to a cycleway).
- 3.8.4. Tree trunks or stems together with shrub planting, should not obstruct visibility within any sight lines required at junctions. Isolated trees at junctions may be acceptable (refer to Manual for Streets (MfS) para 7.8.6) but the designer should first locate trees outside of the visibility splays where possible. Care should be taken to ensure that the underside of canopies also do not impinge on the visibility splay, particularly where there are sags in the carriageway alignment (Refer to CD 109 3.4).
- 3.8.5. Trees planted in the adoptable highway are to be selected and planted to avoid adversely affecting street lighting. Refer to [Technical Guidance Note TG13 - Street Lighting](#).
- 3.8.6. Trees shall not be installed where they would require protection in line with CS 377 – “Requirements for road restraint systems” or the Local Authority Assessment.

### **3.9. Shrub provision design issues**

- 3.9.1. Shrubs have similar growing patterns to trees and are usually distinguished from them by being multi-stemmed. However, many species may grow either into shrubs or trees, depending on their growing conditions.
- 3.9.2. Generally, shrub planting within the Highway should be avoided unless specifically agreed with the Highway Authority in advance. A robust justification for their inclusion will be essential for them to be considered.
- 3.9.3. Given the similar characteristics of trees and shrubs, any shrub planting shall comply with the requirements of Section 3.8 with the exception of paragraphs 3.8.2 and 3.8.3.
- 3.9.4. No shrub shall be planted where the ‘ultimate spread’ is within 0.5 m of the footway, cycleway, carriageway or structure.

- 3.9.5. No shrub with an ‘ultimate height’ greater than 300mm shall be planted where the ‘ultimate spread’ is located within the stopping sight distance, full overtaking sight distance (where relevant) or a visibility splay.
- 3.9.6. Shrub planting densities should be appropriate for the selected species and be capable of achieving substantial ground cover/canopy closure before adoption. Selection should aim to discourage pedestrians taking short-cuts through them, provide all season impact, and reduce the amount of weed growth. Some temporary protective fencing may be required to assist plant establishment. The use of species with spreading habits should be avoided where planting will encroach on adjacent footways or carriageways, to avoid the need for frequent trimming.
- 3.9.7. Shrubs should be selected and planted to define, separate, or contain spaces as appropriate to the overall design objectives. Where space allows, the use of mass planting with a limited number of species with low maintenance requirements can be most appropriate.
- 3.9.8. Shrub species should be those which will stand up to ill treatment and which will withstand vandalism by their hardiness of structure and ability to respond to hard pruning if vandalised. Shrub borders should be of sufficient width to achieve and sustain their function.

### **3.10. Tree and shrub planting within or adjoining the adopted Highway**

- 3.10.1. Where there is a risk of a high level of vandalism, and where it is horticulturally favourable, extra heavy standard trees should be planted. In urban situations it is recommended that newly planted trees have a minimum girth of 14cm. Where there is a high risk of damage, the minimum recommended girth is 18cm.
- 3.10.2. Plants and their handling should comply with BS 3936 Nursery Stock Specification and with the National Plant Specifications published by the Committee for Plant Supply and Establishment (CPSE), obtainable from the Horticultural Trades Association.
- 3.10.3. Careful consideration should be given to the positions and species of trees and shrubs where these are to be planted close to new or existing structures (including roads, footways and engineered structures such as reinforced or strengthened cuttings, embankments or bunds.). The distances detailed in 3.7, 3.8 and 3.9 shall be adhered to during the design and planting.
- 3.10.4. Trees planted in hard surfacing are likely to require provision for some root growing medium under the load-bearing hard surfaces. Several technical solutions are available. These are to be agreed with the Highway Authority.
- 3.10.5. Where tree pits are to have an edging of paving slabs or similar, an internal edging of stainless steel/angle frame should be installed to resist movement of the paving. The detail is to be agreed with the Highway Authority.

- 3.10.6. Drainage tests are to be carried out as part of the technical design phase, and poor drainage improved prior to planting. A drainage layer of grit or similar at the base of the pits does not meet this purpose, but instead further inhibits water movement through the soil horizon.
- 3.10.7. The design of roads and drainage should ensure that unfiltered surface water run-off from the carriageway is not directed into tree pits.
- 3.10.8. Below ground irrigation is expected in hard surfaces. This should consist of a perforated pipe or similar, located at the top of the root ball to ensure water percolates through the entire root ball.
- 3.10.9. Where trees are planted in grass verges, it is expected that mulching is used with the finished level of mulching level with the surrounding ground level. The minimum mulch circle radius for a 14-16cm girth young tree is 1.0m. A weldmesh guard should also be fitted where trees are planted into grass verges.
- 3.10.10. Underground guying is expected in areas with high footfall and traffic count. The stake and tie system is acceptable in grass verges, and other roads where the risk of vandalism is reduced.
- 3.10.11. Roots should have sufficient soil volume to enable them to grow as naturally as possible so as not to affect underground services or damage hard surfaces. A minimum soil volume of 10m<sup>3</sup> is required for new highway trees to be acceptable for adoption with considerably greater volumes expected for medium and large tree species. Where tree or shrub planting is proposed, statutory undertakers may require the provision of ducts or root deflectors to accommodate their apparatus or may require re-routing of the service (the root deflector being provided around the utility rather than around the tree roots). Tree planting shall not take place directly over live services unless they are more than 3.0m deep, or in the case of mains water and drains, 5.0m deep. Trees may be located within canopy spread of water and sewer pipes provided adequate protection measures are taken, such as welded pipes, PVC pipes assembled with solvent cement joints or, in some cases, use of geotextile liners along the backfill material to discourage root growth into the pipe bedding.
- 3.10.12. Tree pit surface treatment should be assessed with the requirements of [Surface materials around trees in hard landscapes](#) (London Tree Officer Association). Details of the proposed surface treatment shall be agreed with the Highway Authority. It is recommended that such agreement be sought prior to submission of the planning application.
- 3.10.13. Where tree pit rooting areas will extend under new roads, footways, or cycleways, support for the pavement structure and associated edge details are to be provided. Any root-cell system shall be capable of supporting the anticipated traffic loading without deformation. Measures shall be incorporated to facilitate gaseous exchange, watering and drainage of roots as appropriate.

- 3.10.14. Trees planted in the adoptable highway needs to be selected and planted to avoid adversely affecting underground and overhead services and street lighting. A minimum distance of 5m between mature tree canopy and the light source will normally be required as a minimum as per Hampshire County Council's Street Lighting Policy Document. See also [Technical Guidance Note TG 13 – Street Lighting](#).
- 3.10.15. Planting proposed for adoption by the Highway Authority shall be maintained by the Developer for an agreed period, usually a minimum of 36 months but this may be reduced to 12 months on some specific sites with prior approval with the Arboricultural Team. Trees proposed for adoption are to be in a healthy condition and of an appropriate form for the species before they will be acceptable for adoption. In some cases, the County Council's Arboriculture Team can carry out the supply, planting and maintenance to highway adoptable standards on behalf of Developers at the Developers' cost. Should you wish to enquire about this service, please contact [Arboriculture.Section@hants.gov.uk](mailto:Arboriculture.Section@hants.gov.uk).
- 3.10.16. A commuted sum will be required from the Developer to cover costs of future maintenance of planting following the initial agreed establishment period for highway planting. Refer to the [Commuted Sum Policy](#).
- 3.10.17. Groundcover plants should be selected which can easily be maintained (by annual strimming, or trimming with a reciprocating cutter, or high blade setting on mowers) or which require no pruning to achieve a general height when fully grown of below 600mm above carriageway level (below 300mm when within visibility splays). Refer also to [Technical Guidance Note TG3 - Stopping Sight Distances and Visibility Splays](#) with regard to planting of verges within visibility splays. Wherever possible, species occurring locally should be used to help reinforce the local sense of place. Specialist advice should be sought from a landscape architect.
- 3.11. Herbaceous planting including grasses**
- 3.11.1. Grass should be used for its particular qualities and not simply as an initially low-cost alternative. Grass shall not be used where pedestrians are likely to walk regularly. These conflicts should be considered in the design stage and avoided. Where that is not possible, the likely route should be effectively obstructed with borders of appropriate planting and/or a suitable form of enclosure. Grass should not be subjected to wheeled traffic. However, there are situations where reinforced grass paving may be used although it should be stressed that grass cannot tolerate oil spillage in any form. Reinforced grass paving should be installed using the manufacturer's recommended soil mix to maximise the effective germination of grass seeding.
- 3.11.2. The maximum height of plants within visibility splays shall not exceed 300mm above the adjacent carriageway level. Refer also to [Technical Guidance Note TG3 - Stopping Sight Distances and Visibility Splays](#) with regard to planting of verges within visibility splays. However, occasional

vertical obstructions within visibility splays may be permitted provided that in combination they do not create a solid visual barrier.

- 3.11.3. Grass is unlikely to survive under large evergreen trees or bushes or in areas heavily shaded by buildings and therefore should be avoided in these areas.
- 3.11.4. Informal grassed areas should not be completely level; a minimum fall of 1:150 is necessary for drainage. For maintenance reasons, areas proposed for short grass cover require modelling with gently rolling contours so that ridges do not occur, localised low spots are not created and slopes are no steeper than 1:4.
- 3.11.5. The amount of grass edging to be trimmed should be minimised. Moreover, grass should not be designed immediately against vertical structures since this creates mowing difficulties requiring trimming by hand. A mowing strip approximately 200mm wide should be provided, using a small-scale paving material with edge restraint as appropriate. Alternatively, a narrow bed of planting, minimum 500mm width, can provide a suitable border. Adequate access for mowing machines should be allowed and areas should not be surrounded completely by fencing or shrub borders. Where an area is large enough to justify it being mown by gang mowers, an access of at least 2.7m width should be available and edge curves should be not less than 5m radius.
- 3.11.6. Consideration should be given to how grass maintenance is likely to be carried to ensure that it may be undertaken without damaging the trees. Where gang mowers are used, trees should be placed at least 3m apart (most tree planting should exceed this in any event for cultural reasons). Areas of longer grass where regular mowing is not required, of shrub planting, or other 'design features' may be used around trees to protect them. Grass will establish on a wide range of soil types although lawn grasses do not thrive on highly acidic soils. Extremely dry and wet areas should be avoided for lawns and excessive shade will discourage healthy grass growth.
- 3.11.7. The selection of the seed mix should be determined by soil type and location (see below). Slow growing 'low maintenance' grass is normally required within the 2m highway edge zone, to reduce the frequency of mowing. It may be appropriate for shallow soil depths to be provided in some sight-line zones to restrict the growth of grass.
- 3.11.8. The provision of wild-flower mixtures appropriate to the locality may be considered for some situations. The advice of an ecologist regarding specification, establishment and maintenance requirements should be sought. Soil fertility is a critical factor to the success of wildflowers. A low fertility soil will discourage the growth of perennial grasses. Generally, thin topsoil depths (25-50mm) are required for the successful establishment of wild flora; subsoils may be suitable in some situations. The use of carefully retained top-soils rich in seed content may be preferable to the introduction of wild flora seeds of 'non-local' provenance. Ongoing future maintenance of wildflower areas are to be

considered at design stage and Hampshire County Council consulted on acceptable maintenance frequencies and requirements for such areas to be considered for highway adoption.

### *Grass mixes*

#### 3.11.9. **Verge mix** – Verge mix within visibility splays and urban landscaped areas

Grass seed to be used within visibility splays shall be low growing and hard wearing; quick to establish but with a slow regrowth after mowing.

Use of perennial ryegrass should be avoided unless specific cultivars that have proven low growing properties

The following mixes are suitable for use:

DFL Seeds	PM 25 Gro-slow
	PM 25R Gro-slow plus
	PM 120 Slow growth
Limagrain	MM16
Boston Seeds	Low Maintenance Grass Seed
Barenburg	e9 Mow saver

Other suppliers are available.

#### 3.11.10. **Embankment mix** – Grass seed mix for use on embankment and cutting slopes

Grass seed on slopes steeper than 1 in 3 should have rapid establishment, covering the ground to provide soil stabilisation with a high percentage of creeping grass species.

Germinal	A4 low maintenance areas
Phoenix amenity	Embankment Grass Seed Mix

- 3.11.11. Where within or adjacent Sites of Special Scientific Interest (or other Sites of Importance for Nature Conservation and Road verges of Ecological Importance, as identified by the County Ecologist) and especially within the boundary of the New Forest National Park, specialist advice needs to be sought as follows:

Sites of Special Scientific Interest (SSSI)	Natural England
Sites of Importance for Nature Conservation (SINC)	Hampshire County Council Ecology Team
Road Verges of Ecological Importance (RVEI)	Hampshire County Council Ecology Team
National Parks (New Forest and South Downs)	National Park Authorities

### 3.12. Soil

- 3.12.1. Soil is a precious resource and should be handled with care. Existing top and subsoils should be handled, stored and placed in accordance with DEFRA guidelines for the “Sustainable Use of Soils on Construction Sites”. Imported soils should meet the requirements of BS 3882: Topsoil and BS 8601 Subsoil.
- 3.12.2. Existing turf and top-soil may be removed and stockpiled near the site of the works for re-use later. However, care should be taken to minimise damage to the structure of the soil. The location of stockpiles shall have regard to the retention of existing shrubs and trees and to eventual landscape proposals. Soil shall not be stockpiled beneath tree canopies or within the root protection areas of trees.
- 3.12.3. Existing soil should be tested and re-used where fit for purpose, rather than importing top-soil.
- 3.12.4. Good quality topsoil to BS 3882 (unless otherwise agreed), and free from all builders’ material, should be used. Excavated materials from the development may be used in the construction of the cores of mounds and banks, and this should then be covered by an appropriate depth of topsoil (usually 100mm – 150mm, but may need to be more depending on the situation). Stones over 50mm should be completely buried or removed from all areas to be grass seeded. Finished levels of topsoil should be at least 25mm above adjacent kerbs and ironworks, to allow for settlement and the avoidance of depressions against hard surfaces which would adversely affect mowing machinery.
- 3.12.5. The term “tree pit” can be misleading as it conveys the image of a confined space below ground. The space required to accommodate a tree as it grows will be larger than the planting hole. Joint working with highway engineers is necessary to find a solution that allows tree roots to

expand beyond the planting hole without significant disruption to services and the highway. In this document, “tree pit” means the surface treatment and below ground rooting volume of soil available to each tree.

- 3.12.6. Soil volume per tree should be calculated using realistic mature tree canopy projections. One calculation used is:

Projected mature canopy area (m<sup>2</sup>) x 0.6m = Target soil volume.

A Minimum soil volume of 10m<sup>3</sup> is required for new highway trees to be acceptable for adoption with considerably greater volumes expected for medium and large tree species.

- 3.12.7. The shape of the soil area need not be regular and can be altered to suit site conditions. For example, a continuous planting pit along the kerb line will increase rooting space. Volume cannot be achieved by providing extra depth. The maximum useful depth of soil for tree planting is 900mm. Topsoil to this depth causes anaerobic conditions – current research suggests max 450mm topsoil with 450mm subsoil (or topsoil/subsoil mix) beneath.
- 3.12.8. Tree pit surface area opening should be approximately 1500mm x 1500mm. Trees in grassed verges will usually establish well in pits of 1200mm x 1200mm x 800mm deep if the surrounding soil is un-compacted and free draining.
- 3.12.9. Adequate volumes of good quality subsoil and topsoil (not screened materials) to support a well-developed root system and healthy plant growth will be required. Topsoil for rooting should conform to BS 3882 Specification for Topsoil. Subsoil for rooting should conform to BS 8601 Specification for Subsoil and requirements for use.
- 3.12.10. The volume of topsoil required for tree rooting needs to consider the ability of the surrounding soil to provide nutrients. In sterile strata such as chalk, a minimum of 10m<sup>3</sup> rooting medium shall be provided. For large species trees, this volume should be increased; advice should be sought from an Arboriculturist on the requirements. Care needs to be taken not to create anaerobic conditions in tree/planting areas. The width of the planting area should be increased rather than the depth. Topsoil should not normally be deeper than 450mm in tree pits with subsoil making up the volume below trenches, adequate provision for watering and, in urban conditions, specialist tree soil, can all improve the chances of successful establishment.
- 3.12.11. Over compaction or a lack of drainage at the base of tree pits, plant beds or grass areas can result in unsuccessful planting. The permeability of the soil surrounding these areas can be as important as that in the bed/pit itself.
- 3.12.12. A minimum of 300 mm depth of topsoil shall be provided for shrubs and generally 100mm depth for grass areas (subject to individual site conditions and requirements). Refer to 3.10.8 for soil requirements for wildflower areas.

### **3.13. Designing for future maintenance**

3.13.1. It is most important to design landscape areas with a view to reducing future maintenance costs wherever possible:

- designs should avoid the use of small, isolated shrub beds and grass areas adjoining the highway
- spacing, species selection and the placing of shrubs and trees should seek to minimise the need for frequent trimming and tree surgery
- temporary protection may be appropriate to aid plant establishment

## 4. Process

### 4.1. Submission requirements

4.1.1. The Arboricultural Report shall include a list of the information reviewed at the Outline Planning Stage regarding existing hedgerows, trees and all other vegetation affected by the Development. An Arboricultural Implications Assessment shall detail:

- i. which trees are proposed for removal
- ii. the impact of works (including utilities) on retained trees (Highway & non-Highway)
- iii. trees subject to Tree Preservation Orders (TPO)
- iv. lengths of hedgerow proposed for removal and whether the Hedgerow Regulations 1997 apply
- v. other vegetation to be cleared
- vi. whether any existing 'private' trees are proposed for highway adoption

Information detailing limits of existing and proposed Highway land is essential to assess the above. Site boundary features are to be recorded to clarify the relationship with surveyed trees, hedges and other vegetation.

4.1.2. The Arboricultural Report shall include a tree survey to BS 5837 including details of:

- i. tree species
- ii. age class
- iii. dimensions
- iv. condition
- v. recommendations for remedial work
- vi. drawing(s) indicating the Root Protection Areas
- vii. location and outline details of any proposed highway planting should be included

4.1.3. Impact of utility diversions on existing or new trees, either above or below ground, will need to be included within the Arboriculture Report.

4.1.4. The location, extent and type of tree protective fencing needs to be clearly shown on a Tree Protection Plan.

4.1.5. Design drawings need to show all proposed planting including all trees and shrubs outside the Highway Boundary. Proposals are to show species at their 'Ultimate Spread' and 'Ultimate Height' based on industry guidance (refer to the TDAG guidance "Species selection for Green Infrastructure) and as is reasonable, based on real life examples of the same species. Landscape drawings are to show the visibility splays.

Refer also to [Technical Guidance Note TG 3 – Stopping Sight Distances and Visibility Splays](#).

- 4.1.6. An Arboricultural Method Statement to BS 5837 shall be provided where works within tree Root Protection Areas (RPA) are liable to adversely affect retained trees or if it is necessary to temporarily remove tree protection fencing.
- 4.1.7. Where trees/shrubs/planting is to be removed an ecological impact assessment covering impacts on any protected species is required.
- 4.1.8. Full details of any planting proposals are to be submitted to the County's Arboriculture team for approval (for Developer schemes this will be though the HDA team as part of the design audit). They shall include specifications for ground preparation, grass, plants and planting and for the 36-month establishment maintenance period. The design and specifications should be prepared by a qualified arboriculturist or landscape architect, and preferably supervised by the same arboriculturist/landscape architect until successful establishment.
- 4.1.9. If an alternative specification to NBS Landscape (National Building Specification for Landscape) is to be used for ground preparation, details are to be submitted to the County and its use approved by the County's Arboriculture team prior to submission of any detailed planning application or S278/S38 application.
- 4.1.10. Where any vegetation, existing or proposed, is considered for adoption a soil assessment and report will be required to identify whether shrinkable clays are present. If so, the Arboricultural Report shall include an assessment of the risk of subsidence to adjacent pavements, carriageways, structures; existing or proposed, and provide clear proposals to mitigate identified risks.

## 4.2. Implementation

- 4.2.1. Both Section 278 technical approval and consent from the local planning authority (LPA) will be required **before** removal of any highway trees, highway hedges and undergrowth affected by roadworks and which are subject to planning permission. It should be noted that LPA planning consent for highway tree removal does not override Hampshire County Council consent and no Highway tree, hedge or shrub can be removed without Hampshire County Council's permission. The Developer must ensure that a felling licence from the Forestry Commission is obtained prior to felling trees outside of the existing Highway boundary (refer to the [Forestry Commission Tree Felling Guidance](#)). Care should be taken not to remove more trees and hedges than agreed by Hampshire County Council. On-site burning of waste vegetation is not permitted; mechanical shredders are to be used or alternatively vegetative waste may be removed to an appropriate composting facility.
- 4.2.2. Sub-contractors for arboricultural works shall be selected from the Arboricultural Association's list of Approved Contractors or approved by

the County Arboricultural Officer. Similarly, consultants providing specialist advice are to be on the Arboricultural Association (AA's) list of Registered Consultants. Any other contractor or consultant shall be approved by the County Arboricultural Officer.

- 4.2.3. Works shall comply with the current versions of the following British Standards, or other current best practice industry guidelines as appropriate:

Topsoil	BS 3882
Subsoil	BS 8601
Nursery stock	BS 3936
Trees (from nursery to independence in the landscape)	BS 8545
Tree Work	BS 3998
General Landscape Operations	BS 4428
Trees in Relation to Construction	BS 5837
HTA National Plant Specification	
CPSE Guidance – Handling and Establishing Landscape Plants	

- 4.2.4. In addition, all Utilities shall be reminded of their obligations under NJUG Guidelines Volume 4 “Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees”.
- 4.2.5. Soil is a precious resource and should be handled with care. Existing top and subsoils should be handled, stored and placed in accordance with DEFRA guidelines for the “Sustainable Use of Soils on Construction Sites”. Imported soils should meet the requirements of BS 3882: Topsoil and BS 8601 Subsoil.
- 4.2.6. Perennial weeds shall be controlled by application of a herbicide approved under the current Control of Pesticide regulations, distributed at an appropriate rate onto the formation. Care needs to be taken not to apply weed killer near vegetation / trees which are to remain and only an approved selective weed killer shall be used on margins. Developers should work to an approved Code of Practice such as that “For the Use of Approved Pesticides in Amenity and Industrial Areas” published by the National Association of Agricultural Contractors and the British Agrochemicals Association. Approval needs to be sought from the appropriate Authority before application.
- 4.2.7. The Developer shall ensure all harmful and invasive weeds identified within and immediately adjacent to areas to be adopted as highway are wholly eradicated prior to adoption (following current legislation). Care must be taken by all contractors on site to ensure that any pernicious weeds anywhere on the development site are not spread. The Developer shall take all necessary precautions against the growth of pernicious weeds on the site from the date of commencement until the termination of the maintenance period. Method statements for dealing with the weeds are to be submitted as part of the S278/S38 application.

#### **4.3. Maintenance requirements**

- 4.3.1. An agreed commuted sum for existing and proposed trees and shrubs will be required. Refer to 3.10.16.
- 4.3.2. A complete set of as-built drawings shall be provided which clearly show any existing trees to be adopted together with the new trees/shrubs to be adopted.
- 4.3.3. A maintenance log should be kept and presented to the tree officer at spot checks and final assessment prior to adoption. Trees may not be adopted if there is evidence of post planting maintenance discrepancies.
- 4.3.4. Operations during the maintenance period are to include:
- a) watering – a minimum of 40 litres per tree at a slow pace, at weekly intervals between April and September
  - b) supplementary watering may be unnecessary if the season/month is particularly wet
  - c) irrigation is likely to be required during the first two full growing seasons (the establishment phase)
  - d) pit surfaces should be kept weed free throughout the establishment phase
  - e) if pit surfaces are mulched, the layer of mulch should be maintained at between 75mm and 100mm - at no point should mulch be placed against the tree trunk
  - f) support systems and guards should be checked for and adjustments made if necessary
  - g) grilles, grates and other furniture should be checked so that they do not damage or compromise the tree, with adjustments made where necessary
  - h) formative pruning should be carried out to reduce the risk of trees developing defects and ill-health

#### **4.4. Adoption**

- 4.4.1. A representative from Hampshire County Council's Arboricultural Section shall attend the joint [defect] inspection where tree or shrub vegetation is included.
- 4.4.2. There shall be a formal handover involving the Arboricultural Section when existing or proposed trees and shrubs are adopted at the end of the 36-month maintenance period. This is to ensure standards have been complied with and to allow release of final Bond sums.
- 4.4.3. The planting will not be adopted in advance of the S278/S38 adoption.

## 5. Further support

- 5.1. Should you have a specific query or feedback about any of the content of this Technical Guidance Note, please send an email to [technical.guidance@hants.gov.uk](mailto:technical.guidance@hants.gov.uk) .
- 5.2. Should you have a query about applying this to your particular project, please contact:
  - the Design Audit Engineer dealing with your S278 or S38 application (if you are a Developer or Developer's Consultant)
  - the Technical Guidance Note Specialist(s) (if you are a working within Hampshire County Council)
- 5.3. Associated Technical Guidance Notes:
  - TG3 – Stopping Sight Distances and Visibility Splays
  - TG13 – Street Lighting
  - TG17 – Departures from Standard