



# Street Trees

## Introduction

5.5.1 Street trees have an important role to play in our street scene. They provide many benefits including providing shelter, improving air quality, support for wildlife, climate moderation, enhancing the landscape, improving local amenity, and reducing the risk of flooding. For these reasons, the Council will not normally remove a street tree unless the tree represents a risk to road safety, or the tree is dead or diseased.

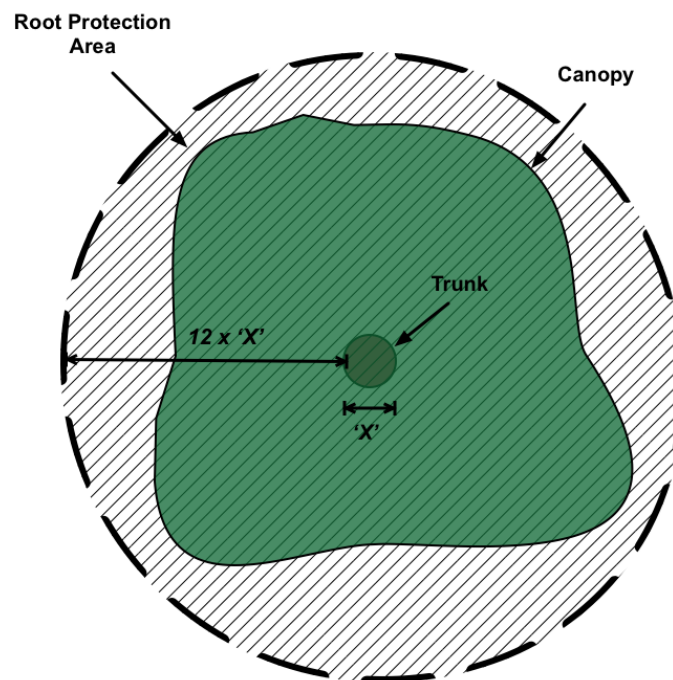
## Development

5.5.2 When considering a development proposal, every effort should be made to avoid existing street trees and their roots which can spread a considerable distance beyond the spread of branches. The removal of trees from public spaces is almost always controversial which could delay the granting of planning permission. This Council may not support a proposal if it would have an adverse impact on the environment or where the proposed mitigation scheme does not provide a net gain to existing local street tree stocks in a form that is resilient to current and future development pressures considering the age, health, life expectancy, and biodiversity benefits of the existing tree(s).

## Works close to trees

5.5.3 A Root Protection Area (RPA) is the minimum area around a tree deemed to contain enough roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. The extent of the RPA from the trunk is calculated by multiplying the diameter of the tree at 1.5m above ground level by 12 (see figure 5.5.1) but is capped as an area with a radius of 15m. This calculation should be undertaken by a trained arborist. The area should then be avoided to prevent damage to the tree's root system immediately under and just beyond the crown. There is no point identifying a tree to be retained which will have a large proportion of its roots removed as the tree will almost certainly die.

**Figure 5.5.1 – Root Protection Area**



### **Works within the RPA**

5.5.4 Where the construction of hard surfaces cannot be avoided within the root protection area say to provide a vehicular verge crossover or to provide a new footway, a no-dig design should be used to avoid root loss due to excavation. In addition, the structure of the hard surface should be designed to avoid localized compaction, by evenly distributing the carried weight over the width of the works within the RPA. Such designs might include the use of a three-dimensional cellular confinement system to support the sub-base and act as a load suspension layer. Where this type of construction is required, site-specific and specialist advice should be sought from an engineer and an arboriculturist to ensure that it is fit for purpose (see figure 5.5.2).

Notes:

It is often not possible to employ no dig techniques to form a vehicular crossover as this may result in an unacceptable crossfall gradient where the verge and or adjacent footway is higher than the carriageway.

The approved engineering design would likely have a waterproof surface (bituminous) and therefore reduce moisture infiltration and gas diffusion around the roots of the tree. The works should therefore cover no more than 20% cumulatively of the RPA or be no wider than 3.0m within it (see figure 5.5.3).

Figure 5.5.2 Surfacing near trees using a cellular confinement system

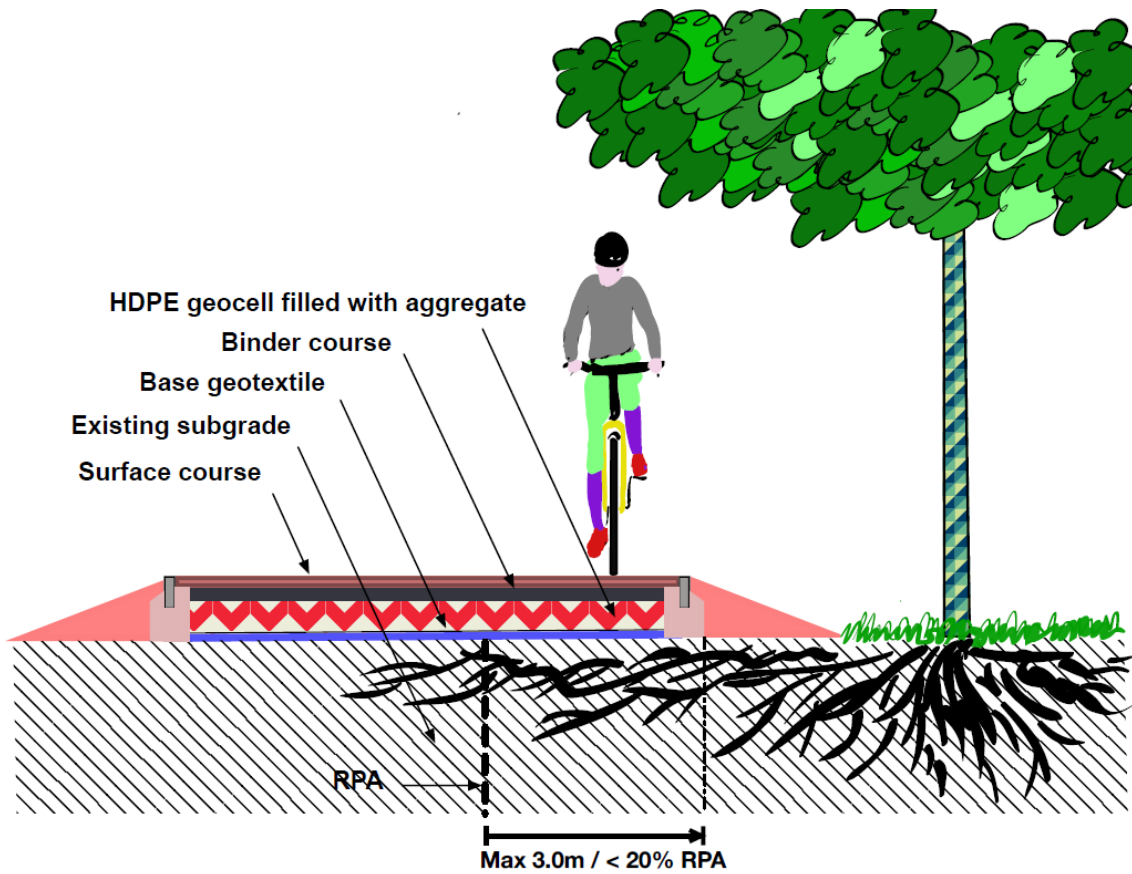
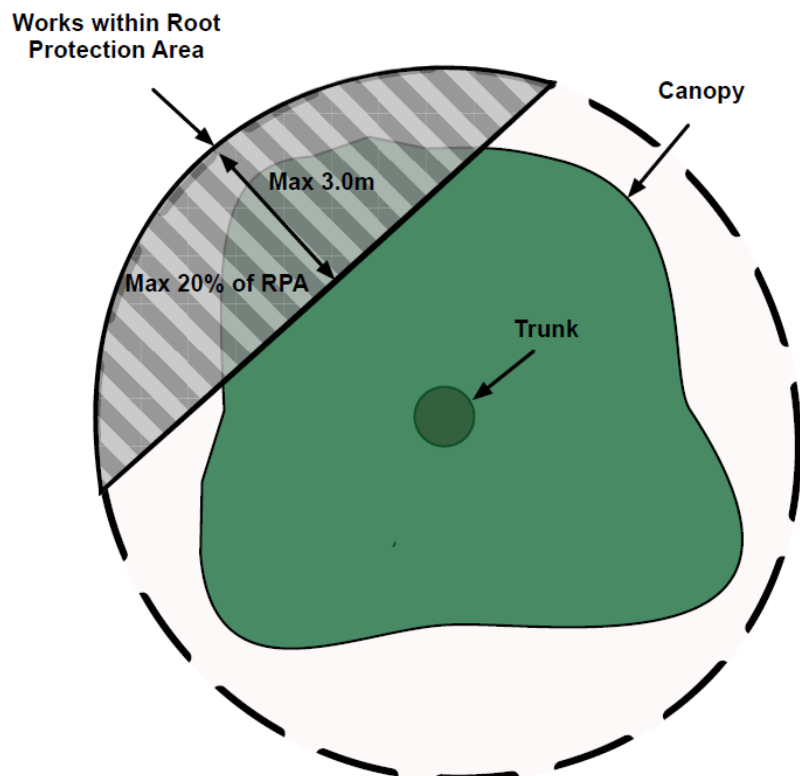
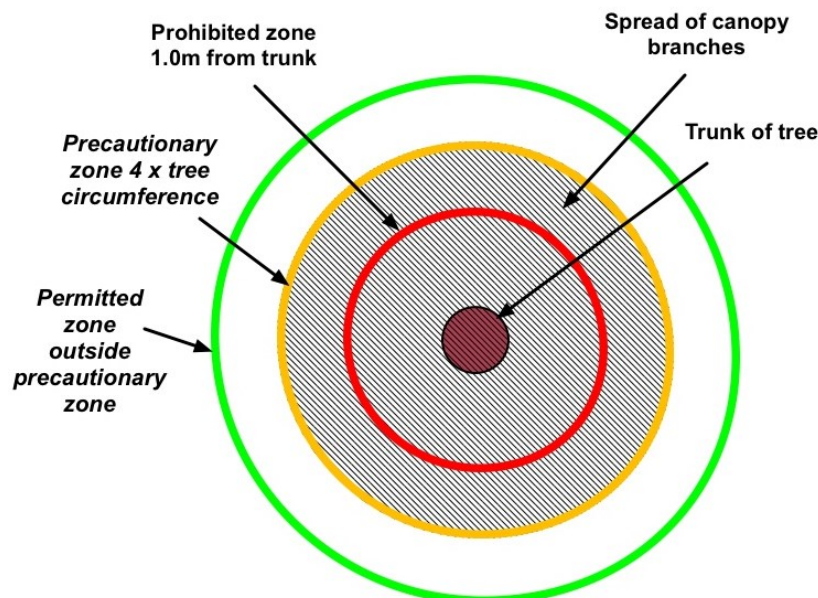


Figure 5.5.3 – Works within Root Protection Area



5.5.5 You should be aware that the Nation Joint Utilities Group – Street Works UK have produced its own guidelines for the planning, installation, and maintenance of utility apparatus in proximity to trees which should be followed when carrying out utility works as part of development near street trees.

**Figure 5.5.4 – Tree protection zone (NJUG)**



See Appendix F - NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees – Issue 2

### **Types of tree**

5.5.6 Choosing the right tree is essential whether a replacement or a new tree to be planted in a new street. The list provided in Appendix D is not exhaustive and other appropriate species can be considered. Scale, urban tolerance, and the appropriateness of the form within the street are key considerations. All tree replacements should be looking to improve Biodiversity Net Gain with a greater focus on natives or native cultivars.

5.5.7 The species listed in Appendix D are typically better suited to the sometimes-difficult conditions found within urban areas and adjacent main streets and require minimal maintenance. To ensure a reasonable chance of a newly planted tree becoming established, it should be at least of heavy standard and be container grown or have a well-prepared root ball, (girth of 12-14cm, height 3.3m to 4.0m).

5.5.8 Tree species which are prone to epicormic growth issues should be avoided due to their potential to block visibility splays, and to obstruct footways and cycleways, as should species with brittle failure characteristics that tend to suddenly fail, causing say a branch to drop suddenly onto the street below.

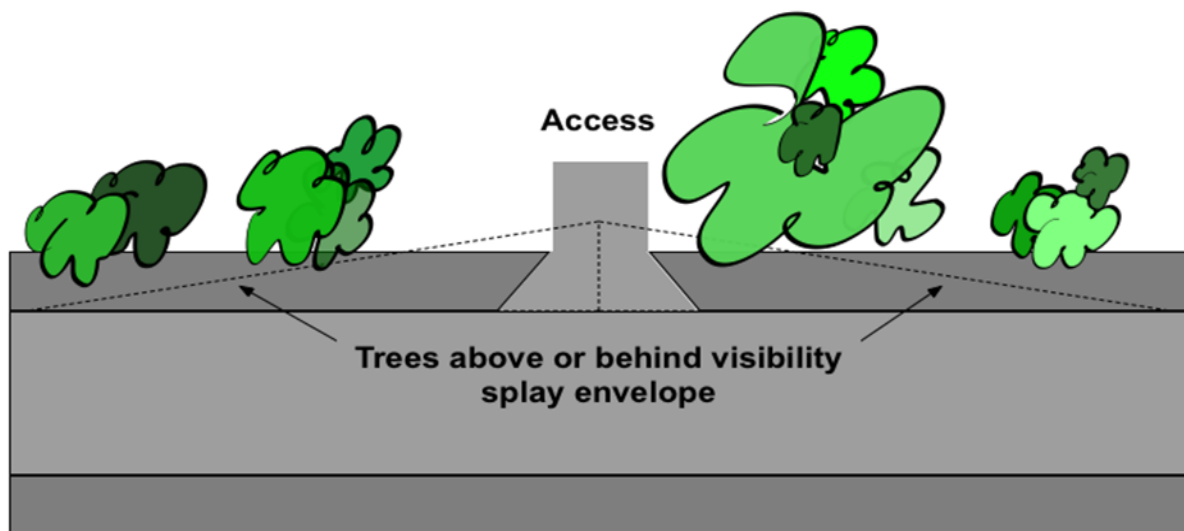
5.5.9 This guidance does not set a minimum or maximum number of trees or extent of canopy cover. What is most important is choosing the right tree for the right place considering the size of the tree at maturity and the species. The tree must be able to

grow freely without affecting the integrity of the highway, highway infrastructure such as bus shelters and street lighting, utility services, and buildings both above and below ground level.

### Street tree plans

5.5.10 The details of a street tree planting scheme will require including on a layout plan of the proposed development. The plan must show nearby visibility splays if applicable (see figure 5.5.5), the new tree(s) location, size when mature, species, sufficient soil volume for root growth, as well as the location and potential constraints presented by existing and proposed utility infrastructure, drainage, gullies, soakaways, street lighting, road signs, bus stops and shelters etc. that would be within the vicinity of the proposed planting scheme. Where there are junctions or vehicular accesses, trees would typically be best located to the rear of a footway/cycleway to avoid visibility splays.

**Figure 5.5.5 – Visibility splays plan view**



Splays applicable to both junctions and accesses (dropped vehicular footway/verge crossovers)

### Footway and cycleway widths

5.5.11 Where a tree is proposed to be in or adjacent a footway, a footway width of 2.0m should remain available considering the width of the trunk once the tree is fully grown and the surface treatment around the base of the tree (see table 5.5.4) as this should allow two wheelchair users to pass one another comfortably. Where this is not possible, due to existing physical constraints, 1.5m is regarded as the minimum acceptable width in most circumstances as this would give enough space for a wheelchair user and a walker to pass one another. The absolute minimum width where there is an obstacle is 1.0m, but not within a new street. A minimum footway width of 3m should be maintained at bus stops and a footway width of 3.5m to 4.5m is usually considered suitable by shops and other areas with high pedestrian activity such as adjacent schools which should not be compromised materially by a proposal that contains multiple trees that are closely spaced. In these cases, additional space may be required. The guidance provided in Department for Transport LTN 1/20

Cycle Infrastructure Design should be followed with respect the space requirements for cyclists.

### **Headroom**

5.5.12 The tree canopy should allow a clearance of 2.6m above a footway increasing to 2.7m over a cycleway. A carriageway clearance of 5.3m will be required where the crown is likely to overhang the path of motor vehicles.

### **Clearance**

5.5.13 The location of the tree must provide enough clearance from the edge of the carriageway to allow for the lateral overhang of the largest vehicle likely to pass i.e. projecting wing mirrors, the height of the vehicle, carriageway camber, and potential sway. A clearance of 0.6m is considered acceptable under normal circumstances which should be available from the time of planting up to when the tree reaches maturity. However, this distance may need to increase to protect visibility splays.

5.5.14 Trees must not be located too close to buildings. Consideration must be given to the eventual spread of the tree canopy. A separation distance of up to 6.0m may be required between trunk centres and façades/structures. A minimum distance of around 0.75-1.5m must be kept between the predicted canopy extent of a tree once mature and buildings/structures (including balconies). Consideration should also be given to the presence of windows, the light requirements of occupants, and their eventual view of the street. Trees may eventually overhang garden walls, railings, and other simple free-standing structures lower than 1.8m without clashing, but it does not necessarily follow that canopies may project over these structures without consent from the adjacent landowner. Covenants may be required to protect trees where the final extent is intended to project over land in third-party ownership.

### **Street safety**

5.5.15 Once a tree is established even a small specimen is sufficiently immovable to contribute to the severity of an accident where a vehicle leaves the carriageway even in a low-speed residential environment. The design of the street must consider whether the proposed location of a tree would materially add to this risk in terms of the tree's location in proximity to a bend or junction, the set back of the tree, and the likely speed of passing traffic.

5.5.16 If a tree trunk is expected to reach a large girth, the tree should be sufficiently set back so not to obscure the view of pedestrians wishing to cross the street especially if any epicormic growth is likely. Particular attention is needed at junctions, close to linking footpaths or alleyways, school accesses, and bus stops etc. An obstruction to pedestrian visibility may be exacerbated by a line of tree trunks forming an extended barrier to inter-visibility.

5.5.17 Sufficient space must be provided around the base of the tree to avoid the surrounding surface becoming distorted or cracked by roots as the tree matures. This is a particular issue for cyclists but can also lead to a trip hazard for pedestrians.

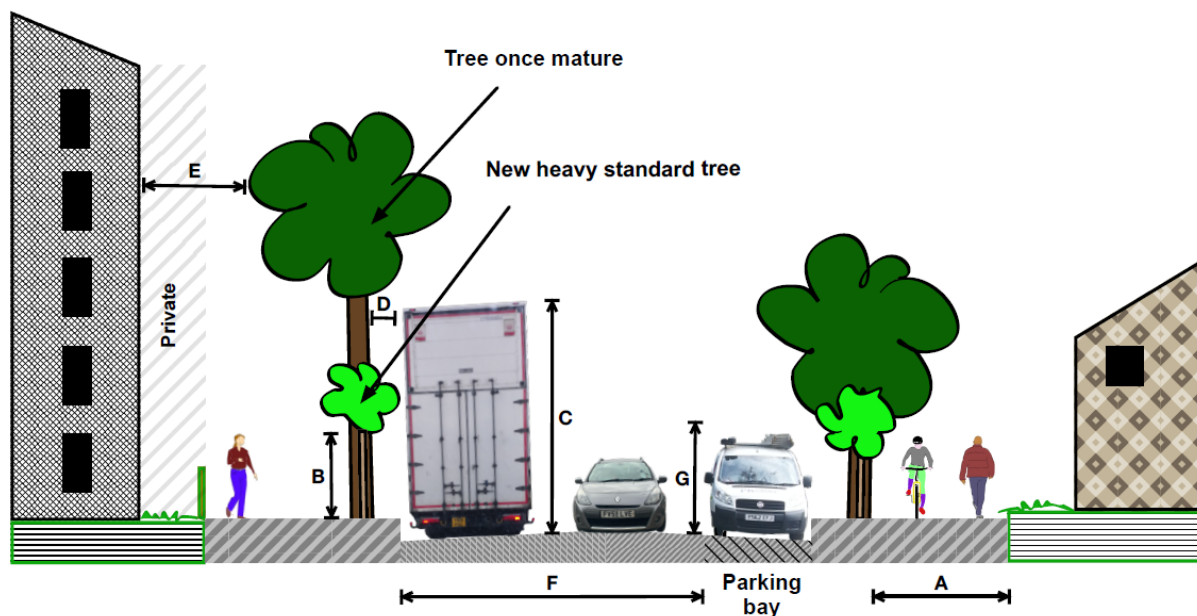


5.5.18 A closely spaced line of trees on the south side of a street can lead to the street surface remaining wet or even icy for extended periods which may be a problem particularly on bends. Leaf litter and other debris may also have safety implications for cyclists particularly when wet.

### Street lighting, road signs, bus stops, and gullies

5.5.19 A planting scheme, both public and private, should avoid street lighting, road signs, and roadside drainage gullies which may be damaged by roots and become blocked with leaf litter. Bus stop/shelters should be avoided where trees may obstruct the visibility of waiting passengers and where a reduction in light may cause waiting passengers to feel vulnerable. Trees should be located equidistant between lamp columns or be located on the opposite side of the street. Lighting Columns when first installed should be sited so that it is not necessary to carry out substantial cutting back of trees, considering the fully mature spread of the tree. In new streets where trees are to be planted, the lighting should be designed in consultation with the landscape architects and/or by considering the landscaping plan or tree schedule. A tree should never be planted in front of a road sign and should be set back from a sign at a distance of at least the maximum spread of the tree canopy once fully grown. All street features should be considered at the design stage with equal importance to ensure satisfactory accommodation. It may be easier to find acceptable alternative locations for say signs or gullies that are likely to require less space than trees.

**Figure 5.5.6 - Typical clearance requirements**



**Table 5.5.3 – Typical headroom and clearance requirements**

Summary table		See figure 5.4
Tree size	Minimum Heavy Standard (girth of 12-14cm, height 3.3m to 4.0m)	
Footway horizontal clearance	<p>Normally 2.0m</p> <p>Minimum 1.5m where space is restricted</p> <p>Absolute minimum 1.0m but not in new build situations</p> <p>Minimum 3.0m near bus stops</p> <p>Generally, 3.5m to 4.5m near shops and other area with high numbers of pedestrians</p> <p>Note: Consideration must be given as to whether the surface materials around the tree is suitable for pedestrians (see Figure 5.5.4).</p>	A
Cycleway horizontal clearance	<p>The guidance provided in Department for Transport LTN 1/20 Cycle Infrastructure Design should be followed with respect the space requirements for cyclists.</p> <p>Note: The surface material around the tree must avoid the cycleway (see Figure 5.5.4).</p>	A
Headroom	<p>≥ 2.6m above a footway</p> <p>≥ 2.7m above a cycleway</p> <p>≥ 5.3m above a carriageway and loading bays</p> <p>≥ 3.0m above designated car parking bays</p>	B, C and G
Clearance from edge of carriageway	Usually 0.6m	D
Distance from buildings	Minimum 0.75-1.5m between canopy and building. (Landowner consent may be required should the eventual canopy spread extend over land in private ownership).	E
Carriageway width	Minimum carriageway width to be maintained between canopies <5.3m high where there are parking bays.	F
<p>Note: All dimensions should be based on the eventual size of the tree once mature.</p>		



## Soil volume

5.5.20 The planting hole or the term “tree pit” should not be interpreted as the space required to accommodate a tree as the space required to accommodate the tree roots as the tree grows must be larger than the planting hole. To ensure a tree’s long-term survival there must be enough space to allow roots to expand without effecting the integrity of the highway or services. The required uncompacted soil volume per tree should be calculated using a realistic mature tree canopy projection. A common calculation used is 0.6m<sup>3</sup> of soil per 1.0m<sup>2</sup> of crown area:

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

*Example:*

*Canopy area:  $\pi \times 5.0m$  (Diameter of mature canopy) = 15.710m<sup>2</sup>*

*Soil volume: 15.710m<sup>2</sup> x 0.6m (Soil depth) = 9.426m<sup>3</sup>*

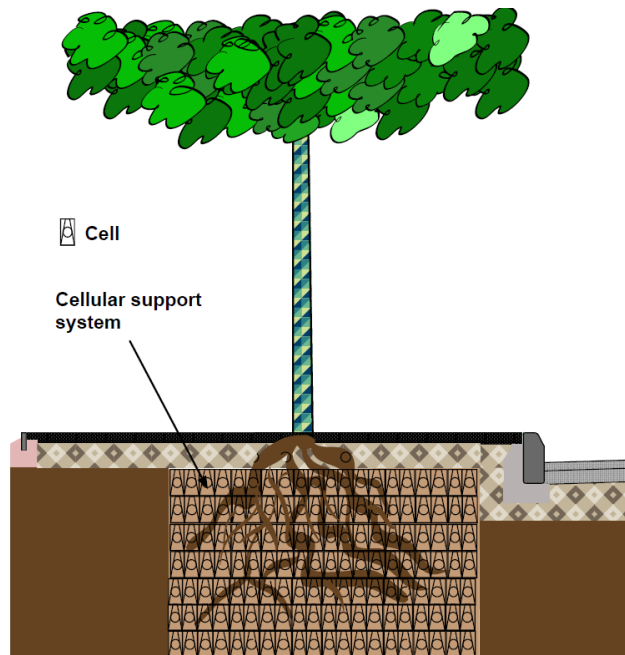
*Soil area extent: 2.5m (Width) x 6.284m (Length) = 15.710m<sup>2</sup>*

Note: A minimum soil volume of 5m<sup>3</sup> is required suitable for trees with a mature canopy diameter of up to 3.0m.

5.5.21 The shape of the soil area need not be regular and can be altered to suit site conditions. For example, a continuous planting pit will increase rooting space. Volume cannot be achieved by providing extra depth. The maximum useful depth of topsoil for tree planting is 900mm. However, the root system of a tree is typically concentrated within the uppermost 600mm of the soil which is appropriate for calculating rooting volume. Consideration must be given as to the effect of including root barriers and/or structural support on the availability of soil volume.

5.5.22 The load bearing requirements of hard surfaced areas require a compacted formation layer that is not compatible with root growth. In hard landscaped areas, where load bearing is required, the sub-surface may need to be engineered to provide sufficient support whilst avoiding compaction of the growing media. Various techniques and products are available including structural growing media, crate, and raft systems, or a combination of these, all of which will require the Council’s technical approval (see figure 5.5.7).

**Figure 5.5.7 – Modular cellular support system**



A modular cell support system resembles a stack of milk crates installed in the ground and filled with soil along with aeration and irrigation pipes. The cells provide load bearing support for the pavement, and prevents compaction of the soil so that water, oxygen, and nutrients can find their way to tree roots.

### **Trees to be removed from existing streets**

5.5.23 To determine whether it is appropriate for a street tree(s) to be removed and whether the proposed mitigation scheme would adequately address the loss of amenity, the submitted details should include a plan of the existing tree(s), as well as a valuation of the tree(s) to be removed and of its replacements. The plan as existing shall accurately identify the location, size (diameter of trunk and spread of canopy), species of the tree(s) to be removed, and the proposed works including, if applicable, the visibility splays that will affect the tree(s).

### **Tree valuation**

5.5.24 Valuing the amenity of trees is important for calculating loss of amenity and a suitable replacement value. The normal method, acceptable to the Council, would be for you to carry out a CAVAT assessment (Capital Asset Value for Amenity Trees) on both the tree(s) to be removed and the proposed tree replacement scheme. The replacement value must be no less than the value of the tree(s) to be removed.

### **Nesting birds**

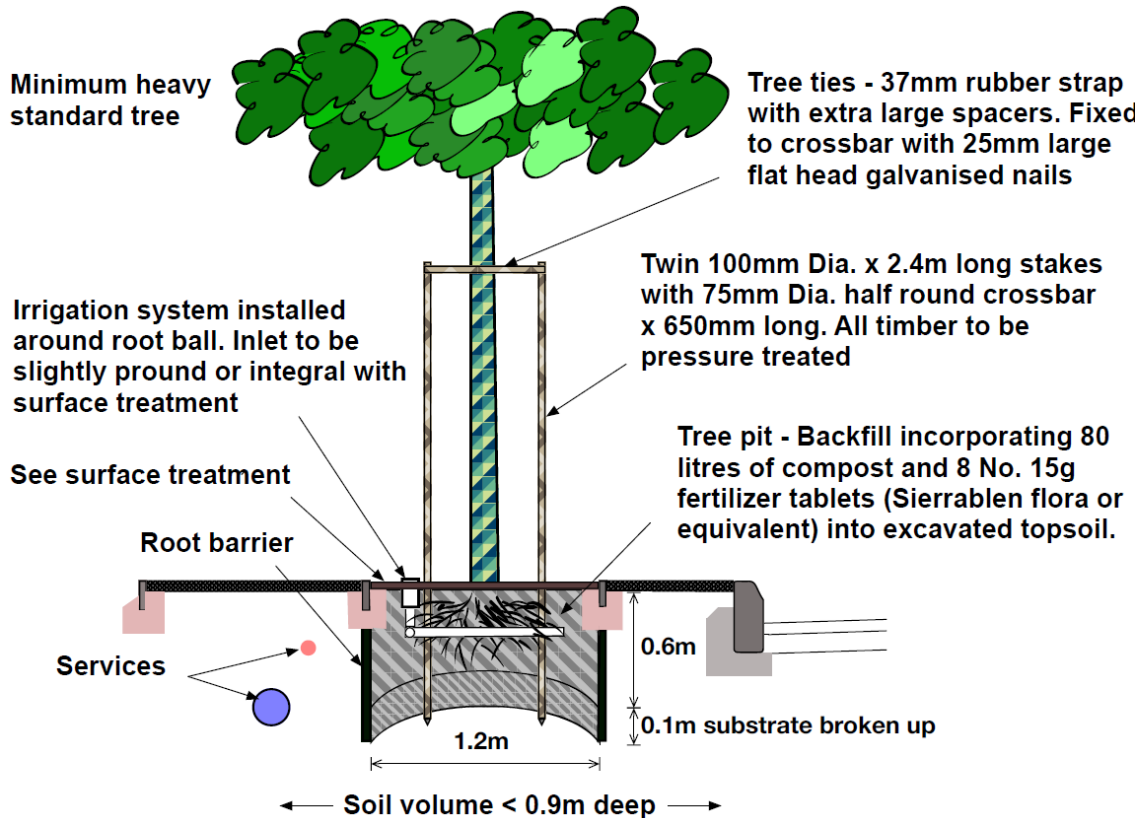
5.5.25 The removal of street trees, shrubs, or other vegetation should take place outside of the months of March to August inclusive to avoid the bird nesting season, unless a recent survey has been undertaken by a competent ecologist to assess the nesting bird activity on site during that period, and details of measures to protect the interests of nesting birds on site have been approved by the Council prior to implementation.

### **Tree planting**

5.5.26 All new trees must be planted in suitably formed tree pits (see figure 5.5.8). Tree removal and planting should be undertaken by appropriately qualified contractors who understand the technical requirements of pit size, irrigation, and

staking. The design of tree guards, grilles and porous gravel should be compatible with the location and will require approval by the Council. In most circumstances tree planting shall take place between the months of November and March inclusive.

**Figure 5.5.8 - Tree pit indicative detail**



**Notes:**

Tree pit sizes should be increased where necessary to ensure pits are at least 300mm wider and 75mm deeper than the tree root system when fully spread.

A ground penetrating radar (GPR) survey should be undertaken to identify underground services as part of the design process. If a new tree pit cannot be excavated due to the location of utility services not previously identified or accurately located, the Council must be notified to agree an alternative location.

**Root barriers**

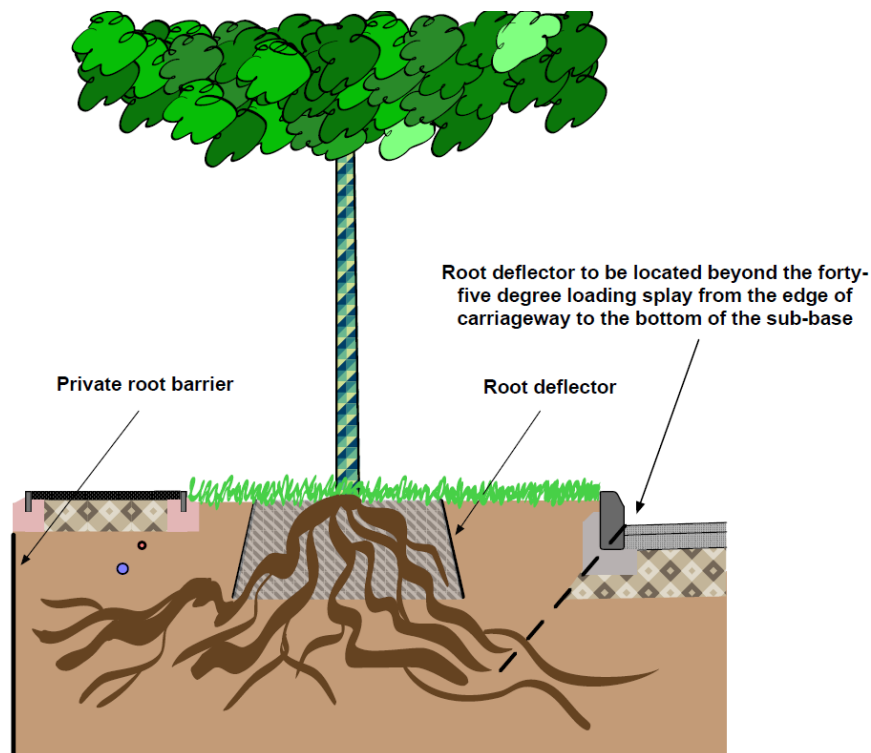
5.5.27 Suitable root barriers such as root-deflectors may be required where a street tree(s) is proposed in a hard-landscaped area (footpaths, footways, paved and blocked paved areas) and where services are close to a proposed street tree(s) to protect against damage to cables and pipes. A report identifying the location and potential constraints presented by the existing utility infrastructure within the vicinity of the proposed planting scheme will require submitting with the plan informed by a GPR survey as well as utility company records.

5.5.28 Depending on what needs to be protected and where it is in relation to the tree, different root management solutions are available. Continuous paved surfaces

for example, require roots to be managed downwards at least 300mm to reduce the risk of pavement heave and other surface root damage. Deeper protection would be required near underground utilities. The standard depth of a water pipe is 750mm, whereas a high voltage cable could be up to 1200mm below ground level (see Chapter 5.3 Utilities).

5.5.29 Root barriers are constructed before planting and can incorporate single trees or protect an entire treeline. For established streets, creating root barriers around each tree is often the best solution, whereas for new streets and footways a long, straight barrier between the planted zone and services is preferred. Vertical root barriers should not be installed all round a tree and should only be used as required to protect underground services. It is also recommended that a root barrier be installed between trees and any proposed buildings in those cases where the face of the building would lie within the eventual root spread of the tree once it is mature, and similarly where private trees are to be planted close to the highway boundary. In both instances, the barrier would then be located beyond the highway boundary.

**Figure 5.5.9 – Indicative street tree with root deflector**




### **Above ground tree protection (guards and grilles)**

5.5.30 Tree guards will be required in areas with a high level of pedestrian activity such as pedestrianized areas, near schools, stadiums, and shopping precincts or anywhere where tree damage is predicted due to carelessness or vandalism. Additional space may be required if the guard would reduce the available footway or cycleway width.

5.5.31 Tree grilles are likely to be required within footways and pedestrianized areas with a footfall that is greater than would be expected in a purely residential setting such as close to schools or shops or where the surface treatment around the tree is

to form part of the width required for pedestrians, particularly the disabled. The design of the grille must consider whether vehicular traffic is anticipated. The aperture within the grille must be sufficient to accommodate the anticipated eventual girth of the tree trunk once the tree is mature or include internal rings which can be removed as the tree grows.

**Table 5.5.4 – Suitability of surface materials around street trees**

<b>Key</b> High – H Medium – M Low – L   Note: Not considered acceptable on first planting but included for completeness.		<b>Surface material</b>							
		Gravel – Resin bound	Bound shredded rubber	Gravel – Self-binding	Grilles	Mulch - Inorganic	Mulch - Organic	Rubber crumb	Bituminous
<b>Tree care</b>	Permeability of air and water	H	H	M	H	H	H	H	L
	Potential to improve soil fertility	L	L	L	L	L	H	L	L
<b>Suitability for location</b>	Pedestrian friendliness	H	H	M	H	L	L	H	H
	Cycle friendliness	L	L	L	L	L	L	L	L
	Resistance to disturbance	H	H	L	H	L	L	H	H
	Weed suppression	M	M	M	L	H	M	M	H
<b>Installation / maintenance</b>	Suitability on planting	M	M	M	H	H	H	L	L
	Suitability up to trunk of a young tree	L	L	M	L	H	H	M	L
	Flexibility of material	M	M	H	L	H	H	H	M
	Engineering difficulty	H	H	M	H	L	L	H	M
	Life expectancy	M	M	M	H	L	L	M	H
<b>Risk of damaging tree</b>	Maintenance burden	H	H	M	M	L	L	H	L
	Young tree if incorrectly installed	H	H	H	M	L	L	M	H
	Established tree if incorrectly installed	L	L	L	H	L	L	L	H
	If not maintained	M	M	L	H	L	L	M	M

Notes:

The inclusion of each potential surfacing material in the above table should not be viewed as an indication of general acceptance. Each proposal will be treated on its own merits given the proposed location.

The low to high grading of each surface treatment against each section is for indicative purposes only. The suitability of the surface treatment in any given location should be confirmed by the manufacturer’s specification and will be subject to technical approval. The London Tree Officers Association provides excellent detailed guidance on “Surface materials around trees in hard landscapes”.

## **Tree maintenance**

5.5.32 Replacement or new street trees will be subject to a 3-year establishment period where you will be responsible for watering at a frequency necessary to ensure establishment and survival of all trees that form part of a planting scheme. You may also remain responsible for replacing trees for an extended period in accordance with the planning permission should a tree die or be damaged.

## **Watering**

5.5.33 For a heavy standard tree between 120mm to 160mm Green Blue Urban's "Urban Tree Planting Design Guide" estimates that a typical Plane tree will require water at a rate of 115lt to 150lt per month during the summer. Additional watering is likely to be required during periods of abnormally dry weather. Water should be applied by low pressure hose at a steady rate to avoid run-off and erosion of the surrounding area via an approved irrigation system installed at the time of planting. Where mulch has been used and is washed or displaced onto adjoining hard surfaces and/or grassed areas, this must be swept up and if not contaminated by weeds or rubbish returned to the planted area and spread to the original depth. Any mulch which has been contaminated by weeds or rubbish will require removing off site and replacing.

5.5.34 Water at a rate of 20 measured litres once a week between March and October for two-years minimum. In dry, hot, or windy weather, increase to 2 to 3 times a week. In wet weather the routine should generally be maintain in hard paved areas as rain runs off pavements. However, caution is required as continuing this routine during prolonged periods of wet weather could lead to drowning the tree where ground conditions are saturated.

## **Planning conditions**

5.5.35 Where street trees are to be removed, are to be replaced, or form part of a new development, planning conditions are likely to be sought to secure an appropriate tree planting scheme that accords with this guidance. Further provisions are also likely to be included where the street works are subject to a Section 38 or Section 278 legal agreement, Highways Act 1980, or where a licence has been granted for minor works that effect street trees. Typical planning conditions:

### **Proposed planting**

- No development hereby permitted shall commence until the full details of a street tree replacement scheme (including its proposed location, species, size, available soil volume, approximate date of planting (between November and March), and the position of underground services/drainage runs/soakaways) and details of tree planting pits including associated irrigation measures, tree staking, barriers and guards have been submitted to and approved in writing by the Local Planning Authority.

Reasons: To preserve and protect street tree stocks which have and may have amenity value that contribute to the character and appearance of the area.



### Planting and maintenance

- The approved street tree planting scheme shall be carried out between November and March unless otherwise agreed in writing with the Local Planning Authority. If within a period of 7 years from the date of planting, should any tree or its replacement be removed, uprooted, destroyed or dies then another of the same species and size of the original shall be planted at the same place. Variations may only be planted on written consent of the Local Planning Authority.

Reasons: To preserve and protect existing trees and new trees which have and may have amenity value that contribute to the character and appearance of the area.

### Nesting birds

- No removal of street trees or shrubs shall take place between March and August inclusive, unless a recent survey has been undertaken by a competent ecologist to assess the nesting bird activity on site during this period, and details of measures to protect the nesting bird interest on the site have first been submitted to and approved in writing by the Local Planning Authority and then implemented as approved.

Reason: To ensure that bird's nests are protected from disturbance and destruction and in the interest of biodiversity.

### Existing tree protection

- No works or development shall take place until an arboricultural method statement and scheme for protection of the retained street trees have been agreed in writing with the Local Planning Authority. This scheme shall include:
  - A plan showing details and positions of the ground protection areas,
  - Details and position of protection barriers,
  - Details and position of underground services/drainage runs/soakaways and working methods employed should these runs be within the designated root protection area of any retained tree/hedgerow on the application site,
  - Details of any special engineering required to accommodate the protection of retained trees (e.g., in connection with foundations, bridging, water features, hard surfacing),
  - Details of construction and working methods to be employed for the installation of drives and paths within the root protection areas of any retained tree/hedgerow on the application site,
  - Details of any scaffolding erection and associated ground protection within the root protection areas,
  - Details of timing for the various phases of works or development in the context of the tree protection measures,
  - Details of existing and proposed soil levels within root protection areas.All works/development shall be carried out in full accordance with the approved tree/hedgerow protection scheme.

Reasons: To preserve and protect existing street trees and new trees which have and may have amenity value that contribute to the character and appearance of the area.

#### Tree removal

- Prior to the [*description of highway works*] taking place, the trees affected by the works shall be felled and stumps shall be removed.

Reason; In the interest of highway safety.

Note: All street planting proposals that form part of the street works will require technical approval of the drawings, specifications, method statements and the post planting maintenance schedule before any highway works can commence on site. The drawings must include the location of all below and above ground services, drainage, street lighting, and road signs, including any protection measures. All works must comply with relevant British Standards and current best practice.

#### **Commuted sums**

5.5.36 Where the Council considers that a commuted sum is appropriate, this will be calculated in accordance with the Commuted Sum Chapter of this guide. Consideration will be given to the eventual size of the tree, whether it is planted within a verge or hard landscaped area, the surface material around the tree, any underground structural support, the need for root barriers or guards and grilles, and the effect these will have on future maintenance costs.

[End]