

Surface materials around trees in hard landscapes

Success with trees in hard landscapes requires a collaborative, cross-disciplinary process from project initiation through to design, implementation, maintenance and monitoring. Such collaboration provides the foundation needed for other fundamental enabling factors such as access to funding and adequate expertise, resilient above – and below – ground design solutions, community support and competent delivery.

Trees and Design Action Group, 2014

Surface materials around trees in hard landscapes

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This document has been produced by the London Tree Officers Association Surface materials around trees in hard landscapes Working Party:

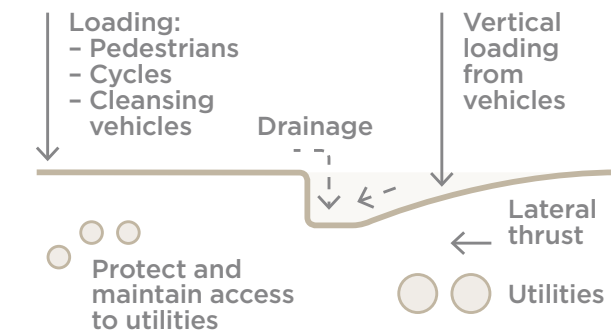
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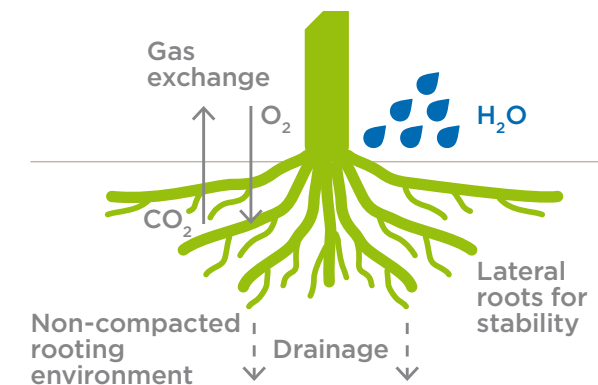
- 1.1 Tree specialists, urban designers, planners, landscape architects and highway engineers may have differing priorities and views about which surface materials should be used around trees in hard landscapes. A balance must be struck to ensure that all requirements are properly considered and that a beneficial environment for the tree is created which also meets the requirements of its surroundings. The best material for the tree may not be the best for pedestrians using the footway; priority of function must be considered during material selection. The intention of this document is to demonstrate that a wide range of materials is available; each has its advantages and disadvantages and no single material is right for every scenario.
- 1.2 This document has been developed in association with a range of stakeholders including tree specialists, project managers and highway engineers and is to be used as guidance for anyone involved in the selection of surface materials. Decisions pertaining to the health and wellbeing of trees should be made by the relevant tree specialist, who must be involved and consulted throughout the design process. The final decision as to which material is most appropriate for a given scenario must rest with them, following input from other professionals such as highway engineers, designers or project managers. This document should not be viewed as an alternative to professional arboricultural advice from the relevant tree specialist.
- 1.3 Trees in soft landscapes are not covered here; nor are any other elements of trees in hard landscapes other than the surface material. For information and best practice about other elements of the tree planting process please refer to British Standard 8545:2014 Trees: from nursery to independence in the landscape (BS8545:2014). The term 'tree pit' has been deliberately avoided; many trees in hard landscapes are not contained within a designated area which could be described as such. However, the principles of surface material selection around trees must be given the same level of consideration whether or not a formal 'tree pit' area has been demarked.
- 1.4 Throughout this document a distinction will be made between newly planted and established trees. A newly planted tree is here defined as one which has been in the ground for less than five years. Some surface materials which are suitable for established trees are less suitable – or require a different specification – for newly planted trees. The maturity of the tree in question must be taken into account when making decisions.
- 1.5 At the heart of this document is the concept of collaborative working. The authors fully endorse the statement made by the Trees and Design Action Group (TDAG) in their 2014 publication Trees in hard landscapes – A guide for delivery: "Success with trees in hard landscapes requires a collaborative, cross-disciplinary process from project initiation through to design, implementation, maintenance and monitoring. Such collaboration provides the foundation needed for other fundamental enabling factors such as access to funding and adequate expertise, resilient above – and below – ground design solutions, community support and competent delivery." (TDAG, 2014).

Key points for success with trees in hard landscapes (reproduced from TDAG, 2014)

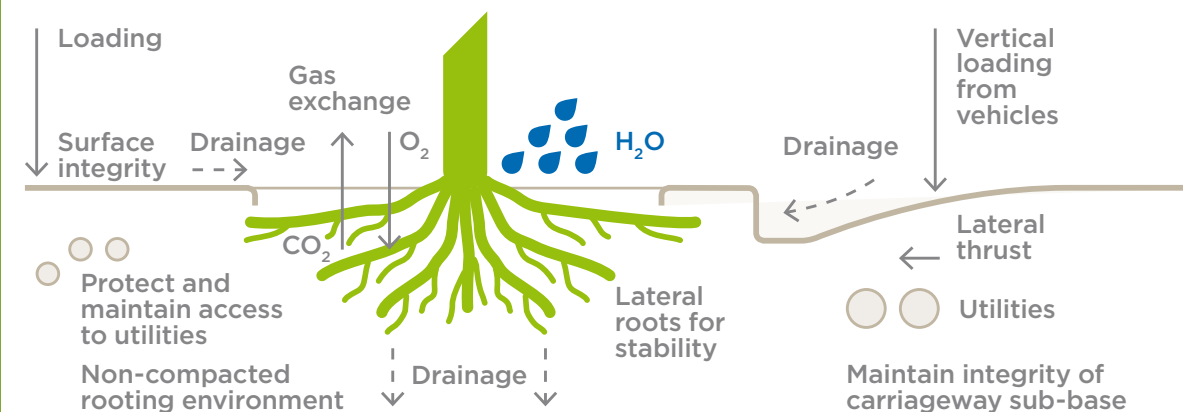
Highway needs



Tree needs



Setting the brief



- 2.1 Newly planted trees require a supply of air and water to the rooting medium in order to develop a healthy root system and become established in the landscape. An important characteristic of a surface material around newly planted trees in hard landscapes - from the perspective of the tree - is therefore permeability.
- 2.2 The roots of more established trees also need sufficient air and water, but typically an established specimen will have developed a root system extensive enough to be able to survive with less permeable materials immediately adjacent to the stem. Despite this, the more air and water which can pass through the surface material to the roots, the better. Avoiding compaction around the tree is important to ensure that the subterranean conditions are favourable for the establishment and development of a healthy root system.
- 2.3 Trees grow incrementally over time and this must be recognised in the selection, installation and maintenance of surface materials. Rigid materials laid up to the base of the tree are likely to cause – and suffer – damage as the tree grows. An engineering solution such as a protective collar could be used to avoid such damage. It must be ensured in turn that the engineering solution itself does not ultimately cause any damage.
- 2.4 Trees require protection when work is being undertaken around them in order to avoid damage both above and below the ground. This could include direct damage or compaction to the rooting medium. Excavation around trees should be avoided, meaning that some surface materials (such as grilles) may not be appropriate for installation around existing trees. For the same reason it may not be appropriate to retro fit edging to existing tree pits if excavation is required for the installation. Guidance about working around trees can be found in British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations (BS5837:2012) and National Joint Utility Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees – Issue 2 (NJUG4).

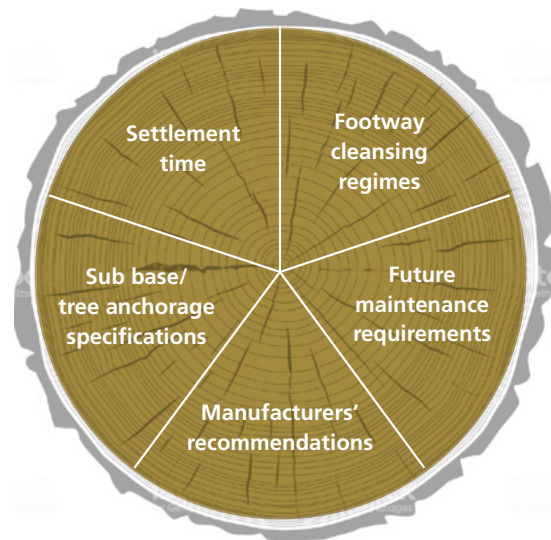


3 Principles for selection, installation and maintenance

3.1 Specific guidance relating to details of specification, installation and maintenance of surface materials has been deliberately omitted from this document. Competent professionals should be used to undertake all work relating to surface materials around trees, and their advice (incorporating manufacturers' recommendations) should be sought before final decisions are made.

3.2 A wide range of considerations must be taken into account when selecting a surface material to be installed around trees in hard landscapes. Some of the most important are:

- Age, species and condition of tree;
- Pedestrian/vehicular traffic levels;
- Width of footway;
- Cost of installation;
- Cost and frequency of maintenance;
- Skill level required for installation and maintenance;
- Predicted lifespan of material;
- Sustainability of source;
- Permeability of proposed material;
- Permeability of soil and existing surface material;
- Overall streetscape and site topography;
- Prioritisation of differing requirements in any given situation;
- Footway cleansing regimes (including salt applications);
- Availability of materials.



Areas for consideration when selecting surface materials

3.3 Careful thought must be given to the installation and maintenance specification associated with whichever material is to be used. This should be agreed prior to a final material being selected; the relevant tree specialist must be engaged throughout the decision making process.

3.4 Manufacturers' recommendations regarding installation and maintenance should be considered in conjunction with input from competent contractors. It is critical that the correct specification is instructed for the specific situation; generic specifications should be avoided because they will not take into account the specific pressures involved in specific cases, for example when dealing with particularly vulnerable trees or especially high pedestrian traffic.

3.5 Consideration must be given to the sub base on which the surface material is to be laid, and the impact that the installation of the sub base might have on the tree and its development. In many cases it can be argued that the sub base is as important as the surface material; a permeable surface laid over an impermeable sub base is obviously not acceptable. Some surface materials need to be laid on compacted substrate; others, like tree grilles, typically require a fixed frame set below the surface level so that they remain stable.

3.6 When selecting a surface material around a newly planted tree consideration must be given to the method with which that tree is to be secured in the ground. Tree stakes should not be used in conjunction with resin-bound gravel or bound rubber crumb as holes will be left in the material when the stakes are removed. However, underground guying is not suitable to be used in all situations. This decision must be made by the relevant tree specialist.



3.7 After a tree has been planted it is common for the planting medium to naturally settle, resulting in the surface level sinking. Allowing a period in which the surface around the tree has time to settle is advisable to avoid sinking or cracking of the new material. Specific guidance should be obtained from the competent professional specifying or installing the material and the manufacturers' recommendations should be considered.

3.8 Future maintenance requirements of the selected material must be understood and taken into consideration. Some materials might involve topping up or weed removal on a regular basis, such as mulch, self-binding gravel or topsoil. For others, such as resin-bound gravel, a programme of cleaning or pressure washing may be needed. It must be ensured that sufficient physical and financial resources are in place to provide the required level of maintenance.

3.9 It should be recognised that it is often the footway area directly beneath the tree canopy which requires the most maintenance due to a combination of factors such as low light levels, animal excavation/mess, narrowing of the footway around the tree etc. The robustness of the chosen material in the context of footway cleansing regimes must be adequately considered.

4 Surface materials

Gravel – resin-bound

Gravel – self-binding

Grilles

Mulch – inorganic

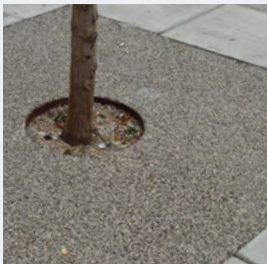
Mulch – organic

Rubber crumb

Soil

Asphalt

4.1 The following section is divided up into some of the most common surface materials used around trees in the hard landscape. These materials are:



Gravel – resin-bound



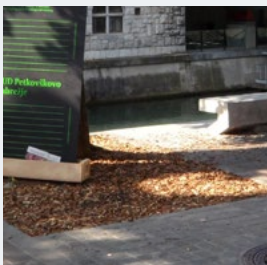
Gravel – self-binding



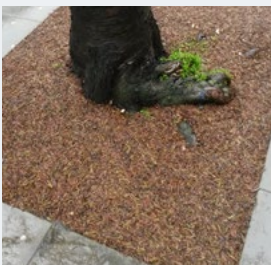
Grilles



Mulch – inorganic



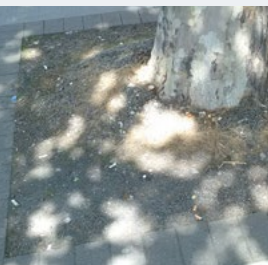
Mulch – organic



Rubber crumb



Soil



Asphalt

4.2 Whilst this document deals only with the materials listed above, it should be noted that other materials are available which may be appropriate for use in certain situations. Furthermore, hybrid solutions using a combination of materials can be considered, such as tree grilles with organic mulch or resin-bound gravel with inorganic mulch.



5

Gravel – resin-bound

- 5.1

A resin-bound surface material is designed to provide a hard-wearing surface tolerant to pedestrian traffic whilst remaining permeable, allowing the roots access to air and water. Permeability can be reduced over time as the pores become blocked with detritus and weeds; this can be mitigated by cleaning or pressure washing. The resin is typically UV stable polyurethane, mixed with aggregate with a typical grading of 6-10mm. Some light-coloured aggregates require a resin system incorporating a UV inhibitor to prevent discolouration of the material over time.
- 5.2

Installation must be undertaken at the correct ambient temperature (minimum 5°C, and above 30°C the material may set too quickly to be worked with); the season and weather conditions at the time of installation should be considered. Settlement of substrate must be allowed prior to installation to avoid the rigid material cracking if not properly supported. Resin-bound gravel can be used around newly planted or established trees. With newly planted trees it is absolutely essential that a collar of loose material be used so that early growth is not impeded. It should also be noted that pre-cast resin-bound gravel inserts/grilles are also available which might under certain circumstances help to alleviate some of the problems described here such as settlement or street sweeper damage in relation to newly planted trees.
- 5.3

Installation should only be carried out by competent contractors. Specification of resin-bound gravel needs to be suited to the site and the use of generic formats should be avoided. For example, in areas where a large surface area of material is required or where there is known to be particularly high footfall (or heavy use of street sweeping machines through the pit area) a different aggregate size or resin compound may be appropriate and the use of an anti-slip compound may also be considered. Resin-bound gravel should not be used where a newly planted tree is supported by stakes as holes will be left in the material once the stakes have been removed.



Good example of resin-bound gravel application



Poor example of resin-bound gravel application

Gravel – resin-bound suitability rating guide

TREE CRITERIA

Permeability for air and water to reach the rooting medium if correctly maintained	HIGH
Flexibility of material	MEDIUM
Risk of damaging young tree health if incorrectly installed	HIGH
Risk of damaging established tree health if incorrectly installed	LOW
Risk of damaging young/established tree health if unmaintained	MEDIUM
Potential to improve soil fertility	LOW
Suitability for installation up to the base of a young tree	LOW

SITE CRITERIA

Tolerance to regular pedestrian traffic	HIGH
Resistance to street sweeping machines/animal excavation	HIGH
Effectiveness at suppressing weed growth	MEDIUM
Availability of different colours/styles	HIGH

INSTALLATION AND MAINTENANCE CRITERIA

Suitability for installation immediately after tree planting	MEDIUM
Likelihood of requiring a sub base prior to installation	HIGH
Level of experience/competence required to correctly install and maintain	HIGH
Expected lifespan of material	MEDIUM
Whole life cost of material, including purchase, installation, maintenance and disposal	HIGH

6

Gravel – self-binding

- 6.1

Self-binding gravel is intended to provide a firm finish tolerant to pedestrian traffic and permeable to allow the movement of air and water, but without using a resin binder. It is relatively hard wearing and is often used for paths, drives and around trees in hard landscapes. A variety of specifications are available, using different aggregate sizes and varying proportions of clay. One frequently used self-binding gravel is hoggin, which is typically a gold-yellow colour and is a mixture of clay, gravel and sand/granite dust.
- 6.2

In areas of high pedestrian traffic there is a chance that self-binding gravel will be dispersed from around the tree by footfall or light vehicular traffic; regular topping-up may therefore be required. The same advice applies in areas susceptible to localised flooding where the material may be washed out by passing vehicles. If the area immediately around the tree is subjected to significant levels of footfall then the material can become compacted and less permeable. Careful use of an air spade may reverse this process and restore permeability.
- 6.3

Self-binding gravel is suitable for use around established or newly planted trees. It must be remembered that the material needs to be compacted at the time of installation, so particular care must be taken when installing around newly planted trees to avoid any damage to the developing root system.



Good example of self-binding gravel application



Poor example of self-binding gravel application

Gravel – self-binding

suitability rating guide

TREE CRITERIA

Permeability for air and water to reach the rooting medium if correctly maintained	MEDIUM
Flexibility of material	HIGH
Risk of damaging young tree health if incorrectly installed	HIGH
Risk of damaging established tree health if incorrectly installed	LOW
Risk of damaging young/established tree health if unmaintained	LOW
Potential to improve soil fertility	LOW
Suitability for installation up to the base of a young tree	MEDIUM

SITE CRITERIA

Tolerance to regular pedestrian traffic	MEDIUM
Resistance to street sweeping machines/animal excavation	LOW
Effectiveness at suppressing weed growth	MEDIUM
Availability of different colours/styles	LOW

INSTALLATION AND MAINTENANCE CRITERIA

Suitability for installation immediately after tree planting	MEDIUM
Likelihood of requiring a sub base prior to installation	LOW
Level of experience/competence required to correctly install and maintain	MEDIUM
Expected lifespan of material	MEDIUM
Whole life cost of material, including purchase, installation, maintenance and disposal	MEDIUM

7 Grilles

- 7.1

Grilles have traditionally been constructed of cast iron sat in a metal frame. The frame is required to ensure that the grille is stable and does not distort under loading; heavier duty frames are available for supporting vehicular traffic. In addition to the traditional style of tree grilles, recessed or integrated tree grilles have a deeper construction with the grille incorporating a continuation of the surrounding hard surface. Gaps between the sections allow water and air through and sections can be removed to allow for tree growth. Concrete grilles in prefabricated sections are also included under the heading of grilles.
- 7.2

Grilles tend to be square or circular, but bespoke shapes are available. Commonly-used materials include cast iron and mild/stainless steel and polyurethane. Mixed usage of material is also possible, with inorganic or organic mulch used to fill in the gaps in in a metal or concrete grille (suitable consideration must be given to what material is used as a filler depending on the situation). Pre-cast resin-bound gravel inserts are available to fit some manufacturers’ grille frames. Grilles tend to be complete units spanning the radius of the surface but some can have sections removed to allow for tree growth. Even when using these systems, it must be remembered that the frame also requires removal to avoid tree damage.
- 7.3

Perhaps the most important consideration when selecting tree grilles is that the grille (along with any supporting frame) must be removed at the right time to avoid causing damage to the tree as it grows. Easy removal should be built into the initial design and accounted for in the maintenance programme. Due to the level of excavation required to install grilles it is rarely appropriate to retrofit them around existing trees. Grilles should therefore only be considered for use as part of a new planting specification.



Good example of grille application



Poor example of grille application

Grilles suitability rating guide

TREE CRITERIA

Permeability for air and water to reach the rooting medium if correctly maintained	HIGH
Flexibility of material	LOW
Risk of damaging young tree health if incorrectly installed	MEDIUM
Risk of damaging established tree health if incorrectly installed	HIGH
Risk of damaging young/established tree health if unmaintained	HIGH
Potential to improve soil fertility	HIGH
Suitability for installation up to the base of a young tree	HIGH

SITE CRITERIA

Tolerance to regular pedestrian traffic	HIGH
Resistance to street sweeping machines/animal excavation	HIGH
Effectiveness at suppressing weed growth	LOW
Availability of different colours/styles	HIGH

INSTALLATION AND MAINTENANCE CRITERIA

Suitability for installation immediately after tree planting	HIGH
Likelihood of requiring a sub base prior to installation	HIGH
Level of experience/competence required to correctly install and maintain	HIGH
Expected lifespan of material	HIGH
Whole life cost of material, including purchase, installation, maintenance and disposal	MEDIUM

8

Mulch – Inorganic

- 8.1

Inorganic mulch can be used to describe a variety of materials, including loose gravel (such as pea shingle), large aggregate stones or loose rubber chippings to name but a few. It is distinctive from organic mulch in that it has not been derived from living material. There is a very wide range of options with regard to size, shape, colour and materials. Inorganic mulch should allow good permeability for air and water but does not provide a firm surface in the same way as resin-bound or self-binding materials.
- 8.2

Inorganic mulch is susceptible to being displaced by pedestrian or vehicular traffic and might not be appropriate for busy urban areas where slip hazards could easily be created. Topping up of the material may be necessary from time to time and a maintenance plan should take into account weeding and cleansing costs. Consideration should also be given to anti-social behaviour which might be exacerbated by the accumulation of a collection of large-aggregate stones beneath a tree.
- 8.3

Elsewhere in this document reference has been made to the importance of ensuring that certain surface materials (particularly resin-bound gravel) are laid around a tree to avoid damage. Inorganic mulch can be a good solution to this problem by being used in a design whereby the rigid material stops a certain distance away from the base of the stem. The gap between the rigid material and the stem can then be filled with an appropriate loose inorganic material.



Good example of inorganic mulch application



Poor example of inorganic mulch application

Mulch – Inorganic suitability rating guide

TREE CRITERIA

Permeability for air and water to reach the rooting medium if correctly maintained	HIGH
Flexibility of material	LOW
Risk of damaging young tree health if incorrectly installed	MEDIUM
Risk of damaging established tree health if incorrectly installed	HIGH
Risk of damaging young/established tree health if unmaintained	HIGH
Potential to improve soil fertility	HIGH
Suitability for installation up to the base of a young tree	HIGH

SITE CRITERIA

Tolerance to regular pedestrian traffic	HIGH
Resistance to street sweeping machines/animal excavation	HIGH
Effectiveness at suppressing weed growth	LOW
Availability of different colours/styles	HIGH

INSTALLATION AND MAINTENANCE CRITERIA

Suitability for installation immediately after tree planting	HIGH
Likelihood of requiring a sub base prior to installation	HIGH
Level of experience/competence required to correctly install and maintain	HIGH
Expected lifespan of material	HIGH
Whole life cost of material, including purchase, installation, maintenance and disposal	MEDIUM

9

Mulch – Organic

- 9.1

Organic mulch is composed of formerly living material. It comes in a variety of materials including composted wood chips, shredded leaved, shredded bark, wood chips, organic compost and well-rotted manure. Organic mulch is permeable to air and water and is known to keep moisture in the soil very effectively. If water is poured on top of the organic mulch during dry weather then there is a risk that the mulch will retain the moisture and it will evaporate before reaching the tree roots. However, this can be overcome by using targeted irrigation. For additional information about mulch (specifically compost) then please refer to BSI Publicly Available Specification 100: Producing quality compost (PAS100).
- 9.2

Mulching around a newly planted tree can provide an important source of nutrients, as well as suppressing the growth of weeds and slowing the evaporation of water from the soil around the tree. In high footfall areas organic mulch is susceptible to being displaced and scattered around the footway, and therefore may require relatively high maintenance to ensure that it is suitably topped up. Organic mulch is typically used around newly planted rather than established trees.
- 9.3

Elsewhere in this document reference has been made to the settlement process of a new tree and the importance of allowing time between planting and the installation of the final surface material. Even if another surface material has been selected for the final finish, a layer of organic mulch can be a useful solution as a temporary surface material between planting and installation of another material. Care must be taken when sourcing organic mulch to ensure that no diseased material is used which could potentially re-infect the new tree.



Good example of organic mulch application



Poor example of organic mulch application

Mulch – Organic

suitability rating guide

TREE CRITERIA

Permeability for air and water to reach the rooting medium if correctly maintained	HIGH
Flexibility of material	HIGH
Risk of damaging young tree health if incorrectly installed	LOW
Risk of damaging established tree health if incorrectly installed	LOW
Risk of damaging young/established tree health if unmaintained	LOW
Potential to improve soil fertility	HIGH
Suitability for installation up to the base of a young tree	HIGH

SITE CRITERIA

Tolerance to regular pedestrian traffic	LOW
Resistance to street sweeping machines/animal excavation	LOW
Effectiveness at suppressing weed growth	MEDIUM
Availability of different colours/styles	LOW

INSTALLATION AND MAINTENANCE CRITERIA

Suitability for installation immediately after tree planting	HIGH
Likelihood of requiring a sub base prior to installation	LOW
Level of experience/competence required to correctly install and maintain	LOW
Expected lifespan of material	LOW
Whole life cost of material, including purchase, installation, maintenance and disposal	LOW

10 Rubber crumb

- 10.1 Bound rubber crumb is designed to provide a firm finish for pedestrian traffic combined with permeability for air and water to penetrate to the roots. The material itself – often constructed using recycled rubber tyres – is similar to the soft surfaces often used in play areas for children and is typically laid in two stages, with a foundation and then a surface layer. Permeability can be reduced over time as the pores become blocked with detritus and weeds; this can be mitigated by cleaning or pressure washing.
- 10.2 When used around mature trees, bound rubber crumb can be laid directly up to the stem of the tree, although an area of loose material can be left around the stem as a collar. With newly planted trees it is essential that a collar of loose material be used so that early growth is not impeded. Care must be taken when installing around a newly planted tree as a semi-compacted sub-base is typically required on which to lay the material; for this reason it may be necessary to leave a settlement period between planting and the installation of the bound rubber crumb.
- 10.3 Installation should only be carried out by competent contractors. Specification of bound rubber crumb needs to be suited to the site and the use of generic formats should be avoided. For example, in areas where a large surface area of material is required or where there is known to be particularly high footfall, a different aggregate size or resin compound may be appropriate. Bound rubber crumb should not be used where a newly planted tree is supported by stakes as holes will be left in the material once the stakes have been removed.



Good example of rubber crumb application



Poor example of rubber crumb application

Rubber crumb suitability rating guide

TREE CRITERIA

Permeability for air and water to reach the rooting medium if correctly maintained	HIGH
Flexibility of material	HIGH
Risk of damaging young tree health if incorrectly installed	MEDIUM
Risk of damaging established tree health if incorrectly installed	LOW
Risk of damaging young/established tree health if unmaintained	MEDIUM
Potential to improve soil fertility	LOW
Suitability for installation up to the base of a young tree	MEDIUM

SITE CRITERIA

Tolerance to regular pedestrian traffic	HIGH
Resistance to street sweeping machines/animal excavation	HIGH
Effectiveness at suppressing weed growth	MEDIUM
Availability of different colours/styles	HIGH

INSTALLATION AND MAINTENANCE CRITERIA

Suitability for installation immediately after tree planting	LOW
Likelihood of requiring a sub base prior to installation	HIGH
Level of experience/competence required to correctly install and maintain	HIGH
Expected lifespan of material	MEDIUM
Whole life cost of material, including purchase, installation, maintenance and disposal	HIGH

- 11.1 The sub-surface planting material for any tree is typically soil, whether an engineered structural soil or standard topsoil. Soil around trees in hard landscapes can often be seen as the absence of an alternative surface material rather than a material in its own right. Soil should allow good permeability of air and water, although it is susceptible to dispersal and compaction if exposed to significant pedestrian footfall. For additional information about soil please refer to British Standard 3882:2007 *Specification for topsoil* (BS3882).
- 11.2 As a loose material soil can be displaced by pedestrians or street sweeping machines, and rainfall will result in mud being washed across the surrounding area. Maintenance requirements are therefore substantial both for the area immediately around the tree – which will likely require weeding, topping up and occasional de-compaction – and the wider site, which will need frequent cleaning. An additional problem presented by soil is that it can be a target for the current trend for third parties planting competing vegetation – including climbing plants, flowers and vegetables – immediately adjacent to newly planted trees, to the detriment of the tree.
- 11.3 Sourcing and specification of soil is very important when using it as a surface material around trees in hard landscapes; particular consideration must be given to the risk of contamination. Poor quality or incorrectly sourced soil might contain large numbers of seeds which will develop into weeds and create additional maintenance responsibilities as well as public complaints. There is a further risk that incorrectly sourced soil might contain seeds or root fragments of pernicious plants such as Japanese knotweed (*Fallopia japonica*) or giant hogweed (*Heracleum mantegazzianum*).



Good example of soil application



Poor example of soil application

Soil suitability rating guide

TREE CRITERIA

Permeability for air and water to reach the rooting medium if correctly maintained	HIGH
Flexibility of material	HIGH
Risk of damaging young tree health if incorrectly installed	LOW
Risk of damaging established tree health if incorrectly installed	LOW
Risk of damaging young/established tree health if unmaintained	LOW
Potential to improve soil fertility	MEDIUM
Suitability for installation up to the base of a young tree	HIGH

SITE CRITERIA

Tolerance to regular pedestrian traffic	LOW
Resistance to street sweeping machines/animal excavation	LOW
Effectiveness at suppressing weed growth	LOW
Availability of different colours/styles	LOW

INSTALLATION AND MAINTENANCE CRITERIA

Suitability for installation immediately after tree planting	HIGH
Likelihood of requiring a sub base prior to installation	LOW
Level of experience/competence required to correctly install and maintain	LOW
Expected lifespan of material	LOW
Whole life cost of material, including purchase, installation, maintenance and disposal	LOW

12 Asphalt

- 12.1

Rather than being selected as a surface material suitable for use around trees in hard landscapes in its own right, asphalt around trees typically occurs when it has been used the footway treatment surrounding the tree but is laid right the way up to the base of the stem. Asphalt provides a firm surface for pedestrian and vehicular traffic but the standard specification is not permeable and therefore will not allow air and water to the roots beneath. Permeable asphalt is available and may be appropriate to use in certain situations. For additional information about asphalt please refer to British Standard 594987:2010 Asphalt for roads and other paved areas. Specification for transport, laying, compaction and type testing protocols (BS594987).
- 12.2

Perhaps the main perceived advantages of using asphalt as a surface material around trees in hard landscapes are the relatively low cost in comparison to more specialist materials, and the lower expertise level required to lay the surface. However, any advantages it may have as a footway treatment must be weighed against the damage which it can cause to the tree. Asphalt must never be used around newly planted trees and should only be considered for established trees when alternatives are not viable for one reason or another.
- 12.3

Asphalt may on occasion be suitable for use around established trees which have developed a substantial root system. However, care must still be taken during installation, especially when using diesel which could cause harm. In addition to the potential damage which could be caused by creating an impermeable barrier to air and water, consideration must be given to direct damage which can be caused by laying the material on top of roots. If used, the recommendation is for a buffer of sand (50mm if possible) between the asphalt and the roots. Asphalt should not be laid immediately up to the stem of a tree.



Good example of asphalt application



Poor example of asphalt application

Asphalt suitability rating guide

TREE CRITERIA

Permeability for air and water to reach the rooting medium if correctly maintained	LOW
Flexibility of material	MEDIUM
Risk of damaging young tree health if incorrectly installed	HIGH
Risk of damaging established tree health if incorrectly installed	MEDIUM
Risk of damaging young/established tree health if unmaintained	MEDIUM
Potential to improve soil fertility	LOW
Suitability for installation up to the base of a young tree	LOW

SITE CRITERIA

Tolerance to regular pedestrian traffic	HIGH
Resistance to street sweeping machines/animal excavation	HIGH
Effectiveness at suppressing weed growth	HIGH
Availability of different colours/styles	MEDIUM

INSTALLATION AND MAINTENANCE CRITERIA

Suitability for installation immediately after tree planting	LOW
Likelihood of requiring a sub base prior to installation	HIGH
Level of experience/competence required to correctly install and maintain	MEDIUM
Expected lifespan of material	HIGH
Whole life cost of material, including purchase, installation, maintenance and disposal	LOW

13 Selection criteria matrix

- 13.1 It is important to note that the selection criteria matrix shown below is designed to be used in conjunction with the preceding materials sections and is not to be regarded as a stand-alone reference in its own right.
- 13.2 Designations of high, medium and low are based purely on the experiences and understanding of the members of the surface materials around trees in hard landscapes Working Party rather than on any research or scientific evidence. The terms are relative to each other only.

13.3 The selection criteria matrix shown below uses colour coding for high, medium and low. For some criteria, HIGH is preferable (lifespan, permeability) while for other criteria LOW is preferable (risk, cost). But in all cases green is preferable to red.

GOOD

NOT GOOD

		Gravel – Resin-bound	Gravel – Self-binding	Grilles	Mulch – Inorganic	Mulch – Organic	Rubber crumb	Soil	Asphalt
TREE CRITERIA	Permeability for air and water to reach the rooting medium if correctly maintained	HIGH	MEDIUM	HIGH	HIGH	HIGH	HIGH	HIGH	LOW
	Flexibility of material	MEDIUM	HIGH	LOW	HIGH	HIGH	HIGH	HIGH	MEDIUM
	Risk of damaging young tree health if incorrectly installed	HIGH	HIGH	MEDIUM	LOW	LOW	MEDIUM	LOW	HIGH
	Risk of damaging established tree health if incorrectly installed	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	MEDIUM
	Risk of damaging young/established tree health if unmaintained	MEDIUM	LOW	HIGH	LOW	LOW	MEDIUM	LOW	MEDIUM
	Potential to improve soil fertility	LOW	LOW	LOW	LOW	HIGH	LOW	MEDIUM	LOW
	Suitability for installation up to the base of a young tree	LOW	MEDIUM	LOW	HIGH	HIGH	MEDIUM	HIGH	LOW
SITE CRITERIA	Tolerance to regular pedestrian traffic	HIGH	MEDIUM	HIGH	LOW	LOW	HIGH	LOW	HIGH
	Resistance to street sweeping machines/animal excavation	HIGH	LOW	HIGH	LOW	LOW	HIGH	LOW	HIGH
	Effectiveness at suppressing weed growth	MEDIUM	MEDIUM	LOW	HIGH	MEDIUM	MEDIUM	LOW	HIGH
	Availability of different colours/styles	HIGH	LOW	HIGH	HIGH	LOW	HIGH	LOW	MEDIUM
INSTALLATION AND MAINTENANCE CRITERIA	Suitability for installation immediately after tree planting	MEDIUM	MEDIUM	HIGH	HIGH	HIGH	LOW	HIGH	LOW
	Likelihood of requiring a sub base prior to installation	HIGH	LOW	HIGH	LOW	LOW	HIGH	LOW	HIGH
	Level of experience/competence required to correctly install and maintain	HIGH	MEDIUM	HIGH	LOW	LOW	HIGH	LOW	MEDIUM
	Expected lifespan of material	MEDIUM	MEDIUM	HIGH	LOW	LOW	MEDIUM	LOW	HIGH
	Whole life cost of material, including purchase, installation, maintenance and disposal	HIGH	MEDIUM	MEDIUM	LOW	LOW	HIGH	LOW	LOW

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The London Tree Officers Association provides an information network for the exchange of views, experiences and ideas about trees and the management of London's Urban Forest. The Association dates back to 1982 and aims to enhance the management of trees and woodlands in the capital. It involves local authority Tree Officers in all 33 London Boroughs, an associate membership of a wide range of tree professionals and those who manage and care for trees. The LTOA is funded by London Boroughs and associate member subscriptions and is hosted by the London Borough of Camden. For more information, documents, advice and guidelines about tree care, please refer to the LTOA website at www.ltoa.org.uk.



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Thanks to GreenBlue Urban for sponsorship of
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