

Arboricultural Impact and Mitigation

Statement for Development Proposals at:

The Cowplain School
Hart Plain Avenue
Waterlooville
PO8 8RY

Proposal: Provision of perimeter (safeguarding) fencing

Prepared for: Kendall Kingscott Ltd

Report Ref: WT 062-22 AIA

Report Date: 4 November 2022



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Summary table: Overall impact on trees

Impact	Reason	High quality trees		Low quality trees	
		A	B	C	U
Trees to be removed	Construction activities	None	None	H009, T032	None
Trees to be removed	Risk management	None	None	None	None
Changes within RPAs	Construction activities	None	T022, T025	T006, T015, T020, T021, T026, H030, H031, T033, T035	None
Retained trees to be pruned	Space for development	None	None	None	None
	Future occupancy	None	None	None	None



1. INTRODUCTION

- 1.1 **Instruction:** This report was instructed by Kendall Kingscott Ltd to inspect the relevant trees and prepare information to accompany the planning submission for perimeter (safeguarding) fencing and associated gates at The Cowplain School, Hart Plain Avenue, Waterlooville, PO8 8RY. The report details all trees that are relevant to the siting of the proposed development and their positions are illustrated on the separately provided tree protection plan attachment WTP1.
- 1.2 **Site visit:** The site visit was undertaken on Friday 28th October 2022. The trees were surveyed visually, externally and from ground level only. No detailed investigations were undertaken, samples, or internal decay detection readings taken for further analysis. All dimensions have been estimated unless stated otherwise. Weather conditions at the time of the survey were clear, still and dry, with good visibility.
- 1.3 **Protected trees:** After investigating the local planning authority (LPA) online mapping system, it was established that there are no tree preservation orders (TPOs) protecting the trees on or surrounding the site and it is not within a Conservation Area (Image 1).

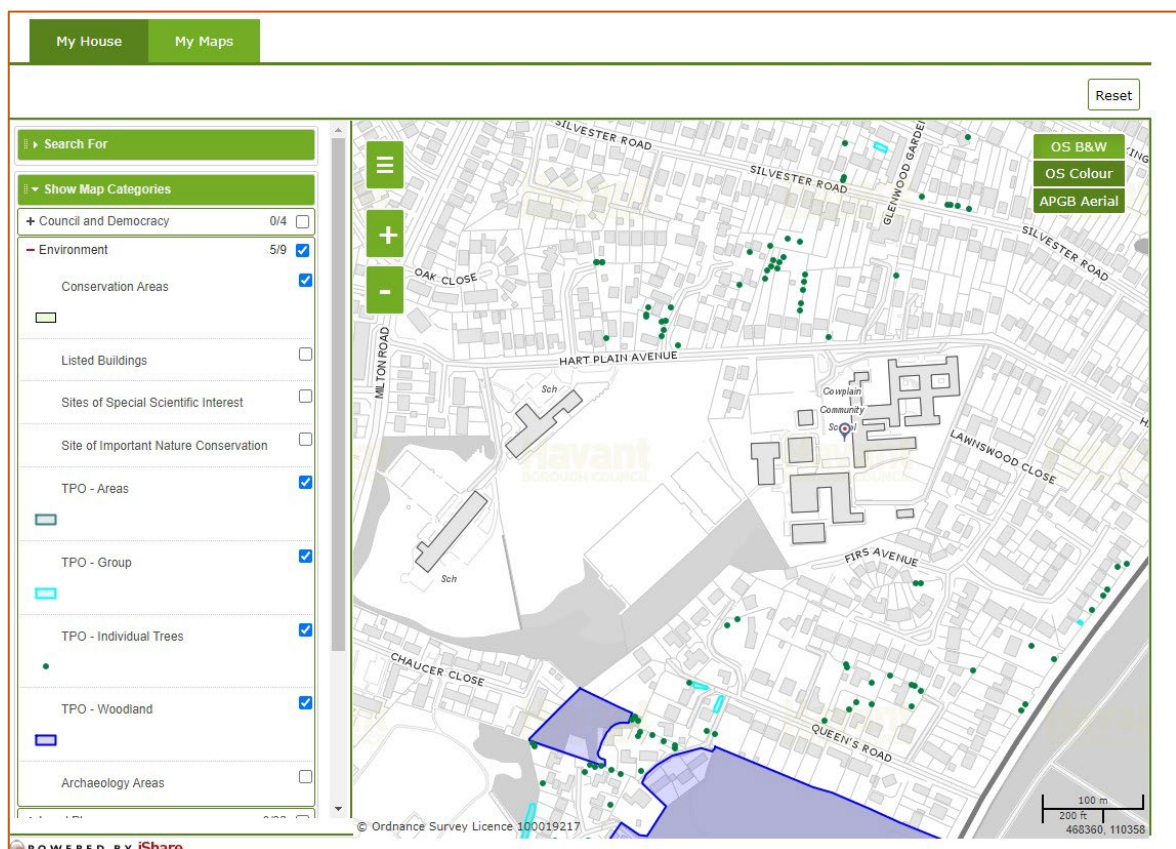


Image 1: Havant Borough Council online map shows the site has no legal tree constraints



- 1.4 **Limitations of this report:** The following limitations apply to this report:
- 1.4.1 **Archaeology:** Although trees can grow in archaeologically sensitive locations, I have no specialist expertise in this discipline and this report does not consider this aspect.
- 1.4.2 **Ecology:** The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000, provides statutory protection to birds, bats and other species that inhabit trees. These could impose significant constraints on the use and timing of access to the site in addition to any of the tree constraints set out in this report. These issues are beyond my area of expertise, and I advise that you seek the advice from an ecologist on whether any such constraints apply to this site.
- 1.4.3 **Tree assessment and management advice:** The comments made about the health and stability of the trees within this report were correct at the time of inspection. It should be recognized that trees are dynamic structures that can never be completely predictable and may become unstable or partially unstable even in average weather conditions. Changes can occur not only to environmental triggers but also in response to biological or mechanical events. My inspection of the trees is made on the basis that they will be annually inspected in the future to identify any changes in condition and review the original recommendations. For these reasons, the tree assessment advice only remains valid for one year from the date that the trees were last inspected. No tree is ever absolutely safe due to the unpredictable laws and forces of nature.

The inspection was carried out from ground level. Where there was restricted access to the base of a tree, its attributes were assessed from the nearest point of access. Binoculars were used to observe features higher in the canopies such as foliage, extension growth and/or bud proliferation. No soil or tissue samples were taken during this inspection. No invasive diagnostic equipment was used to detect decay, and where practicable and reasonable, ivy was removed during the inspection process to get a better view of potential defects.

- 1.5 **Technical references:** This arboricultural impact assessment and arboricultural method statement is based on the following primary technical references:
- British Standards Institution (2012) BS 5837: Trees in relation to design, demolition and construction – Recommendations
 - National Planning Policy Framework (NPPF) revised on 20 July 2021 setting out the Governments planning policies for England and how these should be applied.
- 1.6 **Drawings and documents provided:** Several plans and documents were provided as part of the current planning proposal. My drawings and reports have been developed in context with the land survey reference '220493 Tender Master', received by email on 25th October 2022.
- 1.7 **Qualifications and experience:** This report is based on my site observations and the provided information, interpreted in the context of my experience. I have experience and qualifications in arboriculture that can be reviewed at <https://wadeytrees.co.uk/wp-content/uploads/2020/03/CV-Mark-J-Wadey-2.pdf>.



2. SITE VISIT AND COLLECTION OF DATA

- 2.1 **Brief description of site and surrounding tree cover:** The proposal site is located to the front of the school grounds within the existing road access, playgrounds and parking areas (Image 2). It is mostly covered with hard surfacing and some small planting beds that provide landscaping to the site. There are a variety of ornamental, broadleaved and coniferous trees scattered along the frontage and other site boundaries which appear to be in good condition generally, offering some visual benefits to the surrounding area (Image 3).



Image 2: The proposal boundaries are approximately indicated by the yellow outline



Image 3: Viewed from the front of the school, there are several trees which are visible from public viewpoints



2.2 **Tree assessment method:** The existing tree stock has been identified and graded in line with the current British Standard BS 5837 2012: Trees in relation to design, demolition and construction - Recommendations to enable informed decisions to be made regarding tree retention. The report also details methods of protection to be implemented to safeguard the retained trees.

2.3 **Independent assessment of trees:** I inspected each tree and have indicated the numbering on the tree protection plan (WTP1) in Appendix 1. I identified obvious hedges where appropriate. For each individual tree and hedge, I collected information on species, height, diameter, maturity and potential for contribution to amenity in a development context. As advocated in BS 5837, each tree was then allocated to one of four categories which reflected its suitability as a material constraint on development:

- **Category A:** Trees of high quality and value
- **Category B:** Trees of moderate quality and value
- **Category C:** Trees of low quality and value
- **Category U:** Trees unsuitable for retention, usually to be removed

This information is recorded in the tree schedule included as Appendix 2, with further explanatory notes.

2.4 **The root protection areas and location of tree protection:** BS5837:2012 gives recommendations for the areas of root protection to be the equivalent to the area of a circle centred on the tree with a radius of at least 12 times the trunk diameter. This distance is given for guidance to each tree or group in the schedule. In practice, the siting of the specific protection measures may be different. The implication of this notional root protection area (RPA) is that no significant disturbance should occur within it if the trees are to be successfully retained.

3. **WORKING WITH THE DESIGN PROPOSAL**

General background

3.1 **Tree constraints as part of the design layout:** Following the inspection of the trees, the relevant collected information was used to provide constraints guidance to the architect based on the locations of all the higher quality (category A and B) trees. All the lower quality (category C and U) trees were discounted because they were not considered worthy of being a material constraint.

3.2 Taking account of the above points, I have analysed these constraints to properly inform the planning process and minimise any negative impact on the existing tree stock. Retaining the most important trees in this way means that this proposal will maintain a sustainable tree canopy that will be in harmony with its new surrounding buildings and landscape; thereby enhancing any overall impact on the wider local amenity.



- 3.3 **Relevant Planning Policy taken account during the design stage:** The requirements of the National Planning Policy Framework (NPPF) can be met using planning conditions to require the mitigation measures set out in this report. These proposals comply with the NPPF in terms of achieving sustainable development, good design and conserving the natural environment by retaining all the important trees adjacent the site. Paragraphs 54 and 55 of the NPPF deal with planning conditions. In this respect, sufficient detail has been provided so an enforceable planning condition requiring the trees to be protected can be based on the accompanying arboricultural method statement (AMS) and associated tree protection plan WTP1.

4. **DEVELOPMENT INFLUENCE ON TREE COVER AND PROPOSED MITIGATION**

Specific issues on this site

- 4.1 **Tree protection plan WTP1:** Plan WTP1 in Appendix 1 has been prepared based on the latest layout and is intended to provide a preliminary indication of the tree issues. It shows the existing trees numbered, with high categories (A & B) and low categories (C & U) in their respective colours as set out in paragraph 2.3 above. Trees to be removed are highlighted with a red crown outline. A preliminary location for protective fencing is illustrated with black post and rail annotation and the RPA to be protected behind is shown with the black diagonal hatching. Any precautionary areas are shown with a yellow fill. I stress that this plan is intended to provide an overview of how the tree protection will work and may require more detailed adjustments for the final submission in the context of any feedback.
- 4.2 **Trees to be removed for development:** One small hedge (H009) and one small tree T032 proposed for removal are low quality and do not offer any significant amenity when viewed from outside the site. The scheme offers sufficient space for new landscaping that could include trees or shrubs to mitigate these losses. If required, it would be appropriate for the precise detail to be agreed with the LPA through a planning condition.
- 4.3 **Tree pruning to facilitate access/working space:** At this stage no pruning requirements are anticipated to accommodate these proposals. However, if some pruning of secondary and tertiary low branches is required to facilitate larger construction vehicles, this can be easily achieved without harming the trees' health or appearance. If this changes for any reason, I advise that these matters are considered at an early stage and agreed with the LPA prior to the work commencing.
- 4.4 **Site access:** The RPAs of retained trees can be protected by the existing surfacing or with temporary barriers as illustrated on WTP1. Provided that existing fencing, protective fencing, existing surfacing and proposed is installed/retained correctly, there is unlikely to be any adverse effects on trees from construction traffic moving in and out of the site.
- 4.5 **Proposed perimeter fencing and gate installations:** In some cases, the fencing or gate locations are within RPAs of several trees and hedges (T006, T015, H016, T020, T021, T022, T025, T026, H030, H031, T033 and T035). However, these minor encroachments are less than 20% of the overall RPA identified for each of the trees and unlikely to adversely impact



on their health or stability. As a precaution, the installation works will be undertaken by hand to minimise harm to any roots encountered in the lower subsoil layers.

- 4.6 **Installation of new surfacing/upgraded surfacing:** Once the main fence and gate installations are complete the existing surfacing can be reconditioned and re-aligned in accordance with the proposed layout. This is unlikely to adversely affect tree roots because the sub-base can be retained without significant excavation into the underlying sub-soil or rooting areas.
- 4.7 **Retention of existing surfaces/planting beds:** The existing tarmac surfacing can be retained in most instances and utilised for ground protection over the RPAs. As a precaution, the trunks and existing planting beds around several trees (T012, T013, T014, T015, H016, T019, T020, T021, T022, T025, T026, T027, T028, T029, T033 and T034) will be protected by temporary fencing to avoid accidental damage during construction works.
- 4.8 **Storage and movement of materials:** Materials can be delivered to site using the existing vehicular access and stored on the hard surfaced areas, generally on pallets. It is entirely feasible to move materials to the working areas by hand or using small low ground-effect plant, with no significant harm to trees.
- 4.9 **Drainage and other services:** The site is already serviced, and this establishes the principle of drainage runs, electricity cabling, soakaways and their maintenance and repair. It is not intended for there to be any major service upgrades, and the proposal is to connect into the existing services without the need to cause any disruption to RPAs, that could result in important trees being damaged. If this changes for any reason, I advise that these matters are considered at an early stage and agreed with the LPA prior to the work commencing.

5. CONCLUSIONS

- 5.1 **Overall summary:** The table (on page 1) provides a summary of the relevant changes and potential impacts arising from this development proposal. This layout retains the significant trees adjacent to the site, with sufficient scope to protect them during development. If adequate precautions to protect the retained trees are implemented as recommended in this report, and as may reasonably be required by consent conditions, the overall impact of the proposal on local amenity will be low and limited to the short term only. This submission has demonstrated that it is reasonably practicable to develop the scheme without significant harm to retained trees. Any additional information required for reassurance, can be provided by way of conditions attached to the planning permission. The scheme accords with the principles set out in the National Planning Policy Framework and is also technically compliant with BS5837:2012 and the way in which that Standard has been applied. Therefore, I do not believe there are supportable or reasonable grounds for refusing permission in terms of the trees.



6. RECOMMENDATIONS TO PROTECT TREES DURING DEVELOPMENT

6.1 **Arboricultural method statement:** The successful retention of trees depends on the quality of the protection and the administrative procedures to ensure those protective measures remain in place whilst there is a realistic risk of damage. An effective means of doing this would be through the arboricultural method statement, set out in Appendix 3, that can be specifically referred to in a planning condition. The details of this arboricultural method statement should be made available to the builders and its guidance followed to ensure that the trees are fully protected during the construction works. If appropriate, the builder should instruct an arboricultural consultant to comply with any necessary planning conditions relating to pre-commencement meetings and/or agree protection with ongoing supervision requirements sanctioned by the LPA

6.2 **Provision of a construction method statement:** Providing construction information (that may directly influence tree protection requirements) A construction method statement is a description of how operations that may affect trees will be carried out to minimise any adverse impact on them. The details of how the site will be managed are construction and contractual matters that can only be finalised once the post-consent detailed planning begins. For that reason, at this stage in the planning process, it is only possible to list a summary of the issues that will require more detailed consideration once consent is issued. The issues that may require further clarification on this site include:

- The order of work on site, including site clearance and installations
- Who will be responsible for protecting the trees on site
- Detailed proposals for inspecting and supervising the tree protection
- The parking arrangements for workers and visitors
- A schedule of emergency contact numbers
- Areas for loading and unloading of materials and storage of materials and plant
- Where site facilities will be located and when will they be installed
- How machinery and equipment (such as excavators, or other large vehicles) will enter, move on, work on and leave the site
- Wheel washing facilities near trees
- Measures to control the emission of dust and dirt during construction near trees
- Recycling and storage of waste near trees
- Details of upgrading/removing/replacing existing surfacing and areas where this will happen

Note: It is not my role as an arboricultural consultant to detail the timing and implementation of these measures, although I can input into the process and will need to confirm that the final proposals will not adversely affect retained trees.



7. **RECOMMENDATIONS TO ENHANCE TREE COVER**

- 7.1 **New tree planting strategy and enhancement landscaping opportunities:** In the context of the loss of trees, it is feasible to re-plant new trees elsewhere around the site in prominent locations. It would be appropriate for the precise detail to be agreed with the LPA through a planning condition.
- 7.2 **Tree establishment and care:** Initial guidance for planting new trees is provided in Appendix 3. For further advice on young tree establishment, a useful introductory guide has been produced by the Arboricultural Association which can be found at <https://www.trees.org.uk/Help-Advice/Guide-to-Young-Tree-Establishment>. This sets out the principles of good tree choice, planting practice and aftercare.

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Appendices:

- 1 The tree protection plan WTP1
- 2 Data collection – Tree schedule & explanatory notes
- 3 Arboricultural Method Statement

Appendix 1 – The Tree Protection Plan: Illustrating tree protection and management proposals – WTP1

Content: 1 x A1 plan @ scale 1:500

Appendix 2 – Data Collection: (In accordance with BS 5837 (2012), all tree schedule data has been collected based on the recommendations set out in subsection 4.4 of BS 5837)

NOTE: Colour annotation is A trees green background; B trees blue background; C trees grey background; U trees red background

Ref.	Species	Height (m)	Stem Diam (mm)	Spread	Physiological Cond	Structural Cond	Life Stage	General Observations	Rem. Contrib.	Retention Category	RPA	Recommendations
T001	Common Holly (<i>Ilex aquifolium</i>)	5	50	N:1 E:1 S:1 W:1	Fair	Fair	Semi Mature	Poorly developed tree, with low future potential.	10+ Years	C1,2	Radius: 0.6m. Area: 1 sq m.	
T002	Leyland Cypress (<i>Cupressocyparis leylandii</i> X) Laurel Cherry (<i>Prunus laurocerasus</i>)	5	100	N:1 E:1 S:1 W:1	Good	Fair	Early Mature	Well clipped hedge	10+ Years	C1,2	Area: 13 sq m, plus a 1m buffer.	
T003	Common Hawthorn (<i>Crataegus monogyna</i>)	7	200	N:2 E:2 S:2 W:2	Fair	Fair	Early Mature	Restrictions to access: Dense ivy present. Grows into boundary fence.	10+ Years	C1,2	Radius: 2.4m. Area: 18 sq m.	
T005	Common Ash (<i>Fraxinus excelsior</i>)	5	50	N:1 E:1 S:1 W:1	Fair	Fair	Semi Mature	Poorly developed tree, with low future potential.	10+ Years	C1,2	Radius: 0.6m. Area: 1 sq m.	
T006	Common Ash (<i>Fraxinus excelsior</i>)	6	400	N:2 E:2 S:2 W:2	Fair	Fair	Early Mature	Heavily reduced in past. Poorly developed tree, with low future potential.	10+ Years	C1,2	Radius: 4.8m. Area: 72 sq m.	
T007	Hornbeam (<i>Carpinus betulus</i>)	8	250	N:2.5 E:2.5 S:2.5 W:2.5	Fair	Fair	Early Mature	Heavily reduced in the past	10+ Years	C1,2	Radius: 3.0m. Area: 28 sq m.	
T008	Common Ash (<i>Fraxinus excelsior</i>)	6	450	N:2 E:2 S:2	Fair	Fair	Early Mature	Heavily reduced in past. Poorly developed tree,	10+ Years	C1,2	Radius: 5.4m. Area:	

Appendix 2 – Data Collection: (In accordance with BS 5837 (2012), all tree schedule data has been collected based on the recommendations set out in subsection 4.4 of BS 5837)

Ref.	Species	Height (m)	Stem Diam (mm)	Spread	Physiological Cond	Structural Cond	Life Stage	General Observations	Rem. Contrib.	Retention Category	RPA	Recommendations
				W:2				with low future potential.			92 sq m.	
H009	Cypress (<i>Chamaecyparis sp.</i>)	2	50	N:1 E:1 S:1 W:1	Good	Fair	Semi Mature	Well clipped hedge	10+ Years	C1,2	Area: 3 sq m, plus a 1m buffer.	Fell for development
H010	Cypress (<i>Chamaecyparis sp.</i>)	2	50	N:1 E:1 S:1 W:1	Good	Fair	Semi Mature	Well clipped hedge	10+ Years	C1,2	Area: 22 sq m.	
T011	Pittosporum (<i>Pittosporum sp.</i>)	5	50	N:1 E:1 S:1 W:1	Good	Fair	Semi Mature	Poorly developed tree, with low future potential.	10+ Years	C1,2	Radius: 0.6m. Area: 1 sq m.	
T012	Purple Cherry Plum (<i>Prunus cerasifera 'Pissardi'</i>)	6	4 stems: 200(avg)	N:3 E:3 S:3 W:3	Fair	Fair	Mature		10+ Years	C1,2	Radius: 4.8m. Area: 72 sq m.	
T013	Norway Maple (<i>Acer platanoides</i>)	8	200	N:2.5 E:2.5 S:2.5 W:2.5	Good	Fair	Semi Mature		10+ Years	C1,2	Radius: 2.4m. Area: 18 sq m.	
T014	Purple Cherry Plum (<i>Prunus cerasifera 'Pissardi'</i>)	6	300	N:2 E:1 S:1 W:1	Fair	Fair	Mature	Some small dead branches present.	10+ Years	C1,2	Radius: 3.6m. Area: 41 sq m.	
T015	Common Beech (<i>Fagus sylvatica</i>)	10	200	N:2 E:1 S:2 W:1	Good	Fair	Semi Mature	Grows into lamp post.	10+ Years	C1,2	Radius: 2.4m. Area: 18 sq m.	
H016	Common Beech	3	100	N:1	Good	Fair	Semi	Well clipped	10+ Years	C1,2	Area:	

Appendix 2 – Data Collection: (In accordance with BS 5837 (2012), all tree schedule data has been collected based on the recommendations set out in subsection 4.4 of BS 5837)

Ref.	Species	Height (m)	Stem Diam (mm)	Spread	Physiological Cond	Structural Cond	Life Stage	General Observations	Rem. Contrib.	Retention Category	RPA	Recommendations
	<i>(Fagus sylvatica)</i>			E:1 S:1 W:1			Mature	hedge.			53 sq m, plus a 1m buffer.	
H018	Common Beech <i>(Fagus sylvatica)</i>	2	100	N:1 E:1 S:1 W:1	Good	Fair	Semi Mature	Well clipped hedge.	10+ Years	C1,2	Area: 27 sq m, plus a 1m buffer.	
T019	Cherry <i>(Prunus sp. 'Cherry')</i>	6	100	N:3 E:3 S:3 W:3	Fair	Fair	Early Mature	Grows under overhead cables.	20+ Years	C1,2	Radius: 1.2m. Area: 5 sq m.	
T020	Cherry <i>(Prunus sp. 'Cherry')</i>	10	250	N:4.5 E:3 S:5 W:2	Good	Fair	Early Mature		20+ Years	C1,2	Radius: 3.0m. Area: 28 sq m.	
T021	Cherry <i>(Prunus sp. 'Cherry')</i>	10	2 stems: 100, 200	N:4.5 E:3 S:5 W:2	Good	Fair	Early Mature		20+ Years	C1,2	Radius: 2.7m. Area: 23 sq m.	
T022	English Yew <i>(Taxus baccata)</i>	10	700	N:5 E:4 S:5 W:5	Good	Good	Mature		30+ Years	B1,2	Radius: 8.4m. Area: 222 sq m.	
H023	Common Beech <i>(Fagus sylvatica)</i>	2	100	N:1 E:1 S:1 W:1	Good	Fair	Semi Mature	Well clipped hedge.	10+ Years	C1,2	Area: 67 sq m, plus a 1m buffer.	
H024	Mixed Species Group <i>(Group, mixed)</i>	1.5	100	N:1 E:1 S:1	Good	Fair	Semi Mature	Well clipped hedge.	10+ Years	C1,2	Area: 99 sq m, plus	

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Ref.	Species	Height (m)	Stem Diam (mm)	Spread	Physiological Cond	Structural Cond	Life Stage	General Observations	Rem. Contrib.	Retention Category	RPA	Recommendations
	<i>species)</i>			W:1							a 1m buffer.	
T025	Monterey Pine (<i>Pinus radiata</i>)	16	800		Good	Good	Mature		30+ Years	B1,2	Radius: 9.6m. Area: 290 sq m.	
T026	Common Ash (<i>Fraxinus excelsior</i>)	11	300		Fair	Fair	Early Mature	Ash dieback symptoms visible throughout the crown. Ash Health Class 1 – 100%–75% remaining canopy.	10+ Years	C1,2	Radius: 3.6m. Area: 41 sq m.	
T027	Common Ash (<i>Fraxinus excelsior</i>)	10	250		Fair	Fair	Early Mature	Ash dieback symptoms visible throughout the crown. Ash Health Class 1 – 100%–75% remaining canopy.	10+ Years	C1,2	Radius: 3.0m. Area: 28 sq m.	
T028	Pedunculate Oak (<i>Quercus robur</i>)	11	400		Good	Good	Early Mature	Medium sized tree with future potential.	30+ Years	B1,2	Radius: 4.8m. Area: 72 sq m.	
T029	Pedunculate Oak (<i>Quercus robur</i>)	9	250		Good	Fair	Young	Suppressed by adjacent tree.	20+ Years	C1,2	Radius: 3.0m. Area: 28 sq m.	
H030	Common Beech (<i>Fagus sylvatica</i>)	2	100	N:1 E:1 S:1	Good	Fair	Semi Mature	Well clipped hedge.	10+ Years	C1,2	Area: 2 sq m, plus a	

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Ref.	Species	Height (m)	Stem Diam (mm)	Spread	Physiological Cond	Structural Cond	Life Stage	General Observations	Rem. Contrib.	Retention Category	RPA	Recommendations
				W:1							1m buffer.	
H031	Common Beech (<i>Fagus sylvatica</i>)	2	100	N:1 E:1 S:1 W:1	Good	Fair	Semi Mature	Well clipped hedge.	10+ Years	C1,2	Area: 19 sq m, plus a 1m buffer.	
T032	Swedish Whitebeam (<i>Sorbus intermedia</i>)	5	250		Fair	Fair	Early Mature	Some minor die-back in the crown.	20+ Years	C1,2	Radius: 3.0m. Area: 28 sq m.	Fell for development
T033	Swedish Whitebeam (<i>Sorbus intermedia</i>)	5	300		Good	Fair	Early Mature		20+ Years	C1,2	Radius: 3.6m. Area: 41 sq m.	
T034	Swedish Whitebeam (<i>Sorbus intermedia</i>)	5	250	N:2.5 E:2.5 S:2.5 W:2.5	Good	Fair	Early Mature		20+ Years	C1,2	Radius: 3.0m. Area: 28 sq m.	
T035	Pedunculate Oak (<i>Quercus robur</i>)	10	400		Fair	Fair	Early Mature	Significant crown and/or tip die-back.	20+ Years	C1,2	Radius: 4.8m. Area: 72 sq m.	
T036	White Poplar (<i>Populus alba</i>)	18	750		Good	Fair	Mature	Reduced in past.	20+ Years	B1,2	Radius: 9.0m. Area: 254 sq m.	
T037	Willow (<i>Salix sp.</i>)	15	1000		Good	Fair	Mature	Reduced in past.	20+ Years	B1,2	Radius: 12.0m. Area: 452 sq	

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Ref.	Species	Height (m)	Stem Diam (mm)	Spread	Physiological Cond	Structural Cond	Life Stage	General Observations	Rem. Contrib.	Retention Category	RPA	Recommendations
											m.	
T038	Aspen (<i>Populus tremula</i>)	10	4 stems: 100, 150, 200, 200	N:4 E:4 S:4 W:4	Good	Fair	Early Mature		20+ Years	C1,2	Radius: 4.0m. Area: 50 sq m.	
T039	Aspen (<i>Populus tremula</i>)	10	6 stems: 100, 50, 200, 200, 50, 50	N:4 E:4 S:4 W:4	Good	Fair	Early Mature		20+ Years	C1,2	Radius: 3.7m. Area: 43 sq m.	
H040	Leyland Cypress (<i>Cupressocyparis leylandii</i> X)	6	200	N:2 E:2 S:2 W:2	Good	Fair	Early Mature	Well clipped hedge.	20+ Years	C1,2	Area: 238 sq m, plus a 1m buffer.	
T041	Blue Cedar (<i>Cedrus atlantica glauca</i>)	6	150	N:2 E:2 S:1 W:2	Good	Fair	Semi Mature		20+ Years	C1,2	Radius: 1.8m. Area: 10 sq m.	
T042	Bay Tree (<i>Laurus nobilis</i>)	5	100	N:1 E:1 S:1 W:1	Good	Fair	Early Mature		10+ Years	C1,2	Radius: 1.2m. Area: 5 sq m.	

Appendix 2 - Data Collection Cont'd: Explanatory notes

The site data columns and abbreviations: The relevant tree data was collected and recorded as described in the table below:

Structure: The following categories are assigned appropriately to each landscape feature: T=(tree); G=(group); H=(hedge); C=(coppiced); M=(multi-stemmed); P=(pollard); Sh=(shrubs); S=(stump) or W=(woodland).

Species: Species identification is based on visual observations. Where there is some doubt over tree identity, sp is noted after the genus name in the botanical names section to indicate that the species cannot be reliably identified at the time of the survey. Where there is more than one species in a group, only the most frequent are noted and not all the species present may be listed. The tree botanical names surveyed on this site are listed in column 2.

Height: Height is estimated to provide an indication of the size of the tree.

Stem diameter: Stem or trunk diameter is estimated or measured and recorded in 2.5cm increments as advised in BS 5837 Table D1. It is measured with a diameter tape unless access is restricted, direct measurement is not possible because of ivy on the trunk or the tree is assessed as poor quality. The point of measurement and the adjustments for stem variations are as advised in Figure C1 of BS 5837. The RPAs given below have been used for single stem trees and the equivalent resultant combined stem diameter for multi-stemmed trees.

Branch height and crown spreads: Where crown accuracy varies from site observations and the original topographical survey, new measurements of the crown may be taken and illustrated on the plan as a crown amendment. These are taken in the context of the development proposal where it is considered there may be encroachment from the development. For example, it may only be necessary to record the measurement of one side of the canopy where it overhangs the site, or where there is likely to be some kind of impact to branches/crown of the tree from development proposals. If there are any significant trees missing from the original topographical survey, their positions are estimated and branch spread is taken as a minimum at the four cardinal points, to derive a representation of the crown. Also, where it is considered appropriate, existing height above ground level of: 1) first significant branch and direction of growth (e.g. 2.4-N); 2) canopy will be recorded to inform on ground clearance where access issues may be a concern.

Tree condition: The tree condition is represented by the surveyor's initial visual observations of its health and/or structural integrity. These are separated into the following subcategories:

Physiological condition (P)	Description
Good	Appears to be healthy and have good vitality.
Fair	Generally, in good health but with visible signs of decline or reduced vitality.
Poor	Obviously in poor health and significant decline.
Dead	Dead, or very little live growth.

Appendix 2 - Data Collection Cont'd: Explanatory notes

Structural condition (S)	Description
Good	No significant structural defects/weaknesses.
Fair	Some visible defects but no significant hazards/weaknesses.
Poor	Significant defects/weaknesses or dangerous/potentially dangerous condition.

Life stage: For the purposes of this report the following life stages are recorded as one of seven categories below. Age class is indicative and will vary between species:

LIFE STAGE	DEFINITION
Newly planted	Very young, newly planted trees at least within the last 5 years.
Young	Small establishing tree in its youngest years that could be transplanted with specialist equipment, i.e. less than 150mm in diameter at 1.5m.
Semi-mature	An established tree, but with some growth to make before reaching its potential maximum size. A tree within its first third of lifespan.
Early mature	A tree that is reaching its ultimate potential height, whose growth rate is slowing down but if healthy, will still increase in stem diameter and crown spread. A tree in the second third of life span.
Mature	A mature specimen with limited potential for any significant increase in size, even if healthy. A tree within its final third of expected lifespan.
Over mature	A senescent (declining/degradation) or moribund specimen of low vigour within its final third of expected lifespan. Possibly also containing sufficient structural defects with safety and/or duty of care implications.
Veteran	Specimens exhibiting features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.
Ancient	A tree which is remarkably old for its species.

General observations: Only relevant features such as tree physiology, structural condition, decay and crown or branch structure that may impact on the proposed development are recorded. If there are no notes, then the presumption should be that no relevant features were observed.

Remaining contribution: This is broadly interpreted as <10 years, 10+ years, 20+ years, or 40+ years to provide some indication of a tree's potential for future contribution to its locality.

BS category: Each tree is placed into a relevant coloured category based on their quality and contribution they offer in terms of their arboricultural, landscape or cultural values. This assessment is based on the BS5837 Table 1 cascade chart for tree quality assessment found at the beginning of Appendix 2 in this report.

Appendix 2 - Data Collection Cont'd: Explanatory notes

RPA measurements: For single stem trees, the RPA is calculated as an area equivalent to a circle with a radius 12 times the stem diameter. For trees with more than one stem, one of the two calculation methods set out in paragraph 4.6 of BS5837 recommendations will be used. In all cases, the stem diameter(s) will be measured in accordance with Annex C and Annex D of that document. The calculated RPA for each tree will be capped to 707 m².

Future tree safety inspections: My assessment of the trees was carried out on the basis that a re-inspection would be carried out within a year of the assessment visit and my advice on tree condition must be reviewed annually from the date of that visit.

Tree work considerations

1. **Tree works:** The inspection of all trees was of a preliminary nature and only defects visible from the ground have been identified. Each individual tree may not have been inspected closely because of access difficulties and only defects visible from the inspection point have been noted. In addition to tree removals for development and management reasons, further works are listed to reduce the threats from retained trees. All trees on the site should be checked by the contractor at the time of carrying out the main tree works to deal with any emerging safety issues in the context of the consented development.
2. **Reporting during work operations:** In the context of the preliminary nature of the tree inspection, any defects that may affect tree safety discovered by the contractor when carrying out the work recommendations should be reported to the supervising officer. Modification to the schedule of works may be required because of these reports. The contractor should be specifically instructed on this point.
3. **Implementation of works:** All tree works should be carried out to BS 3998 *Recommendations for Tree Work* as modified by more recent research. It is advisable to select a contractor from the local authority list and preferably one approved by the Arboricultural Association. Their Register of Contractors is available free from The Malthouse, Stroud Green, Standish, Stonehouse, Gloucestershire GL10 3DL; phone 01242 522152; website www.trees.org.uk.
4. **Statutory wildlife obligations:** The Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000 provides statutory protection to birds, bats and other species that inhabit trees. All tree work operations are covered by these provisions and advice from an ecologist must be obtained before undertaking any works that might constitute an offence.

Appendix 3 – Arboricultural Method Statement

1 Introduction

- 1.1 **Purpose of this Arboricultural Method Statement:** This Arboricultural Method Statement (AMS) has been produced in line with *BS 5837 2012: Trees in relation to design, demolition and construction-Recommendations* to aid the successful retention of the trees adjacent to the perimeter (safeguarding fencing) and associated gates at The Cowplain School, Hart Plain Avenue, Waterloooville, PO8 8RY.
- 1.2 **Scope of statement:** This document sets out the methodology for all proposed works that affect trees on and adjacent to the site. Compliance with this method statement will be a requirement of all relevant contracts associated with the development proposals. Copies of this document will be available on site for inspection.
- 1.3 **Relevant plan information:** For details of the trees to be retained and location and types of special protection methods, reference should be made to the tree protection plan WTP1. A copy of which should be displayed prominently on site.

2 Supervision and monitoring

- 2.1 **Responsibilities:** It will be the Project Manager/builder's responsibility to ensure that the details of this method statement are known and understood by all site personnel. A copy must be kept on site at all times and the site manager must brief all personnel who could have an impact on the specific tree protection requirements. This should be a part of the site induction procedures and written into appropriate site management documents. If appropriate, the builder should instruct an arboricultural consultant to comply with any necessary planning conditions relating to pre-commencement meetings and/or agree protection with ongoing supervision requirements sanctioned by the LPA.
- 2.2 **Phase 1 (Establishment of tree protection measures):** A pre-commencement meeting must be held on site before any of the site clearance or construction works start. This must be attended by the contractor's site manager or agent, the arboricultural consultant and the tree officer. The methods of tree protection outlined in this report must be fully discussed at this meeting so that all aspects of their implementation and sequencing are made clear to all parties. Any clarifications or modifications must be recorded and circulated to all parties in writing.
- 2.3 **Phase 2 (special precautions during construction):** All the retained trees will be protected from damage using barriers (fencing). Additionally, in the precautionary areas shown on the tree protection plan, special precautions relating to their management will be required. All these protective measures are shown on the plan WTP1 and explained within the examples provided in the tree protection guidance section below.
- ### 3 Specific tree protection issues on this site
- 3.1 **Tree protective guidance:** The specific tree protection requirements set out below are necessary to minimise harm to retained trees. These must be informed by the following tree protection guidance notes below if tree harm is to be minimised.

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- 3.2 **Protective fencing:** Temporary tree protective fencing is proposed for the retained trees. This will be erected at the locations shown on the tree protection plan WTP1. It will be to the BS5837:2012 section 6.2 recommendations i.e. braced preformed galvanised steel mesh panels (Heras' or similar). It will be installed prior to the commencement of any development related activity and retained at the locations shown on until construction is completed. It may only be moved or removed with consent from the LPA. Provided that the fencing is properly specified, installed and maintained, there is unlikely to be any significant adverse effects on the health or amenity value of these trees.
- 3.3 **Upgrading surfacing:** Once the main fence and gate installations are complete, the existing surfacing can be reconditioned and re-aligned in accordance with the approved road and parking layout. The specific detail for the new surfacing must accord with the principles set out in BS5837:2012 recommendations relating to permanent hard surfacing (clauses 7.4.1 and 7.4.2 p.25) and the tree protection guidance notes below.
- 3.4 **Installation of the perimeter fence and gates:** Any work in the RPAs of trees close to these proposed works must be done with care by following the tree protection guidance notes for hand digging below.
- 3.5 **Storage areas outside the RPA:** Before construction begins on site, it is important to identify the exact areas outside the RPAs that minimise chemical pollution and damage from construction materials. Materials should not be handled or stored within the RPAs of retained trees; the load exerted can result in soil compaction and leachate from spill can be toxic to trees.
- 3.6 **Services:** Where possible, the existing services will be used to avoid disruption within RPAs. However, if minor encroachment is required, the works must be undertaken following the guidance notes below. If this changes for any reason, I advise that these matters are considered at an early stage and agreed with the LPA prior to the work commencing

4 Important arboricultural considerations

- 4.1 **Review of main requirements:** The following general responsibilities should be known to all parties involved with working on site to ensure that important retained trees on site are sufficiently protected:
- Protective barriers must be regarded as sacrosanct and must only be moved under direct supervision of the LPA or named Arboriculturist to enable the undertaking of works within the RPA of the trees, as set out in this AMS, and approved in writing by the LPA. It is of paramount importance the fencing is repositioned correctly after any agreed operations.
 - No materials, chemicals, machinery or vehicles must be stored within the RPA as defined on the TPP and identified on site by protective fencing and above ground root protection.
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- Damage caused to protective fencing must be reported to the site supervisor and the named Arboriculturist to ensure appropriate repair.
- Any damage to retained trees must be reported without delay to the site supervisor, the LPA and the named Arboriculturist so appropriate remedial work can take place without delay.
- No fires will be lit on site.
- Notice boards, telephone cables or any other signage or services are not to be attached to any part of retained trees.

Tree protection guidance

Objective: This guidance sets out the general principles that must be followed when working in Root Protection Areas (RPAs). Before work starts on site, the purpose of this guidance is to demonstrate to the LPA that tree protection issues have been properly considered and to provide a written record of how they will be implemented. Once the site works start, this guidance is specifically for the site personnel to help them understand what has been agreed and explain what is required to fully meet their obligations to protect trees. All personnel working in RPAs must be properly briefed about their responsibilities towards important trees based on this guidance.

RPA description: RPAs are the areas surrounding important trees where disturbance must be minimised if they are to be successfully retained. All RPAs close to the construction area are illustrated on the tree protection plans accompanying this advice. Damage to roots or degradation of the soil through compaction and/or excavation within RPAs is likely to cause serious damage. Any work operations within RPAs must be carried out with great care if trees are to be successfully retained.

Use of this guidance: Anyone working within an RPA must follow this guidance if important trees are to remain unharmed. They must take care to minimise excavation into existing soil levels and limit any fill or covering that may affect soil permeability.

This advice should always be read in conjunction with the tree protection plan (TPP) illustrating the areas where specific precautions are necessary. Each area where precautions are required is annotated on the plans as identified on their keys. All plans are illustrative and intended to be interpreted in the context of the site conditions when the work is started. All protective measures should be installed according to the prevailing site conditions and agreed as satisfactory by the appropriate supervising officer before any demolition or construction work starts.

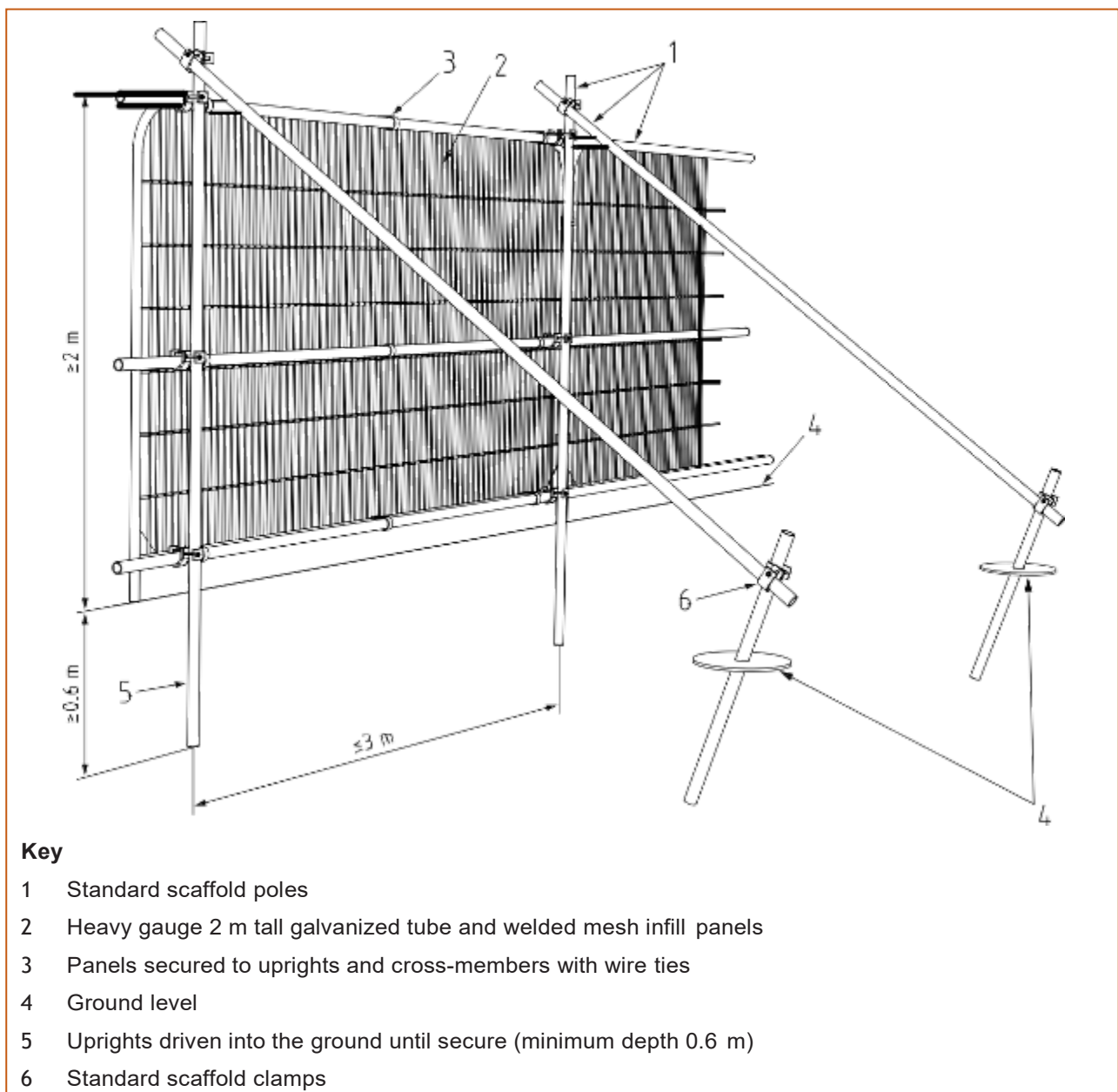
Preventing adverse impact to the RPA: Any part of the RPA beyond the agreed work area must be isolated from the work operations by protective barriers or ground protection to at least the minimum standard described in BS 5837 for the duration of the work. Any further precautions required to minimise harm to trees should be undertaken using the relevant tree protection guidance in the following pages.

Arboricultural supervision: Qualified arboricultural supervision is essential to minimise the risk of harm to trees. Ongoing work must be inspected regularly and, on completion, must be signed off by the arboriculturist to confirm compliance by the contractor and to sign off relevant Planning Conditions. In the context of this guidance, an appropriate supervising officer would normally be an arboriculturist.

Tree protective barriers

Installing Barriers: Tree Protective barriers must be fit for purpose, and once installed must not be moved without written consent from the Local Planning Authority (LPA). If it is absolutely necessary for any adjustments, they should be under direct supervision of the project Arboriculturist to maintain the Root Protection Area (RPA) of each tree. No materials, chemicals, machinery or vehicles must be stored within the protected area as defined on the Tree Protection Plan. On this site, all exposed rooting areas should be protected by barriers (while vulnerable to damage), in accordance with BS 5837 figures 2 and 3 below until there is no risk of damage from the development activity. This work should be subject to arboricultural supervision.

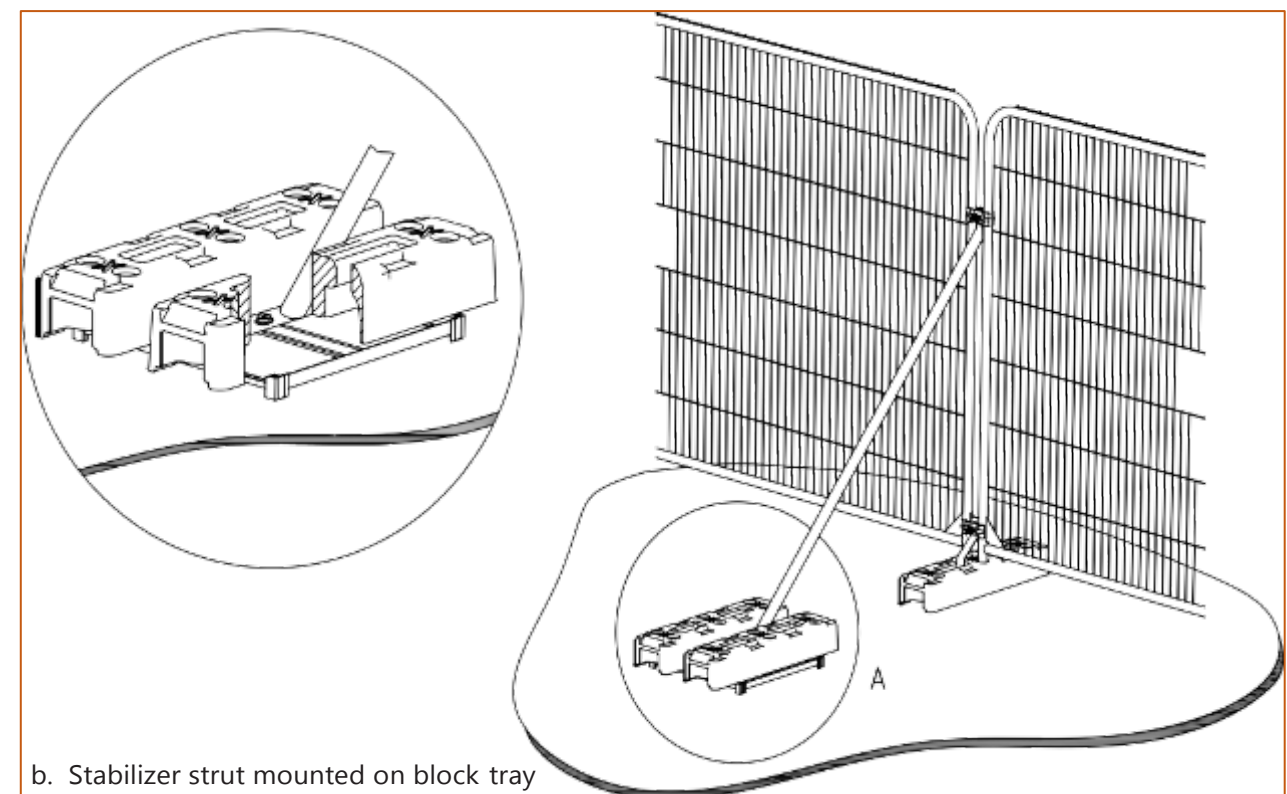
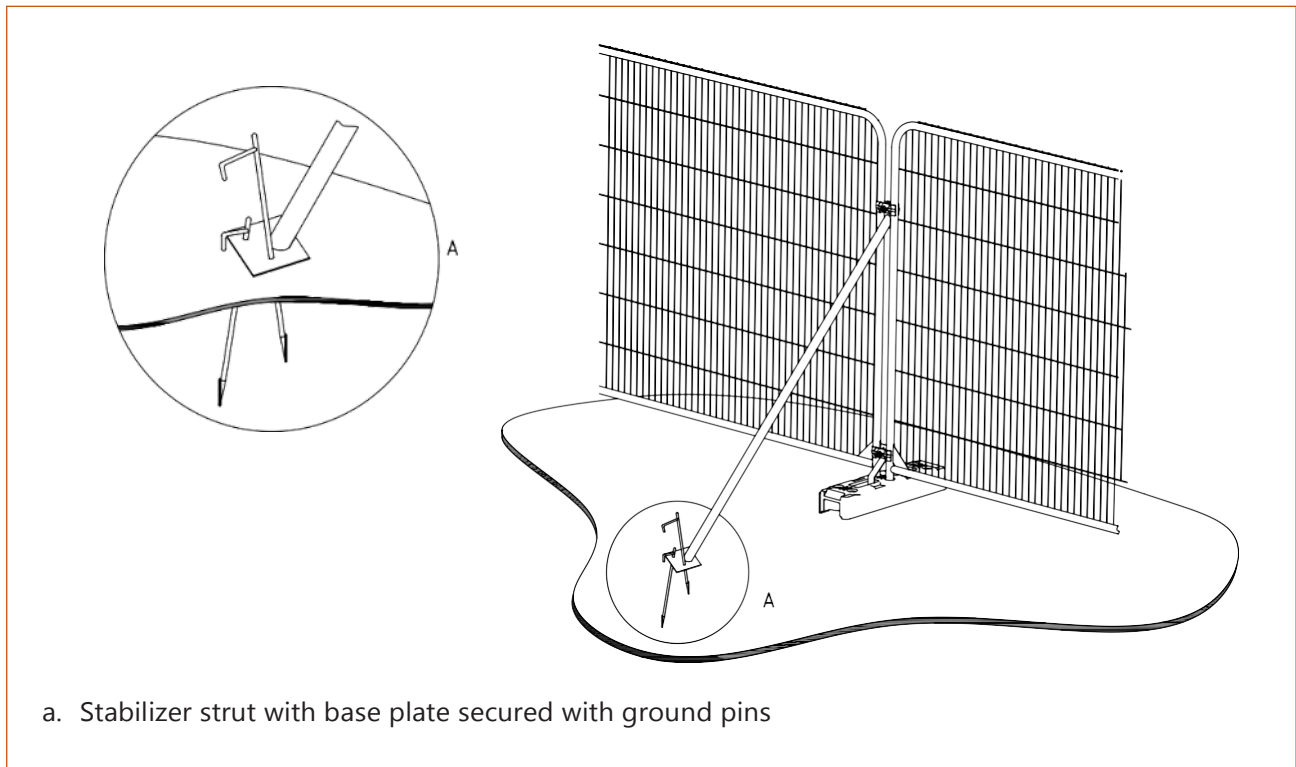
Extract from BS5837: 2012 Figure 2—Default specifications for tree protective barriers



Extract from BS5837: 2012 Figure 3: Examples of above-ground stabilizing systems

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Examples of tailored protective barriers: A range of methods can be used to protect the trunks and underlying soil but whatever the choice of method, the end result must be fit for purpose to prevent the protected area from being breached by the construction activities.



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Picture 1: All barriers should be labelled to keep working activities outside the Construction Exclusion Zones (CEZs).



Picture 2: Scaffolding supports and board coverings erected around the trunks of trees can provide suitable protection against traffic turning into the site.



Picture 3: Temporary barriers are useful around individual trees where construction activities only occur during a short period.



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Pictures 4 & 5: Wooden boards carefully secured around the trunks can provide good protection where access is limited.



Picture 6: Where trees are off site, or public access is required through the work zone, boxing around the tree may be feasible.

Surfacing

Avoiding root damage where surfacing is required within RPAs: Where surfacing already exists, roots are likely to be growing within and below the sub-base structure so great care is needed during access and demolition. Damage can occur through physical disturbance of roots and/or the compaction of soil around them from the weight of machinery or repeated pedestrian passage. This is not generally a problem whilst surfacing is in place because it spreads the load on the soil beneath and further protective measures are not normally necessary. However, once they are removed and the soil below is newly exposed, damage to roots is possible. Equally, new surfacing is potentially damaging to trees because it may require changes to existing ground levels, resulting in localised soil structure degradation and/or disrupt the efficient exchange of water and gases in and out of the soil. Mature and over-mature trees are much more prone to suffer because of these changes than young and maturing trees. Adverse impact on trees can be reduced by minimising the extent of these changes in RPAs. Generally, the most suitable surfacing will be relatively permeable to allow water and gas movement, load spreading to avoid localised compaction and require little or no excavation to limit direct damage. In both these situations, the RPAs exposed by the work must be protected as set out in BS 5837 until there is no risk of damage from the development activity. Removing existing surfacing is a high-risk activity for any adjacent roots and the following guidance **must** be observed:

- a. Appropriate tools for manually removing debris may include a pneumatic breaker, crowbar, sledgehammer, pick, mattock, shovel, spade, trowel, fork and wheelbarrow. Secateurs and a handsaw must also be available to deal with any exposed roots that have to be cut.
- b. Machines with a long reach may be used if they can work from outside RPAs or from protected areas within RPAs. They must not encroach onto unprotected soil in RPAs.
- c. Debris to be removed from RPAs manually must be moved across existing hard surfacing or temporary ground protection in a way that prevents compaction of soil. Alternatively, it can be lifted out by machines provided this does not disturb RPAs.
- d. Great care must be taken throughout these operations not to damage roots as set out above.

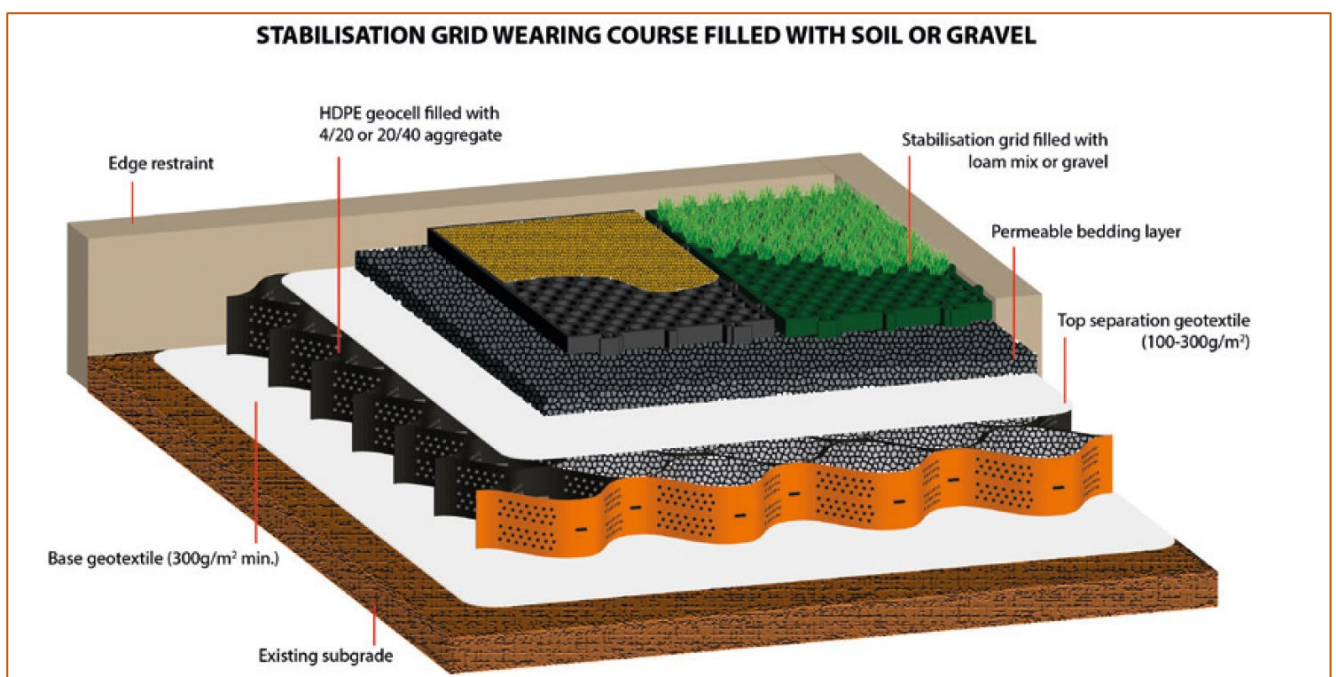
NB: If appropriate, leaving surfacing in place should be considered if its removal may cause excessive root disturbance.

Installing new surfacing: New surfacing is potentially damaging to trees because it may require changes to existing ground levels, result in localised soil structure degradation and/or disrupt the efficient exchange of water and gases in and out of the soil. Mature and over-mature trees are much more prone to suffer because of these changes than young and maturing trees. Adverse impact on trees can be reduced by minimising the extent of these changes in RPAs. Generally, the most suitable surfacing will be relatively permeable to allow water and gas movement, load spreading to avoid localised compaction and require little or no excavation to limit direct damage. The actual specification of the surfacing is an engineering issue that needs to be considered in the context of the bearing capacity of the soil, the intended loading and the frequency of loading. The detail of product and specification are beyond the scope of this guidance and must be provided separately by the appropriate specialist.

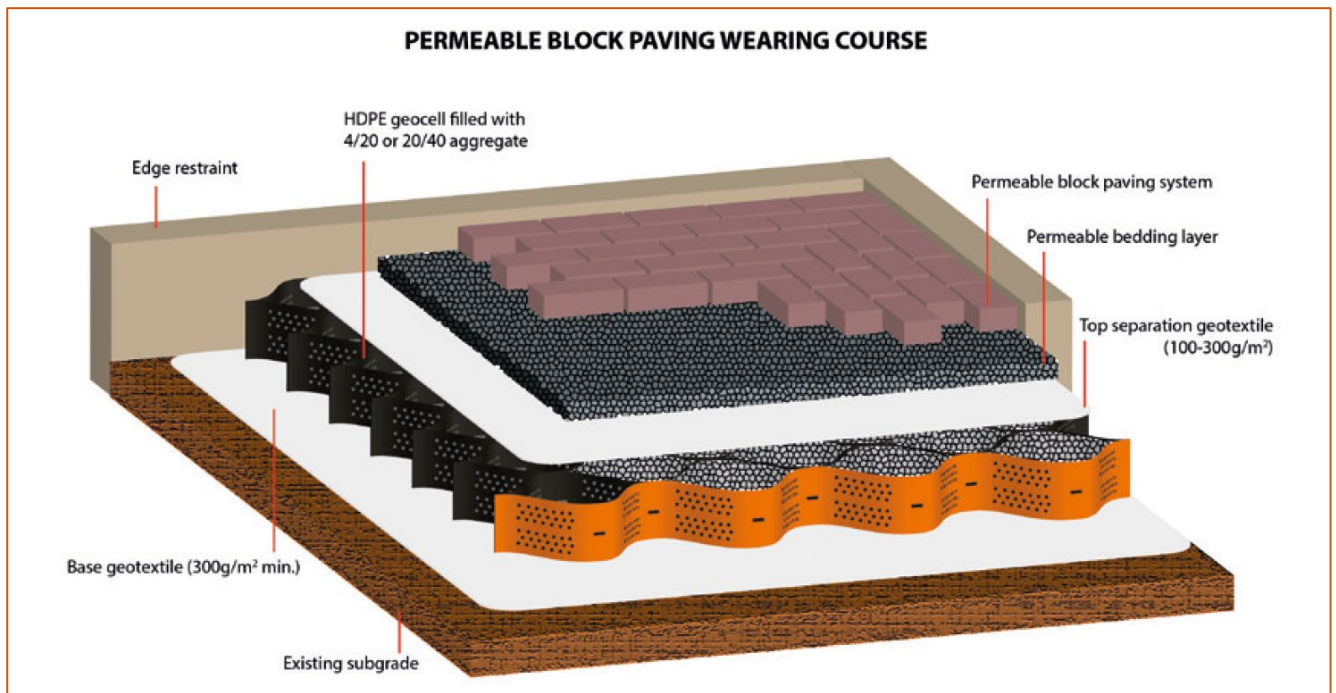
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Establishing surfacing depth: The precise location and depth of roots is unpredictable and will only be known when careful digging starts on site. Ideally, all new surfacing in RPAs should be no-dig, i.e. requiring minimal excavation. New surfacing may require an evenly graded sub-base layer, which can be made up to any high points with granular, permeable fills such as crushed stone or sharp sand. This sub-base must not be compacted like conventional surface installations. Some limited excavation is usually necessary to achieve this and need not be damaging to trees if carried out carefully avoiding the cutting of large tree roots. The removal of a turf layer up to 50mm is unlikely to be damaging to trees and it may be possible to dig to a greater depth depending on local conditions. However, this would need to be assessed by an arboriculturist if excavation beyond the 50mm depth is anticipated. If the roots are less than 25mm in diameter, it would normally be acceptable to cut them and the gradient formed with the preferred minimal excavation of up to 50mm. However, if roots over 25mm in diameter are exposed, cutting them may be too damaging and further excavation may not be possible. If that is the case, the surrounding levels must be adjusted to take account of these high points by filling with suitable material. If this is not practical and large roots have to be cut, the situation should be discussed with the supervising officer before a final decision is made.

Wearing course: Once the sub-base has been formed, the load spreading construction is installed on top without compaction. In principle, the load spreading formation will normally be cellular and filled with crushed stone although the detail may vary with different products. Suitable wearing course finishes include washed gravel, permeable tarmac or block pavements set on a sand base. However, for lightly loaded surfacing of limited widths (<3m) such as pedestrian paths, pre-formed concrete slabs may be appropriate if the sub-base preparation is as set out above. In some situations, limited width floating concrete rafts constructed directly on to the soil surface may be acceptable but the design must not include any strip-dug supports. Examples of low impact surfacing design principles below are taken from the Arboricultural Association guide to good practice booklet 'The use of cellular confinement systems near trees' (*Images courtesy of Core LP*).



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Surface edging: Conventional kerb edge retention set in concrete filled excavated trenches is likely to result in damage to roots and should be avoided. Effective edge retention in RPAs must be custom designed to avoid any significant excavation into existing soil levels. For most surfaces, the use of pre-formed edging secured by metal pins or wooden pegs is normally an effective way of minimising any impact on trees from the retention structure. Examples of low impact kerbs below are taken from the Arboricultural Association guide to good practice booklet 'The use of cellular confinement systems near trees' (*Images courtesy of Core LP*).

	Standard kerbs set on top of concrete-filled geocells If the levels suit, standard kerbstones can be set on top of the geocells. The edge cells can be filled with concrete and the haunchings are above the cellular confinement system. The finish can look very good when this has been carried out properly.
	Small concrete kerbs pegged and set in concrete Where only small load resistance is required narrow concrete kerbstones can be set in concrete at the edge of the geocells, and these can be further stabilised by wooden pegs. This creates an attractive finish that is comparable to standard surface installations.

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Railway sleepers fixed in place

An advantage of using railway sleepers is that they are easy to source and quick to install. They are particularly good for temporary access roads because they can be easily removed at the end of the project and re-used.



Metal or plastic edging strips

There is a range of edging products that are designed to retain block paving or to provide a clean edge to landscape areas. These are typically L-shaped edging strips that are secured by being pinned into the ground below
[image courtesy of Hauraton Ltd].

Replacing existing surfacing: In some instances, existing surfacing can be retained and used as a base for new surfacing. Normally, this will not result in significant excavation that could expose roots so special precautions are not necessary. However, if large roots already protrude above the proposed sub-base level, then the precautions and procedures set out above must be observed.

Hand digging operations

Excavations within RPAs: All excavation must be carried out carefully using hand tools, taking care not to damage the bark and wood of any roots. Specialist tools for removing soil around roots using compressed air may be an appropriate alternative to hand digging, if available. All soil removal must be undertaken with care to minimise the disturbance of roots beyond the immediate area of excavation. Where possible, fibrous roots should be retained or displaced temporarily beyond the excavation without damage.

Where excavations are required within RPAs, the advice below **must** be followed:

Advice for digging trenches

- a. All work within RPAs must be carried out by hand under close and recorded arboricultural supervision.
- b. Machines should not enter protective zones unless there is a suitable existing hard standing.
- c. Excavation of open trenches by machine is unacceptable within the protective zone. Wherever possible, trenchless techniques should be used.
- d. For trenchless installation of services, the pit excavations for starting and receiving machinery should be located outside the protective zone. The depth of run should be below 600mm. Techniques involving external mole lubrication with materials other than water should be avoided unless precautions are taken to ensure that there is no soil contamination within 600mm of the surface.
- e. The broken trench technique combines hand dug sections of trench with trenchless techniques. The open trench is dug by hand with the same precautions as for continuous trenching described below. Open sections of trench should be kept as short as possible and only long enough to allow access for linking to the next section.
- f. Continuous trenches should only be used where it is not possible to use either of the above techniques. The objective is to dig by hand and to retain as many roots as possible. Hand digging must be undertaken with great care to retain all roots greater than 25mm and to prevent damage to those retained.



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- g. Hand tools such as a fork should be used to loosen the soil and help locate any substantial roots. Once roots have been located, a trowel and brush should be used to clear the soil away from them without damaging the bark. Any roots that need to be removed should be cut cleanly with sharp saw or secateurs 100–200mm behind the final face of the excavation

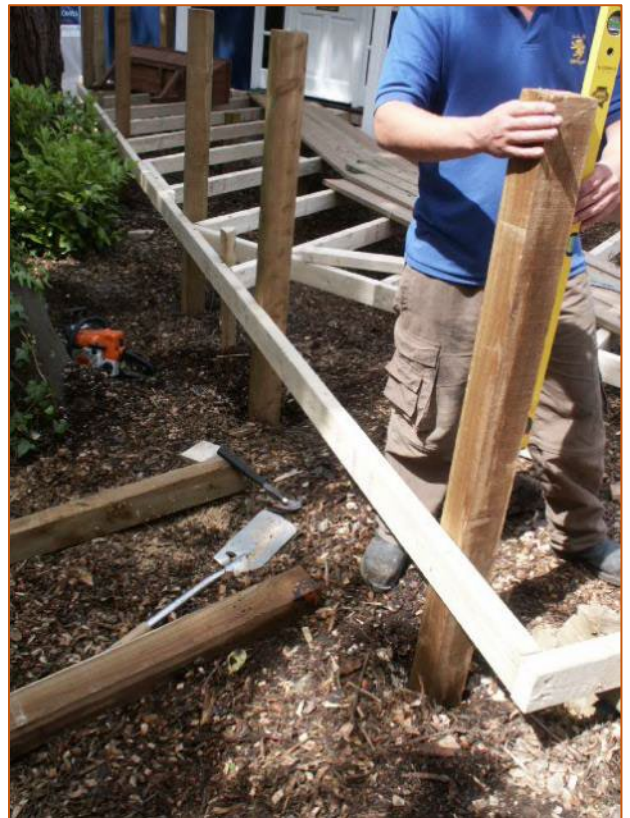


- h. Backfilling should be carried out carefully to avoid direct damage to roots and excessive compaction of the soil around them. Where the finished surface will be hard standing, the backfill material around roots should be a mixture of top soil and a granular fill such as sharp sand to reduce excessive compaction and to secure a local aerated zone. On sites away from hard standing, backfill only with excavated soil.
- i. Exposed roots should remain protected from drying out and extremes of temperature by insulating covering such as sacking.



Advice for hand digging fencing post holes

- a. All excavation in RPAs must be carried out carefully using hand tools, taking care not to damage the bark and wood of any roots. Specialist tools for removing soil around roots using compressed air may be an appropriate alternative to hand digging, if available.
- b. All soil removal must be undertaken with care to minimise the disturbance of roots beyond the immediate area of excavation. Where possible, flexible clumps of smaller roots, including fibrous roots, should be retained if they can be displaced temporarily or permanently beyond the excavation without damage.
- c. If digging by hand, a fork should be used to loosen the soil and help locate any substantial roots. Once roots have been located, the trowel should be used to clear the soil away from them without damaging the bark.
- d. Exposed roots to be removed should be cut cleanly with a sharp saw or secateurs 10–20cm behind the final face of the excavation.
- e. Roots temporarily exposed must be protected from direct sunlight, drying out and extremes of temperature by appropriate covering such as hessian sacking or boards.
- f. Roots greater than 2.5cm in diameter should be retained where possible. Roots 2.5–10cm in diameter should only be cut in exceptional circumstances. Roots greater than 10cm in diameter should only be cut after consultation with the appropriate supervisory officer.
- g. The design should be sufficiently flexible to allow the hole-locations to be moved slightly if roots greater than 2.5cm in diameter are found in the preferred locations.



Services: Excavation to upgrade existing services or install new services in RPAs may damage retained trees and should only be chosen as a last resort. In the event that excavation emerges as the preferred option, the decision should be reviewed by the supervising officer before any work is carried out. If excavation is agreed, all digging should be done carefully and follow the guidance set out above.

Material storage and pollution control

Loose building materials, chemicals and other pollutants that can contaminate the soil must be stored in locations outside the RPAs. If space around the site is limited, materials must be ordered in smaller/less frequent amounts to minimise excessive build-up of unused building materials. Where liquids or powder/granule products are required, precautionary measures of bunding or sealed frameworks should be sufficient to prevent contamination and must be designed so they are fit for purpose. If spillage or leakage occurs, there should be immediate procedures put in place to reduce further risk to the surrounding RPAs. All contributing contaminants must be moved away from the affected RPAs in a way that minimises harm to tree roots and the surrounding soil.



The following points must be adhered to:

Minimising harm from storage of pollutants

- a. The storage of fuels or toxic materials must be kept outside RPAs
- b. Emergency spillage kits must be available on site at all times to reduce the risk of accidents to the environment
- c. Where space is limited, contaminants must be kept safe using tailored containment systems fit for purpose.
- d. Cement washings must be contained to prevent leaching into the soil within RPAs
- e. Concrete pouring must be done in a way that ensures all RPAs within influencing distance are adequately protected. Liners should also be used where possible to prevent contamination.



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Tree planting

Choosing your trees

Right tree, right place: An increasingly common theme in the design of modern landscapes is the importance of plant biosecurity and the use of a variety of species to reduce the potential impacts of future pest threats. For that reason, it is important to offer the opportunity to plant a wide variety of species and optimise the resilience of the site to climate change and potential future losses from tree diseases.

Increasing or improving canopy cover is clearly a desirable objective, but that should not be at the expense of increased inconvenience and nuisance of future occupants. Too many trees of the wrong species too close to occupied areas create conflicts that inevitably lead to long-term reduction in tree cover as affected owners find their own ways of dealing with the problem. Typical inconveniences include sticky deposits on cars and staining to patios from honeydew dripping from some species of tree, excessive shading from species with dense foliage, anxiety caused by overbearing large trees near buildings, debris and fruit falling in sensitive areas, and damage to structures from vigorous branch and root growth.

Such conflicts can be minimised by the careful selection of species and their placements to ensure that future occupants have enough open amenity space near their living areas and are not excessively inconvenienced by inappropriate trees. In principle, a sustainable landscape should aim to achieve a practical balance between the need to maximise the communal benefits from trees whilst minimising the problems they cause to individual owners. All the tree species options below are **examples** with this objective in mind but many choices are available from a wide range of tree nursery outlets around the country.

Future growth characteristics	Species options
Large trees with the potential to achieve 15-20m+ in height with maximum expected crown diameters of 8–10m	• <i>Fagus sylvatica</i> • <i>Pinus sylvestris</i> • <i>Quercus patraea</i> • <i>Quercus robur</i> • <i>Tilia cordata</i>
Future growth characteristics	Species options
Medium to large trees with the potential to achieve 12–15m in height	• <i>Acer platanoides</i> • <i>Alnus glutinosa</i> • <i>Betula pendula</i> • <i>Liquidambar styraciflua</i>
Future growth characteristics	Species options
Small to medium trees with the potential to achieve 5–10m in height with crown diameters that can be reasonably contained at about 4m	• <i>Amalanchier lamarckii</i> 'Robin Hill' • <i>Parrotia persica</i> • <i>Prunus avium</i> • <i>Prunus serrula</i> (multi-stem) • <i>Sorbus aucuparia</i>

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Other examples of relatively narrow trees suitable for residential amenity planting

Fastigate deciduous/broadleaved

1. *Carpinus betulus* '**Frans Fontaine**': Mature height 10m but remains narrower than the 'Fastigiata' (at 10m the tree is only 3m wide). Provides autumn colour, tolerates most soils and exposed sites
2. *Fagus sylvatica* '**Dawyck**': Mature height 20–25 m and a width of approx. 3m. Available in Gold and Purple varieties. Will tolerate moderately exposed site with well drained rich soil
3. *Quercus robur* '**Fastigate Koster**': Mature height 10–15m and a width of 3–6m. Stands up well to hard surfaces making it ideal for urban situations
4. *Liriodendron tulipifera* '**Fastigiatum**': Mature height 8–10m and a width up to approx. 5m. Provides yellow autumn colour and will tolerate most soil including hard surfaces.
5. *Acer platanoides* '**Columnare**': Mature height 15–20m and spread up to 6m. Tolerates all soils apart from very wet sites and does well in an urban situation. Yellow autumn colour
6. *Populus nigra* '**Italica**': Large tree up to 30m forming a narrow columnar crown suitable for parks and large gardens. Creates good wind break and will tolerate exposed sites and most soils
7. *Prunus serrulata* '**Amanogawa**': Small tree up to 6m with a very narrow crown. Pale pink then white flowers ideal for small gardens and tolerates most soils.
8. *Crataegus monogyna* '**Stricta**': Mature height up to 10m with a spread of 3m. Small flowers appear in May followed by fruit and yellow autumn colour. Fairly hardy.
9. *Acer rubrum* '**Scanlon**': Mature height 10–12m and spread approx. 4m. Excellent autumn colour turning shades of purple and orange and will tolerate clay soil

Deciduous/broadleaved trees which are not fastigate but maintain a narrow habit

1. *Acer campestre* '**Street Wise**': Height approx. 12m with a dense closed crown ideal in streets and urban sites. Hardy and tolerates most soils
2. *Pyrus calleryana* '**Chanticleer**': Height 8–12m with a narrow conical to ovoid crown. Profuse flowers in Spring with yellow Autumn colour and leaves held late into the year.
3. *Sorbus aucuparia* '**Joseph Rock**': Small tree up to 9m with an erect, compact crown. Good autumn colour with yellow berries
4. *Malus tschonoskii*: Mature height 8–10m with a pyramidal to ovoid crown. Good on most soils and urban situations with excellent Autumn colour
5. *Tilia cordata* '**Greenspire**': Mature height up to 20m pyramidal to oval/ovoid crown up to 10m. Uniform growing variety with straight stem and suitable on all soils.

Conifers/evergreens with narrow growing habit

1. *Calocedrus decurrens*: Mature height 20–25m with a narrow columnar crown. Does well on all soil types and has good wind resistance
2. *Cryptomeria japonica* '**Cristata**': Mature height of 15m and narrow pyramidal crown up to 5m
3. *Ginkgo biloba*: Height up to 30m with a narrow pyramidal crown which later spreads. Deciduous with striking golden autumn colour, tolerant on all soil and air pollution

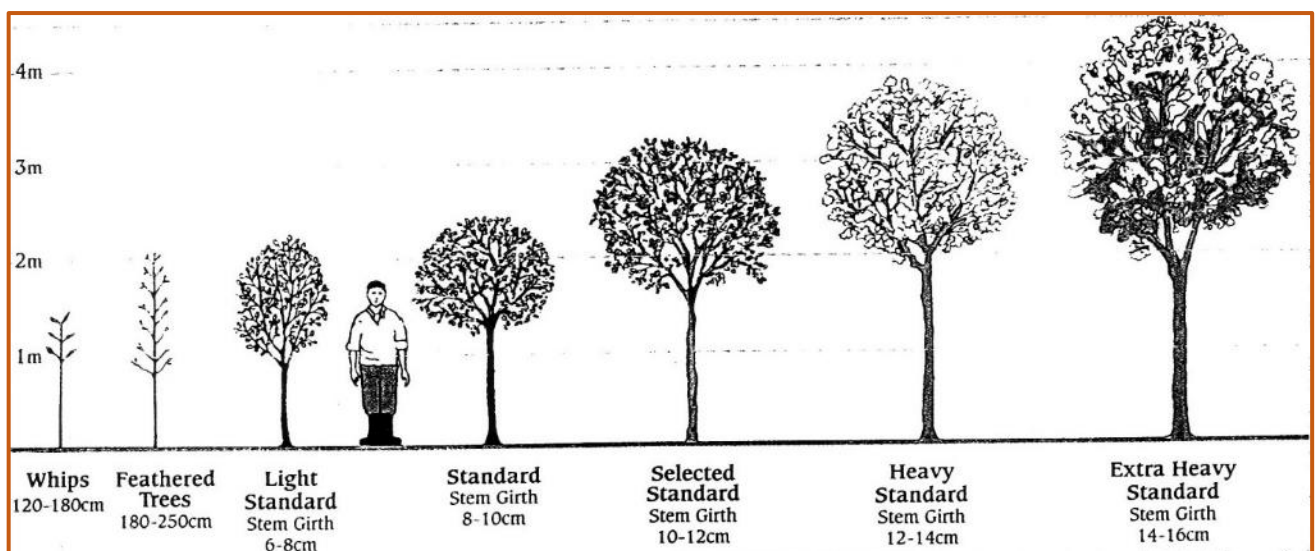
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4. *Cupressus sempervirens*: Medium sized tree with very narrow columnar habit dark green foliage typical of Mediterranean regions.
5. *Metasequoia glyptostroboides*: Mature height up to 30m with a narrow pyramidal crown at first later up to 10m. Robust deciduous conifer tolerant of most sites.
6. *Picea omorika*: Height up to 25m with a slender, straight stem decorative narrow crown to 4m wide.
7. *Taxus baccata* 'Fastigiata': Height 5–10m forming a dense crown some 2m later becoming broader to 5m.
8. *Pinus peuce*: Height 10–20 m vigorous growing narrow pyramidal, vertical tree. Tolerant of all soil.
9. *Chamaecyparis lawsoniana*: Height 40m+ with narrow pyramidal crown. Numerous cultivars fairly hardy and makes an ideal hedge

Appropriate size of tree

New trees – size at planting and other detailed specifications: If instant impact on landscaping is required, the new trees will be as large as possible for the planting space available. The supply, planting and maintenance of all new trees will need to be in accordance with **BS 8545 2014**, with an expectation that any planning conditions will secure the provision of appropriate maintenance and replacement in the event of any trees not surviving to independence in the landscape.

Once you have selected your tree species you need to consider **availability**. Not all species are commercially available in all sizes. The chart below is an illustrative guide to the common sizes of tree stems and heights obtainable from tree nurseries.



All trees are specified as girth size with their 'girth' being measured in centimetres one metre above ground level (i.e. 12-14cm girth).

Root specification is usually referred to as: Bare-root (BR), Root-balled (RB) or Container Grown (CG)

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Semi-mature trees

Semi-mature trees start at 20cm girth and progress in increments of 5cm, e.g. 20-25cm, 25-30cm, etc. Conifers and multi-stemmed trees are generally measured by height in increments of 50cm, e.g. 350-400cm and supplied as a feathered or bush form. When conifers are specified by girth size, this indicates a clear stem is required.

The following pictures indicate the size of tree to expect for your specification.

Oak example



14-16cm



18-20cm



25-30cm



40-45cm

Planting trees and aftercare

Treat your trees with care

- Don't allow the trees to be thrown around on site
- Store trees out of drying winds and under shade to protect against freezing or over heating

Give your trees the best start..

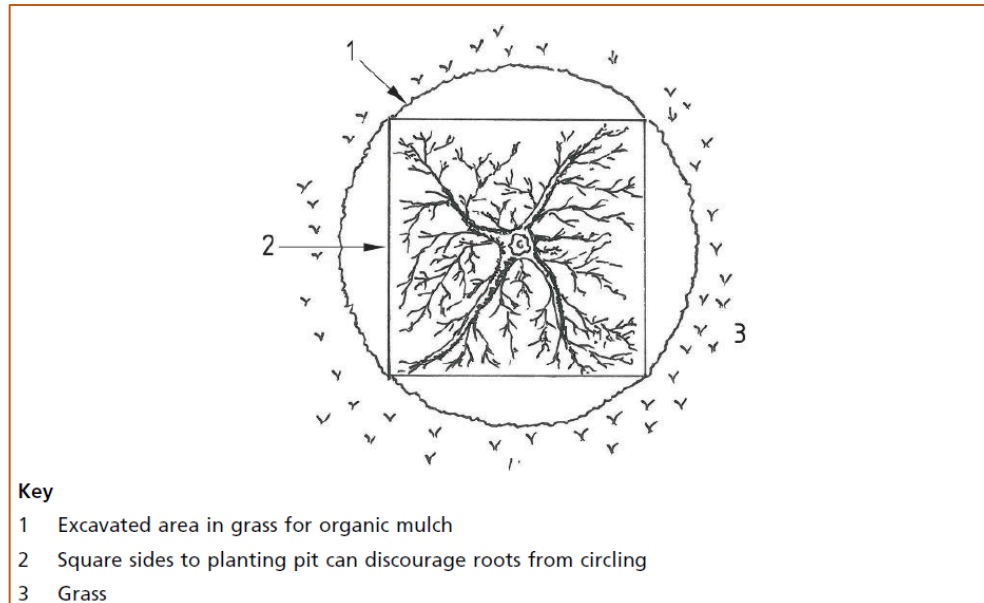
- Plant trees when soils are moist and free from frost, the traditional tree planting period is November through to March, however containerised trees can be planted at any time of year.
- Cultivated soils will generally provide a better medium for root development and plant growth.
- Dig the planting pit to the correct depth – we recommend a planting pit no deeper than the container, unless you have specific issues with drainage throughout your site. In this case, further advice should be sought from the nursery providing the stock.
- The planting pit is dependant on the site conditions, so any constraints to root development will need to be considered on a site-to-site basis. Simple tree pit design is a good starting point with modifications made depending on localised site constraints. The following extracts are taken from **BS 8545 2014**



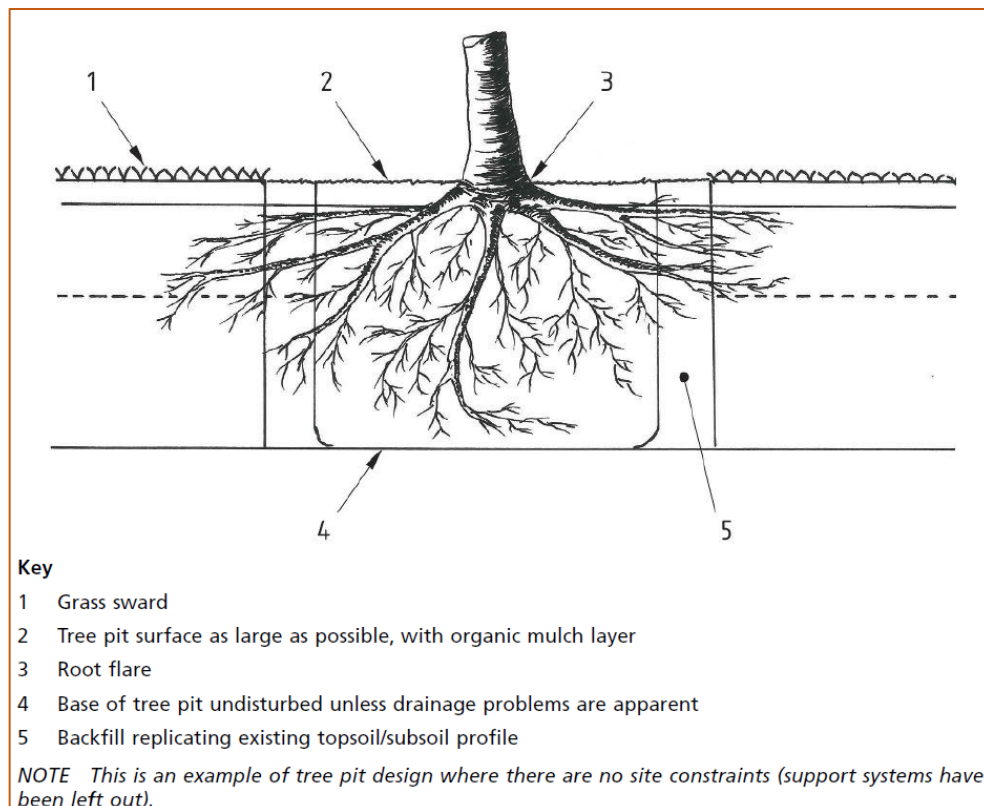
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and could be used to inform the landscape architects or contractors when designing planting pits for varying occasions. None of these are to scale and they are intended only to illustrate varying complexities of tree pit design where modifications to a standard tree pit can be made.

Tree pit design where square sides are recommended to minimise root girdling

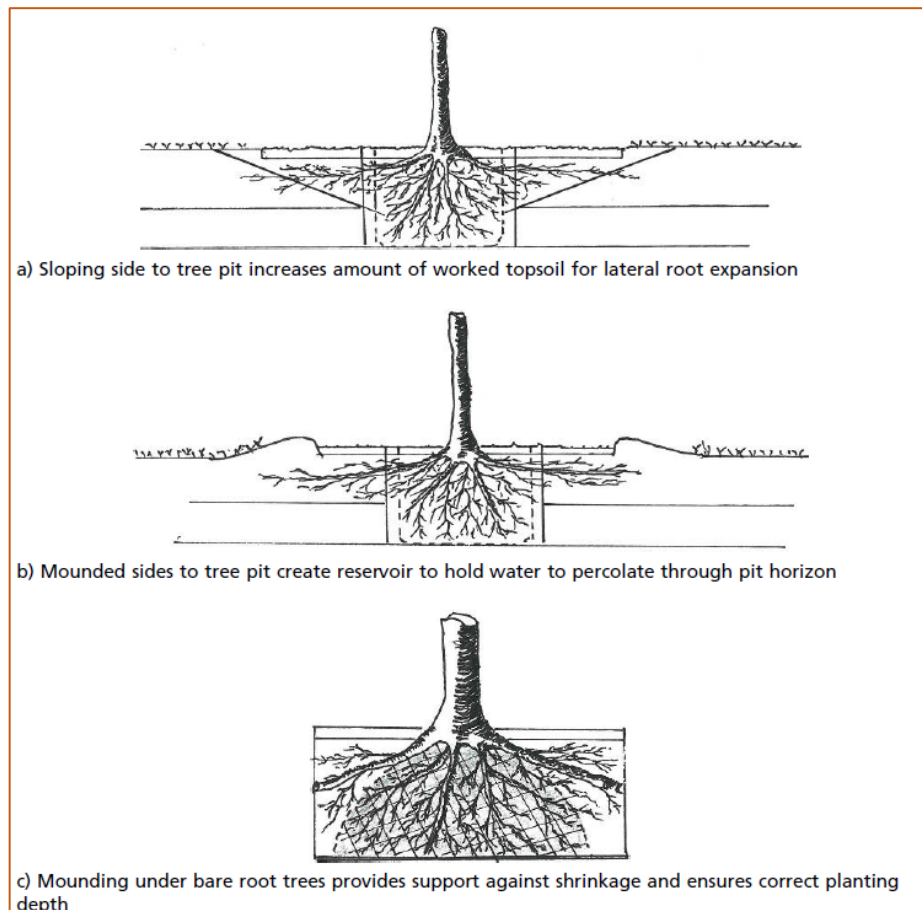


Tree pit design for planting in grass

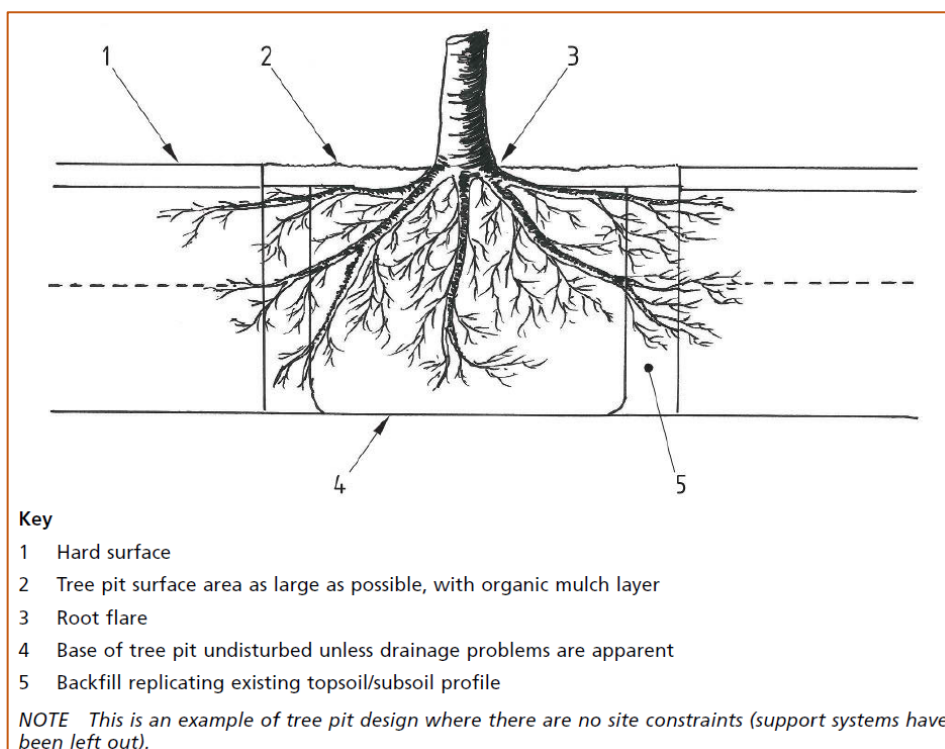


Tree pit design where planting constraints are minimal

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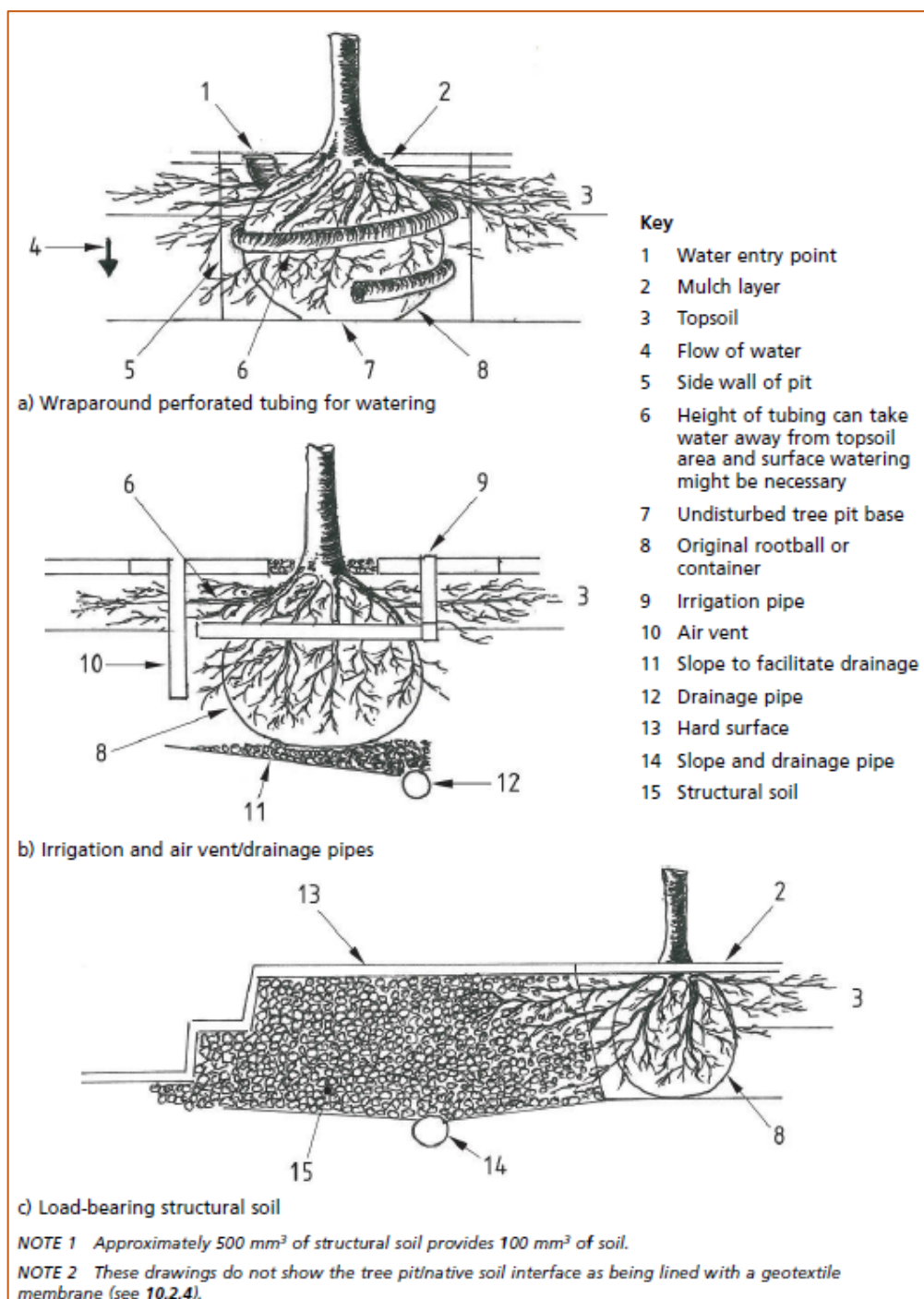


Tree pit design for planting in hard surfaces



Tree pit design where planting constraints require design modifications

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Weeds are your trees worst enemies!

- Weeds compete for water and nutrients in the rooting zone of young plants, restricting their growth.
- Tall weeds, especially bracken, can collapse and smother young trees.
- If using chemicals to weed young trees remember to protect the trees from spray drift.
- Maintain a 1 metre diameter weed free spot around the tree, we recommend using bark mulch to help with this in soft landscape situations.

Watering is key

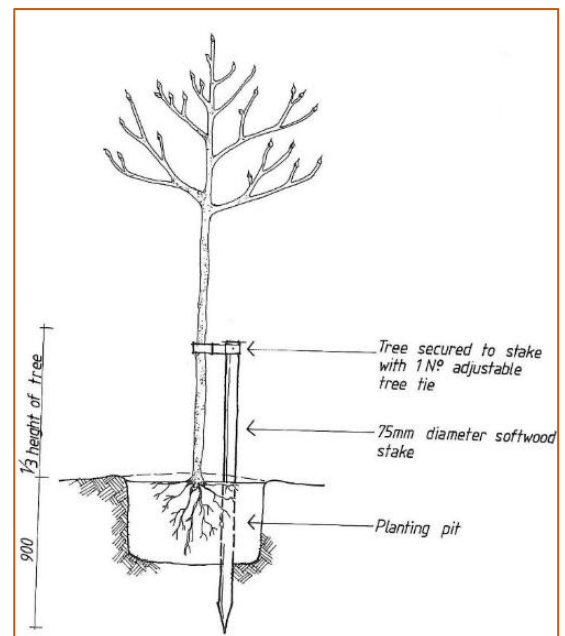
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- The best thing you can do for a tree is give it the best start by planting it correctly, however it is equally essential that once planted you follow up with an aftercare programme.
- The key to any aftercare programme is watering.
- Regular watering should be commenced early in the year when the weather becomes drier and the tree starts to come into leaf and continue until leaf fall in the autumn.
- It is difficult to determine the exact amount to water trees, as this will vary depend upon the site and weather conditions specific to where the tree is planted.
- Thus, sadly it is important to use some common sense in this area and monitor the conditions and act accordingly.
- Newly planted trees should be watered at least 2-3 times a week in the summertime, with at least a full watering can of water.
- Applying water from the top of the planting pit, i.e. using a watering can and rose, is advisable as this allows the water to percolate through the soil slowly and enables the tree to make the most of it.

Staking and tying trees

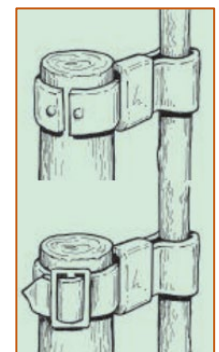
Staking: Recommendations for staking trees have changed in recent years. Tying a tree just below the start of the crown using a tall stake is not now recommended. This is because the stem cannot sway, so little increase in stem diameter occurs from crown to base. Swaying in the wind stimulates growth of stem diameter.

With no stake, the whole tree sways, stimulating maximum diameter growth near the root collar (i.e. the transition from stem to root). Where support is necessary (normally if the tree is more than 1.5m [5ft] tall), stake the tree sufficiently to anchor the rootball in the ground, but allow the stem to sway in the wind. For large trees, two-thirds of the stake should be below ground. It needs to be driven into the base of the pit to make it stable.



Using a single stake Position the stake first, on the side of the tree facing towards the prevailing wind, to reduce chafing in storms. Position the tree 25 to 50mm (1 to 2in) from the stake.

Tying: Attaching tree ties with pads Fix the pad 25mm (1in) from the top of the stake. Thread the belt through and either fasten the buckle or tack as shown to allow adjustment as the tree grows. The right size of pad is important. If it is too small it can split as the tree grows. The belt should form a loop and not be drawn in tightly by the pad. No stake should extend higher than a third of the height of the stem. Use a single flexible tie, to allow movement. A pad between the stake and the tree is always necessary. If trees are well tended, roots should have grown enough to anchor them two years after planting, when stakes should be removed.



Sometimes it is best simply to cut off the stake at soil level, being careful not to damage the bark. This will avoid disturbing the roots.

