

Mr H Sanghera
8 Lakewood Road
Chandlers Ford
SO53 1ES

14 February 2023
Our Ref: WT 092-22 AIA

Dear Mr Sanghera

Re: Tree information relating to planning application at 8 Lakewood Road, Chandlers Ford, SO53 1ES

Further to your request regarding tree protection and management issues for the above site. I have recently visited the site, assessed the situation, and considered it would be satisfactory to provide these details by way of this letter with an attached plan and illustrative notes. In this respect, I enclose plan WTP1, which is an adapted version of the plan provided by Enzo Design, (8 Lakewood Road – Existing and Proposed). It has been annotated to identify all the relevant trees and show the areas where special precautions close to trees may apply. This plan is illustrative, and the precise location of protective measures may need to be modified in the context of the site conditions at the time of implementation.

Protected trees: After contacting the local planning authority (LPA) it was established that several individual trees and groups are covered by TPO references 294-E and 58-H. Therefore, it will be necessary to consult with the LPA before any works other than certain exemptions can be carried out (Image 1).

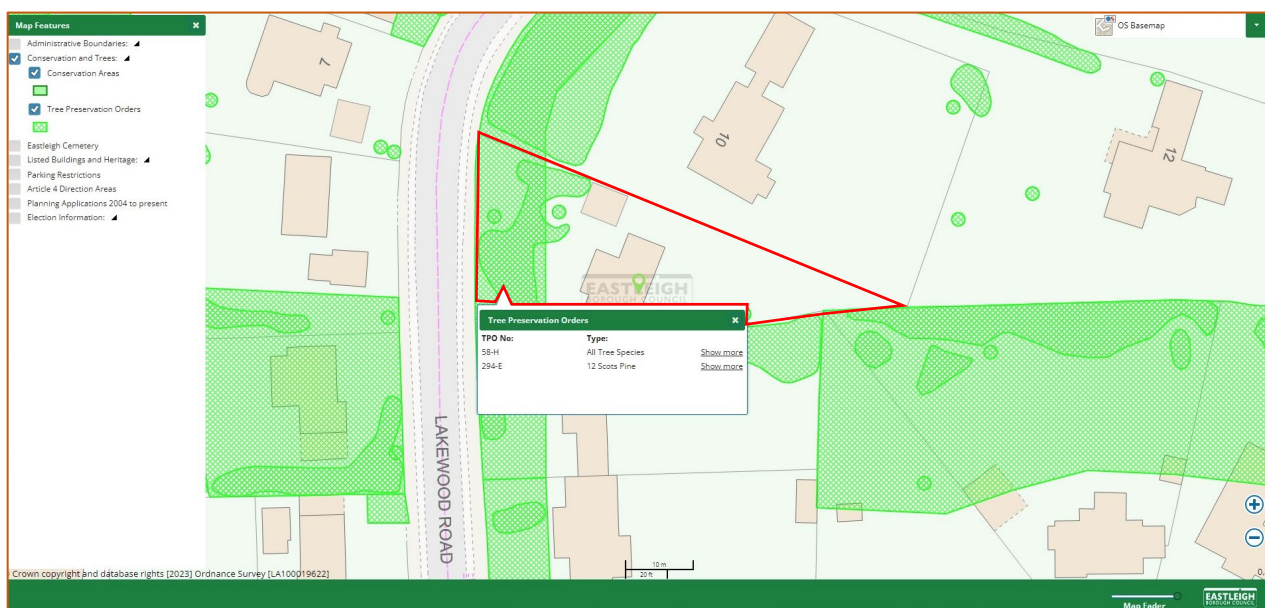


Image 1: The property (indicated by the red boundary outline) is surrounded by TPOs on the frontage



I inspected each tree and have indicated the numbering on the tree protection plan (WTP1) in Appendix 1. For each tree, 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. I stress that my inspection was of a preliminary nature and did not involve any climbing or detailed investigation beyond what was visible from accessible points at ground level.

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.

Site visit and discussions: During our meeting, we discussed the construction methods for the new driveway arrangement and carport that will be within the Root Protection Areas (RPAs) of several trees on and adjacent to your property. To implement the proposed works, you advised me that the soil levels will not need to be significantly reduced around the trees, and as far as you are aware, all proposed changes can be done without necessary conflict to the existing damp course levels around the house. In this context, I believe it is feasible to undertake the proposed works without causing significant harm to the surrounding trees. However, this will need to be done with special precautions and under strict arboricultural supervision.

More specifically, I have considered the following relevant tree issues relating to the planning proposal, and where appropriate, provided necessary mitigation options to minimise harm to their health and amenity value:

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 needed to facilitate the proposal, this can be easily achieved without harming the health or appearance of nearby trees. 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.

Gaining access and working space around trees: Where existing surfacing is proposed to be retained, this can be utilised for ground protection over the RPAs initially. Further temporary protective fencing should also be erected around retained trees to ensure that there is no construction works close to the trunks as set out on WTP1 (Image 2).



Image 2: The existing surface will be utilised as ground protection and upgraded carefully (yellow arrow). The trunk of T005 and the trees along the front boundary will need to be protected from construction traffic moving in and out of site (as illustrated by blue the annotations)

Proposed carport: The footprint of the proposed carport encroaches into the root protection areas of several moderate and high category trees (T005, T008, T009, T010 and T011). In the case of T005, T008, T010 and T011 these minor encroachments are less than 20% of their overall RPAs so these changes are unlikely to adversely impact on their health or stability. In regard to T009, this tree is close to the edge of the structure so special care and supervision will be required to minimise harm to it (Image 3). As an extra precaution, the building will need to be constructed without the need for excavation, so a pile and beam type construction should be suitable. This will need to comply with the recommendations set out in BS5837:2012 relating to minor structures (clause 7.5.3, p.27) and the guidance provided in Appendix 3 of this report.

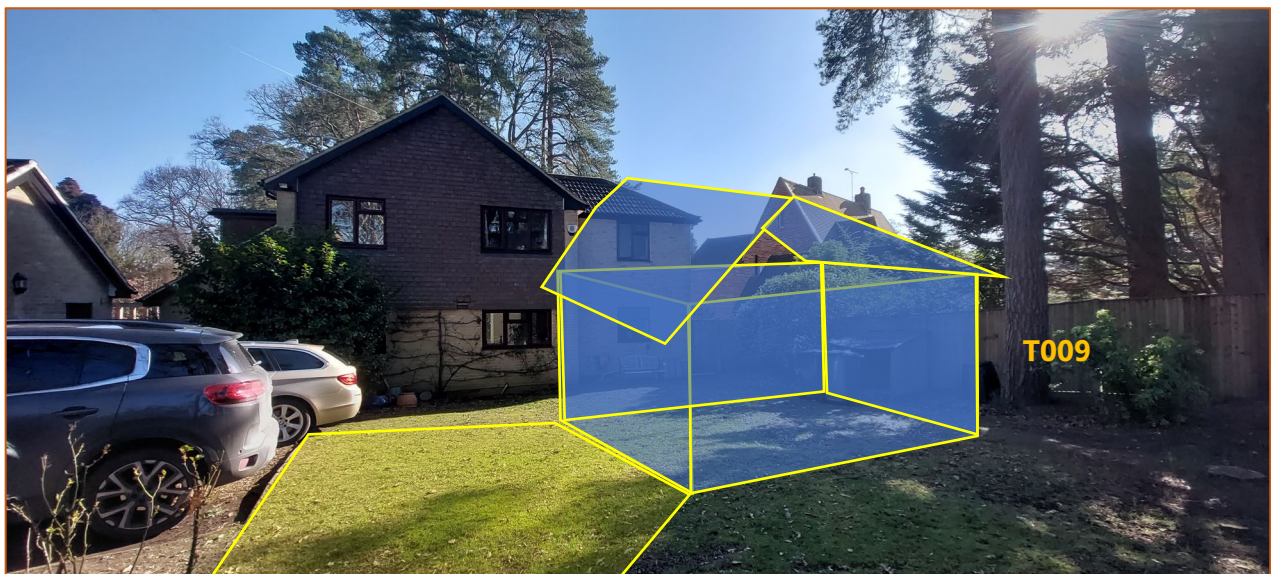


Image 3: Illustration of carport position (not to scale), showing approximate position of structure to T009



Installation of new surfaces: Additional surfacing is required over the RPAs of one high category tree (T005) and two moderate category trees (T006 and T008) so there is potential for harm if precautions are not taken. However, I have looked at the levels on site, and in principle, I believe it should be feasible to match the current surface levels with proposed new ones without the need for significant excavation or soil level build up (Image 4). Provided the works are done by installing a new permeable and load spreading Cellular confinement system in line with the recommendations in BS5837:2012, and the guidance provided in Appendix 3 of this report relating to permanent hard surfacing, I believe the impact on trees can be kept to a minimum.



Image 4: The area of yellow annotation illustrates the approximate area of new surfacing required over the RPAs of trees T005, T006 and T008. The blue annotation represents the proposed location of a temporary protective fence.

Post construction pressures on trees: The location and character of the proposed carport has been achieved in consideration of all the site factors, including the presence of trees. The structure will not have permanent occupation, and the roof will provide added protection for cars which will help improve the current situation with regards to canopy overhang and potential debris fall concerns. Trees and vegetation will continue to provide useful screening between the road and the house, and it will be in the interests of the property owners to retain the boundary trees and any new planting to retain seclusion and privacy. In this context, the changes are unlikely to bring new pressures on trees, and where formal TPO protection measures apply, the LPA will be able to resist unreasonable applications for tree work, with such decisions likely to be supported at appeal.

Storage and movement of materials: Materials can be delivered to site using the existing vehicular access and stored on the existing surfaced drive. 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.

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, we advise that these matters are considered at an early stage and agreed with the LPA prior to the work commencing.



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.

I believe that this covers all the appropriate issues but please call me if there is anything else that you think should be included.

Yours sincerely

Mark Wadey ND Arb CUEW MArborA RCarborA MICFor
Arboricultural Consultant



 Institute of
Chartered Foresters
Registered Consultant

Appendices:

1. Tree Protection Plan WTP1
2. Data Collection
3. Arboricultural Method Statement

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

Content: 1 A2 plan @ scale 1:250

Technical drawing of a standard gate structure. The drawing shows a side view of a gate with a height of 12 m and a width of 23 m. The gate is composed of several horizontal panels (3) supported by vertical poles (1). The gate is attached to a frame (2) and is shown in a partially open position. The drawing includes dimensions for the height (12 m), width (23 m), and the height of the frame (2.6 m). A legend on the right side of the drawing identifies the components:

- 1. Standard poles
- 2. Heavy galvanized welded panels
- 3. Panels
- 4. Uprights
- 5. Ground
- 6. Uprights
- 7. Ground
- 8. Uprights
- 9. Ground
- 10. Uprights
- 11. Ground
- 12. Uprights
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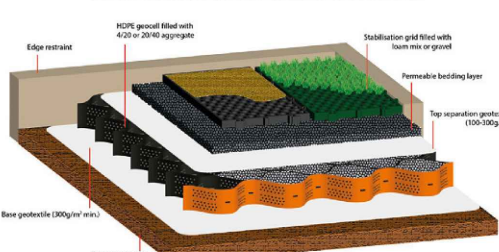
A photograph of a garden area. In the foreground, there is a pile of wooden planks and a blue skip. A metal fence runs across the middle ground, with a large tree behind it. In the background, there are houses and a building with a yellow roof.

Image 1: Scaffold and Heras panels can provide standard protection that is fit for purpose.

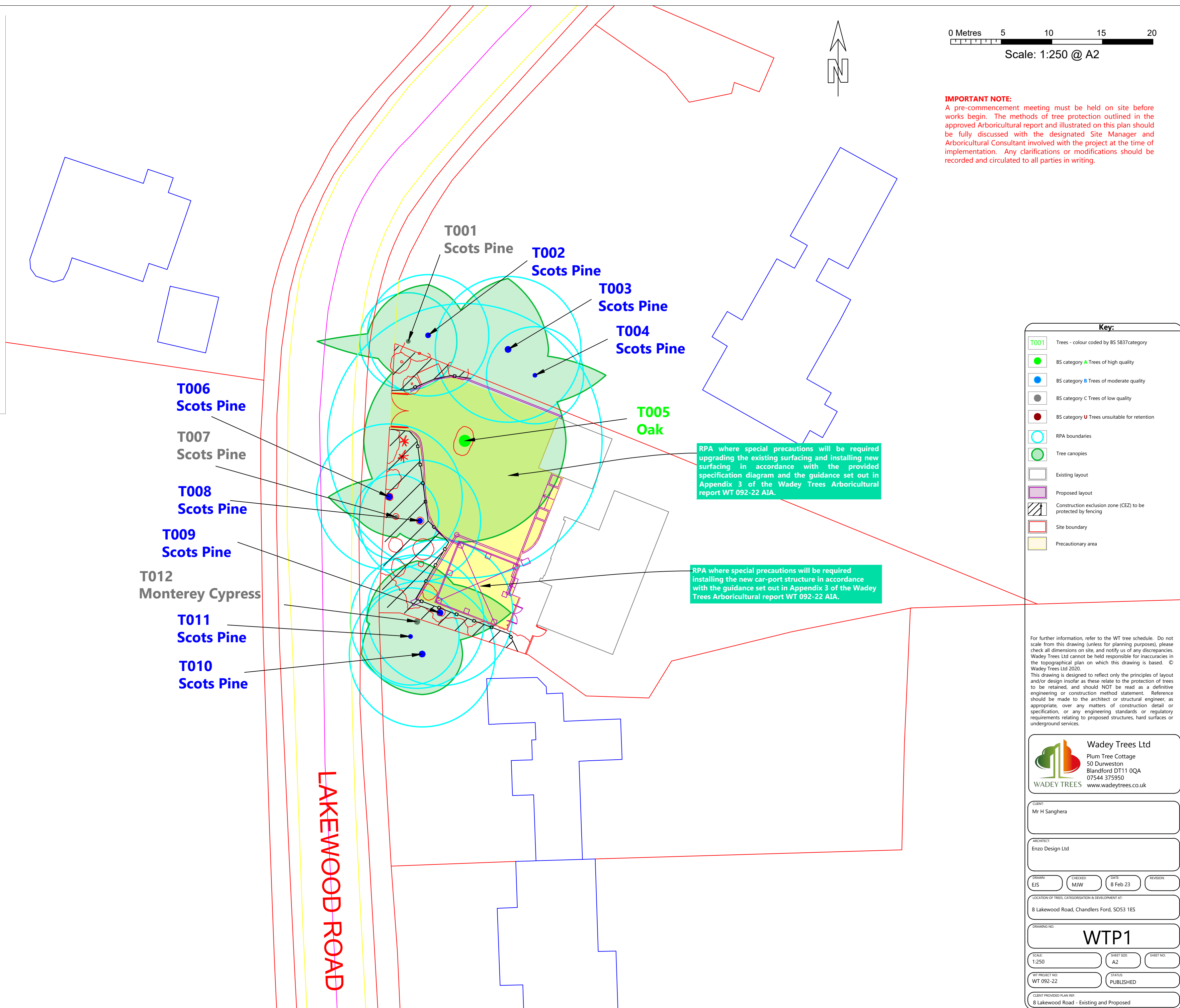
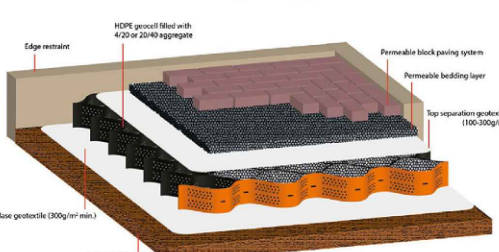
Key Recommendations

- The use of cellular confinement systems can be effective in protecting soils and tree root systems when new hard surfacing is required near trees. However, in this context the installation of geocell sub-bases inevitably involves working on top of tree root systems and as such there may be an elevated risk of damaging tree roots and the structure of the tree. Therefore, careful working procedures are required to ensure that trees are *irrevocably protected* when the installation works are carried out.
- The installation of cellular confinement systems should be directed by a project-specific architectural method statement. The architectural method statement should include the design and construction aspect of the project that has the potential to adversely impact adjacent trees and detail appropriate methodologies for how the works will be undertaken in ways that would minimise those impacts.
- Tree roots can be directly damaged as the ground is levelled in advance of laying down a cellular confinement system and so it is recommended that this part of the process is carried out under arboricultural supervision. The use of a tracked excavator within a tree's root protection area should only be permitted if it is supervised by a suitably qualified arboriculturist.
- The cellular confinement system must be filled with clean granular soil that contains no fine material. To protect the geocell membrane it is advised that geocells are overlaid by a minimum of 25mm in order to function effectively it is crucial that all of the cells are fully expanded and filled to capacity. Therefore, there is insufficient space for a cell to be expanded it should be cut away and discarded.
- When cellular confinement systems are installed within tree root zones it is important that the weaving course is permeable so that air and water can reach the soil beneath. Systems should be put in place to ensure that the surfacing is regularly cleaned so that it maintains its porosity.
- The means to successfully prevent ground compaction during construction need to be planned from the conceptual stages of a building project. The project architect should be consulted at the earliest opportunity to ensure that other solutions the ground may need to be protected until it is time to install the cellular confinement system. Therefore, the project arboriculturist needs to work with the architect, the engineer, and the building contractor during the planning stages as well as during the construction of the surface. Examples of low-impact construction practices are available from the Arboricultural Association guide to good practice booklet. The use of cellular confinement systems near trees (*Images courtesy of Core Ltd*)

STABILISATION GRID WEARING COURSE FILLED WITH SOIL OR GRAVEL



PERMEABLE BLOCK PAVING WEARING COURSE



IMPORTANT NOTE:
A pre-commencement meeting must be held on site before works begin. The methods of tree protection outlined in the approved Arboricultural report and illustrated on this plan should be fully discussed with the designated Site Manager and Arboricultural Consultant involved with the project at the time of implementation. Any clarifications or modifications should be recorded and circulated to all parties in writing.

Key:	
	Trees - colour coded by BS 5837 category
	BS category A Trees of high quality
	BS category B Trees of moderate quality
	BS category C Trees of low quality
	BS category U Trees unsuitable for retention
	RPA boundaries
	Tree canopies
	Existing layout
	Proposed layout
	Construction exclusion zone (CEZ) to be protected by fencing
	Site boundary
	Precautionary area

For further information, refer to the WT tree schedule. Do not scale from this drawing (unless for planning purposes), please check all dimensions on site, and notify us of any discrepancies. Wadey Trees Ltd cannot be held responsible for inaccuracies in the topographical plan on which this drawing is based. © Wadey Trees Ltd 2020.

This drawing is designed to reflect only the principles of layout and/or design insofar as these relate to the protection of trees to be retained, and should NOT be read as a definitive engineering or construction method statement. References should be made to an architect or structural engineer, or other appropriate body, over any matters of construction detail or specification, or any engineering standards or regulatory requirements relating to proposed structures, hard surfaces, or underground services.



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CLIENT:
Mr H Sanghera

ARCHITECT:
Enzo Design Ltd

DRAWN: EJS	CHECKED: MJW	DATE: 8 Feb 23	REVISION:
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8 Lakewood Road, Chandlers Ford, SO53 1ES

DRAWING NO:

WTP1

SCALE:

1:250

SHEET 52

A2

WE PROTECT A

WT 092-2

STATUS:

STATUS
 PUBLIC

CLIENT PROVIDED PLAN RE

8 Lakewood Road - Existing and Proposed

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	Scots Pine (<i>Pinus sylvestris</i>)	14	400	N:1 E:1 S:2 W:9	Good	Fair	Early Mature	Competes with adjacent trees. Heavy biased lean over road. Woodpecker holes at 8m.	20+ Years	C1,2	Radius: 4.8m. Area: 72 sq m.	
T002	Scots Pine (<i>Pinus sylvestris</i>)	15	500	N:5 E:4 S:5 W:6	Good	Good	Mature		30+ Years	B1,2	Radius: 6.0m. Area: 113 sq m.	
T003	Scots Pine (<i>Pinus sylvestris</i>)	18	600	N:7 E:4 S:4 W:6	Good	Good	Mature		30+ Years	B1,2	Radius: 7.2m. Area: 163 sq m.	
T004	Scots Pine (<i>Pinus sylvestris</i>)	12	400	N:2 E:7 S:3 W:1	Good	Fair	Early Mature	Suppressed by adjacent trees. Biased lean to east.	20+ Years	B1,2	Radius: 4.8m. Area: 72 sq m.	
T005	Oak (<i>Quercus sp.</i>)	25	1130	N:10 E:10 S:10 W:10	Good	Good	Mature	Some minor deadwood present.	30+ Years	A1,2	Radius: 13.6m. Area: 581 sq m.	
T006	Scots Pine (<i>Pinus sylvestris</i>)	14	600	N:2 E:1 S:3 W:6	Good	Fair	Mature	Competes with adjacent trees. Biased lean over the road.	20+ Years	B1,2	Radius: 7.2m. Area: 163 sq m.	
T007	Scots Pine (<i>Pinus sylvestris</i>)	10	350	N:2 E:1 S:2 W:4	Good	Fair	Mature	Competes with adjacent trees. Biased lean over the road.	20+ Years	C1,2	Radius: 4.2m. Area: 55 sq m.	

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
T008	Scots Pine (<i>Pinus sylvestris</i>)	14	500	N:3 E:3 S:2 W:3	Good	Fair	Mature	Competes with adjacent trees. Large low dead branch on northern side.	20+ Years	B1,2	Radius: 6.0m. Area: 113 sq m.	
T009	Scots Pine (<i>Pinus sylvestris</i>)	12	600	N:3 E:7 S:3 W:1	Good	Fair	Early Mature	Suppressed by adjacent trees. Biased lean to east.	20+ Years	B1,2	Radius: 7.2m. Area: 163 sq m.	
T010	Scots Pine (<i>Pinus sylvestris</i>)	18	600	N:7 E:4 S:4 W:6	Good	Good	Mature		30+ Years	B1,2	Radius: 7.2m. Area: 163 sq m.	
T011	Scots Pine (<i>Pinus sylvestris</i>)	14	400	N:3 E:3 S:2 W:3	Good	Fair	Mature	Competes with adjacent trees. Large low dead branch on northern side.	20+ Years	B1,2	Radius: 4.8m. Area: 72 sq m.	
T012	Monterey Cypress (<i>Cupressus macrocarpa</i>)	15	550	N:6 E:5 S:2 W:5	Fair	Fair	Mature		20+ Years	C1,2	Radius: 6.6m. Area: 137 sq m.	

Appendix 2 Data Collection Cont'd: Explanatory notes

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 3.

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

Stem diameter: Stem 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.
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.

Appendix 2 Data Collection Cont'd: Explanatory notes

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 summarised at the beginning of this report.

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: Our 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 our 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 proposed development at 8 Lakewood Road, Chandlers Ford, SO53 1ES.
- 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 always kept on site 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 arboriculturist 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 project arboriculturist 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 (see section 4.2 below).
 - 2.3 **Phase 2 (special precautions during construction):** All the retained trees will be protected from damage using barriers (fencing and ground protection). 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 **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.

Appendix 3 – Arboricultural Method Statement

- 3.2 **Tree protective guidance notes:** 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.
- 3.3 **Removal/reinstatement of existing hard surfaces:** Machinery operating on existing surfaces or outside the RPAs and tree canopies could, under arboricultural supervision, be used to carefully remove existing wearing surfaces, however hand tools are preferable and should be used if possible. The subbase of existing surfaces or foundations should be left in situ where possible to avoid unnecessary root disturbance and provide a base for new surfacing (refer to the relevant sections in the tree protection guidance notes below).
- 3.4 **New surfacing:** New surfacing is proposed within RPAs of trees T005, T006 and T008 and may cause harm if not carried out with care. However, I have reviewed the situation carefully and my experience is that the principles of no-dig construction can apply to this situation if appropriate protective measures are properly specified and controlled through proper supervision. 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.
- 3.5 **Structures within RPAs:** Any work in the RPAs of T008, T009, T010, T011 must be done with care. The new car-port will be constructed on a pile and beam foundation raised above ground level, without the need for excavation into soil levels below a depth of 100mm. The design principles of such foundations are set out within the BS5837:2012 recommendations in relation to minor structures (clause 7.5.3, p.27) and the tree protection guidance notes below.
- 3.6 **Storage areas outside the RPA:** Before construction begins on site, it is important to identify the exact areas outside the RPA that minimise chemical pollution and damage from construction materials. Materials can be moved around the site by hand or using small low ground-effect plant, to minimise harm to trees. 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.
- 3.7 **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.
- 3.8 **Landscaping:** No heavy machinery should be driven over unprotected ground and materials must be stored outside RPAs. The tree protective fencing can only be removed with the agreement of the project arboriculturist and may have to be reinstalled during a break in operations. Any soil removal or replacement, excavations for hard landscaping or installation of any structures including lighting, water, electric gates etc must be approved by the project arboriculturist. Unwanted vegetation can be removed using handheld tools to avoid damage to the stems of retained trees. Planting holes for new trees or shrubs shall be dug by hand and will be repositioned if woody roots are encountered. For further advice, refer to the tree protection guidance notes below.

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4. Summary of 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:

- All tree protection details set out on the approved tree protection plan should be agreed at the pre-commencement meeting and recorded by the project arboriculturist for all parties to consider.
- Protective barriers must be regarded as sacrosanct and must only be moved under direct supervision of the LPA or project 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.
- All construction machinery engaged in site clearance work should work from outside the RPAs.
- Before works begin on site, it will be important to identify areas for storage of materials without harming trees.
- Damage caused to protective fencing must be reported to the site supervisor and the project arboriculturist to ensure appropriate repair.
- Any damage to retained trees must be reported without delay to the site supervisor, the LPA and the project 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.

4.2 **Site monitoring checklist:** The following site monitoring checklist should be used for all pre-commencement and site supervision visits. After each visit, it should be circulated to all relevant parties and kept as a record to demonstrate that all site operations have been compliant with the approved tree protection requirements, and to satisfy the discharge of planning conditions.

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Pre-commencement checklist/supervision visits			
Site address		Date	
		Planning reference	
PRESENT		REPRESENTING	
Pre-commencement	Compliant Y/N	Action (If appropriate refer to additional notes)	
Acceptable demolition/site clearance works			
Tree works undertaken/additional requirements			
Method statement/tree protection plan available on site			
Suitable locations for welfare and material storage etc			
Suitable space available for vehicle access etc			
Services/soakaway locations agreed			
Tree protection/precautions	Compliant Y/N	Action (If appropriate refer to additional notes)	
Protective fencing			
Ground protection			
Temporary surfacing			
New surfacing/reinstatement of existing			
Structures in RPAs			
Excavations/level changes in RPAs			
Soft/hard landscaping			
Soil amelioration requirements			

Outcome of meeting	Y/N	Action (If appropriate refer to additional notes)
Can the development lawfully start/continue?		
Are changes required on site to comply with approved tree protection plan?		

Date: / /	Name	Signature	Position

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Additional notes	Agreed actions

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.

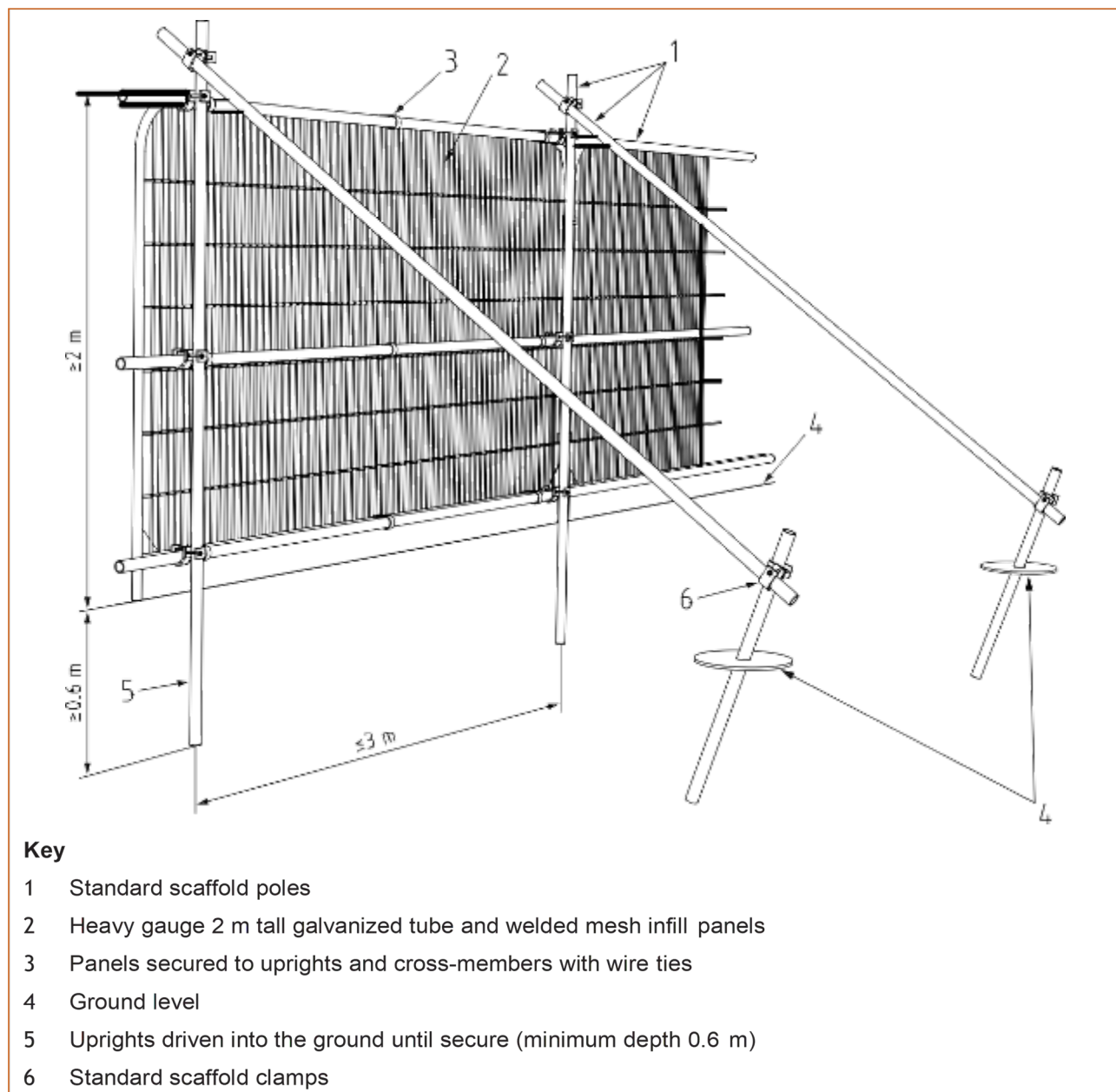
This advice should always be read in conjunction with the tree protection plan (TPP) illustrating the areas where specific precautions are necessary. Each area where precautions are required is annotated on the plans as identified on their keys. All plans are illustrative and intended to be interpreted 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

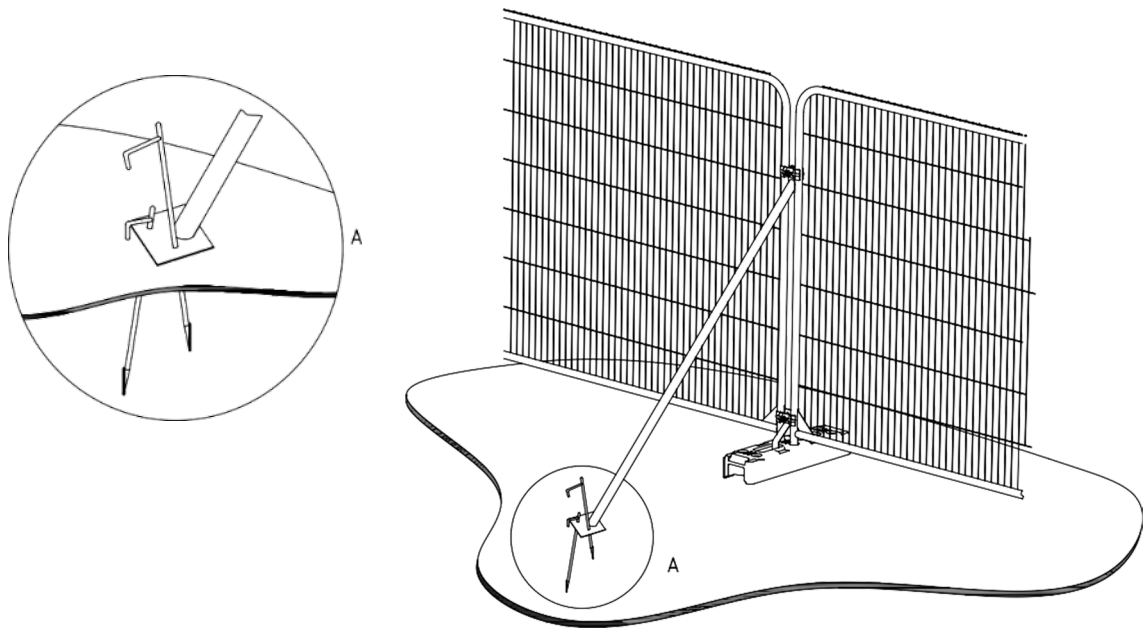
Installing Barriers: Tree Protective barriers must be fit for purpose, and once installed must not be moved without written consent from the Local Planning Authority (LPA). If it is absolutely necessary for any adjustments, they should be under direct supervision of the project Arboriculturist to maintain 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.



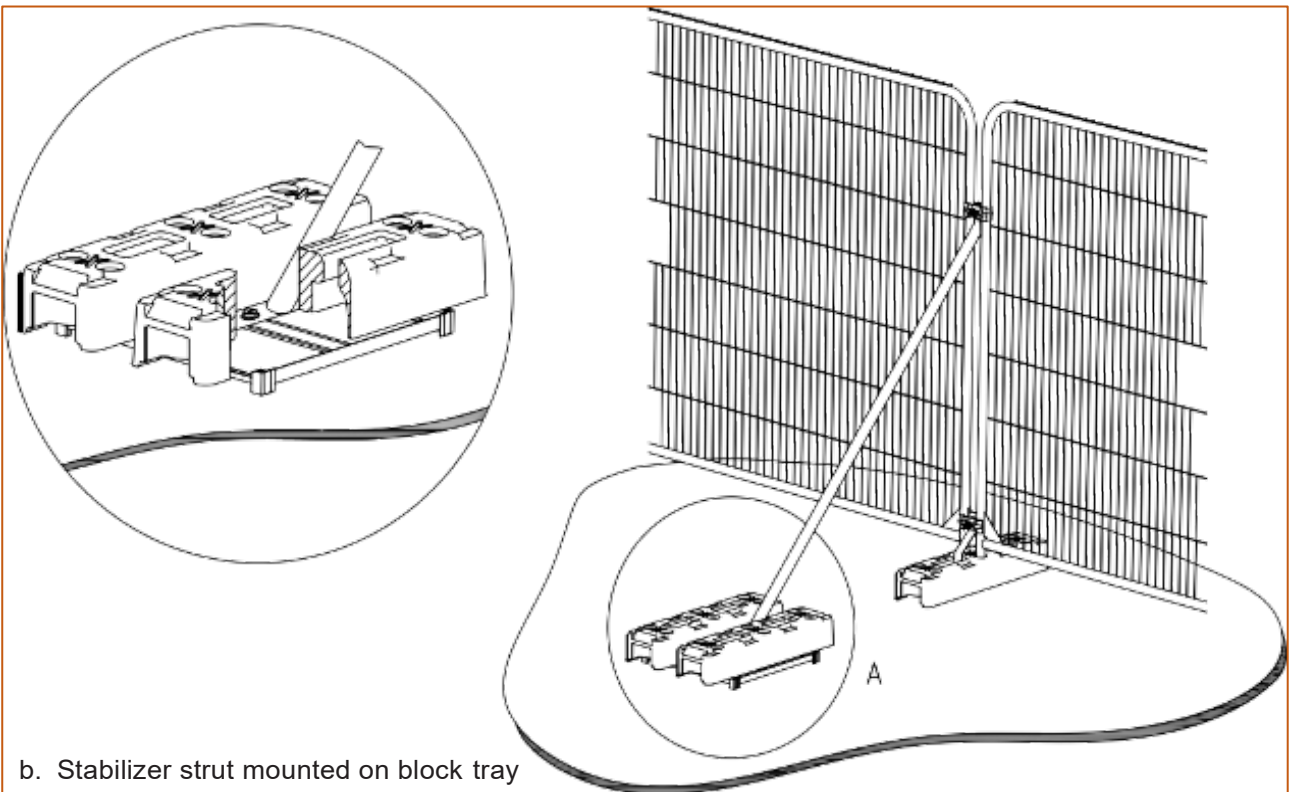
Extract from BS5837: 2012 Figure 3: Examples of above-ground stabilizing systems

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Examples of tailored protective barriers: A range of methods can be used to protect the trunks and underlying soil bit 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.



a. Stabilizer strut with base plate secured with ground pins



b. Stabilizer strut mounted on block tray

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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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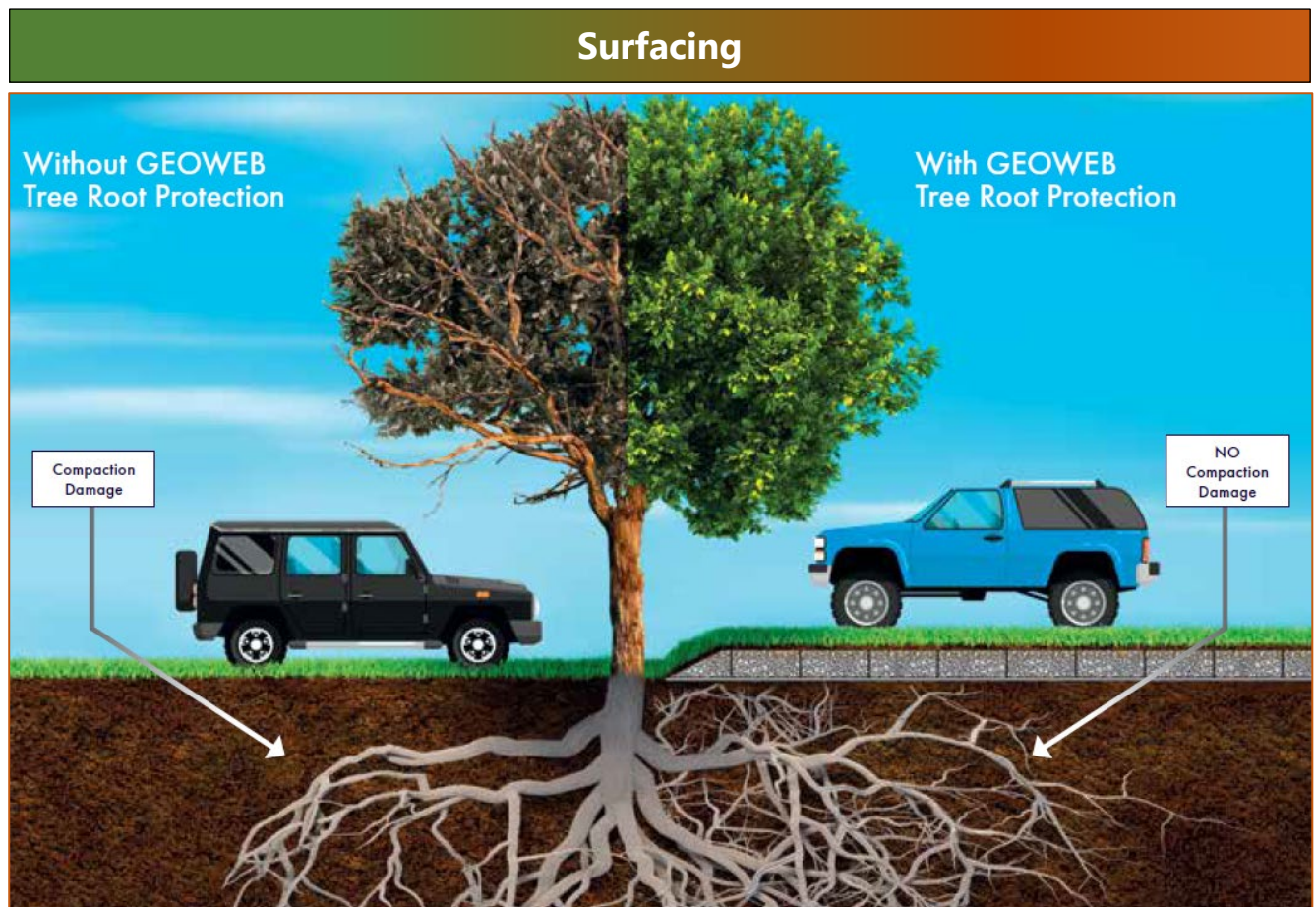


Pictures 4 & 5: Wooden boards carefully secured around the trunks can provide good protection where access is limited.



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

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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.

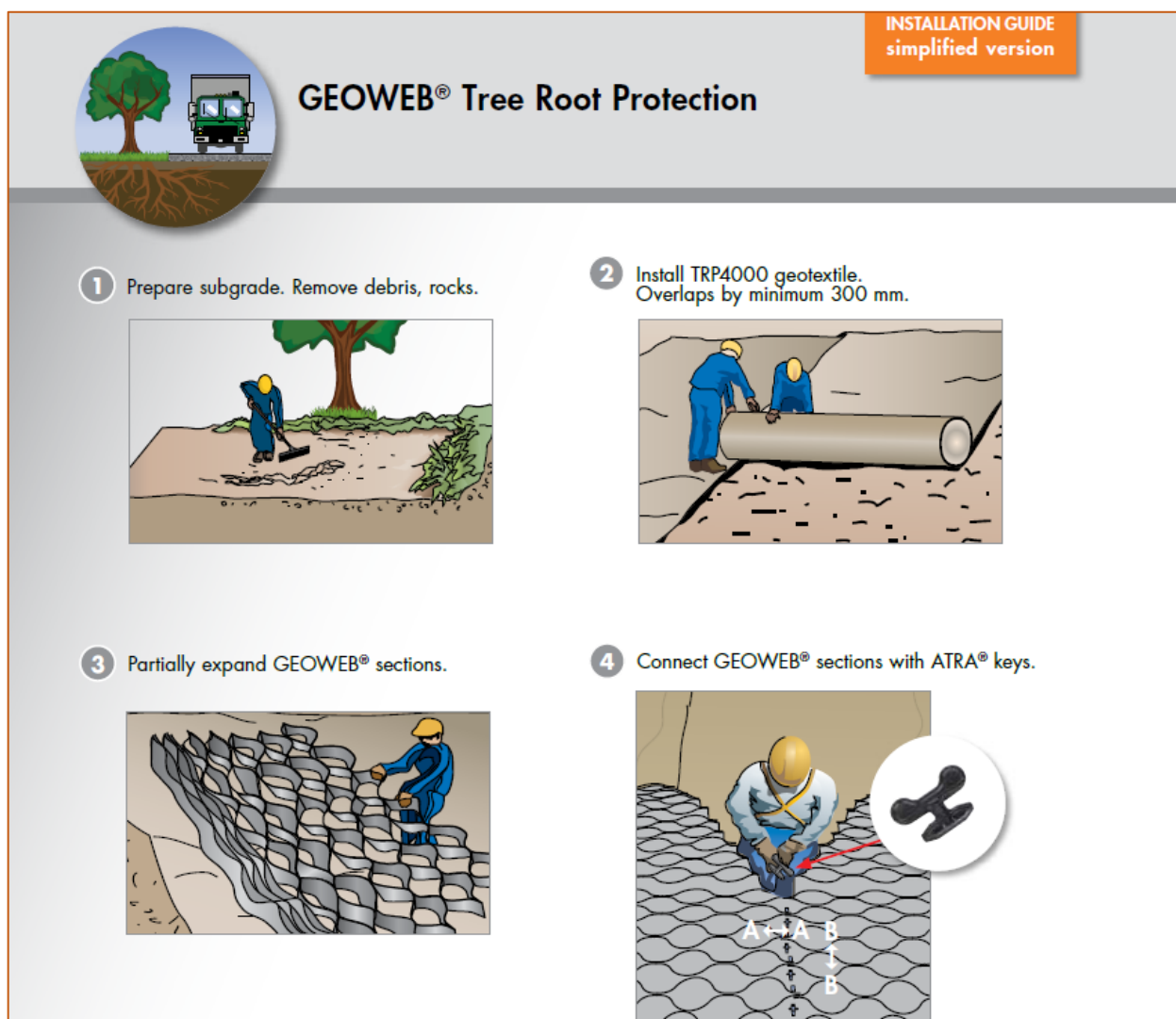
Key recommendations

- 1) Due to the potential risk of harm to trees and their roots, careful working procedures are required to ensure that trees are suitably protected when the installation works are carried out.
- 2) The installation of cellular confinement systems should be directed by a project-specific arboricultural method statement which should list any aspect of the proposed construction that could harm adjacent trees and detail any appropriate mitigation.
- 3) Tree roots can be directly damaged as the ground is levelled in advance of laying down a cellular confinement system and so it is recommended that this part of the process is carried out using hand tools under arboricultural supervision. The use of a tracked excavator within a tree's root protection area should only be permitted if it is supervised by a suitably qualified arboriculturist.

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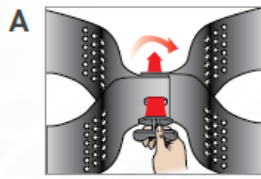
- 4) The cellular confinement system must be filled with clean angular stone that contains no fine material. To protect the geocell membrane it is advised that geocells are overfilled by a minimum of 25mm. In order to function effectively it is crucial that all of the cells are fully expanded and filled to capacity. Therefore, if there is insufficient space for a cell to be expanded it should be cut away and discarded.
- 5) When cellular confinement systems are installed within tree root zones it is important that the wearing course is permeable so that air and water can reach the soil beneath. Systems should be put in place to ensure that the surface is regularly cleaned so that it maintains its porosity.
- 6) The means to successfully prevent ground compaction during construction need to be planned from the conceptual stages of a building project. It may be that the no-dig surface needs to be installed and used during construction, and in other situations the ground may need to be protected until it is time to install the cellular confinement system. Therefore, the project arboriculturist needs to work with the architect, the project engineer, and the building contractor during the planning stages as well as during the construction of the surface.

The detail of product and specification are beyond the scope of this guidance and must be provided separately by the appropriate specialist. The following illustrative guide (provided by Greenfix surfacing specialists) sets out the principles of installing a low impact surfacing product:

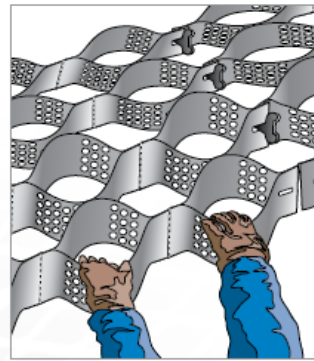


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- 5 Connect side to side (A) and end to end (B).



- 6 Fully expand GEOWEB® sections.



IMPORTANT NOTE:

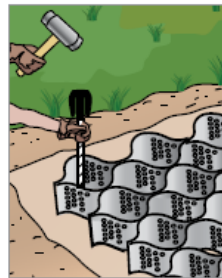
The simplified installation guide provided by Presto GEOSYSTEMS® is intended as a general guideline only. The contractor should follow contract plans and specifications and refer to detailed installation guidelines for more information.

- 7 Hold sections open. Use Options A, B, C or D.

A T-Bars



B ATRA® anchors



C Wood Stakes



D Infill Select Cells



- 8 Infill GEOWEB® cells.

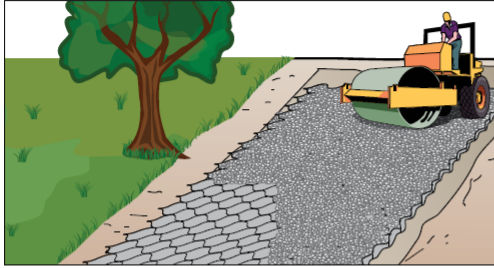


- 9 Spread Infill ensuring a 25 mm overfill at all times.

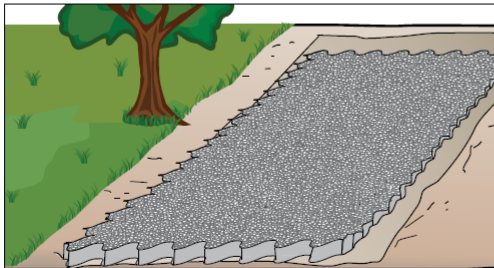


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- 10 If required, use a 4t smooth, non-vibrating roller on overfilled GEOWEB® system. Refill as needed to ensure a 25 mm overfill.



- 11 Surface option ready to install according to specification.



Greenfix
Soil Stabilisation and
Erosion Control Specialists

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tel. 01608 666027
www.greenfix.co.uk

Geoweb infill material for Tree Root Protection
Clean Angular Stone 4-20mm

Specification for open graded infill material for Geoweb cellular confinement within tree root protection applications. The no fines material is to ensure high ratio void space which corresponds with ideal soil void ratios for tree root health.

Material to BS EN13242 or BS EN12620. Crushed gravel is not permitted.

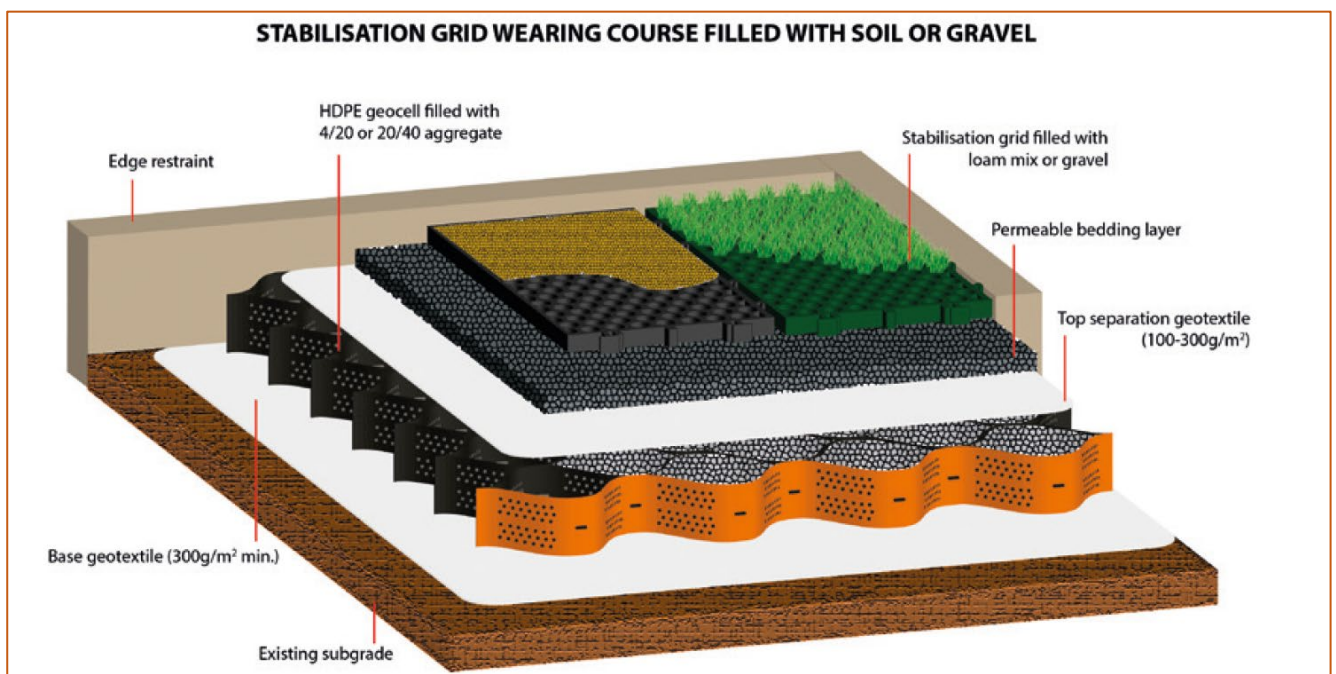
Properties of material		Test	Value
Grading of particle size	BS EN 13242	Grading 4-20mm	
Fines Content	BS EN 13242	f ₄	
Shape flakiness index	BS EN 13242	F _{4.75}	
Resistance to fragmentation	BS EN 13242	LA ₁₀	
Resistance to wear	BS EN 13242	M _{10/20}	
Water absorption rate BS EN 1097-6:2000 clause 7	BS EN 13242	W _A 42	
For typical W _A >2% magnesium sulphate soundness	BS EN 13242	M _S 18	
Acid soluble sulphate content air-cooled blast furnace slag	BS EN 13242	AS _{0.1}	
Acid soluble sulphate content non air cooled blast furnace slag	BS EN 13242	AS _{0.2}	
Total sulphur aggregates other than air cooled blast furnace slag	BS EN 13242		<1% by mass
Total sulphur air cooled blast furnace slag	BS EN 13242		<2% by mass

Sieve Size mm	Percentage of 4.75mm passing
40	100
31.5	95 - 100
20	90 - 99
10	25 - 70
4	0 - 15
2	0 - 5
1	-

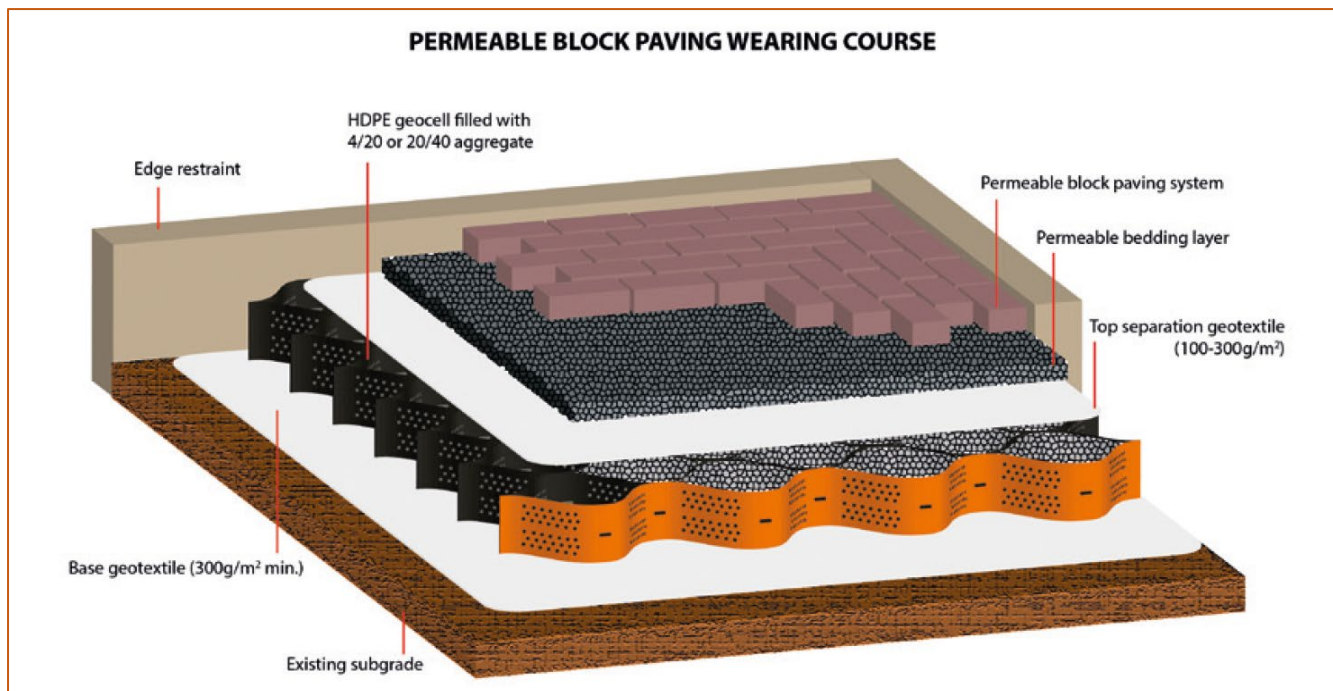
Air cooled blast furnace and steel slag should be free from Dicalcium silicate and iron disintegration in accordance with BS EN 13242:2002, 6.4.2.2 V5
Leaching of materials for blast furnace slag and other recycled materials should meet requirements of the Environmental waste acceptance criteria for inert waste when tested in accordance with BS EN 12457-3
On poor site conditions which require compaction, this should be minimum 4 passes of a smooth wheeled roller at max weight 1000kg/m width without vibration.

For assistance on correct 4–20mm clean angular stone infill specification, please contact Greenfix technical team.

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*).

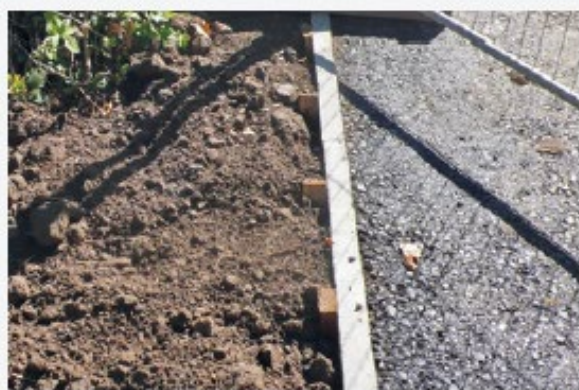


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Standard kerbs set on top of concrete-filled geocells

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 <i>[image courtesy of Hauraton Ltd]</i>.

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*).

Replacing existing surfacing: 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. In some instances, existing surfacing can be retained and used as a base for new surfacing which is less likely to result in significant excavation so special precautions are not necessary. However, if large roots already protrude above the proposed sub-base level, then the precautions and procedures must be observed. Once surfacing is removed to the soil below, damage to roots is possible. In this situation, 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:

- 1) 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.
- 2) 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.

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- 3) 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.
- 4) 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.

Structures

Installation and removal principles: New structures in RPAs are potentially damaging to trees because they may disturb the soil and disrupt the existing exchange of water and gases in and out of it. 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. This can be done by constructing the main structures above ground level on piled supports and redirecting water to where it is needed. The detailed design and specification of such structures is an engineering issue that should be informed and guided by tree expertise. Where work is required around existing and new structures, 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 structures 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 structures in place should be considered if its removal may cause excessive root disturbance.

Small light structures: Bin stores, sheds and other light structures do not normally require substantial foundations and can have permeable bases. Ideally, their bases should be of a no-dig, load-spreading construction set directly on to the soil surface. They require a flat base and so an undulating site will need levelling to provide a suitable surface. Excavation of any high points by up to 50mm and filling depressions with permeable fill to provide a flat base will normally be acceptable provided no roots greater than 25mm in diameter need to be cut. If large roots are found, the preferred course of action would be to raise the base level of the structure by filling rather than cutting roots. However, 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. Above the base, there will often be a protective covering fixed onto a frame that can rise directly from the base or be fixed to supports either banged into the ground or set in carefully dug holes. Provided the supports are well spaced, i.e. greater than 150mm apart, and of a relatively narrow diameter, i.e. not in excess of 150mm, it is unlikely they will cause any significant disturbance to RPAs.

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Larger structures on new foundations:

Conventional strip foundations in RPAs for any significant structure may cause excessive root loss and are unlikely to be acceptable. However, disturbance can be significantly reduced by supporting the above ground part of the structures on small diameter piles and beams or cast floor slabs set above ground level. The design should be sufficiently flexible to allow the piles to be moved if significant roots are encountered in the preferred locations.



Before the actual installation of the new structure starts, all RPAs that may be affected should be covered with temporary ground protection as set out in BS 5837. Gaps in the ground protection should be left where it is expected to install the piles or dig the holes for gate piers. Pile locations should be initially hand dug to a depth of 750mm to establish if there are any significant roots over 25mm in diameter that could be damaged. If significant roots are found, then the pile location must be moved slightly, and a new



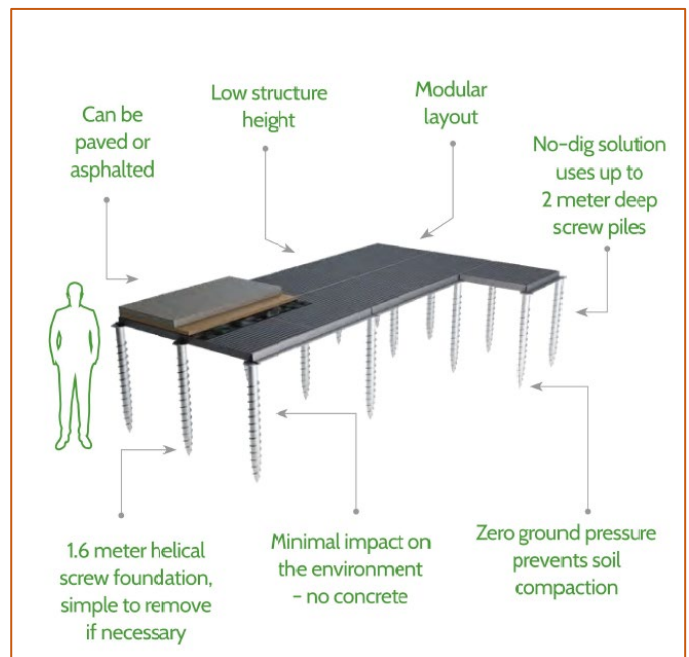
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exploratory hole dug. Once the piles have been installed, the lowest points of the supporting beams for the structure must be above the ground level between the piles and there should not be any further excavation. The beams between the piles can be pre-cast and imported to the site ready to fix or can be cast in position using shuttering for the sides and a biodegradable void-former for the base. Gate piers generally require larger holes and have less flexibility for relocation if large roots are found. Localised loss of roots may be unavoidable so each situation should be assessed on its own merits by an appropriate supervising officer once the careful excavations have been completed. Any roots found should be dealt with as set out in above. When installing any of these structures, the ground protection must remain in place until the construction is completed and there is no risk of damage to RPAs.

Root bridge systems

Factory modular load supporting systems are available from specialist manufacturers that can integrate into many customised situations with trees. These usually consist of adaptable steel lattice constructions, supported on a foundation of screw piles, and can be carefully positioned between the main roots in the RPA. With a low structure height, the system can be implemented with minimal impact and loads of up to 57kN are then absorbed by the structure rather than the roots. Further guidance and information is available from GreenGrid Systems at www.greengridsystems.com.

They can also be contacted by email info@greengridsystems.com or by telephone 01962 433460 for further help and guidance.



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, such as an air spade excavator (Image below), 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

- All work within RPAs must be carried out by hand under close and recorded arboricultural supervision.
- Machines should not enter protective zones unless there is a suitable existing hard standing.
- Excavation of open trenches by machine is unacceptable within the



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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.



- 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.

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.

Advice for hand digging 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.



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.



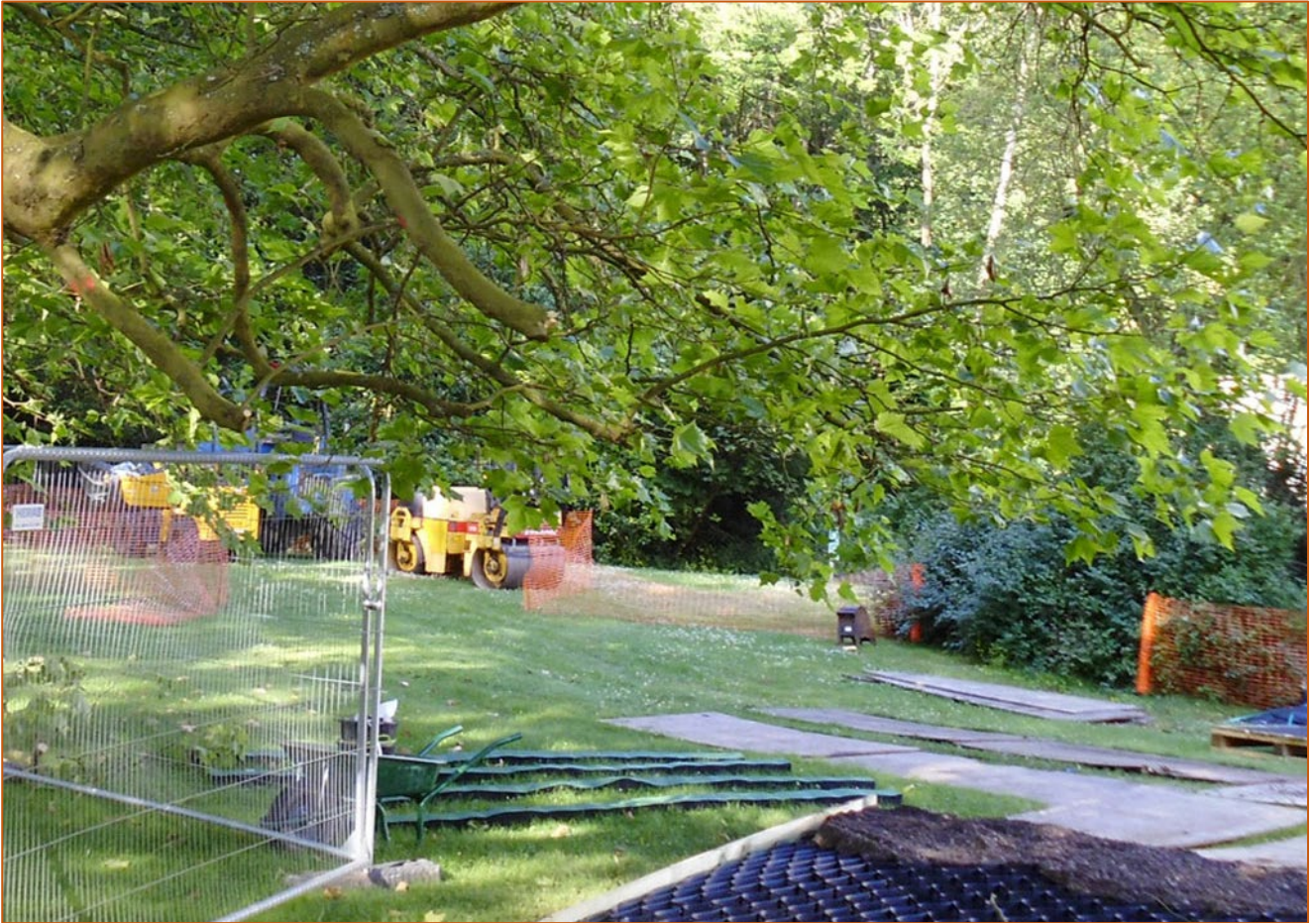
The following points must be adhered to:

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.



Landscaping around trees



Landscaping works in RPAs: landscaping is usually the last stage of works and often the most important to minimise harm within RPAs. The re-profiling of existing soil levels and covering the soil surface with new plants or an organic covering (mulch). It does not include the installation of solid structures or compacted surfacing. Soft landscaping activity after construction can be extremely damaging to trees.

Minimising harm from landscaping works

- a. No significant excavation or cultivation, especially by rotovators, should occur within RPAs.
- b. Where new designs require levels to be increased to tie in with new structures or the removal of an existing structure has left a void below the surrounding ground level, good quality and relatively permeable top soil should be used for the fill.
- c. It should be firmed into place but not over compacted in preparation for turfing or careful shrub planting.
- d. Ideally, all areas close to tree trunks should be kept at the original ground level and have a mulched finish rather than grass to reduce the risk of mowing damage.
- e. All installations of light systems or other garden improvements that involve trenching works must be undertaken following the hand digging guidance above.

