



**British Standards 5837:2012 Tree Survey
Arboricultural Impact Assessment,
Arboricultural Method Statement &
Associated Tree Plans**



**Redmoor Academy,
Wykin Road, Hinckley LE10 0EP The Orchard
For S2e
Report Reference: 231206 Redmoor Academy
AA Tree Surgeons Arboricultural Consultancy
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Caveats and limitations:

- AA Tree Surgeons has prepared this report for the sole use of S2e (Client), their agents or other consultants, in accordance with the agreement under which our services were performed.
- The content of this report is, at least in part, based upon information provided by secondary data sources and on the assumption that all relevant information has been provided by those parties from whom it has been requested. Information obtained from any third party has not been independently verified by AA Tree Surgeons unless otherwise stated in this report.
- When evaluating tree amenity values the Tree Evaluation Method for Preservation Orders (TEMPO) system has been adopted. Although not adopted by all Local Authorities it is an industry recognised system of detailed evaluation.
- This report relates solely to the trees in this schedule, the tree condition and the site assessment on the day of the site survey. No reliance shall be placed on comment(s) the surveyor has made in respect to structural integrity of the tree. Trees are living organisms, subsequently their condition can change over relatively short time periods.
- The findings and recommendations contained within this report are in assumption that recommendations are being carried out and shall remain valid for the duration of twelve months from the date of inspection. On alterations to the property, soil levels or tree work, it is strongly recommended that a new tree inspection be carried out.
- Information contained in this report are based on the author's knowledge and experiences relating to tree issues. No removal of ivy or invasive decay detection equipment was used to assess any possible rot or cavities within the tree itself.
- Where trees were extensively ivy clad this was recorded in the survey schedule. In order to ascertain the possible presence of cavities or other defects underneath the ivy it is advised that ivy be removed and a re-inspection carried out.
- The surveyor is not liable for any failure in relation to any act of 'Force of Nature' or unforeseeable circumstances such as extreme weather conditions, changing soil conditions/levels or through change of natural surroundings which can all affect tree health.

1. Executive Summary

1.1. The Project and Commissioned Work

- 1.1.1. AA Tree Surgeons was instructed via email by Emma Hyett of s2e (Client) to write a report in line with British Standards 5837:2012 Tree Survey. The site is identified as Redmoor Academy. Wykin Road, Hinckley, LE10 0EP.
- 1.1.2. The site is a active secondary school with various school buildings dotted around site. The site boundaries are surrounded by trees in addition to an avenue of trees either side of a main access driveway off Wykin Road. A proposed new sports hall and extension to a current overflow car park is proposed, seen in Appendix 5. The client has expressed their priority is within the significant established trees over the proposed development which has been considered within this report.
- 1.1.3. An arboricultural impact assessment of the trees located on the site has been conducted in order to enable the determination of a planning application through the Local Planning Authority (LPA), taking into consideration site constraints in relation to trees and the proposed development.
- 1.1.4. Reviewing the impact proposals have on the trees and providing guidance on how to achieve the development without causing detrimental impact on the trees to be retained.
- 1.1.5. Current topographical site surveys, produced using AutoCAD format, from provided pdf copies of Tree Survey Plan and Tree Protection Plan with proposed development has formed the basis for the Arboricultural Impact Assessment and Arboricultural Method Statement.
- 1.1.6. The content and scope of this report is listed below:
 - BS 5837:2012 Tree Survey and Categorisation
 - Arboricultural Impact Assessment
 - Arboricultural Method Statement
 - Associated Tree Plans

1.2. Findings

- 1.2.1. The survey identified thirty individual trees and two grouped specimens each growing in a typical school environment near to the proposed development. The quality and value of the surveyed trees is summarised below and viewed in more detail in Appendix 1.
- 1.2.2. No trees attaining a Category 'A' were identified showing trees of high quality and value.
- 1.2.3. Trees assigned to a Category 'A' are of high quality demonstrating a good example of their species, visual importance or possess significant conservation values and an estimated remaining life expectancy of at least 40 years.
- 1.2.4. Seventeen trees attaining a Category 'B' were identified showing trees of moderate quality and value.
- 1.2.5. Trees assigned to a Category 'B' are of moderate quality demonstrating Category 'A' trees which have been downgraded due to an impaired condition, having a high collective value as a group or material conservation values and an estimated remaining life expectancy of at least 20 years.
- 1.2.6. Ten individual trees and two groups attaining a Category 'C' were identified showing trees of low quality.
- 1.2.7. Trees assigned to Category 'C' are low quality unremarkable trees of very limited merit, an impaired condition removing them from higher categorisation, low landscape benefits, no material conservation values, young trees having a stem diameter less than 150mm and an estimated remaining life expectancy of at least 10 years.
- 1.2.8. Three trees attained a Category 'U' showing trees unsuitable for retention.
- 1.2.9. Trees assigned to Category 'U' are unsuitable for retention due to having serious structural defects or pathogens which could result in failure, become unviable after neighbouring Category 'U' trees are removed, dead or seriously declining trees and low-quality trees which are suppressing nearby better quality trees. They cannot be realistically retained as living specimens in the current land use for longer than 10 years.

- 1.2.10. Ash Die Back (ADB) has been noted on a number of trees within this site and on many occasions, it is recommended for reinspection in 6 months.
- 1.2.11. Ash dieback is fungal disease affecting the common ash tree (*Fraxinus excelsior*) and other *Fraxinus* species. It is caused by a fungus called *Hymenoscyphus fraxineus* which is native to eastern Asia.

Chalara has had a large impact on the UK's ash trees. The disease was first recorded in the UK in 2012 and has since spread to most of the country. It infects trees of all ages. The fungus grows inside the tree, blocking the essential water and nutrient transport systems, which is often fatal. The prevalence of this disease has caused significant losses of our ash trees.

Chalara causes characteristic diamond-shaped lesions on the branches and stem of the tree, these tend to form around the point that a shoot or branch joins the trunk. Other symptoms include wilting of leaves and shoots and dieback of branches. Later in the season, the small, white, cup-shaped fruiting bodies of the fungus can be seen in the leaf litter around the base of the tree.

There are a range of tree management options that can be considered for trees affected by ash dieback. These include, Retain the tree with no work – provided the risk level is acceptable. Deadwood removal – prune dead wood and branches showing marked symptoms of dieback to reduce the risk from falling branches. Pollarding/topping – if the tree is posing an unacceptable risk to people or property, reduce its height by removing all the upper branches and allowing it to regrow. Coppicing – cut the tree to the base and allow it to regrow. Felling – fell the tree and prevent regrowth.

- 1.2.12. I have included a guide for tree owners with more detailed information on ADB seen in Appendix 10.

1.3 Recommendations

- 1.3.1 In the interests of promoting sensible arboricultural management, the findings and any associated recommendations as detailed within this report are considered to be reasonable and practicable.
- 1.3.2 Trees for retention includes every tree surveyed apart from T12, T27, T29 & T30. These trees are located around the proposed development area mainly on-site boundaries. T5-11 & T14-21 are part of an avenue of trees planted either side of the main access driveway to the school providing a valued feature as a whole. These trees require some crown lifting to allow minor construction activities underneath such as erection of protective fencing for the proposed sports hall. A root protection area has been set up around the trees, viewable in Appendix 2 Tree Survey Plan, to protect them from the construction process such as movement of machinery/persons and other construction related activities.
- 1.3.3 T12 Norway Maple has been indicated as a low amenity value specimen with a category 'C' rating recommended for removal. This tree has been heavily pruned back on the existing car park side creating a one-sided crown, this particular specimen doesn't form part of the avenue of trees spanning the driveway. It wouldn't be possible to retain this tree within current design proposals. T27 mixed species, T29 Oak & T30 Field Maple have been indicated as a low amenity value specimens with a category U rating recommended for removal. T27 is a mixed bunch of small saplings of little value. T29 & T30 have co-dominant / multiple poor branch unions from previous pruning activities and poor growth habits making them unviable for retention. These trees are low quality trees of limited merit, have an impaired condition removing them from higher categorisation, lower landscape benefits, limited material conservation values or an estimated remaining life expectancy of at least 10 years. These trees can easily be compensated with better replacement planting, see section 1.3.7 below.
- 1.3.4 The overflow car park which is proposed to be overlaid with tarmac is currently made up of compressed road planings and used as an overflow car park, this is due to be extended north away from any tree locations. A number of RPA's from the southern boundary trees along Wykin Road extend into this car parking area but

the car park has been pre-existing for a number of years. Trees T18 & T19 have RPA's over the entrance to the overflow car park. Tree T22 Ash has contravention into to RPA by approximately 7m and trees T18, T19, T21, T23, T24, T25 & T26 by up to 1.5m on the northwestern sides. This whole car park is proposed to be overlaid with tarmac apart from the red shaded segments, seen in Appendix 2, which is to be laid of semi-permeable tarmac. This will place minor constraints to which the compressed stone is not to be dug out but over laid with a semi-permeable tarmac to continue the allowance of air and water displacement for the tree roots which may potentially be sited within this area. This information is assumed with the RPA's of retained trees drawn as a circular circumference. Rooting of these three trees could well have formed asymmetrically with these specimens as there is grassed areas alongside the car park which is more suitable for root growth. The contravention area has been historically a car park therefore there's a good chance that there has been disturbance to the upper portion of ground forcing roots of these trees lower down. With these factors considered it is likely to assume that this contravention into the parking area with the proposed plan for surfacing will cause minimal disturbance to these trees. A root protection area has been set up around the trees, viewable in Appendix 2 Tree Survey Plan with the proposed contravention area marked as a red shaded area, to protect them from the construction process such as movement of machinery/persons and other construction related activities. See section 6.5 if contact with roots occurs. There is to be no excavations or ground disturbance of any sort within the contravention area marked as the red shaded area on the pre-existing car park area seen in Appendix 2. This pre-existing car park currently will be able to withstand pedestrian-operated plant up to a gross weight of 2t. Anything exceeding follow notes in section 6.2.6. If the semi permeable tarmac is laid at the start of the project this will allow heavier machinery over the contravention area.

- 1.3.5 Trees for retention T2, T3, T4, T5 & T6 have contravention into to RPA by approximately 1.5-2m on the northwestern sides. This is to allow paving to be placed around the proposed sports hall building. Therefore, a three-dimensional cellular confinement system will need to be placed within this segment of the footpath, see section 6.6. This can be seen in Appendix 2 as an orange shaded

section of proposed footpath to the south of the proposed sports hall building. This information is assumed with the RPA's of retained trees drawn as a circular circumference. Rooting of these three trees could well have formed asymmetrically with these specimens as there is an abundant open field space for these roots to obtain in all directions apart from the southern roadside segment which will have restricted root growth as it is overlaid footpath and highway constructed of non-permeable tarmac surfacing. The contravention area has been historically a maintained field play area through the history of the site. Although this is a good rooting environment it is a good chance that there has been minor disturbance to the upper portion of ground forcing roots of these trees lower down. With these factors considered it is likely to assume that the slight contravention to which the proposed footpath routes and proposed three-dimensional confinement system will cause minimal disturbance to these trees. A root protection area has been set up around the trees, viewable in Appendix 2 Tree Survey Plan with the proposed contravention, to protect them from the construction process such as movement of machinery/persons and other construction related activities. See section 6.5 if contact with roots occurs.

- 1.3.6 On reviewing the landscape plan, seen in Appendix 2 and the considerations listed above, replacement planting of at least eight varying Silver Birch (*Betula pendula*), Hornbeam (*Carpinus Betulus*), Norway Maple (*Acer Platanoides*) or Lime (*Tilia europaea*) sizes 12/14, in placement of the removed category 'C' trees would be adequate in creating a fast-growing development screen and compensate any losses of canopy cover the proposed development incurs. These replacements can be seen as "new trees NT1-8" within Appendix 2. It is advised to take into account not only the considerations in section 6.14, but the recommended planting distances detailed in table 6.5.
- 1.3.7 With consideration into infrastructure requirements there is no evidence to suggest what impact retained trees will have on lighting, signage, CCTV sightlines or visibility splays, but on current design proposals I would expect some impact to be certain, it is recommended that this be discussed and planned accordingly.
- 1.3.8 Trees indicated on table 7.1 require pruning operations be undertaken as further described in section 6.13.

2. Introductory details

2.1. Authority to carry out the report

- 2.1.1. Andrew Harrison (Author) is a fully qualified arborist with over 20 years' practical experience in the Arboricultural Industry. Thomas Fowler is also a fully qualified arborist with over 16 years' practical experience in the Arboricultural Industry.
- 2.1.2. Andrew was educated for three years at Broomfield College, subsequently gaining supervisory positions for tree contractors, now Managing Director of AA Tree Surgeons Ltd. Andrew is committed to continued professional development and training holding a LANTRA Professional Tree Inspection Certificate, a three-year foundation degree in Arboriculture through Myerscough College and a professional grade member to the Arboricultural Association (www.trees.org.uk).
- 2.1.3. Thomas was also educated for four years at Broomfield College, subsequently gaining lead climber positions for tree contractors, now in supervisory and consultancy positions working with AA Tree Surgeons Ltd. Thomas is committed to continued professional development and training holding a LANTRA Professional Tree Inspection Certificate and a professional grade member to the Arboricultural Association (www.trees.org.uk).
- 2.1.4. A list of qualifications and experience can be viewed in Appendix 3.

2.1.5. Regulatory and Policy Framework

- 2.1.6. Tree Preservation Orders (TPOs) and Conservation Areas where applied place various statutory restrictions on the felling, pruning or damaging of trees and are subject to various exemptions (Department for Communities and Local Government, 2000).
- 2.1.7. A Felling Licence would need to be obtained via the Forestry Commission if more than 5m³ of timber in any calendar quarter is to be removed through tree felling on non-residential land which is subject to various exemptions and variations (Forestry Commission, 2007).
- 2.1.8. An overriding exemption to the above constraints involving tree pruning and felling is accepted when it is deemed necessary to implement development that has already received full planning permission.

3. Inspection Methodology

3.1. Inspection methods

3.1.1. Trees were assessed using a Visual Tree Assessment (VTA); a systematic process to assess a tree for any potential hazards and defects by looking at the biological and mechanical aspects devised by Claus Mattheck (Mattheck 2007). No aerial climbing inspection was undertaken, Binoculars, DSLR camera, Laser Ace clinometer and girth tape were used to assess the tree.

3.1.2. The site was visited and assessed by Andrew Harrison to carry out an assessment in accordance with BS 5837:2012 – Trees in relation to Design, Demolition and Construction Recommendations. The following information was collected for each tree:

- Sequential reference number;
- Species, inc Scientific name;
- Height (Meters);
- No. of stems;
- Stem diameter (Millimetres at 1.5m DBH (BS5837 Annex C));
- Branch spread (North, East, South, West in Meters);
- Existing height above ground level of
 - First significant branch and direction of growth (e.g. 2 SE)
 - Canopy;
- Life stage (Appendix 4);
 - Y - Young,
 - SM - Semi Mature,
 - EM - Early Mature,
 - M – Mature
 - OM – Over Mature,
 - V - Veteran;
- General observations, particularly of structural and/or physiological condition;
- Estimated remaining contribution;
- Category ‘U’ or ‘A’ to ‘C’ grading with the subcategory 1, 2 or 3 reflecting arboricultural, landscape or cultural values, respectively (BS5837 Section 4.5).

3.1.3. Root Protection Area (RPA) radius in Meters (M) and Area M².

4. Site observations

4.1. Site Plan

- 4.1.1. The application site is Redmoor Academy. Wykin Road, Hinckley, LE10 0EP (approximate OS Grid Reference SP 41739 95055), vehicular access to the site is directly from Wykin Road.
- 4.1.2. The location of the site is shown in Figure 4.1 below with the approximate extent of the boundary indicated by a red line. A scaled Tree Survey Plan can be viewed in Appendix 2.

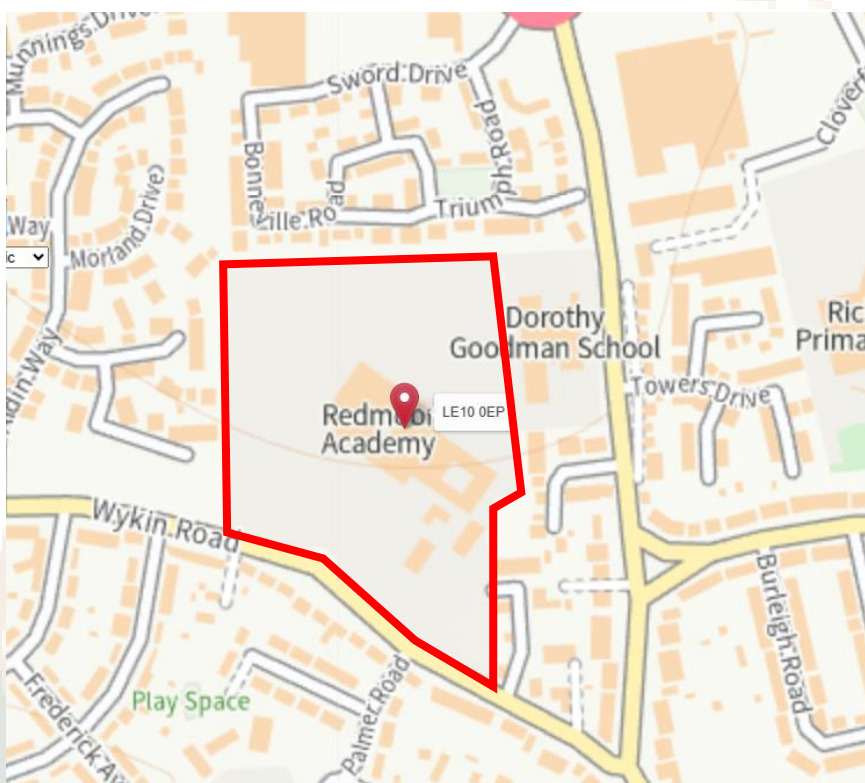


Figure 4.1 Map view of the Site © Crown Copyright and Database rights 2023 Ordnance Survey

4.2. Site Constraints

- 4.2.1. No attempt had been made to check the site for archaeological remains protected by the Ancient Monuments and Archaeological Areas Act 1979 and therefore not liable.
- 4.2.2. The Occupiers Liability Act 1984 (S2) states that the occupier owes a 'common law duty of care' to visitors and those who enter his land or premises, which extends to trespassers.

- 4.2.3. The surveyor has not sent soil or root samples for analysis and all inspections were conducted from ground level using the Visual Tree Assessment (VTA) method (Mattheck 2007), no climbed inspection, removal of ivy or excavation of rooting areas, including movement of paved or tarmacked areas were involved.
- 4.2.4. Soils and rooting characteristics of trees are enormously variable as are their interactions, therefore, quantifying subsidence risk is impossible and has not been assessed nor should any be construed.
- 4.2.5. You are advised where man-made structures are involved you may need to obtain structural engineering and/or geotechnical advice.
- 4.2.6. The Wildlife and Countryside Act 1981 (as amended), the Countryside and Rights of Way Act 2000 and The Conservation of Habitats and Species Regulations 2010 protect ALL wild birds, their nests (whether in use or being built), eggs, also other wild animals including bats and their roosts in or adjacent to trees.
- 4.2.7. Any notifiable weeds found to be present on site are to be given careful consideration into the handling and environmental effects they may pose. Detail of which can be found on Environmental Management Guidance www.gov.uk. There possible presence has not been assessed within this report.

4.3. Site Conditions

- 4.3.1. The weather at the time was dry, bright with a light breeze adequate for conducting the survey.

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5. Results

5.1. Statutory Tree Protection

- 5.1.1. A website check on Hinckley & Bosworth Borough Councils home page at www.hinckley-bosworth.gov.uk/tpomap and www.hinckley-bosworth.gov.uk/info/511/conservation_areas was done on 18th December 2023 to check for any current statutory protection which may apply to any trees on this site in relation to a Tree Preservation Order (TPO) or a Conservation Area. It was seen that the site has no restrictions to trees with regards Conservation Area's or Tree Preservation Orders (TPO's) at this current time.
- 5.1.2. If trees located on this site fall within statutory protection, it should be understood that no pruning works are to be carried out. Permission needs to be granted by the LPA to consider the works by following either:
- a formal application for tree works (Trees protected by a TPO),
 - a 6-week notification period of intended tree works is submitted (Trees within a Conservation Area)
 - or the submission of a 5-day notice under section 198(S6a) of the Town and Country Planning Act 1990 where works are considered exempt due to conditions of dying, dead or have become dangerous. In which proof needs to be provided of such to the LPA. Seeking guidance though a qualified arborist or the LPA is always advised on this instance.
- 5.1.3. Failure in obtaining consent or proceeding with tree works can result, if convicted, to a fine of up to £20,000 in a Magistrates Court. On indictment, a person may be committed to the Crown Court and, if convicted, liable to an unlimited fine.
- 5.1.4. Where full planning permission has been granted there is an overriding exemption for the above restrictions on tree felling and pruning works where it has been deemed necessary to implement development.

5.2. Tree Survey

- 4.3.2. The survey identified thirty individual trees and two grouped specimens each growing in a typical school environment near to the proposed development. The quality and value of the surveyed trees is summarised below and viewed in more detail in Appendix 1 in accordance with BS5837:2012. See also Appendix 4 Life stage and Condition Key.



6. Arboricultural Impact Assessment

6.1. Trees suitable for retention

6.1.1. Where possible Category 'A' and Category 'B' trees are generally considered desirable therefore should be retained and incorporated into new development plans. Category 'U' trees are not considered appropriate for retention. Category 'C' trees can be retained or removed taking into consideration of the proposed development design implementations.

6.1.2. Assessing tree suitability for retention in the context of the proposed layout the following factors have all been considered.

- Root Protection Areas
- Special Engineering for Foundations within the RPA
- Infrastructure
- Excavation/Ground Works
- Hard Surfacing within the Root Protection Area
- Construction Activity
- Shading
- Privacy and Screening
- Direct Damage
- Future Tree Management
- Tree Removal
- Tree Pruning
- Landscaping
- Tree Loss Evaluation
- Seasonal Nuisance

6.2 Root Protection Areas

- 6.2.1 Erection of protective fencing as described on Tree Protection Plan (TPP), section 7.3, prior to the commencement of any site works will protect the RPA of retained trees.
- 6.2.2 Existing ground levels, with the inclusion of topsoil and in this case road planings on the current car park area, must be retained within the RPAs. Intrusion into soil within the RPAs is generally not acceptable.
- 6.2.3 Erection of protective fencing, for this site, is considered likely to place constraints on elements of the construction, its associated activities and possibly limit the working space available. The RPA of tree's T2, T3, T4, T5, T6, T18, T19, T21, T22, T23 T24 T25 & T26 have incursions within the RPA consequently, ground protection measures are required to be adopted where necessary, to minimise the potential for any detrimental effect that the relevant construction activity might have. See sections 1.3.4 & 1.3.5 for further details.
- 6.2.4 General guidance is provided below, which if adopted will help to minimise any potential ground works and construction detrimental effects.
- 6.2.5 Existing hard surfacing which is deemed suitable for the construction and development process should be retained to act as ground protection. This is applicable to the current road access extending through the middle of the avenue of trees upon the tree protection plan and in agreement with the proposed barrier protection. If reinstatement of this surfacing is needed it is to be assessed after construction completion. Suitability of such surfacing for this purpose should be evaluated by the project arboriculturist and an engineer as appropriate (BS 5837:2012).
- 6.2.6 British Standards 5837:2012 advises new temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction to underlying soil and further provides the following note:
- NOTE The ground protection might comprise one of the following:
- a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on*

top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;

b) for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;

c) for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

6.3 Special Engineering for Foundations within the RPA

- 6.3.1 Development can be implemented within the RPA, on the basis that the area of consideration given to the tree roots is extended to include the places where the tree is clearly going to most benefit. Not applicable to the proposed development.



6.4 Infrastructure

- 1.3.9 With consideration into infrastructure requirements there is no evidence to suggest what impact retained trees will have on lighting, signage, CCTV sightlines or visibility splays, but on current design proposals I would expect some impact to be certain, it is recommended that this be discussed and planned accordingly.
- 6.4.1 On the proposed necessary installation of any underground apparatus or drainage particular care should be taken in its routeing and methods of installation. Wherever possible it is to be routed outside RPAs.
- 6.4.2 If it is not possible to route services outside RPAs then detailed plans should be formulated, in conjunction with the project Arboriculturist and taking into consideration NJUG Volume 4 (2010), to outline the proposed routes. Trenchless insertion methods are considered to be most appropriate for this requirement as described within British Standards 5837:2012 detailing different solutions for differing utility apparatus requirements (see table 6.1 below).
- 6.4.3 British Standards 5837:2012, Section 7.7.2 suggests that in digging shallow service runs then excavation using hand-held tools, appropriately retaining and protecting exposed roots by wrapping or covering may be acceptable. Removing the wrapping and backfilling should be done as soon as possible after installation.

Table 6.1 Trenchless solutions for differing utility apparatus installation requirements

Method	Accuracy mm	Bore dia. ^{A)} mm	Max. sub. ^{B)} length m	Applications	Not suitable for
Microtunnelling	<20	100 to 300	40	Gravity-fall pipes, deep apparatus, watercourse/ roadway undercrossings	Low-cost projects due to relative expense
Surface-launched directional drilling	≈100	25 to 1 200	150	Pressure pipes, cables including fibre optic ^{C)}	Gravity-fall pipes, e.g. drains and sewers ^{C)}
Pipe ramming	≈150	150 to 2 000	70	Any large-bore pipes and ducts	Rocky and other heavily obstructed soils
Impact moling ^{D)}	≈50 ^{E)}	30 to 180 ^{F)}	40	Gas, water and cable connections, e.g. from street to property	Any application that requires accuracy over distances in excess of 5 m

^{A)} Dependent on strata encountered.

^{B)} Maximum subterranean length.

^{C)} Pit-launched directional drilling can be used for gravity fall pipes up to 20 m subterranean length.

^{D)} Impact moling (also known as thrust-bore) generally requires soft, cohesive soils.

^{E)} Substantial inverse relationship between accuracy and distance.

^{F)} Figures given relate to single pass: up to 300 mm bore achievable with multiple passes.

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6.5 Excavation/Ground Works

- 6.5.1 Before work commencement erection of protective fencing and/or use of ground protection will allow excavations and ground works to take place without any adverse effect and/or impact on the retained trees.
- 6.5.2 All plant and vehicles engaged in ground works should either operate outside the RPAs or run on ground protection (see 6.2.6) in the proximity of retained trees.
- 6.5.3 Where excavation and groundworks are to be undertaken within or close to a RPA special consideration is to be given to the tree roots as described in Volume 4 NJUG guidelines section 4.1. Operatives handout viewable in Appendix 7.
- 6.5.4 Where an existing hard surface or wall is scheduled for removal, care should be taken not to disturb tree roots that might be present beneath it. Hand-held tools or appropriate machinery should be used (under arboricultural supervision) to remove the existing surface, working backwards over the area, so that the machine is not moving over the exposed ground. If a new hard surface is to be laid, it might be preferable to leave any existing sub-base in situ, augmenting it where required.
- 6.5.5 Roots, whilst exposed, should immediately be wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.
- 6.5.6 Roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in clumps. Roots occurring in clumps or of 25 mm diameter and over should be severed only following consultation with an arboriculturist, as such roots might be essential to the tree's health and stability.
- 6.5.7 Prior to backfilling, retained roots should be surrounded with topsoil or uncompacted sharp sand (builders' sand should not be used because of its high salt content, which is toxic to tree roots), or other loose inert granular fill, before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.

6.6 Hard Surfacing within the RPA

- 6.6.1 Current plans do anticipate that the installation of a 'no-dig' type surface will be necessary on the footpath to the south of the proposed sports hall. General guidance is given below.
- 6.6.2 Arboricultural Practice Note No. 12 (2007) describes in detail requirements needed of a no-dig type installation whilst BS 5837:2012 section 7.4.2 note 1 suggests 'Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems'.
- 6.6.3 The existing site topography needs prior assessment to ascertain if it lends itself to the installation of a three-dimensional cellular no-dig product with the anticipation of the required and final level changes taken into account.
- 6.6.4 Cross sectional example drawings of a suitable product can be seen below (figures 6.2, 6.3 & 6.4) and in Appendix 8 as an installation method.

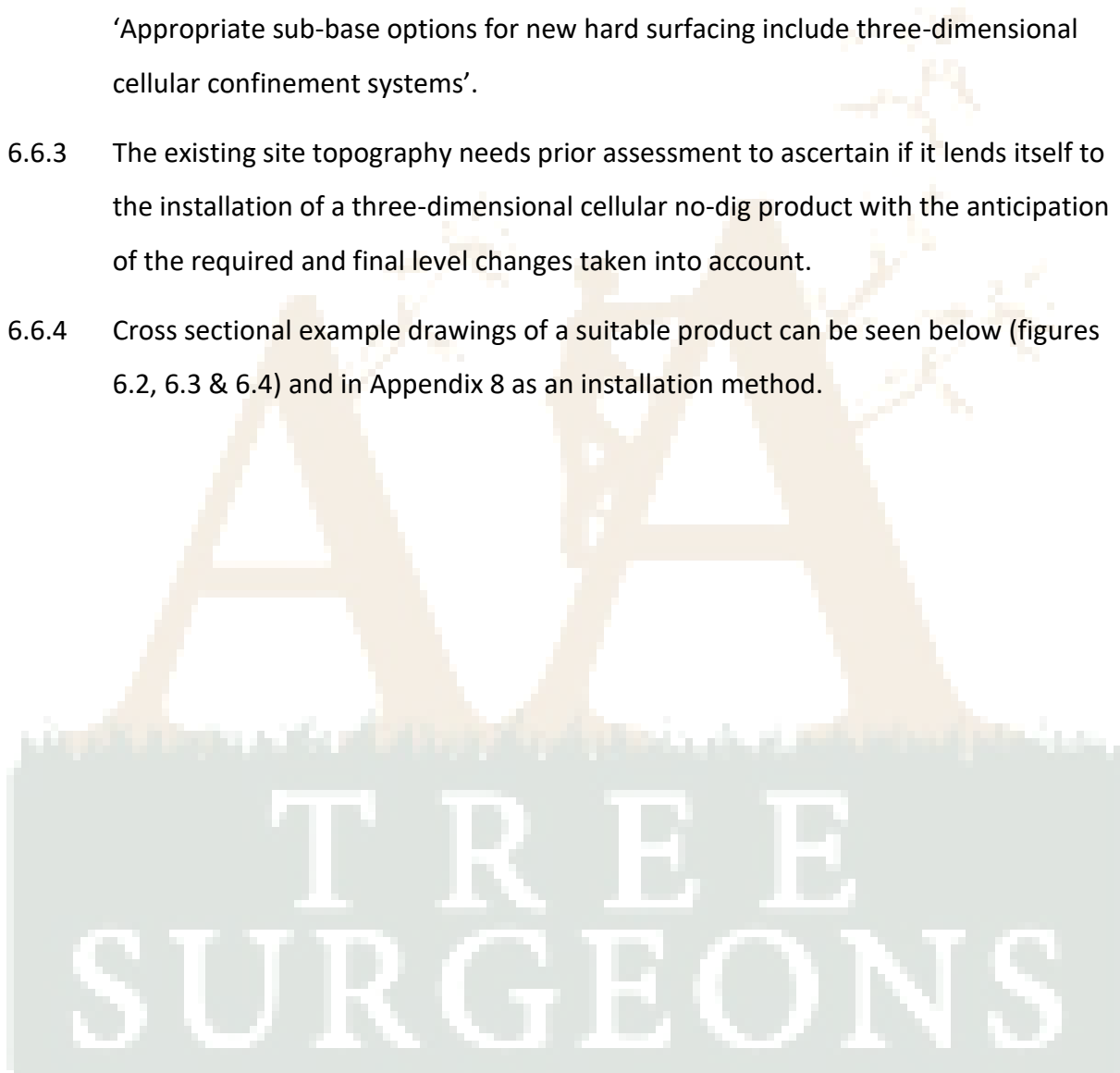


Figure 6.2 Composition of the GeoWeb™ system.

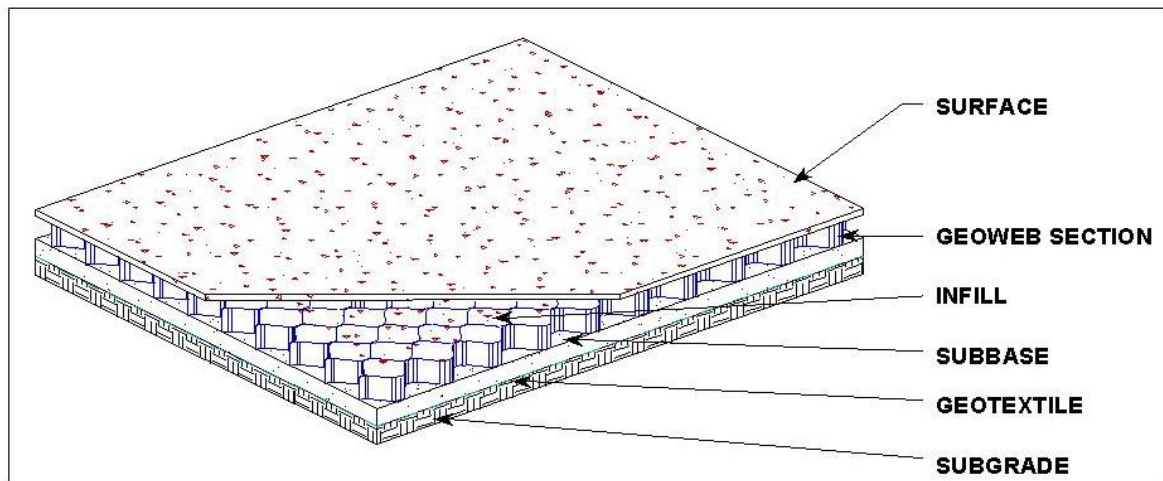


Figure 6.3, Cross section illustrating a block paved surface finish

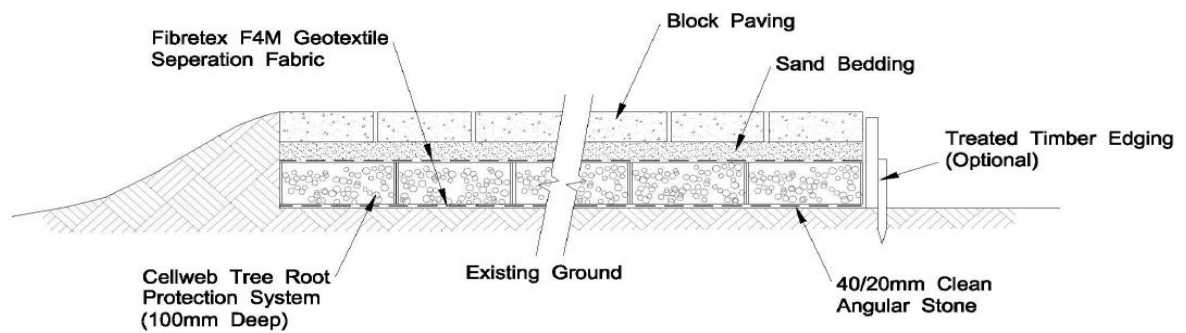
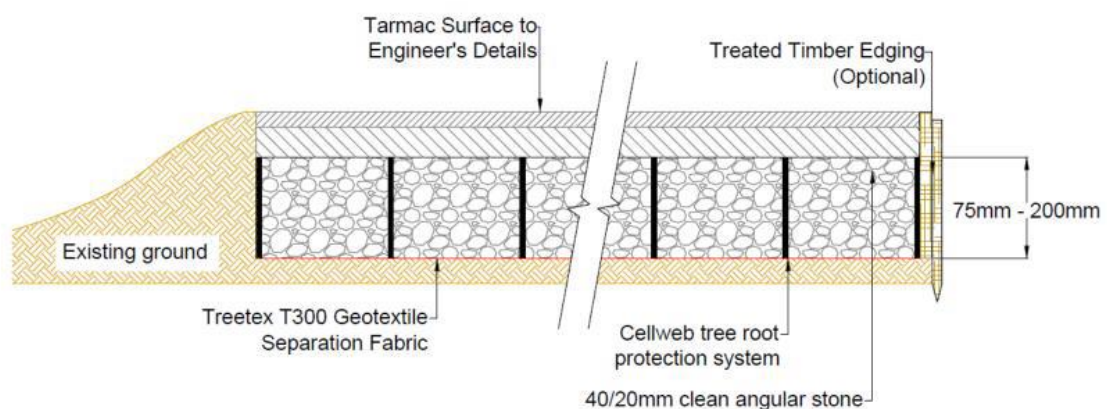


Figure 6.4, Cross section illustrating a tarmac surface finish



6.7 Construction Activity

- 6.7.1 Erection of protective fencing and/or use of ground protection prior to work commencement on site will allow the development to proceed without any adverse effect and/or impact on the retained trees.
- 6.7.2 All plant and vehicles engaged within construction works should operate outside the RPA, or if needed within the RPA do so on ground protection (see section 6.2.6) and Appendix 8 Typical 3 Dimensional 'No-dig' Installation Methodology.
- 6.7.3 Fires should not be lit in a position where their flames can extend to within 5m of foliage, branches or trunk. This will depend on the size of the fire and the wind direction.

6.8 Shading

- 6.8.1 An indication of potential direct sunlight obstruction can be illustrated using drawn segments with a radius from the centre of the stem equal to the current tree height. These are drawn from due north-west to due east.
- 6.8.2 The segments will represent a basic illustration indicating the shadow pattern through the main part of the day. Based on advisory comments detailed in section 5.22, Note 1 of BS 5837:2012.
- 6.8.3 On consideration of the above points, the residents stating to retain the significant trees and no other nearby residences being affected due to the favourable design layout, no further investigation, illustration or mitigation is considered necessary.

6.9 Privacy and screening

- 6.9.1 The proposed development has been considered to prevent any overlooking of neighbouring properties and protect internal privacy. The orientation and aspect of the proposed building use the location of new plantings and surrounding mature trees, assessed to be retained, as a cover to provide privacy and screening.

6.10 Direct Damage

- 6.10.1 Proposed layouts should take into consideration any likelihood of direct damage occurring from incremental root and stem growth and the possibility of the fabric of any new structure being damaged by the whipping of branches against it. Taking into account pruned branches and the trees ultimate growth to minimise frequent remedial pruning.
- 6.10.2 In respect to the submitted layout likelihood of direct damage occurring in the manner described above from retained trees is probable.
- 6.10.3 Table 6.5 below, taken from Annex A of BS 5837:2012 provides advised minimal distances of trees from new structures for new plantings should any new planting be requested.

Table 6.5, Minimum distance between young trees or new planting and structure to avoid direct damage to a structure from future tree growth.

Type of structure	Minimum distance between young trees or new planting and structure, in metres (m)		
	Stem dia. <300 mm ^{A)}	Stem dia. 300 mm to 600 mm ^{A)}	Stem dia. >600 mm ^{A)}
Buildings and heavily loaded structures	—	0.5	1.2
Lightly loaded structures such as garages, porches etc.	—	0.7	1.5
Services			
<1 m deep	0.5	1.5	3.0
>1 m deep	—	1.0	2.0
Masonry boundary walls	—	1.0	2.0
In-situ concrete paths and drives	0.5	1.0	2.5
Paths and drives with flexible surfaces or paving slabs	0.7	1.5	3.0

^{A)} Diameter of stem at 1.5 m above ground level at maturity

©The British Standards Institution 2012

6.11 Future Tree Management

6.11.1 The presence of retained high category trees enhances the immediate environment and upon build completion, sufficient space should be provided within the layout plans. This will allow for future tree growth and eliminate the need for frequent remedial tree pruning operations.

6.11.2 The proposed building is close to the crowns of T2, T3, T4, T10 & T11 but no pruning works would be required to accommodate the proposed construction. In consideration of the above factors pruning would eventually be required to maintain clearances from the proposed structure through ongoing biannual tree maintenance procedures.

6.12 Tree Removal

6.12.1 Table 7.1 shows trees which have been recommended for removal in order to implement design proposals, facilitate construction and reduce any risk of future pressures needed into maintaining the trees on this site.

6.12.2 The proposed layout requires the removal of T12, T27, T29 & T30, all described as category 'C' or 'U' trees due to their age, subsequent stem diameter, condition and viability in consideration of the proposed development.

6.12.3 Trees indicated for removal are described within Appendix 1 Tree Survey Schedule and listed on Table 7.1.

6.13 Tree Pruning

6.13.1 Trees indicated on Table 7.1 require pruning operations be undertaken.

6.13.2 Trees along the avenue T6, T7, T8, T9, T10, T11, T13, T15, T16, T17, T18, T19 and T20 are considered category 'B' & 'C' trees with a moderate to low value. On the access road some low hanging branches may restrict access for construction vehicles therefore crown lifting to obtain a 5.2m clearance over the access route should facilitate the need for the construction traffic and reduce future maintenance pressures.

6.14 Landscaping

- 6.14.1 British Standards 5837:2012 advises that any new tree planting proposals are an essential consideration in development and long-term landscape structure of the site. Landscaping proposals should consider the ultimate height and spread, form, habit and colour, density of foliage and maintenance implications, in relation to both the built form of the new development, and the retained landscape features.
- 6.14.2 Where possible, new planting should be linked to nearby existing tree groups, nearby planned removal of trees or if not feasible, around the edge of the site to form valuable wildlife corridors and visual links.
- 1.3.10 On reviewing the landscape plan, seen in Appendix 2, replacement planting of at least eight varying Silver Birch (*Betula pendula*), Hornbeam (*Carpinus Betulus*), Norway Maple (*Acer Platanoides*) or Lime (*Tilia europaea*) sizes 12/14, in placement of the removed category C trees would be adequate in creating a fast-growing development screen and compensate any losses of canopy cover the proposed development incurs. These replacements can be seen as “new trees NT1-8” within Appendix 2. It is advised to take into account not only the considerations in section 6.14, but the recommended planting distances detailed in table 6.5.
- 6.14.3 Paving slabs and block pavers are available with built-in infiltration spaces between the slabs or blocks, which may be applicable to the southern path of the proposed sports hall. These are ideal but need to be laid dry-jointed on a sharp sand or coarse aggregate no-fines foundation to allow air and moisture to penetrate to the rooting area.

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6.15 Tree loss evaluation

- 6.15.1 The proposed layout requires the removal of trees detailed in Table 7.1, it is advised to check with the LPA if any restrictions through TPO's or conservation areas are placed upon them before work commences.
- 6.15.2 It is considered the removal of these trees will not significantly affect the current public amenity value of the site or wider area. This was evaluated using the Tree Evaluation Method for Preservation Orders (TEMPO) system.
- 6.15.3 The loss of the trees and any associated public amenity through the creation of visibility corridors/sight lines created between T12 or T27, T29& T30 are notably limited to one specific vista i.e. when viewed directly from the school car park or school tennis courts. This is not considered detrimental and not disqualify the development proposal.

6.16 Seasonal Nuisance

- 6.16.1 Seasonal nuisances can be described by some as the fall of foliage, fruit and cones into property grounds or lodged within structures. This is often referred as a seasonal nature problem by LPA's and pruning works requested as a consequence of this seasonal occurrence is often refused.
- 6.16.2 Consideration into this seasonal occurrence when proposing new development plans will help in minimising issues experienced by people living in close proximity to trees.
- 6.16.3 Within the current plans, any Autumnal leaf fall has been considered in view of the proposed structures and proximity to the trees. Although the clients show appreciation to the trees gutter maintenance could pose a future problem.

7. Arboricultural Method Statement

7.1. Issues to be addressed within an Arboricultural Method Statement

7.1.1. This statement details the general methodology for the implementation of any aspects which have the potential for any loss or damage to the retained trees.

7.2. Facilitation Tree Works

7.2.1. Tree works, as indicated in the table below (Table 7.1) have been identified as a direct result of implementing the proposal.

7.2.2. Any additional tree works collated considers facilitating the proposal implementation with integration of a more balanced desirable layout collocation and have been considered necessary or appropriate in the interests of good arboricultural management.

7.2.3. Facilitation tree works identified for T6, T7, T8, T9, T10, T11, T12, T13, T15, T16, T17, T18, T19 and T20 should be carried out prior to the erection of any protective fencing and/or installation of any no-dig product to minimise the risk of unnecessary damage to the tree.

7.2.4. Any tree works should be carried out using the principles and practices described in British Standards 3998:2010 – Tree Work – Recommendations

Table 7.1: Summary of Necessary & Recommended Tree Works

Tree Ref. No.	Species	Category	Recommended Tree Works
T6	Norway Maple (<i>Acer platanoides</i>)	B1	Facilitation pruning to crown lift over access road for 5.2m clearance.
T7	Norway Maple (<i>Acer platanoides</i>)	B1	Facilitation pruning to crown lift over access road for 5.2m clearance.
T8	Norway Maple (<i>Acer platanoides</i>)	B1	Facilitation pruning to crown lift over access road for 5.2m clearance.
T9	Norway Maple (<i>Acer platanoides</i>)	B1	Facilitation pruning to crown lift over access road for 5.2m clearance.

T10	Norway Maple (<i>Acer platanoides</i>)	B1	Facilitation pruning to crown lift over access road for 5.2m clearance.
T11	Norway Maple (<i>Acer platanoides</i>)	B1	Facilitation pruning to crown lift over access road for 5.2m clearance.
T12	Norway Maple (<i>Acer platanoides</i>)	C2	Proposed removal including stump.
T13	Robinia (<i>Robinia pseudoacacia</i>)	B1	Facilitation pruning to crown lift over access road for 5.2m clearance.
T15	Norway Maple (<i>Acer platanoides</i>)	C1	Facilitation pruning to crown lift over access road for 5.2m clearance.
T16	Norway Maple (<i>Acer platanoides</i>)	C1	Facilitation pruning to crown lift over access road for 5.2m clearance.
T17	Norway Maple (<i>Acer platanoides</i>)	B1	Facilitation pruning to crown lift over access road for 5.2m clearance.
T18	Norway Maple (<i>Acer platanoides</i>)	C1	Facilitation pruning to crown lift over access road for 5.2m clearance.
T19	Wild Cherry (<i>Prunus avium</i>)	C1	Facilitation pruning to crown lift over access road for 5.2m clearance.
T20	Norway Maple (<i>Acer platanoides</i>)	B1	Facilitation pruning to crown lift over access road for 5.2m clearance.

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7.3. Tree Protection Plan

- 7.3.1. The TPP as seen in Appendix 2, read in conjunction with this report and the proposed layout, informs and describes the required tree protection measures for the proposed retained trees.
- 7.3.2. This TPP should be read in conjunction with the Tree Survey Schedule (Appendix 1) which will outline the linear radial distances for the erection of the protective fencing and extent of ground protection measures needed for the retained trees.

7.4. Erection of Protective Fencing and boarding

- 7.4.1. Protective fencing should be erected as per the provided TPP measured using the linear distances as specified within the Tree Survey Schedule and constructed prior to any commencement of work on site.
- 7.4.2. The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts and fit for purpose in excluding construction activity. Barriers should be maintained to ensure that they remain rigid and complete. Illustrated in Figure 7.2 below.

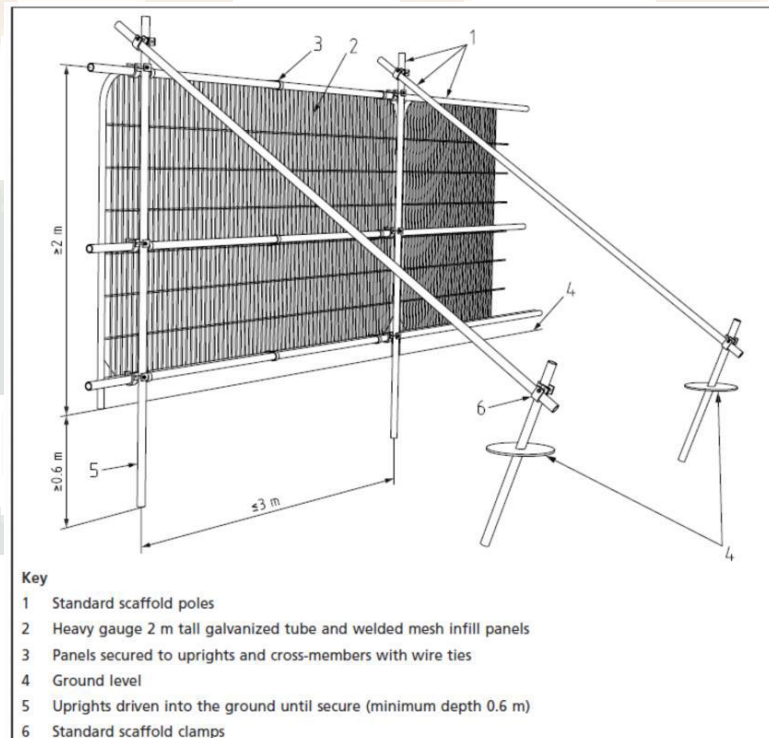


Figure 7.2 Default specification for protective barrier © British Standards Institute 2012

- 7.4.3. All-weather notices should be attached to the fencing; a suitable example for use has been attached in Appendix 6.

- 7.4.4. On erection of the fencing the area within it should be regarded as sacrosanct and not removed or altered without prior consultation from the project Arboriculturist (7.5.1) and, where necessary, Local Planning Authority approval.
- 7.4.5. It might be feasible on some sites to use temporary site office buildings as components of the tree protection barriers, provided these can be installed and removed without encroachment or damage of the retained trees or their RPA's.
- 7.4.6. Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, such as the presence of underground services or contact avoidance with structural roots, an alternative specification should be prepared by the project Arboriculturist. For example, 2m tall welded mesh panels on rubber or concrete feet as illustrated in Figure 7.3 (see below).

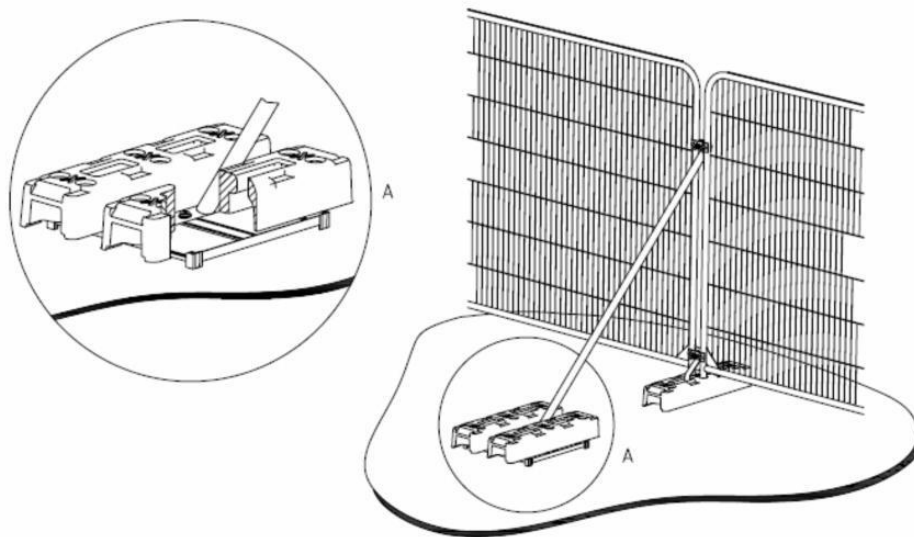


Figure 7.3 Stabilizer strut mounted on block tray © British Standards Institute 2012

- 7.4.7. Access within the RPA, which may be required within the RPA of T2, T3, T4 & T5, to enable foot traffic and scaffolding can be adopted using the following system, if in agreement with the Local Planning Authority. Barriers must be positioned at the edge of the agreed working zone and the installation of ground protection in the form of a single thickness scaffold boards on top of a compressible layer onto a geotextile, or supported by scaffold, may be acceptable. See Figure 7.4 below.

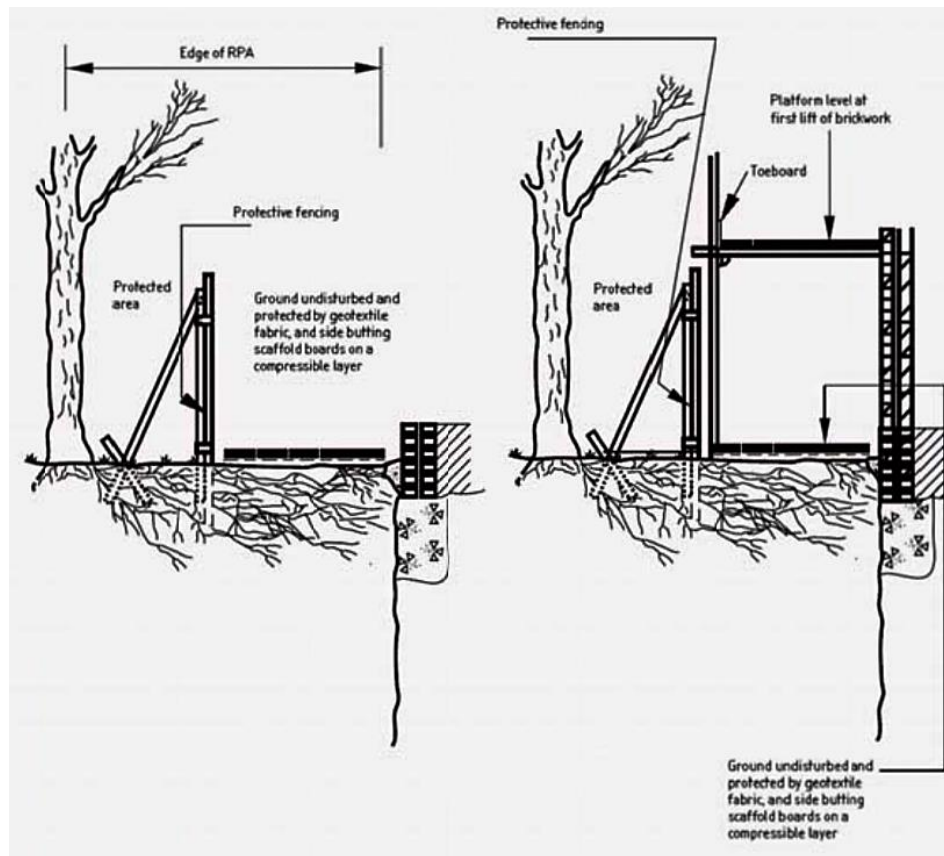


Figure 7.4 Stabilizer strut mounted on block tray © British Standards Institute 2005

7.5. Site Monitoring

- 7.5.1. It is recommended that a Project Arboriculturist is appointed prior to the commencement of any works and retained for the duration of the project.
- 7.5.2. The appointed Arboriculturist can assist in monitoring Arboricultural site activity in association with an accountable/auditable system.
- 7.5.3. In the event of any additional ground protection requirements, incursions into the RPA or root pruning operations the appointed Arboriculturist should be consulted prior to commencement of operations.

7.6. Ground Works & Demolition

- 7.6.1. The erection of protective fencing, as per the TPP prior to the commencement of any works on site allows ground works to be undertaken in consideration of the sacrosanct of the RPA preventing any adverse effects and/or impacts on the retained trees.
- 7.6.2. When demolishing a structure (including underground structures) within what would otherwise be the RPA, barriers should be erected, and ground protection

installed (see 6.2.6), to protect the underlying soil to the edge of the existing structure. Also review section 6.5 within this report.

- 7.6.3. All plant and vehicles engaged in demolition works should either operate outside the RPA, or run on the ground protection (see 6.2.6). Where such ground protection is required, it should be installed prior to commencement of operations.
- 7.6.4. The advice of an arboriculturist should be sought where underground structures present within the RPA are, or will become, redundant. In general it is preferable to leave such structures in situ, as their removal could damage adjacent tree roots.
- 7.6.5. Where an existing hard surface is scheduled for removal, care should be taken not to disturb tree roots that might be present beneath it. Hand-held tools or appropriate machinery should be used (under arboricultural supervision) to remove the existing surface, working backwards over the area, so that the machine is not moving over the exposed ground. If a new hard surface is to be laid, it might be preferable to leave any existing sub-base in situ, augmenting it where required.

7.7. Soil Compaction and Remediation Measures

- 7.7.1. Soil compaction caused by development operations lacks suitable conditions needed for the survival and growth of existing or new vegetation. This is a common cause of tree mortality after development completion.
- 7.7.2. Compacted soils critically affect surface water absorption and gaseous exchange between the roots and the external environment consequently affecting nutrient uptake impeding or restricting root formation.
- 7.7.3. In all circumstances soil compaction should be avoided around existing or proposed vegetation and tree planting locations.
- 7.7.4. If soil compaction has occurred in the vicinity of existing trees remedial works can be undertaken to rectify the problem. This could include sub-soil aeration by use of an air spade, integration of organic matter and nutrients to reinvigorate the host soils.
- 7.7.5. No Heavy mechanical cultivation such as ploughing or rotavation should occur within the RPA.

- 7.7.6. Any cultivation operations inclusive of the RPA are to be undertaken carefully by hand in order to minimize damage to the tree and its rooting system following guidelines in NJUG Volume 4 (2010) see Appendix 7.

7.8. Construction Works

- 7.8.1. The erection of protective fencing, as per the TPP prior to the commencement of any works on site allows construction works to be undertaken in consideration of the sacrosanct of the RPA preventing any adverse effects and/or impacts on the retained trees.
- 7.8.2. All plant and vehicles engaged in ground works should either operate outside the RPA, or run on ground protection (see 6.2.6) and Appendix 8.
- 7.8.3. Where construction works such as the erection of new boundary fencing is proposed within the RPA of retained trees then its installation should be carried out adopting the principles of the NJUG Volume 4 (2010). Operatives handout viewable in Appendix 7.

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7.9. Contractors Storage, Parking & Access

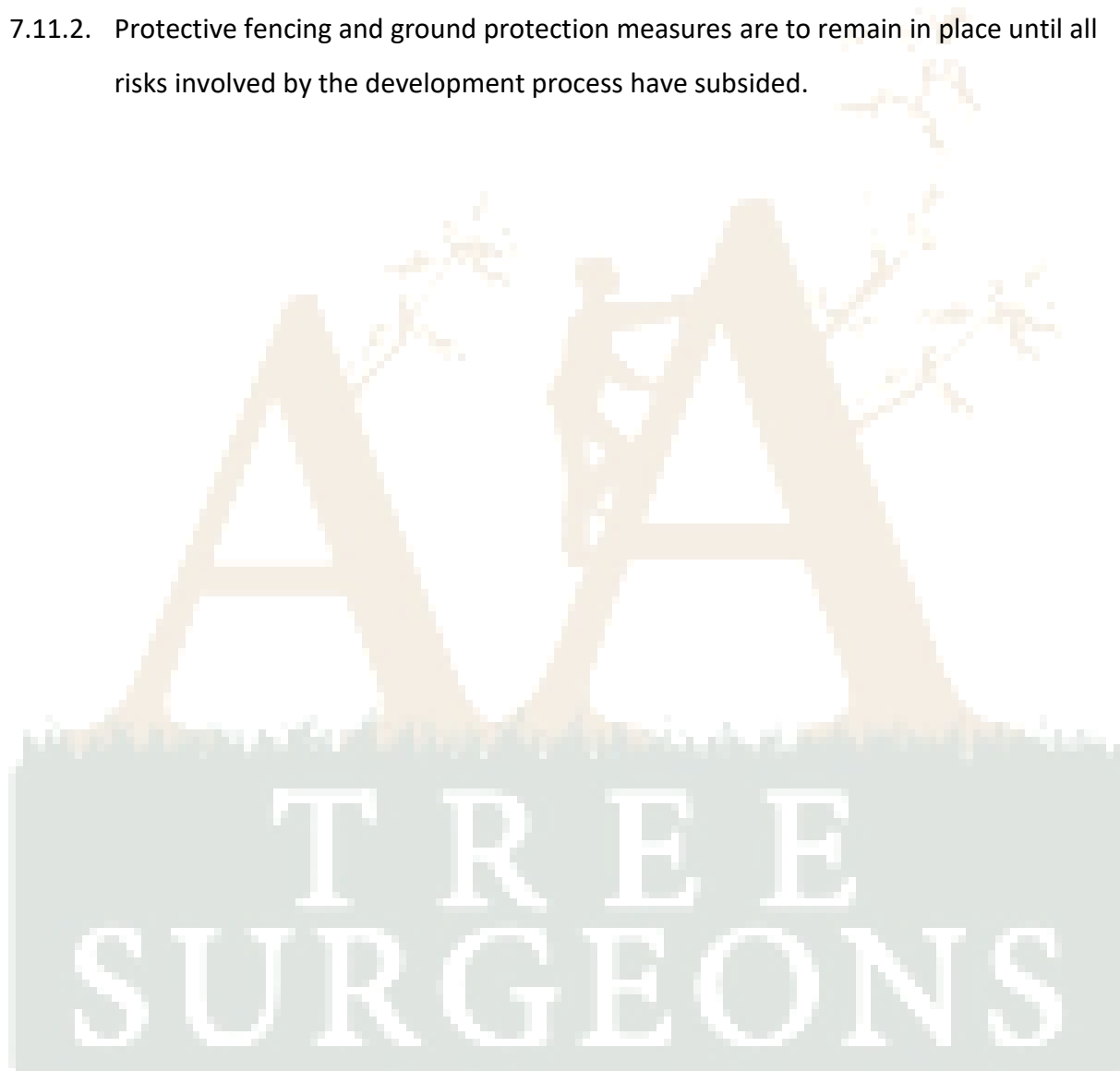
- 7.9.1. Provisions for any contractor's welfare facilities, site offices, parking, storage of materials, plant, construction spoil or mixing of working materials should be done outside the RPA.
- 7.9.2. Any facilities for the storage of oils, fuels or chemicals shall be sited on impervious bases and surrounded by impervious bund walls. The volume of the bund compound shall be at least equivalent to the capacity of the tank, largest tanks or combined tanks if multiple, plus 10%. All filling points, vents, gauges and sight glasses shall be located within the bund pointing downwards with no drainage into any watercourse land or underground strata. Associated pipework shall be located above ground and protected from accidental damage.

7.10. No-Dig Surfacing

- 7.10.1. Proposals have been submitted into the implementation of a no-dig surfacing for this development site on the footpath to the south of the proposed sports hall. Generic guidance is given below, should implementation become a requirement, in respect of its installation methodology. The outline requirement of the no-dig surfacing to be implemented can be viewed on TPP in Appendix 2.
- 7.10.2. Should existing hard surfacing need to be replaced it should be retained as temporary ground protection within the RPA for the duration of the construction period. When removed done so carefully using hand tools with immediate replacement of no-dig surfacing as described in section 6.6 and Appendix 8.
- 7.10.3. Exposure of the RPA on removal of existing hard surfacing should be treated as sacrosanct and no intervention should take place within it.
- 7.10.4. Product specific manufacturer's installation guidelines should be adhered to.
- 7.10.5. No-dig surfacing is required within the RPA's of T2, T3, T4 & T5 and should be set out to product specific manufacturer's installation guidelines following specifications set out in section 6.5 of this report and Appendix 7 – Typical 3 Dimensional 'No-dig' Installation Methodology.

7.11. Completion

- 7.11.1. Upon project completion, advice should be sought from the project Arboriculturist in coordination with the removal of any protective fencing, boarding and ground protection. If necessary, a re-survey of the retained trees to investigate on any symptoms of damage and/or stress in association with the development operations.
- 7.11.2. Protective fencing and ground protection measures are to remain in place until all risks involved by the development process have subsided.



7.12. Contacts

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Enderby, Leics. LE19 4XT. Tel: 07970 860 914, Email: ehyett@s2e.org.uk



Appendix 1 – Tree Survey Schedule



Appendix 2 – Tree Survey and Protection Plan



Appendix 3 – Andrew Harrison Curriculum Vitae

Professional Qualifications

Broomfield College – BTEC First Diploma in Horticulture (2001)
Broomfield College – National Certificate in Horticulture (2002)
Broomfield College – National Certificate in Arboriculture (2003)
City & Guilds NPTC CS30 – Maintain the Chainsaw (2002)
City & Guilds NPTC CS36 – Cross-cut and Stack Produce (2002)
City & Guilds NPTC CS38 – Climb Trees and Perform Aerial Tree Rescue (2002)
City & Guilds NPTC CS31 – Fell Small Trees (2003)
City & Guilds NPTC CS39 – Operate Chainsaw from a Rope and Harness (2003)
City & Guilds NPTC CS40 – Carry out Pruning Operations (2007)
City & Guilds NPTC CS41 – Carry out Dismantling Operations (2007)
Lantra – Professional Tree Inspection (2013)
Arboricultural Association – Tree Pests, Diseases and Fungi (2014)
Lantra – Arboriculture and Bats (2015)
City & Guilds NPTC – Safe use of Manually Fed Wood-chipper (2015)
National Trust – Tree Veteranisation (2016)
National Trust – Veteran Tree Management (2016)
Lowe Maintenance – Ash Dieback Course (2020)
Myerscough College – Foundation Degree in Arboriculture (2015-2017)

Career

2003-2005 – Groundsman to Foreman at Forest Farm Tree Services
2005-2012 – Foreman at Ian Trueman Specialist Tree Services
2012-2018 – Part time Assistant Tree Officer at Amber Valley Borough Council
2012 – Director of AA Tree Surgeons Ltd. (www.aatreesurgeons.co.uk)

Appendix 3 cont. – Thomas Fowler Curriculum Vitae

Professional Qualifications

Broomfield College – Environmental Conservation Lvl 2 (2004-2005)

Broomfield College – Countryside Management Lvl 3 (2005-2007)

Broomfield College – Lvl 3 BTEC National Award in Forestry and Arboriculture (2007-2008)

City & Guilds NPTC CS30 – Maintain the Chainsaw (2008)

City & Guilds NPTC CS36 – Cross-cut and Stack Produce (2008)

City & Guilds NPTC CS38 – Climb Trees and Perform Aerial Tree Rescue (2009)

City & Guilds NPTC CS31 – Fell Small Trees (2008)

City & Guilds NPTC CS39 – Operate Chainsaw from a Rope and Harness (2009)

City & Guilds NPTC – Safe use of Manually Fed Wood-chipper (2009)

Lantra – Professional Tree Inspection (2023)

Arboricultural Association – Professional Membership (www.trees.org.uk)

Career

2008-2010 – Groundsman to Climber at Ian Trueman Specialist Tree Services

2010-2011 – Climber at Nottingham City Council

2011-2012 – Tree Officer at Nottingham City Council

2012-Current – Lead climber and consultant of AA Tree Surgeons Ltd

(www.aatreesurgeons.co.uk)

TREE
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Appendix 4 - Life Stage and Condition Key

Condition	
Good	Trees are relatively free from defects, abiotic, biotic or structural and show normal vitality signs comparable to similar species within the same environment.
Fair	Trees exhibit some minor/manageable defects or evidential minor remedial pruning cuts present and showing normal vitality signs comparable to similar species within the same environment.
Poor	Trees exhibit a high level of defects with or without subsequent significant past pruning works. Showing relatively low vitality signs comparable to similar species within the same environment.
In Decline	Trees nearing the end of useful life expectancy and displaying low vigour and branch retrenchment.
Life Stage	
Newly Planted	Trees suspected to be planted in the past 5 years.
Young	Trees considered to be within the first third of their full life expectancy.
Semi to Early Mature	Tree has not yet reached full maturity and considered to be within their second third of full life expectancy.
Mature	Trees considered to be within their final third of full life expectancy.
Over Mature	Tree is described as having exceeded its full life expectancy but yet to replicate features typical of a veteran tree.
Veteran	Tree exhibits signs as those described in 'Veteran Trees A Guide To Good Management (Reed 2000).

A Typical useful life expectancy of common tree species (Helliwell 2008)

Years	Tree Species
300+	Yew
250-300	Common Oak, Sweet Chestnut, London Plane, Sycamore, Limes, Scots pine
150-250	Cedar of Lebanon, Hornbeam, Beech, Tulip tree, Norway maple, Corsican pine, Common ash
100-200	Norway Spruce, Walnut, Red Oak, Horse Chestnut, Field Maple, Monkey Puzzle, Mulberry, Pear
60-100	Rowan, Whitebeam, Apple, Wild Cherry, catalpa, Robinia, most Poplars, Willows, Cherries, Alders and Birches

Appendix 5 – Scale drawing of Proposed Development



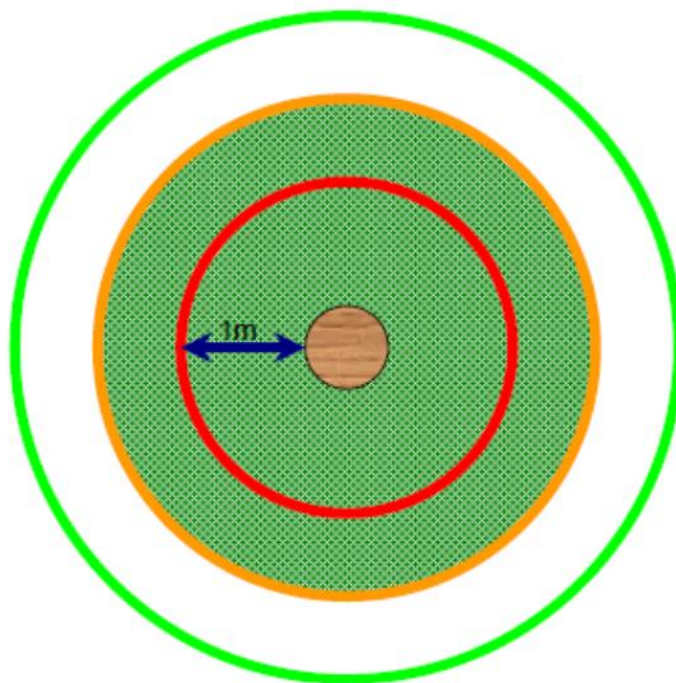
Appendix 6 - Protective Fencing Signage



Appendix 7 – NJUG Volume 4 Operatives Handout



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



TREE PROTECTION ZONE

Key to Diagram



Trunk of Tree



Spread of canopy or branches



PROHIBITED ZONE – 1m from trunk. Excavations of any kind must not be undertaken within this zone unless full consultation with Local Authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.



PRECAUTIONARY ZONE – 4 x tree circumference. Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with Local Authority Tree Officer if in any doubt.



PERMITTED ZONE – outside of precautionary zone. Excavation works may be undertaken within this zone however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.

DAMAGE TO TREES

Tree roots keep a tree healthy and upright. Most roots are found in the top 600mm of soil and often grow out further than the tree's height. The majority of these roots are very fine; even close to a tree few will be thicker than a pencil. Most street tree roots grow under the footway but may also extend under the carriageway. If roots are damaged the tree may suffer irreversible harm and eventually die.

PROTECTING ROOTS - DO'S and DON'TS

There are three designated zones around a tree each of which has its own criteria for working practices.

THE PROHIBITED ZONE

Don't excavate within this zone.

Don't use any form of mechanical plant within this zone

Don't store materials, plant or equipment within this zone.

Don't move plant or vehicles within this zone.

Don't lean materials against, or chain plant to, the trunk.

Do contact the local authority tree officer or owner of the tree if excavation within this zone is unavoidable.

Do protect any exposed roots uncovered within this zone with dry sacking.

Do backfill with a suitable inert granular and top soil material mix as soon as possible on completion of works.

Do notify the local authority tree officer or the tree's owner of any damage.

THE PRECAUTIONARY ZONE

Don't excavate with machinery. Where excavation is unavoidable within this zone excavate only by hand or use trenchless techniques.

Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

Don't repeatedly move / use heavy mechanical plant except on hard standing.

Don't store spoil or building material, including chemicals and fuels, within this zone.

Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

Do backfill the trench with an inert granular material and top soil mix. Compact the backfill with care around the retained roots. On non highway sites backfill only with excavated soil.

Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.

Do notify the local authority tree officer or the tree's owner of any damage.

THE PERMITTED ZONE

Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

Do use caution if it is absolutely necessary to operate mechanical plant within this zone.

Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

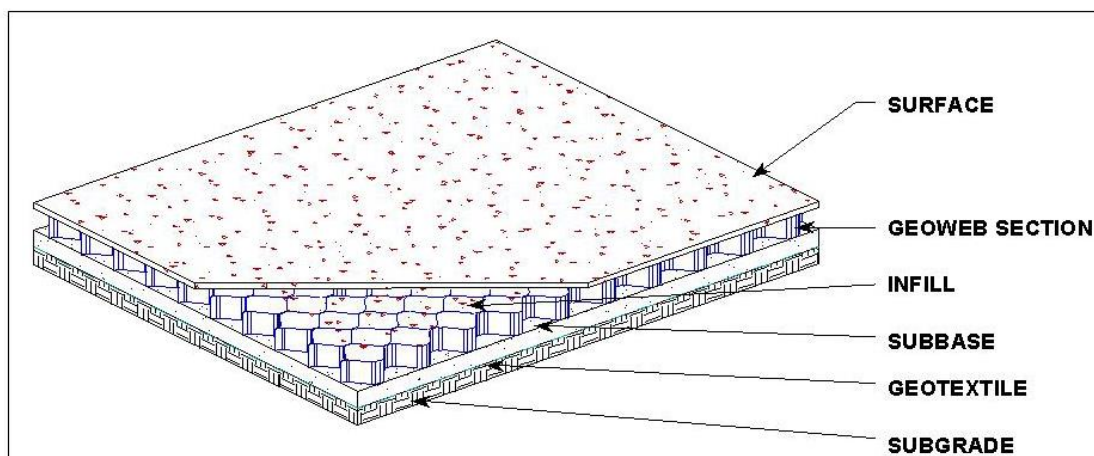
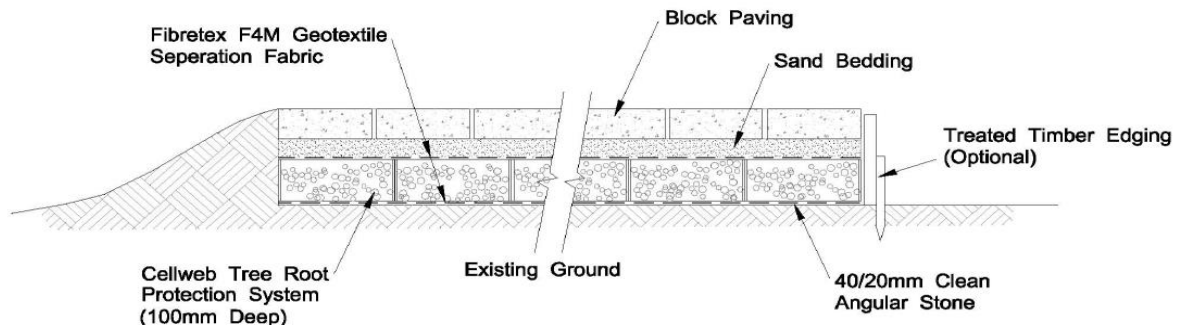
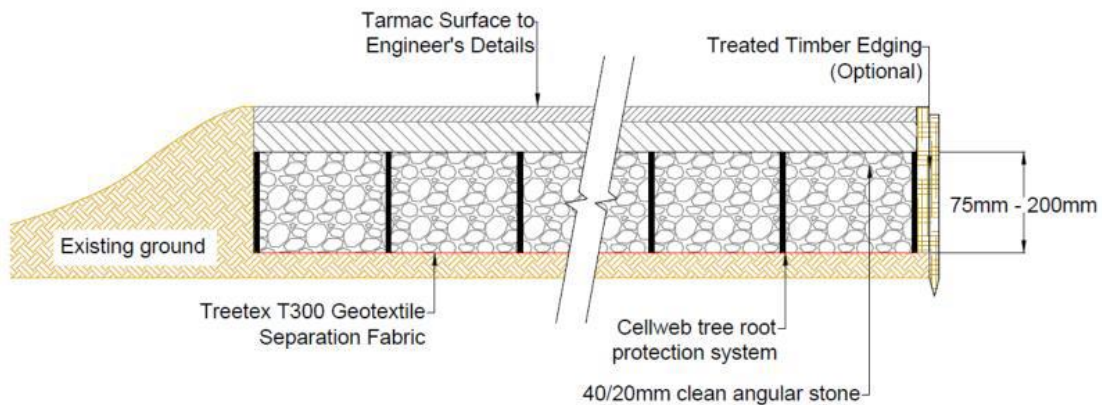
Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.

Do notify the local authority tree officer or the tree's owner of any damage.

Appendix 8 – Typical 3 Dimensional ‘No-dig’ Installation Methodology

1. The construction area should be levelled by filling hollows and removing protrusions and hard landscaping. No soil excavation, other than the removal of the turf layer (no more than 25mm depth), should be carried out during this process and any filling material used should be porous, such as washed sand, to allow water and oxygen to reach the soil.
2. If any roots are to be pruned, sharp cutting tools should be used to ensure that damage to the root system is minimized. No roots, greater than 25mm in diameter should be pruned where possible.
3. Lay G4 Geotextile over existing ground between pegged timber edgings if used, ensuring overlaps of 300mm minimum. Temporarily retain G4 Geotextile with either stakes or weights.
4. Install 8 Number 12mm diameter steel pins across the area to be covered by one panel of the confinement system (the product). The pins shall be orientated in order that each panel of the product may be laid over and remain in an expanded state.
5. Install the product over steel pins; where necessary, remove surplus product with a craft knife.
6. Immediately adjacent panels of the product shall be connected by providing four staples at each overlap.
7. The expanded product panels shall be infilled with 40/20mm clean angular stone using a Mini Excavator, under the direction of a chartered arboriculturist. The product shall be overfilled by 50mm to create a surcharge over the product which protects the leading edges of the cells. The Mini Excavator may track over areas of infilled product panels only i.e. it must not be operated/driven/stored outside the area over which the product is installed and within the RPA.
8. The infilled aggregate shall be rolled and whacked to ensure compaction.
9. Apply final surface e.g. block paving, tarmac etc.

10. Soil may be mounded up to the cellweb system to create sloped ground separating the new surfacing with the existing ground but use caution not to raise the existing soil level within the RPA, particularly against the trees stem.
11. Product specific manufacturer's installation guidelines should be adhered to, their individual design specification will determine the cellweb depth.



Appendix 9 - References

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