BS5837:2012 Tree Survey Report

Proposed Care Home Development, Coventry Road, Hinckley, Leicestershire, LE10 0JR

24th March 2025

ENVIRONMENTAL AND SUSTAINABILITY CONSULTANTS

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Contents

Executive Summary

The trees on this site have been assessed in accordance with BS 5837:2012 "Trees in relation to design, demolition and construction - Recommendations".

This report was initially prepared for the construction of a new residential development on the former leisure centre off Coventry Road, Hinckley, Leicestershire, LE10 0JR which was granted planning permission in 2019. This report now addresses a new application for the construction of a new care home building with 72 bedrooms, including car parking, landscaping and associated works.

The report includes a survey of 37 individual trees, and 4 groups comprising 42 trees located within and in proximity of the former leisure centre, i.e. a total of 79 trees. However, this report is now only concerned with the trees within and close to the boundary for the new care home application, which includes T13-T36, G5 and G6. All other trees are outside the application boundary beyond influence from the proposed development.

The site comes under the planning jurisdiction of Hinckley and Bosworth Borough Council, and a search of their Tree Preservation Order Online Map confirms that there are no trees on the site protected by Tree Preservation Orders. However, there is a group of trees within the vicinity of the site that are protected by Tree Preservation Orders. These trees are located to the north of the site, north of Trinity Vicarage Road which lies just beyond the site boundary. The closest conservation area to the proposed site is Hinckley Town Centre, located to the east of the site, off Trinity Lane. The site itself is not located within the Conservation Area.

There is a mix of trees types surrounding the site, mainly Leyland Cypress, Lime, and Silver Birch, with other species including Cherry, Italian Alder, Oak, Hornbeam, Lombardy Poplar, Small Leaved Lime, Red Maple, Norway Maple, Indian Bean, Pine and Apple.

Generally, a number of the individual trees on and around the site are unremarkable with limited merit, 15 trees have been categorised as C, ie trees of low quality. Other trees are higher quality trees, 5 trees have been categorised as B, ie trees of moderate quality. There is 2 category U tree, ie trees which are dead, dying or with serious defect, and there are 2 category A trees, ie trees of high quality.

Out of the 2 groups on the site, both have been categorised as C, ie trees of low quality.

Of the 24 individual trees and 2 groups of trees, 5 individual trees and 6 trees within the group G6 need to be removed to facilitate construction of the new care home.

The remaining 19 individual trees and single group can be retained as part of the final development. 4 of these trees are categorised as B, ie trees of moderate quality and 11 trees are category C ie trees of low quality. The 2 category A trees, ie trees of high quality, can be retained as part of the new development. The single category C group of trees and the 2 category U trees can also be retained.

Recommendations have been made within the report to safeguard the retained trees and protect them from any damage from construction work including erection of protective fencing to separate from the construction activities and the use of a “no-dig” cellular confinement root protection system where new hardstanding is proposed within the RPA of tree T26 and T31 which is a category A mature Cedar tree and a category A mature Indian Bean tree to the south of the proposed building.

There is an opportunity to introduce new tree planting to increase the diversity of tree species in the area and increase the biodiversity net gain of the site. Landscape proposals for the development have been prepared which include the planting of a number of native individual trees.

As long as the recommendations within this report are fully adhered to the development will have no detrimental impact or effect to the existing trees adjacent to the site. New trees will

be planted to mitigate for the loss of some existing trees and the remaining existing trees including two category A trees, can be retained and successfully integrated into the completed development.

1 Introduction

1.1 This tree survey report has been prepared in respect of the planning application for the proposed construction of a new residential care home development in order to:

- Assess the quality of the trees in proximity to the proposed building work;
- Investigate any legal protection of the trees;
- Provide an Arboricultural Assessment with regard to the proposals; and
- Recommend measures which will suitably protect the trees during the construction process

1.2 The proposal is for the construction of a new 3 storey care home building containing 72 bedrooms including car parking, landscaping and associated works.

1.3 In accordance with recommended best practice, the Arboricultural information is provided within this report in accordance with BS5837:2012.

1.4 The report is based on the following drawings which have been supplied by the client's architect:

- Topographical survey by CLB Surveys, 1104-1C dated April 2010
- 250318 G40003 A002 Proposed Site Ground Floor Plan by Green 4 Architects, March 2025

2 Limitations & Methodology

2.1 The survey is concerned with the arboricultural aspects of the site only. The trees, on site have been surveyed and classified in accordance with BS 5837:2012 "Trees in relation to design, demolition and construction - Recommendations".

2.2 The survey was undertaken using the Visual Tree Assessment (VTA) methodology to conduct a preliminary assessment of the above ground portion of the tree.

2.3 Trees are large dynamic organisms whose health and condition can change rapidly, therefore due to their changing nature and other site considerations, this report and any recommendations made are valid for a 12 month period following the site survey which was conducted on 17th July 2018. After a period of 5 years, the information in this survey should not be relied upon. The site was revisited on 24th of February 2025 in order to re-assess the existing trees against the new proposals for a 72 bedroomed care home.

Third Party Liability

2.4 The limit of Encon Associates Limited indemnity over any matter arising out of this report extends only to the instructing client. Encon Associates Limited cannot be held liable for any third party claim that arises following this report.

Subsistence Risk

2.5 This report is primarily concerned with the condition of existing trees and the application of current guidance for their retention. Any discussion of soil characteristics is only presented where this may have a direct effect on tree growth. This report does not seek to address the specific area of subsidence risk assessment or damage to buildings or structures.

Survey Methodology

2.6 The survey was undertaken from ground level with the aid of binoculars where necessary.

2.7 No aerial inspection nor invasive probing or drilling has been undertaken. No excavations were carried out nor soil or root samples taken.

2.8 The height of each subject tree was measured on site using an electronic Disto measuring device.

2.9 The canopy spread of each subject tree was measured on four compass points using measuring tape.

2.10 The locations of the trees have been taken from the topographical survey provided. We cannot guarantee the absolute accuracy of tree locations; however, the positions are believed to be accurately represented based on the GPS locations used by the surveyor. Encon Associates cannot be held responsible for any discrepancy in the position of the trees.

2.11 The information contained within the "Schedule of Trees" includes the following for each surveyed tree:

1 Tree reference number – cross referenced with the Tree Survey Plan A7099-01 and Tree Constraints Plan A7099-02 and Tree Protection Plan A7099-03.
2 Species – have been given their common and botanical name where specifically known
3 Height – measured on site using an electronic Disto measuring device
4 Stem diameter – have been calculated by measuring the circumference at a height of 1.5m from ground level to determine the diameter
5 Branch spread – the circles indicated on the tree survey plan are a representation of the overall spread of the crown in each compass direction
6 Height of crown clearance – given in metres above adjacent ground level
7 Age class – young (YNG) up to 10 years, 1/3 life expectancy semi-mature (SM), early mature (EM) 2/3 life expectancy, mature (M) over 2/3 life expectancy, over mature (OM) declining/moribund, veteran (V) exceptionally old tree towards the end of its life, (D) dead
8 Condition & Comments – good (G) sound tree needing little or no attention, fair (F) minor but rectifiable defects, poor (P) major structural and/or physiological defects that would be inappropriate to retain and/or expensive, dead (D) no longer alive or those dying and unlikely to recover. General observations on 'physiological/structural condition' and 'preliminary management' is also provided
9 Estimated remaining contribution – in years e.g. <10, 10+, 20+ and 40+
10 Category grading – have been given a grade to classify the quality of each tree based on the Condition Classes and subcategories given overleaf

11 RPA – Protective measures as per BS 5837 section 4.6 which states that an area based on a radius equal to 12 times the stem diameter should be protected against damage to roots known as the "Root Protection Area" (RPA) given in m^2. A radius has also been given shown around each tree on the drawing.

2.12 Category grading for the assessment of tree quality (in accordance with Table 1 "Cascade chart for tree quality assessment" within BS 5837:2012) is described below:

U Trees unsuitable for retention - Those in such a condition that they cannot be realistically retained as living trees in the context of the current land use for longer than 10 years

A Trees of high quality - With an estimated remaining life expectancy of at least 40 years

B Trees of moderate quality - With an estimated remaining life expectancy of at least 20 years

C Trees of low quality - with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm

2.13 Subcategories grading for the assessment of tree quality (in accordance with Table 1 "Cascade chart for tree quality assessment" within BS 5837:2012) is described below:

1 Mainly arboricultural qualities - Trees that are a particularly good example of their species, especially if rare or unusual

2 Mainly landscape qualities - Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features

3 Mainly cultural values, including conservation - Trees, groups or woodlands of significant conservation, historical, commemorative or other value eg veteran trees or wood-pasture

For full description of subcategories, refer to Table 1, page 9 of the BS 5837:2012 document.

3 Project Requirements & Site Overview

Site Context

3.1 The location of the proposed work currently consists of an empty site following the demolition of the leisure centre on Coventry Road, Hinckley. The land is located on Coventry Road, (B4667) which runs to the south of the site, from east to west.

3.2 The site is located to the north-west of the junction between Coventry Road and Trinity Lane. In the immediate vicinity of the site, there is a Holy Trinity Church to the north, and a garage and some restaurants to the south.

3.3 To the north and west of the site there are car parking facilities. There are residential dwellings surrounding the site to the north and the south. To the east there are food & drink, and retail outlets. To the west there is a meeting centre. In the wider vicinity, the site is surrounded by residential areas, a Sainsbury's Superstore, a hospital and Granville Road Park.

Proposed Development

3.4 There is an existing planning consent for the construction of residential development across the whole site. This report now addresses a new application for the construction of a new care home building with 72 bedrooms, includes car parking, landscaping and associated works.

4 Baseline Factors

Tree Preservation Orders (TPO) or Conservation Area (CA) Designation

4.1 The site comes under the planning jurisdiction of Hinckley and Bosworth Borough Council, and a search of their Tree Preservation Order Online Map confirms that there are no trees on the site protected by Tree Preservation Orders. However, there is a group of trees within the vicinity of the site that are protected by Tree Preservation Orders. These trees are located to the north of the site, north of Trinity Vicarage Road which lies just beyond the site boundary. The closest conservation area to the proposed site is Hinckley Town Centre, located to the east of the site, off Trinity Lane. The site itself is not located within the Conservation Area.

Existing Trees on Site

4.2 There is a mix of trees types surrounding the site, mainly Leyland Cypress, Lime, and Silver Birch, with other species including Cherry, Italian Alder, Oak, Hornbeam, Lombardy Poplar, Small Leaved Lime, Red Maple, Norway Maple, Indian Bean, Pine and Apple.

4.3 Generally, a number of the individual trees on and around the site are unremarkable with limited merit, 15 trees have been categorised as C, ie trees of low quality. Other trees are higher quality trees, 5 trees have been categorised as B, ie trees of moderate quality. There is 2 category U tree, ie trees which are dead, dying or with serious defect, and there are 2 category A trees, ie trees of high quality.

4.4 Out of the 2 groups on the site, both have been categorised as C, ie trees of low quality.

4.5 Details of the locations and Root Protection Areas (RPA) are provided on the Tree Protection Plan (TPP) appended to this report.

4.6 A schedule of trees and their condition including their category grading and RPA radius is attached in Appendix A.

Root Protection Area (RPA)

4.7 The Root Protection Area (RPA) of a tree is defined in BS5837 as the area surrounding the trunk that contains sufficient rooting volume to ensure the survival of the tree and is calculated as an area based on the stem diameter of the tree.

4.8 The RPA's have been calculated in accordance with BS5837 and are detailed in the Tree Schedule located in Appendix A of this report. Where ground constraints have, or are likely to have, had an effect on tree root development, for example, where level changes or changes in rooting medium eg heavily compacted ground, areas of hard standing etc, have influenced tree root growth, the RPA is unlikely to follow an exact circle and will probably be more elliptical in shape.

4.9 Detailed analysis of the ground conditions has not been carried out, however a visual assessment concluded that the trees are generally growing in undeveloped grassed areas, with some in proximity to fences and other structures.

4.10 Tree root systems are typically concentrated within the uppermost 600mm of the soil, although it may be deeper within the dense mass of roots and soil closer to the base of the tree. The development of the root system is influenced by the availability of water, nutrients, oxygen and soil penetrability i.e. how compacted the ground is and therefore the root spread does not generally show the symmetry seen in the branch system. The root systems of all trees are expected to have been affected by their growing environment

4.11 The footprint of the proposed construction work encroaches within the RPA of T26 and T31.

5 Arboricultural Impact Assessment

5.1 This section considers the implications that the proposed development may have upon the existing trees within and adjacent to the site and provides advice on solutions to any issues to ensure the retained trees are safeguarded.

5.2 Of the 24 individual trees and 2 groups of trees, 5 individual trees and 6 trees within the group G6 need to be removed to facilitate construction of the new care home.

5.3 The remaining 19 individual trees and single group can be retained as part of the final development. 4 of these trees are categorised as B, ie trees of moderate quality and 11 trees are category C ie trees of low quality. The 2 category A trees, ie trees of high quality, can be retained as part of the new development. The single category C group of trees and the 2 category U trees can also be retained.

5.4 An area of the proposed new hard surfacing is within the RPA of the category A Cedar tree (T26) and category A Indian Bean (T31) tree to the south of the proposed building which needs to be constructed using a “no-dig” cellular confinement system such as Cellweb in order to protect the tree root system close to the surface by ensuring the roots beneath are protected. The encroachment has been calculated at 9% and 4% respectively. See Appendix F for details.

5.5 As the trees are not covered by a TPO, no application is required to carry out tree works and there is no legal impediment to the tree being removed or works carried out to trees by the land owner. Any trees not within ownership of the application site must be granted permission before any tree works are carried out to them.

5.6 There is an opportunity to introduce new tree planting to increase the diversity of tree species in the area and increase the biodiversity of the site. Landscape proposals for

the development have been prepared which include the planting of a number of native individual trees.

5.7 Prior to the removal of any trees, the contractor and/or tree surgeon appointed to carry out the works must ensure any necessary regulations and/or felling licences in accordance with BS5837 are complied with and in place.

6 Tree Protection Method Statement

6.1 This section describes in detail the specific measures that should be implemented to protect the trees to be retained from harm during the construction process. A full tree protection method statement is included in Appendix C.

Protective Fencing

6.2 The existing trees within or in proximity to the application boundary which are to be retained should be protected from damage during construction operations by fencing them off from machinery circulation routes and material storage areas. The distance from the trees to the construction activity is such that damage could occur and therefore construction vehicles should be prevented from unwittingly travelling too close to the trees and causing damage to overhanging branches or compaction of the root zone.

6.3 Protective fencing as detailed in Appendix C of this report should be erected in front of the line of trees as demonstrated on the Tree Protection Plan, prior to the commencement of work to form a construction exclusion zone to prevent the storage of materials within the landscaping areas.

6.4 Where temporary construction access is needed for works within the area fenced off, in accordance with BS5837:2012, this should be facilitated by a set-back in the alignment of the tree protection barrier. The fencing should be moved back to its original location

following completion of surfacing in this area, as shown on the Tree Protection Plan in order to protect the trees throughout the remainder of the construction process. In these areas, suitable existing hard surfacing should be retained to act as temporary ground protection during construction, rather than being removed during demolition.

6.5 Where the set back of the protective fencing would expose unmade ground to construction damage or compaction, new temporary ground protection should be installed prior to working on site.

Avoiding physical damage to the roots during construction

6.6 A number of planned operations detailed in this section have the potential to impact roots, such as constructing new surfacing and excavating foundations. To avoid damage to roots, existing ground levels should be retained within the RPA, and topsoil should be retained in-situ in this area. Limited manual excavation may be acceptable provided it is carried out using hand-held tools only and preferably by compressed air soil displacement (Air Spade).

6.7 If any roots are encountered they should not be damaged and any exposed should be wrapped in dry, clean hessian sacking to prevent desiccation and to protect from rapid temperature changes. Wrapping should be removed prior to backfilling.

6.8 Roots smaller than 25mm diameter may be pruned back, making a clean cut with a sharp tool (secateurs or handsaw), except where they occur in clumps. Roots occurring in clumps or of 25mm diameter or more should be severed only following consultation with an arboriculturist, as such roots may be essential to the tree's health and stability.

6.9 Prior to backfilling, retained roots should be surrounded by topsoil or compacted sharp sand (not builders' sand due to its high salt content which is toxic to tree roots), or other loose granular fill, before soil or other suitable material is replaced. The material should be free of foreign objects that have the potential to cause injury to the roots.

Tree Pruning

6.10 The working and access space needed for the construction of the proposed development and resurfacing works may require “access facilitation pruning” carried out to some of the trees in closer proximity to the works to prevent injurious contact between construction plant and the tree canopy. A one-off tree pruning operation, which is directly necessary to provide access for operations on site, is acceptable in accordance with BS5837 as long as “the nature and effects of the pruning are without significant adverse impact on the tree physiology or amenity value”.

6.11 As the trees are not covered by a TPO no application is required to carry out work to them. Any trees not within ownership of the application site must be granted permission before any tree works are carried out to them.

6.12 All proposed tree works should be undertaken prior to the commencement of construction activities. Trees on site which have been identified to have their crowns lifted and/or access facilitation/ formative pruning must be carried in accordance with BS3998 British Standard Tree Work - Recommendations 2010 by a competent tree surgeon to the following specification:

- Where practicable, pruning should be restricted to healthy, small diameter parts of the tree to minimise the size of resultant wounds and enable these to be occluded.
- Crown lifts should include complete removal of the lowest primary branches and thereafter secondary and tertiary branches (not exceeding 50mm diameter cuts). When pruning branches back to the main stem or fork, the branch will be removed in small sections using the step cut method leaving a small stub before carrying out the final cut. Crown lifting should preferably not result in the removal of more than 15% of the live crown height, and the remaining live crown should make up at least two-thirds of the height of the tree.

- Formative pruning to branches 20mm and less in diameter to be pruned cleanly back to its point of origin, avoiding damaging the bark of the tree and ensuring the canopy maintains a natural shape. Growth greater than 20mm is to be cut back to avoid damage to the branch bark ridge and collar if applicable. All pruning carried out using a sharp handsaw or secateurs. On no account will a chainsaw be used in this operation. All shoots will be removed back to, but not into the branch collar leaving no projections or exaggerating the size of the wound.

Construction of New Surfacing

6.13 BS5837 contains Design Recommendations (7.4.2) where hard surfacing is proposed within the RPA of existing trees.

6.14 In accordance with BS5837, the part of a tree most susceptible to damage is the root system and therefore no excavations should be carried out with machinery which could damage or sever major roots. Damage can also be caused to the roots by building up material to raise existing levels within the RPA.

6.15 New permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA.

6.16 An area of the proposed new hard surfacing within the RPA of the category A Cedar tree (T26) and category A Indian Bean tree is proposed withing existing unmade ground which amounts to 9% and 4% of the overall RPA's respectively. The surfacing needs to be constructed using a "no-dig" cellular confinement system such as Cellweb in order to protect the tree root system close to the surface by ensuring the roots beneath are protected from vehicle loads by confining the sub-base and stabilising the ground. Infill is confined and ensures that downward forces are spread laterally, reducing pressure on the sub-base and avoiding compaction which can potentially damage tree roots.

6.17 Edge supports such as new kerbs within an RPA can damage tree roots where there is a need to excavate. This should be avoided by use of alternative methods of edge support including above ground non-invasive solutions.

6.18 Whilst it is unknown if any roots will actually be encountered, care must be taken when constructing the new surfacing within the RPA of existing trees to be retained. All work should be carried out by hand and not with machinery which could cause damage to the roots by severing them or compacting them. Any roots encountered should not be damaged and any exposed should be wrapped in dry, clean hessian sacking to prevent desiccation and to protect from rapid temperature changes, until the new surfacing is constructed.

Installation of New Fencing

6.19 To ensure the existing trees are not damaged during the installation of any new fencing or knee rail, the following procedures are to be strictly adhered to:

- The dashed line around each tree indicates the Root Protection Area (RPA) as calculated within the Tree Survey Report and shown on the Tree Protection plan.
- Prior to commencing any work on site, Heras type fencing is to be installed as per the detail appended to this report to separate the trees from the work
- No excavations using machinery is permitted
- Holes for fence posts are to be carefully dug by hand avoiding damage any roots which may be encountered
- No storage of materials or mixing of cement is to take place within RPA around each tree and should be done well away from the trees
- No machinery or vehicles to travel within the RPA around each tree
- Holes excavated for fence posts to be lined with polythene prior to pouring concrete to prevent cement coming into contact with any tree roots which may be present

- Extreme care to be taken when installing fence posts and panels to prevent damage to trunk or branches of the trees

Construction of Foundations

6.20 BS5837 contains Special Engineering for Foundations within the RPA (7.5) where structures are proposed within the RPA of existing trees.

6.21 The footprint of the proposed new building does not extend within the RPA of any of the existing trees to be retained, therefore no special foundations are required and no trees will be effected by the construction of the new building.

7 Conclusions

7.1 The proposal is for the construction of a new residential care home development of 72 bedrooms, including parking, landscaping and associated works.

- The report includes a survey of 24 individual trees and 2 groups of trees located within the application boundary and within proximity of the development.
- The site comes under the planning jurisdiction of Hinckley and Bosworth Borough Council, and a search of their Tree Preservation Order Online Map confirms that there are no trees on the site protected by Tree Preservation Orders. However, there is a group of trees within the vicinity of the site that are protected by Tree Preservation Orders. These trees are located to the north of the site, north of Trinity Vicarage Road which lies just beyond the site boundary. The closest conservation area to the proposed site is Hinckley Town Centre, located to the east of the site, off Trinity Lane. The site itself is not located within the Conservation Area.
- In accordance with BS5857 cascade chart for tree quality assessment, 15 trees have been categorised as C, ie trees of low quality, 5 trees have been categorised as B, ie trees of moderate quality and 2 category U trees, ie trees which are dead, dying or with serious defect. There are 2 category A trees, ie trees of high quality. The 2 groups on the site, have both have been categorised as C, ie trees of low quality.
- Of the 24 individual trees and 2 groups of trees, 5 individual trees and 6 trees within the group G6 need to be removed to facilitate construction of the new care home. The remaining 19 individual trees and single group can be retained as part of the final development. 4 of these trees are categorised as B, ie trees of moderate quality and 11 trees are category C ie trees of low quality. The 2 category A trees, ie trees of high quality, can be retained as part of the new

development. The single category C group of trees can also be retained along with the 2 category U trees.

- Recommendations have been made within the report to safeguard the retained trees and protect them from any damage from construction work including erection of protective fencing to separate from the construction activities and the use of cellular confinement root protection where new hard standing is proposed within the RPA of tree T26 and T31.
- There is an opportunity to introduce new tree planting to increase the diversity of tree species in the area and increase the biodiversity net gain of the site. Landscape proposals for the development have been prepared which include the planting of a number of native individual trees.

7.2 As long as the recommendations within this report are fully adhered to the development will have no detrimental impact or effect to the existing trees adjacent to the site. New trees will be planted to mitigate for the loss of some existing trees and the remaining existing trees, including two category A trees, can be retained and successfully integrated into the completed development.

Appendix A - Schedule of Trees

Site: Tanglewood Hinckley Date: 24th February 2025 Weather: Damp, cold

Ref	Species	Height (m)	Stem Diameter (mm)	Branch spread (m) N	E	S	W	Height crown clearance (m)	Age class	Condition & Comments	Years left	Category grading	RPA (m^2)	RPA radius
T1	Italian Alder (Alnus cordata)	14	300	5	5	5	5	3	M	Good. Twisted trunk at 6 metres. No deadwood. Not within application boundary.	20+	B1	41	3.60
T2	Italian Alder (Alnus cordata)	12	300	5	5	5	5	3	M	Good. No deadwood. Not within application boundary.	20+	B1	41	3.60
G1	Leyland Cypress (Cupressus x leylandii)	8	125	2	2	2	2	0.5	SM	Group of 12. Located beyond the boundary fence, and appear to have been initially planted as a hedge, yet have been allowed to mature into trees. Not within application boundary.	20+	B2	7	1.50
G2	Leyland Cypress (Cupressus x leylandii)	8	125	2	2	2	2	0.5	SM	Group of 9. Located beyond the boundary fence, and appear to have been initially planted as a hedge, yet have been allowed to mature into trees. Not within application boundary.	20+	B2	7	1.50
T3	Oak (Quercus)	9	425	6	6	6	6	4	M	Good. No sign of deadwood. Not within application boundary.	20+	B1	82	5.10
G3	Leyland Cypress (Cupressus x leylandii)	6-8	100	1	1	1	2	2	SM	Group of 16. Fair. Located beyond the boundary fence, and appear to have been initially planted as a hedge, yet have been allowed to mature into trees. Not within application boundary.	20	C2	5	1.20
T4	Hornbeam (Carpinus)	10	200	2	2	3	4	3	SM	Fair. Located close to car park kerb. Not within application boundary.	20	C2	18	2.40
T5	Hornbeam (Carpinus)	7	215	2	2	3	4	3	SM	Fair. Evidence of height reduction work, possily due to proximity to lamppost. Located close to car park kerb. Not within application boundary.	20	C2	21	2.58

Site: Tanglewood Hinckley Date: 24th February 2025 Weather: Damp, cold

Ref	Species	Height (m)	Stem Diameter (mm)	Branch spread (m) N	E	S	W	Height crown clearance (m)	Age class	Condition & Comments	Years left	Category grading	RPA (m^2)	RPA radius
G4	Lombardy Poplar (Populus nigra 'Italica')	22	350	2	2	2	2	3	SM	Group of 5. Good. Some deadwood. This tree is a hybrid between the White Poplar and Aspen, and grows into an impressively large tree. Not within application boundary.	20+	B2	55	4.20
T6	Lombardy Poplar (Populus nigra 'Italica')	11	300	5	5	5	5	2.5	SM	Fair. Severe lean to north-west, with a possible risk of falling. Not within application boundary.	20	C2	41	3.60
T7	Italian Alder (Alnus cordata)	125	350	3	5	5	5	1	SM	Fair. Slight lean to the south. Ivy growing on the lower trunk. Not within application boundary.	20	C2	55	4.20
T8	Italian Alder (Alnus cordata)	125	350	3	5	5	5	1	SM	Fair. Slight lean to the south. Ivy growing on the lower trunk. Not within application boundary.	20	C2	55	4.20
T9	Lime (Tilia)	10	650	4	4	4	4	2	M	Fair. Has a split that is revealing heartwood. Evidence of woodworm, and suckers at the base. There is evidence of height reduction work. Significant roots are visible above the ground. Not within application boundary.	20	C2	191	7.80
T10	Lime (Tilia)	10	750	4	4	4	4	2	M	Fair. Has a split that is revealing heartwood. Evidence of woodworm, and suckers at the base. There is evidence of height reduction work. Significant roots are visible above the ground. Not within application boundary.	20	C2	255	9.00
T11	Maple (Acer)	10	315	6	3	6	6	3	M	Good. Bark damage to the lower limbs on the western side. Not within application boundary.	20+	B1	45	3.78
T12	Lime (Tilia)	12	420	6	6	6	5	1.5	M	Good. No deadwood. Not within application boundary.	20+	B1	80	5.04

Site: Tanglewood Hinckley Date: 24th February 2025 Weather: Damp, cold

Ref	Species	Height (m)	Stem Diameter (mm)	Branch spread (m) N	E	S	W	Height crown clearance (m)	Age class	Condition & Comments	Years left	Category grading	RPA (m^2)	RPA radius
T13	Lime (Tilia)	12	450	6	6	6	5	1.5	M	Good. No deadwood. Some suckers at the base. Not within application boundary.	20+	B1	92	5.40
T14	Small Leaved Lime (Tilia cordata)	10	315	4	4	4	4	2	SM	Fair. Some minor deadwood. Native to Britain, and was once a dominant woodland tree, however today is much reduced in range. Not within application boundary.	20	C2	45	3.78
T15	Red Maple (Acer rubrum)	8	315	5	4	5	5	3	SM	Fair. Some deadwood in the lower canopy	20+	B2	45	3.78
T16	Red Maple (Acer rubrum)	8	330	5	4	5	5	3	SM	Fair. Some deadwood in the lower canopy	20+	B2	49	3.96
T17	Norway Maple (Acer platanoides)	8	330	5	4	5	5	3	SM	Fair. Some deadwood in the lower canopy. Commonly planted in Britain for ornamental purposes.	20+	B2	49	3.96
T18	Silver Birch (Betula pendula)	10	175	3	2	1	2	1	SM	Poor. Twisted stem, and major deadwood. There is a bike chain around the base of the trunk.	20	C2	14	2.10
T19	Cherry (Prunus)	7	300	7	5	3	3	2	M	Fair. Some deadwood with an unbalanced crown, and 2 lower limbs have been removed. There are some suckers at the base. The tree is past its best.	20	C2	41	3.60
T20	Silver Birch (Betula pendula)	7	150	0	0	0	0	2.5	SM	Poor. Twisted stem, leaning to the SE, with some deadwood.	<10	U	10	1.80

Site: Tanglewood Hinckley Date: 24th February 2025 Weather: Damp, cold

Ref	Species	Height (m)	Stem Diameter (mm)	Branch spread (m) N	E	S	W	Height crown clearance (m)	Age class	Condition & Comments	Years left	Category grading	RPA (m^2)	RPA radius
T21	Silver Birch (Betula pendula)	10	175	3	3	3	3	4	SM	Poor. Twisted stem and some deadwood.	20	C2	14	2.10
T22	Silver Birch (Betula pendula)	12	250	5	4	3	3	1	M	Fair. Some minor deadwood. There is a birds nest in the upper crown.	20	C2	28	3.00
T23	Silver Birch (Betula pendula)	11	Mutli-stem	3	3	2	3	1.5	M	Forks into 2 stems at 700mm (1x 125mm, 1x 150mm). Some deadwood.	20	C2	22	2.68
T24	Norway Maple (Acer platanoides)	12	Multi-stem	5	5	5	5	1	M	Fair. Forks into 4 stems at 400mm (1x 150mm, 1x 175mm, 2x 285mm). Poor condition, in decline. Large sections of bark missing, exposed heartwood.	20+	C2	113	6.01
T25	Cherry (Prunus)	7	325	6	6	4	5	2.5	M	Good. Minor deadwood.	20+	B1	48	3.90
T26	Deodor Cedar (Cedrus sp)	15	700	7	8	6	5	0.5	M	Good. A good example of the species. Major branch growth at 2.5metres forming a secondary leader.	40+	A2	222	8.40
T27	Silver Birch (Betula Pendula)	8	175	4	4	1	1	2	SM	Poor. Twisted upper stem, leaning to the north. Some deadwood.	20	C2	14	2.10
T28	Apple Tree (Malus sp)	10	315	4	4	4	4	2.5	M	Fair. Leaning to the north, with some deadwood.	20	C2	45	3.78

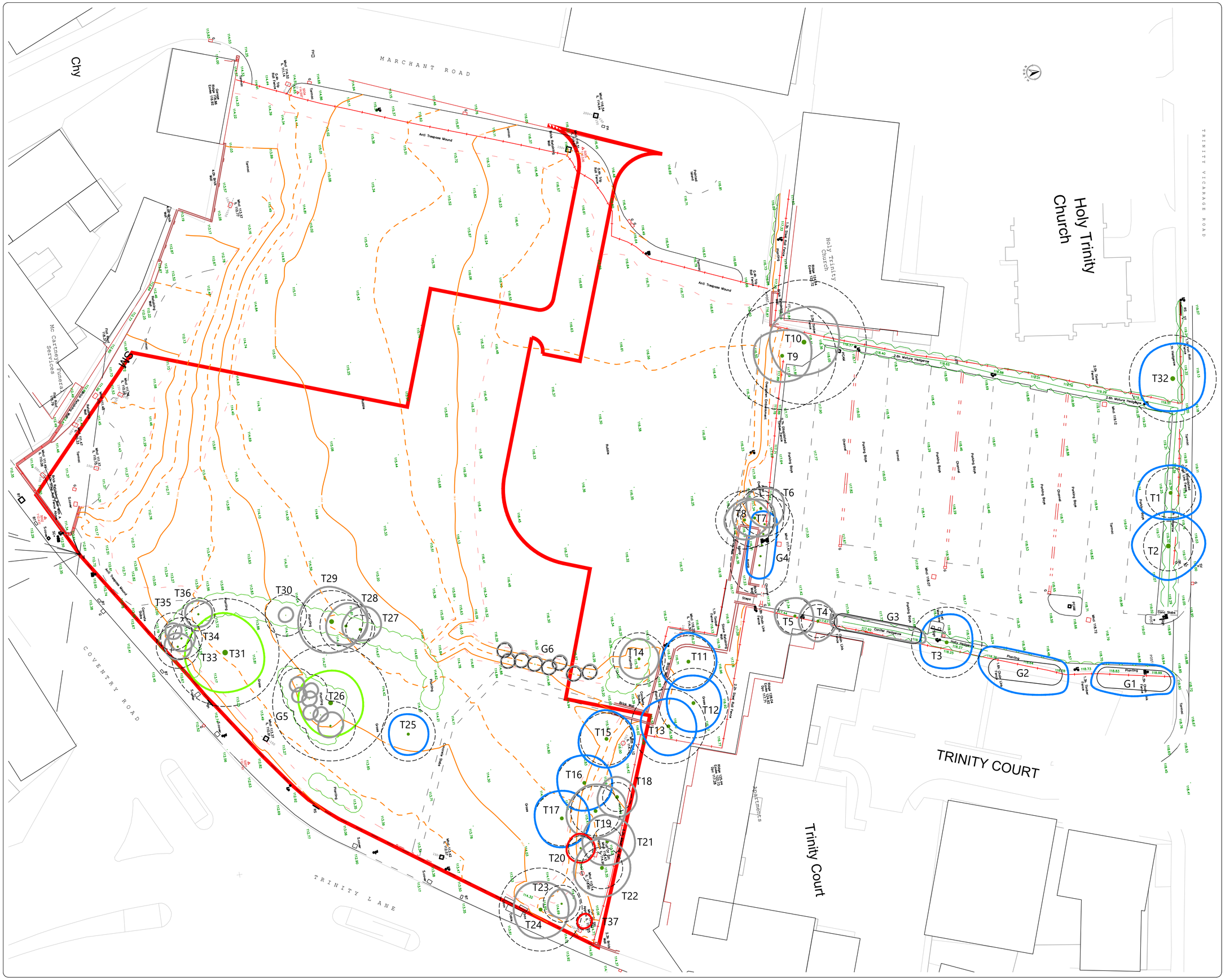
Site: Tanglewood Hinckley Date: 24th February 2025 Weather: Damp, cold

Ref	Species	Height (m)	Stem Diameter (mm)	Branch spread (m) N	E	S	W	Height crown clearance (m)	Age class	Condition & Comments	Years left	Category grading	RPA (m^2)	RPA radius
T29	Silver Birch (Betula Pendula)	12	375	5	7	7	5	3	OM	In decline. The main leader has been removed at 5m, to form 3 new leaders giving a poor crown form. Ivy is growing up the main trunk.	20	C2	64	4.50
T30	Leyland Cypress (Cupressus x leylandii)	8	250	2	2	2	2	0.5	SM	Fair. Dead branches on the western side.	20	C2	28	3.00
T31	Indian Bean Tree (Catalpa bignonioides)	12	650	8	7	7	8	2	M	Good example of this species of tree. Found commonly in larger cities such as London. Some deadwood in the south-east canopy.	40+	A1	191	7.80
T32	Lime (Tilia)	16	525	7	6	6	7	4	M	Good example of this species of tree. Located off site within the grounds of the Holy Trinity Church to the north-west of the site. Not within application boundary.	20+	B2	125	6.30
T33	Lawson's Cypress (Chamaecyparis lawsoniana)	8	260	2.5	2.5	2.5	2.5	1.5	EM	Fair. Planted in a group of 3.	20	C2	31	3.12
T34	Lawson's Cypress (Chamaecyparis lawsoniana)	7	250	2.5	2.5	2.5	2.5	0.5	EM	Fair. Planted in a group of 3.	20	C2	28	3.00
T35	Lawson's Cypress (Chamaecyparis lawsoniana)	8	225	2.5	2.5	2.5	2.5	2	M	Fair. Planted in a group of 3.	20	C2	23	2.70
T36	Silver Birch (Betula pendula)	6	200	2	2	2	2	2	EM	Fair. Colonised with ivy	20	C2	18	2.40

Site: Tanglewood Hinckley Date: 24th February 2025 Weather: Damp, cold

Ref	Species	Height (m)	Stem Diameter (mm)	Branch spread (m) N	E	S	W	Height crown clearance (m)	Age class	Condition & Comments	Years left	Category grading	RPA (m^2)	RPA radius
G5	Lawson's Cypress (Chamaecyparis lawsoniana)	6-8	200-300	0	2.5	2.5	2.5	0	EM	Fair. Group of 4 conifers with no foliage on the northern side of the canopy	20	C2	41	3.60
T37	Silver Birch (Betula pendula)	4	100	1.5	1.5	1.5	1.5	0.2	SM	Poor dead/dying	<10	U	5	1.20
G6	Alder (Alnus glutinosa)	4-5	75	1	1	1	1	1	YNG	Fair. Group of several self-set Alder trees in an overgrown shrub bed	20	C2	3	0.90

Appendix B - Tree Survey Plan & Tree Protection Plan



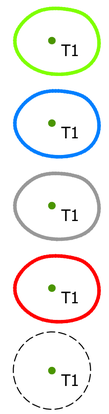
Notes:

Key to Tree Survey Plan

The RPA (Root Protection Area) ie the zone in which the root system is believed to be concentrated, has been calculated for each tree within the site boundary. The results can be found with the Tree Report.

This drawing is based on:

- Topographical survey by CLB Surveys, 1104-1C dated April 2010
- 250318 G40003 A002 Proposed Site Ground Floor Plan by Green 4 Architects, March 2025
- Site visit by Encon Associates, 24.02.25



Rev	Date	Description	Drawn	Checked

Client
Tanglewood Care Homes

Project
Tanglewood
Coventry Road
Hinckley

Title
Tree Survey Plan

Drawing Status
FOR PLANNING APPROVAL

Drawn	MJB	Checked	LB
Date	24.02.25	Scale (A1)	1:250

encon associates
10 Chapel Lane
Arnold
Nottingham
NG5 7DR
T: 0115 987 55 99 E: enquiries@enconassociates.co.uk W: www.enconassociates.co.uk
Environmental Consultants to the Construction Industry
- BREEAM - Code for Sustainable Homes Assessors - Landscape Architecture - Transportation - Life Cycle Costing - Energy Assessment - SAP - EPC - SBEM - Daylight Calculations

Job Number	Drawing Number	Rev
A7099	01	

Notes:

Key to Tree Survey Plan

The RPA (Root Protection Area) ie the zone in which the root system is believed to be concentrated, has been calculated for each tree within the site boundary. The results can be found with the Tree Report.

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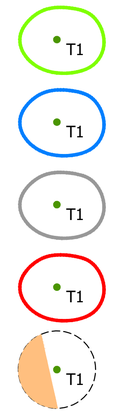
- Topographical survey by CLB Surveys, 1104-1C dated April 2010
- 250318 G40003 A002 Proposed Site Ground Floor Plan by Green 4 Architects, March 2025
- Site visit by Encon Associates, 24.02.25



Rev	Date	Description	Drawn	Checked

Client
Tanglewood Care Homes

Project
Tanglewood
Coventry Road
Hinckley

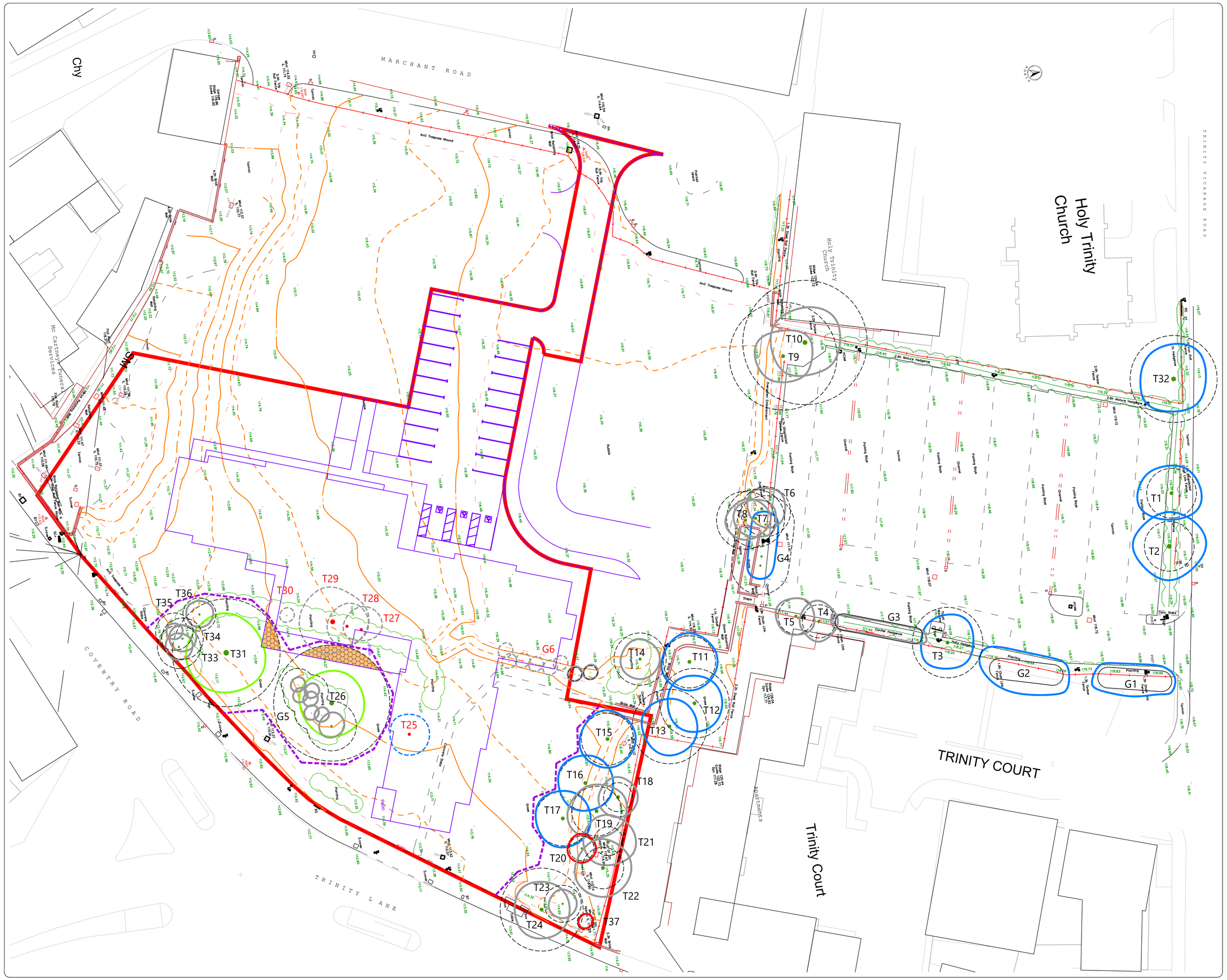
Title
Tree Constraints Plan

Drawing Status
FOR PLANNING APPROVAL

Drawn	MJB	Checked	LB
Date	24.02.25	Scale (A1)	1:250

encon associates
10 Chapel Lane
Arnold
Nottingham
NG5 7DR
T: 0115 987 55 99 E: enquiries@enconassociates.co.uk W: www.enconassociates.co.uk
Environmental Consultants to the Construction Industry
- BREEAM - Code for Sustainable Homes Assessors - Landscape Architecture - Transportation - Life Cycle Costing - Energy Assessment - SAP - EPC - SBEM - Daylight Calculations

Job Number	Drawing Number	Rev
A7099	02	



Notes:

Key to Tree Survey Plan

The RPA (Root Protection Area) ie the zone in which the root system is believed to be concentrated, has been calculated for each tree within the site boundary. The results can be found with the Tree Report.

This drawing is based on:

- Topographical survey by CLB Surveys, 1104-1C dated April 2010
- 250318 G40003 A002 Proposed Site Ground Floor Plan by Green 4 Architects, March 2025
- Site visit by Encon Associates, 24.02.25

T1 **Class A**

T1 **Class B**

T1 **Class C**

T1 **Class U**

T1 **RPA shown as a dashed circle around each tree. Encroachment shown shaded pink**

T1 **Areas of "no-dig" cellular confinement construction for root protection**

T1 **Trees to be removed shown dashed with red circle**

Tree Protection Fencing as per BS5837:2012 Fig 2

Rev	Date	Description	Drawn	Checked

Client
Tanglewood Care Homes

Project
Tanglewood
Coventry Road
Hinckley

Title
Tree Protection Plan

Drawing Status
FOR PLANNING APPROVAL

Drawn	MJB	Checked	LB
Date	24.02.25	Scale (A1)	1:250

encon associates
10 Chapel Lane
Arnold
Nottingham
NG5 7DR
T: 0115 987 55 99 E: enquiries@enconassociates.co.uk W: www.enconassociates.co.uk

Environmental Consultants to the Construction Industry

- BREEAM - Code for Sustainable Homes Assessors - Landscape Architecture - Transportation - Life Cycle Costing - Energy Assessment - SAP - EPC - SBEM - Daylight Calculations

Job Number	Drawing Number	Rev
A7099	03	

Appendix C - Method Statement for Tree Protection

The following Arboricultural Method Statement should be followed by the contractor:

1.0 Root Protection Area (RPA)

The RPA required by the current edition of BS 5837:2012 relates to the stem diameter of each tree when measured at a height of 1.5m from ground level, adjusted where necessary to account for actual rooting patterns on site. The RPAs are to be afforded protection at all times and will be protected by fencing barriers. No works will be undertaken within any RPA that causes compaction to the soil or severance of tree roots.

2.0 Protective Fencing

A protective fence should be erected prior to the commencement of any site works e.g. before any materials or machinery are brought on site, any construction work starts or any stripping of soil commences. The barrier needs to have signs attached stating that this is a Tree Protection Area and that no works are permitted within the barrier. The barrier may only be removed following completion of all construction works.

2.1 The fence is required to be sited in accordance with the TCP. The fence must ideally be constructed as per figure 2 in BS 5837:2012 (see detail at the end of this section) and be fit for the purpose of excluding any construction activity. The construction on site should be excluded from the RPA with 'Heras' type Fencing construction, along with a formal briefing of any work person by the site manager with regards to the contents of this method statement.

3.0 Precautions in respect of Temporary Works

If temporary access is required to an RPA then access may only be gained after consultation with the Local Planning Authority and following placement of materials such as geo-textile fabrics that will spread the weight of any vehicular load and prevent compaction to the soil. For pedestrian movements within any RPA then a single thickness scaffold board on top of a compressible layer laid onto a geotextile fabric may be acceptable. Otherwise, there should be no access within the RPA at any time during the contract.

4.0 Access Details

There is no requirement for any special measures related to the retained trees if access for all construction vehicles is kept away from the trees to be retained and stay outside of the RPA.

5.0 Contractors Car Parking

This is likely to be within the existing car park area onsite. The area designated for parking needs to be away from the area around the trees to be retained.

6.0 Site Huts and Toilets

The area designated for site accommodation needs to be away from the area around the trees to be retained.

7.0 Storage Space

The storage of materials should ideally be on existing hard standing away from existing trees. The contractor should not store any materials on site within the RPA of an existing tree.

8.0 Additional Precautions

No storage of materials or lighting of fires should take place within the RPA. No mixing or storage of materials should take place up a slope where they may leak into an RPA.

8.1 No fires to be lit within 20 metres of any tree stem and the fire size and wind direction should be taken into account so that, no flames come within 5.0m of any foliage.

8.2 No high-sided vehicles or cranes should access the site close to any trees to be retained and should not come into contact with any branches or travel within the RPA

8.3 No notice boards, cables or other services to be attached to any tree.

8.4 Materials which may contaminate the soil should not be discharged within 10m of any tree stem. When undertaking the mixing of materials it is essential that any slope of the ground does not allow contaminates to run towards a tree root area.

9.0 Site Gradients

No alterations of soil levels to take place within the RPA of the protected trees

10.0 Demolition Works

No demolition works to take place with the RPA of the protected trees

11.0 Soft landscaping

Refer to the landscaping scheme for detail on soft landscaping.

12.0 Use of Herbicides

No herbicide use is predicted, however if used, it should be done so in strict accordance with the manufacturer's instructions and contact with any tree foliage should be avoided.

13.0 On Site Monitoring Regime

All operations to be monitored by the main contractor. The site manager shall contact the appointed specialist if there is a breach of the RPA and tree protection measures. The appointed specialist shall recommend an action plan to incorporate mitigation measures where necessary.

14.0 Remedial Tree Works

The recommended tree works should be undertaken prior to the commencement of construction activities. All tree works are to be carried out In accordance with BS 3998 British Standard Tree Work - Recommendations 2010. Permission must be granted by the local authority prior to working on any tree protected by a Tree Preservation Order. Failure to do so may result in prosecution.

14.1 In order to prevent the disturbance of nesting birds, any vegetation clearance, tree works or felling should be carried out outside of the bird nesting season (typically March to August). If this is not possible, and vegetation to be removed should be searched by an ecologist for the presence of active nests immediately prior to clearance. If any active nest are found, these should be retained in-situ until the nestlings have fledge.

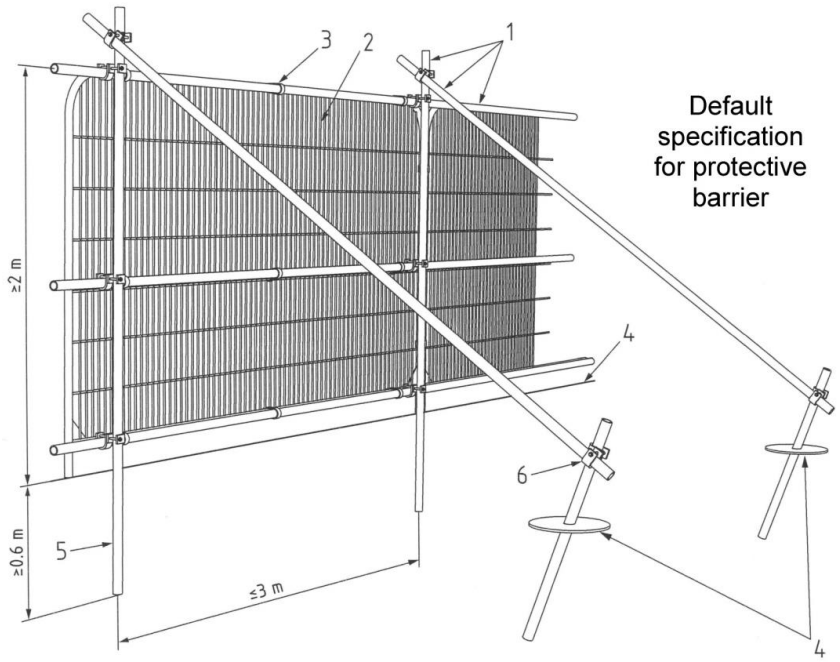
15.0 Responsibilities

It will be the responsibility of the main contractor to ensure that planning conditions are adhered to at all times and that a monitoring regime in regards to tree protection is adopted on site and ensure any necessary licences are in place prior to any felling and all necessary all relevant regulations are adhered.

15.1 The main contractor will be responsible for contacting the Local Planning Authority at any time issues are raised related to the trees on site.

15.2 The main contractor will ensure the build sequence is appropriate to ensure that no damage occurs to the trees during the construction processes. Protective fences will remain in position until completion of ALL construction works on the site.

15.3 Protective fencing should be erected around all trees to be retained as per the following specification:



Key

1	Standard scaffold pole
2	Heavy gauge 2m tall galvanised tube and welded mesh infill panels
3	Panels secured to uprights and cross-members with wire ties
4	Ground level
5	Uprights driven into the ground until secure (minimum depth 0.6m
6	Standard scaffold clamps

15.4 Where protective fencing is located in areas of hard standing, weighted fencing feet should be used to secure the panels and supporting scaffold poles.

15.5 Signs, in accordance with the following example, should be displayed to inform all personnel where the tree protection areas are and to warn them not to enter.

Example of "Keep Out" Sign:

T R E E P R O T E C T I O N Z O N E

KEEP OUT!

No digging or trenching
No storage of plant or materials
No vehicular access
No fire lighting
No chemical handling
Avoid plant contact with tree canopy

Report any tree or fence damage to the Site Manager immediately

Appendix D - Photographic Record

Photo 1 - View of T13

Photo 2 – View of T14

Photo 3 – View of T15

Photo 4 – View of T16-20

Photo 5 - View of 21-23

Photo 6 – View of 24

Photo 7 – View of 24

Photo 8 – View of T25

Photo 9 - View of T26 & G5

Photo 10 – View of T27-T30

Photo 11 – View of T31-T33

Photo 12 – View of T34 & T35

Photo 13 - View of T36

Appendix E - Tree Preservation Order & Conservation Area

Tree preservation order - online map

Home > Tree preservation order - online map

Tree preservation order - online map

Tree preservation orders (TPOs) are mapped as lilac coloured polygons on the online map.

County TPOs

Copies of Leicestershire County Council tree preservation orders which relate to the borough of Hinckley & Bosworth are held by Hinckley & Bosworth Borough Council.

Disclaimer/terms of use

Hinckley & Bosworth Borough Council does not warrant the accuracy of the information on this webpage as tree preservation orders are subject to change and amendment.

The information on tree preservation orders has been prepared using the best available information from records compiled by the Borough Council and is correct to the best of our knowledge. The information does not, however, constitute a definitive statement as to the status

How to

> TPO Guidance Notes

Your location is

> The Meeting Centre, 1 Marchant Road, Hinckley, Leicestershire, LE10 0LQ,

Change location?

14 G 5

TOWN AND COUNTRY PLANNING ACT 1971

AND ALL OTHER AMENDING ENACTMENTS

THE BOROUGH COUNCIL OF HINCKLEY & BOSWORTH

HINCKLEY (TRINITY VICARAGE ROAD)

Tree Preservation Order 1975

The Hinckley and Bosworth Borough Council in this order called "the Authority" in pursuance of the powers conferred in that behalf by section 60 and 61 of the Town and Country Planning Act 1971 and all other amending enactments and subject to the provisions of the Forestry Act 1967, hereby makes the following order:-

1. In this Order -
"the Act" means the Town and Country Planning Act 1971;
"owner" means the owner in fee simple, either in possession or who has granted a lease or tenancy of which the unexpired portion is less than three years; lessee (including a sub-lessee) or tenant in possession, the unexpired portion of whose lease or tenancy is three years or more and a mortgagee in possession; and "the Minister" means the Secretary of State for the environment.

2. Subject to the provisions of this Order and to the exemptions specified in the Second Schedule hereto, no person shall, except with the consent of the authority and in accordance with the conditions, if any, imposed on such consent, cut down, top, lop, uproot, cause wilful damage or wilfully destroy or cause or permit the cutting down, topping, lopping, uprooting, wilful damage or wilful destruction of any tree specified in the First Schedule hereto or comprised in a group of trees or in a woodland therein specified, the position of which trees, groups of trees and woodlands if defined in the manner indicated in the said First Schedule on the map annexed hereto which map shall, for the purpose of such definition as aforesaid prevail where any ambiguity arises between it and the specification in the said First Schedule.

3. An Application for consent made to the authority under Article 2 of this Order shall be in writing stating the reasons for making the application, and shall by reference if necessary to a plan specify the trees to which the application relates and the operations for the carrying out of which consent is required.

4. (1) Where an application for consent is made to the authority under this Order, the authority may grant such consent either unconditionally, or subject to such conditions (including conditions requiring the replacement of any tree by one or more trees on the site or in the immediate vicinity thereof), as the authority may think fit, or may refuse consent:

Provided that where the application relates to any woodland specified in the First Schedule to this Order the authority shall grant consent so far as accords with the principles of good forestry, except where, in the opinion of the authority, it is

NOTE. If it is desired to fell any of the trees included in this Order, whether included as trees, groups of trees or woodlands, and the trees are trees for the felling of which a licence is required under the Forestry Act 1967, application should be made NOT to the authority for consent under this Order but to the Conservator of Forests for a licence under that Act (section 15(5)).

necessary in the interests of amenity to maintain the special character of the woodlands or the woodlands character of the area, and shall not impose conditions on such consent requiring replacement or replanting.

(2) The authority shall keep a register of all applications for consent under this Order containing information as to the nature of the application, the decision of the authority thereon, any compensation awarded in consequence of such decision and any directions as to replanting of woodlands; and every such register shall be available for inspection by the public at all reasonable hours.

5. Where the authority refuse consent under this Order or grant such consent subject to conditions they may when refusing or granting consent certify in respect of any trees for which they are so refusing or granting consent that they are satisfied -

(a) that the refusal or condition is in the interests of good forestry; or

(b) in the case of trees other than trees comprised in woodlands, that the trees have an outstanding or special amenity value.

6. (1) Where consent is granted under this Order to fell any part of a woodland other than consent for silvicultural thinning then unless -

(a) such consent is granted for the purpose of enabling development to be carried out in accordance with a permission to develop land under Part III of the Act, or

(b) the authority with the approval of the Minister dispense with replanting,

the authority shall give to the owner of the land on which that part of the woodland is situated a direction in writing specifying the manner in which and the time within which he shall replant such land and where such a direction is given and the part is felled the owner shall, subject to the provision of this Order and section 175 of The Act, replant the said land in accordance with the direction.

(2) Any direction given under paragraph (1) of this Article may include requirements as to -

(a) species;

(b) number of trees per acre;

(c) the erection and maintenance of fencing necessary for protection of the replanting;

(d) the preparation of ground, draining, removal of brushwood, lop and top; and

(e) protective measures against fire.

On imposing any condition requiring the replacement of any tree under Article 4 of the Order, or giving a direction under Article 6 of this Order with respect to the replanting of woodlands, the authority shall if such conditions or direction relates to land in respect of which byelaws made by a river authority, a drainage board, the Conservators of the River Thames or the Lee Conservancy Catchment Board restrict or regulate the planting of trees, notify the applicant or the owner of the land, as the case may be, of the existence of such byelaws and that any such condition or direction has effect subject to the requirements of the river authority, drainage board, the Conservators of the River Thames or the Lee Conservancy Catchment Board under those byelaws and the condition or direction shall have effect accordingly.

8. The provisions set out in the Third Schedule to this Order, being provisions of Part III of the Act and of section 46 of the Town and Country Planning Act 1971 adapted and modified for the purposes of this Order, shall apply in relation thereto.

9. Subject to the provisions of this Order, any person who has suffered loss or damage in consequence of any refusal (including revocation or modification) of consent under this Order or of any grant of any such consent subject to conditions, shall, if he makes a claim on the authority within the time and in the manner prescribed by this Order, be entitled to recover from the authority compensation in respect of such loss or damage:

Provided that no compensation shall be payable in respect of loss or damage suffered by reason of such refusal or grant of consent in the case of any trees the subject of a certificate in accordance with Article 5 of this Order.

10. In assessing compensation payable under the last proceding Article account shall be taken of:

(a) any compensation or contribution which has been paid whether to the claimant or any other person, in respect of the same trees under the terms of this or any other Tree Preservation Order under section 60 of the Act or under the terms of any Interim Preservation Order made under section 8 of the Town and Country Planning (Interim Development) Act 1943, or any compensation which has been paid or which could have been claimed under any provision relating to the preservation of trees or protection of woodlands contained in an operative scheme under the Town and Country Planning Act 1932, and

NOTE: Any person contravening the provisions of this Order is guilty of an offence under section 102 of the Act and liable on summary conviction to a fine not exceeding four hundred pounds; and if in the case of a continuing offence the contravention is continued after conviction he is guilty of a further offence thereunder and liable on summary conviction to an additional fine not exceeding five pounds for every day on which the contravention is so continued. Under sections 102, 103 of the Act if a tree is wilfully cut down, uprooted, wilfully damaged or destroyed, or if topping or lopping is carried out in such a way as to be likely to destroy the tree the fine is £400 or twice the value of the tree whichever is the greater. If a tree other than one which is part of woodland is removed or destroyed in contravention of the Order it is the duty of the owner of the land, unless on his application the local authority dispense with the requirement to plant another tree of appropriate size and species, at the same place as soon as he reasonably can.

(b) any injurious affection to any land of the owner which would result from the felling of the trees the subject of the claim.

11. (1) A claim for compensation under this Order shall be in writing and shall be made by serving it on the authority, such service to be effected by delivering the claim at the offices of the authority addressed to the General Manager - Administration thereof or by sending it by prepaid post so addressed.

(2) The time within which any such claim shall be made as aforesaid shall be a period of twelve months from the date of the decision of the authority, or of the Minister, as the case may be, or where an appeal has been made to the Minister against the decision of the authority, from the date of the decision of the Minister on the appeal.

12. Any question of disputed compensation shall be determined in accordance with the provision of section 179 of the Act.

13. The provisions of Section 61 of the Act shall apply to this Order and the Order shall take effect on the date on which it is sealed with the Common Seal of the Borough Council.

FIRST SCHEDULE

Trees Specified Individually
(encircled in black on the map)

No. on Map	Description	Situation
T1 and T3	Hawthorns	Trinity Vicarage Road, Hinckley
T2	Atlantic Cedar	Trinity Vicarage Road, Hinckley
T4	Common Beech	Trinity Vicarage Road, Hinckley
T5, T6, T7	Limes	Trinity Vicarage Road, Hinckley.

Trees Specified by Reference to an Area
(within a dotted black line on the map)

No. on Map	Description	Situation
NONE		

Groups of Trees
(within a broken black line on the map)

No. on Map	Description	Situation
NONE		

Woodlands
(within a continuous black line on the map)

No. on Map	Description	Situation
NONE		

SECOND SCHEDULE

This Order shall not apply so as to require the consent of the authority to

(1) the cutting down of any tree on land which is subject to a forestry dedication covenant where

(a) any positive covenants on the part of the owner of the land contained in the same deed as the forestry dedication covenant and at the time of the cutting down binding on the then owner of the land are fulfilled;

(b) the cutting down is in accordance with a plan of operations approved by the Forestry Commission under such deed.

(2) the cutting down of any tree which is in accordance with a plan of operations approved by the Forestry Commission under the approved woodlands scheme.

*(3) the cutting down, topping uprooting or lopping of a tree exempted from the provisions of the Order by section 60 (6) of the Act namely a tree which is dying or dead or has become dangerous, or the cutting down, topping, uprooting or lopping of which is in compliance with obligations imposed by or under an Act of Parliament or so far as may be necessary for the prevention or abatement of a nuisance.

(4) the cutting down, topping, uprooting or lopping of a tree

(a) in pursuance of the power conferred on the Postmaster General by virtue of section 5 of the Telegraph (Construction) Act 1908;

(b) by or at the request of

(i) a statutory undertaker where the land on which the tree is situated is operational land as defined by the Act and either works on such land cannot otherwise be carried out or the cutting down, topping, uprooting or lopping is for the purpose of securing safety in the operation of the undertaking;

(ii) an electricity board within the meaning of the Electricity Act 1947, where such tree obstructs the construction by the board of any main transmission line or other electric line within the meaning respectively of the Electricity (Supply) Act 1919 and the Electric Lighting Act 1882 or interferes or would interfere with the maintenance or working of any such line;

*NOTE: Section 62 (1) of the Act requires, unless on the application of the owner the local authority dispense with the requirement, that any tree removed or destroyed under section 60 (6) of the Act shall be replaced by another tree of appropriate size and species. In order to enable the local planning authority to come to a decision, on whether or not to dispense with the requirement, notice of the proposed action should be given to the local planning authority which except in a case of emergency shall be of not less than five days.

(iii) a river authority established under the Water Resources Act 1963, a drainage board constituted or treated as having been constituted under the Land Drainage Act 1930. The Conservators of the River Thames, or the Lee Conservancy Catchment Board, where the tree interferes or would interfere with the exercise of any of the functions of such river authority, drainage board, Conservators of the River Thames or Lee Conservancy Catchment Board in relation to the maintenance, improvement or construction of water courses or of drainage works; or

(iv) the Secretary of State for Defence, the Secretary of State for Trade & Industry or the Board of Trade where in the opinion of such Secretary of State or Board the tree obstructs the approach of aircraft to, or their departure from, any aerodrome or hinders the safe and efficient use of aviation or defence technical installations;

(c) where immediately required for the purposes of carrying out development authorised by the planning permission granted on an application made under Part III of the Act, or deemed to have been so granted for any of the purposes of that Part;

(d) which is a fruit tree cultivated for fruit production growing or standing on land comprised in an orchard or garden.

THIRD SCHEDULE

Provisions of the following parts of (a) Part III of the Town and Country Planning Act 1971 and (b) section 46 of the Town and Country Planning Act 1971 as adapted and modified to apply to this Order.

(a) PART III OF THE TOWN AND COUNTRY PLANNING ACT 1971.

33. (1) Without prejudice to the following provisions as to the revocation or modification of consents, any consent under the Order, including any direction as to replanting given by the authority on the granting of such consent, shall (except insofar as the consent otherwise provides), enure for the benefit of the land and of all persons for the time being interested therein.

35. (1) The Minister may give directions to the authority requiring applications for consent under the Order to be referred to him instead of being dealt with by the authority.

(2) A direction under this section may relate either to a particular application or to applications of a class specified in the direction.

(3) Any application in respect of which a direction under this section has effect shall be referred to the Minister accordingly.

(4) Where an application for consent under the Order is referred to the Minister under this section, the provisions of Articles 4 and 5 of the Order shall apply as they apply to an application which falls to be determined by the authority.

(5) Before determining an application referred to him under this section the Minister shall, if either the applicant or the authority so desire, afford to each of them an opportunity of appearing before, and being heard by, a person appointed by the Minister for the purpose.

(6) The decision of the Minister on any application referred to him under this section shall be final.

36. (1) Where an application is made to the authority for consent under the Order and that consent is refused by that authority or is granted by them subject to conditions, or where any certificate or direction is given by the authority, the applicant if he is aggrieved by their decision on the application, or by any such certificate, or the person directed if he is aggrieved by the direction, may by notice under this section appeal to the Minister.

(2) A notice under this section shall be served in writing within twenty-eight days from the receipt of notification of the decision, certificate or direction, as the case may be, or such longer period as the Minister may allow.

(3) Where an appeal is brought under this section from a decision, certificate or direction of the authority, the Minister, subject to the following provisions of this section, may allow or dismiss the appeal, or may reverse or vary any part of the decision of the authority, whether the appeal relates to that part thereof or not, or may cancel any certificate or cancel or vary any direction, and may deal with the application as if it had been made to him in the first instance.

(4) Before determining an appeal under this section, the Minister shall, if either the appellant or the authority so desire, afford to each of them an opportunity of appearing before, and being heard by, a person appointed by the Minister for the purpose.

(6) The decision of the Minister on any appeal under this section shall be final.

37. Where an application for consent under the Order is made to the authority, then unless within two months from the date of receipt of the application, or within such extended period as may at any time be agreed upon in writing between the applicant and the authority, the authority either -

(a) give notice to the applicant of their decision on the application, or

(b) give notice to him that the application has been referred to the Minister in accordance with directions given under section 35 above;

the provisions of the last preceding section shall apply in relation to the application as if the consent to which it relates had been refused by the authority, and as if notification of their decision had been received by the applicant at the end of the said period of two months, or at the end of the said extended period, as the case may be.

45. (1) If it appears to the authority that it is expedient to revoke or modify any consent under the Order granted on an application made under Article 3 of the Order, the authority may by Order revoke or modify the consent to such extent as they consider expedient.

(2) (Subject to the provisions of section 61 of the Act and section 46 of the Act) an Order under this section shall not take effect unless it is confirmed by the Minister, and the Minister may confirm any such Order submitted to him either without modification or subject to such modifications as he considers expedient.

(3) Where an authority submit an Order to the Minister for his confirmation under this section, the authority shall furnish the Minister with a statement of their reason for making the Order and shall serve notice together with a copy of the aforesaid statement on the owner and on the occupier of the land affected, and on any other person who in their opinion will be affected by the Order, and if within the period of twenty-eight days from the service thereof any person on whom the notice is served so requires, the Minister, before confirming the Order shall afford to that person, and to the authority, an opportunity of appearing before, and being heard by, a person appointed by the Minister for the purpose.

(4) The power conferred by this section to revoke or modify a consent may be exercised at any time before the operations for which consent has been given have been completed:

Provided that the revocation or modification of consent shall not affect so much of those operations as have been previously carried out.

(5) Where a notice has been served in accordance with the provisions of sub-section (3) of this section, no operations or further operations as the case may be, in pursuance of the consent granted, shall be carried out pending the decision of the Minister under sub-section (2) of this section.

(b) TOWN AND COUNTRY PLANNING ACT 1971

46. (1) The following provisions shall have effect where the local planning authority have made an Order (hereinafter called "such Order") under section 45 above revoking or modifying any consent granted on an application made under a tree preservation order but have not submitted such Order to the Minister for confirmation by him and the owner and the occupier of the land and all persons who in the authority's opinion will be affected by such Order have notified the authority in writing that they do not object to such Order.

(2) The authority shall advertise the fact that such Order has been made and the advertisement shall specify (a) the period (not less than twenty-eight days from the date on which the advertisement first appears) within which persons affected by such Order may give notice to the Minister that they wish for an opportunity of appearing before, and being heard by, a person appointed by the Minister for the purpose and (b) the period (not less than 14 days from the expiration of the period referred to in paragraph (a) above) at the expiration of which, if no such

notice is given to the Minister, such Order may take effect by virtue of this section and without being confirmed by the Minister.

(3) The authority shall also serve notice to the same effect on the persons mentioned in sub-section (1) above.

(4) The authority shall send a copy of any advertisement published under sub-section (2) above to the Minister, not more than three days after the publication.

(5) If within the period referred to in sub-section (2)(a) above no person claiming to be affected by such Order has given notice to the Minister as aforesaid and the Minister has not directed that such Order be submitted to him for confirmation, such Order shall at the expiration of the period referred to in sub-section (2)(b) of this section take effect by virtue of this section and without being confirmed by the Minister as required by section 45 (2) of the Town and Country Planning Act 1971.

(6) This section does not apply to such Order revoking or modifying a consent granted or deemed to have been granted by the Minister under Part II of this Act or under Part IV or Part V of the Act.

The Common Seal of the

Borough Council of Hinckley and Bosworth

was hereunto affixed on the fifth

day of November One Thousand

nine hundred and seventy-five.

45

in the presence of :-

General Manager, Administration.

L

Town and Country Planning Act 1971

THE BOROUGH COUNCIL OF HINCKLEY & BOSWORTH
HINCKLEY (Trinity Vicarage Road)
Tree Preservation Order 1975

Scale 1:1250 **Extract from O.S. sheet** SP4293·N

The Common Seal of the Borough Council of Hinckley & Bosworth was hereunto affixed this fifth . . . day of November . . . One thousand nine hundred and seventy five in the presence of:—

. . . .

General Manager, Adminstration

415

Appendix F - Cellular Confinement System

Cellweb® TRP

Tree Root Protection

Cellweb® TRP is a 3D cellular confinement tree root protection system. The system provides a 'no dig' solution for the construction of new hard surfaces within root protection areas (RPAs). Cellweb® TRP has been designed and independently tested to comply with recommendations made in Arboricultural Practice Note 12 and BS 5837 2012 – Trees in relation to design, demolition and construction.

Cellweb® TRP Key Functions

Cellweb® is a 'no dig' solution which is constructed directly on the existing ground surface. This eliminates the requirement for excavation, preventing root severance.

Cellweb® is a completely porous system allowing continued water permeation and gas exchange between the rooting environment and atmosphere.

Cellweb® spreads point loads, minimising increases in soil compaction within the rooting environment. This maintains an open graded soil structure allowing continued root growth, water, gas and nutrient migration.

The Cellweb® TRP system comprises the following three components

Treetex™ Geotextile. Following minimal ground preparation the Treetex™ is laid onto the existing ground and top soil. This acts as a separation layer, separating the system above from the soil and rooting environment below. Treetex™ performs as a hydrocarbon pollution control measure in accordance with BS5837, holding 1.7lt of oil per square meter.

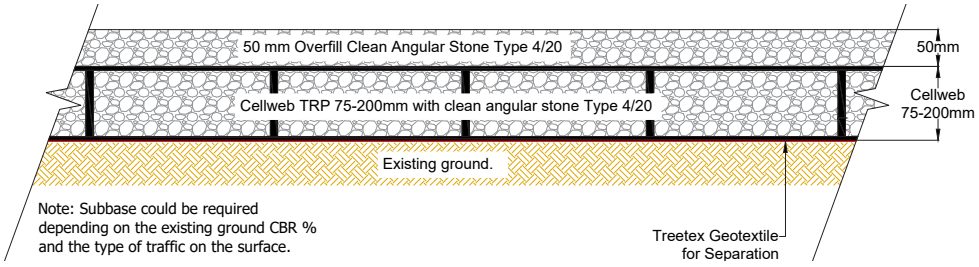
Cellweb® 3D Cellular Confinement. The Cellweb® is installed on top of the Treetex™ layer. This is fixed to the ground using ten steel J pins per panel. The panels can be cut to the required shape and adjoining panels can be connected using heavy duty staples or cell ties.

4-20mm Clean Angular Stone. The expanded Cellweb® is infilled with a 4-20mm clean angular stone. The confined angular stone locks together to produce a rigid stone mattress, while maintaining air pockets for continued water permeation and gas exchange. The low fines content of the stone prevents the Treetex™ layer from becoming blocked over time.

Which depth of Cellweb® TRP?

The Cellweb® System is provided in four different depths; 200mm, 150mm, 100mm and 75mm. The depth required is determined by the proposed traffic loadings and the site ground conditions. Geosynthetics in house engineering department can provide a free site specific technical recommendation. For free technical and engineering support please contact Geosynthetics Ltd 01455 617139 or the full installation guide can be found on our website www.geosyn.co.uk.

Indicative Cellweb with overfill



Web: www.geosyn.co.uk | Tel: 01455 617139
Fax: 01455 617140 | Email: Sales@geosyn.co.uk

Geosynthetics
Engineered Solutions

Tree Root Protection Using Cellweb TRP®

Fact Sheet 1: Use of Cellweb TRP® in Root Protection Areas (RPA's)

Introduction

Cellweb TRP® is a cellular confinement system that confines aggregate materials and makes them stronger. This behaviour allows the depth of pavement construction to be reduced. It also minimises compaction of soils below road pavements constructed using the Cellweb TRP® tree root protection system. Cellweb TRP® is used around the world to provide cost effective road and railway construction, as well as Tree Root Protection.

Cellular confinement was developed by the US Army Corps of Engineers during the 1970s to allow construction of roads for military equipment quickly and easily using whatever local soil material was available (especially across beaches). Since then the method has been developed and it is now routinely used in road and rail construction as well as in tree root protection. There is an extensive research base that demonstrates the performance of cellular confinement and it is a method of pavement construction that is recognised by the US Federal Highways Administration.

Characteristics of Cellweb TRP®

Pokharel et al (2009) stated that about one fifth of pavement failures in the US occur due to either weak subgrades or inefficient load transfer from the sub-base. Cellweb TRP® can improve the strength of road pavement construction to deal with these problems. It is a three dimensional interconnected honeycomb of cells made from HDPE. The cells are filled with aggregate sub-base and laterally confine the material when it is loaded, thus increasing the bearing capacity of the layer. This results in a thinner layer of aggregate being required to achieve the same performance.

It also allows uncompacted open graded aggregate to be used in the sub-base construction which is a vital part of any tree root protection system.

Cellweb TRP® is available in a range of height and aspect ratios to suit different load applications.

Use of Cellweb TRP® in RPAs

The use of Cellweb TRP® tree root protection system for building roads, car parks and other vehicular pathways includes a sub-base infill material of clean angular stone which does not need to be compacted. This immediately provides a layer of material that will absorb compaction energy applied to the top of materials placed over it. Compaction of soils by construction machinery does not extend to a great depth. This is the reason why earthworks materials are normally placed in thin layers because compaction only occurs in the top few hundred mm at most. With the lightweight compaction plant used on most development sites the maximum depth that compaction will extend to is between 150mm and 200mm. Thus, if an 80mm layer of asphalt is placed over a 150mm deep Cellweb TRP® system the compaction reaching the base of the construction and the natural soil will be minimal. This effect was demonstrated by Lichter and Lindsey (1994) where a trial area was trafficked by a front-end loader and only suffered significant compaction of the soil to a depth of 100mm.

The use of Cellweb TRP® also spreads the wheel loads from traffic. There has been extensive research published on the performance of these systems from the original work by the US Army Corps of Engineers (Webster 1981) to more recent studies such as that by Emersleben and Meyer (2008).

Figure 1 - In situ density test prior to construction of pavement

The research shows that Cellweb TRP® acts as a stiff raft to distribute wheel loads and reduce their magnitude at the base of the construction by 30% to 36% (without any asphalt or other surfacing). Once the surface is taken into account, the pressure applied by traffic to soil below roads or pavements constructed using no-dig methods will be significantly reduced and thus compaction will also be reduced. Note, compaction is not prevented but it is reduced, thus maintaining the soil bulk density at levels that are suitable for tree root growth.

The effectiveness of the Cellweb TRP® no-dig construction in reducing soil compaction has been demonstrated in trials carried out by the Environmental Protection Group Limited. Two parking bays were constructed over a fine sand soil, one with a Cellweb TRP® cellular confinement sub-base. The parking bays were surfaced with asphalt and then used by cars for four weeks on a daily basis. It is well known that compaction of soils occurs in the first few passes of a vehicle, so the maximum adverse effects on compaction of soil below the pavement should have been achieved. In situ density tests were carried out on the sand below the pavement before and after construction (Figure 1).

Tree Root Protection Using Cellweb TRP®

Fact Sheet 1: Use of Cellweb TRP® in Root Protection Areas (RPA's)

Figure 2 - Cellweb TRP® in construction.

Figure 3 - In situ density tests post-trafficking.

The results in Figure 4 show that compaction of the soil below the Cellweb TRP® pavement was noticeably lower than that below the normal pavement. The increase in compaction below the normal pavement is similar to the increase found on a number of construction sites by Alberty et al (1984).

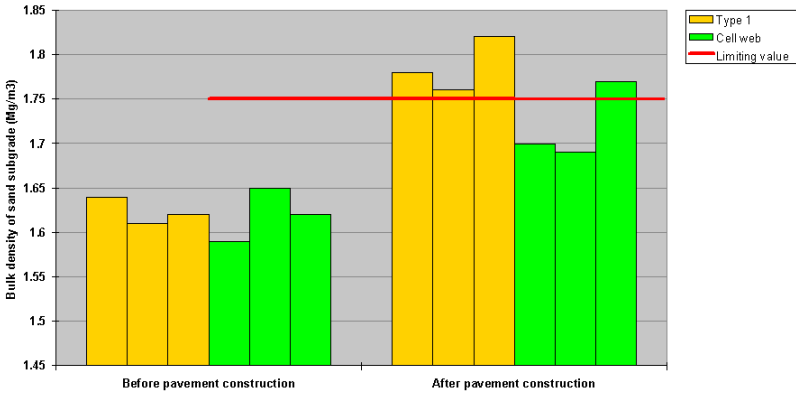


Figure 4 Comparison of soil compaction below pavements

The use of layers of uncompacted material has also been shown by others to reduce compaction of natural soil by construction plant (Lichter and Lindsay 2004). However, these were temporary layers intended to be removed after construction was finished and they are not suitable for incorporation into a permanent car park surface. Nonetheless, it does demonstrate the effectiveness of no-dig techniques using Cellweb TRP®. It is important to note that the specific properties of cellular confinement systems (eg material type, strength, welding at joints, perforations, etc) will affect how each one behaves in trials such as this. Therefore the results are only applicable to the Cellweb TRP® system.

Note

So called tree root protection systems that use Type 1 sub-base or any similar material that requires compaction will not prevent compaction of soils around the tree roots. Type 1 is also not very permeable to air and water and will limit the availability to roots. Therefore geogrid reinforced Type 1 is not suitable for tree root protection.

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Alberty CA, Pellet HM and Taaylor DH (1984). Characterisation of soil compaction at construction sites and woody plant response. Journal of Environmental Horticulture, 2, 48-53.

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Tree Root Protection Using Cellweb TRP®

Fact Sheet 2: Water and Oxygen Transfer Through the Cellweb TRP® System

Water and Oxygen Transfer Through the System

Water and oxygen are the lifeblood of trees without which they will wither and die. It is important to design developments in and around the root protection area (RPA) of existing trees to maximise the availability of water and oxygen to the roots. This can be achieved in a number of ways using the Cellweb TRP® tree root protection system.

The main causes of reduced water and oxygen availability for tree roots are:

- Compaction of the soil around the roots
- Covering the ground surface with impermeable cover which prevents water infiltration.

Both of these effects can be reduced or prevented by using Cellweb TRP® tree root protection within an appropriately designed road or car park surface.

Compaction of Soil

The use of Cellweb TRP® tree root protection system for building roads, car parks and other vehicular pathways includes a sub-base infill material of 20mm to 40mm or 4mm to 20mm clean angular stone which does not need to be compacted. This immediately provides a layer of material that will absorb compaction energy applied to the top of materials placed over it. Cellweb TRP® also spreads the wheel loads from traffic which reduces compaction, thus maintaining the soil bulk density at levels that are suitable for tree root growth.

The effectiveness of the Cellweb TRP® no-dig construction in reducing soil compaction has been demonstrated in trials carried out by the Environmental Protection Group Limited (See Fact Sheet 1).

Water and Oxygen Availability

The Cellweb TRP® tree root protection system is constructed using 20mm to 40mm or 4mm to 20mm gravel infill and has perforated cell walls. The pore spaces between the aggregate particles are greater than 0.1mm in diameter and are therefore defined as macropores (Roberts 2006). This open structure is far more permeable than typical soils and allows the free movement of water and oxygen within it so that supplies to trees are maintained as shown in Figure 1. The use of continuous permeable surfacing and intermittent gaps in impermeable surfacing are recognised ways of providing water and air infiltration pathways through a pavement surface into the tree root zone (Ferguson 2005).

The Cellweb TRP® system incorporates the Treetex® geotextile at the base. This is a very robust geotextile that is resistant to puncturing. Crucially for tree root protection it does not have a water breakthrough head that other geotextiles may have. Therefore it will always be free draining and will not limit oxygen availability to the roots.

Breakthrough Head

All geotextiles are by their nature permeable, however in order to develop optimum water-flow performance, some types of geotextiles (eg, thermally bonded types) require a minimum depth of water to develop over them.

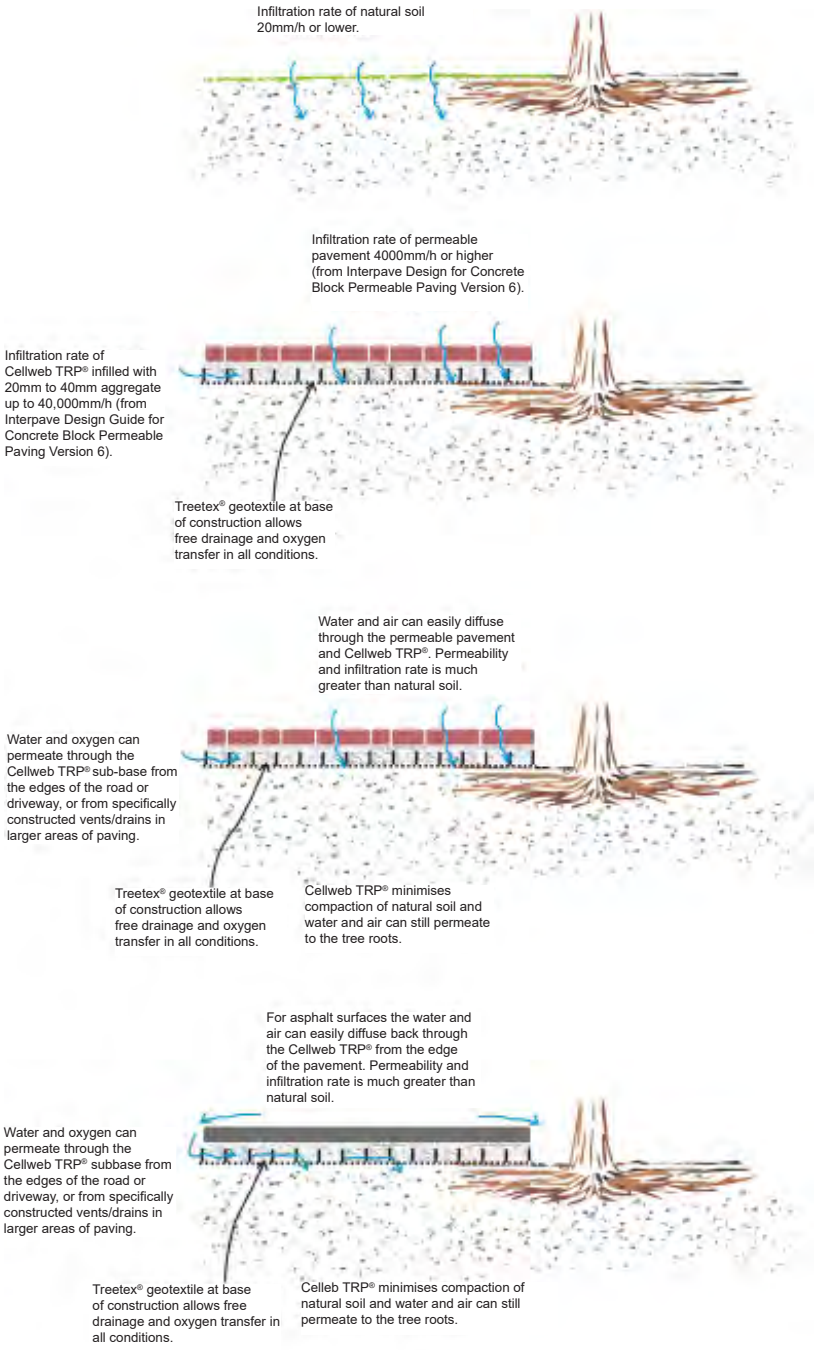
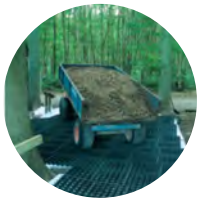


Figure 1 Water and oxygen availability in Cellweb TRP® tree root protection pavements

Therefore a layer of up to 50mm of water can build-up over some geotextiles after rainfall. Treetex® needle punched geotextiles however remains free draining at all times as it has "zero breakthrough head" which means it does not require a build up of water to permeate.

Tree Root Protection Using Cellweb TRP®



Fact Sheet 2: Water and Oxygen Transfer Through the Cellweb TRP® System

If the Cellweb TRP® sub-base layer is covered by a layer of permeable block paving the rate of oxygen transfer through the system is estimated to be around 1 x 10-4 g/s/m² using simple diffusion theory. For a natural sandy soil the rate of transfer to the same depth is around 7 x 10-5 g/s/m². Therefore even on the most aerated of natural soils the Cellweb TRP® tree root protection system does not restrict oxygen supply to tree roots.

Water ingress will also be maintained at the levels similar to a natural sites as water simply passes through the pavement. Permeable block paving and porous asphalt have infiltration rates that are very large (typically > 2500mm/h) in comparison with most rainfall events. The infiltration rate is also far higher than natural soils (infiltration rate for sand is quoted as >20mm/h by Hillel 1998). Thus the pavement allows rainfall to soak into the soil as it would naturally (there will be some reduction as some water soaks into the blocks and gravel as the rainfall passes through).

TABLE 1 - CHARACTERISTICS OF ROOT SYSTEMS OF MATURE EUROPEAN BROADLEAVED AND CONIFEROUS TREE SPECIES GROWING ON WELL AERATED, SANDY SOILS

Species	Tolerance to Oxygen Deficiency	Species	Tolerance to Oxygen Deficiency
Ash	Medium-high	Japanese Larch	Medium
Aspen	High	Lime	Low
Birch	Low	Norway Maple	Medium
Beech	Low	Norway Spruce	Very low
Common Alder	High	Red Oak	Medium-high
Corsican Pine	--	Scots Pine	Medium
Douglas Fir	Medium-low	Sessile Oak	High
English Oak	High	Silver Fir	High
European Larch	Medium	Sycamore	Low
Hornbeam	Medium	White pine	Very low

From Roberts et al (2006)

If the Cellweb TRP® is covered by impermeable asphalt or similar materials the aeration of the sub-base can be promoted from the side of a paved area. This is achieved using gravel filled conduits to connect the sub-base to the surface, allowing oxygen into the layer from where it can freely travel to the root area. Open areas that are normally provided immediately around the tree will also be beneficial in allowing oxygen into the Cellweb TRP® layer. Oxygen can flow horizontally through the Cellweb TRP® because of the perforated walls.

Notwithstanding the above, some trees are more tolerant than others to a deficit of oxygen (Table 1). The use of permeable surfaces over the Cellweb TRP® is advisable where pavements are to be constructed over trees with a low tolerance to oxygen deficit.

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Tree Root Protection Using Cellweb TRP®

Fact Sheet 3: How the Cellweb TRP® System Deals With Oil and Other Pollution

Pollution in Urban Runoff

It has been suggested that pollution from run-off could damage tree health in certain concentrations. Pollution is present in runoff from car parks, roads and even roofs. There are a wide variety of pollutants including heavy metals, oil, fertilisers, pesticides, salts, pathogens and sediment that can cause environmental damage if discharged into rivers or groundwater (CIRIA 2007).

Where permeable pavements are constructed over the Cellweb TRP® the pavement construction will filter out and retain most pollutants. This fact sheet will discuss the extensive evidence base that demonstrates how effective permeable surfaces are at removing pollution. It will explain how they remove pollution from runoff before it reaches the soil below and how robust trees are to the levels of pollution found in runoff.

The effects of de-icing salt on trees are discussed in a separate Fact Sheet No 5.

There is research available which reveals that the pollutant loads from small areas of car park or small roads, where the majority of no-dig installations are used, are much less than for main roads or larger car parks (CIRIA 2003). Such low levels are unlikely to damage tree health. Sustainable drainage systems positively encourage the use of trees and other plants to treat the pollution that is present in run-off from hard surfaces.

Pollution Removal in Permeable Pavements

The effective removal of pollution from runoff by permeable surfaces has been well known since the late 1990s. This early work is summarised in CIRIA Report C582 (CIRIA 2002) and it showed that permeable pavements filter out sediment and act as bio reactors to degrade oil based pollutants. The sediment is filtered as it passes through the fine pores in the surface (either in porous asphalt or in the grit jointing material between blocks) which is where the majority of pollution is trapped (Legret and Colandini 1999, Shackel and Pearson 2005). If it passes this surface filtration layer it will be trapped on geotextiles either within or at the base of the construction. The Cellweb TRP® system will always have a Treetex™ geotextile at the base over the subgrade. This has properties that make it robust enough to survive in contact with the clean angular aggregate.

Worldwide research has generally shown that runoff that has passed through permeable pavements has low concentrations of pollutants, especially metals, oils and bacteria (Wilson 2007). This includes research in countries where the geotextile is generally only provided at the base of the construction. The percentage removal of various contaminants from a permeable pavement is shown in Figure 1. In this case the pavement was sealed and the water collected from a manhole at the outfall. It did not have an upper geotextile in the pavement. Similar findings have been reported by Mullaney and Jefferies (2011).

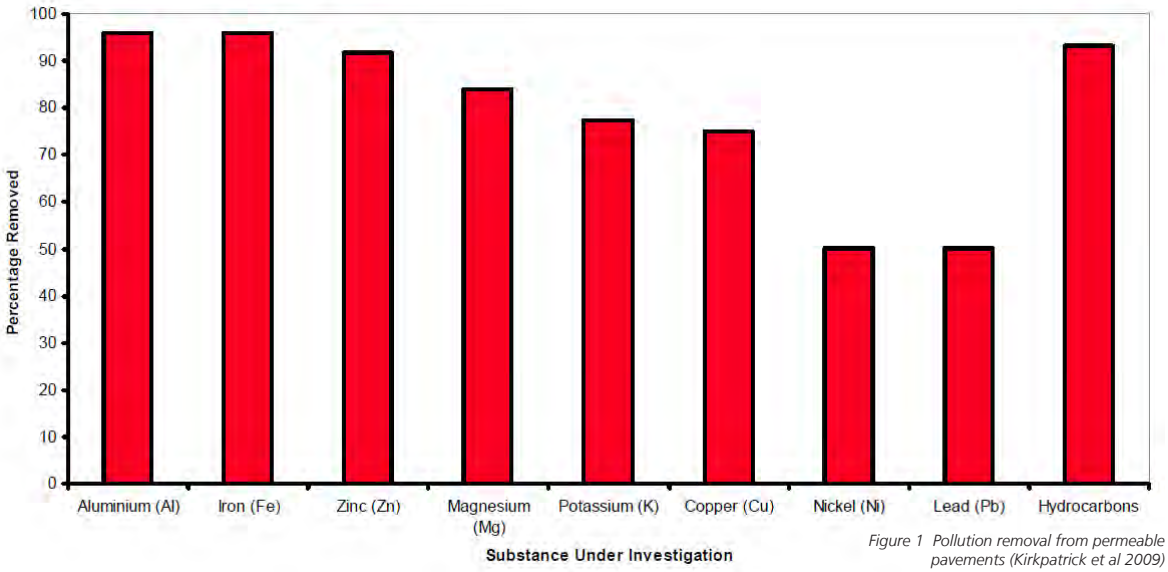

Figure 1 Pollution removal from permeable pavements (Kirkpatrick et al 2009)

All permeable pavements tend to use an open graded sub-base that is similar to the clean angular aggregate used in the Cellweb TRP®and therefore this material will help remove pollution in a similar manner. More recent research has confirmed that day to day pollution removal does not depend on a geotextile at high level in the pavement (Mullaney and Jefferies 2011) but that geotextiles in the construction can be beneficial if there are larger spills of oil (Puehmeier and Newman 2008). The Treetex™ geotextile provided at the base of Cellweb TRP® pavements will reduce the risk of any excessive pollution passing through the system into the soil below. Because of the pollution load and treatment that clearly occurs within the pavement there will not be a significant build up of pollutants within the soil below it.

Tree Root Protection Using Cellweb TRP®

Fact Sheet 3: How the Cellweb TRP® System Deals With Oil and Other Pollution

Ability of Trees to Deal with Pollution

Many trees are able to remove a wide variety of pollutants from soil. One of the more recent developments is stormwater forestry (United States Department of Agriculture (USDA) 2006). The USDA states that 'Trees also show enormous potential to remove other pollutants, such as metals, pesticides, and organic compounds.' The report does go on to suggest that some tree species may be damaged by pollutants in stormwater and this will require consideration on a site-by-site basis. However, these adverse effects can be minimised by careful design of the pavement drainage; for example, by using no-dig permeable pavements that filter out most pollutants before they reach natural soils.

Contaminates in runoff are typically not at concentrations that can adversely affect most riparian tree species. Excess nitrogen and phosphorus in soils are quickly taken up by trees with oxygen rich rhizospheres, because osmosis can happen freely. When nutrients are available trees take advantage of the windfall. Additionally, robust resilient trees are able to metabolize contaminates (heavy metals, inorganic and organic compounds) into their carbon rich heartwoods.

Bioretention areas are widely used in North America to collect and treat runoff in landscaped areas. A study by Toronto and Region Conservation (2009) involved extracting and testing soil cores extracted from three bioretention facilities in the Greater Toronto Area. These varied in age from 2 to 5 years and showed metal and PAH levels comparable to nearby reference sites that were not affected by runoff. The pollution concentrations were below Ontario background concentrations. The testing was repeated at one facility after two years which showed no change in contamination levels. This tends to suggest that pollutant loads from small paved areas will not significantly affect trees.

Benefits of Permeable Paving with Cellweb TRP® Tree Root Protection

Research has clearly shown that the majority of pollution is removed from runoff within the permeable pavement structure (which will include the Cellweb TRP® tree root protection system). Thus the low levels of pollution that are realised from the base of a Cellweb TRP® tree root protection system are unlikely to damage tree health.

The reduced compaction and highly permeable nature of the Cellweb TRP® tree root protection system (see Fact Sheet 1) will help to preserve the health of trees within developments. In addition there are clear benefits in attenuating and treating rainfall runoff using permeable pavements combined with the Cellweb TRP®.

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Tree Root Protection Using Cellweb TRP®

Fact Sheet 4: Treetex™ Geotextile and Oil Pollution

Introduction

The Cellweb TRP® tree root protection system traps pollution in a number of different locations. This makes it robust and minimises the risk of pollution passing into the ground below when it is used as part of a permeable pavement. The Treetex™ geotextile is one part of this system that helps trap and treat oil pollution, especially when an unexpected larger oil spill occurs.

Treetex™

Treetex™ is a heavy duty needle punched non-woven geotextile fleece manufactured from polypropylene. Treetex™ is ideal for use in the tree root protection system as it is easily moulded to the shape of the aggregates used in the pavement and does not form a plane of weakness in the pavement construction. Elvidege and Raymond (1999) found that the greater the mass per unit area of a geotextile the less it is likely to be damaged. The Treetex™ is unlikely to be damaged by the traffic loads it will be subjected to.

Oil Pollution

Day to day small drips of oil pollution in permeable pavements generally trapped and treated in the joints and in the aggregate. However larger spills of oil can overcome this element of the system and the oil retaining capability of these systems has been shown to fail under certain circumstances (e.g. Puehmeier et al. 2004). This is where the Treetex™ geotextile can help trap the excess oil and allow it to degrade aerobically within the pavement construction. Tests have shown that Treetex™ will absorb 1.7 litres of oil per m^2. It provides a substrate on which bacteria necessary for oil degradation can survive.

Product Testing

Tests undertaken at Coventry University have concluded that the Treetex™ will absorb 1.7 litres of oil per m^2, which is four times more effective than standard geotextiles.

References

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Tree Root Protection Using Cellweb TRP®

Fact Sheet 5: Cellweb TRP® and Road Salt Pollution

Introduction

Road salt is applied to roads and pavements to help manage ice and snow and maintain safe access. It is commonly referred to as "gritting" and has been used in increasing quantities since the late 1940's. Although it provides safety benefits and minimises disruption to travel, the adverse impact that road salt can have on trees in some situations is well known (Transportation Research Board 1991 and Forest Research 2011). Road salt is the most commonly used de-icing chemical in the UK. It is crushed rock salt and the main component is sodium chloride. Both sodium and chloride ions can be harmful to some trees if there are excessive quantities in the soil.

The amount of salt applied to roads has reduced over recent years. This is due to generally milder winters (although severe winters can still occur as in 2010/2011) and better management of where and when gritting is carried out.

Salt damage occurs to trees through contamination of the soil around roots or by salt spray. Salt spray is much more likely on roads with fast moving traffic such as motorways and trunk roads. It is likely to be less of a problem where vehicles are moving at low speeds. These low speed areas are where the majority of Cellweb TRP® is installed. Damage to trees occurs most frequently where large volumes of salt are used to de-ice the roads and pavements (Forest Research 2011).

Where the Cellweb TRP® system is used below a permeable surface rainfall will carry the sodium chloride into soil around the roots. The same will happen on traditional impermeable surfaces if the water is allowed to flow off the edge of pavement, for example into a swale. Permeable surfaces (and swales) will not remove sodium or chloride ions from surface water runoff (SPU, 2009). Neither will any other form of sustainable drainage system (swales, etc). However, the difference is that permeable surfaces and the Cellweb TRP® system do not concentrate the polluted water around tree roots. This dissolved pollution is therefore spread out over a wider surface so the load of sodium and chloride ions per m² of soil is reduced. This effect reduces the risk of salt damaging trees.

For example assume that salt is applied to a 10m by 10m area (100m²) at the rate of 20/gm² and this is washed off an impermeable area towards a tree root zone that has 1m² of exposed soil (1m by 1m). The load of salt being washed into the tree root zone will be 2000g/m². If th same area is constructed using permeable pavement the salt load into the soil below the pavement is only 20g/m² (Figure 1).

There is also evidence that permeable paving systems have the capacity to store and then distribute the chloride load over a longer time period than would be observed on a standard, impermeable asphalt pavement, therefore reducing acute levels at trees (Houle 2006).

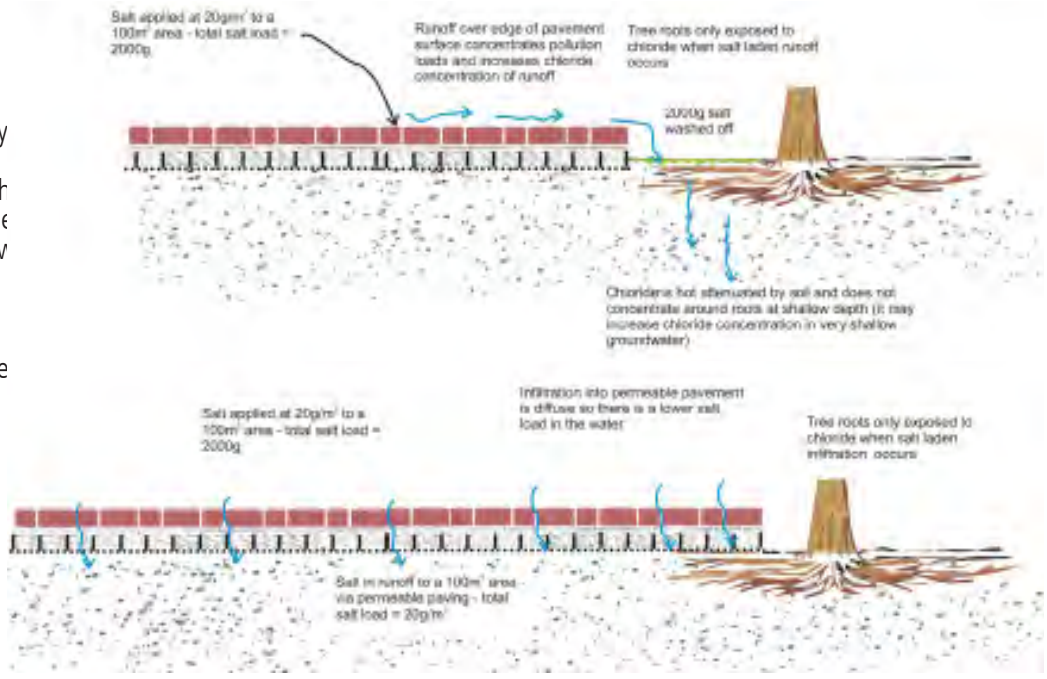

Figure 1: Use of permeable paving over Cellweb TRP® to reduce salt load to trees

Behaviour of Chloride in the Ground

Sodium chloride in runoff is a dissolved contaminant and is not removed by filtration or absorption in the pavement or soil. It does not accumulate in sediments or soils around infiltration systems (Datry 2003) and will pass straight through the vadose zone to the groundwater table (Pitt 1994). Having said that a study in Pennsylvania, USA (where there is frequent salting of pavements in winter) found that the level of chloride in infiltrating groundwater reduces rapidly when salt is not applied. The study concluded that it should not pose a risk to groundwater because of dilution.

Therefore chloride will not accumulate in soil around trees and shallow roots will only be exposed to chlorides during runoff events. The less frequently salt is applied the lower the exposure of trees to chloride.

Trees generally take up less water in winter and therefore if exposed to only a few instances of chloride contaminated water the effects may be minimal, for example in a small car park in the south of the UK. Greater exposure may be expected in a large supermarket car park in a more northerly location such as Scotland where salt treatment may be more frequent. In such instances the salt tolerance of the trees being protected should be considered (Table 1).

Tree Root Protection Using Cellweb TRP®

Fact Sheet 5: Cellweb TRP® and Road Salt Pollution

Icing on Permeable Surfaces

The nature of permeable surfaces means that hoar frosts occur more frequently on permeable surfaces but ice layers are thinner (CIRIA 2002). Snow also settles earlier and stays longer. More frequent hoar frost has also been observed in trial areas of various types of surface constructed as part of a Highways Agency research project. However because surfaces are well drained and generally do not have standing water more recent experience indicates that ice forms less frequently on the surface (Houle 2006).

Pervious concrete has been found to reduce the occurrence of freezing puddles and black ice. Melting snow and ice infiltrates straight down into the pavement facilitating faster melting which will reduce the number of salt applications required (Gunderson, 2008).

De-icing on Permeable Surfaces

Permeable surfacing and tree root protection is used in many cases where surfaces will have much lower levels of salt application than the main road network (e.g. car parks, courtyards, tertiary roads). A study in New Hampshire, USA, found that overall less salt was used on permeable surfaces. When compared to salt application on traditional pavements there was a 75% reduction in annual use on a porous asphalt car park (Houle 2006).

TABLE 1 - TOLERANCE OF COMMON TREE SPECIES TO SALT (FOREST RESEARCH 2011)

Tolerance	Species	Tolerance	Species	Tolerance	Species
Tolerant	Alnus Glutinosa	Intermediate	Acer Campestris	Sensitive	Acer Pseudoplatanus
Tolerant	Elaeagnus Angustifolia	Intermediate	Alnus Incana	Sensitive	Aesculus Species
Tolerant	Gleditsia Triacanthos	Intermediate	Crataegus Monogyna	Sensitive	Betula Pubescens
Tolerant	Pinus Nigra (all varieties/subspecies)	Intermediate	Carpinus Betulus	Sensitive	Cornus Species
		Intermediate	Fagus Sylvatica	Sensitive	Corylus Species
Tolerant	Picea Pungens	Intermediate	Fraxinus Excelsior	Sensitive	Larix Decidua
Tolerant	Quercus Robur	Intermediate	Picea Abies	Sensitive	Platanus X Hispanica
Tolerant	Robinia Pseudoacacia	Intermediate	Pinus Contorta	Sensitive	Prunus Avium
Tolerant	Salix Alba	Intermediate	Pseudotsuga Menziesii	Sensitive	Tilia Cordata
Tolerant	Ulmus Glabra	Intermediate	Sorbus Aucuparia	Sensitive	Tilia Platyphyllos
		Intermediate	Thuja Occidentalis		

Conclusion

Although permeable surfaces and the Cellweb TRP® tree root protection system do not prevent chloride and sodium ions reaching the soil around trees the evidence indicates that they will reduce the load of chloride that tree roots are exposed to. This is due to less frequent applications of salt and the fact that water infiltration from the pavement is diffuse and does not concentrate the chloride load.

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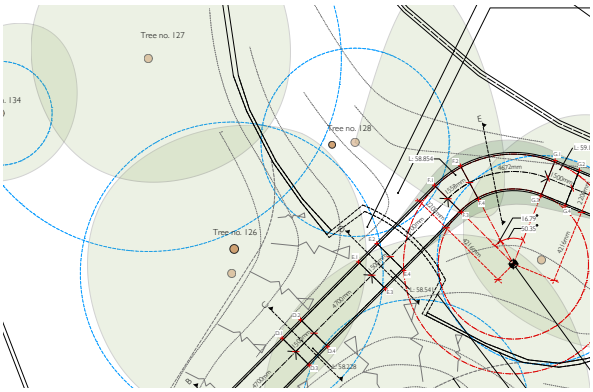
Cellweb® TRP

The Contractors Guide

Complies with BS:5837 | No Dig Solution | Adopted by Councils | 100% Success Rate | Cellweb®TRP Guaranteed | Independently Tested

What is Cellweb®TRP?

Cellweb®TRP is a cellular confinement system specifically designed for tree root protection. The system creates a stable load bearing surface for traffic or footfall whilst eliminating damage to roots through compaction and desiccation. The Cellweb®TRP system comprises of three specific elements; Cellweb® TRP, Treetex pollution control geotextile and an infill of clean angular stone. The system has been designed to combine the best possible products to create an unparalleled solution for tree root protection applications.



What is a Root Protection Area (RPA)?

The Root Protection Area is the minimum area around a tree which is deemed to contain sufficient roots and soil to maintain the trees viability. The RPA is calculated as 12 times the diameter of the tree trunk and 1.5m off the ground; for example a tree has a trunk that is 500mm in diameter and is measured 1.5m above the ground. This calculates that the RPA will have a radius of 6m (500mm x 12 = 6,000mm). The RPA is a radius relative to the tree trunk, but the calculation is based on the trunk diameter. This is used to protect all of the retained trees within and around the development.

What is a Tree Preservation Order (TPO)?

Tree Preservation Orders are put in place by local planing authorities in England to protect specific trees and woodlands in the interest of amenity. Preservation orders prohibit; cutting down, topping, lopping, uprooting, wilful damage and wilful destruction of trees as per The Town And Country Planning (Tree Preservation, England) regulations 1990 and 2012. If found guilty of tree cutting offences in the UK, the court can fine up to £20,000. In serious circumstances, a person can face unlimited fines if found guilty by the Crown Court.

How Cellular Confinement Works?

By confining the infill material, 3D Cellular Confinement Systems work by altering the angle of load distribution, reducing the load on the soil and increasing its bearing capacity. This ultimately minimises soil compaction and maintains an open soil structure. This is crucial for continued water permeation and gas exchange in the rooting environment.

What makes Cellweb®TRP the best solution?

- Cellweb®TRP is the only established guaranteed tree root protection system on the market in the UK.
- It Complies with BS 5837: 2012, Trees in relation to design and demolition/construction recommendations.
- It is the only independently tested system, ensuring compliance with recommendations made in BS 5837: 2012.
- Cellweb®TRP has had a 100% success rate on thousands of projects.
- Our in house tree root protection team will provide technical support both over the phone and on site.
- Our in house qualified civil engineers will provide site specific technical recommendations.
- An extensive bank of case studies is available to download for free.
- We offer free educational tree root protection seminars across the UK.
- Cellweb®TRP has been adopted by a number of local authorities throughout the United Kingdom.

Web: www.geosyn.co.uk | Tel: 01455 617139
Fax: 01455 617140 | Email: Sales@geosyn.co.uk

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What the Guarantee covers and how to get your project guaranteed?
The guarantee covers the replacement of the dead tree(s) up to the value of £10,000 per tree. In the unlikely event the Cellweb®TRP System fails, the guarantee will also cover the replacement of the system up to £50,000.

To obtain the guarantee you will need to provide a copy of the arb report. Geosynthetics Ltd will then send a complementary technical recommendation. A scoping agreement will then be signed to clarify what tree(s) are guaranteed.

For more information please contact the team on 01455 617 139.

Why is stone so important, how can I source it and how much will I need?
In conjunction with Cellweb®TRP we recommend using 4-20mm of clean angular stone. Having an angular stone allows the stone to bind together providing rigidity throughout the cells and also allows pore spaces for the diffusion of water and gasses. Having a clean stone will ensure that fines do not clog the Treetex layer.

If you would like more information on the stone specification, please contact the team on 01455 617 139 however this can be sourced from your local quarry.

What is Treetex and what does it do?
Treetex is a pollution control geotextile developed to work in harmony with the Cellweb®TRP System. The heavy duty needle punched geotextile fleece is manufactured from polyproplyene. Treetex is ideal for use in a Tree Root Protection system as it is easily moulded to the shape of the aggregate and has been independently tested by Coventry University. The product has been proven to absorb 1.7 litres of oil per m^2 ensuring that the roots are not damaged by pollutants from the surface.

Do I need any specialist equipment for installation?
The system is very easy to install and simply requires a stapler, staples and pins to hold the panels down during installation. Please note on larger scale projects for speed of installation, a hydraulic stapler may be used.

What applications can Cellweb®TRP be used for?
Cellweb TRP is likely to be required in the following scenarios:

- For the construction of any new hard surface within the RPA of any retained tree on or bordering the site.
- For the construction of temporary ground protection where construction and foot traffic must pass through the RPA during construction. BS 5837 2012 – Trees in relation to design, demolition and construction recommendations states that: “New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.”
- Where the use of ‘No Dig’ construction has been specified by an arboricultural consultant within the tree protection plan.
- Where Cellweb TRP has been specified in the architects or engineers plans and drawings.

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Free technical support from Geosynthetics Ltd is available

Our tree root protection team can offer support and advice in the following areas.

- Installation
- Overcoming changes in levels and other site specific challenges
- The Cellweb infill material – 'What stone and how much'
- Surfacing options for the Cellweb®TRP system
- Edging the Cellweb system
- Quantifying and pricing

All of the above services are free of charge and have been developed to ensure that you are provided with the required levels of tree root protection for your site. The advice and services have been given to ensure that you are able to provide an excellent service to your clients and do not fall foul to the tree protection law or planning conditions.

What is the delivery turn around time as standard?

Delivery turn around for the Cellweb®TRP system is 24-48 hours* dependent on location and volume purchased.

Which depth of Cellweb®TRP do I need?

Depth of Cellweb®TRP	Unit	Gross Vehicle Weight (GVW)	Application
200 mm	Kg	< 60,000	HGV & Unusual - Crane / piling rig
200 mm	Kg	< 50,000	Heavy Construction Traffic
150-200 mm	Kg	< 30,000	Standard Construction Traffic & Refuse vehicle
150 mm	Kg	< 16,000	Emergency Access & Tractors
100-150 mm	Kg	< 9,000	Delivery Vans
100-150 mm	Kg	< 6,000	Car Park: Cars & Light van
100mm	Kg	< 3,000	Domestic Traffics: Cars
75mm	Kg	< 1,000	Pedestrians (with cyclist) path

Can I use an alternative system?

Cellweb® TRP has a number of unique attributes and once this has been specified by architects and designers, please be aware that no other system can comply. For guidance on ascertaining if another system is suitable, please contact our team for assistance. A system failure can ultimately bring about the demise of the protected tree(s) and could lead to prosecution and unlimited fines.

Please be aware that if Geosynthetics Ltd have completed site specific calculations and provided a full technical recommendation, use of another product will void our engineered solution and the guarantee will no longer be applicable.

For further information and assistance with Cellweb Tree Root Protection, please contact Geosynthetics Ltd on 01455 617 139.

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Fax: 01455 617140 | Email: Sales@geosyn.co.uk

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Reinforcement with Cellweb® TRP

Application [11 RUR-CEL] Information For Calculation

Geosynthetics

Date:	
Client / End user:	
Designer / Specifier:	
Planning Authority:	
Project Title:	
Location:	
Application (or any additional information):	

Traffic information	
Vehicle Type (nb of axles)	
Axle Load: P (kN/axle)	
Wheel load: (kN/wheel)	
Vehicle Weight:(kg or Ton)	
Number of traffic passages:	

Area	
Area approx (m2) and/or Dimensions (m x m)	

Traffic (Please Tick)	
Regular HGV use	
Occasional HGV use	
No HGV use	
Unusual load e.g. crane or piling rig	
Occasional fire engines	
Bin lorries	

Existing Ground	
CBR (%)	

Existing ground	
Type of soil	
Granular Soil	
Cohesive Soil	
Peat Soil	

Type of Surfacing (Porous surface always recommended for TRPA)	**Surface to be used** during construction	after construction
Block Paving+Sand Bedding		
Porous Tarmac		
Resin bound gravel + Porous Binder course Asphalt		
Loose Gravel		
Golpla System infill gravel		
Golpla System infill grass		
Sudscape		
Other		
Depth of Surface *		

*See drawing below