



Geosynthetics

Cellweb® Tree Root Protection

Creating Innovative Solutions with Outstanding Products

Engineering Harmony:

Bridging the Gap Between Development & Nature

In modern urban development, trees are no longer viewed as aesthetic extras; they are vital high-value assets. For the Arboriculturist and Tree Officer, these trees represent decades of environmental investment that must be protected according to strict UK standards. For the Contractor, they often represent a complex logistical challenge that can threaten project timelines and budgets if not managed correctly.

The primary conflict arises beneath the surface. Standard construction methods typically require deep excavation and heavy compaction, both of which are terminal to a tree's root system. Without a specialist solution, the "dig" required for a driveway or access road can lead to irreversible soil compaction, suffocating the roots and ensuring the eventual decline of the tree.

The "No-Dig" Necessity

This brochure introduces Cellweb® TRP, a system designed to align these competing interests. It provides a robust, load-bearing surface that meets the structural demands of heavy vehicular traffic while maintaining the integrity of the soil's bulk density.

By adopting a "No-Dig" philosophy, contractors can bypass the need for traditional deep-strip foundations, significantly reducing on-site excavation time and waste disposal costs. Simultaneously, Tree Officers are provided with the technical assurance that the tree's vital supplies of water and oxygen are maintained through a fully permeable, research-backed system.

At Geosynthetics Ltd, we provide the engineering data, CAD support, and field-proven technology to ensure that your project satisfies the requirements of BS 5837:2012 without compromising on construction efficiency.

Protecting Your Project:

A guide to Tree Preservation & Compliance

In the UK, trees are not just part of the landscape, they are often strictly protected by law.

Under the Town and Country Planning Act 1990, unauthorised work on protected trees is a **criminal offence**. Whether a tree is covered by a Tree Preservation Order (TPO), situated within a Conservation Area, or protected via specific planning conditions, you must secure proper authorisation before any site activity begins.

The True Cost of Non-Compliance

Ignoring these protections can be a costly affair. On any construction site, all protected trees must be managed in accordance with BS 5837:2012. Failure to comply puts multiple parties at risk of significant financial penalties:

Destruction or wilful damage:

Convictions in a Magistrates' Court can carry **fines** of up to **£20,000**. If the case is committed for trial in the Crown Court, the fine is unlimited.

Minor unauthorised works:

Even activities that do not destroy the tree can result in a fine of up to £2,500.

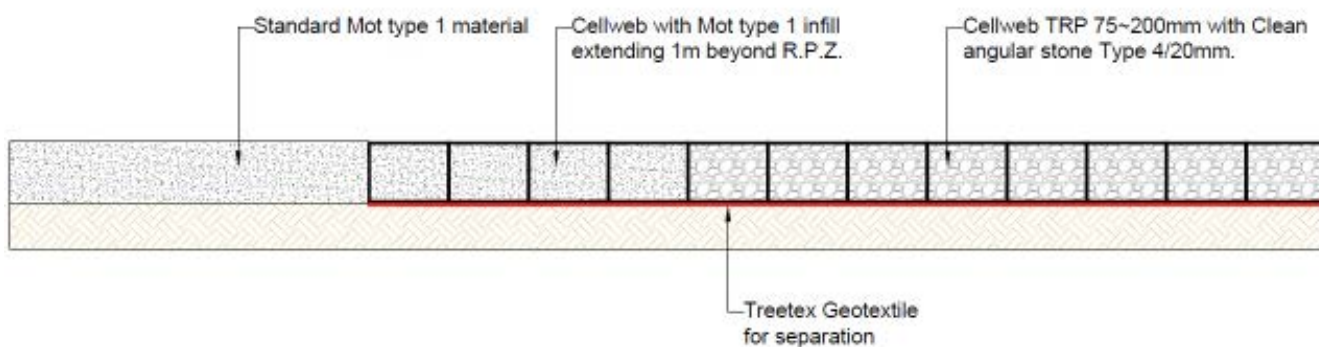
It is important to note that the Courts do not require a tree to be completely obliterated to be considered "destroyed." If a tree is rendered useless as an amenity, it meets the legal threshold for destruction.



The “Hidden” Danger: Soil Compaction

Many developers and building contractors are unaware that compaction of soils within the Root Protection Area (RPA) constitutes wilful damage. If vehicular or pedestrian access within the RPA is necessary, either for construction operations or final site access, the effects of this activity must be addressed.

When tracked or wheeled traffic movements are involved, the **ground protection system must be designed by an engineer** to account for the specific loadings involved. Failure to address this doesn't just risk the health of the tree; it risks the financial viability of your project.



The Proven **Solution:** Cellweb® TRP

To meet the requirements of BS 5837:2012, your project requires a specialised approach. The standard explicitly states that:

"Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems..." (BS 5837:2012, Section 7.4.2, Note 1).

The Market Leader in Root Protection

Cellweb® TRP is the established market leader for tree root protection across the United Kingdom and Ireland.

Our cellular confinement system is engineered to protect delicate root networks from the twin threats of soil compaction and desiccation, all whilst creating a stable, load-bearing surface capable of supporting heavy vehicular traffic.

Choosing Cellweb® TRP provides your project with a "no-dig" solution that is tried, tested, and proven in the field since 1998.

It remains the only tree root protection system to have undergone rigorous **independent testing**, and it is the only system on the market backed by a 10-year product guarantee.

Evidence-Based Performance: The Field Trials

At Geosynthetics Ltd, we back our claims with solid data. We are the only company in the UK and Ireland to have conducted live, completely independent field tests on the performance of 3D cellular confinement in no-dig applications.

The results are conclusive: **Cellweb® TRP significantly reduces sub-soil compaction, keeping it well within the healthy root growth parameters** established by Dr K.D. Coder (University of Georgia). This independent report is available upon request and provides the technical depth required to satisfy even the most stringent planning requirements.

The Geosynthetics Ltd Guarantee

We pride ourselves on providing a reliable, end-to-end service, from initial technical advice and site support, to detailed installation guidance.

Our 10-year guarantee provides developers, Tree Officers, and Arboricultural Consultants with total confidence. You can be certain that the designed system will perform as intended, protecting the health of the tree whilst ensuring the long-term integrity of your site's surfaces.



How Cellweb® TRP works

Cellweb® TRP is a three-dimensional cellular confinement system designed to reinforce aggregate materials. By confining the infill, the system increases the structural strength and bearing capacity of the sub-base.

Independent research demonstrates that Cellweb® TRP functions as a stiff raft. This mechanism effectively distributes heavy wheel loads across a wider area, significantly reducing the pressure exerted on the ground below.

By mitigating this magnitude at the base of the construction, the system maintains soil bulk density at levels that support healthy, ongoing tree root growth.

Cellweb® TRP provides a cost-effective, durable solution for hard surface construction over sensitive root zones.

Nutrient Transfer: Maintaining the Vital Exchange

For a tree to thrive, it requires a constant exchange of water and oxygen. Traditional solid surfaces often “seal” the ground, leading to root suffocation and desiccation.

The Cellweb® TRP system is engineered to be entirely permeable. By using a specific open aggregate infill and perforated cell walls, the system maintains pore spaces greater than 0.1mm in diameter.

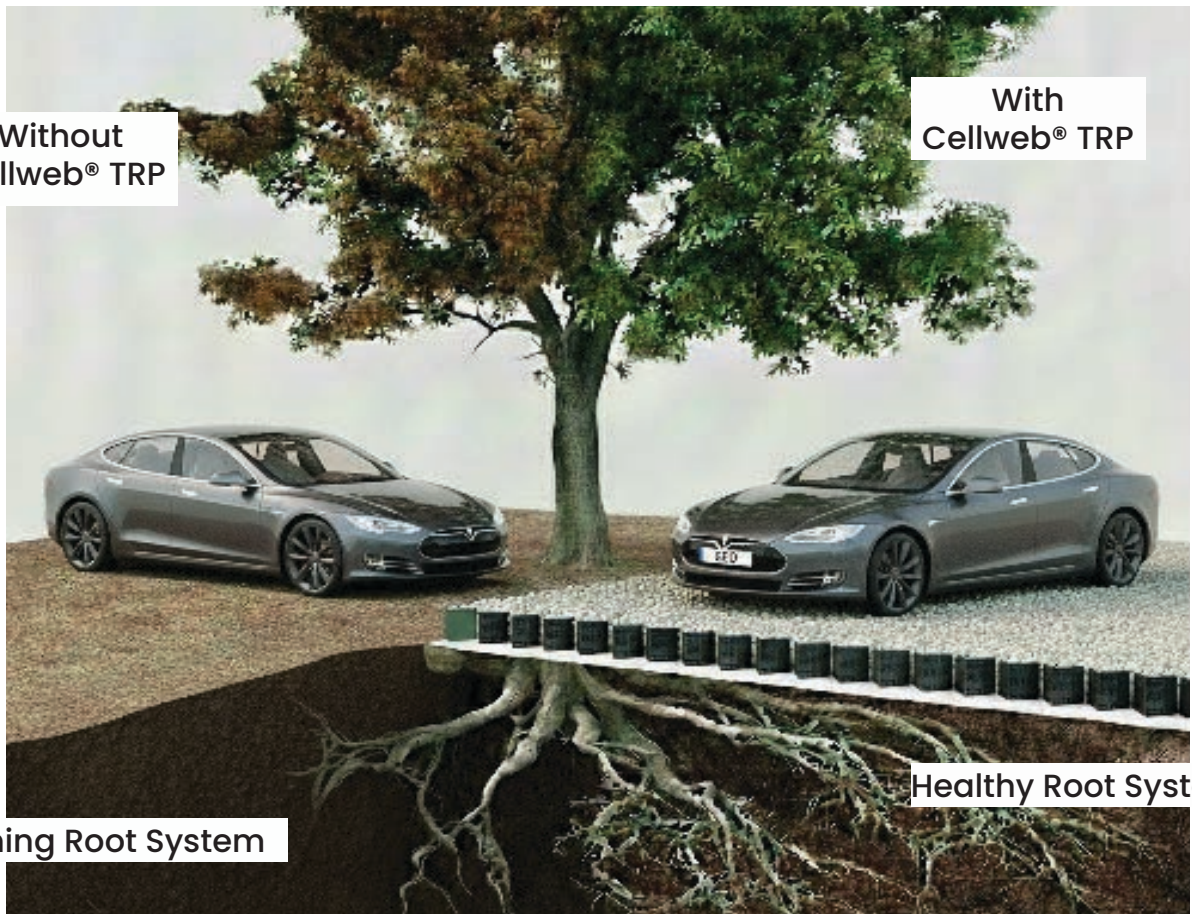
The result? A structure that is far more permeable than typical soils. This open architecture allows for the free movement of water and oxygen, ensuring that the tree’s vital supplies are maintained despite the presence of a hard surface above.

Without
Cellweb® TRP

With
Cellweb® TRP

Declining Root System

Healthy Root System



Environmental Protection: Managing Pollution



To ensure maximum environmental integrity, a permeable pavement system should always be constructed above the Cellweb® TRP system. The effectiveness of permeable pavements in removing pollutants from run-off is well-documented; worldwide research confirms that water passing through these systems contains significantly lower concentrations of harmful contaminants.

While the joints between paving blocks and the internal aggregate can manage small oil spills, protecting the sensitive root zone from larger, more significant spills requires a dedicated specialist layer.

The Power of Treetex:

Advanced Filtration and Absorption

The Treetex geotextile is an essential component of the Cellweb® TRP system, performing two critical functions to safeguard the ecosystem:

Effective Separation: It keeps the sub-base aggregates distinct from the underlying soil, maintaining the structural integrity of the installation.

Pollutant Capture: Treetex is engineered to trap hydrocarbons within its structure, allowing them to degrade aerobically within the pavement construction.

The specific weight, thickness, and structure of Treetex are designed to create the optimum environment for this biological breakdown. Most importantly, independent tests prove that Treetex will absorb 1.7 litres of oil per square metre making it four times more effective than standard geotextiles.

A System-Based Guarantee

Treetex is an intrinsic part of the Cellweb® TRP system. To guarantee the long-term success of the installation and protect the health of the trees, Treetex must be used in conjunction with the Cellweb® TRP 3D confinement layers.

By using the complete system, you ensure full compliance with our technical standards and environmental safety requirements.

(Please see page 14 for full details and terms of the 10-year guarantee).

Advice, Design & Product Selection

At Geosynthetics Ltd, we have been supplying the Cellweb® TRP system since 1998. With almost 30 years of application experience, we recognise that no two projects are identical.

Our team understands the unique variables such as soil types and expected traffic loads that must be considered to specify the correct Cellweb® TRP solution for your site.

To support your project, we provide a comprehensive consultation, design, and advisory service. Our goal is to find the most cost-effective and beneficial solution for your specific requirements.

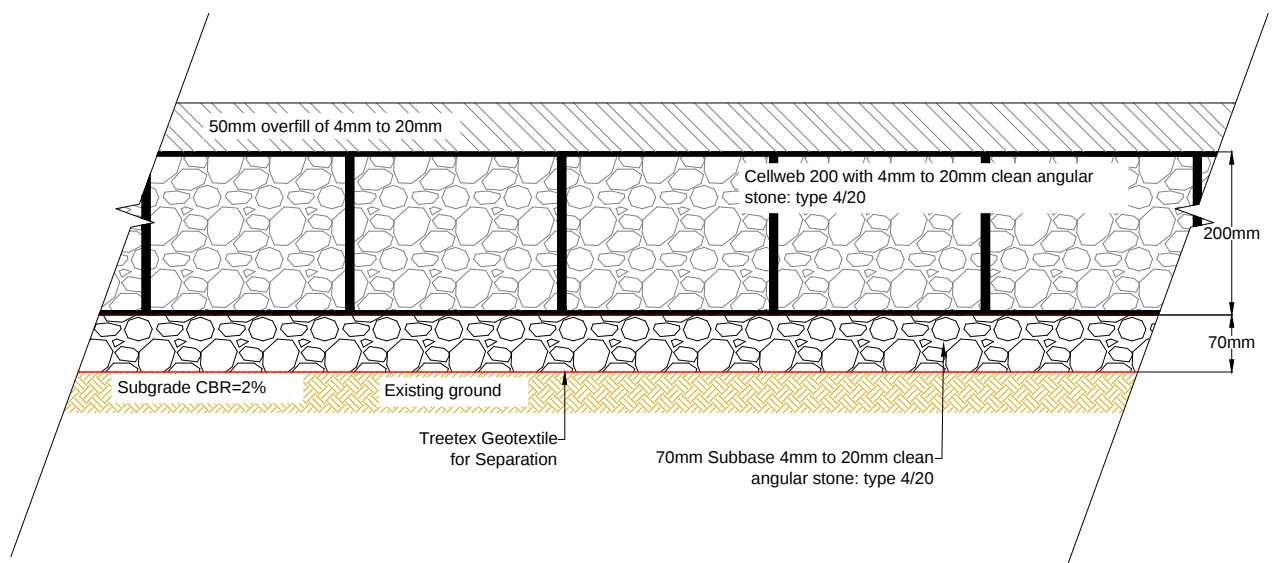
This service includes:

Product Selection: Tailored to your site's specific constraints.

Engineering Calculations: Providing the data-backed certainty your technical team requires.

CAD Drawings: Clear, professional visuals for planning and installation.

Full Instructions: Technical guidance to support you from project conception to final completion.





Selecting the Final Surface

To maintain the long-term benefits of the Cellweb® TRP system, it is vital to select a suitably porous final surface. This ensures the continued transfer of water and oxygen to the root zone.

We recommend the Golpla™ grass reinforcement and gravel retention system. Golpla™ provides a visually attractive and fully porous finish that complements the environmental goals of your project. Alternative porous options include block paviors, porous asphalts, and loose or resin-bonded gravel.



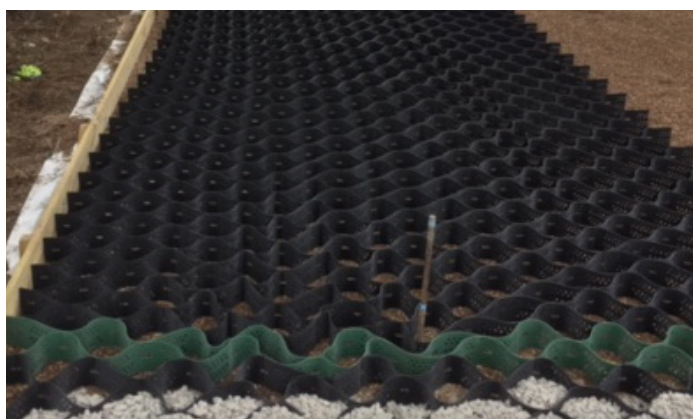
Why You Should Always Specify Cellweb® TRP

Cellweb® TRP is the only research-backed system of its kind in the UK with a 100% success rate. Specifically developed for the tree root protection market and supported by decades of data across thousands of installations, it remains the system of choice for the majority of UK Tree Officers and Arboricultural Consultants.

Uniquely Identifiable

To ensure you are using the genuine and guaranteed system, Cellweb® TRP is designed to be uniquely identifiable.

Each panel is manufactured with a signature bright green edge. When installed correctly, these edges align to create a visible green band across the construction. This provides immediate on-site verification of quality and compliance for all stakeholders.





Geosynthetic

Innovative Solutions for Enhanced Accessibility and Conservation

Hurst Farm: Heritage Trail



Contractor: G F Tomlinson



Hurst Farm Woodland, Matlock, Derbyshire.



Sector: Environmental – Heritage and Conservation

Project Overview

In June 2022, Derbyshire Dales District Council was granted £1.2 million from the National Lottery Heritage Fund to bring the Hurst Farm Heritage Trail to fruition.

This five-year initiative aims to boost accessibility and connectivity across Hurst Farm Woodland via a circular footpath linking four key heritage sites: Baileys Tump WWII site, John Bowne Memorial, Victorian Wishing Stone, and Lumsdale Industrial Heritage Site.

The project underscores a broader regeneration strategy for Hurst Farm, enhancing public amenities, safeguarding natural and built heritage, and fostering community engagement through conservation, volunteering, and educational activities.

The Challenge

- **Accessibility in sensitive zones:** The trail needed to traverse heritage and ecological areas without disrupting existing conditions.
- **Tree root protection:** Construction had to avoid damaging tree roots while allowing pedestrian and light vehicular access.

- **Compliance with standards:** Ensuring adherence to BS 5837:2012 guidelines for development near trees.
- **Sustainability and community use:** The solution had to support long-term conservation and usage by the community.

Innovative Solutions:

Geosynthetics Ltd proposed a robust solution using the 100mm Cellweb® TRP system with Treetex geotextile at the base, infilled with 4/20mm clean angular stone.

- ◆ **Load Distribution:** Safeguards tree roots by distributing weight across the surface, preventing compaction.
- ◆ **Environmental Health:** Facilitates water and oxygen flow to the root zone, maintaining tree health.
- ◆ **Stable Surface Creation:** Provides a stable, low-maintenance trail for walking, cycling, and maintenance access.
- ◆ **Technical Guidance:** Our team ensured optimal installation with specific site recommendations and support.



Key Benefits Delivered:

1

Enhanced Accessibility:

Seamless connectivity across heritage woodland.

3

Community Engagement:

Promotes wellbeing through environmental stewardship and educational activities.

2

Tree and Habitat Preservation:

Protects mature trees and sensitive ecological zones.

4

Conservation Support:

Aids long-term sustainability and conservation goals.

Customer Testimonial:

"Geosynthetics delivered a reliable, efficient solution that exceeded our expectations. Their team was extremely helpful at Design stage, knowledgeable, and committed to quality throughout. In particular they were responsive to technical queries at the installation stage which included site visits to review site specific detailing."



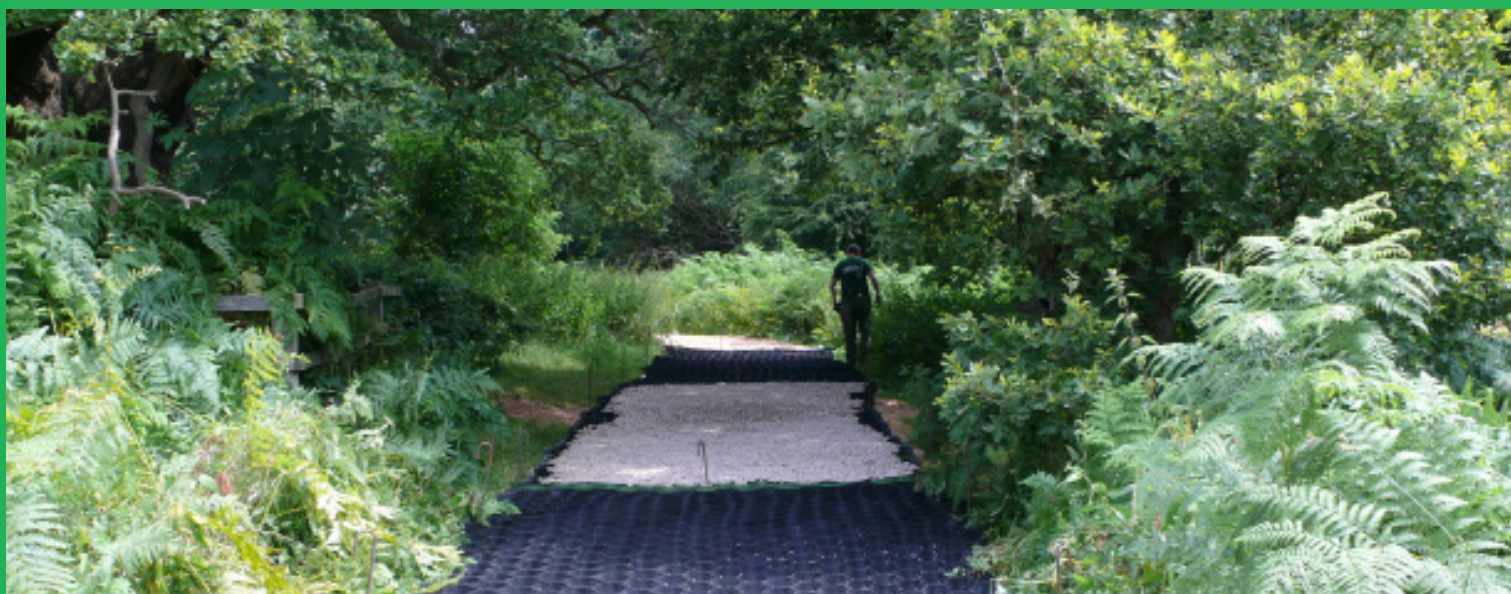
GF Tomlinson have used Geosynthetics on several schemes that require no dig solutions and bank retention. We would highly recommend Geosynthetics with regards to their Cellweb® TRP product."

R Sullivan –Senior Contracts Manager



Ancient Tree Protection with Innovative No-Dig Solution

Calke Abbey



 **Installer:** Geosynthetics Limited & National Trust

 **Sector:** Environmental – Heritage and Conservation

 **Location:** Calke Abbey, Ticknall, Derby, DE73 7LE

Project Overview

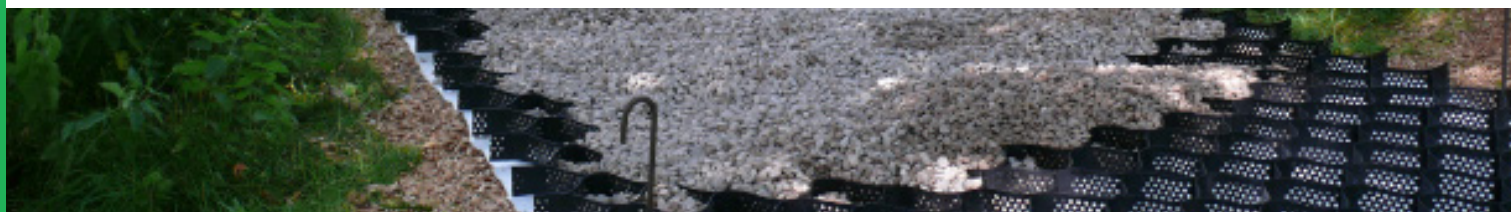
Calke Abbey is home to 'The Old Man of Calke,' a remarkable oak tree estimated to be up to 1200 years old, making it one of Britain's oldest veteran trees. When William the Conqueror arrived in 1066, this tree was already two centuries old.

Over the years, significant pedestrian footfall had led to severe soil compaction on one side of the tree, restricting water and oxygen availability to roots. This compaction caused noticeable crown dieback, raising urgent concerns about the tree's long-term health and prompting a preservation intervention.

Challenge

Protecting a National Treasure from Soil Compaction

- **The tree suffered accelerated dieback** due to compacted soil beneath high-traffic areas limiting root health.
- **A solution was required to alleviate existing soil compaction** and prevent further damage from ongoing foot traffic.
- **Maintaining natural soil aeration** through biological decomposers was a key technical aim.
- **The intervention had to balance** conservation, accessibility, and environmental sensitivity without invasive excavation.



Innovative Solutions:

Geosynthetics Limited's specialist engineering team collaborated closely with Brian Muelaner, the National Trust's ancient tree advisor, to develop a sensitive, effective root protection strategy:

◆ Layer of Mulched Wood Chip (90mm):

Applied over the existing ground to encourage decomposers such as earthworms, which naturally aerate and reduce soil bulk density.

◆ Treetex Geotextile Layer:

Laid over the mulch as a separation and pollution control layer, protecting root zones while allowing gas and water exchange.

◆ Permeability and Gas Exchange:

Cellweb® TRP's design maintains water infiltration and oxygen movement, essential for root vitality and long-term tree health.

◆ Cellweb® TRP Panels:

Installed above the geotextile and infilled with clean angular stone to provide a robust geocellular confinement system. This structure evenly distributes surface loads, preventing further soil compaction beneath the rooting environment.

The entire project – from design through to supply and installation – was undertaken by Geosynthetics Limited. In a generous act of stewardship, the Geosynthetics Tree Root Protection Team donated their time, expertise, and materials, and committed to preserving The Old Man of Calke for future generations.



Key Achievements:

1

Alleviated Soil Compaction:

Encouraged biological soil aeration via mulch and decomposer activity, enhancing root health naturally.

3

Sustained Soil Hydrology:

The combined system preserved natural water and air flow, critical to tree longevity.

2

True No-Dig Protection:

Cellweb® TRP prevented further soil compaction without excavation or disturbance, fully protecting the ancient roots.

4

Conservation-Focused Design:

The solution honoured the tree's heritage status by blending ecological sensitivity with technical innovation.

Our Impact

For tree root protection solutions that respect conservation imperatives and environmental sensitivities, **contact Geosynthetics Ltd's technical team to discuss bespoke, no-dig systems designed to safeguard heritage trees across the UK.**

Client Testimonial

"This is an exciting new development in how to reduce compaction damage from vehicles and footfall to an ancient tree's roots, made possible by the generous donation by Geosynthetics in time, expertise and materials."

– Brian Muelaner, Ancient Tree Advisor, National Trust



Product Guarantee

1. Geosynthetics Limited can only guarantee Cellweb® TRP where its installation has been carried out in strict accordance with the Installation guide and technical recommendation issued by Geosynthetics Limited. Therefore the guarantee will **only** be applicable where:

(a) The customer has provided a BS5837 tree report and agreement has been made with Geosynthetics Limited as to which trees will be covered by this guarantee.

(b) There was no compaction of the ground or damage to any tree roots prior to the installation of the Cellweb® TRP.

(c) Geosynthetics Limited has provided a technical recommendation in relation to the installation.

(d) Where surface vegetation was present, it was removed to the approved methods of sections 7.4.2.1 and 8.7 of BS5837:2012 in relation to ground vegetation removal.

(e) The Treetex geotextile was laid in accordance with the technical recommendation and the Cellweb® TRP Installation Guide.

(f) Where a sub-base of clean angular stone was required by the technical recommendation, the correct depth was created as per the specifications issued by Geosynthetics Limited by using hand tools to avoid compaction.

(g) The Cellweb® TRP panels were installed and fixed using **Cell Ties** purchased from Geosynthetics Limited or using similar products which are of the same or a higher quality.

(h) The Cellweb® TRP panels were infilled with clean angular stone in accordance with the specifications issued by Geosynthetics Limited.

(g) The finishing surface was laid in accordance with BS5837:2012 and the Cellweb® TRP Installation Guide.

2. As Geosynthetics Limited may need to determine whether the Cellweb® TRP has failed or whether the tree has been killed or damaged by another cause, the customer must not allow anyone else to examine the installation before Geosynthetics Limited have had the opportunity to inspect it, as damage could be caused to the installation by any other inspection. If the customer does let third parties onto the site or the customer or their agents interfere with the installation, this guarantee will lapse.

3. The customers' use of the surface and the traffic flow over the installation must be (and at all times have been) in accordance with the information provided to Geosynthetics Limited at the time of the design of the installation. Geosynthetics Limited can only provide designs based on the information provided by the customer and will have recommended the relevant Cellweb® TRP product according to that information.

4. This guarantee is for the benefit of the landowner of the site. Geosynthetics Ltd suggests a copy of this guarantee is issued to the solicitor of the customer should the ownership of the land transfer.

5. Where a tree which was intended to be protected by the installation dies and Geosynthetics Limited concludes that this was caused by a failure of Cellweb® TRP then Geosynthetics Limited shall:

- Replace the dead tree with a tree as close to the dead tree (as available generally in the marketplace) as possible subject to a maximum replacement cost of £10,000 per tree; and

- Replace the Cellweb® TRP which has failed (but not any other part of the installation where the Cellweb® TRP has not failed) subject to a max. replacement cost of £50,000.



From Specification to Site: The Geosynthetics Advantage

Choosing Cellweb® TRP is more than a product selection; it is a commitment to project certainty. We understand that the transition from a planning condition to a finished surface involves multiple stakeholders, tight deadlines, and the need for absolute structural reliability.

At Geosynthetics Ltd, our role is to remove the friction from this process. We bridge the gap between the arboricultural requirements of the Tree Officer and the practicalities of the contractor's site. By providing a system that is as easy to install as it is effective at protecting roots, we ensure that your project moves forward without delay or non-compliance risks.

Why Partner with Geosynthetics Ltd?

Decades of Proven Performance: With over 25 years of experience and thousands of successful installations across the UK and Ireland, we provide a level of historical data that is unmatched in the industry.

Engineering Excellence: We don't just supply materials. Our in-house technical team provides bespoke engineering calculations and CAD drawings tailored to your site's specific traffic loads and soil conditions.

On-Site Support: We offer installation guidance and technical advice to ensure that the "No-Dig" solution is executed perfectly, maintaining the validity of your 10-year guarantee.

Total Compliance: Our systems are designed to satisfy the most stringent local authority requirements, ensuring your project meets all BS 5837:2012 and APN 12 standards from day one.

Take the Next Step in Your Project

Whether you are in the early stages of a planning application or are ready to begin construction, our team is standing by to provide the technical support you need. Do not leave your tree protection to chance! Specify the only system with a 100% success rate and the backing of independent field trials.

Tel: 01455 617 139

Email: sales@geosyn.co.uk

Web: www.geosyn.co.uk



Geosynthetics



This brochure is produced to give an example of the products we supply and how, subject to your own testing, our products may be used. Nothing in this brochure shall be construed so as to make any ascertain or give/constitute any warranty as to specification or the fitness for purpose of any of our products in respect of any specific job. You should satisfy yourself through your own testing as to the suitability of our products for any specific purpose and rely solely on such testing and/or the advice of any professional(s) you commission. While we try to ensure as far as possible that all information given in this brochure is accurate at the time of print, information and examples given in this brochure are by way of illustration only and nothing contained in this or any other promotional literature produced by Geosynthetics Limited shall in any way be binding on us or constitute any offer or contract with you or shall be relied upon by you as a statement or representation of fact.