


Appendix 9 – TPO locations within the vicinity of the site

**WELWYN
HATFIELD**

Council Offices, The Campus
Welwyn Garden City, Herts, AL8 6AE

| | |
|--------------------------------|-----------------|
| Title: Northaw House | |
| Project: TPO Search | Drawing Number: |

| |
|----------------------------|
| Scale: |
| Date: 05-12-2019 |
| Drawn: |

© Crown Copyright. All rights reserved Welwyn Hatfield Borough Council LA100019547 2019

Appendix 10 – Site Induction Form Tree Awareness

TREE AWARENESS – SITE INDUCTION

SITE NAME:

DATE OF INDUCTION:

Trees are an important part of this development. They must be kept undamaged so that they can fully benefit the finished project well into the future. All persons working on this site have a responsibility to be aware of trees and to abide by tree protection procedures.

How trees can be damaged

Above the ground – contact and impact with branches and trunk (machine operations eg teleporters, high-sided vehicles, crane use, fixings to trunk, unauthorised cutting back of branches)

Below the ground – root severance (eg soil stripping during site clearance, excavations) and root damage resulting from compaction of soil near trees (eg vehicles, pedestrian, storage of materials). Effects of root damage take time to become obvious, but will result in disfiguring dieback of leaves and branches, or even tree death.

Tree protection procedures

Provided that the simple steps are followed most tree protection is straightforward:

- Stay out of tree Construction Exclusion Zones (CEZs). These are the areas of ground surrounding retained trees that are protected by barriers. If you need to go into a CEZ, you must first gain authorisation from the Site Manager
- No construction activity of any description within CEZs, eg soil stripping, cement mixing, services installation, storage of materials etc
- No fires within 20m of trunk of any retained tree
- If authorised to work within a CEZ, work to the **Arboricultural Method Statement**, eg demolition, construction, landscaping works etc
- If damage occurs, inform the Site Manager.

Remember

All trees on the site are protected by planning conditions. The trees on the site are also legally protected by Conservation Area status.

Planning Authority enforcement action needs to be avoided:

- ‘Breach of Conditions’ notices can prevent a site from being signed-off.

- 'Temporary Stop Notices' halt site operations and result in associated high costs.
- Wilful damage/destruction of Conservation Area trees can result in company and/or individual prosecutions - fines can be anything up to £25,000 (County Court fines can be higher). Remember that fines apply to the person committing the offence as well as the site owner and main contractors!

Be aware of tree protection and stick to the procedures. Tree protection is straightforward. If in doubt –ask!

I have received site induction in tree awareness and tree protection procedures

PRINT NAME

SIGN

DATE

Appendix 11 – Tree Protection Sign



PROTECTIVE FENCING. THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.



**TREE PROTECTION AREA
KEEP OUT !**

**(TOWN & COUNTRY PLANNING ACT 1990)
TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A TREE PRESERVATION ORDER.
CONTRAVENTION OF A TREE PRESERVATION ORDER MAY LEAD TO CRIMINAL PROSECUTION**

ANY INCURSION INTO THE PROTECTED AREA MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY

Appendix 12 – Tree Protection Fencing examples

Figure 2 Default specification for protective barrier

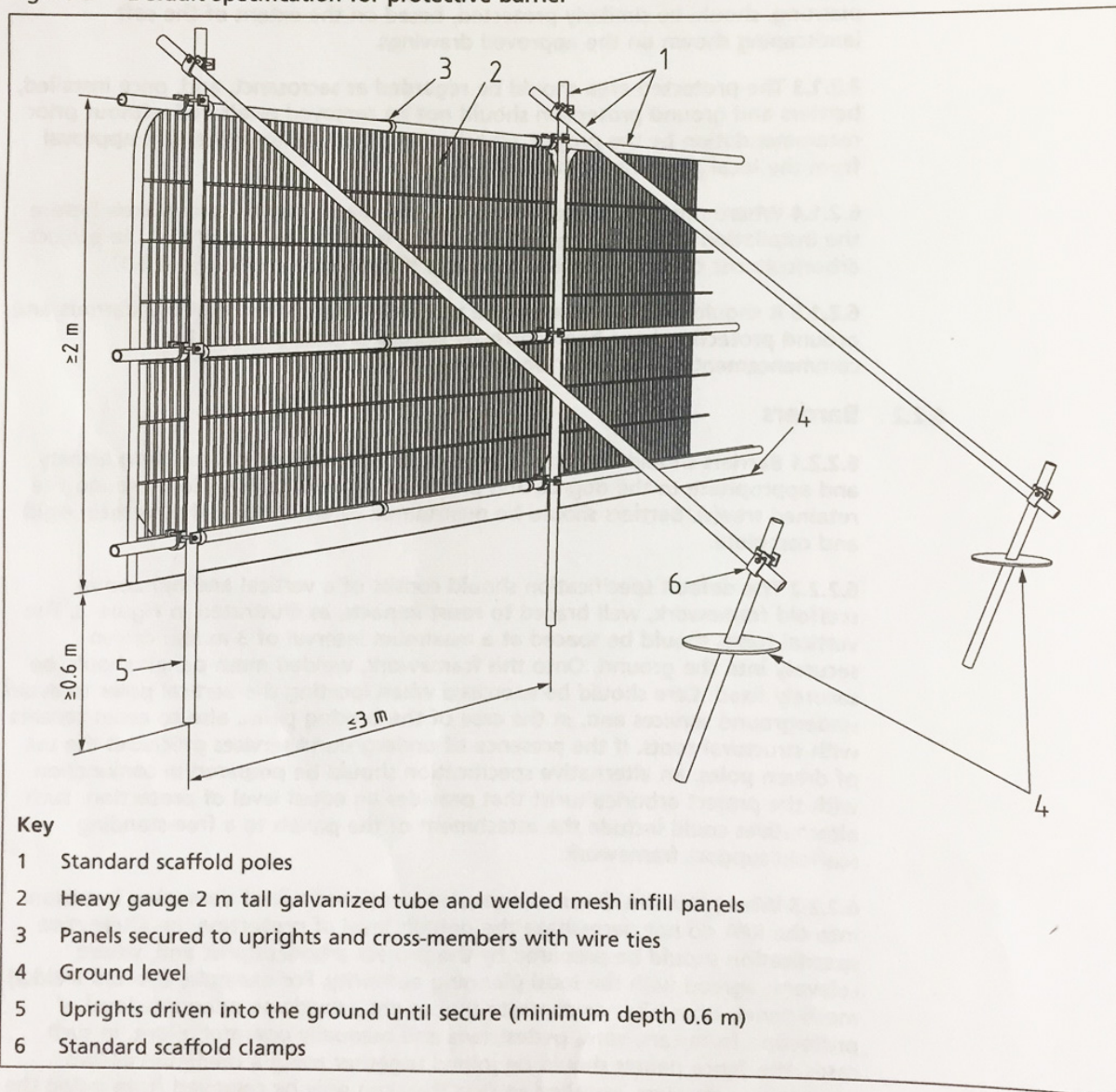
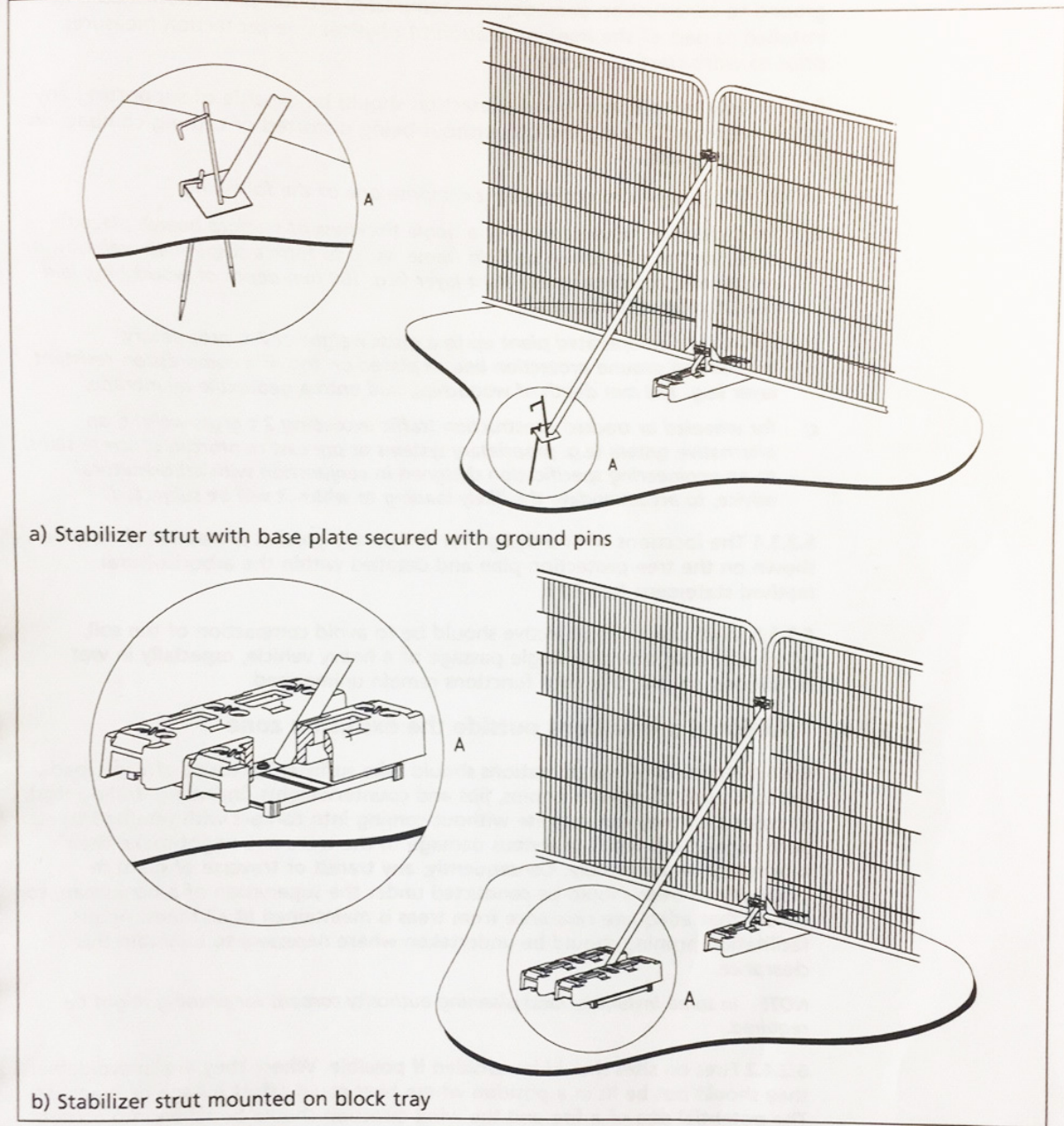


Figure 3 Examples of above-ground stabilizing systems



Appendix 13 – Cellweb No-Dig Construction Methodology



Geosynthetics Ltd
Fleming Road
Harrowbrook Industrial Estate
Hinckley, Leicestershire
LE10 3DU
Tel 01455 617139 Fax 01455 617140
sales@geosyn.co.uk
www.geosyn.co.uk

Method Statement

For The Installation of Cellweb Tree Root Protection System.



When considering damage to tree roots, in applications of vehicular access and parking, the risk of oxygen depletion caused by compaction of subsoil's, site clearance damaging the root source and type of reinforcement are areas which need to be given due consideration.

Other risk factors are:

- Creating an impermeable surface
- Causing a rise in the water table due to construction
- Increasing ground level
- Contamination of subsoil's

1. Compaction

When looking at site conditions and use, the following information should be considered to enable a load bearing structure capable of supporting traffic to be proposed:

- Californian Bearing ratio (CBR) – Standard test method for measuring soil strength
 - Soil types
 - Water table
 - Maximum load (vehicles)
 - Acceptable rut depth
 - Reinforcement type Cellweb Cellular Confinement 150mm deep
- Type and Depth of engineered infill material Clean, angular. Usually 40mm to 20mm.

2. Dig (site strip)

Site stripping does damage some root structure prior to construction; however, the use of no-dig construction elevates the access road requiring edge protection.

3. No dig

- 3.1. Remove surface vegetation Use a suitable herbicide suitable for the specific vegetation and not harmful to the tree root system
- 3.2. Place geotextile separation filtration layer Use a Treetex T300 non woven Geotextile over the prepared sub-grade. Overlap dry joints by 300mm. The three dimensional cell structure, is formed by ultrasonically welding polyethylene (perforated) strips / panels together to create a three dimensional network of interconnecting cells. A high degree of frictional interaction is developed between infill and the cell wall, increasing the stiffness of the system
- 3.4. Edge restraint A treated timber edging is usually acceptable.

4. Cellular Confinement and Backfill Material.



Expand the Cellweb 2.56m wide panels to the full 8.1 metre length. Pin the Cellweb panels with staking pins to anchor open the cells and staple adjacent panels together to create a continuous mattress. Infill the Cellweb with a no fines angular granular fill (typically 4-20mm) within each open cell. The use of cellular confinement reduces the bearing pressure on the subsoil by stabilising aggregate surfaces against rutting under wheel loads. Comparisons between cellular confinement and traditional aggregate and geogrid-reinforced structures demonstrate a 50%

reduction in construction thickness of the granular material.

5. Surfacing Options

Block Paving:

- 5.1. Lay second layer of Treetex T300 Geotextile separation fabric over the infilled Cellweb sections
- 5.2. Lay sharp sand bedding layer compacted with a vibro compaction plate to recommended depth.
- 5.3. Place block paviors as per manufacturers instructions.

Tarmac:

Place 25mm surcharge of the granular material above the Cellweb system and lay the bitumen base and wearing courses.

Loose Gravel:

- 5.4. Ensure Cellweb is completely filled.
 - 5.5. Place decorative aggregate to required depth
- NOTE: A treated timber edge should be provided to restrict gravel movement.

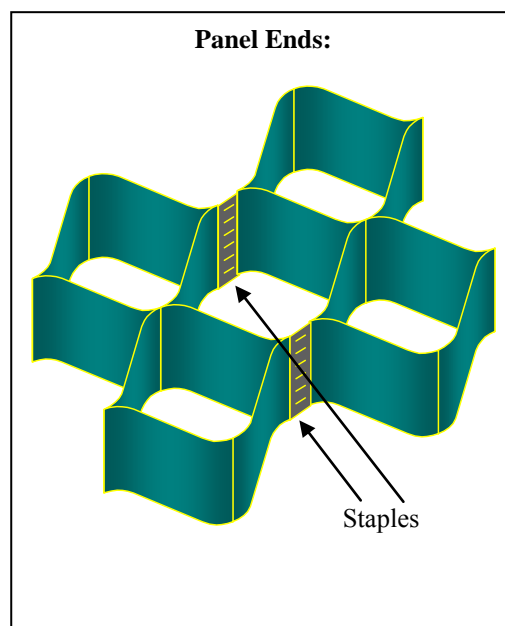
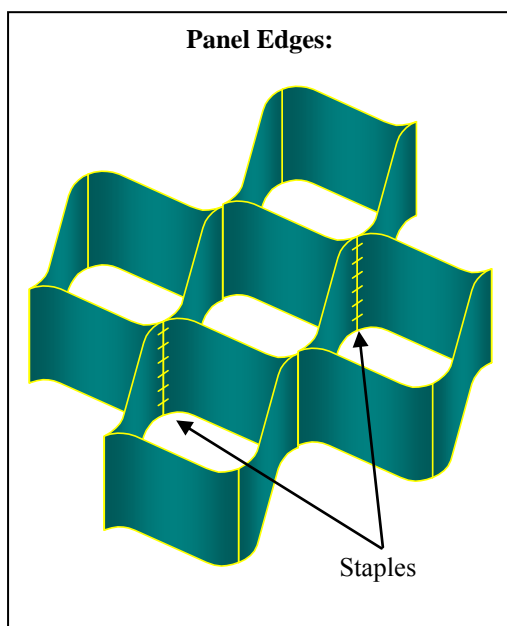
Grass Blocks:

- 5.6. Place second layer of Treetex T300 Geotextile separation fabric over the infilled Cellweb sections
 - 5.7. Place 50/50 rootzone bedding layer to the required depth
 - 5.8. Lay recycled Duo Block 500 Grass Protection System infilled with 50/50 rootzone mix.
 - 5.9. Seed as per architects instructions.
- (Alternatively the Grass Blocks may be infilled with gravel.)

Concrete Slab

6.0 Lay Cellweb as previous and place second layer of Treetex Geotextile directly over the filled panels. Pour concrete base as specified.

Below are illustrations of the correct stapling procedure for joining both edges and ends of panels together;



CI/SfB

Common Arrangement R12

Uniclass
L81208/L81210



CellWeb™



Tree Root Protection System



Geosynthetics

CellWeb™

Tree Root Protection System



The CellWeb™ TRP cellular confinement system protects tree roots from the damaging effects of compaction and desiccation, while creating a stable, load-bearing surface for vehicular traffic.

CellWeb™ offers an alternative to the traditional methods of constructing roadways and building foundations that involve excavation, which can result in tree root severance and soil compaction from the passage of vehicles. Such damage can severely influence tree health, and in extreme cases leads to death. CellWeb™ can be sensitively installed close to and under the canopies of trees without negative effects.

Trees are valuable landscape features and a vital environmental resource. Increasingly, contractors are being required to ensure the health and survival of trees during and beyond the construction period. Although this is enshrined in BS 5837: Trees in Relation to Construction: Recommendations (2005) and Tree Preservation Order legislation, it presents several issues when implementing construction projects near to trees:

- Root severance caused by excavation, leaving trees open to decay, less stable and with a diminished capacity to utilise soil water and nutrients.
- Destruction of soil structure and compaction due to the passage of heavy vehicles, restricting the flow of water and air to tree roots.
- Need for construction access, new roadways and hard surfaces that require engineering-standard load-bearing foundations that meet building regulations.
- Need for high-performance, cost-effective driveways and roadways in the vicinity of tree roots.



Potential loss of existing tree due to poor construction techniques.

The CellWeb™ system overcomes these issues and helps contractors to comply with tree health guidelines by creating a load-bearing base that is water-permeable, stable and durable.

With no need for excavation, the system is quick and easy to install, reducing construction time and saving costs and making it suitable for temporary and permanent solutions.



Glynebourne Wood.

Pedestrian path to recreational woodland built using a CellWeb™ foundation which was covered with DuoBlock and then filled with woodchip to create a porous surface.

Product features



CellWeb™ comprises an expandable cellular mattress that is then filled with a clean stone sub-base and above a Treetex T300 Geotextile.

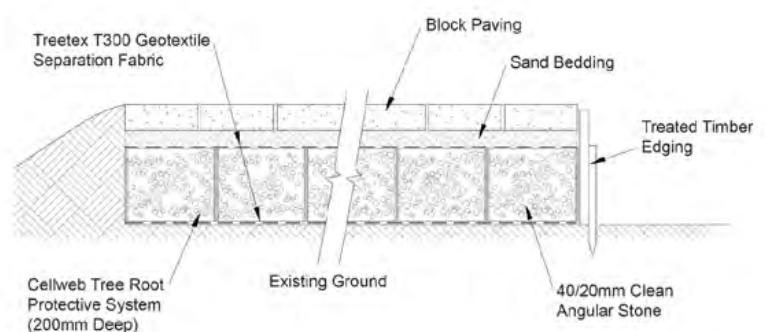
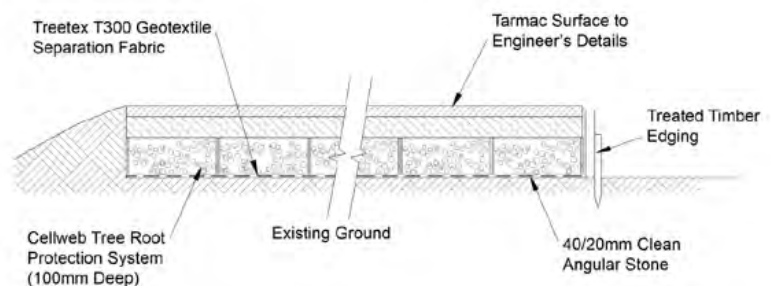
The honeycomb-like structure is made of robust high-density polyethylene (HDPE) that is simply stretched out and filled with clean angular material. Just like traditional roadways, the strength of the structure comes from the binding together of the infill, but with CellWeb™ this is achieved without compaction and without reduction in permeability.

Perforated cell walls allow the angular infill to bind with the contents of the adjacent cell, but with sufficient space for the movement of water and air to nearby tree roots. As the infill contains no fines and the geotextile layers prevent clogging from particles washing into the system, the structure remains permeable to water over time and protects the roots for the lifetime of the tree.

As well as being quick and easy to install, CellWeb™ also dramatically cuts down the depth of sub-base required, in most cases by as much as 50%, further reducing costs. CellWeb™ significantly reduces surface rutting, increasing the long-term performance of the finished surface and ensuring that tree roots remain protected from vertical loads.

CellWeb can be used as a permanent solution or alternatively the system can be used in a temporary situation. In a temporary application the system can be used for the required period of time, then removed for use on another site or recycled, thereby adding to CellWeb's green credentials.

- No excavation – Soil structure remains undisturbed; risk of root damage minimised.
- Porous infill – Allows tree roots to conduct moisture and gas exchange.
- No compaction – No need to compact the infill to achieve a load-bearing structure.
- Lateral stability – Structure remains rigid to vertical loads.



**Please call
01455 617 139**

or email sales@geosyn.co.uk
for further information.

Wide
product
range

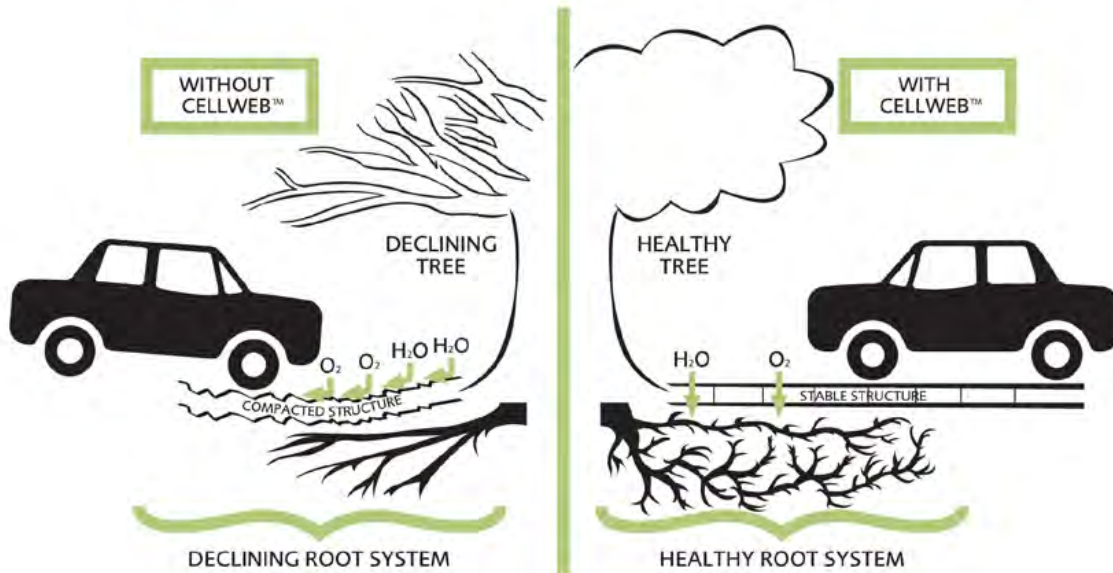
Large
stock
holding

Next day
delivery

Hydrological benefits

Water is a shrinking resource in the urban environment. As the extent of the built environment increases, more and more ground is being covered by impermeable hard surfaces that repel rainwater runoff, preventing it from reaching the roots of vegetation, and in particular trees. Rapid water runoff stretches the capacity of stormwater drains and frequently results in drainage management issues that are rarely resolved in favour of adjacent trees.

Using CellWeb™ mitigates these issues by promoting both the vertical and the lateral movement of water, whether the system is installed above or below ground. The 'pores' that are created by the spaces between the infill stones and the cell perforations even allow water to flow to adjacent tree roots that are effectively 'trapped' under areas of impermeable hard standing. CellWeb™ therefore helps to promote root growth and allows roots to continue to grow within areas of hard surfacing.



Design
service

Onsite
support



Geosynthetics



Design & installation

Final surfacing

The benefits of the CellWeb™ system to trees can only be maintained if a suitably porous final surface is selected. An ideal surfacing is the DuoBlocks grass reinforcement and gravel retention system, a visually attractive surface that has the advantage of being fully porous. Alternatives include block paviors, porous asphalts and loose or bonded gravel.

Call the Geosynthetics sales team on 01455 617 139 for more advice on surfacing options and other products and systems.

Advice and product selection

Geosynthetics Limited has been supplying the CellWeb™ system for many years and has acquired solid experience in its application. No two contracts are the same, and we understand the factors that need to be taken into account to specify the right CellWeb™ product.

We provide a FREE consultation, design and advisory service to find the solution that is most cost-effective and beneficial for your site. Our service includes product selection, CAD drawings and full instructions to help you from project conception to completion.

Call our sales office on 01455 617 139 for specification details and project-specific design assistance.

CellWeb™ in action:

Access road for the Lake District National Parks Authority.



Site before construction pictured above.



Installation of the CellWeb™ system.



Four years later.

Technical specification

Product Specifications

| Properties | Standard Cell |
|--------------------------|-----------------------------------|
| Material | Virgin HDPE |
| Wall thickness | 1.25mm |
| Seam welding | Ultrasonic to 100% of seam length |
| Cell depth | 75, 100, 150, 200 and 300mm |
| Width of expanded panel | 2.56m |
| Length of expanded panel | 8.1m |
| Cell diameter (expanded) | 259 x 224mm |

Certified Quality

CellWeb™ is manufactured in accordance with the ISO 9001 Quality Management System in a comprehensive range of cell diameters and depths.



Geosynthetics Ltd



Geosynthetics

Geosynthetics Limited

Fleming Road, Harrowbrook Industrial Estate
Hinckley, Leicestershire LE10 3DU.

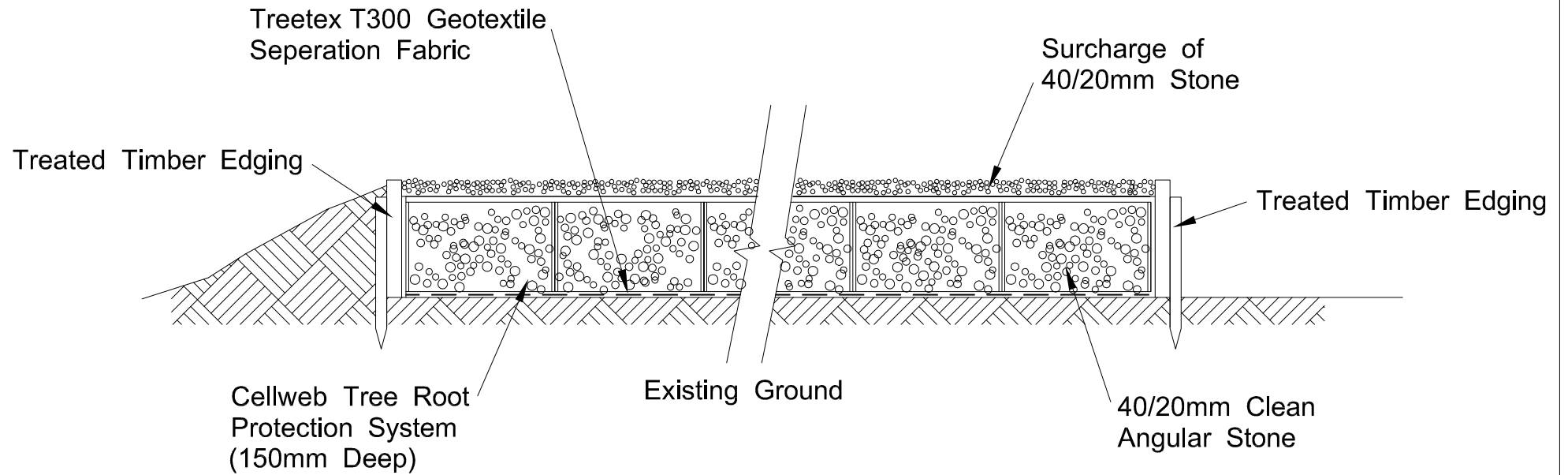
Tel: 01455 617 139

Fax: 01455 617 140

Email: sales@geosyn.co.uk

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 any warranty as to 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 ensure as far as is 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 us shall in any way constitute an offer or contract with you or shall be relied upon by you as a statement or representation of fact.

Appendix 14 – Alternative access roads surfacing construction example



Geosynthetics Ltd

Fleming Road, Harrowbrook Industrial Estate,
 Hinckley, Leicestershire. LE10 3DU
 Tel: 01455 617139 Fax: 01455 617140 www.geosyn.co.uk

TITLE

Cellweb Section - Tree Root Protection

| | | | |
|-------------|-------|----------|------------|
| DRAWN BY | SCALE | DATE | CHECKED BY |
| | 1:10 | 04/09 | |
| DRAWING NO | | REVISION | APPROVED |
| GS-CW-G-150 | | | |