

**Wood's**  
Tree Consultancy Ltd

**APPENDIX 3  
SPECIAL SURFACE CONSTRUCTIONS  
WITHIN TREE RPAS:**



## Cellular confinement

Initially developed by the Army Corps of Engineers to construct unpaved roads over weak ground, CellWeb dramatically improves the performance of infill materials across a range of applications including:

- Load support
- Erosion control
- Retaining walls
- Channel protection
- Tree root protection

CellWeb is a three-dimensional cellular confinement system

manufactured from high-density polyethylene (HDPE) strips that are ultrasonically welded together to create a strong, lightweight expandable panel.

Its unique hoop strength and interconnecting cell walls form a durable composite mattress that can be filled with common materials for the most demanding load support and erosion control applications.

Versatile, effective and economical CellWeb gives you the following benefits:

- Reduces subbase thickness
- Simple, speedy installation saving on construction costs.
- Environmentally friendly.
- Protection for germination on vegetated slopes.

### Load support

Providing reinforcement to infill materials, CellWeb performs like a semi-rigid slab. This effectively distributes loads laterally reducing sub grade pressures. This means that CellWeb can help you to reduce the sub-base thickness by up to 50% saving time and material costs.

### Product function

Millions of square meters of CellWeb systems have been successfully installed across the globe, answering many of today's challenging technical design problems.



## Erosion control and slope STABILISATION

CellWeb confines and reinforces vegetation on steep slopes by increasing the soils natural resistance to erosion and protects the root zone layer during germination. Similarly on non- vegetated slopes it prevents the down slope migration of granular infill resulting in greater stability. Perforated CellWeb panels increase lateral drainage and reduce hydrostatic build up.

## Retaining walls

When used to construct a retaining wall, CellWeb functions as both the face protection and the reinforcing element. Its structure confines the soil and prevents it from falling or being eroded, resulting in a longer life and less maintenance. CellWeb panels significantly increase the thickness of the wall, which in turn increases the weight of the wall and its retaining ability.

## Channel Protection

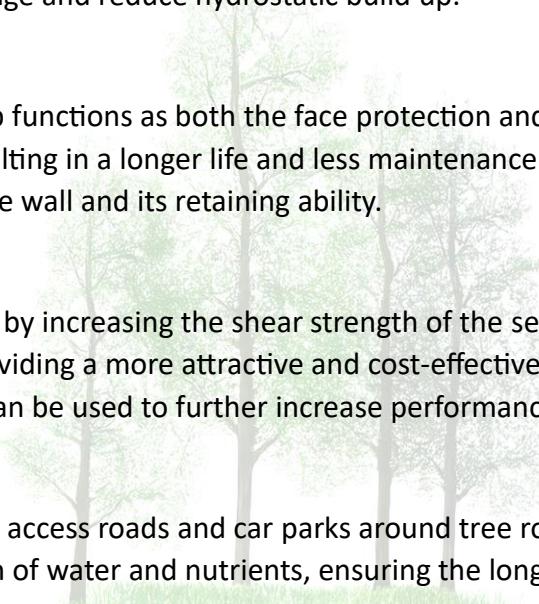
CellWeb protects channels, riverbeds and swales by increasing the shear strength of the selected infill. Water is directed above the infilled cellular structure, leaving the root zone undisturbed, providing a more attractive and cost-effective solution to concrete lined channels. In watercourses with high velocities a granular or concrete infill can be used to further increase performance.

## Tree Root Protection

Because CellWeb reduces the need for stabilizing access roads and car parks around tree root systems. What is more, it reduces compaction of sub soils above the roots and promotes the migration of water and nutrients, ensuring the long-term preservation of the tree itself.

## CellWeb construction

The following pages show a cross section of how CellWeb should be used in construction:



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## Cellular confinement construction with block paving top surface

Stretch out the cellular confinement on membrane.



Pin the edges of the cellular confinement with wooden or metal pins and add wooden retention board.



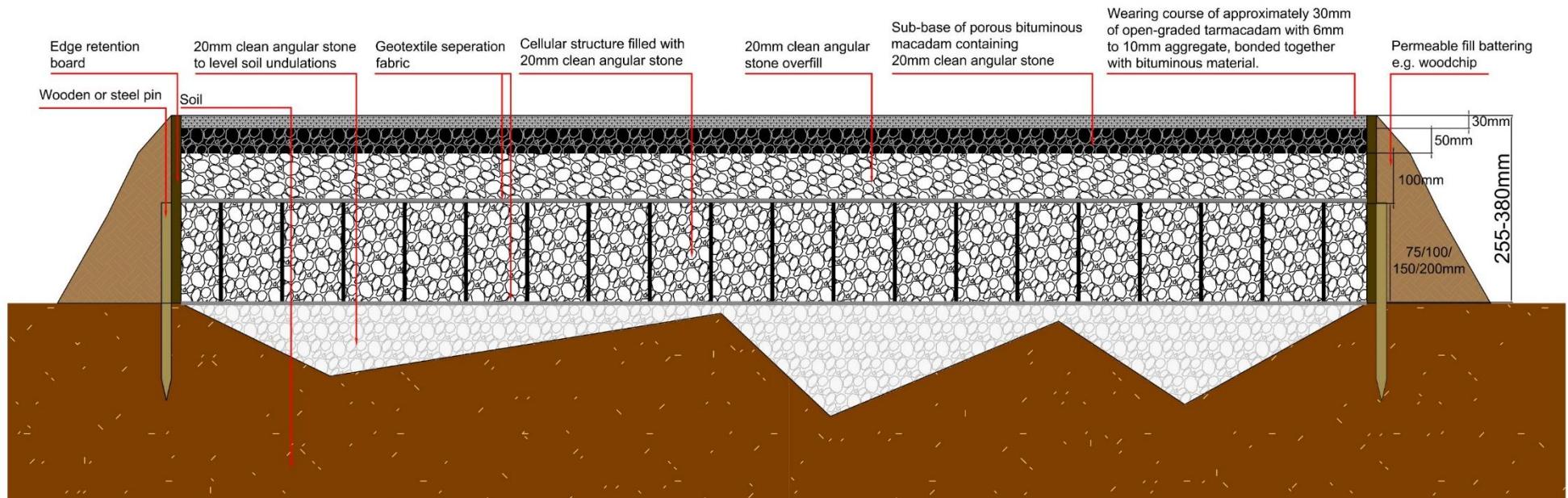
Fill with non-fines aggregate



Lay permeable block paving on cellular confinement.



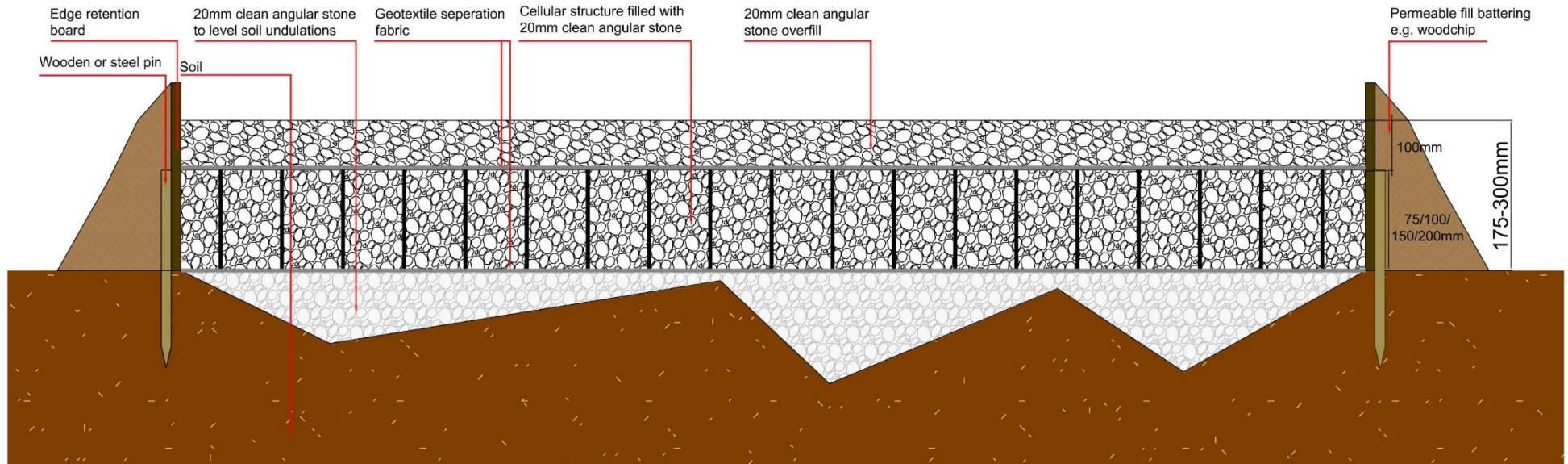
## Cross section of cellular structure with porous macadam finish



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## Cross section of cellular structure with gravel overfill



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# TREE ROOT PROTECTION SERVICE METHOD STATEMENT

ABBEY PYNFORD FOUNDATION SYSTEMS LIMITED

## Introduction

Abbey Pynford piling & foundations Limited have been asked to quote for the installation of the Housedeck piled foundation system.

Due to the proximity of the trees to the location of the proposed development, it is proposed to use the Tree Root Protection Service (TRPS) during the installation of the foundations

This document outlines the possible extent of works involved with the TRPS.

It is intended that this document is used in conjunction with the site specific Arboriculturist's Method Statement. On receipt of that document, its site specific requirements will be adopted by Abbey Pynford and incorporated into this method statement.

Hand auguring is undertaken at all pile positions within the Root Protection Area, if roots greater than 20mm diameter are found the pile is moved and the new position re-augured. Our in-house design department then re-analyse the slab design to ensure the new position is adequate.

The ground surface is protected with a breathable geotextile membrane. Over this CellWeb is pegged out and the pockets filled with pea shingle to provide a permeable low bearing pressure working surface.

A typical piling rig used on a Tree Root Protection Service project. The rig is custom designed to have very low bearing pressure, equivalent to a 12 stone man wearing size 10 shoes. The power pack (in back of photo) is left outside the root zone, leaving just the lightweight piling rig operating on the site.



Each pile position is sleeved using a polythene coated cardboard tube to prevent concrete from the pile leaching into the root zone.

The clear void is created using our proprietary collapsible void formers known as Deck Support Units. These are laid under the footprint of the building.



Perimeter jacks are laid around the edge of the footprint to allow fine level adjustments to be made.

The Deck Support Units are covered with marine ply to provide the formwork for the concrete slab.



The completed deck with pile overlays made of flexible material prevents concrete from the slab pour leaching onto the ground surface. Similarly, the aluminium strips between the sheets of ply prevent concrete reaching the ground surface.

The reinforcement steel, service ducts rising through the slabs and the stainless-steel edge detail can all be seen in the slab prior to the concrete pour. The edge is levelled to a high tolerance by means of perimeter jacks.

Concrete is poured to a fine finish producing a slab with a very high tolerance. After 7 days of curing the Deck Support Units are removed.



This picture shows the finished voided system. The piles supporting the slab can be seen as well as the clear void the Housedeck system leaves. The pea shingle and CellWeb under the slab are also visible and the geotextile membrane which prevents materials entering the void can be seen attached to the underside of the slab.

## Pile Foundations

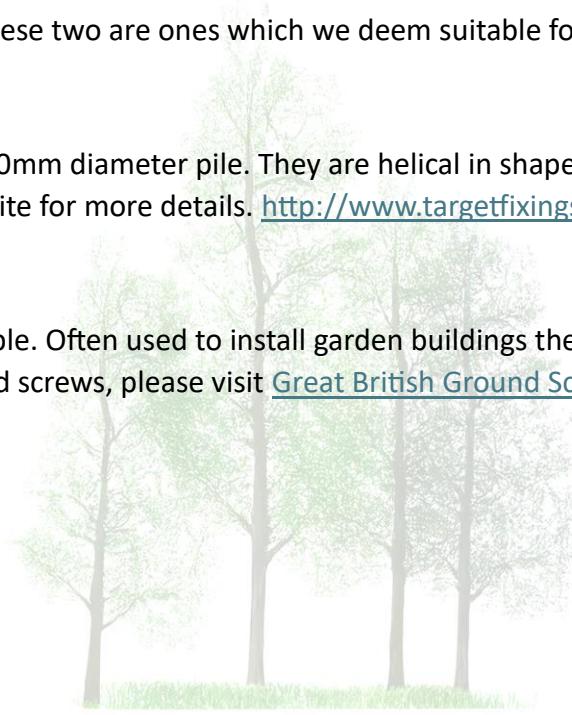
There are several pile foundations on the market but these two are ones which we deem suitable for installation near trees.

### Target Fixing Heli-pile

Heli-piles come in two sizes a 60mm diameter and a 100mm diameter pile. They are helical in shape and are inserted using a pneumatic hammer – no heavy machinery required. Please refer to Target Fixings website for more details. <http://www.targetfixings.co.uk/>

### Ground screws

For lighter weight projects ground screws may be suitable. Often used to install garden buildings they can be an efficient solution requiring only hand tools to insert them into the ground. For more details on ground screws, please visit [Great British Ground Screw company's website](#)



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