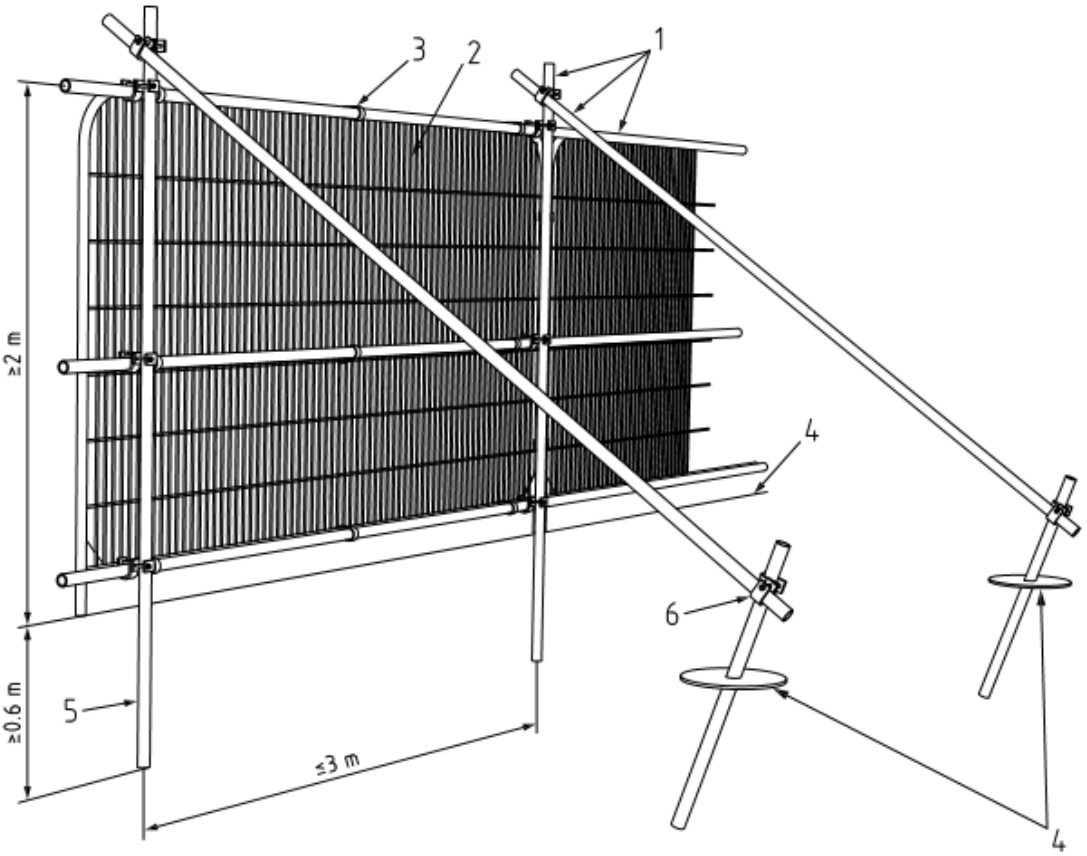
Appendix 4

Tree Protection, Protective Fencing Detail, and Ground Protection Detail

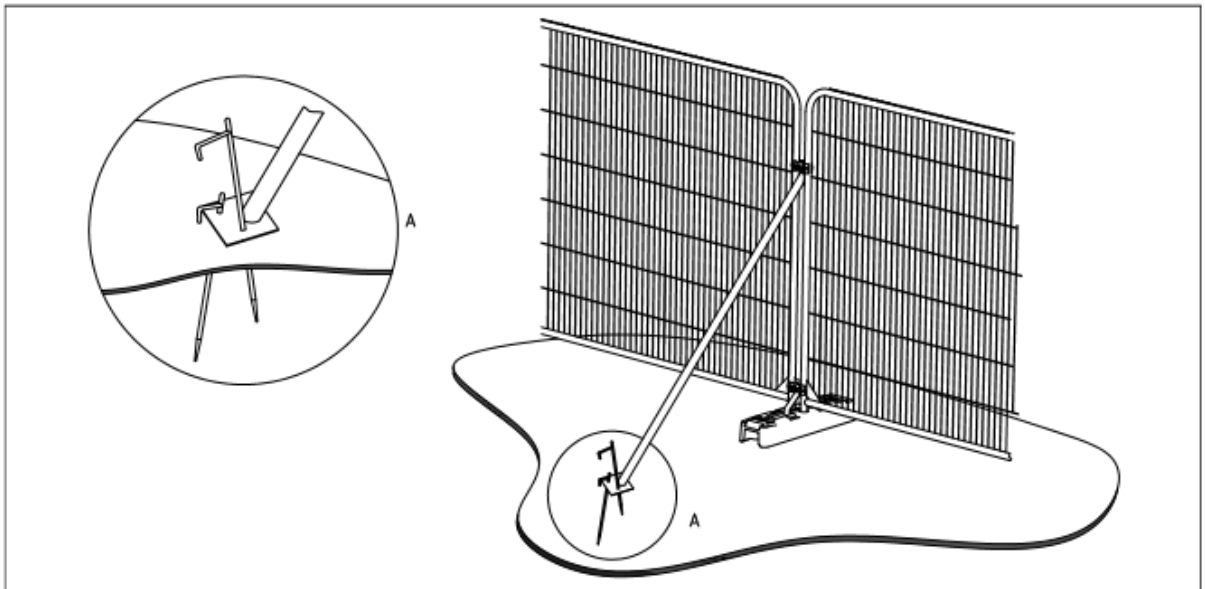
Default specification for protective barrier BS 5837:2012 –Trees in relation to Design, Demolition and Construction



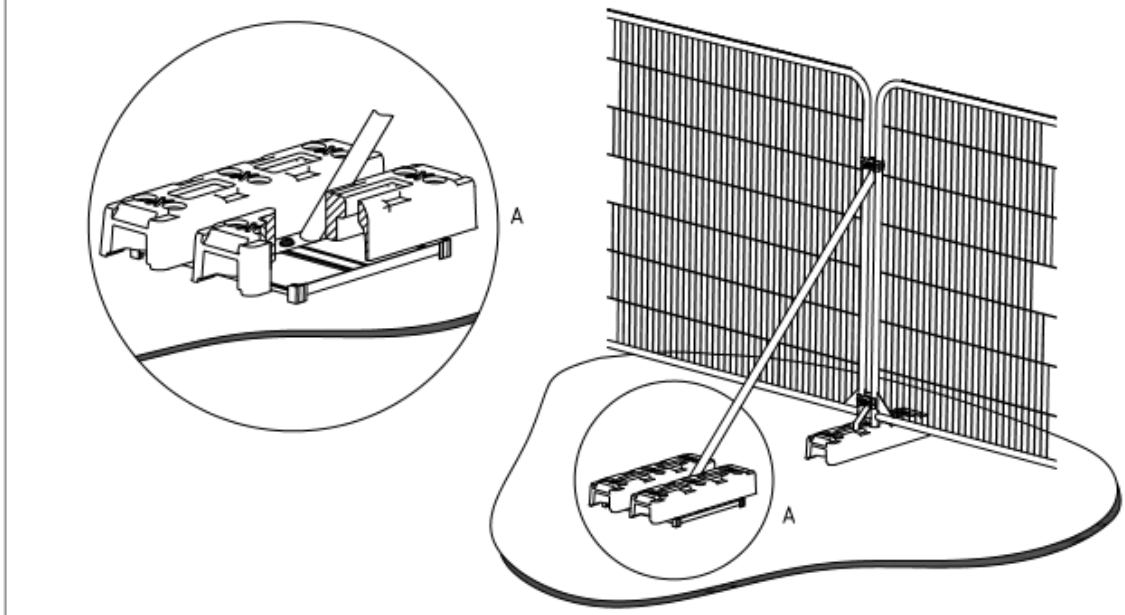
Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized 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 0.6 m)
6 Standard scaffold clamps

Examples of above ground stabilizing systems BS 5837:2012 –Trees in relation to Design, Demolition and Construction



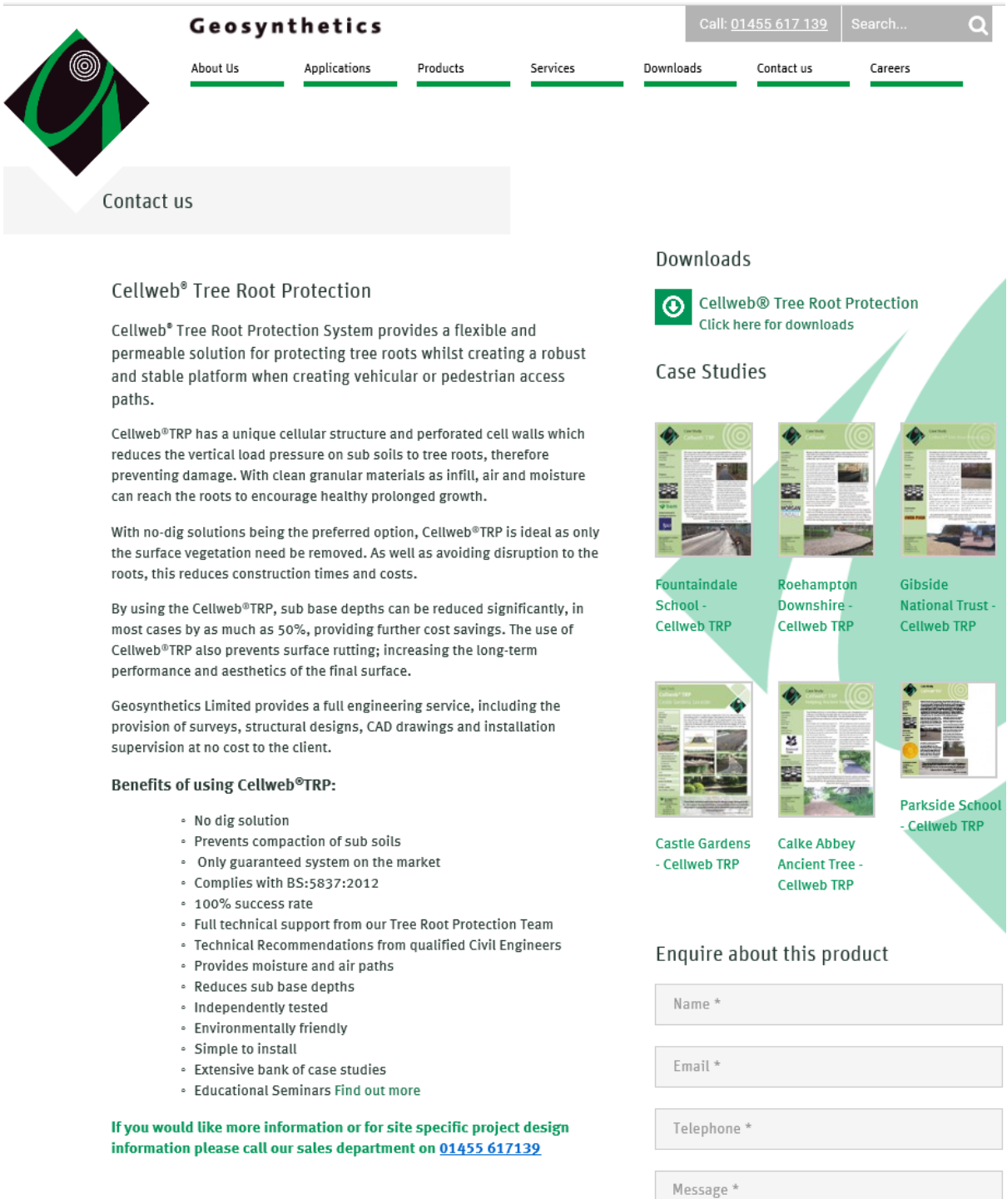
a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray

Example of Ground Protection for Plant Access and surfaces within RPAs

Ground Protection and effective site access systems can be achieved using products such as Cellweb, specifically designed for protecting ground for areas within RPAs and compliant with BS5837:2012.



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Cellweb® Tree Root Protection System provides a flexible and permeable solution for protecting tree roots whilst creating a robust and stable platform when creating vehicular or pedestrian access paths.

Cellweb®TRP has a unique cellular structure and perforated cell walls which reduces the vertical load pressure on sub soils to tree roots, therefore preventing damage. With clean granular materials as infill, air and moisture can reach the roots to encourage healthy prolonged growth.

With no-dig solutions being the preferred option, Cellweb®TRP is ideal as only the surface vegetation need be removed. As well as avoiding disruption to the roots, this reduces construction times and costs.

By using the Cellweb®TRP, sub base depths can be reduced significantly, in most cases by as much as 50%, providing further cost savings. The use of Cellweb®TRP also prevents surface rutting; increasing the long-term performance and aesthetics of the final surface.

Geosynthetics Limited provides a full engineering service, including the provision of surveys, structural designs, CAD drawings and installation supervision at no cost to the client.

Benefits of using Cellweb®TRP:

- No dig solution
- Prevents compaction of sub soils
- Only guaranteed system on the market
- Complies with BS:5837:2012
- 100% success rate
- Full technical support from our Tree Root Protection Team
- Technical Recommendations from qualified Civil Engineers
- Provides moisture and air paths
- Reduces sub base depths
- Independently tested
- Environmentally friendly
- Simple to install
- Extensive bank of case studies
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Case Studies

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Roehampton Downshire - Cellweb TRP

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Castle Gardens - Cellweb TRP

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http://www.geosyn.co.uk/product/cellweb-tree-root-protection

Construction using No-Dig methods and ground protection (taken from Arboricultural Practice Note 12, *Through the Trees to Development*, The Tree Advice Trust, 2007)

Construction should incorporate two main components:

- A synthetic load spreading material
- A no-fines aggregate sub-base

'Load spreading' materials, are synthetic grids/webs designed to support roads on soft ground by distributing the load of a wheel over a larger area than would normally occur. They may be 2- or 3- dimensional.

When placed on a 2-dimensional grid, appropriate, no-fines granular sub-base material penetrates the mesh, but is unable to pass through it, forming a positive interlock. This interlock between aggregate and grid provides a reinforced platform and efficient load spread into the underlying ground over a wider area than the footprint of the wheel on the surface. A suitable geogrid/aggregate combination constructed with the grid under tension should prevent rutting of the ground beneath construction.

The 3- dimensional load spreading products (Cellular confinement system) creates cells into which the sub base material is placed. Such a construction does not support the sub-base material, it confines the material in discrete cells. Manufactures recommend, therefore, that a geotextile is placed between the ground and the load spreader to prevent the cell- contained mineral material being pressed down into the underlying soil.

A no-dig construction, will need to be contained to prevent outward creep under the weight of vehicles. This may be achieved with an edging support provided its construction does not require excavation. A suitable material may be long-life timbers pinned through the load spreader into the underlying soil. This could add strength to the structure because the pressure of vehicles forcing the sub-base downwards and onwards will tend to increase the tension on the grid and any tendency to rutting.

The granular sub base material should have a no 'fines' content which means that even when it is compacted it should be freely draining and will allow oxygen to diffuse into, and damaging gases (e.g. carbon dioxide and methane) out of the soil. The minimum distance from the tree should be 0.5m.

Further information should be sought from the manufacturer.

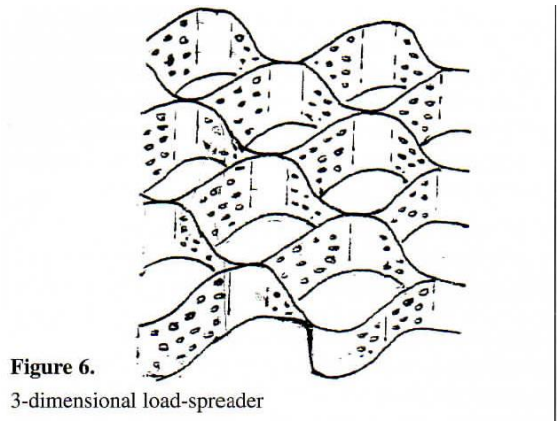


Diagram of 3-dimensional load spreader, from Arboricultural Practice Note 12, (2007)