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Date: 06/12/2021

Project: Advanced Proteins Facility, Bones Lane, Cheddleton, Leek, ST13 7BT

BS 5837:2012 Method Statement

Inspection Record.

Date of Inspection	Surveyor
02/12/2021	Matthew Lally. FdSc MArborA

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1.0 Discussion

- 1.1 The majority of the root system of a tree is in the surface 600mm of the soil extending radially for distances frequently in excess of the trees height. Beyond the main structural roots (close to the base of the trunk), the root system rapidly sub-divides into smaller diameter roots: off this main system, a mass of fine roots develops.
- 1.2 The shape of the main structural roots develops in response to the need for the tree to have physical stability. Beyond these major roots, root growth and development is influenced by the availability of water and nutrients. Unless conditions are uniform around the tree, which would be unusual, the extent of the root system will be very irregular and difficult to predict. It will not generally show the symmetry seen in the branch system.
- 1.3 The parts of the root system, which are active in water and nutrient uptake, are very fine, typically less than 0.5mm diameter. They are short lived, developing in response to the needs of the tree, with the majority dying each winter. It is *essential* that conditions in the soil remain conducive to the healthy growth of these fine roots so that the water and nutrients necessary for healthy tree growth can be absorbed.
- 1.4 All parts of the root system, but especially the fine roots, are vulnerable to damage. Once they are damaged, water and nutrient uptake will be restricted until new roots have regenerated. Vigorous young trees will be capable of rapid regeneration, but over mature trees will respond slowly, *if at all*.
- 1.5 In order to live and grow, roots need oxygen from the soil. Respiration by the roots and other soil organisms depletes this oxygen and increases carbon dioxide levels in the soil; a correct balance of these gases is normally maintained by diffusion between the soil and the atmosphere. Anything, which disturbs this balance, will affect the condition of the root system.
- 1.6 The factors that most commonly affect this diffusion adversely, and therefore damage roots, are the following: -
 - a) Compaction of the ground, which reduces the space between soil particles. This is particularly important on clay soils. A single passage by heavy equipment on clay soils or storage of heavy materials can cause significant damage.
 - b) Changing soil levels, even for a few weeks.
 - c) Covering the root area with impervious surfaces.
 - d) A rise in the level of the water table. Roots can tolerate submersion for short periods. But a permanent rise will deplete the soil of oxygen.
- 1.7 Serious damage is often caused during preliminary site works by stripping the topsoil. For this reason, such works should be avoided until protective fencing has been erected.
- 1.8 Excavations in the rooting area can sever roots. As the majority of roots are in the surface 600mm, even shallow excavations can cause damage.

- 1.9 Excavations for foundations, landscaping or service trenches are usually sufficiently deep to sever most of the roots, and it should therefore be assumed that all parts of the root system beyond the excavation would no longer serve the tree.
- 1.10 Excavation or soil stripping which sever or damage the roots may impair the stability of the tree and make it dangerous.

2.0 Method Statement

Before any form of development commences on the site the following works should be undertaken: -

2.1 Tree Works

Tree No.	Proposed Works
T1	No Works Required
T2	No Works Required
T3	No Works Required
T4	No Works Required
G5#	No Works Required
T6#	No Works Required
G7#	No Works Required
G8#a	No Works Required
G8#b	No Works Required
G8#c	No Works Required
G8#d	No Works Required
G8#e	No Works Required
T9#	No Works Required
T10#	No Works Required
G11#	No Works Required
T12#	No Works Required
T13#	No Works Required
T14#	No Works Required
W15#	No Works Required
W15a#	No Works Required
T16#	No Works Required
T17#	No Works Required
W18#	No Works Required
G19#	No Works Required
G20#	No Works Required
T21#	Reduce crown on north-western side by up to 2.5m as outlined in the tree protection plan
T22#	Remove
G23#	Remove 1 x Section as outlined in the Tree Protection Plan
G24#	No Works Required
G25#	Remove

All works to be carried out in line with BS 3998:2010. Tree Work. Recommendations.

2.2 Protective Fencing

- 2.2.1 All fencing used on the site should fully comply with BS 5837:2012 (Trees in Relation to Construction – Recommendations).
- 2.2.2 The fencing should be strong and suitable for local conditions. It should also take into account the degree of construction activity on the site.
- 2.2.3 The fencing should be at least 2.3m in height and should be erected with both a vertical and horizontal scaffolding framework capable of withstanding impact, with vertical tubes spaced at a maximum of 3 m. This should support either weldmesh panels which should be securely fixed with wire or scaffold clamps.
- 2.2.4 Notices should also be erected on the fencing stating, 'Protected Area - No operations within fenced area'.
- 2.2.5 The positioning of the protective fencing is also very important and should be erected in the proposed location identified in Appendix One. Once the fence has been erected it should never be crossed and particular care should be taken not to store any materials or soil within the protected area.

2.3 Additional Precautions Outside Fenced Areas

- 2.3.1 Oil, bitumen, cement or other material likely to cause damage to the tree will not be stacked or discharged within 10m of the trees stem or within the protective area. Also, materials in general will not be stacked or discharged within the exclusion zone.
- 2.3.2 Concrete mixing and washing will not be carried out within 10m of any retained trees.
- 2.3.3 Fires will not be lit beneath the foliage or in a position where the flames could extend to within 5m of the foliage, branches or trunk. If the fire is large, then this may necessitate a distance of at least 20m.
- 2.3.4 Trees that are to be retained will not be used as anchorage for equipment.
- 2.3.5 Notice boards, telephone cables, or other services will not be attached to any part of the retained tree.
- 2.3.6 Care should be taken when using cranes or other equipment near the canopy of the retained trees. Also, any trees to be felled in proximity to the retained trees should be done so with particular care.

2.4 Supervised Root Pruning and Excavation

- 2.4.1 As part of the development will encroach into the RPA of T16#, T17#, G19# & T21#, supervised root pruning and excavation will be required to ensure the long-term retention of wellbeing of this tree is not adversely affected. The following point MUST be adhered to:

- Excavation must be carried out using hand tools to avoid direct damage to the bark of the roots. It may be possible in some instances to use specialised equipment such as high air pressure machinery to excavate the soil with minimal disturbance to roots.
- Exposed roots will be wrapped in dry, clean Hessian to prevent the roots from drying out. In hot or dry weather, the hessian should be kept moist. The hessian must be removed before backfilling.
- Roots less than 25mm diameter may be pruned back, preferably to a growing point. A sharp cutting tool such as bypass secateurs or a handsaw should be used to leave the smallest wound possible. Roots greater than 25mm in diameter should be retained wherever possible but due to the limited incursion into the RPAs larger roots can be pruned.
- Root pruning will be carried out under the supervision of the Arboricultural Consultant.
- Backfilling of any excavation must be carried out by hand to avoid direct root damage or compaction, where possible. Builder sand must not be used in the backfill material.

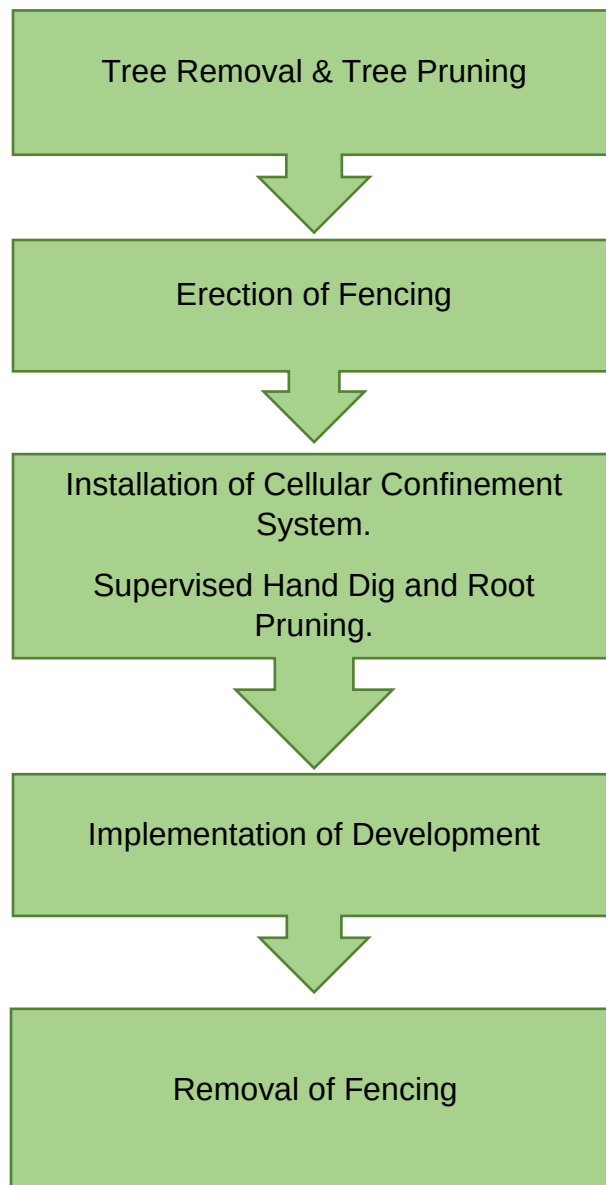
2.5 Cellular Confinement System.

- 2.5.1 The use of a cellular confinement system will be employed to create drive that encroaches into the RPA of T4 without having a detrimental effect.
- 2.5.2 A cellular confinement system provides a load transfer mattress which prevents direct loads on tree roots and reduces the bearing pressure on subsoil's by stabilising aggregate surfaces against rutting under wheel loads.
- 2.5.3 A proposed methodology and cross-sectional diagram for the construction of the access way can be found in appendix three.

2.6 Uplift & Re-Laying of Existing Hardstanding areas adjacent to T2

- 2.6.1 The uplift & re-laying of the existing hardstanding could have implications for T2 and may adversely affect the Safe Useful Life Expectancy of this tree.
- 2.6.2 During the uplift & re-laying of the existing hardstanding within the RPA of any retained trees, all excavation within the RPA of these trees will be limited to the existing hard standing layer and work will be undertaken with hand tools only.

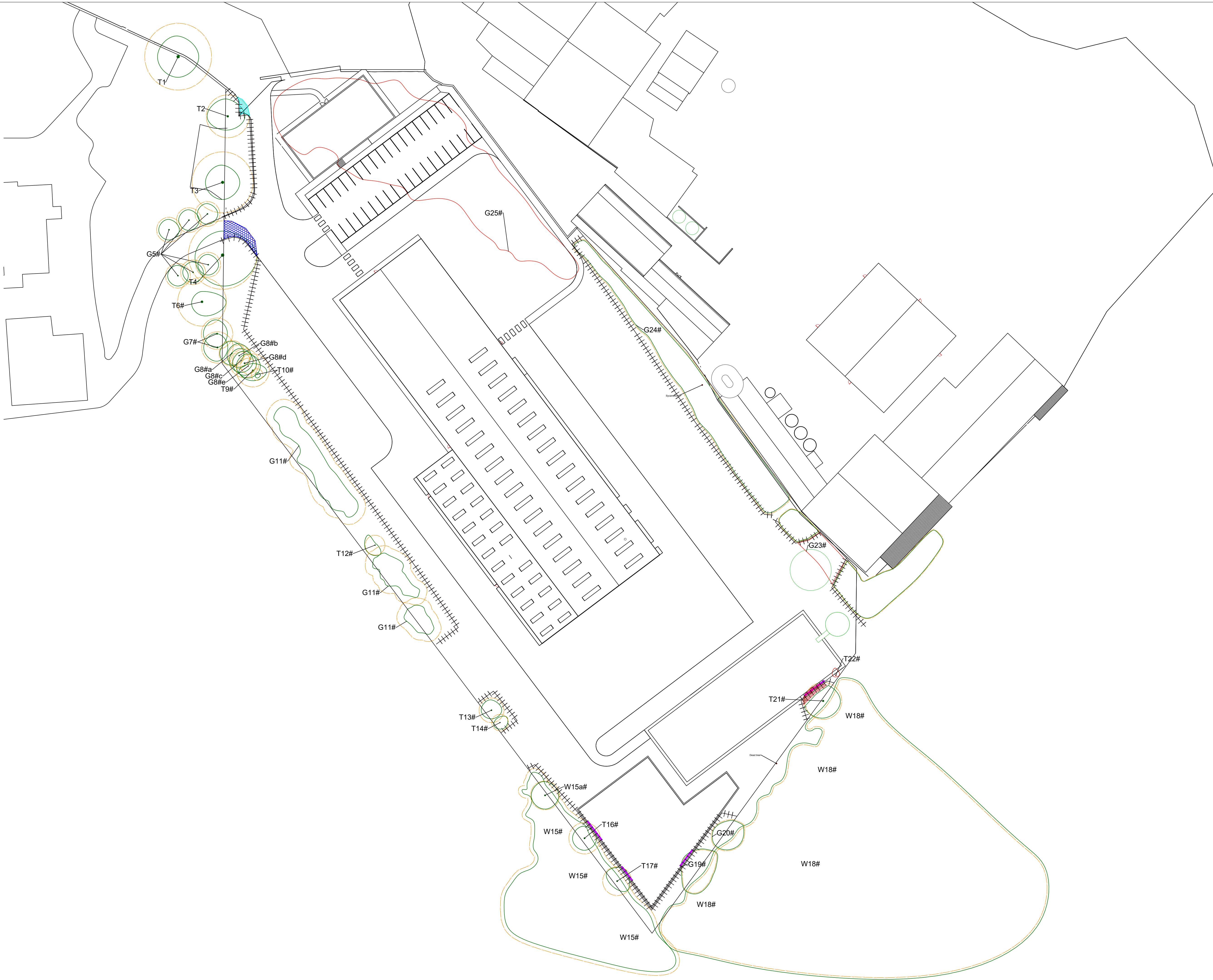
2.7 Summary of Methodology for the Protection of the Trees



Appendix One

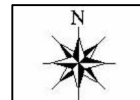
Tree Plan





Do not scale this drawing (printed or electronic version).
Contractors must check all dimensions from site.
This drawing is for use on this site only and should be used in conjunction with all relevant consultants drawings.

LEGEND



- Retained Trees
- Removed Trees
- Area of Crown Removed
- Root Protection Areas
- Supervised Root Pruning and Excavation
- Protective Fencing (Metal)
- Excavation into existing hardstanding with hand tools only.
- Cellular Confinement System
- Position estimated on site



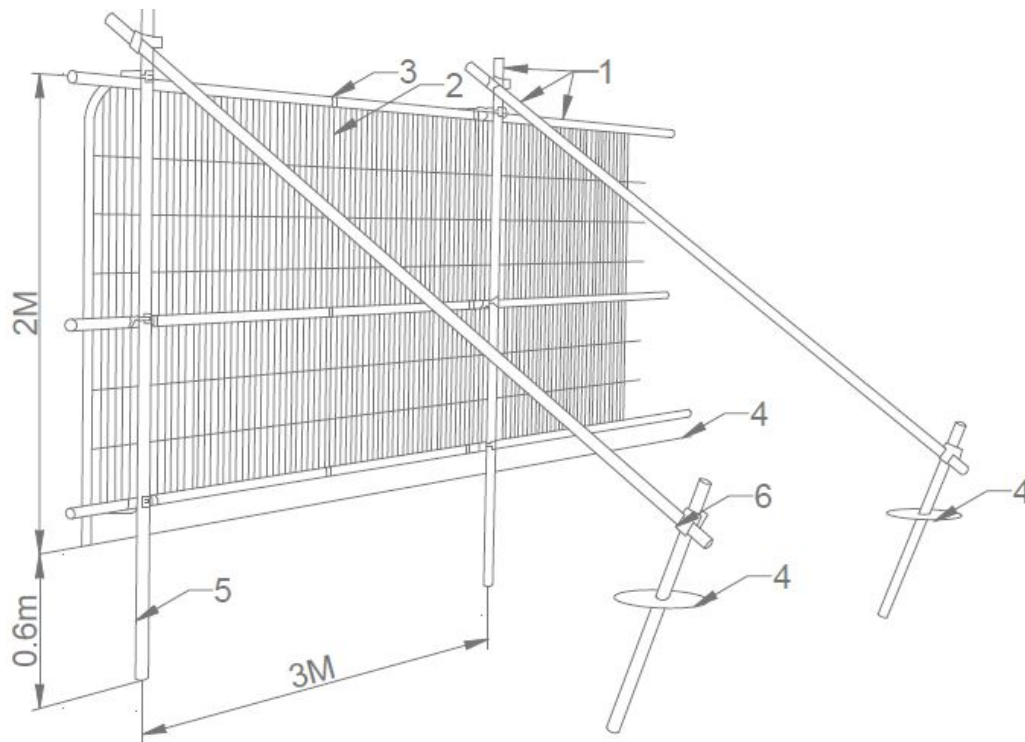
Scale:	1:500@A1	Date:	02/12/2021
Job:	LTM0385.AIA.01		
Address	Advanced Proteins Bones Ln, Leek ST13 7BT		
Client:	Earth & Marine Environmental Consultants Ltd		
Drawing Number:	LTM0385.TPP.01		
Drawn by:	Matthew Lally		
TREE PROTECTION PLAN			

Appendix Two

Tree Protection Fencing



Tree Protection Fencing (BS5837: 2012)



Key

- 1 Standard scaffold poles
- 2 Heavy gauge 2m tall galvanised tube and welded mesh infill panels
- 3 Panels secured to upright 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

Protective fencing Notice to attached to fencing



Appendix Three

Construction of Special Surface



METHODOLOGY FOR THE CONSTRUCTION OF HARDSTANDING WITHIN RPA OF A RETAINED TREE

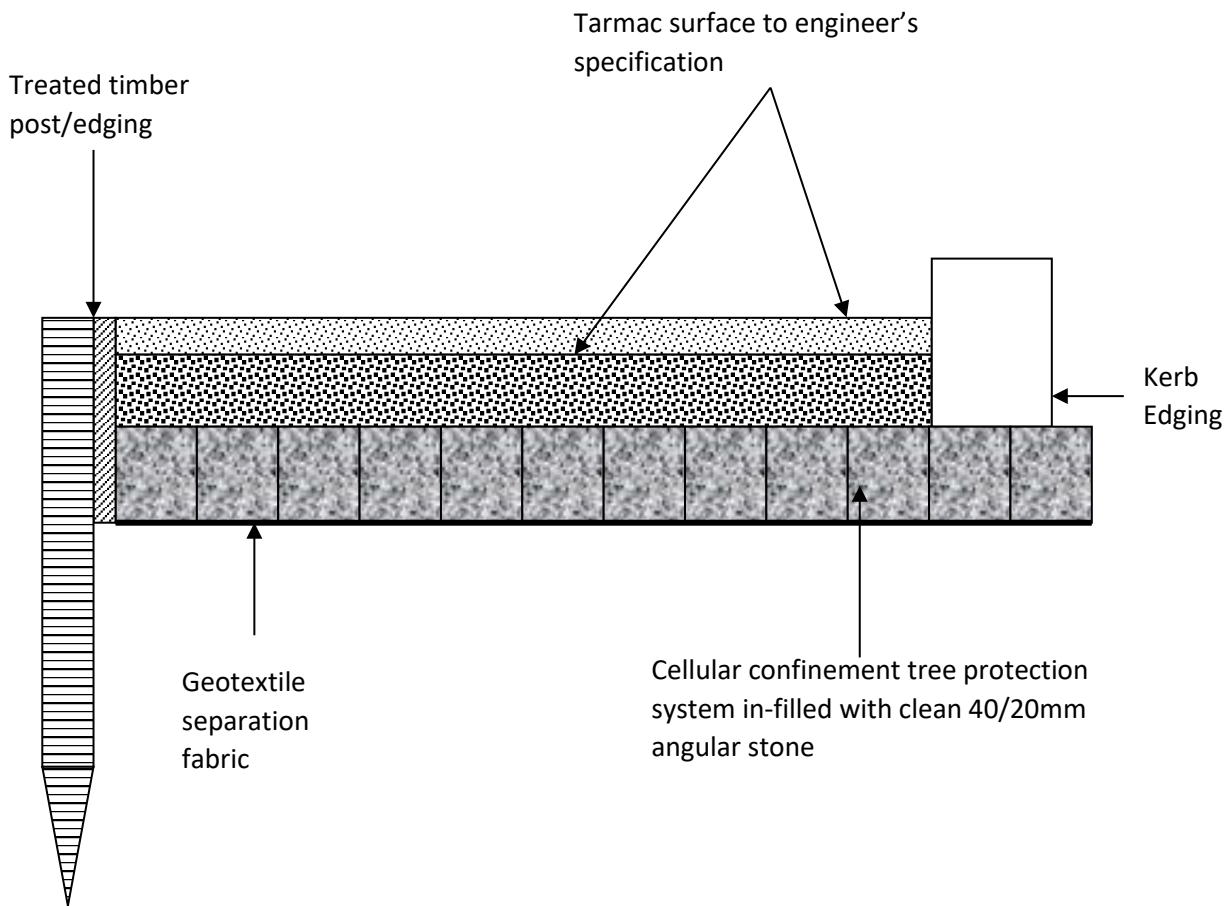
The following methodology supports the drawing indicating the construction of the hardstanding. The methodology is prepared on the basis of the sequence of operations necessary to complete the construction of the hardstanding, with the minimum damage to the trees proposed for retention.

- Surface layer to be scraped off. This can be done either by hand or by very small machinery.
- Erect protective fencing to the edge of the construction area.
- Spread a sub grade material over the length of the hardstanding, to fill any small ruts.
- Construct edging using treated timber if required.
- Lay geotextile mat over smoothed area.
- Extend the Geoweb perforated tree root protection system over the area of the hardstanding, with sufficient overlap such that kerbs can be constructed on top of the Geoweb.
- Fill the voids within the Geoweb with reduced fines Type 1 material working into the site over the top of the Geoweb.
- Lay kerbs and surface over the Geoweb such that the construction binds itself together.
- Construct finished surface as required in line with guidance illustrations below.

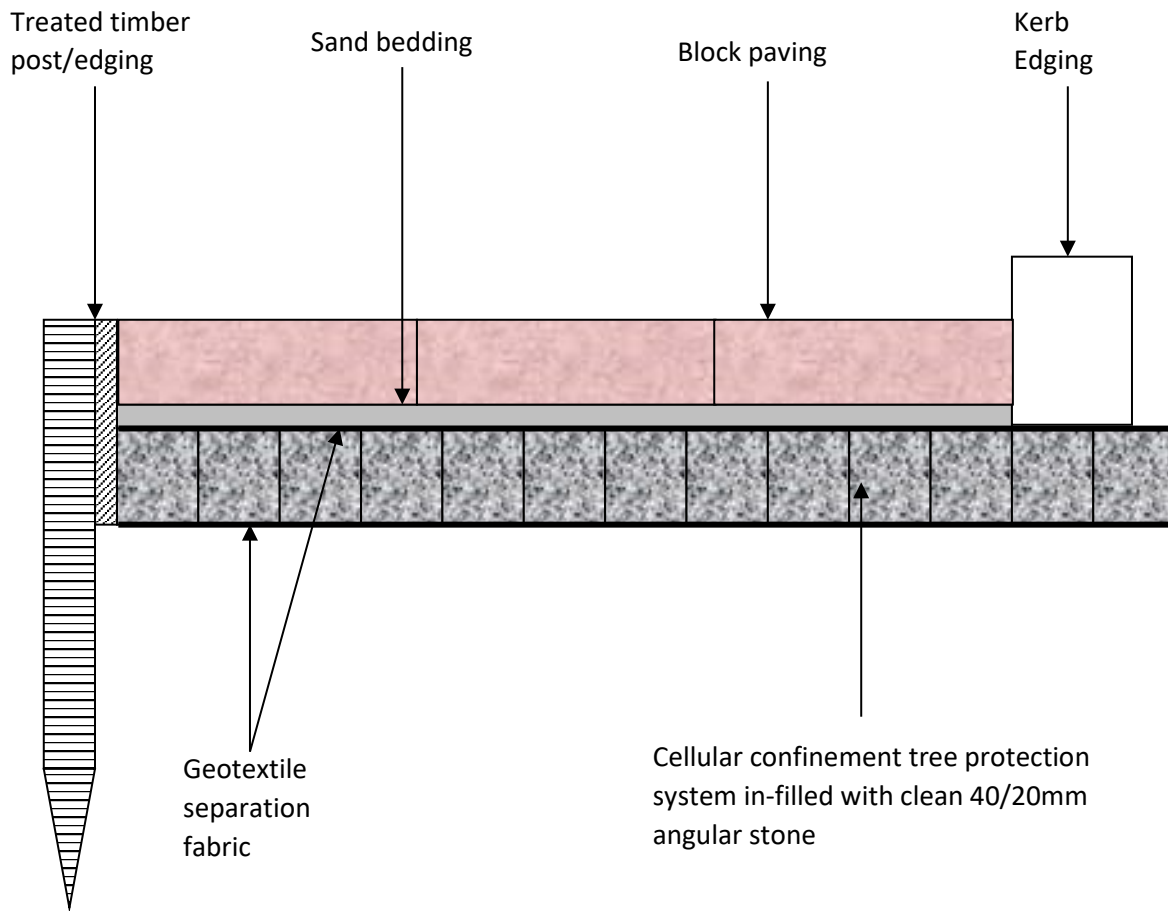
GEOWEB BASED CONSTRUCTION – (INDICATIVE ONLY)

Depth of confinement system variable according to use- refer to manufacturer

Tarmac Surface



Block Paved Surface



Gravel Surface

