12/00014/FUL

Arboricultural Report and Tree Condition Survey for Proposed Extension at: 77 Avondale Road, Rayleigh, Essex.

Prepared For:
John R A Jackson LLP
Architectural Design Associates

Prepared by
Peter Wilkins BA (Hons) M. Arbor A.
Ruskins Group Consultancy

Our Ref 0512-1029 Rev 1
May 2012

1.0 Introduction

Ruskins Group Consultancy have been appointed by John R A Jackson LLP Architectural Design Associates to provide advice on the arboricultural issues relating to the proposed extension of 77 Avondale Road, Rayleigh, Essex.

We visited the site and undertook a Pre-Development Tree Condition Survey (see Appendix 1), on 8th May 2012.

We have been provided with a copy of the planning application drawings. The significant vegetation is a mature oak tree T1 located within the pavement to the front of the property.

2.0 Scope of Report

The following report addresses the arboricultural issues relating to the proposed extension at the above site.

The purpose of this report is comment on the arboricultural implication of the proposed development and to aid the preservation of the oak tree T1 during the construction works by setting out the tree protection methods, construction techniques and working practices that are to be adopted on this site. We have also included a Tree Protection Plan showing the site set up during the construction process.

The success of the tree protection measures outlined in this document are dependent on the property owner and contractors adhering to the principles set out within this report, which are to be approved and enforced by the local planning authority.

If the recommendations contained within this document are acceptable to the Local Planning Authority then we suggest that they be controlled by standard planning conditions.

3.0 Site Description and Description of Proposed Extension

The subject property is a detached bungalow estimated to date from the 1930s. The property is located on a corner plot. The site slopes very gently uphill from front to rear. The front garden is predominately lawn. The proposed extension is described in detail elsewhere in this planning submission, but briefly the works extend the bungalow to the right-hand side and add roof accommodation to the original and new part of the property. These works involve the construction of piers along the front of the property to support the chalet-type roof.

4.0 Arboricultural Background Information

For all trees but particularly those growing in urban areas, root growth is not predictable. Tree roots are opportunistic, they grow most prolifically in areas where conditions are favourable and will be deflected by natural features and man-made structures. When hostile conditions are encountered root growth will be limited.

It is generally agreed that the majority of tree roots, even for a mature tree are found in the top 90cm of the soil. These roots absorb moisture and nutrients needed for growth and contrary to popular belief mature trees do not have a large deep taproot that obtains moisture from great depth.

An ideal soil for root growth is about 50% pore space (in urban areas this is often significantly reduced). These pores, the spaces between soil particles, are filled with water and air, construction activity can compact the soil and can dramatically reduce the amount of pore space. This not only inhibits root growth and penetration but also decreases oxygen in the soil that is essential to the growth and function of the roots.

The two main possibilities for injury to trees during and following the construction process are from direct and indirect damage.

- Direct Damage can be defined as injury resulting from physical contact including contact with machinery or fire, and excavation of the root area.
- Indirect Damage can be defined as injury resulting from activities that take place near the tree such as level changes, compaction of the soil, or contamination by chemical spillage in proximity to the root plate.

The BS 5837 2012 calculator for Root Protection Areas aims to ensure a sufficient area of the trees root system is protected. It aims to protect an area around each retained tree of sufficient size to maintain the health and vigour and ensure the longevity of the retained trees. We have indicated the Theoretical Root Protection Area of each tree on the Tree Survey Plan.

It is thought that a healthy tree tolerates the removal of approximately one-third of its roots (Harris 1992, Helliwell 1985). Helliwell further states that a healthy vigorous tree could withstand removal of up to 50% of its roots without dying. The BS 5837 (2012) is understandably more conservative suggesting the up to 20% of the RPA can be offset by increasing the RPA in other directions to compensate. It states that this offsetting is only appropriate for 'open grown' trees but clearly the intention of the BS5837 is not to protect a perfectly circular Theoretical Root Protection Area around all trees nor protect areas of soil where roots are unlikely to be present.

Tree surgery works, the provision of tree protection measures and appropriate specified, supervised and implemented construction works can reduce the risk of damage to the retained trees.

Damage to trees (including their root systems) may impact on their long-term health, stability and or vitality. Damage may result in the partial or complete structural failure of the tree and increases the risk of personal injury. It is therefore essential that this report is read by all parties and the guidelines are followed by the main contractor, site agent and all contractors, particularly those undertaking groundworks on site.

5.0 Arboricultural Issues Relating to the Proposed Extension

The Oak T1 is a mature tree, located within the pavement beyond the front (north–eastern) corner of the subject property. This tree is owned by the Local Authority, it makes a positive contribution to the streetscape and with regard to its remaining life-expectancy and ownership the successful retention of this tree is a primary consideration for this planning application.

Historically T1 has been heavily reduced to 4m, it now has a broad spreading canopy formed by co-dominant branches that originate from these pruning wounds. There are overhead cables running through the canopy of this tree, although it does not appear to have been subject to any significant recent management. There is some decay in original pruning wounds.

We have been informed that the bungalow has been underpinned to resolve a clay shrinkage subsidence claim.

The proposed extensions has been designed to minimalise its impact on the health and longevity of this tree. With regard to the health, vigour and known species characteristics of the Oak, it is my opinion that provided the guidelines outlined in this report are followed the proposed works can be undertaken without detriment to the health and longevity of T1.

The theoretical Root Protection Area as calculated using the formula in BS5837 (2012) is shown on the Tree Protection Plan. It should be noted that appropriate development within the Root Protection Area particularly within urban previously developed areas should not be prevented, particularly if it can be shown that the proposed works will not impact on the health, stability, longevity and consequently amenity of the existing trees.

The environment for root growth will be most favourable within the existing open ground to the front and flank of the property but this does not preclude the growth of an extensive root system in all directions.

It is often stated that the environment beneath roads and pavements is unsuitable for tree root growth. Based on undertaking 1000s of subsidence claims, working on numerous infrastructure projects and observing mature thriving trees surrounded by hardstanding, it is apparent that extensive root growth is often encountered beneath areas of hardstanding.

It is my opinion that the root system of the oak tree will be present over a considerable distance in all directions. Nevertheless the proposed extension and the associated constriction works have the potential to impact on the rooting environment of the Oak tree T1 within the open ground to the front and flank of the property.

To allow for clearance of the building line and to maintain a reasonable relationship between the subject property and tree canopy, we recommend T1 is subject to some pruning works. The owner of the property has a common law right to cut back overhanging branches to the site boundary. The Oak tree has not been subject to any recent management and we would recommend that a 25% reduction to the overall crown spread will achieve a satisfactory relationship with the proposed extension without compromising its overall appearance. Ideally to leave a balanced canopy T1 should be subject to a complete crown reduction, for the branches beyond the site boundary this would require action from the Local Authority and if this is not forthcoming then the reduction should be restricted to only the canopy overhanging the property boundary.

Damage to the root system of T1 can be prevented by the use of specialised foundations to avoid the requirement for deep strip foundations. We have been informed that the proposed extension is to utilise pile and beam foundations, these allow for continued root growth both between the piles and underneath the ground beam. The engineer has indicated that the piles supporting the roof along the front elevation will be isolated piles with a ground beam between the piles to the external walls only. We have been informed by the engineer that this ground beam would be 300mm wide by 400mm deep, with the top of the beam would be 150mm above the ground level and therefore the beam would be 250mm into the ground.

To avoid damage to the root system of the Oak tree we recommend hand excavation (or the use of an 'air-spade') of the proposed pile locations to a depth of 900mm to confirm the absence of structural roots. If roots over 50mm diameter are encountered the pile location will need to be moved to a location clear of any roots.

With regard to the distance between the tree and the proposed extension it is very likely the structurally important roots will remain undisturbed. These important larger roots radiate outwards from the trunk, they are characterised by being relatively few in number and tapering rapidly from the base of the tree. Even for mature trees they are usually only 2-3m in length, at this length they are likely to be 2-5cm in diameter and they have lost their rigidity and physical strength. (See Tree Root Systems AAIS 1995).

This level of excavation required for the installation of the foundations would not have a significant impact on the root system of the oak tree.

The construction works have the potential to impact on the health and longevity of the oak tree by compaction and indirect damage to the root system of the oak tree growing beneath the front garden. To avoid this damage we recommend the front garden is protected by the use of a suitable temporary hardstanding. This temporary hardstanding and the proposed driveway will be specified to be 'no-dig', with the surface and sub-base being permeable and porous and able withstand the construction machinery and associated traffic.

To prevent the proposals impacting on the health, stability or longevity of the Oak tree, the main requirement is the installation of suitable tree protection measures. We have provided a Provisional Tree Protection Plan showing the proposed location of the Tree Protection Fencing and Temporary Ground Protection.

6.0 Summary of Tree Protection Measures

Subject to planning the Tree Protection Measures outlined in this report will be revisited in detail based on the working drawings, construction programme and method statement to be prepared. This matter can be addressed by use of a standard planning condition.

To prevent the proposals impacting on the health, stability or longevity of the retained trees the main requirement is the installation of suitable tree protection fencing, to protect the above ground part of the trees which along with Temporary Ground Protection will serve to prevent compaction of the open ground within the Root Protection Area.

The Tree Protection Fencing and Temporary Ground Protection will be installed as per the Tree Protection Plan which will be agreed with the Local Authority Tree Officer, we have provided a draft copy of this plan See Appendix 2, The proposed fencing specification can be found in Appendix 3.

The Tree Protection Fencing and Temporary Ground Protection should be installed prior to any enabling or ground-works commencing, and must remain in place throughout construction and be removed only after completion of the construction works. Prior to commencing any demolition or construction works, the fencing will be inspected by the appointed consultant. Within the fenced off Tree Protection Area;

- No excavation by any means
- No storage of plant or materials
- No storage or handling of any chemical including cement washings
- No Pedestrian, Machinery or Vehicular Access
- No level changes + or -

Clear notices are to be fixed to the outside of the fencing with words such as 'TREE PROTECTION AREA – NO ACCESS OR WORKING WITHIN THIS AREA'. See Appendix 3.

For the area identified on the Tree Protection Plan, temporary ground protection area will be utilised. The ground protection will be no-dig porous, permeable and specified to prevent compaction of the subsoil dependent on the level and type of traffic in these areas.

Within the Temporary Ground Protection Area;

- No level changes >100mm
- No Pedestrian, Machinery or Vehicular Access across open ground
- No storage of plant or materials on open ground
- No storage or handling of any chemical including cement washings
- Existing underground service routes will be utlised

All contractors and other relevant personnel are to be informed of the role of the Tree Protection Fencing and their importance. A copy of the Tree Protection Plan will be displayed on site at all times during construction.

Existing underground service routes will be utilised

Dismantling the protection barriers around retained trees and removal of the Temporary Ground Protection may be required to allow completion of final surface treatments and landscaping. Supervision of this exercise and control of the landscaping thereafter will be administered by the appointed Arboricultural Supervisor.

The removal of the Tree Protection Fencing and Ground Protection is not an opportunity for machinery to access the previously fenced off area.

7.0 Conclusion

British Standard BS5837:2012 contains clear and current recommendations for a best practice approach to the assessment, retention and protection of trees on development sites. The proposed development complies with the guidance outlined in this document.

The protection of the Oak tree during the proposed development works can be achieved by continuing to follow the recommendations in BS5837:2012 and by use of standard planning conditions.

With regard to the proposed foundation design, the recommendations contained in this report and the known species characteristics, we are confident that the proposed extensions can be constructed without detriment to the long term future of the Oak tree T1..

Peter Wilkins BA (Hons) M. Arbor A.
Ruskins Group Consultancy 10th May 2012

Appendix 1

Tree Condition Survey

Tree Condition Survey for Proposed Extension at:
77 Avondale Road,
Rayleigh,
Essex.

Prepared For:
John R A Jackson LLP
Architectural Design Associates

Prepared by
Peter Wilkins BA (Hons) M. Arbor A.
Ruskins Group Consultancy

Our Ref 0512-1029 Rev 1
May 2012

Tree Condition Survey at Copthorne Road Felbridge

1.0 Introduction

This survey has been compiled on behalf of **John R A Jackson LLP Architectural Design Associates,** , we have been asked to assess the condition of the oak trees located in close proximity to the boundary of the site. The site was visited in May 2012 and an assessment of the tree condition was made in accordance with BS 5837 2012.

2.0 Survey Methodology

We have surveyed all the individual trees and groups of trees located within and close to the boundary of the site. The objective of the survey is to collect tree data relevant to the proposed redevelopment of the site and to categorise individual trees or tree groups in accordance with BS 5837 (2012) 'Trees in relation to design, demolition and construction – Recommendations' based on their condition, quality and future potential.

The purpose of the categories within BS5837 2012, is not to determine whether retention of trees is desirable, '*The purpose of the tree categorization method, which should be applied by an arboriculturist, is to identify the quality and value (in a non-fiscal sense) of the existing tree stock, allowing informed decisions to be made concerning which trees should be removed or retained in the event of development occurring.*' (BS5837 2012 Section 4.5.2). This survey should therefore be regarded as an initial appraisal and observations, assessments or recommendations relating to tree protection zones, remedial tree works, protective fencing, foundation design, material specification are beyond the scope of this report.

The location of the tree is shown on the attached drawing. A detailed inspection with respect to decay, defects and hazard is not included.

TABLE 1

Tree No.	Species	Hgt (m)	Dia. @ 1.5m (m)	No of stems	CS N (m)	CS E (m)	CS S (m)	CS W (m)	ER CY	Vig.	Form	Age Class	Description	Recommendations	BS Cat
T1	Oak	16	0.80	1	9	8	8	8	40+	A	A	M	A mature council owned tree growing within the pavement close to the north-eastern corner of the site. Historically this tree has been heavily reduced, it has a canopy formed by co-dominant branches originating from these old pruning wounds. There is some decay in the old wounds. It has not been subject to any recent management. Overhead electric cables run through the canopy of this tree. T1 has a limited potential for significant further growth and have a long remaining life-expectancy.	No Works	B1

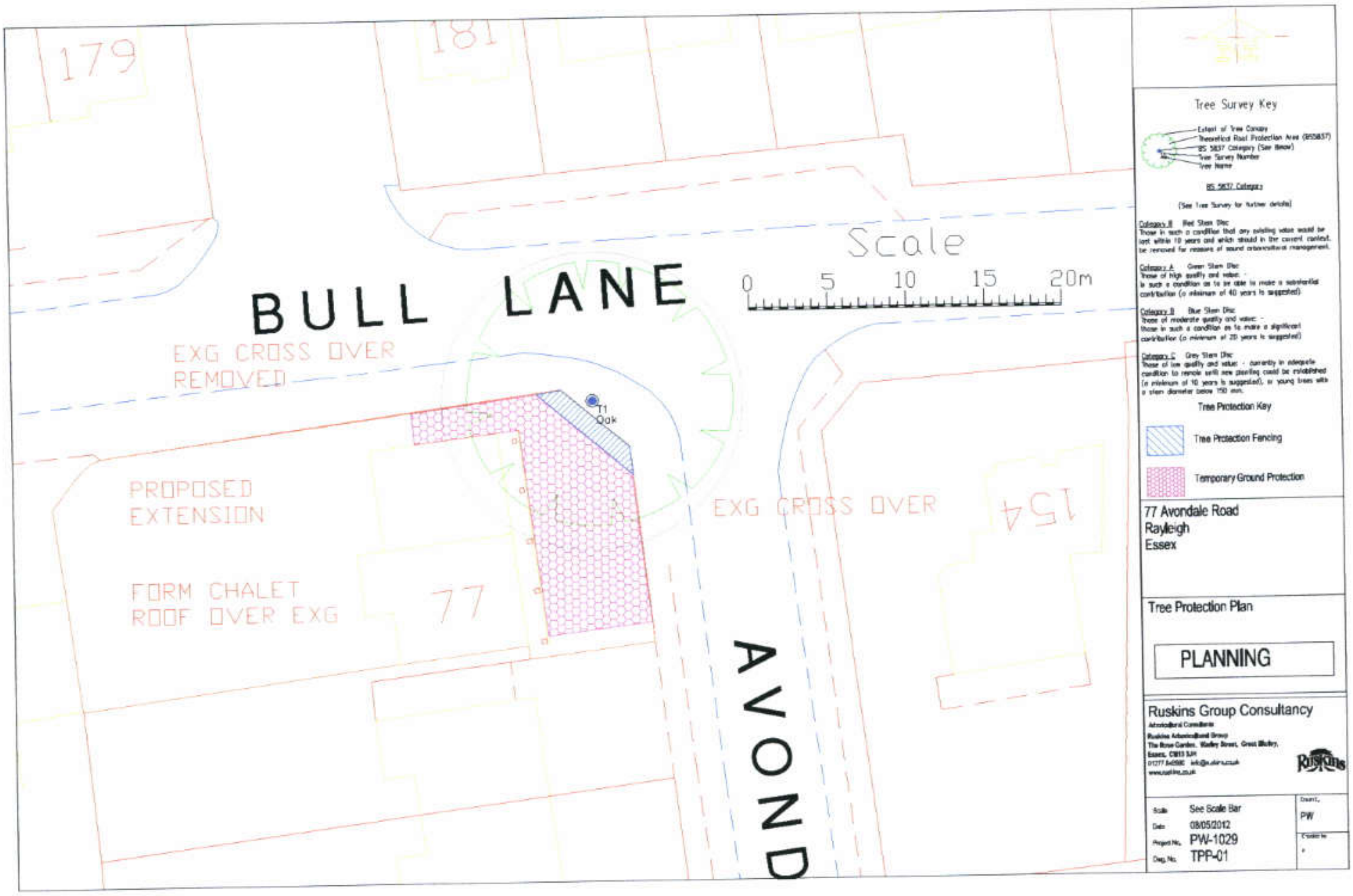
Table 1 Cascade chart for tree quality assessment

Trees unsuitable for retention (See Note)				
Category and definition	**Criteria (including subcategories where appropriate**			**Identification on plan**
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see ***4.5.7***.			Red
Trees to be considered for retention				
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands See Table 2 of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	Green
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	Blue
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	Grey

From BS 5837 (2012) Trees in relation to design, demolition and construction - Recommendations

Appendix 2

Tree Protection Plan


179
181
BULL LANE
Scale
0 5 10 15 20m
EXG CROSS OVER REMOVED
T1 Oak
PROPOSED EXTENSION
FORM CHALET ROOF OVER EXG
77
EXG CROSS OVER
154
AVOND
Tree Survey Key
Extent of Tree Canopy
Theoretical Root Protection Area (BS5837)
BS 5837 Category (See Below)
Tree Survey Number
Tree Name
BS 5837 Category
(See Tree Survey for further details)
Category A Green Stem Disc
Category B Blue Stem Disc
Category C Grey Stem Disc
Tree Protection Key
Tree Protection Fencing
Temporary Ground Protection
77 Avondale Road
Rayleigh
Essex
Tree Protection Plan
PLANNING
Ruskins Group Consultancy
Ruskins
Scale See Scale Bar
Date 08/05/2012
Project No. PW-1029
Dwg. No. TPP-01
PW

Appendix 3

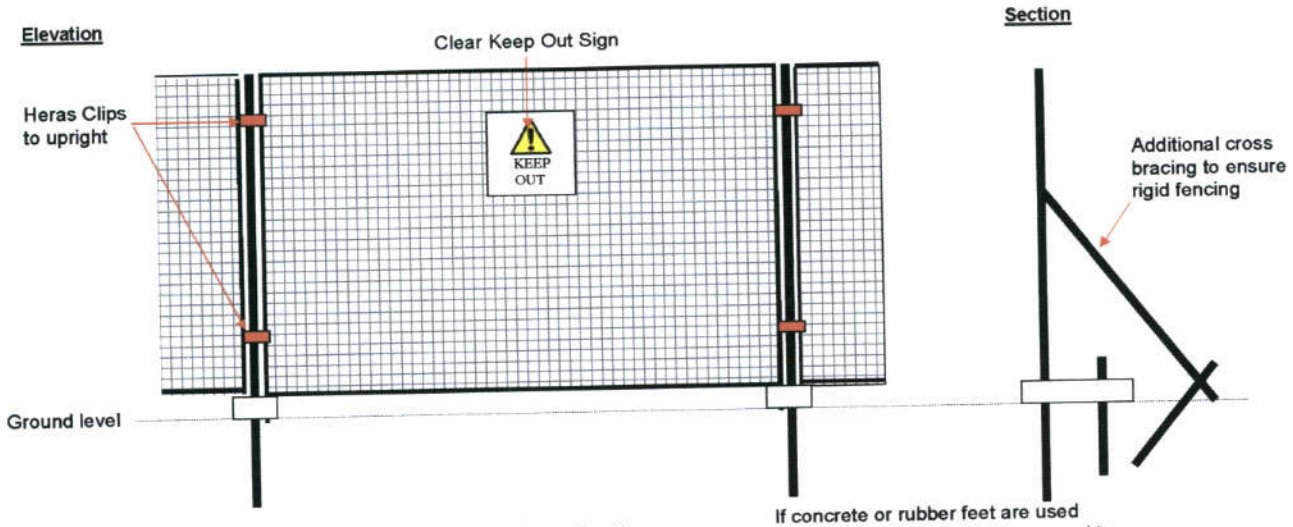
Tree Protection Fencing Specification

Indicative Temporary Ground Protection Specification

Tree Protection Fencing Notice

Temporary Ground Protection Information

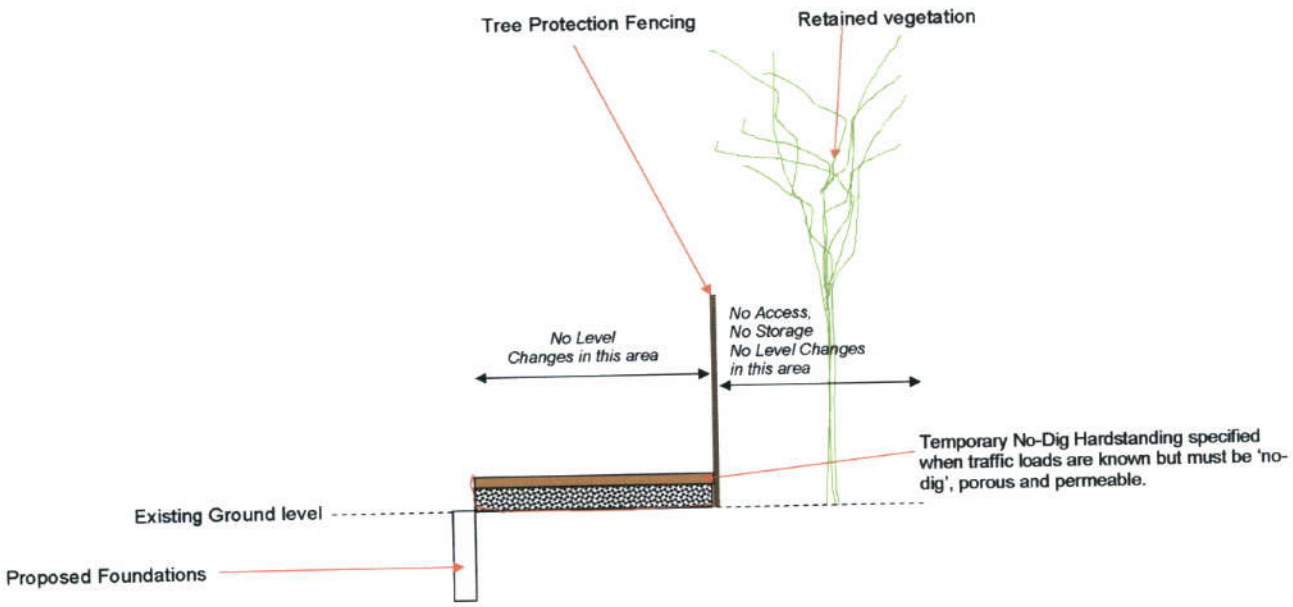
Tree Protection Fencing Specification



Tree Protection Fencing should be erected as per the Tree Protection Plan prior to any works commencing or materials being delivered to site.

If concrete or rubber feet are used these must be pinned to the ground to prevent movement.

Indicative Temporary Ground Protection Specification

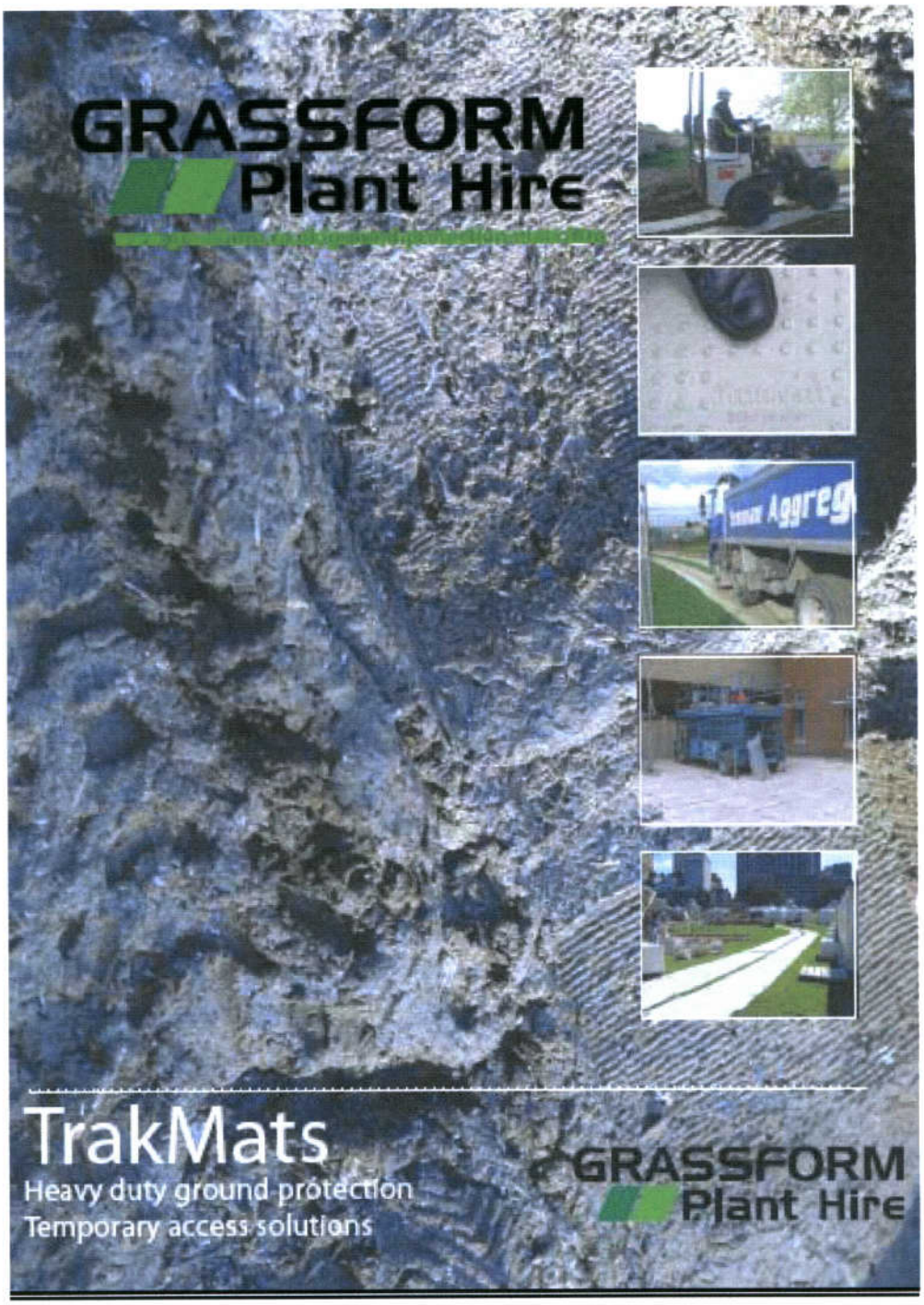


Ground Protection should be installed as per the Tree Protection Plan prior to any works commencing.

TREE PROTECTION AREA

PLEASE KEEP OUT

Ground Protection Measures


GRASSFORM
Plant Hire
TrakMats
Heavy duty ground protection
Temporary access solutions
GRASSFORM
Plant Hire

- Provides temporary access and ground protection
- Protects lawns and landscapes aswell as tarmac and concrete
- Avoids bogged down vehicles
- Avoids damage to property, heritage and eco friendly areas
- Avoids Health and Safety Issues
- Easy to handle
- Simple to lay
- Temporary or semi-permanent

GRASSFORM Plant Hire

TrakMats

Heavy duty ground protection mats

Unbreakable up to 60 tonnes*, TrakMats are the world's leading ground protection and temporary access mat for moving and operating personnel, plant and equipment over soft or sensitive ground. Excavators, Barrows, Cranes, Trucks, Drilling Rigs, Diggers, Caravans, Boats, Cars, Tractors, the list of possibilities is endless....

TrakMats provide efficient vehicle access with weight distribution upto 60 tonnes*. The tough 12.7mm thick polyethene mats are unaffected by extreme heat or cold with the option of light colours to reflect and not absorb heat when covering sensitive areas.

TrakMats have a unique self cleaning grip surface profile designed to dispel mud whilst vehicles traverse, ensuring a highly efficient non-slip traction of vehicle, to mat and mat to ground. Optional connectors are available, increasing stability further.

The 2,440mm x 1,130mm panels can be laid in two parallel tracks for temporary road use, laid as one roadway 2,440mm wide or laid to form parking or turning areas. They can be laid in any combination / pattern to achieve the desired access or area of protection.

AMAZINGLY TOUGH & FLEXIBLE Tough 12.7mm thick polyethylene mats weigh only 33kg and their built in handles make handling and movement easy.

TEMPORARY ROAD Laid in two parallel tracks or as one 2,440mm wide track, the mats are ideal for use as temporary roadways.

ANTI SLIP SURFACE Unique grip surface profile ensures mud is dispelled whilst vehicles traverse and non-slip traction is maintained.

SEMI-PERMANENT USAGE Connection options are available for more permanent situations, steep terrain and very heavy and tracked equipment.

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Features

- 2,440mm x 1,130mm (8'x4') high density polyethylene mats weigh just 33kg each
- Light enough for manual handling and laying
- Hand cutouts for easy handling and laying
- Low transport and handling costs
- No ground preparation required
- Strong yet flexible to follow contours of the underlying surface
- Unique grip surface profile designed to continuously dispel excess mud from the mats, ensuring non-slip traction is maintained
- Light colours available to reflect, not absorb heat, so safeguarding sensitive surfaces
- Unaffected by extreme heat or cold
- Range of connection options for different terrain and equipment
- Minimal maintenance and easy storage
- Weather-proof and environmentally friendly
- Standard light green, black and white - corporate colours and logos are also available
- 5 year warranty

TrakMat Applications

- Construction, civil engineering and ground work industries
- Emergency access routes
- Golf course and sports field maintenance
- Sports and leisure facilities
- National Parks
- Landscaping
- Utilities and infrastructure maintenance
- Boat regattas
- Cemeteries
- Temporary roadways and carparks
- Military sites
- Caravan parks
- Heritage sites and eco friendly areas

NON-SLIP TRACTION CYLINDERS ON ONE SIDE
With a smooth surface on the reverse these panels are ideal for use over paving, pavements, tarmac etc. Used smooth side down, no indentation marks are made and efficient load spread is achieved.

NON-SLIP TRACTION CYLINDERS ON BOTH SIDES
For use on soft surfaces like grass, soil, astroturf etc. the traction cylinders will bed into the soft surface and reduce any sliding effect whilst vehicles traverse. The uppermost traction cylinders are effective for tyre and track grip and are designed to help dispel excess mud from vehicle tyres as they pass over.

	Thickness	Dimension (w x l)	Weight per sheet
TM4496 single sided	12.7mm	1,130 x 2,440mm	33kg
TM4496 double sided	12.7mm	1,130 x 2,440mm	33kg
TM2296 single sided	12.7mm	560 x 2,440mm	17kg
TM2296 double sided	12.7mm	560 x 2,440mm	17kg
Material	100% Recycled High Density Polyethylene (black) 100% High Density Polyethylene (light green / white)		
Colours available	Standard - light green, black and white		
Optional extras for connectivity	Neoprene connectors for longer term connection Metal connectors for heavy and tracked equipment Metal U pins for slopes and cambers		
Environmentally Friendly	Weather proof, water resistant and unaffected by extreme heat or cold		
Customisation	Corporate colours and logos available (subject to minimum order)		
Guarantee	Warranty 5 years with a field life of 10 years		

TrakMats from Grassform Plant Hire Ltd. - for hire or sale now

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MAKE YOUR JOB EASIER & SAFER

- Easy to install ground protection
- Fast temporary access, working areas and trackways
- Avoid property, heritage and environmental damage
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Unbreakable upto 60 tonne refers to the material strength of Trakmats. The weight load distribution performance of Trakmats is subject solely to ground conditions, weight and type of vehicle or plant. Grassform Plant Hire Ltd. always recommends strongly that a site survey be carried out to determine weight loading and ground conditions. Grassform Plant Hire Ltd. and its employees are not liable for any claims made to existing ground or property through the use of Trakmats.

TrakMats are available for hire and sale from Grassform Plant Hire Ltd. Contact us with your requirements on how TrakMats can solve your access issues.

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CI/SfB

Common Arrangement R12

Uniclass
L81208/L81210

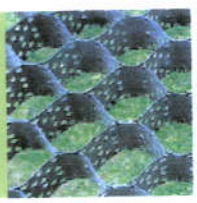
CellWeb

Tree Root Protection System

Geosynthetics

CellWeb

Tree Root Protection System



CellWeb Tree Root Protection System provides a flexible and permeable solution for protecting tree roots while creating a strong stable surface for traffic.

With increased urbanisation and more redevelopments of existing properties, the need to be mindful of the impact on the surrounding environment is more important than ever.

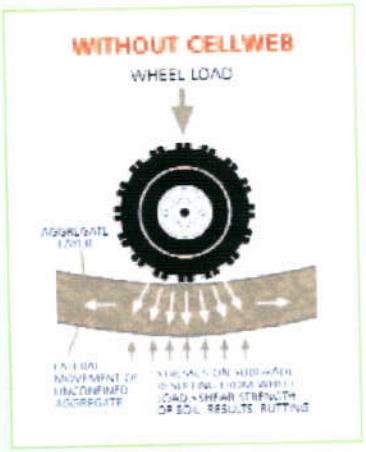
The demand for building site access, driveways and parking around existing trees can have a potentially fatal impact on the tree if carried out incorrectly. Tree preservation orders (TPO's) ensure that trees are not wilfully damaged. However the need for vehicle access over and around tree roots can still cause the following problems:

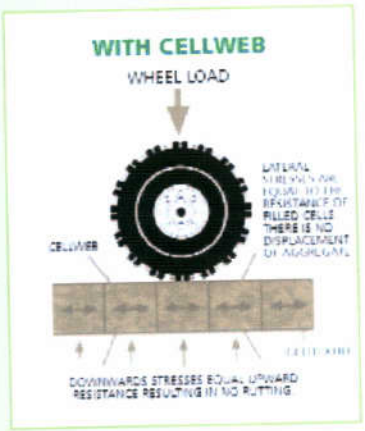
Problems:

- Compaction of subsoils (especially by construction traffic) causing oxygen and nutrient depletion
- Creating an impermeable surface that prevents water reaching the roots
- Changes in ground level and water table
- Damage caused during excavation
- Contamination of the subsoil

By using CellWeb Tree Root Protection System you can avoid these problems and ensure the tree's long-term future. BS 5837:1991 (revised 2005) and APN 1 provide information for the protection of trees during the construction process, and CellWeb is a well-established solution that conforms to these guidelines.

Product features

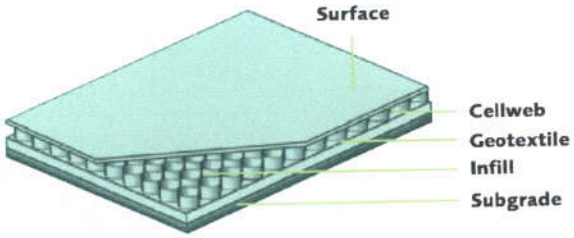




Cellweb's patented design with its unique cellular structure and perforated cell walls reduces the vertical load pressure on tree roots and prevents damage. With clean granular materials as infill, air and moisture can reach the roots to encourage healthy growth.

With no-dig solutions being the preferred option of most Arboricultural Consultants and Tree Officers, CellWeb is ideal as only the surface vegetation need be removed. As well as avoiding disruption to the roots this reduces installation time and saves money.

What's more CellWeb also cuts down the depth required for the sub base – in most cases by 50% for further cost savings. CellWeb also significantly reduces surface rutting, increasing the long-term performance of the finished surface.



Using CellWeb for tree root protection gives you these benefits:

- Reduced depth of excavation required
- Preventing the compaction of subsoils
- Preventing oxygen and nutrient depletion
- Environmentally sound
- Quick, easy and cost-effective installation
- Free technical support available

CellWeb gives you the cost-effectiveness you need at the same time as helping to preserve trees.

Geosynthetics Ltd is a leading dis

Please call
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Wide product range

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Next day delivery

Access road for the National Lake District Parks Authority.

Site before construction pictured above.

CellWeb during installation.

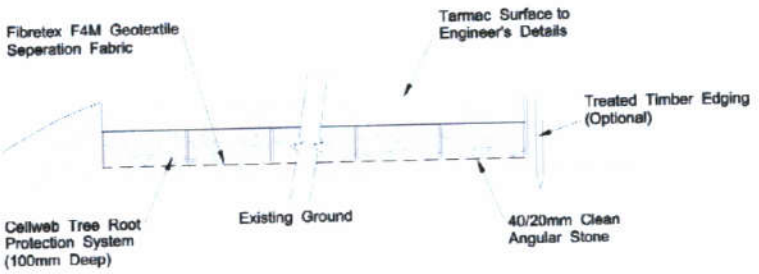
Final surfacing.

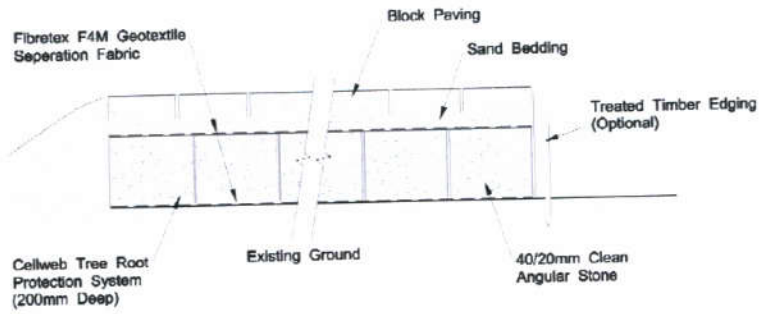
Final surfacing

The CellWeb Tree Root Protection is totally confined within the clean stone sub base, therefore you can choose whichever surface materials are most appropriate for your installation. Some materials are more suitable than others and serious consideration should be given to the porosity of the surface for continued healthy growth of the tree. An ideal surfacing are DuoBlocks: a grass reinforcement and gravel retention system. Geosynthetics can supply these systems for a visually attractive surface that also has the advantage of being fully porous.

Loose or bonded gravels can be used as an alternative hard landscaping and CellWeb can also be used with block paviors whose porous joints will permit moisture and air transfer to the roots. Where planning allows, porous asphalt is yet another possible surfacing treatment.

Call our sales office on 01455 617 139 for more information.





Quality assurance

Certified quality

Cellweb™ is manufactured in accordance with an ISO 9001 Quality Management System with perforated walls, and a comprehensive range of cell diameters and depths. The perforated system improves the frictional interlock of infill material giving greater stability and facilitating lateral drainage.

Advice and product selection

Geosynthetics Limited has been supplying the CellWeb Tree Root Protection System for many years and as a result have acquired a vast amount of experience and knowledge. No two contracts are the same, and we understand the factors that need to be taken into account to specify the right CellWeb product for the right situation.

We provide a FREE consultation, design and advisory service to give you the reassurance that your project will be cost-effective and beneficial to existing trees. The service includes product selection, CAD drawings and full installation instructions and will help you from conception stage all the way through to completion.

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

Geosynthetics Ltd is committed to offering the best solutions for soil stabilisation, erosion control, drainage and environmental protection problems.

Well trained staff are always available to discuss which materials are best suited to any particular application.

Technical specification

Product Specifications

Properties	Standard Cell	Large cell
Material	Virgin HDPE	Virgin HDPE
Wall thickness	1.25mm	1.25mm
Seam welding	Ultrasonic to 100% of seam length	Ultrasonic to 100% of seam length
Cell depth	75, 100, 150, 200 and 300mm	75, 100, 150, 200 and 300mm
Width of expanded panel	2.56m	2.56m
Length of expanded panel	8.1m	13.72m
Cell diameter (expanded)	259 x 224mm	508 x 475mm

Please call - **01455 617 139**
or email sales@geosyn.co.uk for more technical advice and further information.

Geosynthetics Limited

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Geosynthetics