



ARBORICULTURAL IMPACT ASSESSMENT	
Site:	Pendle Garage, Clitheroe Road, Barrow, Lancashire, BB7 9AQ
Report Date:	20 November 2012
Prepared By:	Phill Harris – Chartered Arboriculturist
Report Ref:	BTC347
Agent for Client:	Bowsall Limited

Introduction and Rationale. Bowland Tree Consultancy Ltd was instructed to carry out an appraisal of the potential for the construction of a residential development at the above site to impact upon trees and, in turn, to advise on appropriate protective measures during development and on facilitation pruning and/or felling works where identified as necessary. Further to this instruction I confirm that I visited the site on 5 July 2012 and carried out a survey of trees in accordance with BS5837:2012 - Trees in Relation to Design, Demolition and Construction – Recommendations, and our disclaimer at page 6.

In this respect I set out a brief overview of my observations, findings and recommendations below, along with comments on any issues raised. I also enclose a Tree Survey Schedule (TSS) and Tree Constraints Plan (TCP) detailing specific tree related information and a Tree Impact Plan (TIP). The TIP shows the site under consideration with pertinent existing tree constraints detailed, plus an overlay of the proposed development with associated tree impacts indicated. The TIP is based upon a scaled electronic site proposal plan, as supplied by the client and, for the purpose of this report, I presume the details of the plan to be accurate.

The Site and the Proposal. The site under consideration is located in a suburban/rural edge area to the south of Barrow, Lancashire, within the administrative boundaries of Ribble Valley Borough Council. The site is bordered to the north by a light industrial building, to the east by open fields, to the south by a disused plant nursery with residential planning permission and to the west by Clitheroe Road (see Fig. 1, below).



Fig. 1: The site access from Clitheroe Road, as seen from the north-west looking south-east, with group G1 visible to the centre

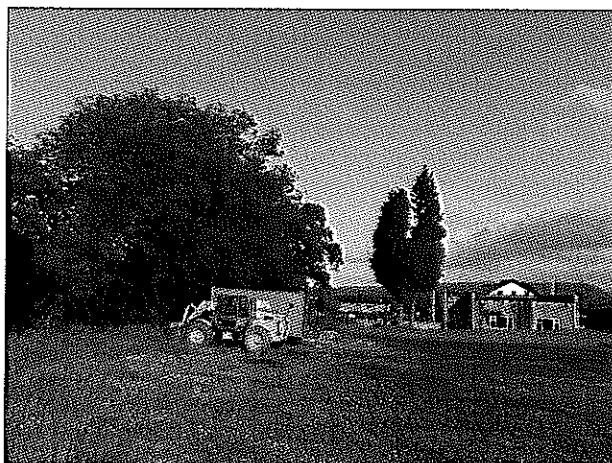


Fig. 2: The western section of the site, looking west, with group G1 just right of centre and tree T3 left of centre

The site consists of a disused garage building with associated bitumen hard-standing to the west (see Fig. 1, above), an area of gravel hard-standing to the centre (see Fig. 2, above) and an overgrown field to the east. There are several individually surveyed trees and a hedgerow along the southern boundary. Site topography is variable, being level in many parts but having various minor to moderate undulations and abrupt level changes in several areas and a ditch to the southern boundary. In this respect I would note that Oak tree T5 is sited within a basin like hollow in the ground. Vehicular access is currently via two points off Clitheroe Road in the site's north-western and south-western corners (see Fig. 4, overleaf).

I am informed by the client, Bowsall Ltd, that the proposal is to construct 29 new residential properties with associated private gardens, garages, drives, hard-standing and an access road at the site under consideration, as detailed on the TIP. Vehicular access is proposed from a single point in its south-western

corner off Clitheroe Road, with the internal access road proposed to run along the south of the site, as also detailed on the TIP.

The Trees. Seven individual trees (prefixed 'T'), five groups of trees (prefixed 'G') and two hedges (prefixed 'H') were surveyed in respect of the proposal and its associated potential to impact upon said vegetation, and the respective constraints are plotted on the TIP attached. I have not been informed if any of the trees at the site are the subject of a Tree Preservation Order (TPO), and it is therefore important to contact the planning office at Ribble Valley Borough Council to check for the presence of any such statutory protection prior to scheduling or carrying out any tree works. According to Lancashire County Council's 'Maps & Related Information Online' (MARIO) website the site itself does not stand within a Conservation Area.

The surveyed trees consist of various deciduous broadleaf and evergreen coniferous species including Common Oak, Leyland Cypress and Ash. The majority of the trees stand within the site boundaries, but large Ash T6 is located on adjacent land within a neighbouring field to the south-east and, as such, was therefore not inspected in detail as part of this assessment. The surveyed trees are in the young to post-mature age range and stand at heights of up to 21 metres, have maximum diametrical crown spreads of up to approximately 26 metres and stem diameters of up to approximately 1200 millimetres. Tree dimensions and other pertinent information such as structural defects and physiological deficiencies, along with recommendations for remedial management works, are included in the TSS attached.

Table A: BS5837:2012 Retention Categories of the Surveyed Trees

	Ret. Cats.	Tree Numbers	Totals
Trees of a high quality that should be afforded appropriate consideration in the context of development	'A'	T1, T5, T6	3 Trees (42.9%)
Trees of a moderate quality that should be afforded appropriate consideration in the context of development	'B'	T2	1 Tree (14.3%)
Trees of a low quality that should be afforded appropriate consideration in the context of development	'C'	T2, T7, G2, G3, G4, G5, H1, H2	2 Trees (28.6%) 4 Groups (80%) 2 Hedges (100%)
Trees unsuitable for retention	'U'	T4, G1	1 Tree (14.3%) 1 Group (20%) = 7 Trees, 5 Groups & 2 Hedges in Total

The trees were appraised in accordance with BS5837:2012 Table 1 (attached) and, as detailed in Table A (above), three of the trees were allocated a high retention values of 'A', one of the trees was allocated a moderate retention value of 'B' and two of the trees, four of the groups and the two hedges were allocated a low retention value of 'C'. In addition, one of the trees and one of the groups were allocated 'U' categories as they are unsuitable for retention in the current context. With regard to Table A it should be noted that tree quality and value is categorised within the existing context without taking into account any site development related issues, but that the recommendations for works take the proposal into consideration where there are clearly definable potential impacts upon trees.



Fig. 3: Trees T1 to T3, as seen from the north looking south



Fig. 4: The south-western access point to the site, looking west

The larger broadleaf deciduous trees along the southern boundary, in particular Oak T1 and Ashes T2 and T3 (see Fig. 3, above), are readily visible in both the immediate and the wider local landscape and are of locally native species that grow naturally in the surrounding countryside. As such, these trees are considered to confer a high visual amenity in the locality. All the trees located internal to the site, apart from 'U' category group G1, are relatively small and, overall, confer a low visual amenity in the local landscape.

The Proposal's Projected Impacts on Trees. As detailed in Table B (below) and on the TIP, implementation of the proposed development will require the removal of one 'C' category (i.e. low quality) tree, three 'C' category groups and one 'C' category hedge. Nonetheless, the loss of these trees is projected to have a negligible impact upon the visual amenity of the locality. In addition, as discussed previously, one of the trees and one of the groups are unsuitable for retention in the current context and should therefore be removed in accordance with pertinent arboricultural management regardless of the proposals.

Table B: Arboricultural Impacts of Proposed Development & Other Tree Removal Proposals

	Ret. Cats.	Removals necessary to implement development	Removals suggested for non-development related reasons	Total number of tree removals
Trees of a high quality that should be afforded appropriate consideration in the context of development	'A'	-	-	-
Trees of a moderate quality that should be afforded appropriate consideration in the context of development	'B'	-	-	-
Trees of a low quality that should be afforded appropriate consideration in the context of development	'C'	T7, G3, G4, G5, H2	-	1 Tree 3 Groups 1 Hedge
Trees that should be removed for sound management reasons regardless of site plans	'U'	-	T4, G1	1 Tree 1 Group
Totals		1 Tree 3 Groups 1 Hedge	1 Tree 1 Group	= 2 Trees, 4 Groups, & 1 Hedge in Total

Special Materials and Working Methods for Proposed Hard Surfaces within RPAs. Section 7.4 of BS5837:2012 recommends that, where the construction of hard surfaces cannot be avoided within RPAs, such as is the case with the proposed footpath within the RPAs of T1 to T3 and the proposed access road that encroaches slightly into the RPA of T3, then a 'no-dig' design such as a three dimensional cellular confinement system should be used to avoid excavations and subsequent root loss and damage. In this respect a manufacturer's brochure detailing the design and construction of a typical 'no-dig' hard-surface is attached.

Arboricultural Method Statement and Tree Protection Plan. In consideration of the need for *special mitigation construction*, such as the construction of hard surfaces within tree RPAs using special methods, it is important that an Arboricultural Method Statement and a Tree Protection Plan be produced. These documents describe the procedures, working methods and protective measures to be used in relation to retained trees in order to ensure that they are adequately protected during the construction process, and their production can be conditioned to a detailed planning approval if considered necessary by the LPA.

Mitigation for Projected Tree Losses. As preliminarily indicated on the TIP, there is sufficient space within the site for extensive new trees as part of the landscaping scheme for the development. In consideration of the proposed retention of a strip of undeveloped land along the site's southern boundary it would be appropriate to concentrate new tree planting within this area. Such planting should consist of the provision of individuals and small groups of moderate to large growing trees of locally native species, including Sessile Oak, Pedunculate Oak, Field Maple and Common Alder. Tree planting in and around private gardens should preferably consist of the provision of smaller growing trees of a selection of both native and non-natives planted as individuals. Suitable species include Rowan and Bird Cherry. In this respect a landscape plan should be produced for the development proposal.

Overall therefore, in consideration of the site's capacity to accommodate a substantial number of new trees as part of the development it is projected that the relatively low number of necessary tree removals will be more than adequately mitigated for over the long-term.

Tree Retention Recommendations. Adequate protection of retained tree Root Protection Areas (RPAs) during construction is essential if their long-term viability is to be assured. RPAs, which are calculated through a method provided in BS5837:2012, are ground areas around trees that are to be kept free from major disturbance throughout development through the installation of temporary protective fencing to form a

Construction Exclusion Zone. The TSS lists the RPAs of the individually surveyed trees as areas in square metres and as radial distances in metres from stem centres, whilst the RPAs are indicated in magenta on the TIP. A Temporary Protective Fencing Specification is attached which gives details of the type, purpose and construction of the temporary protective fencing that should be used. The successful retention of Oak T5 will require that the existing basin-like ground arrangement around the tree be retained as is, with no major ground works carried out. Details regarding tree protection specifics can be included in the Arboricultural Method Statement.

In addition to the points raised herein I would also emphasise the importance of ensuring that all relevant recommendations included under the General Recommendations section at page 6 be followed accordingly.

Summary and Conclusions. A development of 29 residential properties is proposed at the site under consideration. As such, seven individual trees, five groups of trees and two hedges were surveyed in respect of the proposal and its associated potential to impact upon said vegetation. Three of the trees have high retention values, one of the trees has a moderate retention values, two of the trees, four of the groups and the two hedges have low retention values, and one of the trees and one of the groups are unsuitable for retention in the current context.

My appraisal determines that implementation of the proposed development will require the removal of one low quality tree, three low quality groups and one low quality hedge, whilst one tree and one group are considered unsuitable for retention in the current context. In this respect I would note that all of the trees that require removal to facilitate the development are of low quality and value and should not therefore be considered a constraint to development. My appraisal subsequently concludes that the removal of the trees in question will have a negligible impact upon the visual amenity of the locality and that the losses will be more than adequately mitigated for over the long-term, both in visual and ecological terms.

I also conclude that the existing trees that are to be retained can be adequately protected throughout the development in accordance with BS5837:2012, provided that various recommendations made herein are followed, in particular the use of a cellular confinement system to construct the proposed access road and footpath and the production of an Arboricultural Method Statement and a Tree Protection Plan.

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Enclosures: Tree Survey Schedule
BS5837:2012 Table 1
Tree Constraints Plan
Tree Impact Plan
Temporary Protective Fencing Specification
Manufacturer's 'no-dig' hard-surface brochure

GENERAL RECOMMENDATIONS

Non-Development Related Tree Works and Recommendations. Any general management pruning works for retained trees that are stated to be non-development related, as detailed in the TSS, are recommended in accordance with prudent arboricultural management and should therefore be carried out regardless of any site plans and potential changes in land usage. All tree works should be carried out in accordance with BS3998:2010 - Tree Work – Recommendations.

Tree Work Related Consents. No tree pruning or removal works should commence on site until necessary consents have been obtained from the LPA as part of a planning approval or in respect of any statutory tree protection.

Protected Species. Hedges, climbing plants, shrubs and trees should be inspected for birds' nests prior to any clipping, pruning or removal works, and any work likely to destroy or disturb active nests should be avoided until the young have fledged. All personnel carrying out tree works should also be vigilant of the possibility that roosting bats may be present in trees and, if any bat roosts are identified, then it is essential that works are halted immediately and that a suitably qualified and experienced ecologist investigate prior to works continuing.

Arboricultural Contractors. All tree works should be carried out by suitably qualified and experienced arboricultural contractors carrying appropriate public liability insurance cover and be implemented to the minimum current CE and UK industry standards and in accordance with industry codes of practice. Only certificated personnel should, in accordance with The Control of Pesticides Regulations, apply any pesticides.

Contractors and Subsequently Identified Tree Defects. Contractors should be made aware that, should any significant tree defects become apparent during operations that would not have been immediately obvious to the surveyor, then such defects should be notified immediately to the client and subsequently confirmed to the consultant within five working days.

New Tree Planting. Where trees are removed in order to facilitate construction then new tree planting proposals should be included as part of the landscape design plan for the site. All tree planting should be carried out in accordance with BS4428:1989 - Code of Practice for General Landscape Operations, BS3936-1:1992, Nursery Stock – Part 1: Specification for Trees and Shrubs and BS4043:1989, Transplanting Root-Balled Trees where applicable.

Retained Tree Management. Any tree risk management appraisal and subsequent recommendations made in this report were based on observations and site circumstances at the time of my survey. Trees are dynamic living organisms whose structure is constantly changing and even those evidently in good condition can succumb to damage and/or stress. In this respect I would note that, under the Occupiers' Liability Act (1957 & 1984), site occupants have a duty of care to take reasonable steps to prevent or minimise the risk of personal injury and/or damage to property from any tree located within the curtilage of the land they occupy. It is accepted that these steps should normally include commissioning a qualified and experienced arboriculturist to survey their trees in order to identify any risk of harm to persons or damage to property that they may present and, where unacceptable risks are identified, taking suitable remedial action to negate those risks.

DISCLAIMER

Survey Limitations: Unless otherwise stated all trees are surveyed from ground level using non-invasive techniques, in sufficient detail to gather data for and inform the design of the current project only. The disclosure of hidden crown and stem defects, in particular where they may be above a reachable height or where trees are ivy clad or in areas of ground vegetation, cannot therefore be expected. All obvious defects, however, are reported. Detailed tree safety appraisals are only carried out under specific written instructions. Comments upon evident tree safety relate to the condition of said tree at the time of the survey only. Unless otherwise stated all trees should be re-inspected annually in order to appraise their on-going mechanical integrity and physiological condition. It should, however, be recognised that tree condition is subject to change, for example due to the effects of disease, decay, high winds, development works, etc. Changes in land use or site conditions (e.g. development that increases access frequency) and the occurrence of severe weather incidents are also significant considerations with regards tree structural integrity and trees should therefore be re-assessed in the context of such changes and/or incidents and inspected at intervals relative to identified and varying site conditions and associated risks.

Where trees are located wholly or partially on neighbouring private third-party land then said land is not accessed and our inspection is therefore restricted to what can reasonably be seen from within the site. Stem diameters of trees located on such land are estimated. Any subsequent comments and judgments made in respect of such trees are based on these restrictions and are our preliminary opinion only. Recommendations for works to neighbouring third-party trees are only made where a potential risk to persons and/or property has been identified during our survey or, if applicable, where permissible works are required to implement a proposed development. Where significant structural defects of third-party trees are identified and associated management works are considered essential to negate any risk of harm and/or damage then we will first attempt to inform the site occupier of the issues and, if not possible, then inform the relevant Council. Where a more detailed assessment is considered necessary then appropriate recommendations are set out in the Tree Survey Schedule.

Where tree stem locations are not included on the plan(s) provided then they are plotted at the time of the survey using, where appropriate and/or practicable, a combination of measurement triangulation and GPS co-ordination. Where this is not possible then locations are estimated. Restrictions in these respects are detailed in the report.

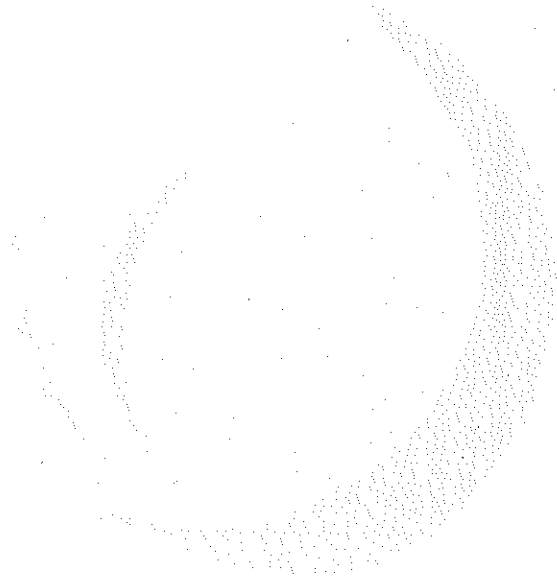
The potential influence of trees upon buildings or other structures resulting from the effects of their roots abstracting water from shrinkable load-bearing soils is not considered herein. The advice of a structural engineer should be sought with regard to appropriate foundation depths for new buildings with reference to NHBC Standards Chapter 4.2 (NHBC, 2008).

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TREE SURVEY SCHEDULE & BS5837:2012 'TABLE 1'



TREE SURVEY SCHEDULE FOR ARBORICULTURAL IMPACT AND PROTECTION APPRAISAL

Site: Pendle Garage, Clitheroe Road, Barrow, Lancashire, BB7 9AQ

Client: Bowsall Limited

Surveyor: Phill Harris – Chartered Arboriculturist

Assessment Date: 5 July 2012

Job Reference: BTC347

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No.	Species	Height	Stem Diam.	Branch Spread	Branch & Canopy Clearance	Life Stage	PC	General Observations and Comments		Management Recommendations	ERC	Cat. Grade	RPA (m ²)	RPA Radius (m)
T1	Common Oak	14.5	720	N 7.5 E 5 S 7 W 8	5-E 1.5	M	G	4m ground clearance over site. - Stem trifurcates into primary branches at a height of approximately 4m. - Has sustained previous secondary branch failure leaving large stub to south. - Moderately large amount of deadwood to approximately 100mm diameter.		- Retain and ensure protection of Root Protection Area (RPA) throughout development with Construction Exclusion Zone (CEZ), in accordance with Tree Impact Plan. - Prune to remove deadwood above 50mm diameter.	40+	A1/2	235	8.64
T2	Ash	15.5	750	N 7 E 6 S 7 W 6	2.5-E 5	M	M	- Grade previously raised in rootzone to north up to stem. - Stem divides into multiple primary branches at a height of approximately 2m. - Has sustained several primary and secondary branch failures in past leaving number of large decaying stubs. - Bacterial cankers to upper branches. - Crown showing signs of a substantial reduction in vitality with moderately small leaves and moderately sparse foliage cover.		- Retain and ensure protection of RPA throughout development with CEZ, in accordance with Tree Impact Plan. - Carry out detailed risk assessment inspection following development.	10+	C1	254	9
T3	Ash	15	1000	N 8 E 11.5 S 7 W 7	2.5-S 2	M	M	- Grade previously raised in rootzone to north up to stem. - Dense ivy up stem and into branches. - Stem divides into multiple primary branches at a height of approximately 2.5m. - Crown showing signs of a minor reduction in vitality.		- Retain and ensure protection of RPA throughout development with CEZ, in accordance with Tree Impact Plan. - Sever ivy and carry out detailed risk assessment inspection following ivy's dieback/removal.	20+	B1/2	452	12
T4	Common Oak	6	430	N 4.5 E 5 S 2 W 4.5	3-NE 3.5	SM	MD	- Crown showing signs of a significant and progressive reduction in vitality with 80% defoliation and remaining leaves being very small. - In late stages of decline with short projected remaining safe life expectancy.		- Remove as is in decline. - Grub out stump.	<10	U	84	5.16
T5	Common Oak	13	640	N 5 E 8 S 6 W 5	2.5-NE 0	M	G	- Within recessed 'basin'-like ground area. - Small amount of deadwood to approximately 100mm diameter.		Retain and ensure protection of RPA throughout development with CEZ, in accordance with Tree Impact Plan.	40+	A1/2	185	7.68

Headings and Abbreviations:

No. Allocated sequential reference number - Tree (T), Group (G), Woodland (W) or Hedge (H) reference number - refer to plan and to numbered tags where applicable

Species: Common name

Height: In metres, to half nearest metre - where possible approximately 80% are measured using an electronic clinometer and the remainder estimated against the measured trees. In the case of Groups and Woodlands the measurement listed is that of the highest tree

Stem Diam.: Stem diameter in millimetres, to nearest 10mm - measured and calculated as per Annex C of BS5837:2012. MS = multi-stemmed, TS = twin-stemmed

Branch Spread: Crown radius measured (or estimated where considered appropriate) from the four cardinal points (north, east, south and west) to give an accurate visual representation of the crown

Branch & Canopy Clearance: Existing height above ground level, in metres, of first significant branch and direction of growth (e.g. 2.5-N) and of canopy at lowest point - to inform on crown to height ratio, potential for shading, etc.

Life Stage: Estimated age class. Y = young, SM = semi-mature, EM = early-mature, M = mature, PM = post-mature

PC: Physiological Condition - a measure of the tree's overall vitality, i.e. D = Dead, MD = Moribund, P = Poor, M = Moderate, G = Good

General Observations and Comments: Comments relating to the tree's overall condition and any other pertinent factors including structural defects, current and potential direct structural damage, physiological decline, poor form, etc.

Management Recommendations: Either Preliminary or In Consideration of the Proposal - In the case of Arboricultural Constraints Surveys the recommended management works only take existing site and tree circumstances and conditions into account and not proposed developments. Arboricultural Impact Assessment and Method Statement related

ERC: Surveys take the proposed development into consideration with recommendations made accordingly. More than one option may be given if considered appropriate

Cat. Grade: Estimated Remaining Contribution - in years as per BS5837:2012 (i.e. <10, 10+, 20+, 40+)

RPA m²: Category Grading - tree retention value listed as U, A, B or C - in accordance with BS5837:2012 Table 1

(Estimated Dimensions): Root Protection Area Radius - in metres measured from the centre of the stem to the line of tree protection

Where trees are located off-site, or are inaccessible for any other reason, and accurate measurements or other information cannot be taken then the information provided is estimated and is duly suffixed with a '*' symbol

TREE SURVEY SCHEDULE FOR ARBORICULTURAL IMPACT AND PROTECTION APPRAISAL

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No.	Species	Height	Stem Diam.	Branch Spread	Branch & Canopy Clearances	Life Stage	PC	General Observation and Comments		Management Recommendations				ERC	Cal. Grade	RPA (m ²)	RPA Radius (m)
T6	Ash	21	1200#	N 13 E 10 S 13 W 10	4-W 0	M	G	- Located on neighbouring land and therefore not inspected in detail. - Evidently of veteran age. - Unidentified black fungal fruiting body evidently present between buttresses.		- Ensure protection of RPA throughout development with CEZ. - Land-owner should have tree inspected in detail.				40+	A1/2	651	14.4
T7	Ash	9	5x150 (ms)	N 4.5 E 4.5 S 4.5 W 4.5	1.5-S 0	SM	G	Multi-stemmed tree growing out of earth mound.		- Remove in order to construct development as proposed. - Grub out stump.				>40	C1/2	61	4.41
G1	2no. Leyland Cypress	≤ 19	≤ 510	N ≤ 3 E ≤ 3 S ≤ 3 W ≤ 3	4.5-S ≥ 5	EM	M	- Closely spaced group. - Tree to north has sustained upper crown failure. - Short projected remaining safe life expectancies.		- Remove due to short projected remaining safe life expectancies. - Grub out stumps.				<10	U	≤ 118	≤ 6.12
G2	approx. 9no. Leyland Cypress	≤ 12	≤ 200	N ≤ 2 E ≤ 2 S ≤ 2 W ≤ 2	0.2 ≥ 1	Y	G	- Very closely spaced linear group. - Located on neighbouring land next to boundary fence.						10+	C1/2	≤ 18	≤ 2.4
G3	approx. 4no. Hawthorn, 2no. Elder, 1no. Hazel	≤ 10	≤ 9x70 (ms)	N ≤ 3 E ≤ 3 S ≤ 3 W ≤ 3	0 ≥ 0.5	M-PM	D-G	- Moderately closely spaced group of multi-stemmed trees in two clumps. - Several of the Elders are dead.		- Remove in order to construct development as proposed. - Grub out stumps.				10+	C1/2	≤ 20	≤ 2.52
G4	Goat Willow	≤ 6	≤ 9x40 (ms)	N ≤ 3.5 E ≤ 3.5 S ≤ 3.5 W ≤ 3.5	0 ≥ 0	Y	G	Very closely spaced group of multi-stemmed trees.		- Remove in order to construct development as proposed. - Grub out stumps.				40+	C1/2	≤ 7	≤ 1.44
G5	2no. Ash	≤ 6.5	≤ 100	N ≤ 2 E ≤ 2 S ≤ 2 W ≤ 2	2-S ≥ 1	Y	G	Both are self-set and their stems are almost in contact with the boundary fence.		- Remove due to projected conflicts with boundary fence. - Grub out stumps.				10+	C1	≤ 5	≤ 1.2
H1	Hawthorn, Hazel, Blackthorn	≤ 7	≤ 9x70 (ms)	≤ 8 wide	N/A ≥ 2	EM	G	- Mainly made up of Hawthorn. - Short section to west is maintained at a height of approximately 1.2m. Rest is overgrown.		- Retain and ensure protection of RPA throughout development with CEZ. - Lay existing trees and infill plant any spaces.				40+	C1/2	N/A	≤ 2.52
H2	Leyland Cypress	≤ 5	≤ 200	≤ 2 wide	N/A ≥ 1.5	SM	M	- Short length of maintained hedge on site boundary. - Several height changes along length. - Ownership unclear.		- Assess ownership. - If within site then remove and replace with mixed native hedge.				10+	C1/2	N/A	≤ 2.4

BS5837:2012 Table 1 – Cascade Chart for Tree Quality Assessment

Category and definition	Criteria (including subcategories where appropriate)	Identification on plan
Trees unsuitable for retention (see Note)		
Category U	- 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 <i>Note: Category U trees can have existing or potential conservation value which it might be desirable to preserve; see BS5837:2012 paragraph 4.5.7.</i>	Red
Trees to be considered for retention		
Category A	Mainly arboricultural qualities	Mainly landscape qualities
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 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, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)
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 with material conservation or other cultural value
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 with no material conservation or other cultural value

KEY

T = Surveyed Individual Tree
G = Surveyed Group of Trees
H = Surveyed Hedge

Please refer to the schedule of appendices for a full list of trees and hedges. The schedule is located in the appendix to the main report.

Tree Categories:

Trees to be Considered for Retention:

- Category 'A' Tree/Group/Hedge
These are trees and hedges which are considered to be of high value and are likely to be retained for a long period of time.
- Category 'B' Tree/Group/Hedge
These are trees and hedges which are considered to be of medium value and are likely to be retained for a medium period of time.
- Category 'C' Tree/Group/Hedge
These are trees and hedges which are considered to be of low value and are likely to be retained for a short period of time.

Trees Unsuitable for Retention:

- Category 'D' Tree/Group/Hedge
These are trees and hedges which are considered to be of low value and are likely to be removed.
- Category 'E' Tree/Group/Hedge
These are trees and hedges which are considered to be of low value and are likely to be removed.

Root Protection Areas (RPAs):

- RPAs
These are areas of ground around trees and hedges which are considered to be of high value and are likely to be retained for a long period of time.
- RPAs
These are areas of ground around trees and hedges which are considered to be of medium value and are likely to be retained for a medium period of time.

Tree Planting:

- Approximate Location of New Planting
These are the approximate locations of new trees and hedges which are likely to be planted.
- Approximate Location of New Planting
These are the approximate locations of new trees and hedges which are likely to be planted.

3201301690

Project: PENDLE GARAGE
CLITHEROE ROAD
BARROW
LANCASHIRE
BB7 9AQ

Client: BOWSALL LTD

Title: TREE IMPACT PLAN

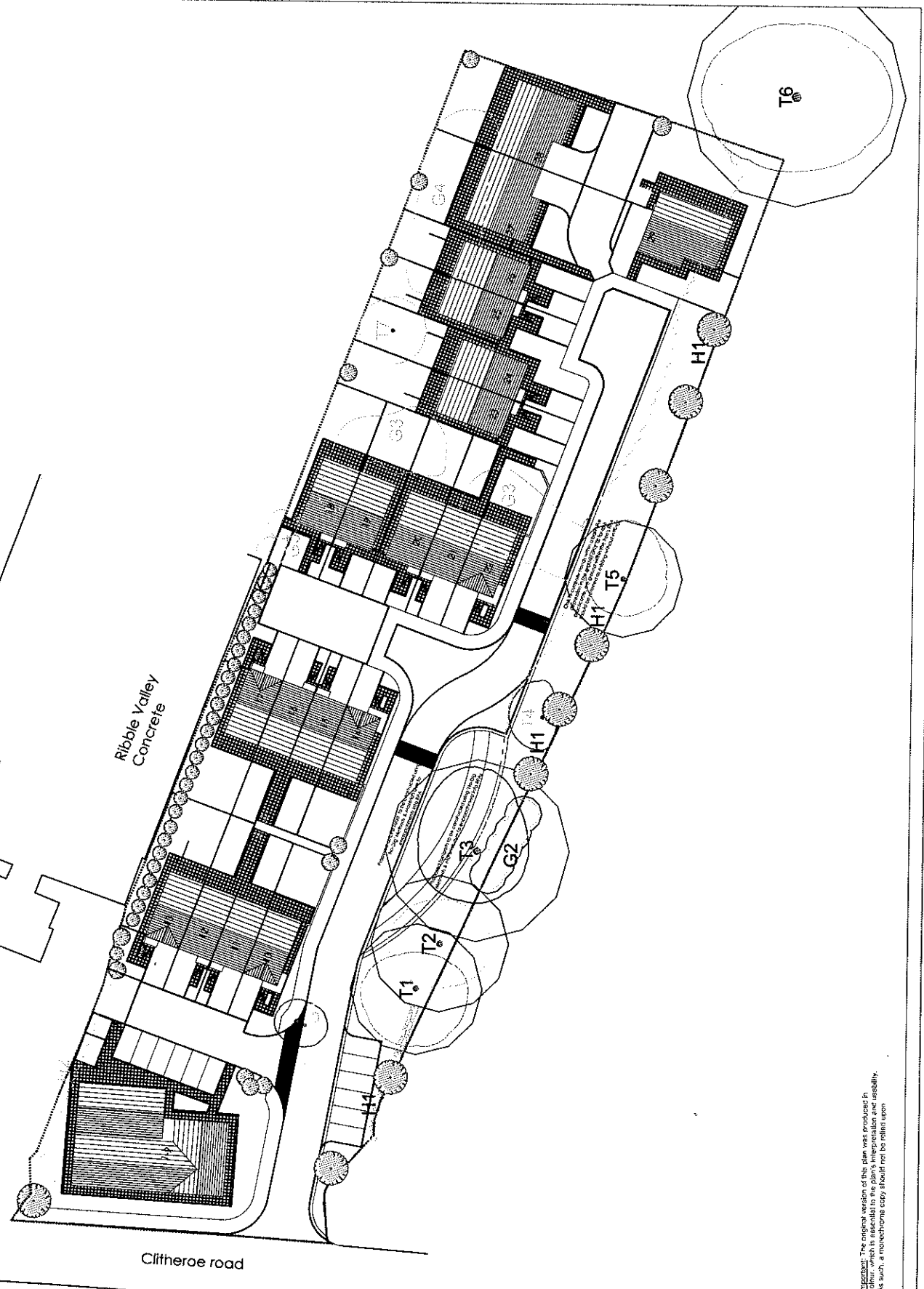
Scale: 1:500 @ A3

Date: November 2012

Drawn by: PH

Ref: B7C47-71P

Rev:



Important: The original version of this plan was produced in colour. It is essential that the plan is interpreted and used in colour. As such, a monochrome copy should not be relied upon.



- TEMPORARY PROTECTIVE FENCING SPECIFICATION -

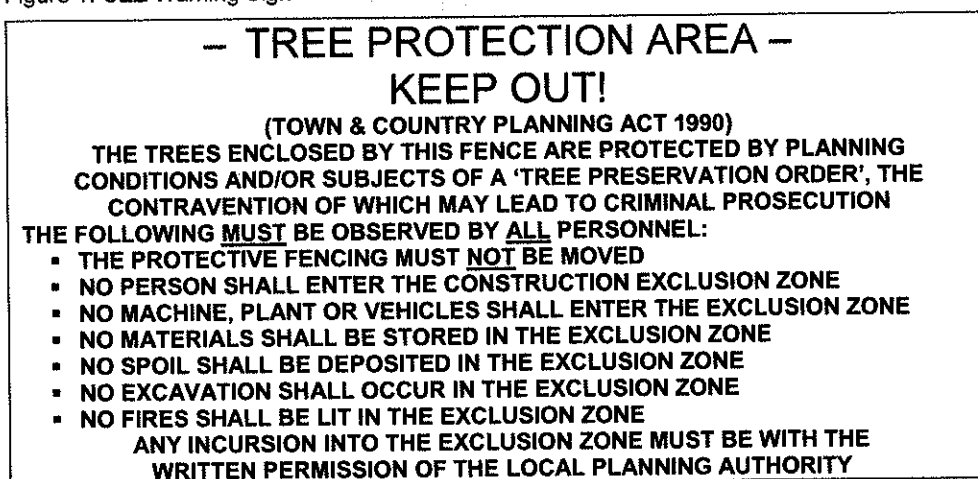
Construction Exclusion Zones (CEZs), enclosed by Temporary Protective Fencing, as detailed below and to be agreed with the Local Planning Authority (LPA), shall:

1. be retained in place throughout the development process, as specified in the 'Temporary Protective Fencing Construction' section below and detailed in BS5837:2012 Figure 2 (overleaf);
 2. be sited in the area defined on the Tree Protection Plan (TPP);
 3. be erected prior to any construction, demolition or excavation works and remain in place for the duration of the project;
 4. preclude any delivery of site accommodation and/or materials and/or plant machinery;
 5. preclude all construction related activity, with the sole exception of specified arboricultural works and any other works to be carried out under supervision that have been agreed by all parties; and
 6. preclude the storage of all development related materials and substances including fuels, oils, additives, cement and/or any other deleterious substance.
- Any incursion into CEZs must be by prior arrangement, following consultation with the LPA.

Temporary Protective Fencing Construction

1. Temporary protective fencing panels shall be weldmesh "Heras" panels of at least 2.0 metres in height.
2. The panels shall butt together and be securely fixed to a scaffold framework, as per 3 to 5 below.
3. The scaffold framework shall comprise of upright poles of at least 3.0 metres in length driven no less than 0.6 metres into the ground at maximum 3.0 metre centres with horizontal and diagonal poles fixed to the uprights, as per 4 to 5 below.
4. The two horizontal rail poles shall be attached to the uprights at heights of 0.6 and 1.8 metres with 3 no. clamps to each joint.
5. The diagonal scaffold pole struts be clamped to the top rail of the scaffold framework at a 45° angle and extend back into the CEZ and clamped to a 0.7 metre length of scaffold tube that shall be driven no less than 0.5m into the ground.
6. No fixing shall be made to any tree and all possible precautions shall be taken to prevent damage to tree roots when locating posts.
7. A 600mm x 300mm warning sign reading "TREE PROTECTION AREA KEEP OUT" (see Figure 1, below) shall be fixed to every 10.0 metre length of protective fencing.
8. On completion and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist shall inspect the Temporary Protective Fencing.

Figure 1: CEZ Warning Sign



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Figure 2: BS5837:2012 Default specification for protective barrier

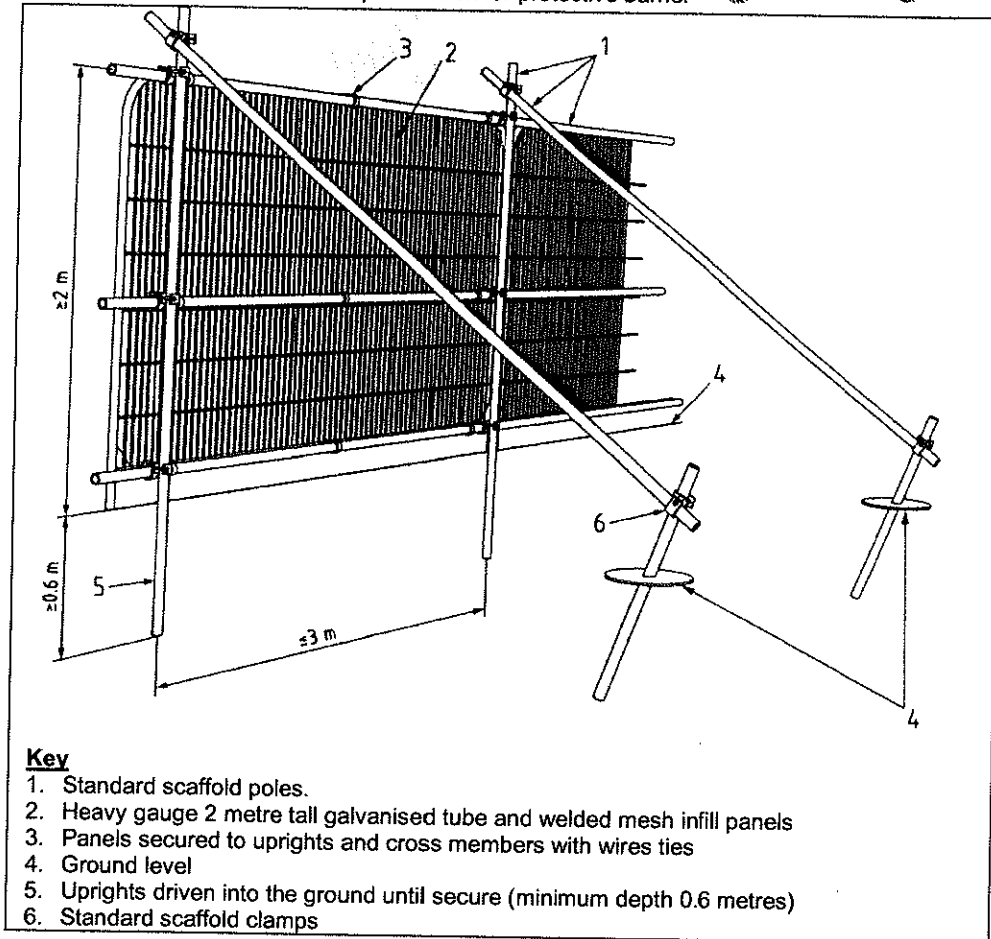
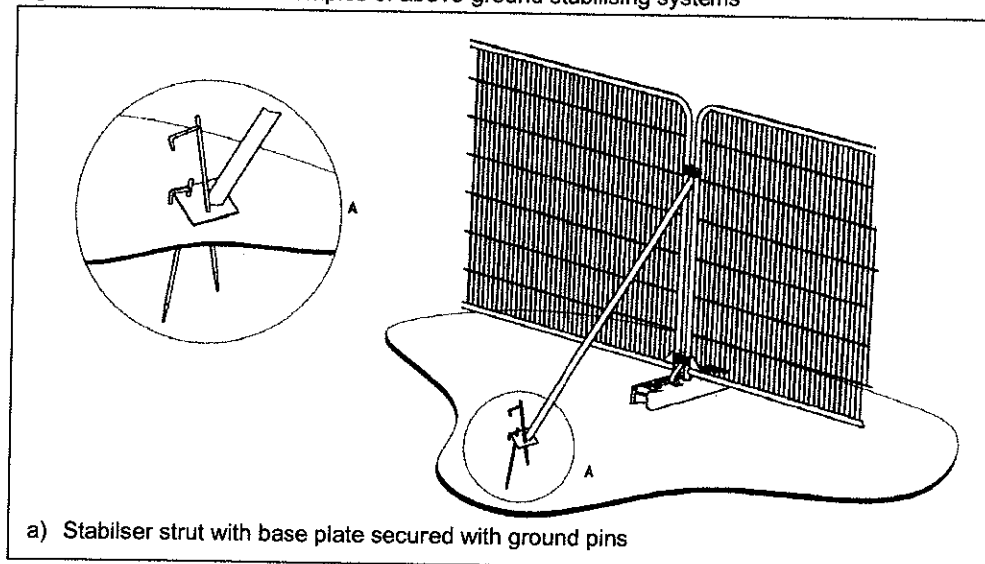
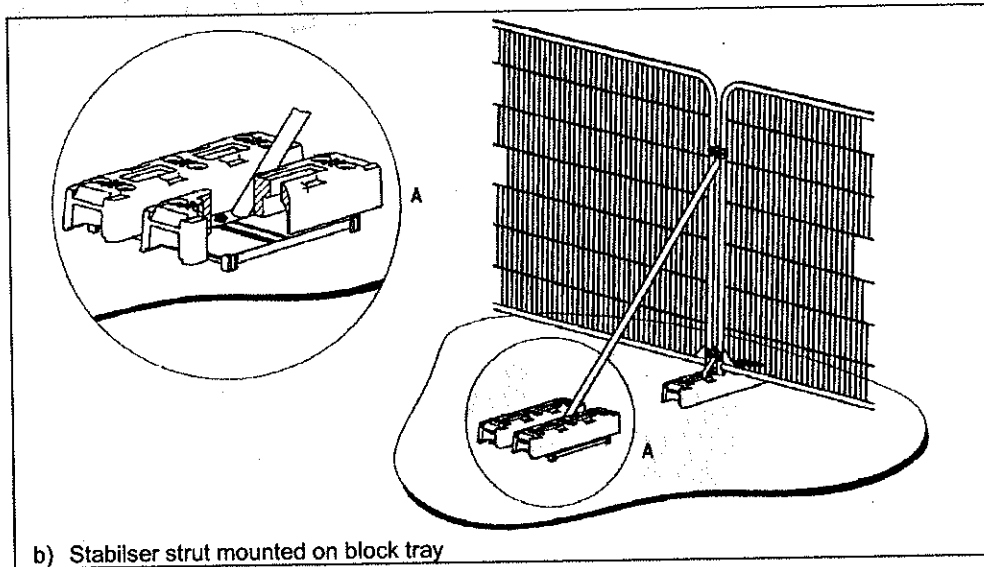


Figure 3: BS5837:2012 Examples of above-ground stabilising systems





CI/SfB

Common Arrangement R12

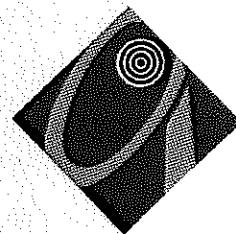
Uniclass
L81208/L81210

320130169P

CellWeb™



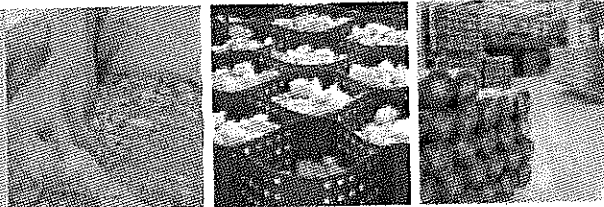
Tree Root Protection System



Geosynthetics

CellWeb™

Tree Root Protection System

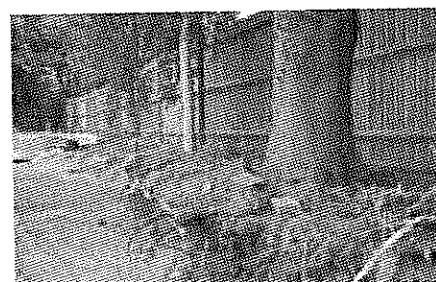


The CellWeb™ TRP cellular confinement system protects tree roots from the damaging effects of compaction and desiccation, while creating a stable, load-bearing surface for vehicular traffic.

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.

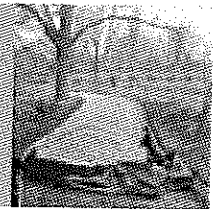
With no need for excavation, the system is quick and easy to install, reducing construction time and saving costs and making it suitable for temporary and permanent solutions.



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.

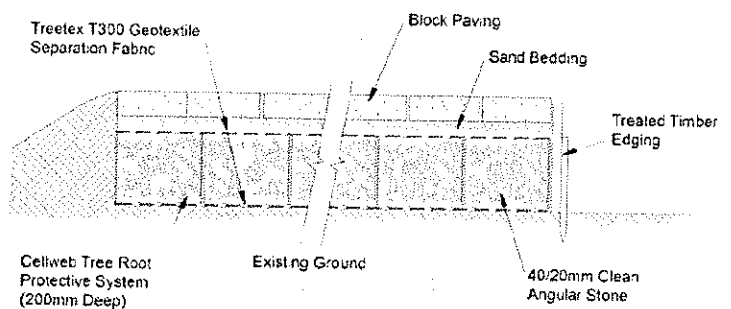
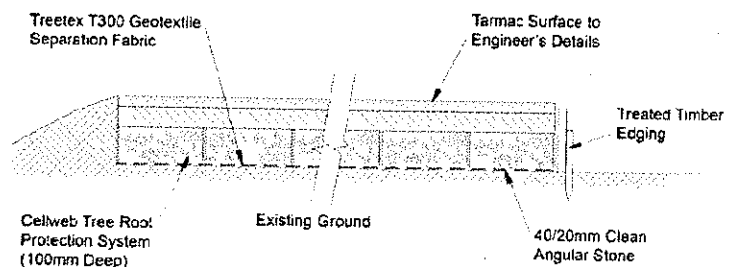
The honeycomb-like structure is made of robust high-density polyethylene (HDPE) that is simply stretched out and filled with clean angular material. Just like traditional roadways, the strength of the structure comes from the binding together of the infill, but with CellWeb™ this is achieved without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

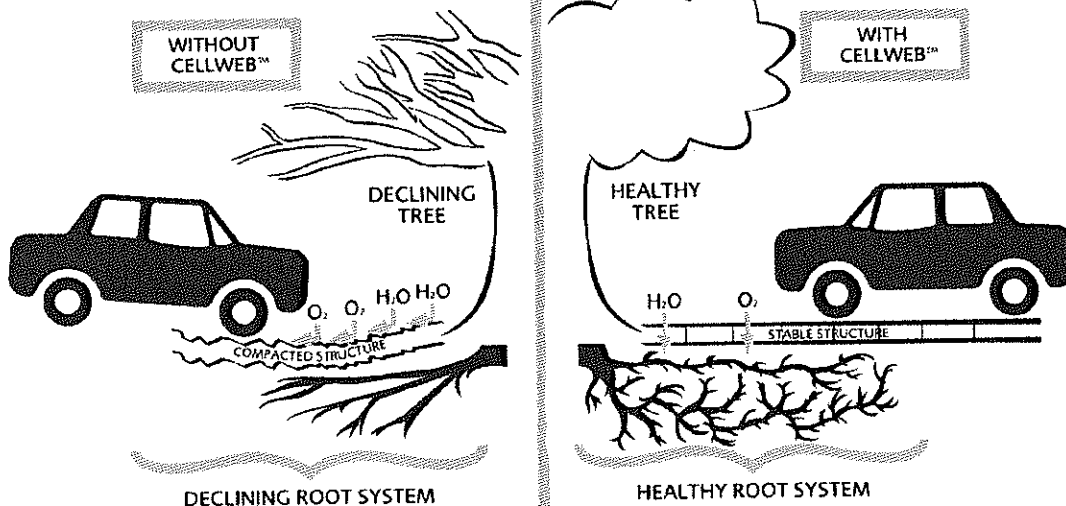
Large
stock
holding

Next day
delivery

Hydrological benefits

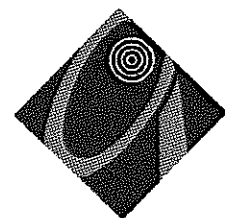
Water is a shrinking resource in the urban environment. As the extent of the built environment increases, more and more ground is being covered by impermeable hard surfaces that repel rainwater runoff, preventing it from reaching the roots of vegetation, and in particular trees. Rapid water runoff stretches 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

320130169P

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.

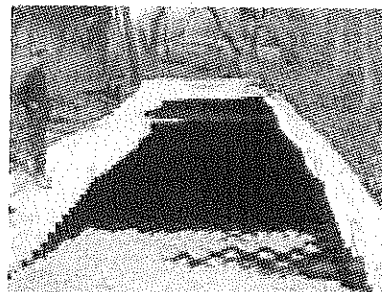
Call our sales office on 01455 617 139 for specification details and project-specific design assistance.

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

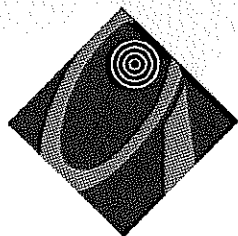
Properties	Standard Cell
Material	Virgin HDPE
Wall thickness	1.25mm
Seam welding	Ultrasonic to 100% of seam length
Cell depth	75, 100, 150, 200 and 300mm
Width of expanded panel	2.56m
Length of expanded panel	8.1m
Cell diameter (expanded)	259 x 224mm

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 Limited

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Hinckley, Leicestershire LE10 3DU.

Tel: 01455 617 139

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Email: sales@geosyn.co.uk

Geosynthetics

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