APPENDICES

TREE SURVEY SCHEDULE FOR ARBORICULTURAL IMPACT APPRAISAL			
Site:	Land off Clitheroe Road, Barrow, Lancashire, BB7 9AQ		
Client:	Reilly Developments		

Surveyor:	Jennie Keighley PhD MSc MArborA
Survey Date:	22 November 2017
Job Ref:	BTC1475

No.	Species	Height	Stem Diam.	Branch Spread		Branch & Canopy Clearances	Life Stage	PC	General Observations and Comments	Management Recommendations	ERC	Cat. Grade	RPA (m^2)	RPA Radius (m)
T1	Common Horse Chestnut	8	1x140 2x50 (ms)#	N E S W	2.5 2.5 2 2.5	0.5-N 4	Y	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Subordinate stem emerges west side of base.	▪ Located outside proposed development boundary and not projected to be impacted.	40+	C1	11	1.88
T2	Common Alder	15	1160	N E S W	11 10 11 10	3-S 1	M	G	▪ Moderately heavy basal epicormics and several adventitious growths to a diameter of 100mm emerging from heights around 0.5m. ▪ Occasional partially occluded cavities throughout crown to a diameter of 100mm. ▪ Proposed hard surfaces encroach 1.5% into Root Protection Area (RPA).	▪ Prune to lift west side of crown to create a 2m ground clearance in order to install boundary treatment as proposed. ▪ Construct proposed hard surfaces, where within RPA, using 'no dig' methods and materials in accordance with s7.4 of BS5837: 2012. ▪ Protect RPA throughout development using Temporary Protective Fencing (specification appended) to form a Construction Exclusion Zone (CEZ).	20+	A3	609	13.92
T3	Common Oak	16.5	830	N E S W	9 12 9.5 7.5	4-N 1.25	M	M	▪ Significant stem lean east, with crown now largely weighted east due to large diameter branch failures on western side of crown. ▪ Multiple branch failures and long, dead pruning stubs to a diameter of 230mm throughout. ▪ Fruiting bodies of saprophytic fungi abundant on attached deadwood. ▪ Risk of stem or rootplate failure due to weighting issues.	▪ Located outside proposed development boundary and not projected to be impacted. ▪ Landowner is advised to have detailed risk assessment inspection carried out by professional arboriculturist.	10+	C1	312	9.96
T4	Common Ash	16	1200#	N E S W	9 12 9 9	4 4	M	M	▪ Traverses boundary lines. ▪ Historically pollarded. ▪ Long history of pruning works, with numerous unoccluded to fully occluded wounds. ▪ Frequent deadwood to a diameter of 150mm.	▪ Located outside proposed development boundary and not projected to be impacted.	10+	C1	651	14.4

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 nearest half 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 Clearances: 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 exiting site and tree circumstances and conditions into account and not proposed developments. Arboricultural Impact Assessment and Method Statement related Surveys take the proposed development into consideration with recommendations made accordingly. More than one option may be given if considered appropriate
ERC: Estimated Remaining Contribution - in years as per BS5837:2012 (i.e. <10, 10+, 20+, 40+)
Cat. Grade: Category Grading - tree retention value listed as U, A, B or C - in accordance with BS5837:2012 Table 1
RPA m^2: Root Protection Area in m^2 - calculated area around the tree that must be appropriately protected throughout the development process in order avoid root damage
RPA Radius (m): Root Protection Area Radius - in metres measured from the centre of the stem to the line of tree protection
 # (Estimated Dimensions): 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

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Client:	Reilly Developments	**Job Ref:**	BTC1475

No.	Species	Height	Stem Diam.	Branch Spread		Branch & Canopy Clearances	Life Stage	PC	General Observations and Comments	Management Recommendations	ERC	Cat. Grade	RPA (m^2)	RPA Radius (m)
T5	Common Alder	12	300#	N E S W	5 5.5 5 5.5	3 3.5	EM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ No significant visible defects.	▪ Protect RPA throughout development using Temporary Protective Fencing to form a CEZ.	20+	B1	41	3.6
T6	Common Oak	19	900#	N E S W	9.5 9.5 9 9.5	2.5-W 1.5	M	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Several partially occluded pruning wounds to a diameter of 300mm on southern side of crown. ▪ Proposed garage encroaches 0.5% into RPA.	▪ Construct proposed garage, where within RPA, using specially engineered foundations in accordance with s7.5 of BS5837: 2012. ▪ Protect remainder of RPA throughout development using Temporary Protective Fencing to form a CEZ.	20+	B1	366	10.8
T7	Common Horse Chestnut	11	450#	N E S W	5 6 5 6	2-S 1.75	EM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Lower stem out of view behind close board timber board fence. ▪ No significant visible defects. ▪ Crown overhanging site by 4m with relatively low clearance.	▪ Protect RPA throughout development using Temporary Protective Fencing to form a CEZ.	20+	B1	92	5.4
T8	Common Ash	13	450#	N E S W	5 6 5 6	3.5-SW 1.5	EM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Lower stem out of view behind close board timber board fence. ▪ No significant visible defects. ▪ Crown overhanging site by 4m with relatively low clearance.	▪ Protect RPA throughout development using Temporary Protective Fencing to form a CEZ.	20+	B1	92	5.4
T9	Common Ash	7	100#	N E S W	0.5 2.5 2.5 2.5	1.5-S 1.25	Y	M	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Growing between wire mesh fence and close board timber fence. ▪ Limited potential for future growth due to conflict with boundary treatments.	▪ Protect RPA throughout development using Temporary Protective Fencing to form a CEZ.	<10	U	5	1.2
T10	Common Ash	8	400#	N E S W	3 3 3 3	3 3	EM	P	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Topped at least two seasons ago at a height of 5m, with regrowth to a diameter of 30mm. ▪ Short projected life expectancy.	▪ Protect RPA throughout development using Temporary Protective Fencing to form a CEZ.	<10	U	72	4.8
T11	Weeping Willow	11	320	N E S W	4 5 4 3	1.5 0.5	EM	G	▪ Growing within group G6. ▪ No significant visible defects.	▪ Located outside proposed development boundary and not projected to be impacted.	10+	C1	46	3.84

TREE SURVEY SCHEDULE FOR ARBORICULTURAL IMPACT APPRAISAL		Surveyor:	Jennie Keighley PhD MSc MArborA	Page: 3 of 4
Site:	Land off Clitheroe Road, Barrow, Lancashire, BB7 9AQ	Survey Date:	22 November 2017	
Client:	Reilly Developments	Job Ref:	BTC1475	

No.	Species	Height	Stem Diam.	Branch Spread		Branch & Canopy Clearances	Life Stage	PC	General Observations and Comments	Management Recommendations	ERC	Cat. Grade	RPA (m^2)	RPA Radius (m)
G1	3no. Beech, 2no. Hawthorn, 1no. Common Oak, 1no. Sycamore	≤ 8	≤ 140	N E S W	≤ 2.5 ≤ 2.5 ≤ 2.5 ≤ 2.5	1.25-N ≥ 0.5	Y-M	G	▪ Northernmost tree is on site side of fence, but rest of group is located on neighbouring land and therefore not inspected in detail. ▪ Growing very close to or in contact with post and rail boundary fence. ▪ Limited potential for future growth due to conflict with boundary treatment.	▪ Located outside proposed development boundary and not projected to be impacted.	<10	U	≤ 9	≤ 1.68
G2	6no. Hybrid Black Poplar	≤ 22	≤ 1030	N E S W	≤ 14 ≤ 14 ≤ 14 ≤ 14	2-NW ≥ 1.25	M	M/G	▪ Moderately spaced linear group growing at edge of wet field ditch. ▪ Interspersed with younger individuals, some of which are dying back, moribund or dead. ▪ Two trees removed from centre of group in past. ▪ Large pile of earth, resulting from neighbouring development site preparation, piled within southern side of RPAs of eastern trees. ▪ Proposed footpath and access road encroach 8% into RPA of one of retained trees.	▪ Remove 1no. tree, as indicated on Tree Impact Plan, in order to construct access as proposed. ▪ Construct footpath and road, where within RPA of retained tree, using 'no dig' methods and materials in accordance with s7.4 of BS5837: 2012. ▪ Protect RPAs throughout development using Temporary Protective Fencing to form a CEZ.	10+	C2	≤ 480	≤ 12.36
G3	Hybrid Black Poplar	≤ 24	≤ 1000#	N E S W	≤ 11 ≤ 15 ≤ 10 ≤ 8	3-E ≥ 6	M	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Start of another moderately spaced linear group of Poplars extending southwards, running perpendicular to group G2.	▪ Protect RPAs throughout development using Temporary Protective Fencing to form a CEZ.	10+	C2	≤ 452	≤ 12
G4	8no. Common Ash, 6no. Common Oak, 4no. Sycamore	≤ 18	≤ 450#	N E S W	≤ 7 ≤ 7 ≤ 7 ≤ 7	1-W ≥ 1	EM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Moderately spaced linear group evidently planted as a shelterbelt for the young woodland W1 beyond. ▪ Many of crowns overhanging site with low clearance.	▪ Prune to lift north sides of crowns to create a 4m ground clearance where overhanging proposed dwellings' outdoor amenity space. ▪ Protect RPAs throughout development using Temporary Protective Fencing to form a CEZ.	20+	B2	≤ 92	≤ 5.4
G5	2no. Common Hawthorn	≤ 5	≤ 3x100 (ms)#	N E S W	≤ 2 ≤ 2 ≤ 2 ≤ 2	1.75-N ≥ 1.75	M	G	▪ Growing between post and wire fence and close board timber fence at northern site boundary. ▪ Ownership unclear, expected to be located on neighbouring land. ▪ Very closely spaced pair.	▪ Protect RPAs throughout development using Temporary Protective Fencing to form a CEZ.	10+	C1	≤ 14	≤ 2.08
G6	2no. Leyland Cypress	≤ 7	≤ 200#	N E S W	≤ 2.5 ≤ 2.5 ≤ 2.5 ≤ 2 .5	0.5 ≥ 0.5	SM	G	▪ Very closely spaced pair. ▪ No significant visible defects.	▪ Located outside proposed development boundary and not projected to be impacted.	10+	C1	≤ 18	≤ 2.4

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Client:	Reilly Developments	**Survey Date:**	22 November 2017	
		Job Ref:	BTC1475	

No.	Species	Height	Stem Diam.	Branch Spread	Branch & Canopy Clearances	Life Stage	PC	General Observations and Comments	Management Recommendations	ERC	Cat. Grade	RPA (m²)	RPA Radius (m)
G7	2no. Silver Birch, Hazel, Common Oak, Common Alder	≤ 18	≤ 320#	N ≤ 4.5 E ≤ 4.5 S ≤ 4.5 W ≤ 4.5	0.5-S ≥ 1.5	Y-EM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Moderately closely spaced linear group extending northwards. ▪ Two early-mature Silver Birches with several young trees of other species in between.	▪ Located outside proposed development boundary and not projected to be impacted.	20+	B2	≤ 46	≤ 3.84
W1	Birch, Oak, Ash, Hazel, Hawthorn, Wild Cherry, Scots Pine, Holly	≤ 12	≤ 180#	N ≤ 3 E ≤ 3 S ≤ 3 W ≤ 3	0 ≥ 0.5	Y	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Young, planted, closely spaced mixed woodland. ▪ Occasional trees with protective tubes still in place.	▪ Located outside proposed development boundary and not projected to be impacted.	40+	B3	≤ 15	≤ 2.16
W2	Common Beech, Common Oak, Elder, Holly, Hawthorn	≤ 20	≤ 280#	N ≤ 5 E ≤ 5 S ≤ 5 W ≤ 5	0 ≥ 0	EM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Edge of moderately to widely spaced woodland extending eastwards. ▪ Fronted by a recently laid and currently sparse Hawthorn hedge.	▪ Located outside proposed development boundary and not projected to be impacted.	40+	A3	≤ 35	≤ 3.36
H1	Common Beech	≤ 5	≤ 70#	≤ 3 wide	0.25 ≥ 0	Y	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Evidently planted as a hedge, but not managed as such.	▪ Located outside proposed development boundary and not projected to be impacted.	10+	C2	N/A	≤ 0.84
H2	Common Beech	≤ 1.5	≤ 50#	≤ 1 wide	0 ≥ 0	Y	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Managed garden boundary hedge.	▪ Located outside proposed development boundary and not projected to be impacted.	10+	C2	N/A	≤ 0.6
H3	Leyland Cypress	≤ 3	≤ 100#	≤ 2 wide	0.25 ≥ 0.5	SM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Managed garden boundary hedge.	▪ Protect throughout development using Temporary Protective Fencing to form a CEZ.	10+	C2	N/A	≤ 1.2
H4	Leyland Cypress	≤ 8	≤ 150#	≤ 4 wide	0 ≥ 1.25	SM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Unmanaged garden boundary hedge.	▪ Protect throughout development using Temporary Protective Fencing to form a CEZ.	10+	C2	N/A	≤ 1.8
H5	Leyland Cypress	≤ 8	≤ 100#	≤ 3 wide	0.25 ≥ 0.25	SM	G	▪ Unmanaged garden boundary hedge.	▪ Protect throughout development using Temporary Protective Fencing to form a CEZ.	10+	C2	N/A	≤ 1.2

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 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 BS5837:2012 paragraph 4.5.7.*			Red
	1. Mainly arboricultural qualities	**2. Mainly landscape qualities**	**3. Mainly cultural values, including conservation**	
Trees to be considered for retention				
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 of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	Green
Category B Those of moderate quality and value: those in such a condition as to make a significant contribution. A minimum of 20 years is suggested.	Trees that might be included in the high category, but are downgraded because of impaired condition. Examples include the presence of remediable defects including unsympathetic past management and minor storm damage	Trees present in numbers, usually as groups or woodlands, so they form distinct landscape features which attract a higher collective rating than they might as individuals. But which are not, individually, essential components of formal or semi-formal arboricultural features. For example, trees of moderate quality within an avenue that includes better, A category specimens. Or trees which are internal to the site, therefore individually having little visual impact on the wider locality	Trees with clearly identifiable conservation or other cultural benefits	Blue
Category C Those trees of low quality and value: currently in adequate condition to remain until new planting could be established - a minimum of 10 years is suggested - or young trees with a stem diameter below 150 mm	Trees not qualifying in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit	Trees with very limited conservation or other cultural benefits	Grey
	Note – Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150mm should be considered for relocation			

- TEMPORARY PROTECTIVE FENCING & GROUND PROTECTION SPECIFICATION -

Construction Exclusion Zones (CEZs), shall be enclosed by **Temporary Protective Fencing** and/or, where necessary, **Temporary Ground Protection Measures**. The fencing/ground protection Type(s), locations, and extents shall be agreed, in writing, with the Local Planning Authority (LPA). In turn, the **Temporary Protective Fencing** and/or **Temporary Ground Protection Measures** shall:

1. be constructed as in accordance with the Type 1, Type 2 or Type 3 'Temporary Protective Fencing Construction' sections and, where applicable the 'Temporary Ground Protection Measures' section, as detailed herein and agreed, in advance with the LPA;
2. be retained in place throughout the development process until completion of the project, and only removed following receipt of written permission from the LPA;
3. be sited in the area(s) defined by the Root Protection Areas on the associated Tree Impact Plan, or as the CEZs on the Tree Protection Plan;
4. be erected prior to any construction, demolition or excavation works and remain in place for the duration of the project;
5. preclude any delivery of site accommodation and/or materials and/or plant machinery;
6. 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;
7. preclude the storage of all development related materials and substances including fuels, oils, additives, cement and/or any other deleterious substance; and
8. be affixed with a 600mm x 300mm warning sign reading "TREE PROTECTION AREA KEEP OUT" (see Figure 1, below), at every 10.0 metre length of protective fencing.
9. Important: Any incursion into CEZs must be by prior arrangement, following consultation with the LPA.

Figure 1: CEZ Warning Sign

– TREE PROTECTION AREA –
KEEP OUT!

(TOWN & COUNTRY PLANNING ACT 1990)
THE TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR SUBJECTS OF A 'TREE PRESERVATION ORDER', THE CONTRAVENTION OF WHICH MAY LEAD TO CRIMINAL PROSECUTION

THE FOLLOWING MUST BE OBSERVED BY ALL PERSONNEL:

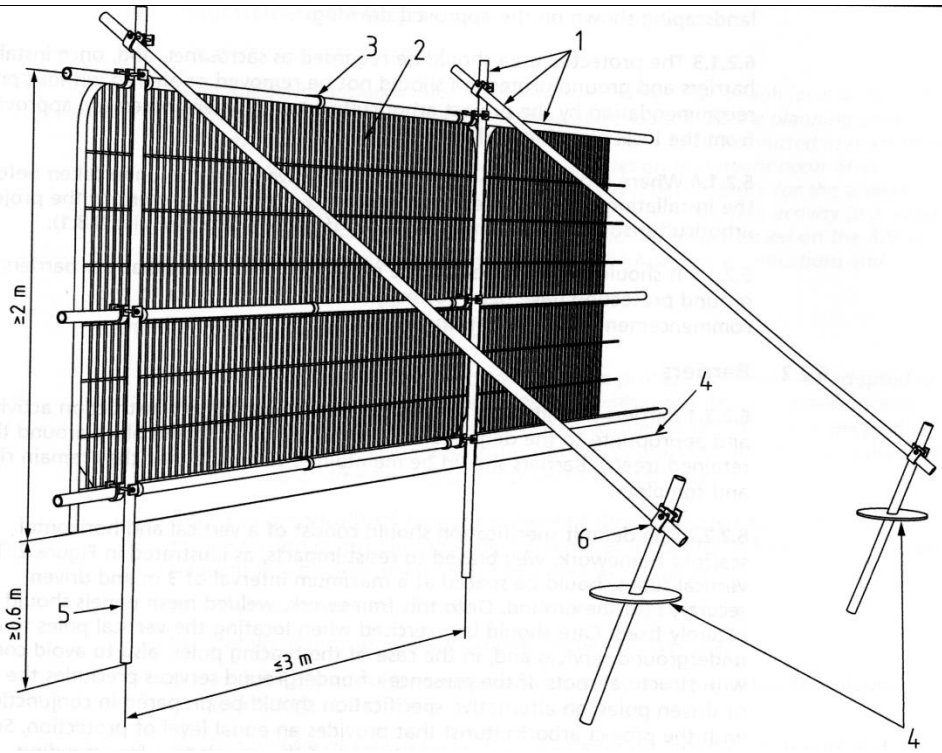
- THE PROTECTIVE FENCING MUST NOT BE MOVED
- NO PERSON SHALL ENTER THE CONSTRUCTION EXCLUSION ZONE
- NO MACHINE, PLANT OR VEHICLES SHALL ENTER THE EXCLUSION ZONE
- NO MATERIALS SHALL BE STORED IN THE EXCLUSION ZONE
- NO SPOIL SHALL BE DEPOSITED IN THE EXCLUSION ZONE
- NO EXCAVATION SHALL OCCUR IN THE EXCLUSION ZONE
- NO FIRES SHALL BE LIT IN THE EXCLUSION ZONE

ANY INCURSION INTO THE EXCLUSION ZONE MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY

Type 1 (i.e. 'Default') Temporary Protective Fencing Construction (see Figure 2, below)

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 points 3 to 5 of Figure 2, overleaf.
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 points 4 to 5.
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 45º 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) shall be fixed to every 10.0 metre length of protective fencing.
8. On completion of erection, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Protective Fencing.

Figure 2: BS5837:2012 Default specification for protective barrier



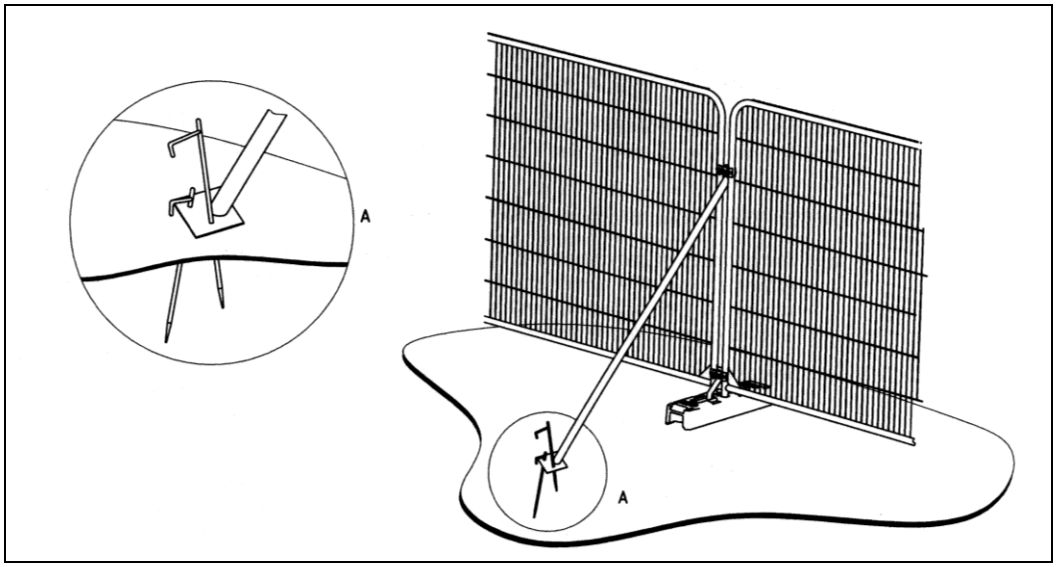
Key

1. Standard scaffold poles.
2. Heavy gauge 2 metre tall galvanised tube and welded mesh infill panels
3. Panels secured to uprights and cross members with wires ties
4. Ground level
5. Uprights driven into the ground until secure (minimum depth 0.6 metres)
6. Standard scaffold clamps

Type 2 Temporary Protective Fencing Construction (see Figure 3(a), below)

1. Temporary protective fencing panels shall be weldmesh "Heras" panels of at least 2.0 metres in height.
2. The panels shall stand on rubber or concrete feet.
3. The panels shall butt together, and be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence.
4. The distance between the fence couplers shall be at least 1.0 metre, and shall be uniform throughout the fence.
5. The panels shall be supported on the inner side by stabiliser struts, which shall be clamped to the scaffold framework at a 45º angle and extend back into the CEZ and shall be attached to a base plate, which shall be secured to the ground with pins (Figure 3a).
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) shall be fixed to every 10.0 metre length of protective fencing.
8. On completion of erection, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Protective Fencing.

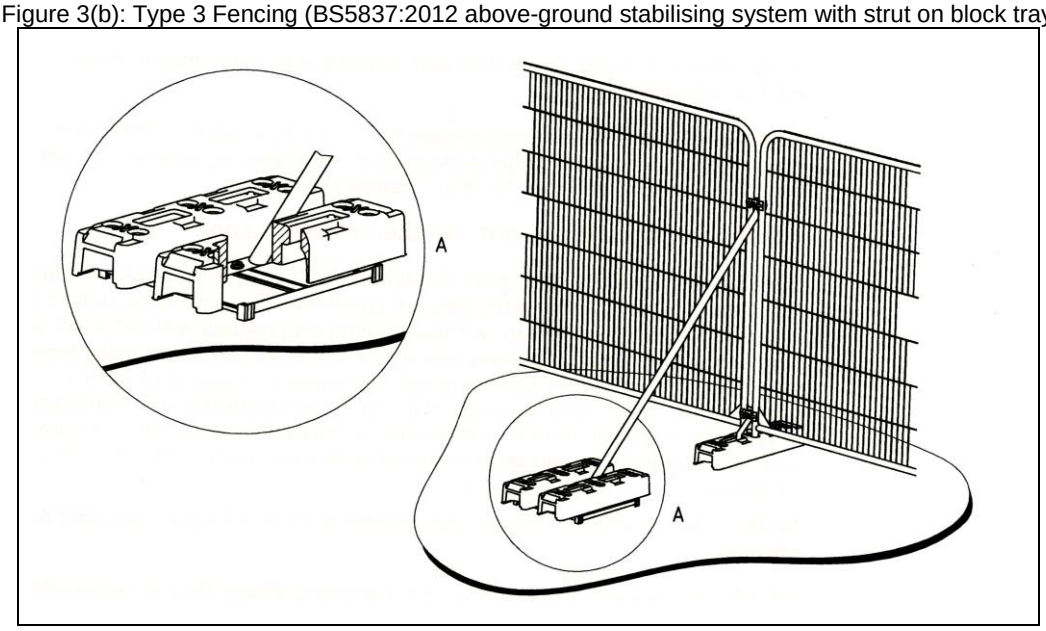
Figure 3(a): Type 2 Fencing (BS5837:2012 above-ground strut stabilising system with ground pins)



Type 3 Temporary Protective Fencing Construction (see Figure 3(b), overleaf)

1. Temporary protective fencing panels shall be weldmesh "Heras" panels of at least 2.0 metres in height.
2. The panels shall stand on rubber or concrete feet.
3. The panels shall butt together, and be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence.
4. The distance between the fence couplers shall be at least 1.0 metre, and shall be uniform throughout the fence.
5. The panels shall be supported on the inner side by stabiliser struts, which shall be clamped to the scaffold framework at a 45º angle and extend back into the CEZ and shall be attached to a block tray base (Figure 3b).
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) shall be fixed to every 10.0 metre length of protective fencing.
8. On completion of erection, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Protective Fencing.

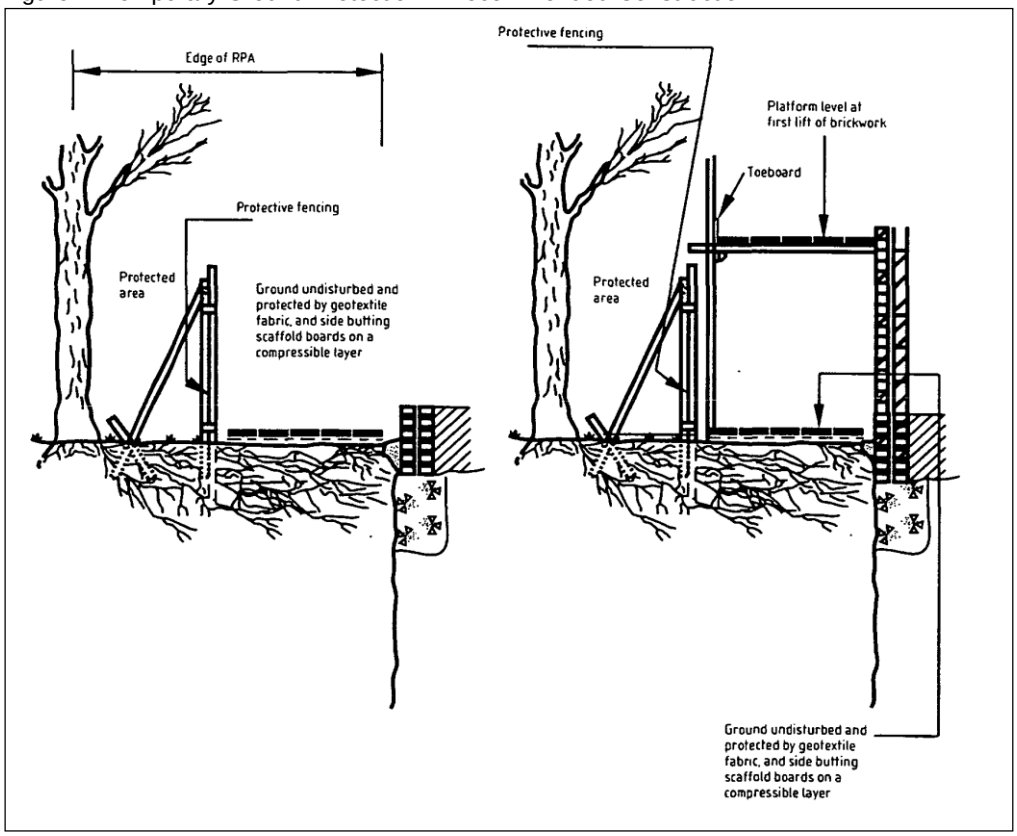
Figure 3(b): Type 3 Fencing (BS5837:2012 above-ground stabilising system with strut on block tray)



Temporary Ground Protection

1. Any necessary Temporary Ground Protection areas shall conform to Figure 4, below, unless otherwise agreed with the LPA.
2. The Ground Protection Area shall be left undisturbed and covered by a semi-permeable geotextile membrane which shall, in turn, be covered by a compressible layer consisting of a material such as woodchip.
3. Side-butting scaffold boards shall then be fitted to cover the Ground Protection Area.
4. On completion of installation, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Ground Protection.
5. The Temporary Ground Protection shall remain in place until completion of the project and only removed following receipt of written permission from the LPA.

Figure 4: Temporary Ground Protection – Recommended Construction



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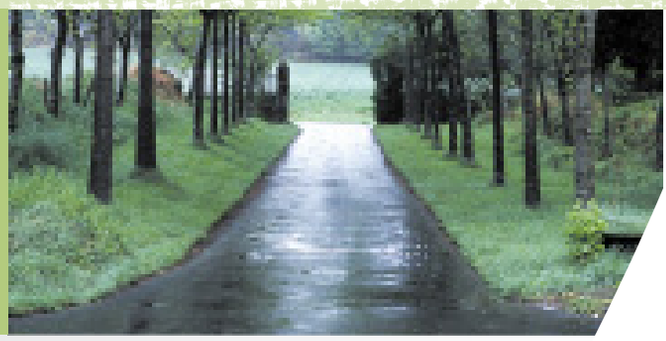

Tree Root Protection Guaranteed

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CellWeb TRP® System

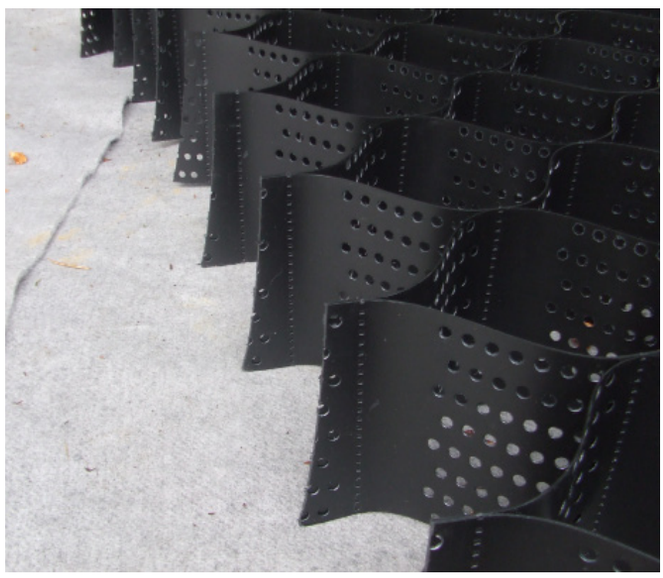
Tree Root Protection System



The Consquences Of Tree Root Damage During Construction

It is an offence to cut down, lop, uproot, top, wilfully damage or destroy a protected tree without authorisation. Trees can be protected under the Town and Country Planning Act 1990 and the Town and Country Planning (Trees) Regulations 1999. Trees are protected when they are the subject of Tree Preservation Orders (T.P.O) or within Conservation Areas, subject to certain exemptions. Retention and protection of trees on development sites is also secured through the use of planning conditions.

On a construction site all trees with a Tree Preservation Orders need to be managed in accordance with BS5837 2012 (Trees in relation to construction); failure to comply with these orders can be a costly affair as many parties have discovered.



Fishponds, Ketton

There are two offences which apply equally to trees protected by Tree Preservation Orders and those within Conservation Areas:

- Firstly, anyone who cuts down, uproots or wilfully destroys a tree, or who lops, tops or wilfully damages it in a way that is likely to destroy it is liable, if convicted in the Magistrates Court, to pay a fine of up to £20,000. If the person is committed for trial in the Crown Court, they are liable on conviction to an unlimited fine. The Courts have held that it is not necessary for a tree to be obliterated for it to be "destroyed" for the purposes of the legislation. It is sufficient for the tree to have been rendered useless as an amenity.
- Secondly, anyone who carries out works on a tree that are not likely to destroy it is liable, if convicted in the Magistrates Court, to a fine of up to £2,500. In addition to directly carrying out unauthorised works on protected trees, it is an offence to cause or permit such works.

Developers and building contractors are often completely unaware that 'compaction of soils within the Root Protection Area (RPA)' constitutes wilful damage to the tree. When vehicular or pedestrian access within the RPA is necessary, either for the construction operation or final site access, the effects of this activity must be addressed and the ground must be protected. When tracked or wheeled traffic movements are involved, the ground protection system should be designed by an engineer and take into account the loading involved.

Shelton Road, Shewsbury

The Solution:

Geosynthetics CellWeb TRP® System



The Solution According to BS 5837:2012

"Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems ....."

(BS 5837 2012 section 7.4.2 Note 1)

The CellWeb TRP® Solution

CellWeb TRP® is the market leader in the United Kingdom and Ireland for tree root protection. 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 TRP® complies with BS 5837:2012 and APN 12. It provides a no-dig solution, is tried and tested having been used successfully since 1998. It is the only tree root protection system which has been independently tested and it is the only tree root protection system which is guaranteed for 20 years. See page 6 for the full terms and conditions of the guarantee.

Fishponds, Ketton

Field Trials

Geosynthetics Limited are the only company in the UK and Ireland to carry out live, completely independent field tests on the performance of a 3 dimensional cellular confinement system when used in a no-dig tree root protection system application. The results prove that CellWeb TRP® significantly reduces the compaction of sub-soils within the root growth limiting parameters established by K D Coder, 'Soil damage from compaction'. University of Georgia. July 2000. A copy of the report is available upon request.

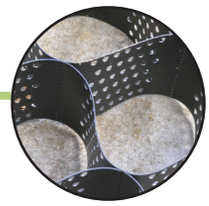
CellWeb TRP® Product Guarantee

Geosynthetics Limited prides itself on a providing a reliable, consistent service; including technical advice, on site support and installation guidance. Geosynthetics Limited provides a 20 year guarantee for the CellWeb TRP® tree root protection system. This guarantee gives the client, the tree officer and arboricultural consultant the confidence that the designed system will perform as intended without damaging the health of the tree.

See page 6 for the full terms and conditions of the guarantee.

CellWeb TRP® System

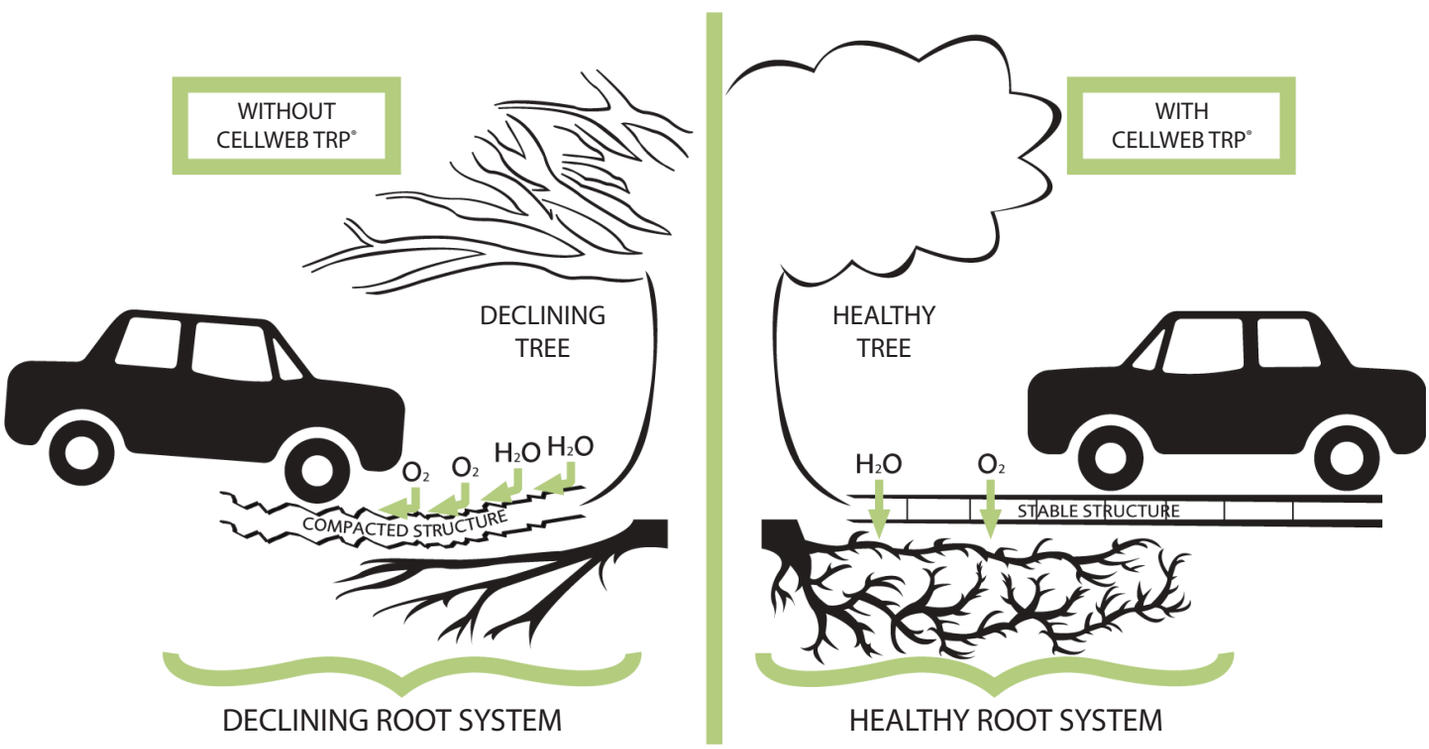
How the System Works



How CellWeb TRP® Works

CellWeb TRP® is a cellular confinement system that confines aggregate materials and makes them stronger, thus increasing the bearing capacity of the sub base materials. Research shows that CellWeb TRP® acts as a stiff raft to distribute wheel loads and reduce their magnitude at the base of the construction, thus maintaining the soil bulk density at levels that are suitable for tree root growth.

CellWeb TRP® is used around the world to provide cost effective hard surface construction over tree roots and is the system of choice for Tree Officers and Arboriculturists. For more information on this subject see CellWeb TRP® Fact Sheet No 1.



Water and Oxygen Transfer Through the CellWeb TRP® System

The CellWeb TRP® system is constructed using open aggregate infill and CellWeb TRP® has perforated cell walls. The pore spaces between the aggregate particles are greater than 0.1mm in diameter. This open structure is far more permeable than typical soils and allows the free movement of water and oxygen so that supplies to trees are maintained.

For more information on this subject see CellWeb TRP® Fact Sheet No 2.

CellWeb TRP® and Pollution

How CellWeb TRP® Deals With Catastrophic Oil Spills

How CellWeb TRP® Deals With Pollution

Where possible a permeable pavement system should always be constructed above the CellWeb TRP® system. The effective removal of pollution from runoff by permeable pavements is well known. Worldwide research has shown runoff that has passed through permeable pavements has low concentrations of pollutants.

Small spills of oil will be dealt with within the joints between the paving blocks and in the aggregate used within the system. However, large catastrophic spills are a different matter.

For more information on this subject see CellWeb TRP® Fact Sheet No 3.

Castle Gardens

Ambleside Lake District

Harcourt Aboretum

The Treetex® geotextile used in the CellWeb TRP® system has two functions. Treetex® separates the sub base aggregates from the soil beneath and it traps oil within its structure and allows it to degrade aerobically within the pavement construction. The structure, thickness and weight of Treetex® creates the perfect environment for this to happen. Most importantly tests prove that Treetex® will absorb 1.7 litres of oil per square metre, this is 4 times more effective than standard geotextiles.

Treetex® is an intrinsic part of the CellWeb TRP® system; and must be in conjunction with the CellWeb TRP® in order to guarantee the success of the system.

Please see page 6 for full details of the guarantee.

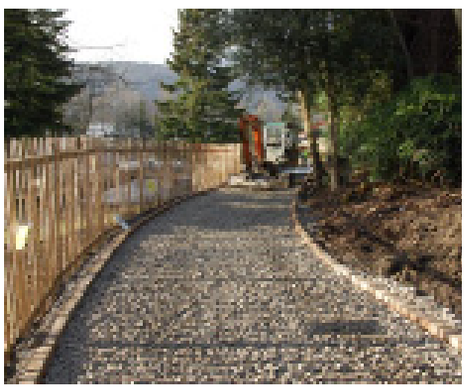
Geosynthetics CellWeb TRP® System:

A Proven No Dig Solution

Advice, Design and Product Selection

Geosynthetics Limited has been supplying the CellWeb TRP® system since 1998 and has vast 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 correct CellWeb TRP® 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, engineering calculations, CAD drawings and full instructions to help you from project conception to completion.



Fallbarrow Park, Windermere: Prior to CellWeb TRP® Installation

Fallbarrow Park, Windermere: CellWeb TRP® Installation

Fallbarrow Park, Windermere: Completed CellWeb TRP® Installation

Final Surfacing

The benefits of the CellWeb TRP® system can only be maintained if a suitably porous final surface is selected. An ideal surfacing is the Golpla 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.

Always Use CellWeb TRP®

The CellWeb TRP® system is the only research backed system of its kind in the UK with a 100% success rate. CellWeb TRP® has been specifically developed for the Tree Root Protection market. The system is supported by 15 years of data and thousands of installations making it the system of choice for the majority of Tree Officers and Arboriculturists in the UK.

CellWeb TRP® is uniquely identifiable. It is manufactured with a bright green panel on each side. When installed the green panels are laid adjacent, creating a green band across the construction.

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