



Old Oak Tree Care

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Report Reference: OOTC/PC14/4

Arboricultural Report

Land to north of Tudor Drive
Penley
Wrexham

For the purpose of dealing with all tree issues in accordance with
BS5837:2012 Trees in Relation to design, demolition and construction:
Recommendations for a development at the site.

Commissioned by

Geraint Edwards
Greenspace Architects
Ellesmere

Surveyed by

David Bailey
BSc (hons), M.Arbor.A, cert. Arb.(RFS)

Survey date: 11th April 2014

Report date: 2nd May 2014

Updated: 12th Nov 2014

Updated information is marked with a star

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1.0 Qualifications and Experience

- 1.1 My name is David Bailey. I am the owner of Old Oak Tree Care, an Arboricultural Consultant and Contractors business based on the Staffordshire/Shropshire border. I have run my business as a Contractor since 2004 and progressed to work as a consultant since 2008.
- 1.2 I attained the Honours Degree in Arboriculture at Myerscough College, Lancashire at an upper second level in 2011 after completing the Foundation Degree in Arboriculture at Merit level from Myerscough College, in 2008. I attained the Certificate of Arboriculture from the Royal Forestry Society in 2006.
- 1.3 I am a professional member of the Arboricultural Association and hold Professional Indemnity Insurance to £500 000.
- 1.4 Old Oak Tree Care is an approved contractor to Shropshire Council and carries out work for Government Agencies, County Councils, Town Councils, The Forestry Commission and private individuals.
- 1.5 In my work as a consultant, I have carried out surveys of trees in relation to construction, large scale health and safety tree surveys, private consultancy work and LPA appeals.

2.0 Instructions

- 2.1 I am instructed by Mr. Geraint Edwards of Greenspace Architects, to carry out a tree survey at land to north of Tudor Drive, Penley, Wrexham and provide arboricultural advice and recommendations in respect to gaining planning permission.
- 2.2 The purpose of the report is to survey trees on, or adjacent to the site, that may be affected by development on it. It is proposed to build **nine** properties . The survey is to show that a proposal could be built without damaging retained trees. The retained trees will remain healthy and the the amenity value of the neighbourhood will suffer no negative effect.
- 2.3 The Survey should comply with the findings of BS5837:2012 Trees in Relation to design, demolition and construction: *Recommendations*
- 2.4 **As of 11th November 2014, I am to update my report to align with a different lay out and reply to concerns brought about by the LPA.**

3.0 Summary

- 3.1 *The proposal is to build, *nine* new houses on land to the north of Tudor Drive, Penley.*
- 3.2 *All the significant trees can remain on site, meaning no loss in amenity value.*
- 3.3 *Adequate protection for all trees will be easy to put in place.*
- 3.4 *The loss of Hedgerow 2 could be mitigated by planting trees in the front gardens of the properties*
- 3.5 *I am satisfied that, with care and sympathy for the trees on site, a development could take place that would cause no loss to amenity and ensure no loss to the viability and longevity of the retained trees.*

4.0 Extent of Survey

- 4.1 The survey covers only arboricultural matters on, or next to the site.
- 4.2 Statutory protection (either Tree Preservation Orders or Conservation Area Status), was not investigated.
- 4.3 Information was gathered to comply with British Standard 5837:2012 Trees in relation to design, demolition, and construction – Recommendations.
- 4.4 Trees were surveyed to assess their health, structural condition, estimated remaining longevity and amenity value to the area.
- 4.5 The survey deals with the building of *nine* houses on the site. The positioning of these buildings are set out in Appendix B
- 4.6 Any tree work carried out should comply with British Standard 3998:2010 Tree Work – Recommendations.

5.0 Survey Method

- 5.1 The survey was carried out from ground level.
- 5.2 Trees are identified by the use of a metal disk with the corresponding number stamped on it. This disk is nailed to the tree where it can be easily spotted.
- 5.3 The trees were assessed for health and structural integrity using the Visual Tree Assessment method set forth by Mattheck and Breloer in The Body Language of Trees, Research for Amenity Trees no. 4, 1994.
- 5.4 The trees were assessed for longevity using survey data, experience gained in working with similar trees and assessing if human intervention was likely to reduce the life span of the tree.
- 5.5 The amenity value of the tree was assessed by survey data, visual prominence, form of the tree and consideration of the loss of amenity, if the tree were not there.
- 5.6 Trees were placed into categories using the criteria set out in BS5837:2012 (Appendix C)
- 5.7 No destructive testing was carried out.
- 5.8 No soil samples were taken.

- 5.9 Internal investigations and tissue samples were not taken.
- 5.10 Tree information is plotted in Appendix A, overlaid on top of a topographic survey supplied to myself by Greenspace architects.
- 5.11 *An updated plan was supplied to me on 11th November and amendments made*
- 5.12 Tree heights were estimated using a clinometer.
- 5.13 Stem diameters were measured in millimetres, taking the circumference at approx 1.5 metres above the ground and dividing by π (Pi), in accordance with Annex C of BS5837:2012. Where ivy or any other material would give an incorrect measurement, a suitable correction was made before recording.
- 5.14 Crown diameters and heights were estimated using a laser rangefinder.

6.0 The Site

- 6.1 The land is a paddock accessed from Tudor Drive.
- 6.2 To the north lies an agricultural field, to the east a house can be found. In a southerly direction is Tudor Drive and a housing estate with a wooded area to the west.
- 6.3 The profile of the site is approximately flat
- 6.4 An overhead power cable to the north of the site takes a subterranean route through the paddock.
- 6.5 In the wooded area to the west a stream runs in a deep ditch in a northerly direction.
- 6.6 Two hedgerows run on the north and south of the site. The northern hedgerow is approximately 1.5 metres high. The southern hedgerow which borders the road is approximately 2.5 metres high.
- 6.7 The trees currently on site are native species and generally add to the amenity of the area.
- 6.8 Viewing the Geology of Britain Viewer as supplied by the British Geological Survey (www.bgs.ac.uk), it appears that the bedrock is a Till Devensian rock. Soil on this kind of bedrock is generally free draining and provides a good medium for the growth of trees. Vegetation sourced soil shrinkage and heave is not associated with this soil.
- 6.9 The soil is therefore likely to be a good medium for tree growth. As long as there are no buried obstructions, a typical root distribution could be expected for all of the trees on site apart from the trees described in section 6.10.

- 6.10 The ditch running through the woodland to the west of the site is liable to constrain the growth of roots below the stream to the other side of the ditch.

7.0 Trees Surveyed

The schedule of trees surveyed is set out in the following section.

- Tree Number Tree identifier. Letter denotes species and number is sequential.
- Species Using common names. Where needed, scientific names will be used.
- Height In metres
- Stem diameter Taken 1.5 m from the ground in accordance to Annex C of BS5837:2012.
- Age class Either young, mid aged, early mature, mature, over mature or veteran.
- Est R Cont Estimated Remaining Contribution. Trees useful life in years.
- Physiological Assessment of the vitality of the tree irrespective of structural condition.
- Structural Assessment of the structural condition irrespective of physical condition.
- Ret. Cat. Retention Category. See Appendix C for details.
- RPA radius radius of the Root Protection Area (RPA) from the centre of the tree.
- Fence from... Distance from the tree bark a protective fence should be placed.
- Prelim Man Rec Preliminary management recommendations
- Notes Notes of importance to the survey

Tree Number	543	Species	Oak	Height	15m
Stem diameter	750mm	Age class	Mature	Est R Cont	10 to 20 years
Physiological cond.	fair	Structural cond.	fair	Ret. Cat	C1
RPA radius	9m	Fence from bark distance		8.6m	
Prelim Man Rec	Remove deadwood from tree				
Notes	Tree appears to be in decline. Profusion of dead wood and dying back tips indicate poor health.				

Tree Number	544	Species	Oak	Height	20.5
Stem diameter	850	Age class	Mature	Est R Cont	20 to 40 years
Physiological cond.	good	Structural cond.	fair	Ret. Cat	B1
RPA radius	10.2m	Fence from bark distance		9.8m	
Prelim Man Rec	None				
Notes	Branch removed to south at approx. 5 metres has introduced decay down the stem. Tree appears to be compensating well for the decay.				

Tree Number	545	Species	Scots Pine	Height	15
Stem diameter	600	Age class	Mature	Est R Cont	20 to 40 years
Physiological cond.	good	Structural cond.	good	Ret. Cat	B2
RPA radius	7.2m	Fence from bark distance		6.9m	
Prelim Man Rec	None				
Notes					

Group category 1

A number of generally young and elongated woodland trees on the far side of a deep ditch consisting of Cherry, Scots Pine and Sycamore. The ditch will present a major obstacle to root penetration into the site.

Of concern to any development on the site are two cherry trees as shown on the TCP. These tall and leggy trees overhang the site and are liable to be weak. Removal of these trees will be necessary.

Hedgerow 1

A fairly thin hedgerow with a number of gaps. Would make an excellent rear garden hedgerow for the development that would be in keeping with the surrounding area. This hedgerow is to be protected with a fence distanced 2 metres from it.

Hedgerow 2

A taller and thicker hedgerow than Hedgerow 1. Its removal will be necessary for the development.

8.0 Work required

- 8.1 Remove the deadwood from 543.
- 8.2 Remove the two cherries from G1 that overhang the site.
- 8.3 Remove Hedgerow 2.

9.0 Tree Protection

- 9.1 Root Protection Areas (RPAs) are an area around a tree that contains the minimum amount of roots and rooting medium to maintain the viability of the tree. This area is prioritised for the tree.
- 9.2 The Tree Protection Plan (TPP), Appendix B, shows all retained trees and how their RPA's are to be protected by a fence as set out in paragraph 9.5.
- 9.3 RPAs are to be protected from infill, chemical incursion, fuel spillage, building material storage, solid waste disposal, liquid waste disposal or soil compaction of any kind, be it machinery, goods, foot traffic or vehicular.
- 9.4 The RPA should be protected from any kind of digging into it.

- 9.5 Tree protection should be utilised by a fence. Examples of such a fence are given in Appendix D.
- 9.6 Note should also be given to tree crowns should they overhand the RPA of the tree. Thought should be given to these crowns to avoid damage to them in the building stage.

10.0 *Work within Root Protection Areas (RPAs)*

- 10.1 The buildings are clear of the trees RPAs but some pathways and service areas are within the RPA of 543 and 544
- 10.2 The use of a three dimensional cellular confinement system (TDCCS), shown in pink on Appendix B, will prevent damage to roots or soil where incursions into the RPA are necessary. A checklist for the use of Cell Web, a well known TDCCS is found in Appendix E.
- 10.3 The use of the TDCCS is slight and on the edge of the trees RPAs. At most the TDCCS will reach 2.5 metres into the RPA of 544 covering less than 5% in total. It would be acceptable to use a non porous top layer to this TDCCS
- 10.4 The TDCCS should be constructed before any construction work begins. If this is not possible, then the protective fencing should remain around the full RPA until the point where the TDCCS is to be installed and then moved back to the position as shown in Appendix B.

11.0 Post Development Pressure

- 11.1 It would be favourable to ensure the hedgerow on the northern side is regularly cut. This is liable to be a practice that the new owners of the properties will undertake to ensure encroachment into the garden is kept in check.
- 11.2 Should 543 continue to decline, it is liable that it's removal will be required as a matter of safety concern. However, the trees decline is from the extremities towards the trunk, making the decline less of a safety hazard than if whole major branches were dying. The decline is easy to assess and the tree may yet retrench itself to a smaller size and regain it's vitality.
- 11.3 The proximity of 543 and 544 to the semi detached houses adjacent to them may cause concerns to prospective buyers. However, the trees are unlikely to grow any bigger than their current size and will be easy to assess by a prospective buyer of the site.

- 11.4 As some concern is raised as to the health and/or structure of 543 and 544, it would be sensible to monitor these trees for signs of rapidly developing decay or dysfunction. This is liable to be carried out by owners of the property, but it would be prudent to carry out an in depth inspection every three years.
- 11.5 *The crown size of 543 is considerably smaller than the indicated size on the plans. This is because the majority of branch tips have died off and the tree has retrenched back up to 2 metres from the dead branch tips. The crown density is also significantly less dense than common. The crown is effectively 4 metres away from the corner of the last house to the east. This will help reduce issues of over dominance.*
- 11.6 *The crown of 544 does come to within two metres of the last house to the east, but the considerable 10 metres height of the crown, will give good views below it. If issues of tree dominance still remain some crown raising could be carried out in conjunction with a reduction of 2 metres in a southerly direction. This would allow four metres of clearance between the house and crown.*
- 11.7 *Given the previous comment and for the sake of safety and the longevity of the tree it would be prudent to carry out a crown reduction of the entire tree by two metres. This would reduce any leverage on the decay column in the trunk of the tree ensuring the trees future whilst providing clearance for the housing without any significant losses to the amenable nature of the tree.*
- 11.8 *It is unlikely that 543 or 544 will be felled by new owners of the housing as it appears that the tree belongs to the owners of the field to the north.*
- 11.9 *I have drawn tree shading arcs on Appendix B using tree heights of 12 metres. It is clear that the gardens will be considerably shaded, but all gardens will receive some direct sunlight. This is also true for the houses. Given the nature of the tree is Group 1, the woodland is not a wall of green but offers views into it, therefore offering interest and variety.*
- 11.10 *The trees from Gr1 will periodically overhang the garden spaces. Removal of these branches or stems will be acceptable and will not alter the make-up or nature of the woodland.*
- 11.11 *Again, this woodland is not owned by the residents of the houses and therefore removal of trees from it would be an illegal act that is unlikely to happen.*

12.0 Conclusion

- 12.1 The overhanging cherries and Hedgerow 2 will need to be removed together with the deadwood removal from 543.
- 12.2 All other trees can remain and will not be constrained by the development.
- 12.3 Mitigation for the loss of the hedgerow would suggest the planting of a number of trees on site. Positioning these trees in the front gardens of these properties would help to break up the new development. I would suggest planting one tree in the front garden of each of the detached houses and planting two trees in the front gardens of the four semi-detached properties. These trees could be positioned between the houses.
- 12.4 With careful application of sound arboricultural techniques as set out in this report, the retained trees will not be damaged, either above or below the ground.
- 12.5 The scheme is arboriculturally sound and will add to the tree amenity value of the area.
- 12.6 *Some concern is raised over proximity of trees to buildings and shading. It would be easy to cut back crowns without losing amenity value and shading within some gardens will be noticeable, but not to an unacceptable degree*.

The data, views and opinions of this report relate to the survey undertaken on the date shown and do not take into account effects of weather conditions, vandalism or accidental damage. Neither can the effects of tree surgery work, poorly executed or which does not comply with BS3998:2010, be predicted. Old Oak Tree Care cannot accept any liability in connection with any of these factors. This report becomes out of date and in need of renewal two years from the survey date.

Appendix A

Land to north of Tudor Drive, Penley
Showing existing building and all trees

Tree Constraints Plan version 1 Tree categories and Root Protection Areas (RPA's)

SCALE :
1 : 500

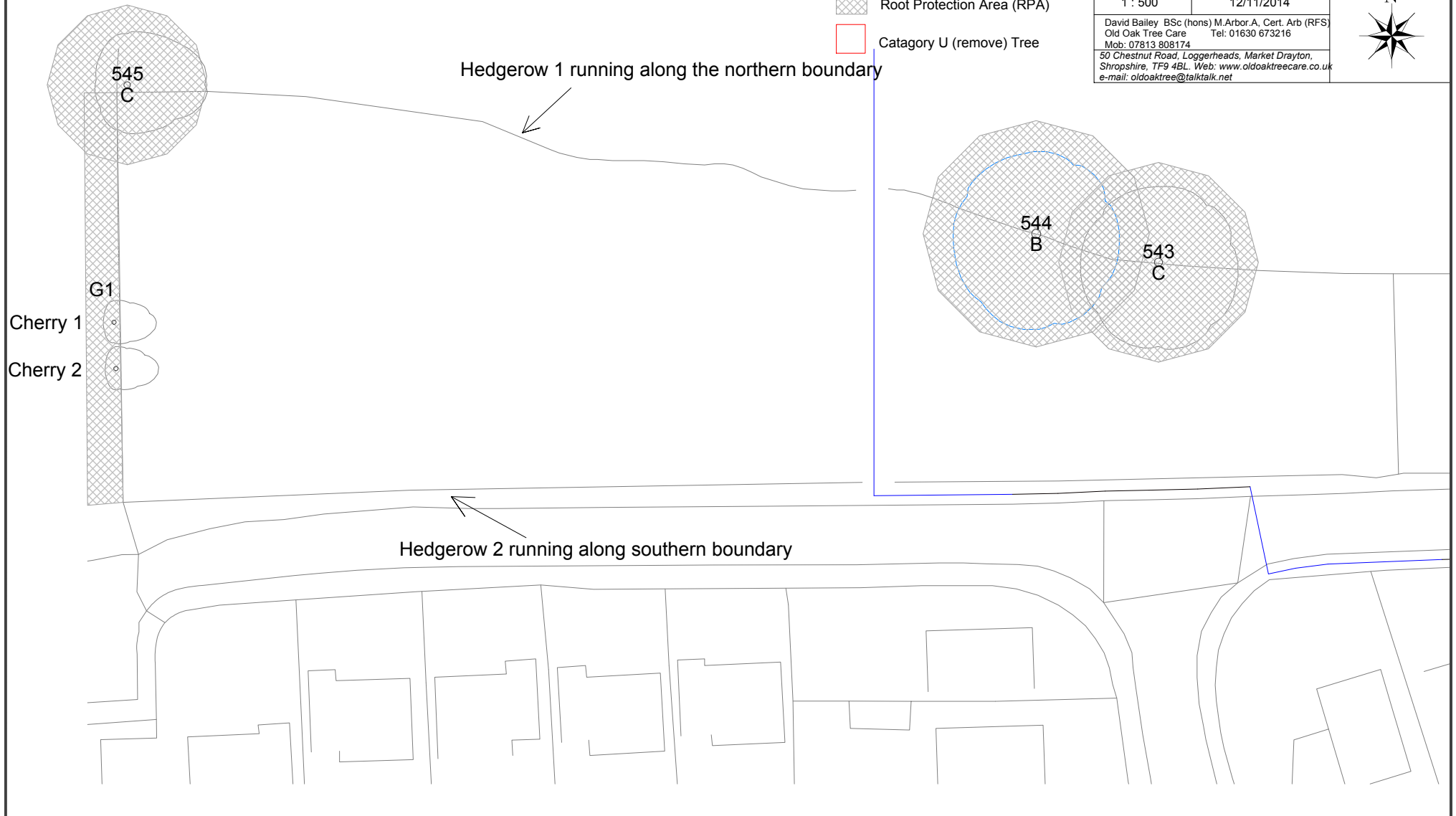
DATE :
12/11/2014



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- Category A Tree
- Category B Tree
- Category C Tree
- Root Protection Area (RPA)
- Category U (remove) Tree





Appendix B

Land to north of Tudor D

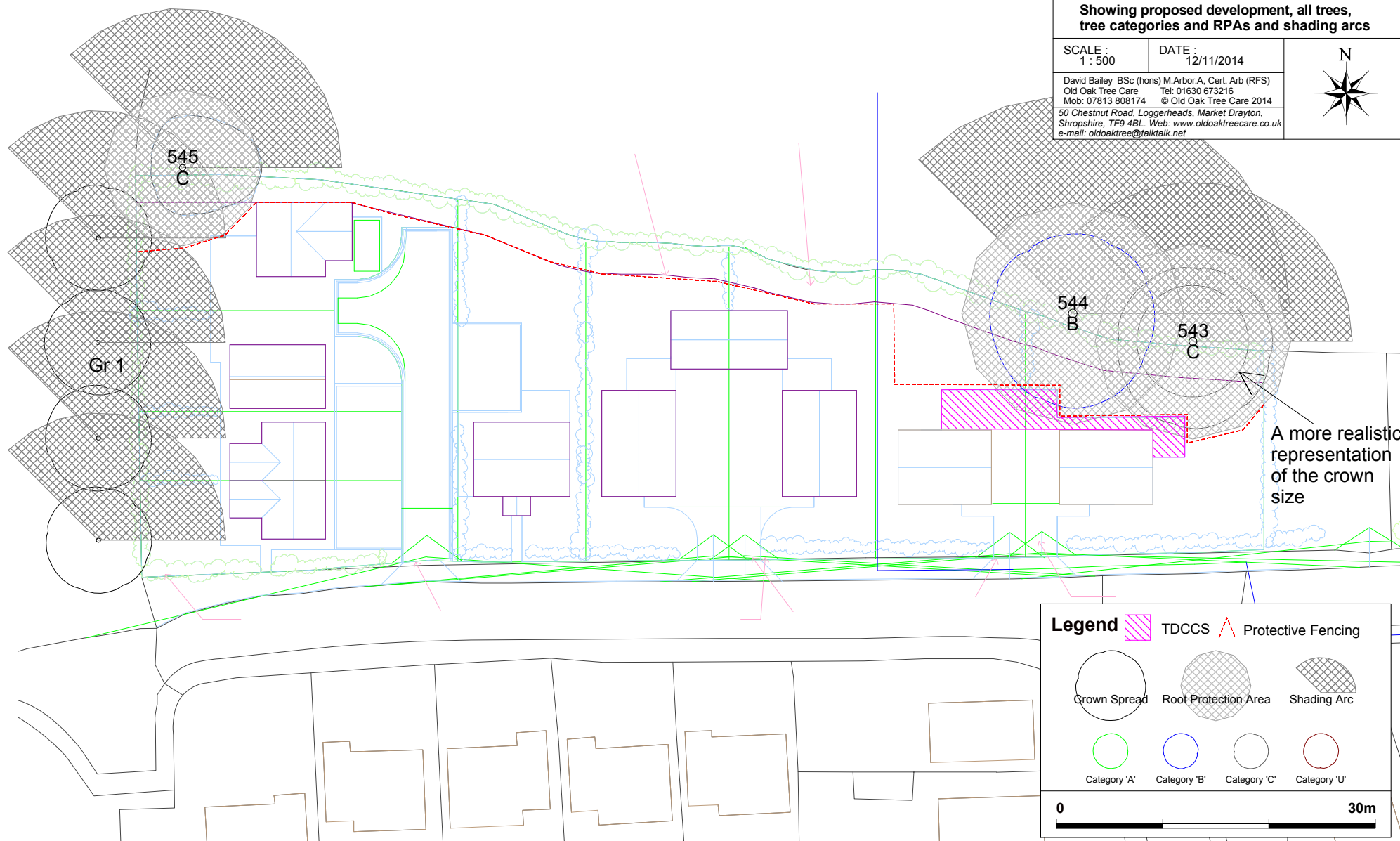
Tree Protection Plan v2
Showing proposed development, all trees,
tree categories and RPAs and shading arcs

SCALE :
1 : 500

DATE :
12/11/2014



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Legend

TDCCS Protective Fencing

Crown Spread Root Protection Area Shading Arc

Category 'A' Category 'B' Category 'C' Category 'U'

0 30m

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 <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>	See Table 2
Trees to be considered for retention		
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	1 Mainly arboricultural qualities 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) 2 Mainly landscape qualities Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features 3 Mainly cultural values, including conservation Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
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	See Table 2
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	See Table 2

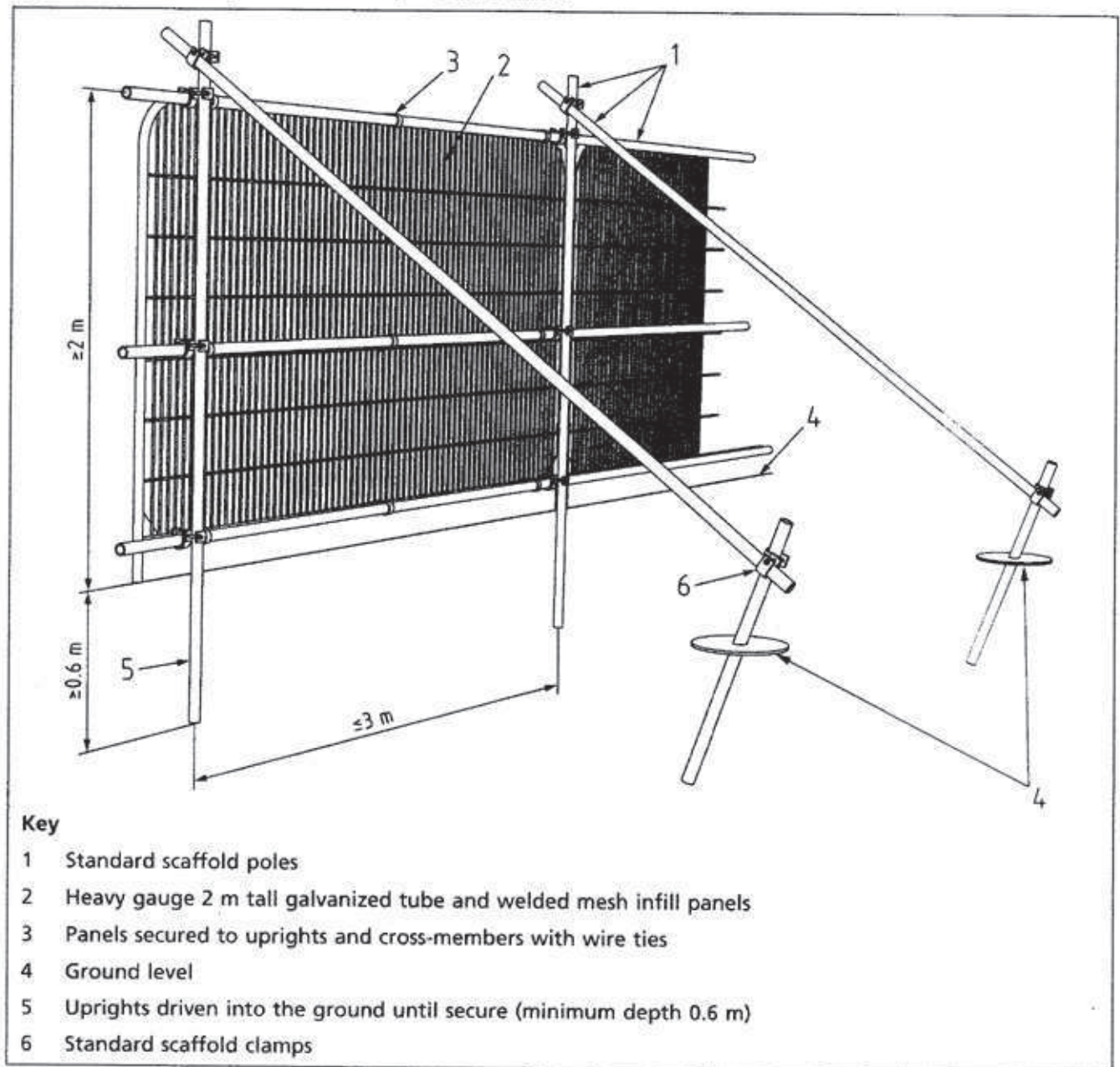
Appendix D Extract from British Standard BS5837:2012

6.2.2.1 Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). Barriers should be maintained to ensure that they remain rigid and complete.

6.2.2.2 The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated in Figure 2. The vertical tubes should be spaced at a maximum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.

6.2.2.3 Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification should be prepared by the project arboriculturist and, where relevant, agreed with the local planning authority. For example, 2 m tall welded mesh panels on rubber or concrete feet might provide an adequate level of protection from cars, vans, pedestrians and manually operated plant. In such cases, the fence panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The distance between the fence couplers should be at least 1 m and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (Figure 3a). Where the fencing is to be erected

Figure 2 Default specification for protective barrier



Appendix D (cont.) Extract from British Standard 5837:2012

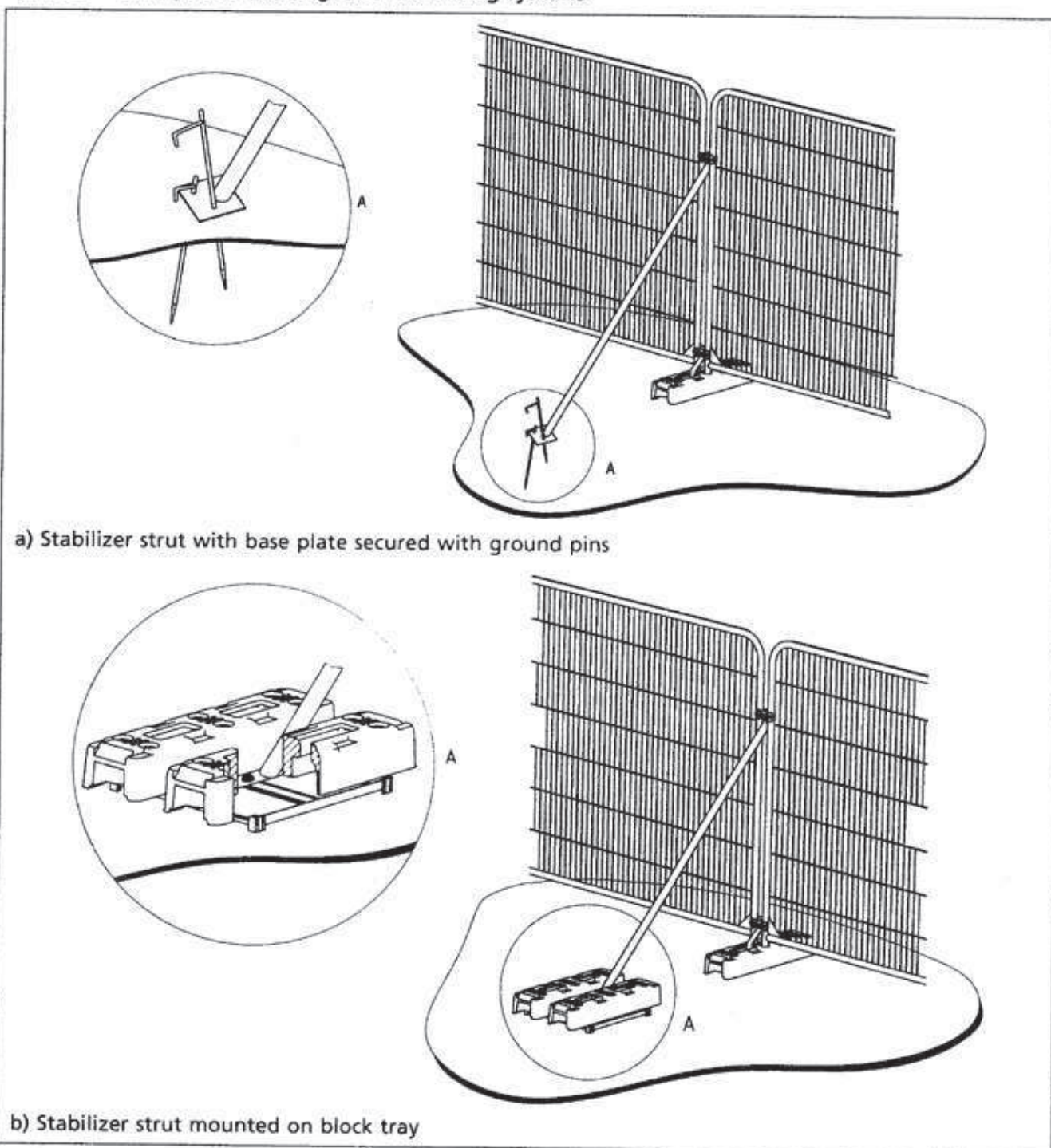
on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabilizer struts should be mounted on a block tray (Figure 3b).

NOTE 1 Examples of configurations for steel mesh perimeter fencing systems are given in BS 1722-18.

NOTE 2 It might be feasible on some sites to use temporary site office buildings as components of the tree protection barriers, provided these can be installed and removed without damaging the retained trees or their rooting environment.

6.2.2.4 All-weather notices should be attached to the barrier with words such as: "CONSTRUCTION EXCLUSION ZONE – NO ACCESS".

Figure 3 Examples of above-ground stabilizing systems



CellWeb TRP (Installation Checklist)

Installation of the CellWeb™ Cellular Confinement System within the Root Protection Area of Trees



The following installation checklist can be used on projects where CellWeb™ is being installed as a permanent hard surface, a sub-base, or as temporary root protection during construction works.

The installation procedure can be utilised by the Local Authority (LA) tree officer to ensure that CellWeb™, that is being used for tree root protection, will be effectively installed. Alternatively, it may be more appropriate to request that the installation is certified by arboricultural consultants who are experienced in the installation of CellWeb™ and who can offer installation certification as part of a package endorsed by Geosynthetics.

The completion of the CellWeb™ installation in accordance with this procedure will enable planning conditions to be successfully signed off on completion of the project.

Stage 1 Initial site meeting to assess tree protection requirements in line with the Arboricultural Method Statement (AMS) produced by the developer's arboricultural consultant.

- Check the ground conditions, including the presence of compaction or made ground.
Is any remedial work required, such as the removal of old hard surfaces and rubble or soil decompaction?
- Compare the existing ground levels with the new levels proposed in the development.
Do the new levels allow for the depth of hard surfaces installed with a CellWeb™ foundation without excavation?
Will excavation be required to achieve the proposed levels or to enable site drainage or integration with other water management solutions?
- Assess the suitability of tree protection proposals, including the fencing and ground protection that will be used throughout the demolition and construction phases of development.
Can CellWeb™ be used as ground protection throughout the development period and also form the foundation for final hard surfaces?
Is a temporary CellWeb™ installation needed to enable site access for construction traffic over an area designated as requiring tree root protection?
- Consider how utility service installations can be integrated with the installation of CellWeb™.
Can services be installed before the CellWeb™ is laid, or is it possible to use directional drilling later on in the development?
- Consider how other water management solutions for the site can be integrated with CellWeb™, including porous hard surfaces, drainage and underground storage.
Has a combined and integrated water management plan been designed that considers retained trees?
Do the water management solutions for the site consider the water requirements of retained trees?
Do the storage solutions allow for the slow release of water into areas of the site accessible by tree roots, while also dealing with potential soil pollutants from surface water run-off?
- How are the developers going to ensure that the CellWeb™ is specified and installed effectively?



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Stage 2 Approval of the CellWeb™ site-specific installation method statement, which should include:

- Details of the sensitive removal of existing hard surfacing.
- Details of any remedial de-compaction work required.
- Root investigation procedures where site level changes require limited excavation to allow the installation of CellWeb™.
- A scaled site plan illustrating where the CellWeb™ will be installed that includes both existing and proposed levels.
- Details of how the CellWeb™ tree root protection system will be integrated with other traditional hard surface foundations on site.
- An integrated water management site plan illustrating working porous surfaces, drainage and water storage solutions, with consideration of the physical presence of roots and tree water requirements.
- Details of the CellWeb™ load limit specifications, with site-specific information.
- Engineering drawings provided by Geosynthetics showing the CellWeb™ specification.
- An engineering design indemnity policy based on a site-specific soil assessment.

Stage 3 Site visit before CellWeb™ installation to check that the ground has been prepared in accordance with the AMS. Check:

- Site level layout.
- The need for root investigations where excavation work is required to meet level requirements.
- Soil bulk density (compaction) CBR has been maintained.
- Completion of any site remedial work required before the installation of CellWeb™.

Stage 4 Site visit to check that materials supplied for installation comply with the installation method statement and AMS specifications. Check:

- The specification of the geotextile underlay.
- The specification of the cellular confinement system (depth and product used).
- The specification of the fill material (4/20, 20/20 or 20/40 washed angular stone with site-specific pH if required and appropriate structural load rating).

Stage 5 Site visit to check that the installation methodology meets the manufacturer's specification and is in accordance with the AMS. Check:

- The minimum cell size.
- The orientation of the sheet layout.
- There is sufficient fill to form a cell structure.
- The upper geotextile has been installed to maintain the CellWeb™ sandwich.

Stage 6 Site visit to check that the final surface installation meets the porosity specification in the installation method statement and the AMS.

Stage 7 Project sign off.

Following this checklist should ensure the successful specification and installation of CellWeb™ as a tree root protection system, either as a temporary ground covering during development or as a structural sub-base for permanent porous hard surfaces.

This checklist has been written to enable Local Authority Tree Officers to plan site visits and document checks in a structured way. However, the same procedure can be completed by an independent arboricultural consultant as part of a certification program offered by Geosynthetics Ltd using dedicated arboricultural consultants and approved installers.



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