



Arboricultural Method Statement

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Land behind Sion Chapel,
Pontfadog,
Wrexham

Specifying the requirements that must be carried out to maximise the protection to trees that are to be retained on, or adjacent to, the site throughout the construction phase of development.

Commissioned by:

Mike Banks
Gareth Morris Construction Ltd

Prepared by:

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16th May 2018

Report date:
9th July 2019



Contents

1.0	Aims and Requirements
2.0	Basic useful facts
3.0	Avoiding damage
4.0	Sequence of events
5.0	Method statement
6.0	Conclusion
7.0	Appendix A: Tree Protection Plan PC19/325/TPP
8.0	Appendix B: Tree categories from BS5837:2012
9.0	Appendix C: Examples of Protective Fencing from BS5837:2012
10.0	Appendix D: Sign for fencing panel
11.0	Appendix E: Tree Raw Data
12.0	Appendix F: Tree Management Plan (including works required before construction)
13.0	Appendix G: Site Monitoring Form
14.0	Appendix H: Cell Web checklist and method statement
15.0	Appendix I: TDCCS edging

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1.0 Aims and Requirements

- 1.1 This Arboricultural Method Statement (AMS) is prepared to ensure retained trees are adequately protected before and throughout the construction phase of the development.
- 1.2 Planning permission has been granted for the building of six houses on the above land.
- 1.3 Construction activities close to trees requires an AMS to be produced to ensure they are protected at all times during construction work. There are a number of trees on site, some being large and of high quality. Some construction work is required within root protection areas, requiring special guidance and mitigation.
- 1.4 Care of retained trees and hedges is to comply with planning requirements, give the site instant maturity and for the development to provide high amenity landscaping to add to its appeal for residents.
- 1.5 It is recognised that, sometimes, trees on building sites can be easily and avoidably damaged by construction activity.



- 1.6 This AMS aims to guide developers and contractors in the best way possible to protect trees on the site that are required for retention due to their arboricultural, landscape and wildlife importance or added financial value to the finished development.
- 1.7 A designated person, usually the site foreman, is to be made responsible for the seeing through of this method statement. They should understand and be happy with all aspects of the requirements of it, being able to explain the needs of the AMS to all staff and contractors. The author is always available to be contacted by telephone in relation to any issues relating to trees before or during the construction process. A copy of the AMS should always be available on site.
- 1.8 Differing amounts of information and explanation will be required for differing trades and areas of work. Obviously, trees present more difficulties to those working on the foundations of buildings, where roots can constrain building work, rather than a plasterer working inside a new building. However, all need to be aware of the need to avoid damage to trees both directly or indirectly.
- 1.9 Should the correct sequence and manner of operations not be followed, it may result in damage to trees, which could be held as a breach of planning consent or damage to a tree with a preservation order. This could have legal consequences. Of most importance is the need to install well designed and casually unmoveable protective fencing before any work or deliveries begin on site.
- 1.10 **Experience shows that lack of timely installation of suitably designed and placed immovable protective fencing and its retention throughout the construction phase is the primary reason for damage to trees, enforcement notices, forced stops to work and expensive remediation programmes. Correctly placed, constructed and maintained fencing prevents the majority of common problems. However, diligent care for trees is not wholly associated with the correct application of protective fencing and close attention should be paid to protecting trees at all times.**
- 1.11 If, at any time, there appears to be a problem with trees or damage is likely to happen to them, then the work should not be carried out and the opinion of an arboriculturist sought.

2.0 Some basic useful facts

- 2.1 Trees can be a controversial and problematic issue in construction areas, frequently because of myths, which are often wrong.
- 2.2 Tree roots do not mirror the above-ground part of the tree. Roots are unlikely to be found deeper than one metre in the soil as they need oxygen as well as water and nutrients. The roots will spread much further than the crown of the tree, often further than twice the extent of the crown. Roots at distance from the trunk are most usually very thin.
- 2.3 In areas that make rooting difficult, such as the urban environment, trees can and do adapt their rooting to best utilise whatever resources they can find. This may involve rooting to much deeper depths, or solely in one direction, wherever the most favourable rooting conditions can be found.
- 2.4 A design tool called the root protection area (RPA) is often used to show where, if all other roots outside it were to be lost, an area of rooting could be preserved to ensure the tree has enough rooting area to survive. Although RPAs can sometimes be moved around a little, this rooting area will need to be protected from any damage.
- 2.5 Roots require un-compacted soil where air, water and nutrients can easily be reached. Therefore, RPAs on a building site are fenced off to prevent any damage to this now small island for which the tree will be reliant upon.
- 2.6 It doesn't take much to compact the soil to a point where a tree will find it very difficult to utilise. Just a couple of passes in a vehicle over an unprotected rooting area can do this.

3.0 Avoiding damage

- 3.1 The designated person, usually the site foreman, is responsible for the trees on site. They should plan work in a careful and logical manner. Any operation that could damage trees should be carried out in a way so that no damage occurs. If damage is likely and no other method can be envisaged, an arboriculturist should be consulted before the operation takes place.
- 3.2 For the sake of clarity, all trees identified in the report should be treated as being covered by a tree preservation order (TPO). In any case, trees to be retained on site will need to be correctly cared for as part of the planning conditions.
- 3.3 Wilfully damaging, cutting down, uprooting or killing a tree protected by a TPO is a criminal offence, carrying a maximum fine of £20 000.
- 3.4 RPAs are to be left alone. No attempt should be made to use them as building stores, parking areas, wash out areas, footpaths or refuse piles.



- 3.5 Should a need to enter an RPA occur, then this should be done by the responsible person or under their supervision.
- 3.6 No trenching should occur within the RPA unless this is done using trenchless techniques. Set off and retrieval pits should be outside of any RPA.
- 3.7 Any fires should be lit at least 10 metres away from the crown of any tree and anything burnt should be done so on a hot fire, to reduce smoke and combust the material more effectively, reducing the possibility of noxious fumes for both plants and animals.

4.0 Sequence of events

- 4.1 The order of events should be:
 - 1. Pre-commencement arrangements
 - 2. Pre-commencement site meeting with arboriculturist
 - 3. Tree work
 - 4. Site monitoring
 - 5. Setting out of protective fencing and ground protection
 - 6. Work inside of RPAs
 - 7. Construction work
 - 8. Removal of protective fencing
 - 9. Landscaping including work within RPAs

5.0 Method Statement

5.1 Pre-commencement arrangements

- 1. Day to day monitoring of building work is to be carried out by an independent arboriculturist to oversee tree issues and monitoring.
- 2. Once the arboriculturist is employed, their details are to be provided to the LPA case officer. The overseeing arboriculturist is to contact the author of this report to talk through the requirements and take over monitoring of the site. The author will always be available to discuss any issues with the overseeing arboriculturist.

5.2 Pre-commencement site meeting

- 1. Before any activity takes place on site, a meeting will occur between the site foreman who will be responsible for the day to day tree protection, all employees of the construction firm and the overseeing arboriculturist.

2. The main points of the conversation should be recorded with explanations of basic tree requirements, root architecture, methods to prevent damage and a run through of the method statement.
3. Pertinent points that should be brought up are outlined below.
4. The legal requirements driving tree protection.
5. Importance of maintaining protective fencing and ensuring damage does not occur from compaction or poisoning.
6. Methods of working to ensure tree protection and ease of the operation.
7. Areas for parking, storage of plant, fuel and equipment.
8. Possible unexpected occurrences which may require the advice of an arboriculturist.
9. Contact details for an arboriculturist should be available at all times to construction staff.

5.3 Tree Work

1. A tree management plan is included in Appendix F. This details all required tree work which is to take place before any building work or deliveries begins.
2. All tree work is to take place to best practice as set out in BS3888:2010 Tree Work: Recommendations.
3. Vehicles and plant relating to tree work should be parked outside of the indicated RPAs.

5.4 Site Monitoring

1. A system of site monitoring is required by the LPA to ensure all arboricultural requirement are met and reported back to the LPA.
2. Appendix G represents the monitoring form. A Microsoft Word document is also provided which can be used to send back and forth between the overseeing arboriculturist and the LPA case officer to confirm inspection and receipt of reports.

5.5 Setting out Tree Protection

1. Protective fencing should be used to protect areas where access is temporarily forbidden during the construction phase. **Experience shows that poor attention to the timely and correct installation of protective fencing is the main reason for damage to trees, enforcement notices or forced stops to building projects in relation to trees.** Correctly placed and constructed protective fencing, positioned at the right time will prevent the vast majority of tree issues causing disruption to the build.
2. Before any plant, machinery, site buildings or materials arrive on site, the protective fencing should be installed.
3. The protective fencing should comply with the specifications as set out in BS5837:2012 Trees in relation to design, demolition and construction: Recommendations (Appendix C).
4. The positioning of protective fencing is shown in Appendix A with minimum distances marked in purple. The fence is to abut all fences, or hedges securely to ensure they cannot be moved.
5. After installation of fencing, designated areas are to be set aside for materials storage, parking and mixing of materials.
6. Should the design need to be altered for site-specific circumstances, the approval of the project arboriculturist and LPA will need to be specified in writing.
7. Areas protected by protective fencing are not to be used as storage, parking or waste disposal areas. The Run-off from washings is not to enter into protective areas.
8. Additional ground protection within an RPA is required at the west of the site next to EI4. To allow access around this sensitive area of construction within an RPA, this ground protection is to be held firmly in place and able to support tracked plant up to a weight of 1 tonne.
9. Ground protection could take the form of 18mm shutter board laid on the ground with undulations flattened out using sharp sand to allow the board to sit flat on the ground and spread the weight of its load. The boards should be pegged in position so they cannot move.
10. Prior to groundwork preparation, levelling, excavations or any demolition, the overseeing arboriculturist is to inspect fencing and ground protection to ensure it is fit for duty. Photographs should be taken and a short report prepared and sent to the LPA tree officer to show compliance with the tree and ground protection. It would be sensible to add details of TDCCS in with this report (see 5.6).

5.6 Work Inside of RPAs

1. A path to reach the rear of the properties needs to be positioned across the RPA of EI4. This can be achieved without damaging the soil or roots below by utilising a no-dig construction technique along with a three-dimensional cellular confinement system (TDCCS).
2. The TDCCS should be installed at the same time as the protective fencing and ground protection to provide complete ground protection and encourage builders to use the path.
3. The use of foot traffic grade TDCCS will lift the path at least 100mm above the existing ground level. Edging supports will be needed to retain the path in position. Appendix I gives details on how this can be achieved within the RPA without significant impact on roots. Topsoil can be laid at a 30-degree angle to the board allowing a natural finish to the path.
4. Appendix H is a checklist and method statement for the use of Cell Web, a well-known TDCCS. This method statement is to be followed to ensure the ground protection is effective. Special mention is made for the need to use the correct infill material for the TDCCS.

5.7 Construction Work

1. The main construction work can now begin. During the building work, builders' vehicles are to be parked away from RPAs. Protective fencing is not to be moved to create parking or storage areas.
2. All deliveries are to drop materials into the storage area. Deliveries are not to attempt to drop materials in any RPA. A storage area is shown in Appendix A.
3. A mixing area is to be designated with an impermeable floor and a bund of at least 50mm. All mixing of materials should take place here to prevent run-off or washings contaminating the RPA of trees. A mixing area is shown in Appendix A.
4. A parking area is shown in Appendix A and should be used to avoid RPAs and grassed areas.
5. Every second fencing panel should have the sign, shown in Appendix D, fixed to it. It should be laminated to ensure it is weatherproof.



5.8 Removal of protective fencing and ground protection

1. Only when all construction work including hard landscaping has ceased and all plant, site buildings, skips, building spoil and spares are removed from the site, can protective fencing and ground protection be removed.
2. Fencing is to be removed first with ground protection used as the main way of gaining access. After this ground protection should be removed. Sharp sand used to level the ground can be left in place.
3. Vehicles collecting protective fencing should remain on the road or hard standing and not enter RPAs.

5.9 Soft landscaping within and close to RPAs

4. After removal of protective fencing, soft landscaping within RPAs, if necessary, can occur.
5. Soft landscaping includes the planting of trees and shrubs, but this must only be done by digging individual holes. No rotovating, trenching or ploughing is to occur within any RPA.
6. Turfing of parts of the RPA can occur as long as the depth of turf as well as bedding material does not exceed 100mm in depth.

6.0 Conclusion

- 6.1 The diligent following of this method statement will ensure the trees are successfully retained and remain healthy into the future. The advantages of this are that the site retains these large trees and users of the site will appreciate the maturity brought to the buildings, creating pleasant and amenable surroundings. Mature trees on a site will increase the value of the new buildings.

The data, views and opinions of this report relate to the survey undertaken on the date shown and do not take into account the 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 Behind Sion Chapel, Pontfadog,
Wrexham

Tree Protection Plan
Showing all retained trees, crown dimensions, tree
categories, RPAs, fencing and special engineering

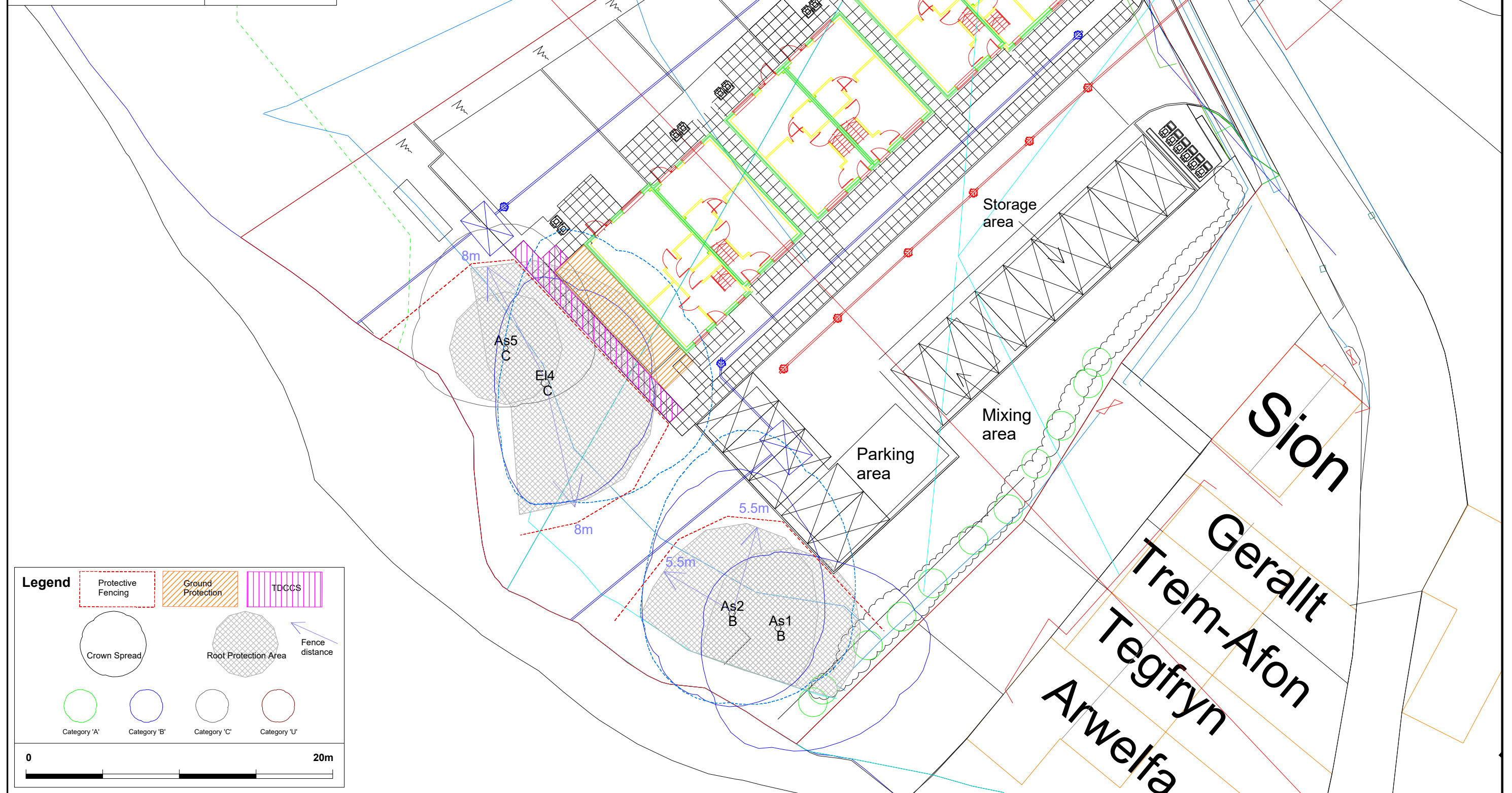
SCALE :
1 : 250 @ A3 DATE :
11/07/2019

David Bailey Old Oak Tree Care 01630 673216
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This plan is to be reproduced in colour
B+W copies will not contain all information

Map reference:
PC19/325/TPP

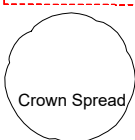


Legend

Protective
Fencing

Ground
Protection

TDCCS



Crown Spread



Root Protection Area

Fence
distance



Category 'A'



Category 'B'



Category 'C'



Category 'U'

0

20m

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		
1 Mainly arboricultural qualities 2 Mainly landscape qualities 3 Mainly cultural values, including conservation		
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of 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

BS 5837:2012

BRITISH STANDARD

Figure 2 Default specification for protective barrier

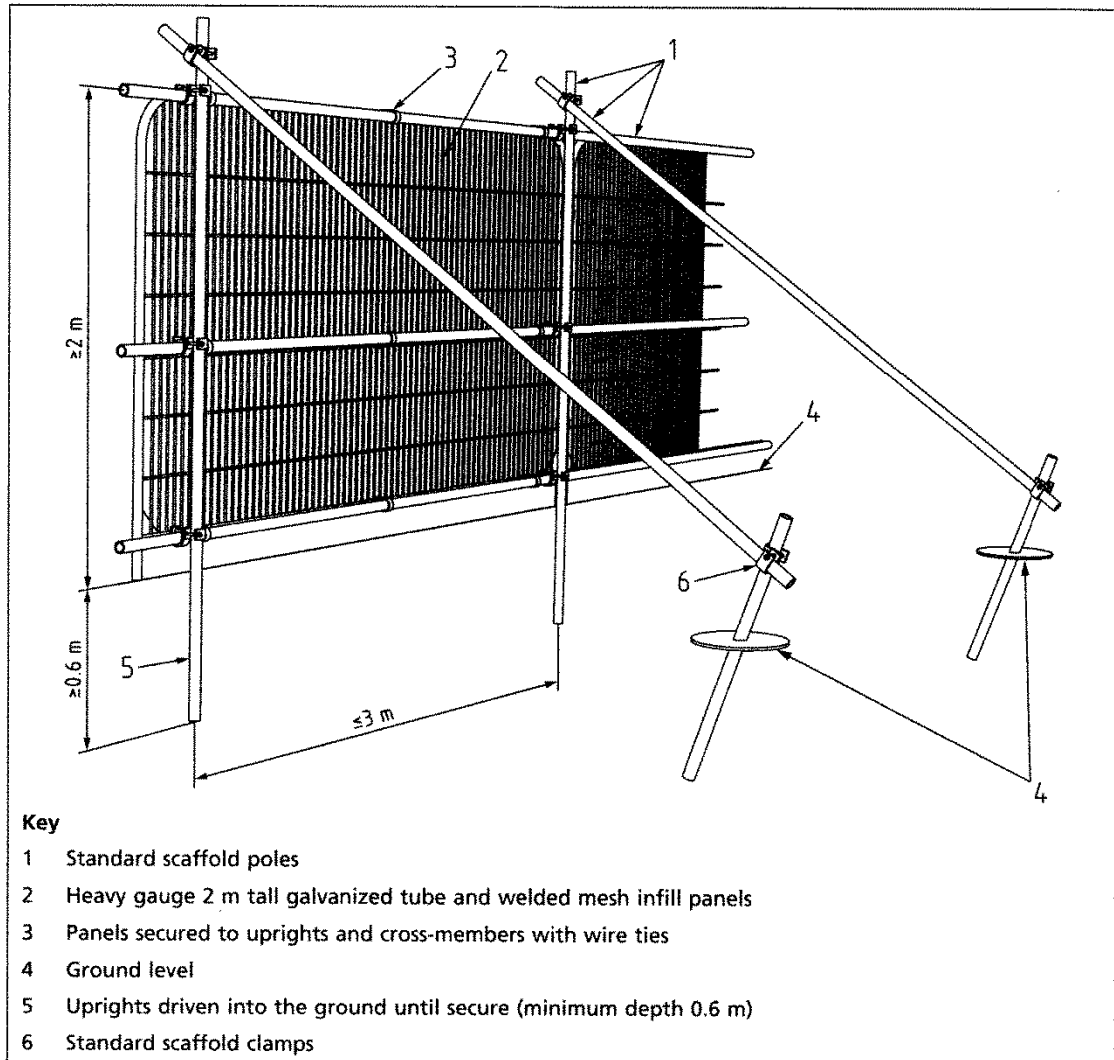
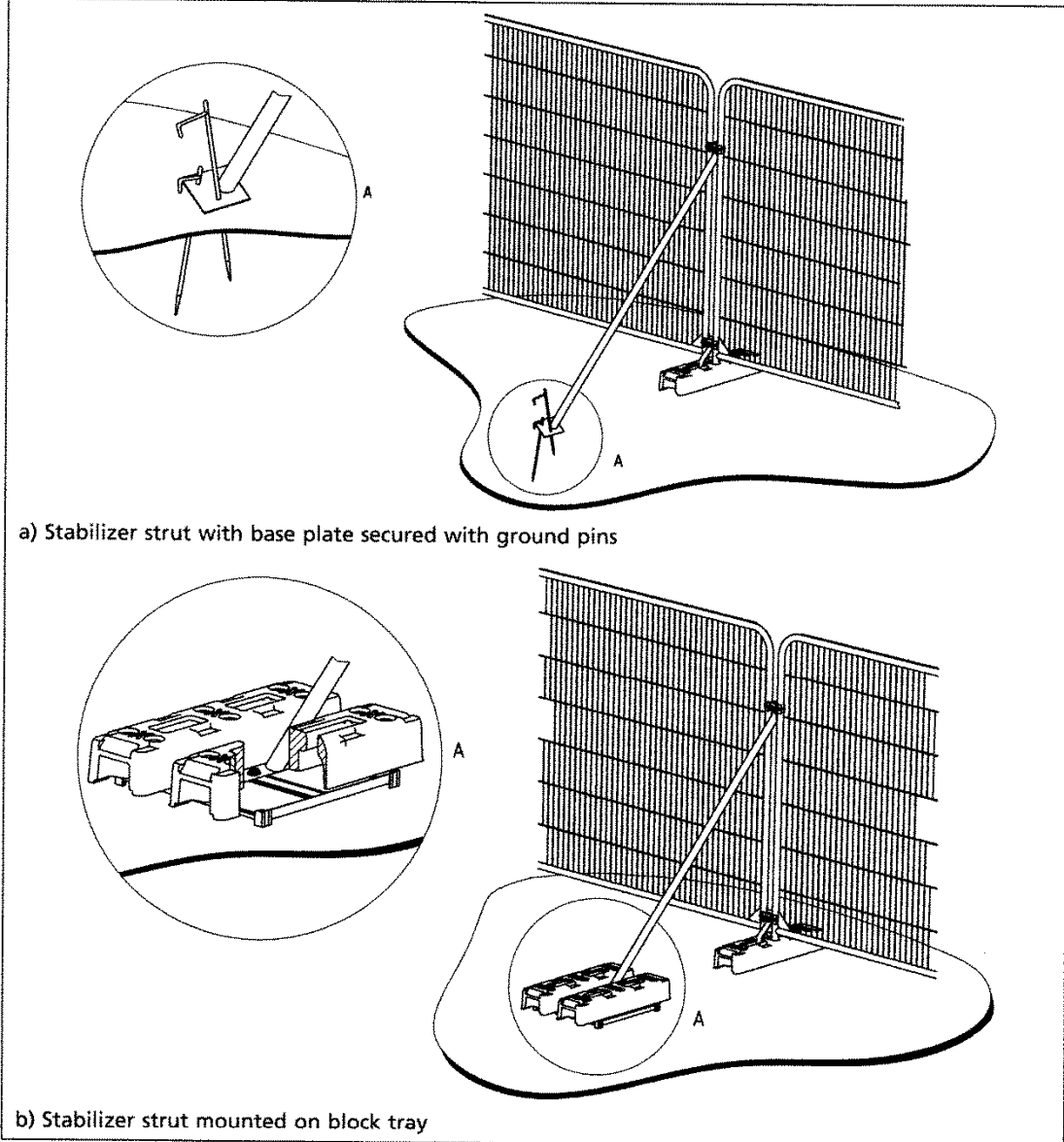


Figure 3 Examples of above-ground stabilizing systems





**PROTECTIVE FENCING. THIS
FENCING MUST BE
MAINTAINED IN ACCORDANCE
WITH THE APPROVED PLANS
AND DRAWINGS FOR THIS
DEVELOPMENT.**



**TREE PROTECTION AREA
KEEP OUT !**

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

**ANY INCURSION INTO THE PROTECTED AREA MUST BE
WITH THE WRITTEN PERMISSION OF THE LOCAL
PLANNING AUTHORITY**

Appendix E		Tree survey raw data																	
Tree number	Species	Height (m)	Diameter (mm)	N Crown spread (m)	E	S	W	N Crown Height (m)	E	S	W	Age bracket	Physiological Condition	Structural Condition	Years remaining	Quality assessment	RPA radius(m)	RPA Area (m2)	Notes
As1	Ash	20	400	5	10	8	5	10	4	5	10	mature	good	good	10to20	B	4.8	73	
As2	Ash	20	425	10	12	6	6	6	2	12	4	mature	good	good	10to20	B	5.1	82	
Sy3	Sycamore	20	800	6	12	6	6	6	2	12	4	mature	good	fair	10to20	C	9.6	290	significant basal decay
EL4	Elm	20	550	8	12	10	8	3	3	2	10	mature	good	good	10to20	B	6.6	137	
As5	Ash	14	300	6	10	4	6	2	5	10	10	mid-aged	good	good	10to20	C	3.6	41	
Gr6	Group	6	100	3	3	3	3	0	0	0	0	young	good	good	10to20	C	1.2	5	group of coppiced alder, willow and hazel
Gr7	Hedge	1	100	1	1	1	1	0	0	0	0	mature	good	good	10to20	C	1.2	5	gappy hedge on wall.



Old Oak Tree Care



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(APPENDIX F)

Land Behind Sion Chapel, Pontfadog Tree Work and Management Plan

2nd March 2019

I have been asked to produce a tree work schedule and tree management plan for the above site.

Six properties are to be built on the site which will be managed by a housing association. The tree work schedule, which was outlined in the tree report which accompanied the planning application, details work to be carried out before the properties are built. The tree management plan details inspection and upkeep work to keep the trees on site in a safe and presentable manner. A plan showing trees in place at this date is found in figure 1.

This tree schedule and management plan does not supersede or negate the tree protection requirements during construction as detailed in my tree report OOTC/PC18/227 and shown in the attached plans.

Initial tree work

1. Sy3, a large sycamore tree, has suffered significant erosion and decay in and around its trunk which is next to the stream. This tree should be felled as it is likely to suffer failure at the roots in the future.
2. The large elm, El4 stretches significantly over the site as its crown has sought the light. With this tree now being the dominant tree in the locality, it does not need to stretch so far. The considerable reach of these branches will slightly overhang the property closest to the tree. A crown reduction of approximately 3 metres of the branches which overhang the site to the east will move foliage well away from the building.
3. In a similar fashion, the crowns of As2 and As5 will need to be cut back by approximately 2 metres in an easterly direction.
4. All crown reduction work will need to take place with a keen eye on ensuring the trees are not significantly disfigured. The work should chamfer the cut branches into the upper crown to present a naturally proportioned tree. All cuts should be made back to correctly proportioned side branches as in industry best practices.

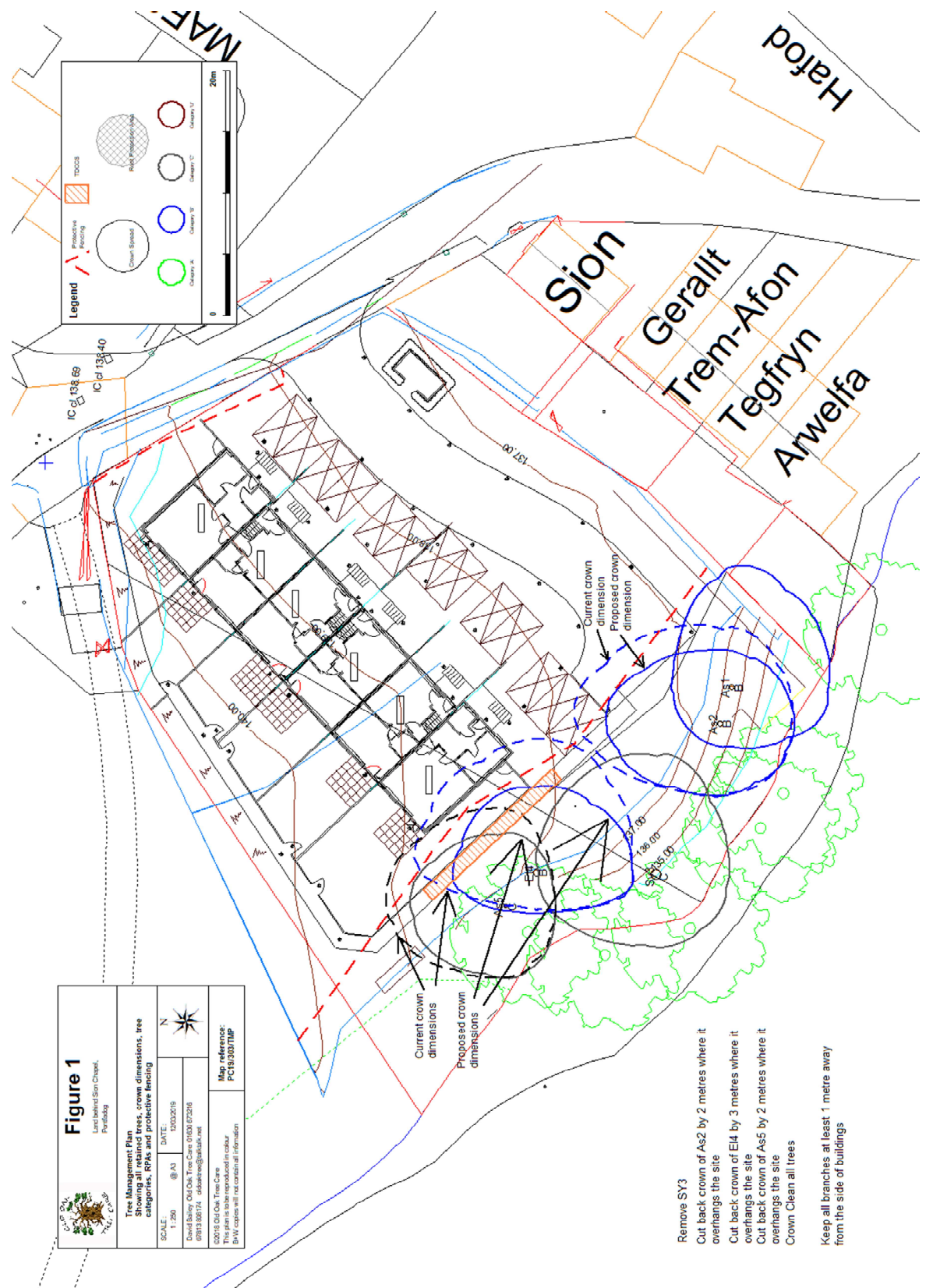
5. All retained trees should have ivy cut at the base of the tree to allow unblocked inspection of trees in the future once the ivy has died and fallen off.
6. All trees are to be crown cleaned. Dead diseased or faulty branches are to be removed. Dead wood up to 50mm in diameter at its largest part or above is to be removed. Smaller dead wood can be left as it is unlikely to cause harm.
7. All tree work is to comply with BS3998:2010 Tree Work: Recommendations. Tree surgeons carrying out the work are to be insured to at least £5 million public liability and hold suitable employers liability insurance. Only those who can demonstrate an understanding of the requirements should be employed to carry out the work.

Tree Management Plan

- a. A tree inspection should take place after construction work has finished. Any significant faults or concerns should be discussed with Wrexham Borough County Council's Tree Officer and work agreed.
- b. Anyone carrying out tree inspections and providing advice will need to be suitably qualified and/or experienced. They are required to hold professional indemnity insurance to safeguard the owners from liability.
- c. Any tree surgery company carrying out work is to be insured to at least £5 million public liability as well as suitable employer's liability insurance. All operatives are to be fully qualified for the work they undertake. All tree work is to comply with BS3998:2010 Tree Work: Recommendations.
- d. After the initial tree inspection, a record is to be filed with the housing association who owns the site as to the condition of the trees and proximity of branch tips to the building.
- e. A similar tree inspection is to take place every two years unless the condition of trees deteriorates and require more frequent inspection.
- f. Should the tree inspection reveal a need for work, this is to be recorded with the site owners and discussions with the WCBC tree officer will be held to ascertain the best course to be taken.

- g. The result of tree inspections will result in tree work schedules being created to deal with expected management issues such as removal of ivy if it starts to re-grow up stems or removal of large pieces of dead wood. It is recommended that dead wood above 50mm in diameter or larger at its largest part are removed from the tree. Small dead wood can remain as it is highly unlikely to cause significant damage.
- h. The branches of El4 and As5 will slowly extend towards the building over time and it is recommended that once within 1 metres distance to the house or overhanging it, the branches should be cut back by up to 2 metres in length. A similar care and methodology should be used as in paragraph 4.
- i. It is recognised most of the trees on-site are susceptible to serious and potentially fatal diseases, namely Dutch elm disease and Chalara dieback of ash. For this reason, tree inspections are set at two-year intervals. Appearance of this disease in either species of tree is to be monitored if found. Should the tree die it is to be removed. Communication with the WCBC will be necessary to update and propose tree works.
- j. All tree inspections and works are to be recorded with their findings and recommendations filed with the site owner.
- k. Any tree removed is to be replanted and maintained to BS8545:2014 Trees, from nursery to independence in the landscape: Recommendations.
- l. Should advice be required on tree inspections, conditions found or tree works required, I am always happy to discuss options over the telephone.

Page 4 of 4



Appendix G: Arboricultural Monitoring

Construction of six houses behind Sion Chapel, Pontfadog

Each item is to be dealt with by

- i) Contractor to organise stage and put in place all requirements as set out in method statement. PC19/325/MS. Advice is always available from the overseeing arboriculturist. Contractor to contact project arboriculturist to arrange site meeting.
- ii) Arboriculturist to attend site. Any areas of concern are to be addressed. Arboriculturist to sign off this stage and send form to LPA for countersigning.
- iii) Contractor to complete work until arriving at next stage.

	Description (relating to para of method statement)	Notes by Arboriculturist	Arb Sign off + date	LPA sign off + date
1	Hand-over of oversight from MS author to overseeing arboriculturist	MS author - David Bailey - 07813 808174 Overseeing arb – <i>insert name and contact details</i>		
2	Pre-commencement site meeting with foreman and as many staff as possible.			
3	Tree Work			
4	Erection of protective fencing and ground protection			
5	Correct installation of TDCCS			
6	Ad hoc visit (every 6 weeks (+/- 1 week))			
7	Ad hoc visit			
8	Ad hoc visit			
9	Ad hoc visit			
10	(Add as many visits as necessary)			
11	Contractor ready to remove tree protective fencing at end of project			
12	Any soft landscaping proposed in RPAs is suitable.			
13	At end of build, sign off tree protection has been correctly carried out			

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.



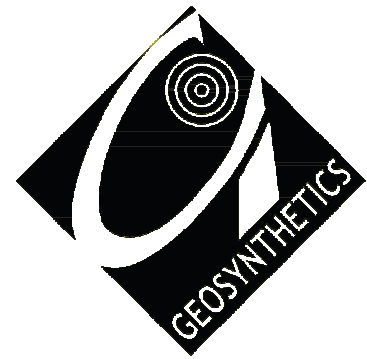
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Method Statement

For The Installation of Cellweb Tree Root Protection System.



When considering damage to tree roots, in applications of vehicular access and parking, the risk of oxygen depletion caused by compaction of subsoil's, site clearance damaging the root source and type of reinforcement are areas which need to be given due consideration.

Other risk factors are:

- Creating an impermeable surface
- Causing a rise in the water table due to construction
- Increasing ground level
- Contamination of subsoil's

1. Compaction

When looking at site conditions and use, the following information should be considered to enable a load bearing structure capable of supporting traffic to be proposed:

- Californian Bearing ratio (CBR) – Standard test method for measuring soil strength
- Soil types
- Water table
- Maximum load (vehicles)
- Acceptable rut depth
- Reinforcement type Cellweb Cellular Confinement 150mm deep
- Type and Depth of engineered infill material Clean, angular. Usually 40mm to 20mm.

2. Dig (site strip)

Site stripping does damage some root structure prior to construction; however, the use of no-dig construction elevates the access road requiring edge protection.

3. No dig

- | | |
|---|--|
| 3.1. Remove surface vegetation | Use a suitable herbicide suitable for the specific vegetation and not harmful to the tree root system |
| 3.2. Place geotextile separation filtration layer | Use a Treetex T300 non woven Geotextile over the prepared sub-grade. Overlap dry joints by 300mm. The three dimensional cell structure, is formed by ultrasonically welding polyethylene (perforated) strips / panels together to create a three dimensional network of interconnecting cells. A high degree of frictional interaction is developed between infill and the cell wall, increasing the stiffness of the system |
| 3.4. Edge restraint | A treated timber edging is usually acceptable. |

4. Cellular Confinement and Backfill Material.



Expand the Cellweb 2.56m wide panels to the full 8.1 metre length. Pin the Cellweb panels with staking pins to anchor open the cells and staple adjacent panels together to create a continuous mattress. Infill the Cellweb with a no fines angular granular fill (typically 4-20mm) within each open cell. The use of cellular confinement reduces the bearing pressure on the subsoil by stabilising aggregate surfaces against rutting under wheel loads. Comparisons between cellular confinement and traditional aggregate and geogrid-reinforced structures demonstrate a 50% reduction in construction thickness of the granular material.

5. Surfacing Options

Block Paving:

- 5.1. Lay second layer of Treetex T300 Geotextile separation fabric over the infilled Cellweb sections
- 5.2. Lay sharp sand bedding layer compacted with a vibro compaction plate to recommended depth.
- 5.3. Place block paviors as per manufacturers instructions.

Tarmac:

Place 25mm surcharge of the granular material above the Cellweb system and lay the bitumen base and wearing courses.

Loose Gravel:

- 5.4. Ensure Cellweb is completely filled.
 - 5.5. Place decorative aggregate to required depth
- NOTE: A treated timber edge should be provided to restrict gravel movement.

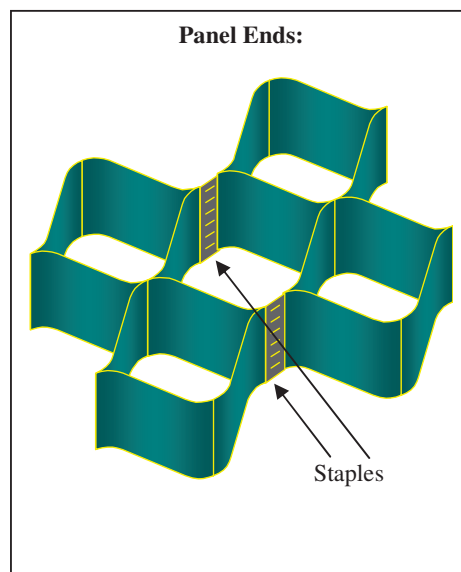
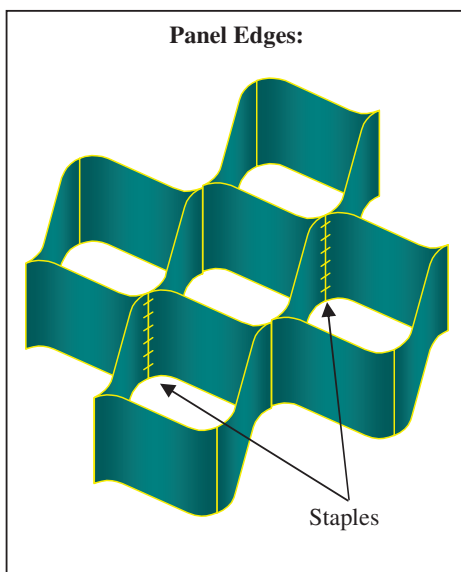
Grass Blocks:

- 5.6. Place second layer of Treetex T300 Geotextile separation fabric over the infilled Cellweb sections
 - 5.7. Place 50/50 rootzone bedding layer to the required depth
 - 5.8. Lay recycled Duo Block 500 Grass Protection System infilled with 50/50 rootzone mix.
 - 5.9. Seed as per architects instructions.
- (Alternatively the Grass Blocks may be infilled with gravel.)

Concrete Slab

- 6.0 Lay Cellweb as previous and place second layer of Treetex Geotextile directly over the filled panels. Pour concrete base as specified.

Below are illustrations of the correct stapling procedure for joining both edges and ends of panels together;



Appendix I - TDCCS edging

