



Arboricultural Implications Assessment and Method Statement



Land at Horndean Road, Emsworth

Arboricultural Implications Assessment and Method Statement

LAND AT HORNDEAN ROAD, EMSWORTH

Produced by:

Barrie Draper BSc (Hons) Arb TechCert(ArborA) CertArb(RFS)

Arboricultural Consultant

Report Ref: **181041 - AIA**

Report Date: **19 July 2019**

CONTENTS

No.	Title	Page
1	INTRODUCTION	3
2	SITE VISIT, DESCRIPTIONS AND SURVEY METHODOLOGY	5
3	ARBORICULTURAL IMPLICATIONS ASSESSMENT	7
4	SUMMARY OF THE IMPLICATIONS OF THE DEVELOPMENT ON TREES	12
5	PRELIMINARY ARBORICULTURAL METHOD STATEMENT	13
APPENDIX 1	Tree Protection Plan	18
APPENDIX 2	Tree schedule and inventory	19
APPENDIX 3	Illustrative specification for tree protection barriers	26
APPENDIX 4	Illustrative specifications for 'low invasive' type surfacing in RPAs	27
APPENDIX 5	BS 5837 (2012) – Assessment categories	29
APPENDIX 6	Qualifications and experience of Barrie Draper	30

1 INTRODUCTION

- 1.1 **Instruction:** I am instructed by Metis Homes to report on trees that could be affected by a development proposal for land at Horndean Road, Emsworth and prepare an Arboricultural Implications Assessment (AIA) and preliminary Arboricultural Method Statement (AMS) to support a planning application on the site.
- 1.2 **Document disclosure:** Initially, I was provided with a topographical survey (drawing reference 'Metis Homes-Emsworth-Horndean Road-REV A'). This showed the positions of the significant trees on or near the site, together with the existing buildings and other important features. Subsequently, I was supplied with a copy of the proposed layout, (drawing reference '1862-02') showing a new site configuration.
- 1.3 **Scope of report:** All my tree observations are of a preliminary nature, with the tree survey carried out from ground level without any investigations using invasive or diagnostic equipment. I was not able to fully view all the trees detailed in this report from all directions, as some were located on an adjacent private property. I have therefore confined observations of them to what was visible from within the site. I have not checked the accuracy of the positions of the trees shown on the provided plans and I have estimated all dimensions unless otherwise indicated.
- 1.4 **The Tree Protection Plan:** This is included in Appendix 1 and is a composite drawing derived from the information provided. It shows the existing landscape features (from the land survey) in grey superimposed over the top of the proposed layout shown in colour. This allows the relationship between the two to be clearly seen and an appropriate analysis of the implications of the proposed site changes to be undertaken. The Tree Protection Plan has also been annotated to show protection measures for the trees that could realistically be affected by the proposed development. It shows any activities in Root Protection Areas (RPAs) and if trees are to be removed, they are shown with a red dashed outline.

- 1.5 **Qualifications and experience:** This report is based on my site observations and I have come to my conclusions in the context of my experience as a former local government tree officer and a private practice arboricultural consultant. I have qualifications in both arboriculture and forestry and details of these, together with a career summary are provided in Appendix 6.
- 1.6 **Ecological issues and statutory tree protection:** Providing guidance on ecological issues is not within my sphere of expertise. However, trees and other vegetation can often provide nesting, roosting and feeding opportunities for protected species. Therefore, before any tree work proceeds on site, I advise that appropriate advice is sought to see whether the trees to be removed are being utilised by any protected species. At the time of writing, I have made no checks to ascertain whether any of the trees discussed are covered by tree preservation orders, or if the site is located in a conservation area. Therefore, any person intending to carry out any operations involving trees (before a formal planning consent is issued) should consult the council before any works are undertaken.

2 SITE VISIT, DESCRIPTIONS, OBSERVATIONS AND SURVEY METHODOLOGY

- 2.1 **Site visit and description:** I visited the site on 12 June 2019 to conduct my tree survey. The site is located in Horndean Road, which is situated toward the outskirts of the village of Emsworth and it is positioned to the rear of residential properties located on the western side of the road. The site is mainly under grass and there are a number of individual trees and intimate groupings located on or near to the site margins.
- 2.2 **Description of proposed development:** This development proposal is to construct sixteen new dwellings on the site.
- 2.3 **Soil assessment:** British Standard (BS) 5837: 2012 Trees in relation to design, demolition and construction – Recommendations advocates that a soil assessment should be carried out to inform decisions relating to Root Protection Areas (RPAs), tree protection, new planting and foundation design. I have consulted the British Geological Survey (BGS) website and their Geology of Britain viewer and this advises that the bedrock geology for the site is London Clay Formation - Clay, Silt and Sand. I did not undertake any excavations on site to confirm this and a full geotechnical site investigation may need to be undertaken to provide a more in-depth level of information regarding soil type for the site.
- 2.4 **Tree survey methodology:** My inspection of the trees was visual and did not involve any climbing or exploratory investigations. During my visit, I identified obvious groups where this was appropriate and I assigned an identification number to each tree or group, as shown on the plan in Appendix 1. I then collected the tree data included in Appendix 2 and placed the vegetation in one of four categories (U, A, B or C), as set out in British Standard (BS) 5837: 2012. I have included the BS categorisations in Appendix 5 for easy reference. Where of relevance, I also estimated the crown spreads for each tree at the appropriate cardinal compass points and this information is also shown in the tree schedule in Appendix 2. Although this document is not meant to be a full and detailed report on tree health and safety, any significant visible structural defects or physiological conditions identified, together with preliminary tree works, are also noted in the appropriate columns in the tree schedule in Appendix 2. However, a full post

development tree inspection is recommended to establish that the trees retained during construction pose acceptable levels of risk once the development has been completed.

- 2.5 **Data interpretation:** The Root Protection Area (RPA) calculations are included in Appendix 2. As set out in paragraphs 4.6.2 and 4.6.3 of the BS, the RPAs may have been adjusted as a matter of arboricultural judgement, to indicate the estimated likely position of tree roots. These modified (or unmodified) RPAs dictate the location of the tree protection barriers (which encompass the Construction Exclusion Zones - CEZs) and also determine the position of any ground protection measures. Tree protection details are shown on the plan included in Appendix 1. Where there is a need for incursions into RPAs, an assessment of the implications of these activities is set out in Section 3 (Arboricultural Implications Assessment) of this report. Where appropriate, details of suitable work methodologies to mitigate any impact are set out in Section 5 (Arboricultural Method Statement).

3 ARBORICULTURAL IMPLICATIONS ASSESSMENT

3.1 **Introduction to the implications of the development proposal on trees:** BS 5837: 2012 sets out in some detail how trees on development sites should be managed. It is usually accepted amongst arboriculturists that Category A (high quality) and Category B (moderate quality) trees are potential constraints on any development proposal, whereas those belonging to Category C (low quality) are considered to be generally less important. Category U trees/hedges are in such poor condition that they are considered unsuitable for retention. This is because they cannot realistically be retained as living entities in respect of the current land use for longer than 10 years. Therefore, these can be effectively discounted in the context of a planning application. On this site a total of TWENTY TWO individual trees and groups are detailed in this report and were assigned to the BS 5837 (2012) categories, as set out in Table 1 below:

Category A and B trees	A total of ELEVEN trees and groups (T1, T2, T3, T5, T6, T8, T9, G10, T12, G16 and T17) were rated Category A and B
Category C trees	A total of TEN trees and groups (G4, T7, G11, G14, T15, G18, G19, T20, G21 and T22) were rated Category C
Category U trees	A total of ONE tree (T13) was rated Category U

Table 1: Tree numbers and BS categories

I have focussed on the implications of the development proposal mainly on the important trees on or near the site (Category A and B) in terms of tree loss/retention and by the extent of any incursions into and/or disturbance to Root Protection Areas (RPAs). I have also considered the implications on the Category C trees present. Of the total of TWENTY TWO trees and groups detailed in this report, TWO groups are scheduled to be removed to facilitate this development proposal. Additionally, FIVE trees will have activities arising from the development occurring within their RPAs. I have summarised the development related implications on trees in Table 2 below and set these aspects out in more detail in the following paragraphs.

Trees to be removed for development		Activities in RPAs arising from the development proposal	
Category A and B	Category C	Category A and B	Category C
n/a	G19 and G21	T1 (ground protection issues and new car parking, footpath and bin storage area/shed), T5 (sheds and footpath), T6 (new car parking, footpath and shed) and T17 (new car parking, footpath and bin storage area/shed)	T20 (new car parking)

Table 2: Trees lost and activities in RPAs arising from the development proposal

3.2 Direct implications of the development proposal - Tree retention and tree loss

3.2.1 BS Category A and B trees to be retained (trees of high and moderate quality): All the Category A and B trees surveyed will be retained and protected in accordance with the guidance set out in BS 5837 (2012). Consequently, no high or moderate category trees will need to be removed to facilitate this development proposal.

3.2.2 BS Category C trees to be removed (or those of low quality): As discussed, trees belonging to Category C are not normally retained where they would impose a significant constraint on the development or redevelopment of a site. In this instance, TWO groups (see Table 2) are scheduled to be removed to facilitate the development proposal. I set out my view on the implications of the loss of these trees, as follows:

- **Group G19:** This group of trees is small in size and they will be located very close to the new access drive. I have therefore shown them to be removed. The trees are small in size and as such I feel that they make a limited contribution to local amenity. Consequently, I feel that their removal is unlikely to have significant implications in the locality.

- **Group G21:** The trees in this group will need to be removed to allow the new entrance drive to be formed. Access into the area was not possible to conduct a full survey due to the presence of brambles and other dense vegetation and so observations of these trees were from areas within the site and also the nearby highway. The trees within the group appeared to be either quite small in size, self-sown or rather unremarkable. Consequently, I do not feel that there are particularly important trees in the local area. New tree planting is indicated along the side of the new access and further details are included on the Landscape Architects plans for the project submitted to the council under a separate cover. In my view, this new planting has the potential of maturing into a significant and useful landscape feature and would be more than capable of mitigating the loss of the trees scheduled to be removed.

3.3 **Additional implications arising from the development proposal**

3.3.1 **Trees and activities in RPAs:** FIVE trees will have activities arising from the development occurring in their RPAs. My comments on these issues are as follows:

- **New car parking:** New car parking spaces are proposed within the RPAs of trees T1, T6, T17 and T20. After careful consideration and discussions with the client, it has been agreed that the sub base for this new hard surfacing will be a cellular confinement system. This will negate the need for significant excavation and excessive disturbance within the RPAs of nearby trees. The use of cellular confinement systems is supported in BS 5837 (2012), together with bespoke suspended engineered solutions (paragraph 7.4.2.7). The surfacing will be installed before any clearance or construction activities occur on site and will act as ground protection throughout the construction phase. Consequently, the protective barrier positions shown on the plan included in Appendix 1 are set back from the full BS protection distances to allow space for this to be installed. I have set out some guidance in section 5.2.2 of this report detailing how this work should proceed in order to reduce the risk of implications for these trees. Provided the work proceeds in accordance with this methodology, then I feel that the risk of significant impact for these trees is likely to be relatively low.

- **Ground protection:** The protective barriers around tree T1 will need to be set back in two positions to allow sufficient room for the positioning of scaffolding and to provide suitable space for the movement of materials and personnel around the new buildings during their construction. The protective barrier positions around the trees are shown on the plan in Appendix 1. The part of the RPA that is outside of the barriers will be covered in ground protection and this will be installed after the erection of the barriers, but before any clearance or construction work starts on site. It is proposed that the ground protection will consist of a temporary cellular confinement system, with the areas then accommodating new pedestrian footpaths. The provision of ground protection to allow pedestrian access in RPAs is supported in paragraph 6.2.3 of BS 5837 (2012) and I do not perceive this to be a particular problem provided it is implemented correctly and remains in situ during the construction phase of the project.

- **New sheds/bin storage and pedestrian footpaths:** Trees T1, T5, T6 and T17 will have new provision of these elements within their RPAs. In my experience, sheds and bin storage areas do not require significant foundations and these can sit upon simple concrete slabs cast at more or less ground level. Consequently, I do not feel that the construction of the sheds and bin areas require any particular precautions and I would not envisage any significant tree implications arising from their positioning. The pedestrian footpaths within RPAs can also be constructed at natural ground level and incorporate cellular sub bases to reduce any implications, as set out in the guidance included in section 5.2.2 of this report.

3.4 Additional site tree issues

- 3.4.1 **BS Category U trees normally removed for management reasons:** Category U trees are in such poor condition that they are considered unsuitable for retention. This is because they cannot realistically be retained in an acceptable condition in the context of the current land use for longer than 10 years. Therefore, these can be effectively discounted in the context of the planning process. On this site, I have assessed tree T13 as falling into Category U. However, it is shown for retention as it was felt that it is sufficiently far enough away from areas of residential occupancy, or high use zones and so its retention is not currently in conflict with the safe use of the site.

- 3.4.2 **Tree protection during development:** A preliminary Arboricultural Method Statement is included in Section 5 and it details the various issues associated with successful tree protection in a development context on this site. If deemed appropriate by the council, this can be specifically referred to in a suitably worded planning condition attached to any subsequently issued planning consent.

4 SUMMARY OF THE IMPLICATIONS OF THE DEVELOPMENT ON TREES

- 4.1 **Summary:** Of the total of TWENTY TWO trees and groups detailed in this report, TWO groups are scheduled to be removed to facilitate this development proposal. Additionally, FIVE trees will have activities arising from the development occurring within their RPAs. These activities include the installation of new surfacing/structures and the use of ground protection measures within RPAs. The trees to be removed are either small in size and/or unremarkable and so their loss is unlikely to have any particular implications in the locality. Provided the tree protection measures set out in this report are realised and the sensitive work within RPAs is carried out with due care, then the proposed development is arboriculturally acceptable and there will be a low risk of any adverse impact on the trees scheduled to be retained.

5 PRELIMINARY ARBORICULTURAL METHOD STATEMENT

5.1 Tree protection issues

5.1.1 Tree Protection Plan (TPP): The plan in Appendix 1 is illustrative, but is based on the layout drawings and topographical survey provided. Therefore, all scaled measurements should be checked against the original design documents. The attached plan and all other information in this report should only be used for dealing with the tree protection issues and all other uses are prohibited, unless authorised by **ecourban** Ltd. Normally, all the existing trees will have been numbered, with higher categories (A and B) highlighted in green and blue rectangles and low categories (C and U) highlighted in grey and red respectively. The plan also shows the locations of the proposed protective measures, including areas where special care may be required. Additionally, any trees to be removed are indicated with a red dashed crown outlines. The TPP is an important document, and a copy of it should be kept on site for reference whilst the development is under construction.

5.1.2 Protective barriers: The approximate location of the barriers is illustrated on the plan in Appendix 1 and information on barrier design based on BS 5837 (2012) guidance is included in Appendix 3. The protective barriers will be erected before any materials or machinery are brought onto the site and before any clearance or construction activities occur. With the exception of the barrier positions around trees T1, T5, T6 and T17 (see below), once the protective barriers have been positioned, these will stay in situ for the duration of the construction, unless previously agreed with the arboricultural consultant or council's tree officer. There will be no access into the protected areas and the storage of excavated debris and building materials will be prohibited, unless authorised by the arboricultural consultant, after discussion with the council's tree officer. No fires or fuel storage will be allowed within or near to protected areas under any circumstances.

5.1.3 Temporary repositioning of barriers: With regard to trees T1, T5, T6 and T17, the barriers around these trees encompass areas where new sheds, footpaths and bin stores are required. The barriers around these trees will be redeployed to the edge of the construction zone to allow limited and controlled access into the protected areas to allow

these activities to commence. However, the movement of the barriers will only occur immediately prior to the commencement of these tree sensitive works, so as to reduce the risk of any incidental construction related damage occurring to trees scheduled for retention.

5.1.4 **Ground protection measures:** Where the positioning of tree protection barriers is not feasible due to the need for construction access, then ground protection measures will be needed to safeguard RPAs. The position of ground protection is shown on the plan included in Appendix 1. The ground protection will be installed before any materials or machinery are brought onto the site and before any clearance or construction activities occur. In this instance, it is proposed that the ground protection will consist of a temporarily positioned cellular confinement system installed as set out in section 5.2.2 below. Again, once the ground protection has been positioned, it will stay in situ for the duration of the construction phase, unless previously agreed with the arboricultural consultant or council's tree officer.

5.2 **Arboriculturally sensitive operations**

5.2.1 **Activities in Root Protection Areas (RPAs):** Work in RPAs must be done with care, as set out in the following text. Site personnel will be properly briefed before any activities start and all sensitive work will be inspected regularly during the course of operations.

5.2.2 **Installation of new surfacing:** Trees T1, T6, T17 and T20 will be affected by this activity. I have shown the minimum extent of 'low invasive' type surfacing required to successfully retain these trees on the plan included in Appendix 1. This is based on their BS derived RPAs and so will also act as ground protection for the parts of their RPAs that are outside the protective barriers. Consequently, this surfacing will need to be installed before any other construction activity occurs on site. The use of a cellular confinement system is suggested in BS 5837 (2012) as one appropriate way to achieve hard surfacing over tree roots, and the following guidance is based on this principle. However, before implementation the following specifications and guidance will need to be reviewed by an engineering specialist, to ensure that the final construction is appropriate from an engineering viewpoint and suitable for the purpose intended.

- **Installation:** An installation video for a proprietary cellular confinement system is available to view at http://www.youtube.com/watch?v=-vIzHJ_LFho. Generally, any required changes in topography will be accomplished by the use of fill materials rather than cutting into the existing site levels, which could have a significant impact on tree health. Suitable fill materials include uncompacted crushed stone or sharp sand. In this instance, the removal of the top layer of vegetation to a depth of 50mm (to provide a flat surface for the installation of the cellular sub base) is unlikely to encounter or damage any tree roots. Any additional excavation will need to be assessed by the arboriculturist, in consultation with the council's tree officer. Where roots may need to be cut, those smaller than 25mm diameter may be pruned back, preferably to a side junction, using a cutting tool such as bypass secateurs or handsaws. Roots larger than 25mm should only be severed following consultation with an arboriculturist, as they may be essential to the tree's health and stability.

- **Sub base and final wearing courses:** Once a level surface has been formed, the cellular system will be installed on top of the existing soil, with no compaction of its structure. The cell infill material will be crushed aggregate (typically 20-40mm, clean angular stone), with no fines, as per the manufacturer's specification. A temporary wearing course of tarmac and/or aggregate, separated by a geotextile membrane is likely to be the most appropriate way of providing a suitable ground protection/working surface during the clearance and construction phase of the project. At the final stages of the construction, the temporary wearing course will be removed (under arboricultural supervision), and the final surfacing will be installed. Suitable final wearing courses include resin bound gravel, paving slabs, washed gravel or block pavements set on a sand base, although other surfacing may be suitable after consultation with the arboriculturist.

- **Edge retention:** The use of non-invasive ground contact structures (including proprietary edging products, gabions, wooden boards or railway sleepers) is suggested in BS 5837 (2012) as effective edge supports in RPAs, to be secured by metal rods, track or road pins or wooden pegs. This, or a similar approach (negating the need for excessive disturbance in RPAs) will be used to minimise any adverse risk of impact on trees.

- **Illustrative specifications:** Final drawings will be prepared by the project engineer. These will be based on the illustrative manufacturers specifications for special surfacing included in Appendix 4, or an alternative 'low invasive' construction technique. These definitive plans can be secured by way of a suitably worded planning condition and approved by the council before any construction activity occurs on site.

5.3 **Additional tree-related issues**

- 5.3.1 **Site supervision:** Site personnel will be properly briefed regarding the tree protection issues before any work starts and the tree protection will be inspected periodically to ensure the retained trees are protected in accordance with this document and any conditions imposed by the council.
- 5.3.2 **Installation of new services or upgrading of existing provision:** Final details relating to services are traditionally left until after planning consent has been granted by the council. Where practicable, all new services will be outside RPAs, but where existing services within RPAs need upgrading or new provision is required, great care will be taken to minimise any disturbance. Trenchless installation will be the preferred option, but if this is not feasible, any excavation will be carried out by hand in accordance with the guidelines set out in NJUG Volume 4 - Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.
- 5.3.3 **Material storage areas and site compounds:** All construction material storage areas, cement silos or cement mixing areas, fuel storage points and compounds for machinery etc. will be outside protected areas, unless otherwise agreed with the council.
- 5.3.4 **Contractors car parking, site offices and welfare facilities:** Whilst it is possible to have site offices and welfare facilities within RPAs, care is needed in their positioning and also in the connection of water, electricity and drainage to service them. Therefore, these will generally be sited outside the RPAs, unless agreed previously with the council. Contractor's car parking facilities will also be located away from retained trees.

5.3.5 **Tree works:** Any tree pruning or tree removal operations are set out in the tree schedule included in Appendix 2. Additionally, those trees scheduled for removal are also shown on the Tree Protection Plan included in Appendix 1.

5.3.6 **Planning, communication and preliminary timing of events:** It is not unusual for the details of timing of operations that could impact on important trees to only be finalised once planning consent has been given. Site managers, clearance and construction teams, and other important personnel are normally only appointed at this stage and it is these people who will be crucial in delivering the tree protection detailed in this report. My experience is that the pre commencement site meeting is critical in terms of avoiding damage to trees and this particular aspect, along with tree protection issues should be specifically referenced in a suitably worded planning condition imposed by the council. In the intervening time I propose the following preliminary cascading timetable of events to help minimise any risk of impact on important trees. However, the following schedule may be modified at the pre-commencement meeting, subject to discussion with all parties and agreement with the council:

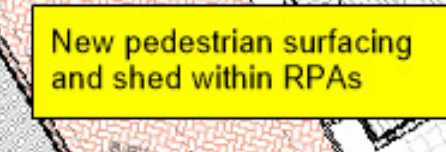
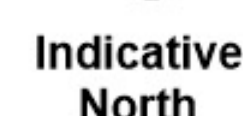
1. Pre-commencement site meeting
2. Extent of arboricultural supervision agreed
3. Tree works undertaken
4. Protective barriers erected before any clearance or construction activities occur on site and notification to the council that this is in place
5. Ground protection installed before any clearance or construction activities occur on site and notification to the council that this is in place
6. Installation of new surfacing – Where this is to also act as ground protection, this must be installed before any clearance or construction activities occur on site
7. Temporary repositioning of barriers to allow controlled access into protected areas to allow construction of new bin stores, sheds and footpaths
8. Tree protection only removed at the end of the construction phase when there is no longer any risk to trees

Barrie Draper BSc (Hons) Arb TechCert(ArborA) CertArb(RFS)
Arboricultural Consultant

Date: **19 July 2019**

APPENDIX 1: TREE PROTECTION PLAN

1 A0 plan



This drawing was originally produced in colour, therefore any subsequent monochrome photocopies may not show appropriate levels of detail and should not be relied upon for the purposes of dealing with site tree issues

APPENDIX 2: TREE SCHEDULE AND INVENTORY

Background fill colour represents BS 5837 (2012) categories: A Category trees have green backgrounds, B Category trees have light blue backgrounds, C Category trees have grey backgrounds and U Category trees have red backgrounds.

Tree No.	Species	Ht (m)	Single stem diameter at 1.5m (cm)	Est. Dia. *	STEM DIAMETERS (Multi Stem)							Branch Spread (m)				Height above ground (m)	Age class	Notes	Management proposals	BS cat.	RPA area (m ²)	RPA radius (m)	
					Multi stemmed trees with 1 - 5 stems (cm)					Multi stemmed trees with 1 - 5 stems combined (cm)	Multi stemmed trees >5 stems												
					1	2	3	4	5		Mean stem dia (cm)	No. of stems	N	E	S								W
All Trees																			Crown lift to 4m over site where needed and crown clean canopies				
T1	Oak	18	>125	-	-	-	-	-	-	-	-	-	11	-	8	8	4	OM	Aged boundary tree. Cavities main stem with decay ingress and storm damage in canopy. Limited access to survey because of ground/shrub vegetation. Some large diameter deadwood in crown.	Further investigation required.	A2	707	15.0
T2	Oak	16	68	*	-	-	-	-	-	-	-	-	4	-	4	8	4	MA	Boundary tree. Limited access to survey because of ground/shrub layer vegetation. Stem covered in ivy. Some large dead wood in canopy. Influenced by proximity to adjacent trees.		A2	209	8.2

APPENDIX 2: TREE SCHEDULE AND INVENTORY

Tree No.	Species	Ht (m)	Single stem diameter at 1.5m (cm)	Est. Dia. *	STEM DIAMETERS (Multi Stem)								Branch Spread (m)				Height above ground (m)	Age class	Notes	Management proposals	BS cat.	RPA area (m ²)	RPA radius (m)
					Multi stemmed trees with 1 - 5 stems (cm)					Multi stemmed trees with 1 - 5 stems combined (cm)	Multi stemmed trees >5 stems												
					1	2	3	4	5		Mean stem dia (cm)	No. of stems	N	E	S	W							
T3	Oak	16	60	-	-	-	-	-	-	-	-	-	2	-	7	7	4	MA	Boundary tree. Limited access to survey because of ground/shrub layer vegetation. Influenced by proximity to adjacent tree.		A2	163	7.2
G4	Mainly hawthorn, goat willow and blackthorn	6	15	* largest	-	-	-	-	-	-	-	-	3	3	3	3	3	Y/MA	Small trees/shrubs.		C1	10	1.8
T5	Oak	19	80	*	-	-	-	-	-	-	-	-	9	-	9	10	4	M	Boundary tree. No direct access to survey due to brambles. Epicormic on lower stem.		A2	290	9.6
T6	Oak	16	80	*	-	-	-	-	-	-	-	-	4	-	8	8	4	M	Boundary tree. No direct access to survey due to brambles. Some crown asymmetry due to proximity to nearby tree. Some large diameter deadwood in canopy.		A2	290	9.6
T7	Oak	9	25	*	-	-	-	-	-	-	-	-	3	3	3	3	3	Y	Small boundary tree. No access or clear lime of sight to survey.		C1	28	3.0

APPENDIX 2: TREE SCHEDULE AND INVENTORY

Tree No.	Species	Ht (m)	Single stem diameter at 1.5m (cm)	Est. Dia. *	STEM DIAMETERS (Multi Stem)								Branch Spread (m)				Height above ground (m)	Age class	Notes	Management proposals	BS cat.	RPA area (m²)	RPA radius (m)
					Multi stemmed trees with 1 - 5 stems (cm)					Multi stemmed trees with 1 - 5 stems combined (cm)	Multi stemmed trees >5 stems												
					1	2	3	4	5		Mean stem dia (cm)	No. of stems	N	E	S	W							
T8	Oak	23	72	*	-	-	-	-	-	-	-	-	8	-	-	9	4	M	Boundary tree. Stem covered in ivy and access restricted for measurement by fence. Some deadwood in canopy. Some crown asymmetry.		A2	235	8.6
T9	Oak	23	101	-	-	-	-	-	-	-	-	-	9	12	-	12	4	M	Offsite park tree.		A2	461	12.1
G10	London plane	11	29	* largest	-	-	-	-	-	-	-	-	5	2	-	4	3	Y	Linear grouping of young offsite trees with long potential safe and useful life expectancy.		B2	38	3.5
G11	Mainly blackthorn with some oak and a sweet chestnut and white poplar	6	20	*	-	-	-	-	-	-	-	-	-	3	-	-	3	MA	Small trees/shrubs.		C1	18	2.4
T12	Oak	12	38	-	-	-	-	-	-	-	-	-	4	4	4	-	3	MA	Boundary tree. Long potential safe and useful life expectancy.		A2	65	4.6
T13	Oak	9	24	-	-	-	-	-	-	-	-	-	3	7	3	-	2	Y/MA	Stem lean and severely unbalanced canopy.		U	26	2.9

APPENDIX 2: TREE SCHEDULE AND INVENTORY

Tree No.	Species	Ht (m)	Single stem diameter at 1.5m (cm)	Est. Dia. *	STEM DIAMETERS (Multi Stem)								Branch Spread (m)				Height above ground (m)	Age class	Notes	Management proposals	BS cat.	RPA area (m²)	RPA radius (m)
					Multi stemmed trees with 1 - 5 stems (cm)					Multi stemmed trees with 1 - 5 stems combined (cm)	Multi stemmed trees >5 stems												
					1	2	3	4	5		Mean stem dia (cm)	No. of stems	N	E	S	W							
G14	Goat willow	8	-	* largest	33	24	43	-	-	59	-	-	-	9	-	-	3	M/OM	Closely spaced trees, most with structural defects, some collapsed.	Remove any damaged or broken branches and crown lift to 3m over site	C1/U	159	7.1
T15	Oak	8	25	*	-	-	-	-	-	-	-	-	3	4	3	-	3	Y	Small tree.		C1	28	3.0
G16	Oak	15	85	*	-	-	-	-	-	-	-	-	-	9	8	-	4	M	Boundary trees, no access or clear line of sight to survey. Some deadwood in canopies.		A2	327	10.2
T17	Oak	17	90	*	-	-	-	-	-	-	-	-	-	6	8	6	4	M	Offsite tree, no direct access or clear line of sight to survey. Some thinning of branch extremities and large limb removal upper canopy.	Monitor	B1	366	10.8
G18	Elder and holly	3	15	* avg.	-	-	-	-	-	-	-	-	-	-	2	-	3	MA	Small trees/shrubs.		C1	10	1.8
G19	Elm, cherry and apple	7	19	* largest	-	-	-	-	-	-	-	-	-	-	5	-	3	Y/MA	Small trees.	Fell	C1	16	2.3
T20	Oak	12	42	*	-	-	-	-	-	-	-	-	2	5	5	4	3	MA	Stem covered in dead ivy. Leaning. Unbalanced.		C1	80	5.0

APPENDIX 2: TREE SCHEDULE AND INVENTORY

Tree No.	Species	Ht (m)	Single stem diameter at 1.5m (cm)	Est. Dia. *	STEM DIAMETERS (Multi Stem)								Branch Spread (m)				Height above ground (m)	Age class	Notes	Management proposals	BS cat.	RPA area (m²)	RPA radius (m)
					Multi stemmed trees with 1 - 5 stems (cm)					Multi stemmed trees with 1 - 5 stems combined (cm)	Multi stemmed trees >5 stems												
					1	2	3	4	5		Mean stem dia (cm)	No. of stems	N	E	S	W							
G21	Fruit, elder, ash, sycamore and Lawson cypress	9	16	* largest	-	-	-	-	-	-	-	-	2	2	2	2	2	Y/MA	No direct access to survey, overgrown. Unremarkable domestic conifer planting and small fruit trees.	Fell	C1	12	1.9
T22	Ash	18		*	35	38	38	40		76					6			M	Offsite tree. Old pollard. Canopy symptoms indicating declining vitality. Possible Ash Dieback Disease infection.		C1/U	258	9.1

ABBREVIATIONS:

Abbreviations	Meaning	Abbreviations	Meaning	Abbreviations	Meaning
T	Individual tree	M	Mature	RPA	Root Protection Area
G	Groups of trees	MA	Maturing	<	Less than
H	Hedge	Y	Young	>	More than

APPENDIX 2: TREE SCHEDULE AND INVENTORY

TREE SCHEDULE GUIDANCE NOTES:

Tree number	Assigned during the site visit and also referenced on the plan in Appendix 1.
Species	Common name and referenced to scientific name in the above list. Where I have some doubt over the actual tree species, the genus will have been noted followed by sp. Where trees are numerous and present in groups, not every individual species may have been noted.
Height	Measurement of total tree height using a laser hypsometer to nearest metre or where clear line of site is not possible then an estimate based on interpolation of heights of nearby measured trees.
Stem diameters	Measurement of stem diameter either at 1.5m above ground (or in accordance with BS guidance where trees have multiple stems) with a forester's girth measuring tape. Diameters followed by asterisk symbol indicate estimated diameters because of access difficulties, presence of ivy or other obstructions. Where trees are present in a group, the tree with the largest stem diameter within the group will have been measured/estimated.
Est. Dia.	Estimated diameters due to access restrictions are indicated with an asterisk
Branch spread	Where appropriate and where ground conditions allow, an estimate of the crown spread at each of the cardinal compass points. Where only part of the site is affected by trees, measurement may be in one or two directions only
Existing height above ground level	Distance in metres to first significant branch or canopy or a height above which crown lifting operations would not be appropriate
Age class	Simplistic estimate of tree age in one of FOUR categories (young, maturing, mature or over mature).
Notes	Although this document is not intended to be a full and detailed report on tree health and safety, any significant structural defects or physiological conditions have been identified where these were visible. Where no entries are recorded, this indicates no observable issues were identified. Where there is restricted access to the base of a tree, its attributes are assessed from the nearest point of access. Climbing inspections are not carried out during a walkover tree survey and, if heavy ivy is present, tree condition is assessed from what can be seen from the ground.
Management proposals	The inspection of all trees was of a preliminary nature and only defects visible from the ground have been identified. Each individual tree may not have been inspected closely because of access difficulties and only defects visible from the inspection point have been identified. Monitoring may be indicated where tree risk can be adequately managed by increased frequency of site inspections. Further investigation may be indicated where additional data may be required beyond a purely visual assessment. However, a full post development tree inspection is recommended to establish that the trees retained during construction pose acceptable levels of risk once the development has been completed.

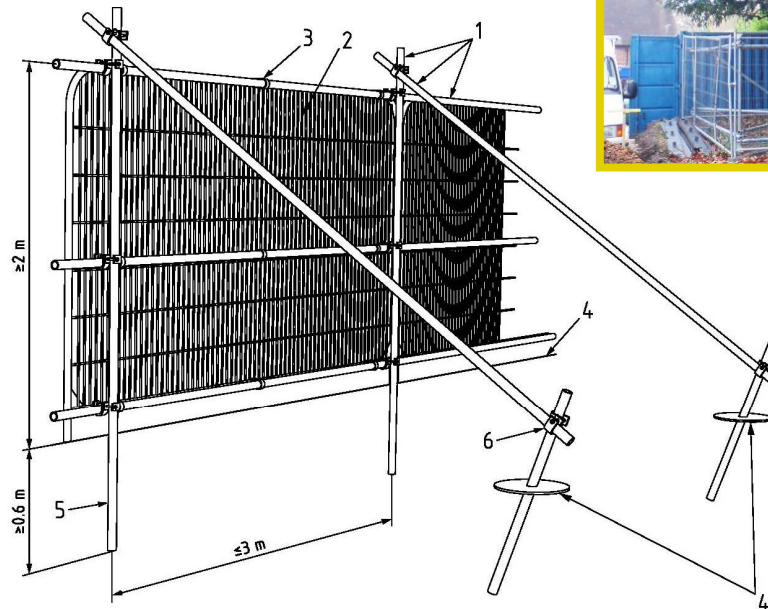
APPENDIX 2: TREE SCHEDULE AND INVENTORY

BS 5837 (2012) Category	<i>Either U, A, B or C based on the BS 5837 (2012) guidance.</i>
RPA and RPA radius	<i>RPA and RPA radius calculations have been undertaken in accordance with the guidance set out in BS 5837 (2012).</i>

TREE INVENTORY:

Common Tree Names	Scientific Tree Names		Common Tree Names	Scientific Tree Names
Ash	<i>Fraxinus excelsior</i>		Lawson cypress	<i>Chamaecyparis lawsoniana</i>
Blackthorn	<i>Prunus spinosa</i>		Lime	<i>Tilia x europaea</i>
Cherry	<i>Prunus</i> sp		London plane	<i>Platanus x hispanica</i>
Elder	<i>Sambucus nigra</i>		Oak	<i>Quercus robur</i>
Fruit	<i>Malus</i> sp, <i>Prunus</i> sp or <i>Pyrus</i> sp		Sycamore	<i>Acer pseudoplatanus</i>
Goat willow	<i>Salix caprea</i>		Sweet chestnut	<i>Castanea sativa</i>
Hawthorn	<i>Crataegus monogyna</i>		White poplar	<i>Populus alba</i>

APPENDIX 3: ILLUSTRATIVE SPECIFICATION FOR TREE PROTECTION BARRIERS



Key

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

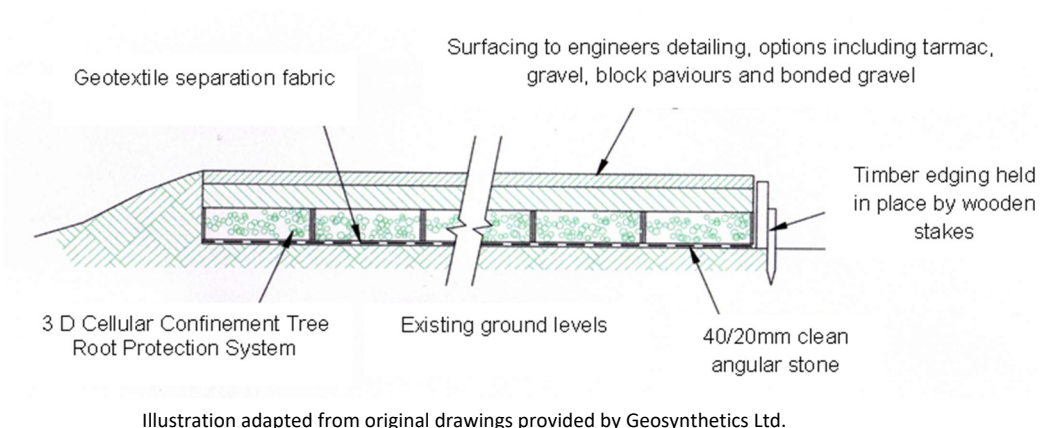
Illustration taken from British Standard 5837 (2012): Trees in relation to design, demolition and construction – Recommendations.

The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts. 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.

– BS 5837 (2012)

Ref: Tree Protection Barriers (Type 1)	Drawing No. TPB1
Scale: N/A	

APPENDIX 4: ILLUSTRATIVE SPECIFICATION FOR 'LOW INVASIVE' TYPE SURFACING IN RPAs



Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems. Alternatively, piles, pads or elevated beams can be used to support surfaces to bridge over the RPA or, following exploratory investigations to determine location, to provide support within the RPA while allowing the retention of roots greater than 25 mm in diameter.

– BS 5837 (2012)

Ref: No dig surfacing	Drawing No. NDS 1
Scale: N/A	

APPENDIX 4: ILLUSTRATIVE SPECIFICATION FOR 'LOW INVASIVE' TYPE SURFACING IN RPAs

CellWeb



The CellWeb System uniquely prevents rutting action of sub-soils by confining infill material within the hoop structure of the panel, increasing the infills shear strength. The use of a CellWeb System increases the load capacity of granular infill by up to 50% reducing the overall construction depth required. Perforated cell walls permit through drainage and also provides frictional interlock of the infill again increasing the shear strength of the system.

A non woven geotextile filtration/separation membrane is used beneath the system to prevent migration of materials and also to aid with drainage vertically through the system.

The CellWeb panels are infilled with a clean angular gravel which provides load support and permits air and moisture transfer to the roots ensuring the long term preservation of the tree root structure. (fig. 5)

Surfacing materials are at the discretion of the client, however for specific advice please contact our sales office.

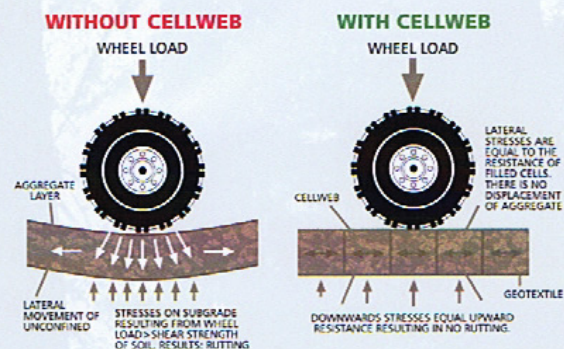


fig. 3

fig. 4

Benefits of using CellWeb

- Reduction in construction depth.
- Prevent compaction of sub-soils.
- Prevent oxygen/nutrient depletion.
- Environmentally friendly option.
- Fast and economic installation.
- Technical support available.

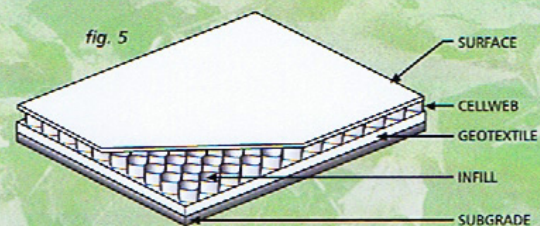


fig. 5

CellWeb is available in four cell depths; 75mm, 100mm, 150mm and 200mm.

The cell depth required is dependant upon specific site conditions. For specification details or project specific design assistance please contact our sales office.

Please contact:

Geosynthetics Limited
Fleming Road,
Harrowbrook Ind. Estate,
Hinckley, LE10 3DU.

Telephone: 01455 617139

Facsimile: 01455 617140 Email: sales@geosyn.co.uk

www.geosyn.co.uk

APPENDIX 5: BS 5837 (2012) – ASSESSMENT CATEGORIES

TREES FOR REMOVAL				
Category and definition	Criteria			Identification on plan
<u>Category U</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.</i>			RED
TREES TO BE CONSIDERED FOR RETENTION				
Category and definition	Criteria — Subcategories			Identification on plan
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
<u>Category A</u> 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
<u>Category B</u> Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation)	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	BLUE
<u>Category C</u> Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	GREY

APPENDIX 6: QUALIFICATIONS AND EXPERIENCE OF BARRIE DRAPER

- 1 Qualifications:** I have a BSc degree (with Honours) in Arboriculture from the University of Central Lancashire. I also hold a BTEC Higher National Diploma (HND) in Forestry (Lowland Management), the Arboricultural Association's Technician's Certificate in Arboriculture (Tech Cert), the Royal Forestry Society's Certificate in Arboriculture (Cert Arb) and the National Examinations Board Certificate in Forestry.
- 2 Career experience:** I began my arboricultural career in 1993 as an arborist with Portsmouth City Council. During my time with the council I worked for both the direct labour organisation and for a private contractor where I obtained valuable hands on experience in all aspects of arboriculture. From 1999 to 2002 I was employed as Senior Arborist by Parchment Housing Group, a housing association based near Portsmouth. I managed the Groups' tree stock on their behalf, carrying out tree inspections and practical management operations. I have also worked in local government, spending time with Thurrock Borough Council in Essex where I was the Tree and Landscape Officer, and with Winchester City Council, where I was Arboricultural Officer for a period of 2 years. During my time working in local government I was responsible for making Tree Preservation Orders, administering applications to work on protected trees and advising on planning applications when trees were considered material constraints on development. Working within a planning environment allowed me to gain valuable experience in the management of trees in development situations and an understanding of the planning process and how it relates to trees. From January 2005 I worked for Barrell Tree Consultancy Ltd advising clients on a wide range of tree related issues. I left the company in September 2008 and set up ecourban ltd, where I am currently the sole practitioner.



ecourban ltd, Radley House, 8 St Cross Road, Winchester, SO23 9HX

T: 01962 877 397 **E:** barrie@eco-urban.co.uk **M:** 07532 373 563

W: www.eco-urban.co.uk