



Arboricultural Implications Assessment and Method Statement



40 Queens Road, Waterloooville

Arboricultural Implications Assessment and Method Statement

40 QUEENS ROAD, WATERLOOVILLE

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1 INTRODUCTION

- 1.1 **Instruction:** I am instructed by Southcott Homes to report on trees that could be affected by a development proposal at 40 Queens Road, Waterloooville 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:** I have been provided with a topographical survey, drawing reference 'Land Survey 1630-01-A1'. This shows the positions of the significant trees on or near the site, together with the existing buildings and other important features. I was also supplied with a copy of the proposed layout, drawing reference '120051_02_proposedblockplan' showing a new site configuration.
- 1.3 **Scope of report:** All my observations are of a preliminary nature and the tree survey was carried out from ground level without any investigations using invasive or diagnostic equipment. I was not able to fully view all the trees and hedges detailed in this report from all directions, as some were located on adjacent private properties. 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 and the proposed layout shown superimposed over the top in blue. This allows the relationship between the two to be clearly seen. 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 crown 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, no checks have been made 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 carried out.

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.

- 2.6 **Tree survey methodology:** My inspection of the trees was visual, and did not involve any climbing or exploratory investigation. During my visit, I identified obvious hedges and groups where this was appropriate and I assigned an identification number to each tree, hedge 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 Trees in relation to design, demolition and construction – Recommendations. 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.

- 2.7 **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 other protective measures as 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 Overview of the implications of the development proposal on trees: BS 5837 (2012) – Trees in relation to design, demolition and construction – Recommendations sets out in some detail how trees on development sites should be managed. It is generally accepted that Category A (high quality) and Category B (moderate quality) trees are considered potential constraints on any development proposal, whereas those belonging to Category C (low quality) are considered to be generally less important. Category U trees are in such poor condition that they are considered unsuitable for retention as they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years. Therefore, these trees can be effectively discounted in the context of the planning process.

On this site a total of NINE individual trees, groups and hedges were recorded during the tree survey and were assigned to the BS 5837 (2012) categories, as set out in Table 1 below:

Category A and B trees	A total of THREE trees (T1, T2 and T5,) were rated Category B
Category C trees	A total of SIX trees, groups and hedges (G3, G4, G6, T7, H8 and T9) were rated Category C
Category U trees	No trees, groups or hedges were rated Category U

Table 1: Tree numbers and BS categories

No Category A trees were recorded during my survey and I have focussed on the implications of the development proposal mainly on the Category B trees on or near the site and to a lesser extent on any Category C trees present.

Of the total of NINE trees, groups and hedges surveyed, only FOUR will need to be removed. Additionally, THREE will also have activities arising from the development occurring in their RPAs. I have summarised the implications on Category A, B and C

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	G3, G6, T7 and T9	T1 and T2 (removal of existing drive and upgrade with low invasive surfacing) T5 (incursion into RPA and provision of temporary ground protection)	G4

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 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, FOUR Category C trees and groups (see Table 1) will need 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 G3 and Tree T7:** These unremarkable domestic conifers are not particularly large in size and they are positioned well within the site. Consequently, I do not believe that their loss will have any particular amenity implications.

- **Group G6:** This is a small group of mixed species trees and shrubs. The tree component of the group is relatively small in size and the group as a whole is located behind trees and hedges to be retained. In my view, the loss of these small trees/shrubs is unlikely to have any significant amenity or landscape implications in the locality.
- **Tree T9:** This small tree is located close to the northern site boundary. It will be close to the new building and I have considered whether it would be feasible to prune its canopy to give sufficient separation, or whether it would be more sensible to remove the tree entirely. On balance I feel that it would be more appropriate to remove it, although this may create a small gap in the existing boundary screening. This won't be large as the tree is quite small, but if the council are concerned then new tree/shrub planting could be considered to plug any gap formed. Details could be secured by way of a suitably worded landscape condition attached to any subsequent planning consent. Alternatively, the tree could be cut to size and shape and incorporated into the existing hedge planting located either side of its position.

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

3.3.1 **BS Category A and B trees and activities in RPAs:** THREE trees (see Table 1) will have activities arising from the development occurring in their RPAs, as follows:

- **New surfacing:** New 'low invasive' surfacing will be installed within the RPAs of trees T1 and T2. Part of the existing drive will need to be carefully removed and the new drive will need to work with the existing levels and follow the site topography. After careful consideration and discussions with the project architect, it has been agreed that the sub base for the new access will use a cellular confinement system. This will negate the need for significant excavation and excessive disturbance to the RPAs of nearby trees.

The use of cellular confinement systems is supported in BS 5837 (2012). The surfacing will need to 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. In my experience these trees can be successfully retained without any adverse effects if the measures set out in this report are adhered to.

- **Ground protection:** The protective barriers around tree T5 (and also some Category C trees in group G4) will need to be set back to allow sufficient room for the positioning of scaffolding and to provide suitable space for the movement of materials and personnel around the new building during its construction. The protective barrier positions around the trees are shown on the plan in Appendix 1. The area of the RPAs 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, which will be removed at the end of the development, with the area returned to soft landscaping. 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.
- **Incursion into RPA:** The position of the new dwelling on Plot 1 will require a small incursion into the RPA of tree T5. I have considered whether it would be necessary to deploy a custom designed foundation for the building to reduce the impact on the tree. In consideration of this, I have isolated the affected area in AutoCAD and have calculated its area to be around 8.4m² from a total Root Protection Area of 408m². Therefore, the incursion represents only around 2.1% of the total RPA. In my view this is such a small area that it is unlikely to have any specific or long term implications for the health and well being of the tree.

- 3.4 **Protection of trees during construction:** A preliminary Arboricultural Method Statement is included in Section 5 and 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 subsequent consent.

4 SUMMARY OF THE IMPLICATIONS OF THE DEVELOPMENT ON TREES

- 4.1 **Summary:** Of the total of NINE trees, groups and hedges surveyed, only FOUR will need to be removed. Additionally, THREE will also have activities arising from the development occurring in their RPAs. These include the installation of a new access driveway, an incursion into an RPA by a new building and provision of temporary ground protection to allow construction access during the build phase. These aspects have been carefully considered to minimise any risk of impact on trees and full details relating to this and tree protection are included in this report.

In my view the loss of the trees indicated is unlikely to have any particular amenity implications. If appropriate care is taken and the sensitive work proposed is implemented correctly, then the proposed development is arboriculturally acceptable and there will be minimal risk of any adverse impact on the nearby trees 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, and 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. However, on this site no Category A or U trees were recorded. The plan also shows the locations of the proposed protective measures, including areas where special care may be required. Additionally, trees to be removed are indicated with a red dashed crown outline. 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: Information on barrier design based on BS 5837 (2012) guidance is included in Appendix 3 and the approximate location of the barriers is illustrated on the plan in Appendix 1. The protective barriers will be erected before any materials or machinery are brought onto the site, and before any clearance or construction activities occur. 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 area and the storage of excavated debris and building materials will be prohibited in RPAs, 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 **Ground protection:** 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 temporary cellular confinement system (to be removed at the end of the construction phase. Additional guidance on installation is included in Appendix 4.

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 paragraphs. 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 **Removal of existing concrete access drive:** Trees T1 and T2 could be potentially affected by this activity and great care must be taken to avoid damage, particularly to tree roots. With this in mind, I set out the following guidance to minimise any risk of significant impact occurring to the trees:

- **Working in RPAs:** All works will generally be undertaken using appropriate hand tools. A small machine with a suitable reach may be used (under arboricultural supervision) if it can work from outside the RPA or from the existing surfacing within the RPA. If a machine is being used, the bucket of the excavator should be kept level, so that the front edge is horizontal and be used in a 'scraping' motion to minimise disturbance to the underlying soil.
- **Tree roots:** During hand digging, care will be taken to locate any substantial tree roots. Once roots have been located, soil will be carefully cleared away from them without damaging the bark. Roots temporarily exposed will be protected from direct sunlight, drying out and extremes of temperature by appropriate covering. Where roots may need to be cut, roots smaller than 25mm diameter may be pruned back, preferably to a side branch, using a proprietary cutting tool such as bypass secateurs or handsaws. Roots larger than 25mm should only be severed

following consultation with an arboriculturalist, as they may be essential to the tree's health and stability.

- **Rubble and debris removal:** This will be removed from RPAs manually across the existing hard surfacing (or temporary ground protection) in a way that prevents any soil compaction. Alternatively, debris or spoil can be lifted out by machines working from outside the RPA or positioned on pre installed ground protection.
- **Potential for compaction of the soil structure:** Once the concrete surfacing has been removed, the newly exposed soil and roots beneath are vulnerable to damage. Therefore, vehicular or repeated pedestrian access across the RPA will not be permitted, unless on the sub base for the new access drive.

5.2.3 **Installation of new surfacing:** Trees T1 and T2 may be affected by the installation of new surfacing. 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 BS derived RPAs. This will also act as ground protection for the parts of the RPAs that are outside the protective barriers, and so 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 an 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.

- **General points:** Extensive areas of surfacing in RPAs will generally be of a permeable construction to allow water ingress to tree roots, and to assist the movement of gases in and out of the soil profile. To avoid localised compaction and other ground disturbance, the sub base for the surfacing will generally be a cellular and load spreading construction, requiring no excavation (or very limited excavation) during installation.

- **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 raising levels rather than lowering, negating the need for any significant root disturbance. Any level changes will be achieved using uncompacted granular, permeable fills such as crushed stone or sharp sand. In this instance, the removal of the top layer of vegetation and the sub base for the existing drive to a depth of 50mm (to provide a flat surface for the installation of the sub base) is unlikely to encounter or damage any tree roots. Any additional excavation will need to be assessed by the arboriculturalist, in consultation with the council's tree officer.

- **Sub base and final wearing courses:** Once a level surface has been formed, the load spreading construction will be installed on top of the existing soil, with no compaction of the existing soil structure. For cellular load spreading constructions, the infill will be crushed stone (typically 20-40mm, clean angular stone), with no fines, as per the manufacturer's specification. This is to ensure acceptable levels of moisture penetration and gaseous exchange. 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 bonded gravel, paving slabs, washed gravel or block pavements set on a sand base, although other surfacing may be suitable after consultation with the arboriculturalist.

- **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 services:** 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 require 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 **Storage of materials, cement mixing and washing points:** All construction storage areas, cement mixing and washing points for equipment and vehicles will be outside RPAs, 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:

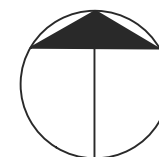
1. Pre-commencement site meeting
2. Extent of arboricultural supervision agreed
3. Tree works undertaken
4. Protective barriers erected before any clearance or construction activities occur on site and notification to the council that this is in place
5. Ground protection installed before any clearance or construction activities occur on site and notification to the council that this is in place
6. Removal of surfacing
7. 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
8. Installation of services
9. Tree protection only removed at the end of the construction phase when there is no longer any risk to trees

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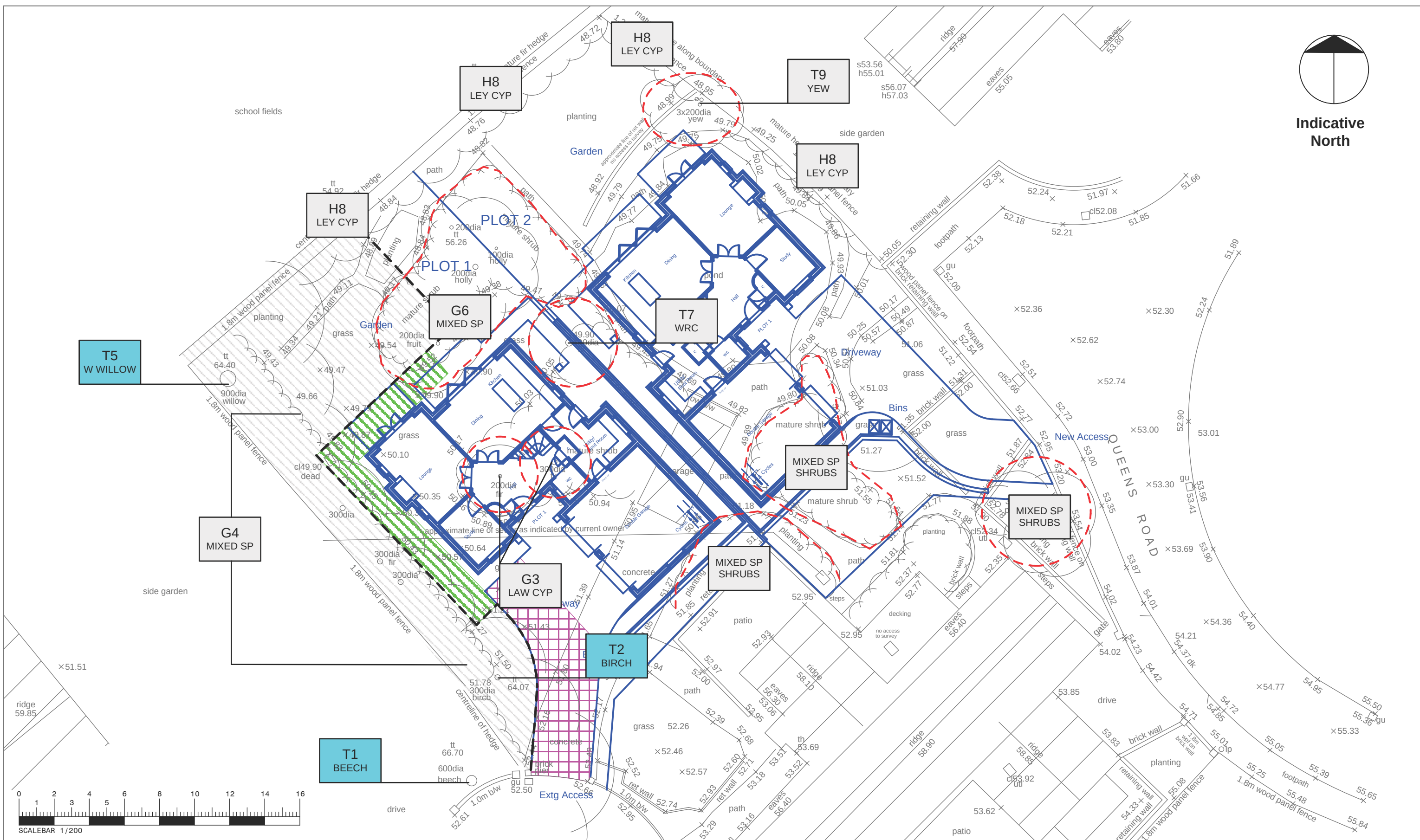
Date: **12 June 2013**

APPENDIX 1: TREE PROTECTION PLAN

1 A3 plan



Indicative
North

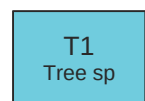


TPP 2 - TREE PROTECTION AT 40 QUEENS ROAD,
WATERLOOVILLE

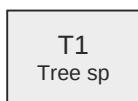
SCALE: 1:200 @ A3

COMPOSITE PLAN: LAND SURVEY IN
GREY, PROPOSED LAYOUT IN BLUE

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



BS Category B: Trees
of moderate quality



BS Category C: Trees
of low quality



Tree protective barriers with
construction exclusion zone



RPA outside barriers requiring
ground protection



Minimum extent of 'Low Invasive' type
surfacing based on BS derived RPAs



Trees/shrubs to be removed

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 dia. at 1.5m (cm)	STEM DIAMETERS (MULTIPLE)								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							
All trees																	Crown clean all trees. Where appropriate, crown lift trees to 4m over site and 5m over public carriageway					
T1	Beech	15	-	50	39	-	-	-	63	-	-					4	MA	Twin stemmed at 1m with tight fork. Some crown asymmetry		B1	182	7.6
T2	Birch	12	-	33*	32*	-	-	-	46	-	-					4	M	Twin stemmed at ground level, stem covered in ivy	Sever ivy and reinspect	B1	96	5.5
G3	Lawson cypress	7	-	19	18	-	-	-	26	-	-					2	Y	Small unremarkable domestic conifer type planting	Fell	C1	31	3.1
G4	Lawson cypress, Leyland cypress and yew	11	20	-	-	-	-	-	-	-	-					n/a	Y/MA	Boundary and unremarkable domestic conifer type planting		C2	18	2.4
T5	Weeping willow	15	95	-	-	-	-	-	-	-	-					7	M	Stem defect		B1	408	11.4
G6	Mixed species incl. apple, holly and Lawson cypress	6	22*	-	-	-	-	-	-	-	-					2	Y/MA	Small trees	Fell	C2	22	2.6
T7	Western red cedar	12	-	43	23	-	-	-	49	-	-					3	MA	Unremarkable domestic conifer type planting	Fell	C1	108	5.9

APPENDIX 2: TREE SCHEDULE AND INVENTORY

Tree No.	Species	Ht (m)	Single stem dia. at 1.5m (cm)	STEM DIAMETERS (MULTIPLE)								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							
H8	Leyland cypress	9	22*	-	-	-	-	-	-	-	-					n/a	Y	Offsite boundary hedging		C2	22	2.6
T9	Yew	6	-	-	-	-	-	-	-	10*	5*					n/a	Y	Small tree	Fell	C1	27	2.9

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

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.
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

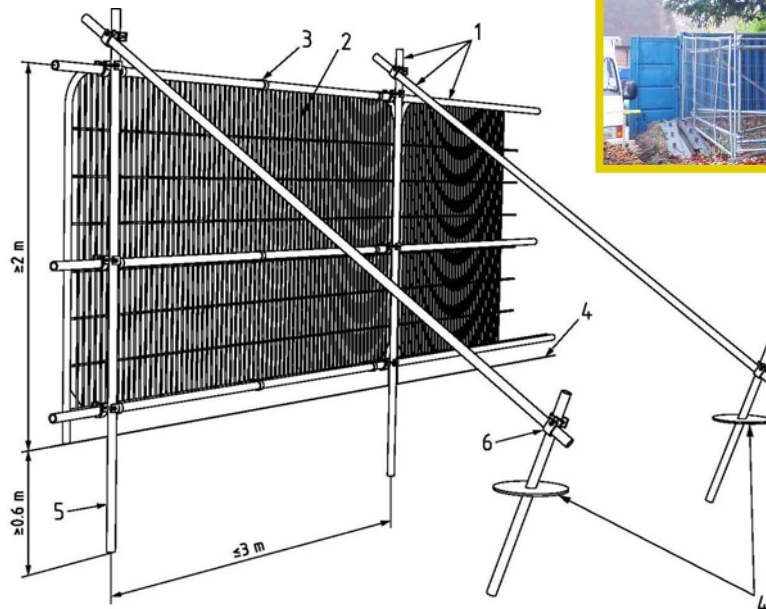
APPENDIX 2: TREE SCHEDULE AND INVENTORY

	<i>largest stem diameter within the group will have been measured/estimated.</i>
Branch spread	<i>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</i>
Existing height above ground level	<i>Distance in metres to first significant branch or canopy</i>
Age class	<i>Simplistic estimate of tree age in one of FOUR categories (young, maturing, mature or over mature).</i>
Notes	<i>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.</i>
Management proposals	<i>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.</i>
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
Apple	<i>Malus domestica</i>		Leyland cypress	<i>x Cupressocyparis leylandii</i>
Beech	<i>Fagus sylvatica</i>		Western red cedar	<i>Thuja plicata</i>
Birch	<i>Betula pendula / pubescens</i>		Weeping willow	<i>Salix babylonica / x sepulcralis 'Chrysocoma'</i>
Holly	<i>Ilex aquifolium</i>		Yew	<i>Taxus baccata</i>
Lawson cypress	<i>Chamaecyparis lawsoniana</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

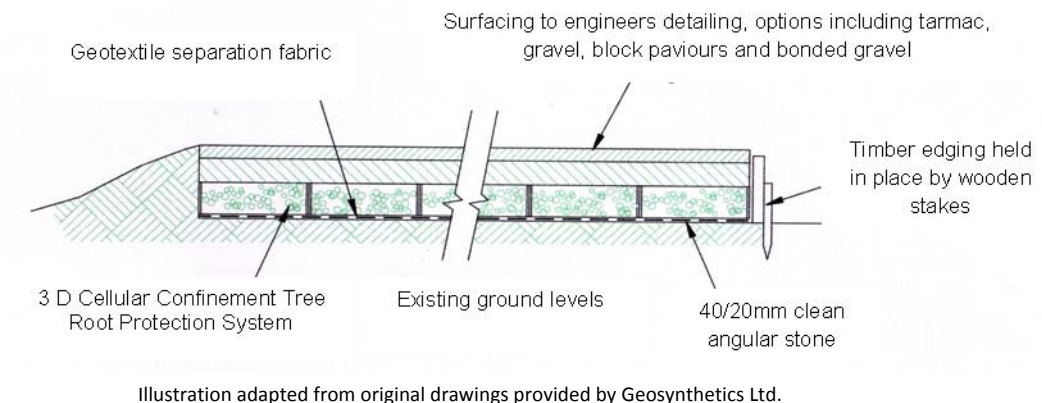
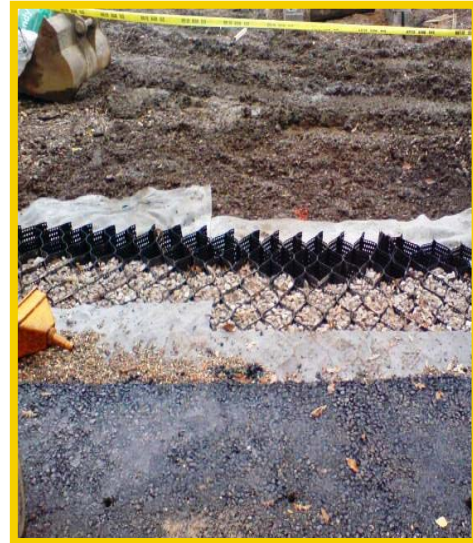
Illustration taken from British Standard 5837 (2012): Trees in relation to design, demolition and construction – Recommendations.

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.

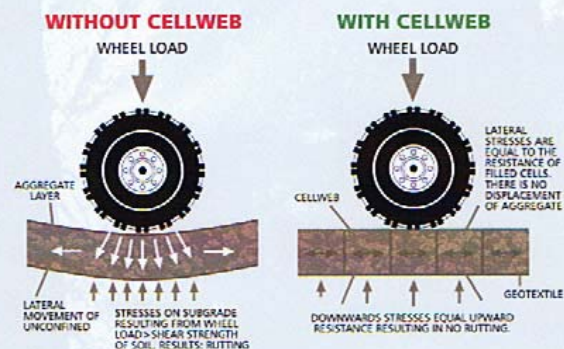


fig. 3

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.

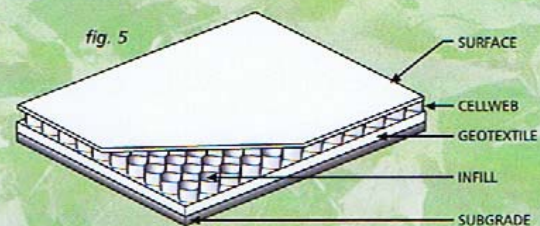


fig. 5

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.

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