



Arboricultural and Planning Integration Report

at

**Land at Blackhall Spinney,
Blackhall Lane,
Sevenoaks,
Kent.**

20th October 2010



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ARBORICULTURAL REPORT

LOCATION	Land at Blackhall Spinney, Blackhall Lane, Sevenoaks, Kent, TN15 0HP.	REF: AR/2398/ci
CLIENT	Mrs K Potter, Blackhall Spinney, Blackhall Lane, Sevenoaks, Kent, TN15 0HP.	DATE OF REPORT 20 th October 2010
REPORT PREPARED BY	C L Ingram, Chartered Forester, BSc (Forestry), FICFor, M Arb A.	DATE(S) OF INSPECTION 13 th & 14 th October 2010
SURVEY INSPECTOR(S)	C L Ingram, Chartered Forester, BSc (Forestry), FICFor, M Arb A.	SHEET No. 1 of 8
LOCAL AUTHORITY	Sevenoaks District Council	
CONTACT	Arboricultural Officer Mr L Jones	

Please note that abbreviations introduced in [square brackets] are used throughout the report.

INSTRUCTIONS

Issued by – Mrs K Potter, Blackhall Spinney, Blackhall Lane, Sevenoaks, Kent, TN15 0HP, by e mail dated 10th October 2010.

TERMS OF REFERENCE – To survey the subject trees in order to assess their general condition and to provide a planning integration statement for the proposed development that safeguards the long term well being of the retained trees in a sustainable manner.

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Summary

Thirty-five trees and seven tree groups were recorded in the survey including one tree that was growing off site. One tree was in category A, ten trees were in category B, twenty-two trees and seven groups were in category C and two trees were in category R. The proposal will require the removal of one tree and one group, both in category C, which will have negligible impact on the landscape of the area. Any loss of amenity will be mitigated in the long term by new planting and all retained trees will be protected in accordance with current industry standards and guidance. No irresistible post development pressures are anticipated.

Documents Supplied

- Site survey plan with proposed development reference 20/SH/112.01c

Scope of Survey

- 1.1 The survey is concerned with the arboricultural aspects of the site only.
- 1.2 No discussions took place between the surveyor and any other party.
- 1.3 The trees were inspected on the basis of the Visual Tree Assessment method expounded by Mattheck and Breloer (The body language of trees, DoE booklet Research for Amenity Trees No. 4, 1994).
- 1.4 The survey was undertaken in accord with British Standard 5837:2005 Trees in relation to construction – Recommendations [BS5837].
- 1.5 Pruning works will be required to be in accord with British Standard 3998:1989 Recommendations for Tree Work [BS3998].
- 1.6 The planting of a standard tree will be required to be in accord with British Standard 4043:1989 Transplanting root-balled trees [BS4043].
- 1.7 Underground services near to trees will need to be installed in accord with the guidance given in BS5837 together with the National Joint Utilities Group Publication Volume 4 'Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees', August 2007 [NJUG 4].
- 1.8 The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.
- 1.9 Where hard surfacing may be required in close proximity to trees, BS5837:2005 and the principles of Arboricultural Practice Note 12, Through the Trees to Development, AAIS 2007, [APN 12] with regard to "No-Dig" surfacing will be employed, although incorporating improvements with the construction methods.
- 1.10 Where scaffolding needs to be installed within a RPA the provisions of Figure 3 of BS5837 with regard to ground protection must be employed.
- 1.11 Reference is made to the National House Building Council Standards, 2007, chapter 4.2, Building near trees [NHBC].
- 1.12 The survey does not set out the working specifications of tree protection measures and engineering and design features, but provides enough detail in principle to demonstrate the feasibility of the scheme.

Survey Method

- 2.1 The survey was conducted from ground level with the aid of binoculars.
- 2.2 No tissue samples were taken nor was any internal investigation of the subject trees undertaken.

- 2.3 No soil samples were taken.
- 2.4 The height of each subject tree was estimated using a clinometer.
- 2.5 The stem diameters [SD] were measured in centimetres at 1.5 metres above ground level for single stems, and just above the root flare for multi-stemmed trees. Where access was difficult the diameters were estimated and marked as such on the Schedule of Trees.
- 2.6 The crown spreads were estimated by pacing.
- 2.7 The positions of the subject trees are plotted at Appendix B in a general location plan. Please note that the attached plan is for indicative purposes only.

The Site

- 3.1 The subject site is the southern part of the garden of Blackhall Spinney. Blackhall Lane lies to the south with a wide verge between the carriageway edge and the site boundary, and there are domestic dwellings with large gardens to the east and west, with a shared access drive for Blackhall Spinney itself and neighbouring properties on the western site boundary. There is a rectangular fenced enclosure at the south-western corner of the site which houses a small electrical sub station.
- 3.2 The subject site has a group of mature trees near to the southern and western boundaries and a grassed area with occasional trees and mature shrub beds within the site. The land slopes gently downwards from south to north.

- 3.3 The site is ringed in blue on this extract reproduced from the Geological Survey Drift Map, Sheet 287, Sevenoaks by permission of the British Geological Survey ©NERC. All rights reserved. The indicated soil parent material shown yellow is Folkestone Beds which consist mainly of sand with some veins of pebbles and clay.



*C08/105-CSL
British Geological Survey.
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- 3.4 The depth of the soil was not determined but there is no reason to suppose that it is inadequate for normal tree root development. The possible presence of clay in the soil indicates that there may be potential for tree related subsidence on the site and that construction activities could cause compaction which is highly damaging to trees.

Subject Trees

- 4.1 Thirty-five trees and seven tree groups were recorded in the survey including one tree that was growing off site within the electrical sub station enclosure. Their details are listed at Appendix A and their positions are indicated at Appendix B. The mature trees growing near to the southern and western boundaries were crowded in places with frequent Laurels below and accurate height measurements were not achievable in many cases.
- 4.2 Sweet Chestnut was the commonest species (24 trees and 1 group) followed by Beech (5 trees) and Birch (1 tree and 1 group). Eight other species were represented by a single tree or group and there were two groups of mixed species. Thirty trees and one group were mature and five trees and six groups were semi-mature.
- 4.3 One mature Beech tree T37 was in category A (see the key at Appendix A for an explanation of BS5837 categories). This is a large specimen growing near to the south-eastern corner of the site and prominent in the local landscape as viewed from the public road.
- 4.4 Ten trees were in category B nine of which were mature Sweet Chestnuts growing near to the site boundaries. They are significant in the local landscape though many appear to be of coppice origin and of sinuous form. The other tree was an Ash T21 which was growing next to the western site boundary.
- 4.5 Twenty-two trees and seven groups were in category C. These include many small trees of low individual landscape significance but there are also some large trees with defects that disbar them from higher grades. Those growing close to the site boundaries do contribute to the screening of the site.
- 4.6 Two trees, T4 and T12, were in category R. Both are Sweet Chestnuts with broken stems but they do not present any current risk of collapse and no immediate action is needed to reduce the risk they present. They are not worthy of retention if they conflict with any planning proposal however.
- 4.7 I am advised by Sevenoaks District Council that the subject site together with the neighbouring sites to the east is subject to tree preservation order [TPO] reference TPO/69/01/SU. This TPO was made in 1969 and protects seventeen individual Beech trees, seven of which are on the subject site, and one area A1 on the western side of the subject site. The approximate location of area A1 is shown at Appendices B and C and those trees which I believe are within this area and are likely to have been present in 1969 have TPO written next to the species at Appendix A.
- 4.8 I consider that the Beech tree T37 is protected as the individual TPO tree T12 but there are no other Beech trees on the site that correspond to the remaining six individual protected trees on the subject site and I assume that these have been lost since the order was made. The other four Beech trees recorded in my survey are relatively small and I consider it unlikely that they were present in 1969, or if they were then they would have been too small to have been protected.
- 4.9 The equivalence of the recorded trees with the protected trees is given for general guidance only. For definitive identification of the protected trees the original TPO documents should be consulted.
- 4.10 The subject site is also in a conservation area.

The Proposal

- 5.1 The proposal is to erect a new dwelling house with a new access drive from Blackhall Lane as indicated at Appendix C. The existing dwelling house will remain unaltered other than for the reduced size of the southern part of the garden.
- 5.2 The proposed development was previously approved by Sevenoaks Council (planning reference 05/01136/FUL approved on 16th August 2005) and the current application is for an extension of time for that approval.

Planning Integration

- 6.1 The proposal will require the removal of tree T41 and group G26, both in category C, as indicated by the hollow broken circles at Appendix C and listed in the table below. T41 is a semi-mature Beech of columnar form growing within the site. It has no external visibility and the impact of its loss on the local landscape will be negligible. Group G26 comprises Sweet Chestnut coppice re-growth up to 12 metres in height. It is growing next to the southern site boundary but is surrounded by mature Sweet Chestnuts and the impact of its loss on the landscape of the area will be minimal.

Trees to be Removed		Trees to be Retained
For development	For condition	T1#, T2#, T3#, T4#, T5#, T6, T7, T8#, T9#, T10#, T11#, T12#, T13#, T14#, T15, T16, T17, T18#, T19#, T20#, T21#, T22, G23, T24, T25, T27, T28, T29. G30, T31, G32, T33, T34, T35, T36, T37#, G38, G39, T40, G42,
G26, T41		

= TPO tree

- 6.2 Any loss of amenity arising from the tree removals will be mitigated in the long term by new planting as indicated at Appendix C.

Post Development Pressure

- 7.1 The proposed building is sufficiently distant from the retained trees to ensure that any shading of direct sunlight will be minimal and transient.
- 7.2 Trees T1, T16 and T22 will overhang the new driveway but any potential risks from falling branches and inconvenience caused by minor tree debris can be easily controlled by routine maintenance including regular inspections and the removal of dead wood.
- 7.3 In the event that clay is discovered during soil testing indicating potential for tree related subsidence damage to the new building it will be for an Engineer to design the foundations in accordance with NHBC guidelines to reduce the risk potential.
- 7.4 Where existing or proposed drains pass within the root system of a tree (not just the RPA), technical advice must be sought to assess the root-tightness of joints. Modern compression joints do not reliably prevent root ingress and it may be necessary to upgrade them.
- 7.5 In consideration of these matters, there will be no appreciable post development pressure, and certainly none that would oblige the Council to give consent to inappropriate tree works.

Tree Protection Measures

- 8.1 The BS5837 gives a root protection area [RPA] for each retained tree by reference to Table 2 in the BS. The RPA is usually described as a circle with a radius of the prescribed distance within which no unspecified activity should occur, though the shape and position of the RPA can be modified by an arboriculturalist to meet individual site conditions according to the probable distribution of the tree roots (see Appendix D for RPA equivalent radii). This area is to be fenced off prior to and for the duration of all construction work with tree protection barriers [TPB] as described in figure 2 of the BS (see Appendix E). Intrusion into the RPA can take place only where the ground is adequately protected in accord with the requirements of section 9.3 of the BS. The barriers are to carry waterproof warning notices denying access within the RPA.
- 8.2 The positions of the TPBs for the project are shown at Appendix C.
- 8.3 The new access drive intrudes into the RPAs of trees T1, T16, T22 and T27 and the soil will be protected in the areas shown hatched at Appendix C by the use of a no-dig construction method (see Appendix F) incorporating a cellular confinement system as a base (see Appendix G) with no-fines aggregate as fill and kerb stone edging as described at Appendix H. This surfacing is only required within the RPAs but as the cost is similar to that of traditional construction it can be extended further than shown if desired. The no-dig construction does have a higher finished level than traditional construction and ramps will be needed where they meet as indicated by the heavy black lines at Appendix C. A permeable wearing surface will be used to allow air and water to reach the soil below in accordance with section 11.9 of BS5837. The final positioning of the drive will be subject to ground measurements to ensure that the edge is at least 1 metre from any tree stem.
- 8.4 The new access drive and parking surfaces are to be laid immediately after the site clearance works and the erection of the TPBs and before any other work begins. To avoid damage or disfigurement of the wearing surface a temporary surface can be laid which provides an opportunity to increase its load bearing capacity for the duration of the construction works. In the event that the installation of the no dig construction surfaces is delayed until after the main construction is started the TPBs shown at Appendix C must be repositioned to enclose the full extent of the RPAs of trees T1, T16, T22 and T27.
- 8.5 Pruning for construction access may be required on tree T22 but any such pruning will be minor and not detract from the amenity of the tree. In any event all such pruning will be agreed beforehand with the Council's Arboricultural Officer.
- 8.6 I have not been advised of the underground service routes. Clearly if any underground service routes should enter an RPA, the provisions of BS5837 and NJUG 4 should be employed and if necessary, further arboricultural advice sought.
- 8.7 The surface water run-off and soil drainage has not been studied. However, due to the site topography and soil type, I do not foresee any detrimental effects on the trees in hydrological terms as a result of development.
- 8.8 The protection of the trees will also include recognition of other types of potentially damaging activities, such as the storage of materials (and other substances likely to be toxic to plants), parking, site-building requirements, and the use and parking of plant. Particular care and planning is necessary to accommodate the operational arcs of excavation and lifting machinery, including their loads, especially large building components such as beams and roof trusses. Operations like these have the potential to cause incidental damage and logistical planning is essential to avoid conflicts.

- 8.9 Please note that the hard landscaping operations are part of the construction works and should be planned and carried out within the construction phase TPB and other tree protection measures.

Conclusion

- 9.1 The development can proceed with the retention of all of the significant trees on the site.
- 9.2 The removal of the one category C tree and one category C group will have negligible impact on the landscape of the area.
- 9.3 Any minor loss of amenity will be mitigated in the long term by new planting.
- 9.4 No irresistible post development pressures are anticipated.
- 9.5 The retained trees will be protected in accordance with current industry standards and guidelines.
- 9.6 I have taken account of the information given to me and my own observations on site and I am satisfied that this scheme is arboriculturally sound and that the long term well being of the retained trees will be safeguarded in sustainable manner.

Recommendations

- 10.1 Trees T4 and T12 require no immediate action but in the event that the occupancy level of the land around them changes significantly they should be re-appraised for risk by a competent arboriculturalist.
- 10.2 Tree T41 and group G26 should be felled to facilitate the development.
- 10.3 The combined RPAs of the retained trees are to be protected by a Tree Protection Barrier [TPB] comprising steel mesh panels of 1.8 metres in height ('Heras'). These panels can be mounted on a scaffolding frame as shown at Figure 2 of BS5837 (see Appendix E) or in special circumstances mounted in blocks. If the latter installation method is used the panels should be braced and the top edge at the joints clamped between two pieces of wood (e.g. 100mm x 50mm) to discourage their movement or dismantling. The blocks should be fixed to the ground with steel pins at least 75 centimetres in length. This TPB is to be erected before any work commences on site, is to remain in situ undamaged for the duration of all work or each phase, and only to be removed once all work is completed. The only exception is the completion of soft landscaping.
- 10.4 The tree protection measures given in section 8 above should be applied.
- 10.5 All tree work should be undertaken by trained and competent personnel to current industry standards and guidance.
- 10.6 There is scope for new tree planting and suggested locations are shown at Appendix C. Although the species choice will be a matter of negotiation with the Council's Arboricultural Officer, the principle of that choice will be to select trees of suitable mature size and in some instances tree-like shrubs may be more appropriate. In any event the objective is one of sustainability and ensuring that any planted tree can achieve its normal mature size without the need for regular pruning.

10.7 The sequence of works should be as follows:

- i) initial tree works – tree removal and pruning for working clearances
- ii) installation of TPB
- iii) installation of underground services
- iv) construction of new drive including No-Dig surfacing
- v) main construction, including hard landscaping
- vi) removal of TPB
- vii) soft landscaping including tree planting

The statements made in this Report do not take account of the effects of extremes of climate, vandalism or accident, whether physical, chemical or fire. Quaife Woodlands cannot therefore accept any liability in connection with these factors, nor where prescribed work is not carried out in a correct and professional manner in accordance with current good practice. The authority of this Report ceases at any stated time limit within it, or if none stated after two years from the date of the survey or when any site conditions change, or pruning or other works unspecified in the Report are carried out to, or affecting, the Subject Tree(s), whichever is the sooner.

Arboricultural Survey AR/2398/ci - Blackhall Spinney, Blackhall Lane

Appendix A

KEY

Pre:	Prefix:	T = Tree	G = Group	H = Hedge		
No	Tree reference number.					
Ht	Tree Height in metres.					
SD	Stem diameter in centimetres at 1.5 metres above ground level or immediately above the root flare for multi-stemmed trees.					
	*	Estimated.	+	Multi-stemmed.		
N-S-E-W	Branch spread in metres to the four compass points.					
CrB	Height in metres of crown clearance above adjacent ground level.					
AC	Age Class	Y – Young.	S – Middle aged.	M – Mature.	O – Over-mature.	V – Veteran.
PC	Physiological Condition	G – Good	F – Fair	P – Poor	D – Dead	
SC	Structural Condition	G – Good	F – Fair	P – Poor	D – Dangerous	
ERC	Estimated remaining contribution in years	D - less than 10, S - 10-20, M - 20-40, L - more than 40.				
BS	Category grading					
	R – Existing condition is such that any existing value would be lost within 10 years and should therefore be removed for reasons of sound arboricultural management.					
	A – High quality and value (40+ yrs).					
		1) Mainly arboricultural values	2) Mainly landscape values	3) Mainly cultural values incl. conservation.		
	B - Moderate quality and value (20+ years).					
		1) Mainly arboricultural values	2) Mainly landscape values	3) Mainly cultural values incl. conservation.		
	C – Low quality and value (10+ years).					
	Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a SD of less than 15cm should be considered for relocation.					
Rad	Root Protection Radius in metres.					
RPA	Root Protection Area in square metres.					

Arboricultural Survey AR/2398/ci - Blackhall Spinney, Blackhall Lane

Appendix A

Pre	No	Species	Ht	SD	N-S-E-W	CrB	AC	PC	SC	ERC	BS	Rad	RPA	Observations	Recommendations
T	1	Sweet Chestnut TPOt	18	51	2-4-3-3	10.0	M	G	G	M	B2	6.5	133		
T	2	Sweet Chestnut TPO	11	29	1-3-4-2	7.0	M	F	G	M	C	3.5	38		
T	3	Sweet Chestnut TPO	18	57	3-7-4-4	8.0	M	G	G	M	B2	7.0	154	Limb over road with old wound - no hazard. Sinuous form	
T	4	Sweet Chestnut TPO	12	29			M	F	F	S	R	-	-	Broken top.	
T	5	Sweet Chestnut TPO	18	61	3-4-2-2	7.0	M	G	G	M	B2	7.5	177		
T	6	Beech	12	27	4-4-4-2	3.0	S	G	G	M	C	3.5	38		
T	7	Sweet Chestnut	18	64*	2-5-3-4	6.0	M	G	F	M	C	8.0	201	In fenced enclosure. Old lightning scar on stem.	
T	8	Sweet Chestnut TPO	18	47	2-4-2-4	7.0	M	F	G	M	C	6.0	113	Some top dieback.	
T	9	Sweet Chestnut TPO	18	71	4-3-3-4	9.0	M	G	G	M	B2	8.5	227		
T	10	Sweet Chestnut TPO	10	29	3-2-/-7	3.0	M	G	F	S	C	3.5	38	Bends out to west.	
T	11	Sweet Chestnut TPO	14	41	2-6-2-6	8.0	M	G	F	M	C	5.0	79	Bends out to west.	
T	12	Sweet Chestnut TPO	14	68/24	3Ø	10.0	M	P	P	M	R	-	-	2 Stems. Main stem has broken top.	
T	13	Sweet Chestnut TPO	18	54	4-4-3-3	10.0	M	G	G	M	B2	6.5	133	Small basal wound.	
T	14	Sweet Chestnut TPO	19	72	3-3-3-2	11.0	M	F	G	S	C	9.0	255	Some dieback.	
T	15	Beech	10	29	4-4-3-5	3.0	S	G	G	M	C	3.5	38		
T	16	Sweet Chestnut	17	53	4-3-5-2	5.0	M	G	G	M	B2	6.5	133		
T	17	Sweet Chestnut	17	41	4-2-3-3	5.0	M	G	G	M	C	5.0	79		
T	18	Sweet Chestnut TPO	17	58	3-3-3-3	7.0	M	G	G	M	B2	7.0	154		

Pre No	Species	Ht	SD	N-S-E-W	CrB	AC	PC	SC	ERC	BS	Rad	RPA	Observations	Recommendations
T 19	Horse Chestnut TPO	15	55	3-3-3-5	8.0	M	F	G	M	C	7.0	154		
T 20	Sweet Chestnut TPO	10	31	5-5-3-7	4.0	M	F	F	M	C	4.0	50	Bends out to the west. Poor form. Open wound on stem above fork.	
T 21	Ash TPO	18	36	4-4-2-6	9.0	M	G	G	M	B2	4.5	64		
T 22	Beech	10	45	3-6-6-3	3.0	M	G	G	M	C	5.5	95		
G 23	Various	9	15	3Ø	2.0	S	G	F	M	C	2.0	13	Sweet Chestnut coppice stools & Birch.	
T 24	Cedar	13	32	6Ø	3.0	S	G	G	M	C	4.0	50	In Rhododendron clump.	
T 25	Sweet Chestnut	19	65	5-3-4-4	5.0	M	G	G	M	C	8.0	201		
G 26	Sweet Chestnut	12	18		6.0	S	G	G	M	C	2.5	20	Coppice re-growth.	
T 27	Sweet Chestnut	16	52	3-5-5-3	8.0	M	G	G	M	B2	6.5	133		
T 28	Cypress	13	33	3Ø	7.0	M	G	F	S	C	4.0	50	2 Old lightning scars on stem. Leans to south.	37
T 29	Sweet Chestnut	11	40	4-7-5-3	6.0	M	G	G	M	C	5.0	79		
G 30	Birch	8	9	2Ø	3.0	S	G	G	S	C	2.0	13	4 Trees.	
T 31	Sweet Chestnut	15	41	2-6-3-3	5.0	M	G	G	M	B2	5.0	79	Leans to the south.	
G 32	Lawson Cypress	12	30	4Ø	3.0	M	G	G	M	C	4.0	50		
T 33	Sweet Chestnut	9	24	5-/-5-5	4.0	S	G	F	M	C	3.0	28	Multi-stemmed from 4m.	
T 34	Sweet Chestnut	15	54	5-4-2-3	8.0	M	G	F	M	C	6.5	133	Forks @ 1m.	
T 35	Sweet Chestnut	15	+	4-5-3-8	5.0	M	G	F	M	C	8.0	201	Multi-stemmed. SDs 51,34,15. Leans to the south.	
T 36	Birch	13	26	4-4-4-4	3.0	M	G	G	S	C	3.5	38		
T 37	Beech TPO T12	24	102	14Ø	7.0	M	G	G	L	A2	12.5	491		

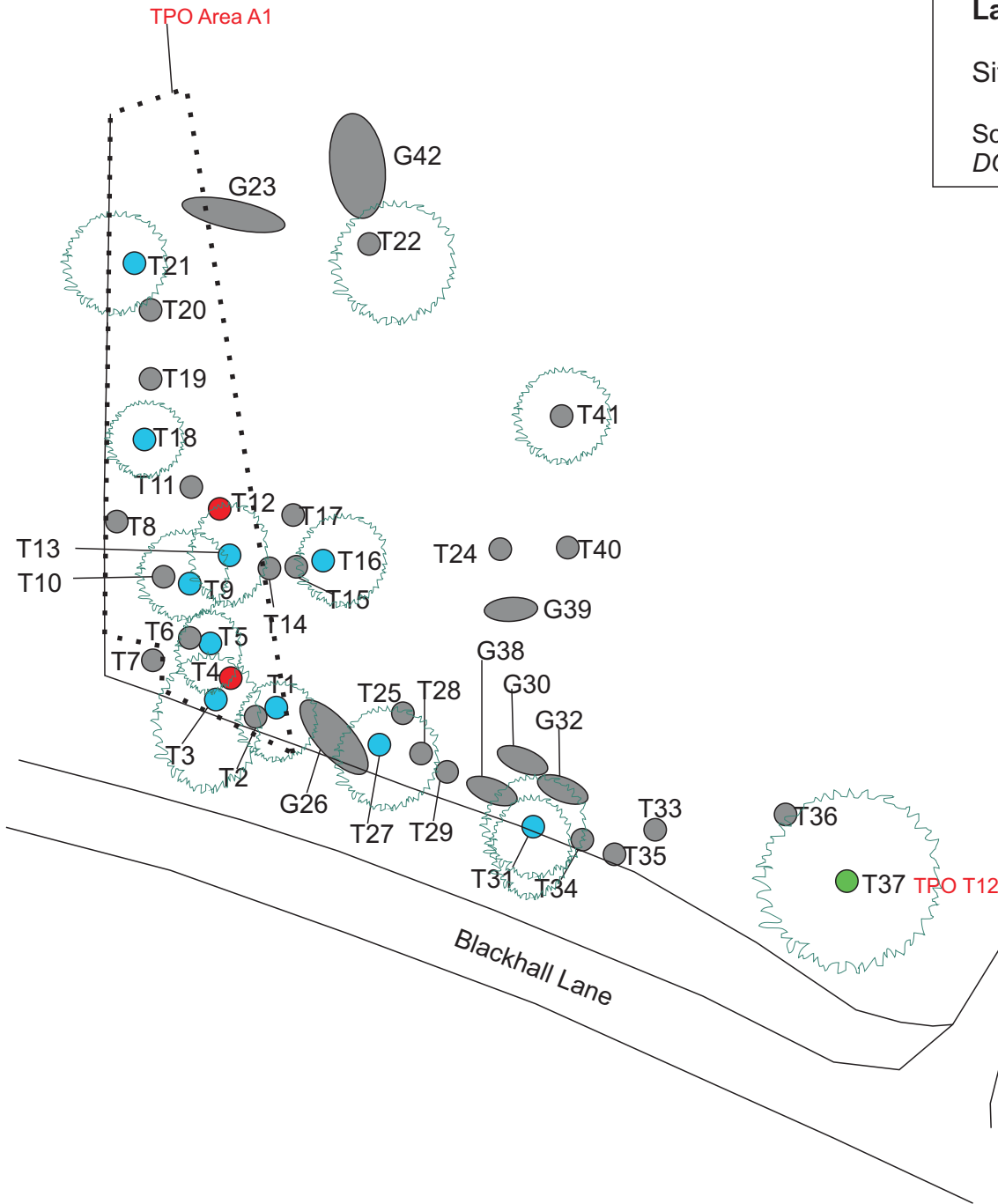
Pre	No	Species	Ht	SD	N-S-E-W	CrB	AC	PC	SC	ERC	BS	Rad	RPA	Observations	Recommendations
G	38	Holly	9	35+*	6Ø	1.0	S	G	F	M	C	3.5	38	2 Multi-stemmed clumps.	
G	39	Rowan	8	18	4Ø	2.0	S	G	F	M	C	2.5	20	3 Trees in Rhododendron clump. Low forking.	
T	40	Willow	9	5X18	6-4-5-5	2.0	M	G	F	S	C	5.0	79	Multi-stemmed from 1m. Old bracket in fork.	
T	41	Beech	9	26	7Ø	1.0	S	G	G	M	C	3.5	38	Narrow crowned form	
G	42	Various	10	20	4Ø	2.0	S	G	F	M	C	2.5	20	Multi-stemmed Sweet Chestnut with Birch & Rowan.	

Quaife Woodlands Arboricultural Survey AR/2398/ci

Land at Blackhall Spinney, Blackhall Lane, Sevenoaks.

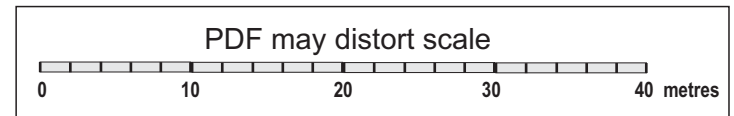
Site Plan - existing October 2010

Scale 1:500 approximately @ A4
DO NOT SCALE FROM DRAWING



BS 5837:2005 Tree Categories

- R Tree that should be removed
- A Tree that is highly desirable for retention
- B Tree that is desirable for retention
- C Tree of no particular merit, could be retained
- Tree crown
- Area TPO boundary

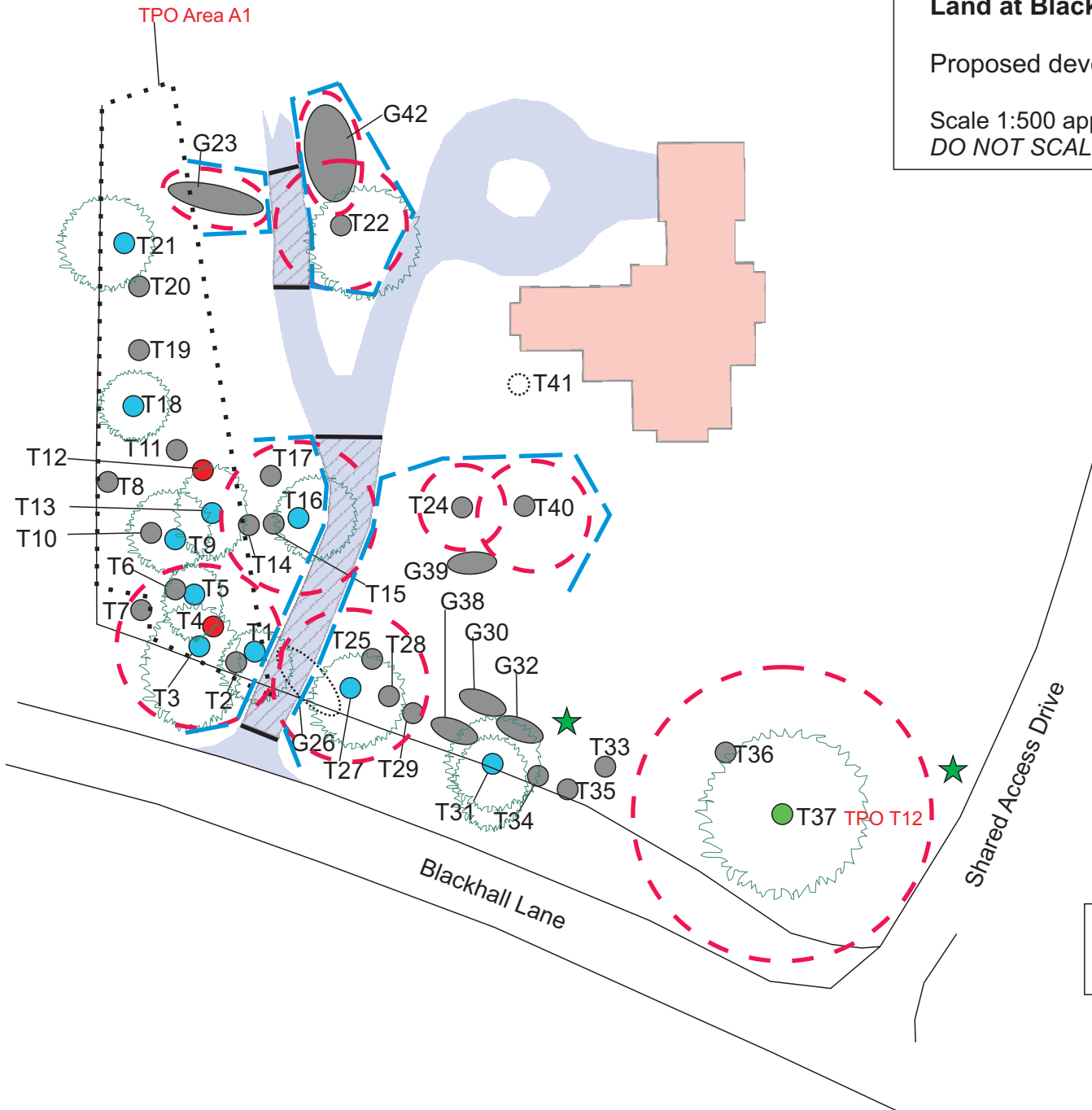


Quaife Woodlands Arboricultural Survey AR/2398/ci

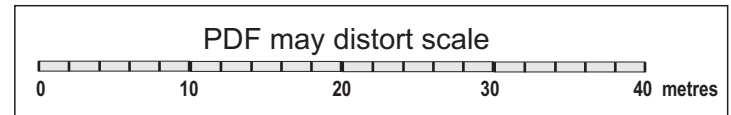
Land at Blackhall Spinney, Blackhall Lane, Sevenoaks.

Proposed development and tree protection October 2010

Scale 1:500 approximately @ A4
DO NOT SCALE FROM DRAWING



- New building
- New drive - traditional construction
- New drive - no-dig construction
- Ramp
- Trees to be retained
- Tree to be removed
- Tree crown
- Root protection area
- Tree protective barrier
- New planting



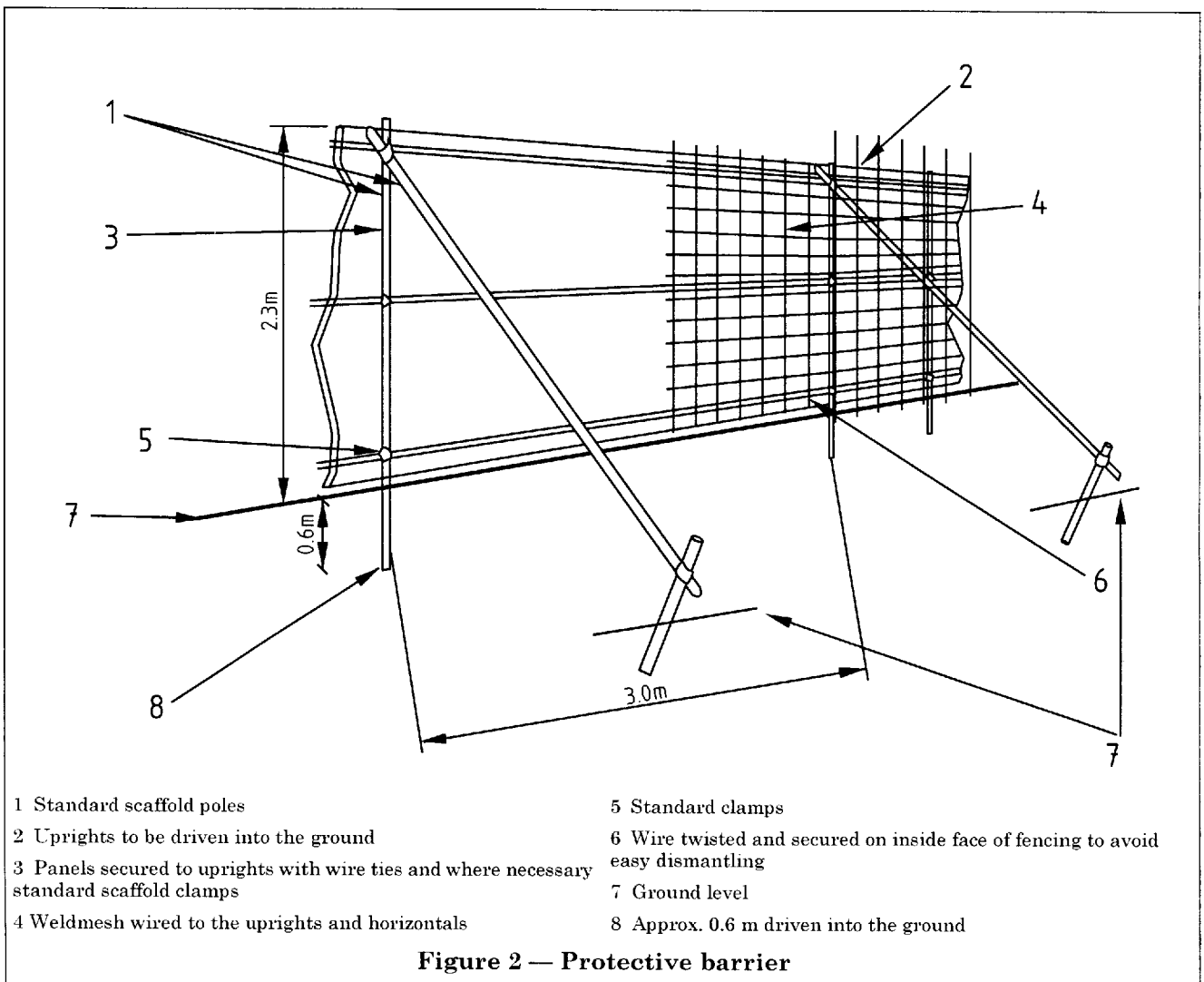


The ½ metre graduations of RPA radii have been calculated back to produce diameter dimensions, which in turn have been rounded down to the nearest centimetre. If the BS5837 multiplier factor is plotted on a graph it produces a straight gradient and if the ½ metre steps are plotted they are all above that line, thus ensuring that the RPA radii err on the generous side.

<i>Multiple Stems up to diameter (mm)</i>	<i>Single Stem up to diameter (mm)</i>	<i>RPA Radius (m)</i>	<i>RPA (m²)</i>
1500	1250	15.0	707
1450	1210	14.5	660
1400	1170	14.0	616
1350	1120	13.5	573
1300	1080	13.0	531
1250	1040	12.5	491
1200	1000	12.0	452
1150	960	11.5	416
1100	920	11.0	380
1050	870	10.5	346
1000	830	10.0	314
950	790	9.5	284
900	750	9.0	255
850	710	8.5	227
800	670	8.0	201
750	620	7.5	177
700	580	7.0	154
650	540	6.5	133
600	500	6.0	113
550	460	5.5	95
500	420	5.0	79
450	370	4.5	64
400	330	4.0	50
350	290	3.5	38
300	250	3.0	28
250	210	2.5	20
200	160	2.0	13

Extract from British Standard 5837: 2005, Trees in relation to construction

Figure 2. Indicated framework support as the usual method of support for steel mesh panels ('Heras'). Some variation as described in the Report text can be employed if appropriate

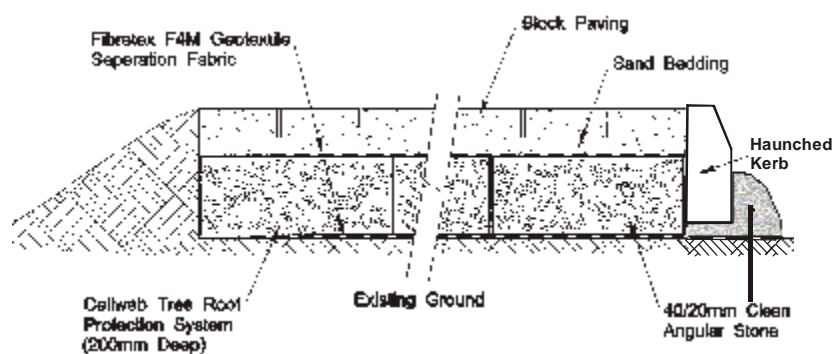


No-Dig Surfacing Construction Method within a Root Protection Area [RPA] (based on Arboricultural Practice Note 12 [APN12] and BS5837)

The construction works should progress in the following order;

- Kill ground vegetation using a systemic herbicide and gather dead organic material. Care must be taken to select (by reading the product label) a herbicide that will not affect the roots of retained trees and vegetation. This must be carried out by an appropriately trained operative.
- Remove major protrusions such as rocks and stumps (stumps should be ground out to minimise ground disturbance). Fill significant hollows with sharp sand.
- Lay a geotextile membrane directly onto the soil over the whole of the parking area or drive.
- Edging to the surfacing will be as detailed in Appendix H.
- Lay the Three Dimensional Cellular Confinement System [TDCCS] (e.g. CellWeb by Geotechnics [Appendix G] or similar). The specification will be prepared by an engineer.
- Cover the TDCCS with a no fines aggregate infill. This will be installed progressively so that machinery only moves on the laid sub-base. The aggregate will not tipped straight onto the TDCCS.
- Compact the sub-base to ensure binding with the TDCCS and to minimise future rutting of the surface.
- Lay a geotextile membrane directly onto the sub-base over the parking area or drive.
- If the proportion of RPA covered by No-Dig surfacing is more than 20% or the surface exceeds 3 metres in width within the RPA, the surfacing must be porous. This can be achieved with brick paviours on a dry bed and grouted with kiln-dried sand, or porous or perforated asphalt or concrete.

Schematic Diagram of a No-Dig Surface (Block wearing surface)



CellWeb

Tree Root Protection System

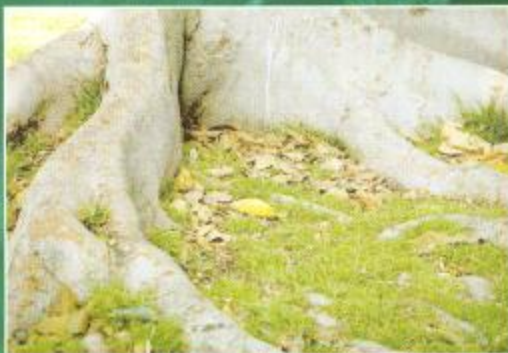


fig. 1

Problems associated with the construction of new developments around mature or any existing trees is well documented. BS5837 (1991) and later APN1 (1996) offer guidelines to those concerned with the protection of trees during the construction process.

The provision of car parking facilities and access roads around trees can lead to problems culminating in the premature loss of the tree itself unless preventative measures are taken to protect the tree roots during and after construction. (fig. 1)



fig. 2

Vehicular traffic above tree roots creates compaction of unconfined sub-soils causing oxygen depletion and even a loss of vital nutrients. Creating an impermeable surface above tree roots by installing a compacted sub base for load support also adds to these problems.

The solution is CellWeb, a three dimensional Cellular Confinement System that provides a load transfer blanket significantly reducing vertical loads on unprotected tree roots. (fig. 2)

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

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.

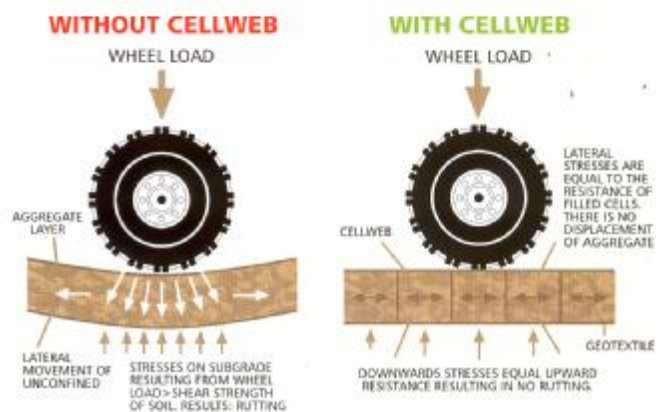


fig. 3

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:

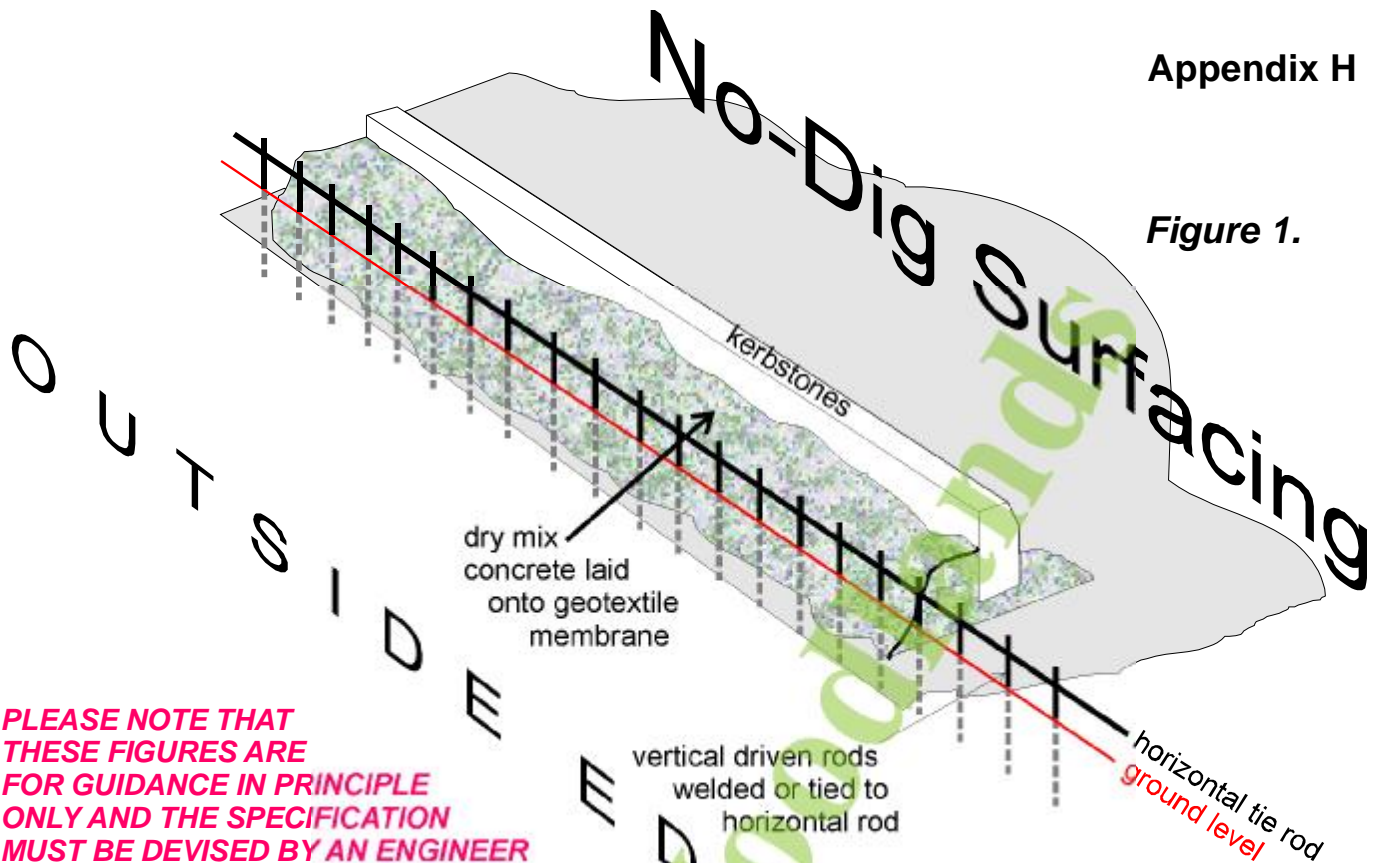
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Figure 1.



PLEASE NOTE THAT THESE FIGURES ARE FOR GUIDANCE IN PRINCIPLE ONLY AND THE SPECIFICATION MUST BE DEvised BY AN ENGINEER

No-Dig Surfacing edge retention details

Based on Arboricultural Practice Note 12, 2007

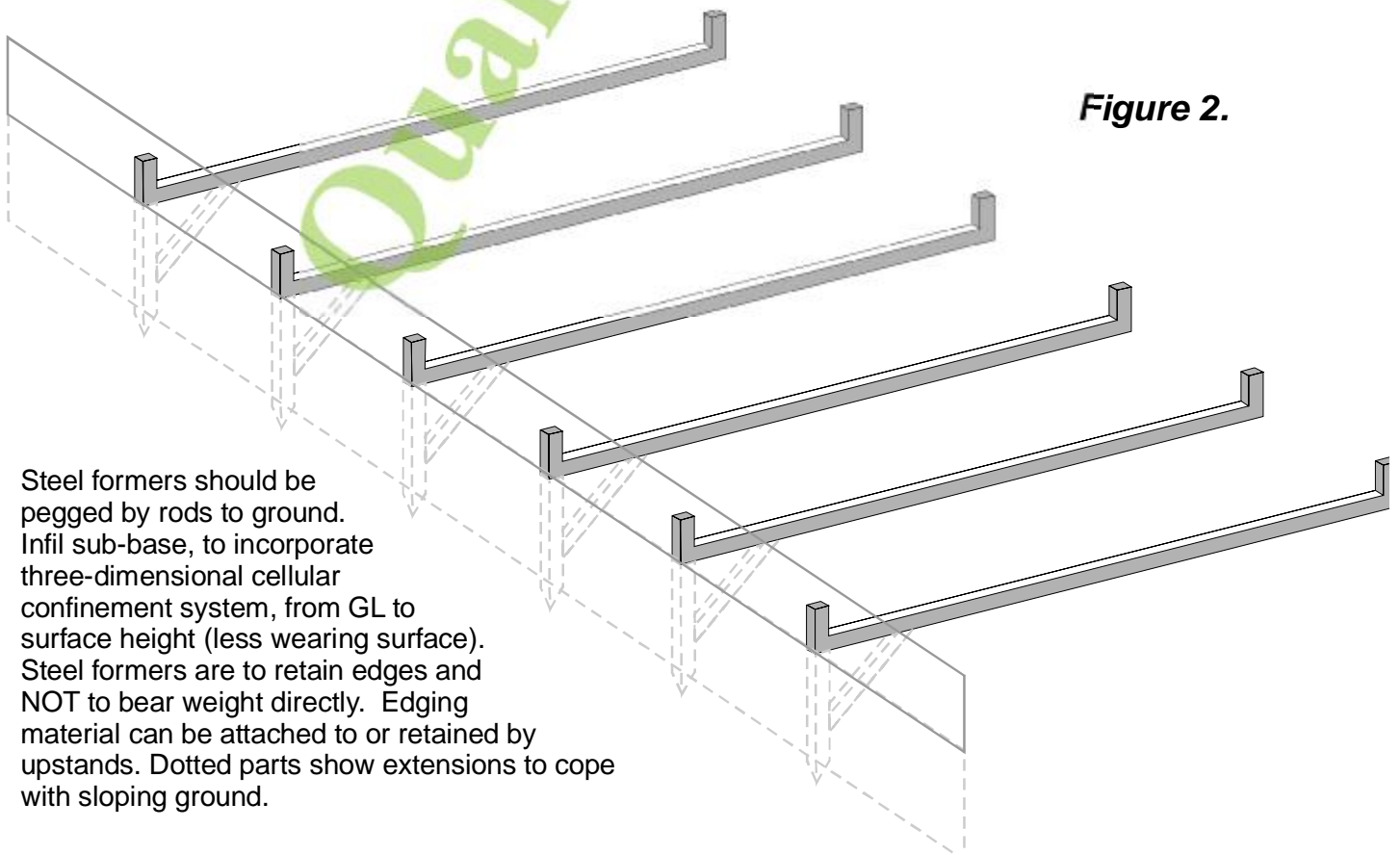
Figure 1. Installation of independent kerb edging

Figure 2. Installation of tied edges

QWAPN1edge00

N.B. Maximum width of No-Dig with a non-porous surface INCLUDING edges within a Root Protection Area is 5 metres

Figure 2.



Steel formers should be pegged by rods to ground. Infil sub-base, to incorporate three-dimensional cellular confinement system, from GL to surface height (less wearing surface). Steel formers are to retain edges and NOT to bear weight directly. Edging material can be attached to or retained by upstands. Dotted parts show extensions to cope with sloping ground.