BJH.0227

Bernie Harverson

- 9 JUL 2009

ARBORICULTURAL METHOD STATEMENT & TREE PROTECTION PLAN REPORT

for

40 St. Catherines Road, Hayling Island

*- prepared on behalf of **PWP Architects Ltd.**-*

HAVANT BOROUGH COUNCIL
21 JUL 2009
RECEIVED

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SITE SPECIFIC
ARBORICULTURAL METHOD STATEMENT

Client	**PWP Architects Limited**
Site Location	**40 St. Catherines Road, Hayling Island**
Project Arboricultural Consultant:	Bernie Harverson *M.Arb.*,
Date MS Prepared	July 2009

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1.0 INTRODUCTION

1.1 This project involves the demolition of the existing building and construction of two new detached residential dwellings on the same site; with associated garages and hard standing on the frontages. The existing access drive will be modified to form a crescent to avoid conflict with the feature Oak on the road frontage.

1.2 As part of this exercise the primary trees on and adjacent to the development works have been surveyed (**see at appendix BH1**) and will be referred to in this Method Statement.

1.3 I have been advised that there is a legal constraint in the form of a **Tree Preservation Order** relating to this site which protects the majority of the tree cover; both on and off site – **Havant Borough Council – TPO 1817/2003 & TPO 1319 (off site)/2001.**

1.4 In advising my client I am duty bound to comply with 'Best Practice' industry guidelines and to follow the recommendations contained in BS5837:2005 – Tree In Relation To Construction Recommendations – adopting the sequential approach illustrated in the Figure 1 Diagram summarizing planning for trees on development sites (**see at appendix BH1**).

2.0 CLIENTS BRIEF

2.1 I am instructed in this instance by the project Architects - **PWP Architects Limited.**

2.2 I have been commissioned to prepare a Method Statement and Tree Protection Plan Report.

2.3 Providing details of phasing and any need for ground protection measures as appropriate.

3.0 DOCUMENT DISCLOSURE

3.1 The finalised layout has been made available to me in hard copy format :– **PWP Architects – Site Plans – Drawing No. 3770/1100 – Rev.A June 2009 at 1:200 scale.**

3.2 I rely totally on the accuracy of this drawing and have used it as the base to prepare my **Tree Protection Plan BH.03** (**see at appendix BH5**).

4.0 ASSESSMENT OF TREE CONSTRAINTS

4.1 Tree Losses, Retentions and Protection Measures

4.2 As part of this assessment, dimensions have been scaled from the development layout drawings provided to me and upon which I rely.

4.3 The data is presented here in tabular format:- **Key**: RSAM = Remove for sound arboricultural management reasons RTFD = To be removed to facilitate development UF of. = Under footprint of development

Tree No	Species	Cat	S or M	Stem Diam mm	BS5837:2005 Min.Radial Prot. Zone m	BS5837:2005 Min.Root Prot. Area m^2	Distance from Site Features (see key above)	Can Tree Be Retained
Grp 1 1817 Grp1	Hawthorns	R	M	350	-	-	n/a	NO - RSAM
Grp 2	Mixed Evergreen Species	C2	M	200	2.0	12.6	2m to 2.5m from garage 6.6m from building	YES
1 1817 T2	Walnut *Juglans regia*	B1	S	230	2.8	24.0	UF of access drive	NO - RTFD
2 1817 T1	Pedunculate Oak *Quercus robur*	A1	S	800	9.6	289.6	10m to access drive each side 10m to internal turning heads	YES (1)
3 1817 T3	Silver Birch *Betula pendula*	C1	M	Est 450	4.5	63.6	UF of access drive	NO - RTFD
4	Silver Birch *Betula pendula*	C1	M	Est 400	4.0	50.3	5.8m to garage 4.2m to access drive	YES

Tree No	Species	Cat	S or M	Stem Diam mm	BS5837:2005 Min.Radial Prot. Zone m	BS5837:2005 Min.Root Prot. Area m^2	Distance from Site Features (see key above)	Can Tree Be Retained
5	Silver Birch *Betula pendula*	*C1*	*S*	*Est 400*	4.8	72.4	UF of building	NO - RTPO
6	Hawthorn *Crateagus monogyna*	C1	M	Est 400	4.0	50.3	7m to building 6.2m to patio	YES
7 1817 T5	Pedunculate Oak *Quercus robur*	C1	M	800	8.0	201.1	25.8m to building	YES
8 1817 T4	Hawthorn *Crateagus monogyna*	B1	M	460	4.6	66.5	29m to building	YES
9	Hawthorn *Crateagus monogyna*	C1	M	-	-	-	40m + to building	YES
10	Hawthorn *Crateagus monogyna*	B1 / C1	M	-	-	-	40m + to building	YES
11	Hawthorn *Crateagus monogyna*	C1	M	-	-	-	35m + to building	YES
12	Hawthorn *Crateagus monogyna*	C1	M	-	-	-	25m + to building	YES

Tree No	Species	Cat	S or M	Stem Diam mm	BS5837:2005 Min.Radial Prot. Zone m	BS5837:2005 Min.Root Prot. Area m^2	Distance from Site Features (see key above)	Can Tree Be Retained
13	Hawthorn *Crateagus monogyna*	C1	M	-	-	-	18m + to building	YES
14 1319 T4	Scarlet Oak *Quercus coccinea*	C1	M	Est 800	8.0	201.1	18m to building	YES
15 1319 T3	Sycamore *Acer pseudoplatanus*	B1	S	Est 500	6.0	113.1	6.6m to building	YES
16	Beech *Fagus sylvatica*	B1	S	Est 250	3.0	28.3	8m to access drive 11.5m to garage	YES

4.4 **YES**

Grp2; T4; T6; T7; T8; T9; T10; T11; T12; T13; T14; T15 & T16 – These trees can all be retained and afforded full protection in accordance with the BS5837 recommendations.

4.5 **YES (1)**

T2 – Oak – This is the most prominent and significant mature tree on the site and one which will need to be fully respected and protected during the development process. The current planning layout has allowed for the abandonment of the current compacted access arrangement where cars run across the unprotected ground within 2m of the trunk centre, in favour of a crescent shaped access at a minimum distance of 10m radius from the trunk. This satisfies the radial distance set down for a tree of this diameter by BS5837 but I have assessed that there is a constraint to rooting to the east side because of the road thus the tree will tend to root slightly more into the open ground areas of the site to the west side of the tree. I have assessed the likely difference in the form of a polygon root protection area which is shown on the Tree Survey/Constraints Plan 01/02 **(see at appendix BH3).** With the

planning application layout now being submitted this area marginally overlaps the proposed turning heads to the west side. At a distance of 10m + from the tree the roots will have tapered down very considerably and there will only be small diameter fibrous roots encountered in the dig process. This type of small fibrous root material can readily be severed and provided that this is done professionally with clean cuts made (with Silky handsaw or Secateurs) at the trench edge new roots will be generated from the cut ends. This will also be subject to the need for a well aerated medium for them to grow back into. The excavation work to form the turning heads will need to be done with hand tools only and NO MACHINERY EXCAVATION. The use of 'Amsterdam Tree Soil' as the sub-base material will provide a material which can be consolidated without excluding the air that is vital to tree growth. There is an organic content in the mix which should be sufficient to encourage new root growth into and through this zone. The wearing course will need to be porous and I suggest 'Formpave' brick setts (or similar product) which will allow water to percolate through to the roots. In this way a stable base for light vehicular traffic can be provided which does not conflict with the health and vigour and vitality of the Oak tree. I would see these measures as adequate to ensure the safe and healthy retention of this tree. In fact they should be seen as an improvement on the current situation where there is no root protection at the access to the site.

4.6 NO – RSAM

Grp 1 – Hawthorns – These TPO'd trees are in very poor condition with a very limited life expectancy which is why they have been graded **R** and would be removed for sound arboricultural reasons regardless of any redevelopment of the site. There are plans to provide replacements for these trees either as part of the approved planning layout or indeed regardless of same as part of a requirement under the provisions of the TPO.

4.7 NO – RTPO

T1 – Walnut; T3 – Birch and T5 Birch – All three of these trees are shown to be removed and replaced as part of the landscaping proposals which accompany the planning layout currently being considered.

T1 – Walnut – A young TPO'd tree which is of fair form and moderate B grading. It is not yet a significant specimen either in stature or form and it can only just be glimpsed by looking directly into the site from the current access point. Thought was given to transplanting this tree but given that the survival rate is only 50-50 with trees of this size and species with transplanting it was decided that the better long term solution was to remove the current tree and provide a high quality semi-mature replacement at a slightly different location but still at the front of the site where it can be enjoyed by the general public and comply with the TPO requirements.

T3 – Birch – A TPO'd tree of poor form which has a weak fork at ground level and has been extensively suppressed by the dominant Oak tree. It has low crown density and dieback within the crown and thus is graded low C category with a relatively short life expectancy. The plans for the new access to better respect the prime Oak on the frontage mean that this tree would have to be removed. Its loss can be mitigated by the planting of a new semi-mature tree (Himalayan Birch suggested) as part of the landscaping works accompanying the planning application. This would be further away from the dominant Oak which would give the new tree a better chance to develop a fuller crown than the present tree and thus enhance the site.

T5 - Birch – A TPO'd tree of poor form with significant cavities in old pruning wounds on the trunk and also in old pruning wounds in the upper crown where it has been topped out in the past. This is a tree of low C grading and limited life expectancy, which cannot be readily seen from the road frontage and the current proposals allow for its removal and the planting of a replacement semi-mature tree a little further back into the site so that it is in the rear garden of one of the plots and sufficient distance from it that there will be no pressures to prune or fell because of shading or light restriction issues.

5.0 PHASING OF OPERATIONS

Phase 1 - Pre-Demolition/Construction Tree Works

- Undertake all approved pre-development tree work – see appendix BH4.
- The tree surgery specialist contractors are to be given clear guidelines and a remit that prohibits heavy plant (Lorries, Cranes and Work Platforms) tracking through the site within tree protection zones.

Phase 2 – Pre-Demolition/Protective Fencing Works

- Grp1 and T1/T3 & T5 will have been removed thus providing the space to form the two new access points on the site frontage thus providing an area outside of the crown spread of the primary Oak tree and protecting it both above and below ground for the duration of the Demolition and subsequent Construction phases of works.
- Erect the protective fencing - the protective fencing barriers are to be located exactly as specified on the **Tree Protection Plan BH03** – see at appendix BH5. Which is in full accordance with the recommendations contained within British Standard 5837:2005- Figure 2. A copy of the Tree Protection Plan is to be pinned up in the temporary offices/mess hut on site for all site staff to see. The area within the construction exclusion zone is to be regarded as **sacrosanct** and the fencing shall not be taken down or relocated at any time without the prior written approval of the monitoring arboriculturist or local authority tree officer, unless this has already been agreed as part of the planning application consent process and is detailed in writing and shown on a plan. The fencing shall comprise of interlocked Weldmesh (Heras) panels (or agreed alternative which meets the BS5837 standards), well braced to

resist impacts and securely attached to a scaffolding framework by means of wires or scaffold clamps. It shall have top and bottom horizontal bars, with uprights set into the ground at no greater interval than 3m spacings. Angled bars shall be located behind the fencing to act as braces, these will be firmly clamped to the top rail and set into the ground braced as necessary; these shall be spaced at no less an interval than one brace per two panels.

- The following prohibitions shall apply within the area enclosed by the Tree Protection Fencing :-
  - **No** mechanical digging or scraping once the initial ground cover vegetation has been cleared and the site fenced off.
  - **No** storage of plant, equipment or materials
  - **No** vehicular or plant access
  - **No** fire lighting
  - **No** handling, discharge or spillage of any chemical substance, including cement washings
  - **No** action likely to cause localised water-logging
  - **No** change in ground levels
  - **No** construction of a hard surface
- Whilst the heading of this Phase refers to the Demolition works the fencing that is erected will remain in place throughout the Construction Phase as well. The exception will be the few places where for practical reasons the demolition phase cannot be undertaken if fencing is erected too close to the existing building. In this instance as soon as the Demolition work has been completed and prior to occupation of the site by the Construction Contractors the full protective fencing measures must be erected at the correct distances.

Phase 3 – Demolition Works

- Machine operators are to adhere strictly to the guidelines at Section 7.0 of this report.
- On no account will protective fencing be moved to facilitate access for demolition purposes.
- Materials and debris will need to be removed as soon as possible from site as the works progress with no long term storage of materials unless they are to be recycled.
- The existing building walls are to be **pulled in on the building footprint** and not allowed to spread beyond this to areas of open ground where there is currently no hard surfacing.

Phase 4 – Construction Works

- The main building and car parking works will take place outside of the retained trees root protection zones so they are adequately respected and protected.
- Provided that the Protective fencing is erected and maintained as shown of Plan BH.03 the retained trees will be adequately protected.

Phase 5 - Post Construction Landscaping Works

- General landscaping works are to be organised in accordance with the BS5837 extracts included at appendix BH6.
- On completion of all building works and immediately prior to landscaping works being undertaken and with the agreement of the LPA Tree Officer the Protective Fencing may be removed and the area within opened up for soft landscaping and final surface treatments.
- This is to be hand excavation works only with no machinery being used unless specific ground protection has been laid. Even then only lightweight mini excavators are to be permitted access.
- It is acknowledged that by the nature of the works some surface excavation is needed to prepare for tree and shrub planting or laying of lawns. This work shall be undertaken with hand forks and any exposed roots are to be cleanly severed to encourage new growth and an adequate soil medium laid around them to encourage same.

6.0 UTILITY SERVICE CONNECTIONS

6.1 At the time of writing this Method Statement the exact route of underground service connections is not known, but wherever possible they must link in with existing manholes and service runs and not create new ones within tree protection zones.

6.2 In the event that the creation of new service routes through tree protection zones cannot be avoided it is essential that all such service trenches are excavated utilising the principles of NJUG 10. The first resort will be to use trenchless Thrust Boring/Moling below the main rooting zone (1m and greater depth). If this is not possible then an open trench form of excavation will have to be used with all excavation works undertaken by hand and only roots of 25mm or less severed. This exercise must only be carried out under the direct supervision of an arboricultural expert.

6.2 A copy of NJUG 10 Guidelines is included (at appendix BH6) as a basis for further discussion in the event that it should prove necessary to run service routes through tree protection zones. In which case there will be a need for a separate Method Statement to be approved by the Local Authority which incorporates provision for Arboricultural supervision and monitoring.

7.0 AVOIDING DAMAGE TO TREE TRUNKS AND BRANCHWORK

7.1 Care shall be taken when planning site operations to ensure that wide or tall loads or plant with booms, jibs and counterweights and static and mobile cranes can operate without coming into contact with the retained trees. Such contact could result in serious injury which might make a trees safe retention impossible.

7.2 ALL machine operators are required to undergo an induction session prior to being allowed to work on site, where the Method Statement will be explained to them and a copy provided for their reference. In addition a copy of the Tree Protection Plan will be provided or pinned up in the site hut and the trees which are to be retained and protected will be pointed out to the operator and they will also be shown which trees these are on site before they start work. In this way it is hoped that unnecessary damage, by root disturbance and collision of machinery booms and operating arms with tree crowns can be avoided.

8.0 REPORTING DAMAGE TO TREES AND PROTECTIVE FENCING

8.1 Should any damage occur to trees noted for retention either by the above works or as the result of any other action, the damage must be reported to the site manager immediately. The site manager shall report up the chain of responsibility and also to the retained consultant arboriculturist or in the absence of such an appointment to an appropriately qualified arboriculturalist, to enable remedial measures to be specified and implemented as appropriate.

8.2 Should protective fencing become damaged so as to impair its function in protecting trees, all work shall cease in the vicinity of the damage until the fence has been returned to standard.

9.0 SITE MONITORING AND SUPERVISION

9.1 It is recommended in BS5837:2005 that an arboriculturist is retained to advise on all aspects of site monitoring and supervision and it is the local authority's responsibility to make this a condition of planning approval requiring agreement of a set schedule of operations and timings prior to undertaking works on site.

10.0 SOFT LANDSCAPING WORKS

10.1 Any soft landscape works within the protected areas shall be in accord with Table 3 and Sections 13 & 14 of BS5837:2005 (see copy extracts at appendix BH6).

10.2 It is strongly recommended that the plans and specifications for the landscaping of this development are drawn up by a qualified Landscape Architect.

11.0 CONTACT LIST

11.1 It is suggested that clear and concise points of contact and lines of communication are established prior to commencement of the works on site including:-

- Arboricultural Consultant ; Local Authority Tree Officer ; Local Authority Planning Officer; Site Manager and Foreman

11.2 It is advised that the Site Manager establishes his own listing of contact details at the Pre-Start site meeting and pins this up in his office for general use as necessary.

12.0 CONCLUSIONS

- This project involves the demolition of the existing detached dwelling and then the construction of two new detached dwellings with associated access and parking arrangements.
- There is a very minimal loss of trees and where this is necessary to facilitate the layout (and for sound management reasons – Grp1) semi-mature trees will be planted at agreed locations to mitigate their loss.
- All other retained trees will be fully protected in accordance with BS5837 Recommendations.
- Given these circumstances and strict adherence to the methodology prescribed within this report I would see the new proposals as acceptable and supportable in arboricultural terms.

Fernie Harverson

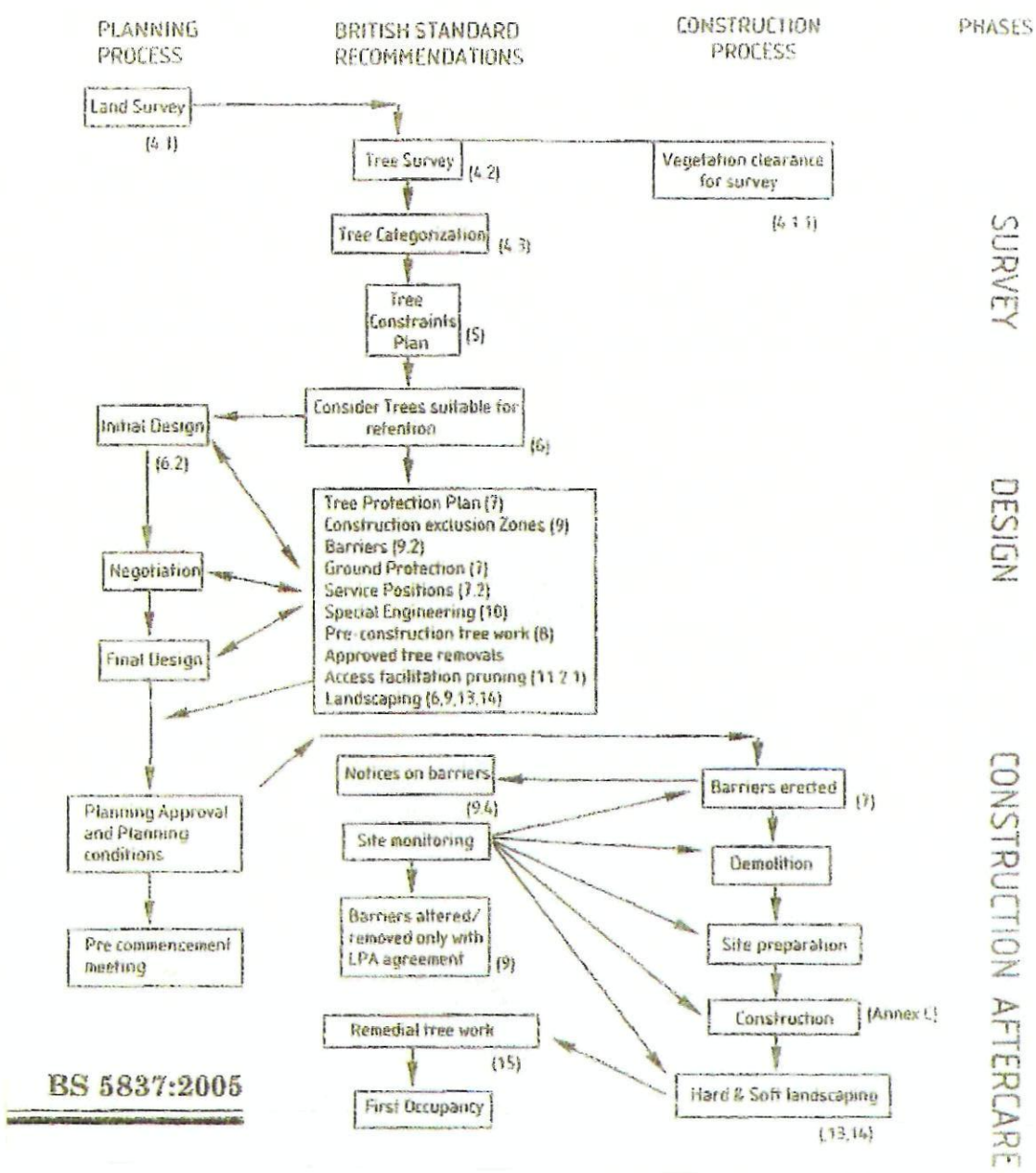
BH 1

Tree Survey Schedule

(in accordance with Table 1 of BS5837)

+ Tree Survey Notes + Flow Diagram

Bernie Harverson
arboricultural consultant



Figures in brackets refer to Clause numbers.

Figure 1 — Flow diagram, summarizing planning for trees on development sites

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TREE SURVEY NOTES

These Tree Survey Notes have been prepared in accordance with the recommendations of **British Standard 5837:2005** and define the criteria for pre – development tree surveys.

- Each tree/group has been allocated a unique number (**No.**). Where specifically commissioned small durable numbered metal tags can be applied to each tree/group surveyed.
- The tree species (**Species**) is provided in both English and Latin formats.
- Height assessments (**Ht**) are estimated in metres. This will be adequate for the majority of cases, but where accurate heights become a critical issue it may be necessary to return to site, as a separately commissioned exercise, to collect accurate measurements with the aid of optical instruments.
- Trunk/stem diameters (**Trunk Diam**)are measured in millimetres at 1.5m above ground level and denoted as **S** single stemmed trees or **M** for multi-stemmed trees which are measured immediately above the root flare.
- Radial crown spread assessments (**Brch Sprd**) are estimated in metres from the centre of the trunk/group to each of the four primary points of the compass (**N**-north; **E**-east; **S**-south and **W**-west) in order to achieve a representation of the crown shape which will be recorded on the accompanying tree survey plan. These provide a general guide as to the main bulk outline of a tree/groups crown but are not tape measured dimensions. These would only be undertaken as part of a separately commissioned exercise, where precise dimensions are critical to the project at hand.
- The average ground clearance (**Grd Cl**) is estimated and shown in metres.
- An assessment of a tree/groups age (**Age**) class is made in terms of its site specific maturity as part of the surrounding landscape, taking into account its overall shape and form in that setting, and is recorded thus :-

  Y - Young tree/group
  MA - Middle – aged tree/group
  M - Mature tree/group
  OM - Over – mature tree/group
  V - Veteran tree/group
- An assessment of a tree/groups overall physiological condition (**Fm**)is recorded as :-

  G - Good
  F - Fair
  P - Poor
  D - Dead
- Data on the structural condition (**Condition Comments**) of the tree/group is provided to give an indication of its visual appearance and any significant health and safety issues.
- Details of necessary tree works required at the time of survey is given under the heading – **Preliminary Management Recommendations**
- An estimate of a tree/groups future life expectancy (**Rem Cont**) is made and is recorded thus :-
  1-10; 10-20; 20-30; 30-40 or **>40** years.
- The category grading (**Cat**) for each tree/group is assessed according to the criteria provided within **BS5837:2005.** The assessment is made of the tree/group in its current condition and within the environment encountered bearing in mind its suitability for retention as part of any future proposed development; although the exact layout detail of any specific scheme will not be known at the time of surveying. The trees have been classified into one of four categories and colour coded as BS5837 recommends - **R** (dark red); **A** (light green); **B** (mid-blue) and **C** (grey).Please note that the numerical sub-categories which are also applied are for guidance only and do not carry any cumulative or increased value for the tree/group. This colour coding scheme will be applied to all drawings provided.

Table 1 – Cascade chart for tree quality assessment

TREES FOR REMOVAL		
Category and definition	**Criteria**	**Colour on plan**
Category R Those in such a condition that any existing value would be lost within 10 years and which should, in current context, be removed for reasons of sound arboricultural management.	• 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 **R** category trees (i.e. 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 (e.g. Dutch Elm Disease), or very low quality trees suppressing adjacent trees of better quality	Dark Red

TREES TO BE CONSIDERED FOR RETENTION				
	Criteria – Subcategories			
	1	**2**	**3**	
Category A – Those of high quality and value: in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested)	Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or *principal trees within an avenue*)	Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particularly visual importance (e.g. avenues or other arboricultural features assessed as groups)	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	Light Green
Category B – Those of moderate quality and value: in such a condition as to make a significant contribution (a minimum of 20 years is suggested)	Trees that might be included in the high category, but are downgraded because of impaired condition(e.g. presence of remediable defects including unsympathetic past management and minor storm damage)	Trees present in numbers, usually as groups or woodlands, such that they form distinct landscape features, thereby attracting a higher collective rating 3than they might as individuals but which are not, individually, essential components of formal or semi-formal arboricultural features (e.g. trees of moderate quality within an avenue that includes better, A category specimens), or trees situated mainly internally to the site, therefore individually having little visual impact on the wider locality	Trees with clearly identifiable conservation or other cultural benefits	Mid Blue
Category C – Those of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150mm	Trees not qualifying in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit	Trees with very limited conservation or other cultural benefits	Grey
Note: Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150mm should be considered for relocation				

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TREE SURVEY SCHEDULE

Client : Mr.N.Danby (via PWP Architects)

Site Location : 40 St Catherines Road, Hayling Island

Surveyor : Bernie Harverson *M.Arb.* **Date Surveyed :** 21st May 2008 **Verified : June 2009**

No	Species	Ht m	S or M	Trunk Diam mm	Brch Sprd m	G Cl m	Age	F	Condition Comments	Preliminary Management Recommendations	Rem Cont yrs	Ca
Grp 1 1817 Grp1	Hawthorns	6	M	350	N3 E3 S3 W3	0	MA	P	Ivy smothering- suppressed and dominated by Oak tree-poor quality trees of limited value-only the southernmost tree contains live growth-otherwise they are ivy trees	Recommend removal and stump grinding	1-10	R
Grp 2	Mixed Evergreen Species	6	M	200	N2.5 E2.5 S2.5 W2.5	0	MA	P	Ivy on main trunks-crown shapes dictated by group pressures-merged crowns-linear hedge-unkempt and overgrown	Cut back to a former hedge status	20-30	C2
1 1817 T2	Walnut *Juglans regia*	6	S	230	N6 E3 S3 W5	1	Y	F	Suppressed to east side by Oak tree	No works required at the time of surveying	>40	B1
2 1817 T1	Pedunculate Oak *Quercus robur*	18	S	800	N10 E10 S10 W10	5	M	G	Unable to access base of tree because of dense ivy cover-ivy smothering-minor dead wood throughout-good shape and form and outwardly sound and healthy	No works required at the time of surveying	>40	A1
3 1817 T3	Silver Birch *Betula pendula*	15	M	Est 450	N5 E4 S2.5 W5	4	MA	P	Unable to access base of tree because of dense vegetation-ivy on main trunk-bifurcated at ground level-suppressed to the south side by Oak tree-low crown density-minor dieback-minor dead wood throughout-cables through crown	No works required at the time of surveying	10-20	C1
4	Silver Birch *Betula pendula*	13	M	Est 400	N5 E2.5 S2.5 W4	5	MA	P	Bifurcated at 1m above ground-suppressed to the east side-low crown density-minor dieback-cavities in old pruning wounds-cables through crown	No works required at the time of surveying	10-20	C1

5	Silver Birch *Betula pendula*	13	S	Est 400	N2.5 E2.5 S3 W5	2	MA	F	Cavities in old pruning wounds-previously topped out	No works required at the time of surveying	10-20	C1
6	Hawthorn *Crateagus monogyna*	5	M	Est 400	N2.5 E4 S2.5 W2	1.5	MA	P	Unable to access base of tree because it is off-site-dieback on west side of crown-minor dead wood throughout-previously reduced and reshaped	No works required at the time of surveying	10-20	C1
7 1817 T5	Pedunculate Oak *Quercus robur*	15	M	800	N7 E7 S7 W5	2	M	P	Ivy on main trunk-bifurcated at 1m above ground-major deadwood and stubs-minor deadwood throughout-storm damage and hangers-cavities in old pruning wounds-previously hard pruned back on south side	Remove major dead wood and stubs and storm damage and hangers-reshape lower crown to tidy.	>40	C1
8 1817 T4	Hawthorn *Crateagus monogyna*	8	M	460	N4 E4.5 S4.5 W5.5	1	M	G	Multi-stemmed at 0.5m above ground-previously reduced and reshaped-generally outwardly of good form	No works required at the time of surveying	>40	B1
9	Hawthorn *Crateagus monogyna*	-	-	-	N- E- S- W-	-	M	P	No Updated Data Collected For This Tree	-	-	C1
10	Hawthorn *Crateagus monogyna*	-	-	-	N- E- S- W-	-	M	P	No Updated Data Collected For This Tree	-	-	B1 / C1
11	Hawthorn *Crateagus monogyna*	-	-	-	N- E- S- W-	-	M	P	No Updated Data Collected For This Tree	-	-	C1
12	Hawthorn *Crateagus monogyna*	-	-	-	N- E- S- W-	-	M	P	No Updated Data Collected For This Tree	-	-	C1

13	Hawthorn *Crateagus monogyna*	-	-	-	N- E- S- W-	-	M	P	No Updated Data Collected For This Tree	-	-	C1
14 1319 T4	Scarlet Oak *Quercus coccinea*	12	M	Est 800	N9 E7 S6 W7	5	M	P	Unable to access base of tree because it is off-site-significant dieback –one low branch to the north side overhangs the boundary line and is out of character with the remainder of the crown spread giving the impression of a greater spread overall	No works required at the time of surveying	10-20	C1
15 1319 T3	Sycamore *Acer pseudoplatanus*	16	S	Est 500	N4 E5 S4 W5	4	M	G	Unable to access base of tree because it is off-site-minor branch overhang of boundary-generally outwardly sound and of good overall form	No works required at the time of surveying	>40	B1
16	Beech *Fagus sylvatica*	10	S	Est 250	N4.5 E6 S3 W4	2	Y	F	Unable to access base of tree because it is off-site-ivy on main trunk	No works required at the time of surveying	>40	B1

Fernie Harverson

BH 2

Tree Root Protection Area Schedule
(in accordance with Table 2 of BS5837)

Bernie Patterson

BJH.0227

ROOT PROTECTION ZONE/AREA SCHEDULE

Client : Mr.N.Danby (via PWP Architects)
Site Location : 40 St Catherines Road, Hayling Island

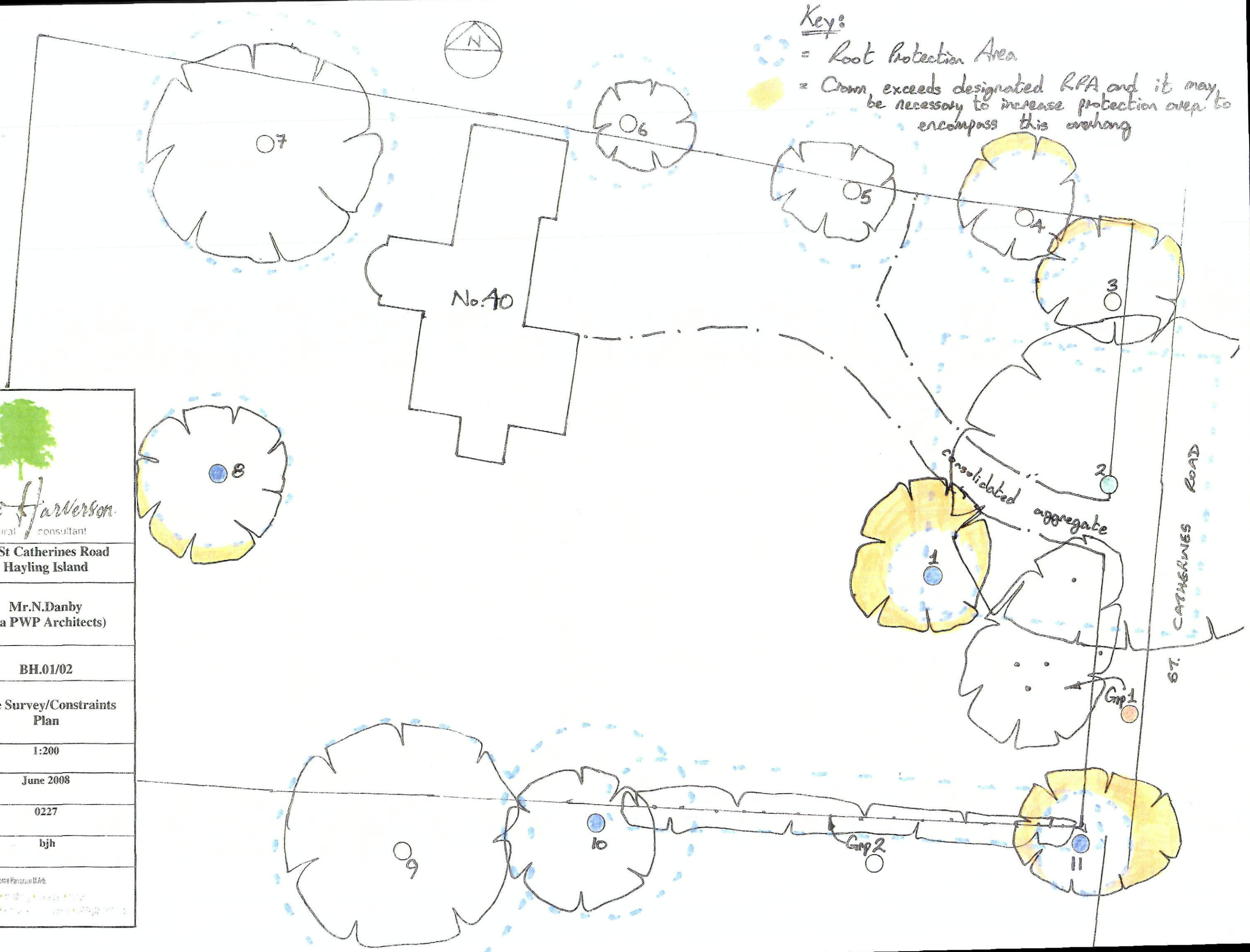
Tree No.	Tree Species	Grade	Single or Multi Stem	Diam. mm	BS5837:2005 Table2- Radial Protect. Zone m	BS5837:2005 Table2- Root Protect. Area m^2	Is An Offset Required To Cater For Existing Rooting Pattern Restrictions
Grp 1 1817 Grp1	Hawthorns	R	M	350	-	-	NO – these tree should be removed for sound arboricultural reasons regardless of any redevelopment proposals
Grp 2	Mixed Evergreen Species	C2	M	200	2.0	12.6	YES – competition for rooting space will focus rooting to the north side
1 1817 T2	Walnut *Juglans regia*	B1	S	230	2.8	24.0	NO – free rooting to all directions
2 1817 T1	Pedunculate Oak *Quercus robur*	A1	S	800	9.6	289.6	YES – the hard surfacing will focus rooting out into the front garden to the west side
3 1817 T3	Silver Birch *Betula pendula*	C1	M	Est 450	4.5	63.6	NO – free rooting to all directions
4	Silver Birch *Betula pendula*	C1	M	Est 400	4.0	50.3	NO – free rooting to all directions
5	Silver Birch *Betula pendula*	C1	S	Est 400	4.8	72.4	NO – free rooting to all directions

6	Hawthorn *Crateagus monogyna*	C1	M	Est 400	4.0	50.3	NO – free rooting to all directions
7 1817 T5	Pedunculate Oak *Quercus robur*	C1	M	800	8.0	201.1	NO – free rooting to all directions
8 1817 T4	Hawthorn *Crateagus monogyna*	B1	M	460	4.6	66.5	NO – free rooting to all directions
9 to 13	Hawthorn *Crateagus monogyna*	C1	M	Est 400	4.0	50.3	NO – free rooting to all directions
14 1319 T4	Scarlet Oak *Quercus coccinea*	C1	M	Est 800	8.0	201.1	NO – constraints all around tree hemming it in
15 1319 T3	Sycamore *Acer pseudoplatanus*	B1	S	Est 500	6.0	113.1	NO – free rooting to all directions
16	Beech *Fagus sylvatica*	B1	S	Est 250	3.0	28.3	NO – free rooting to all directions

Fernie Harverson

BH 3

Tree Survey& Constraints Plan -BH01/02



Bernie Harverson
arboricultural consultant

project:	40 St Catherines Road Hayling Island
client:	Mr.N.Danby (via PWP Architects)
drawing title:	BH.01/02
drawing no.	Tree Survey/Constraints Plan
scale:	1:200
date:	June 2008
job no:	0227
drawn by:	bjh

Bernie Harverson M.Arb.

Fernie Harrison

BH 4

Pre-Development Facilitation
Tree Works Schedule

BJH.0227

TREE WORK SPECIFICATION

Client : Mr.N.Danby (via PWP Architects)

Site Location : 40 St Catherines Road, Hayling Island

The abbreviations used in the header block below are fully explained within the attached Tree Survey Notes. The assessment of remaining contribution in years and the category are made as viewed and may be subject to variation where the management strategy suggests further investigations/actions followed by re-surveying. Group details/dimensions are recorded as an average.

Attention is drawn to the fact that some mature trees could provide suitable habitat for bird nesting (ivy and cavities) and bat roosting (ivy, branch cracks and cavities) and this might at certain times of year influence and possibly restrict the form of management which can be applied. Given the legal constraints imposed by the Habitat Regulations and the Wildlife and Countryside Act this may necessitate expert ecological advice being sought before proceeding with the recommendations.

No	Species	Tree Works Recommended
Grp 1 1817 Grp1	Hawthorns	• Fell to ground level • Grind out the stumps
Grp 2	Mixed Evergreen Species	• Cut back the face of the hedgerow close to the boundary fence line making final cuts adjacent to living growth points wherever possible. • Top out the hedge at 3m to 4m above ground throughout
1 1817 T2	Walnut *Juglans regia*	• Fell to ground level • Grub out the stump
2 1817 T1	Pedunculate Oak *Quercus robur*	• Remove fragile dead branches only – retain anything which is stable and firmly attached
3 1817 T3	Silver Birch *Betula pendula*	• Fell to ground level • Grub out the stump

4	Silver Birch *Betula pendula*	• Prune to clear route of cables • Remove any dead wood and dieback
5	Silver Birch *Betula pendula*	• Fell to ground level • Grub out the stump
6	Hawthorn *Crateagus monogyna*	• No works required to this off site tree
7 1817 T5	Pedunculate Oak *Quercus robur*	• Remove storm damage and hangers • Remove fragile dead branches only -- retain anything which is stable and firmly attached • Prune to improve shape and form after the removal of the storm damage making all final cuts adjacent to living growth points
8 1817 T4	Hawthorn *Crateagus monogyna*	• No works required at this time
9	Hawthorn *Crateagus monogyna*	• No works required at this time
10	Hawthorn *Crateagus monogyna*	• No works required at this time
11	Hawthorn *Crateagus monogyna*	• No works required at this time
12	Hawthorn *Crateagus monogyna*	• No works required at this time
13	Hawthorn *Crateagus monogyna*	• No works required at this time
14 1319 T4	Scarlet Oak *Quercus coccinea*	• No works required to this off site tree

15 1319 T3	Sycamore *Acer pseudoplatanus*	• No works required to this off site tree
16	Beech *Fagus sylvatica*	• No works required to this off site tree

BH 5

Tree Protection Plan BH03

38

Key:

..... = Setting out positions for Protective Fencing in accordance with BS 5837 - Section 9.2 & Figure 2

= Ground Protection measures in accordance with BS 5837 - Section 9.3 & figure 3

project:	40 St Catherines Rd Hayling Island
client:	PWP Architects
drawing title:	Tree Protection Plan
drawing no.	BH.03
scale:	1:200
date:	July 2009
job no:	0227
drawn by:	bjh

Bernie Harverson M Hub.

ST CATHERINE'S ROAD

TPO OAK 07

HWTH 06

REPLACEMENT

HIMALAYAN BIRCH

existing building to be demolished

OUTLINE OF EXISTING BUILDING

PLOT 1

05 SB

04 SB

REPLACEMENT

03 TPO SB

Connection to existing services to be outside hand dig zone

Proposed service connection point (existing)

02 TPO OAK

08 TPO HWTH

09 HWTH

10 HWTH

11 HWTH

12 HWTH

13 HWTH

14 OFFSITE TPO

15 OFFSITE TPO

16 BCH

01 TPO WAL

GRP1 TPO HWTH

REPLACEMENT

REPLACEMENTS

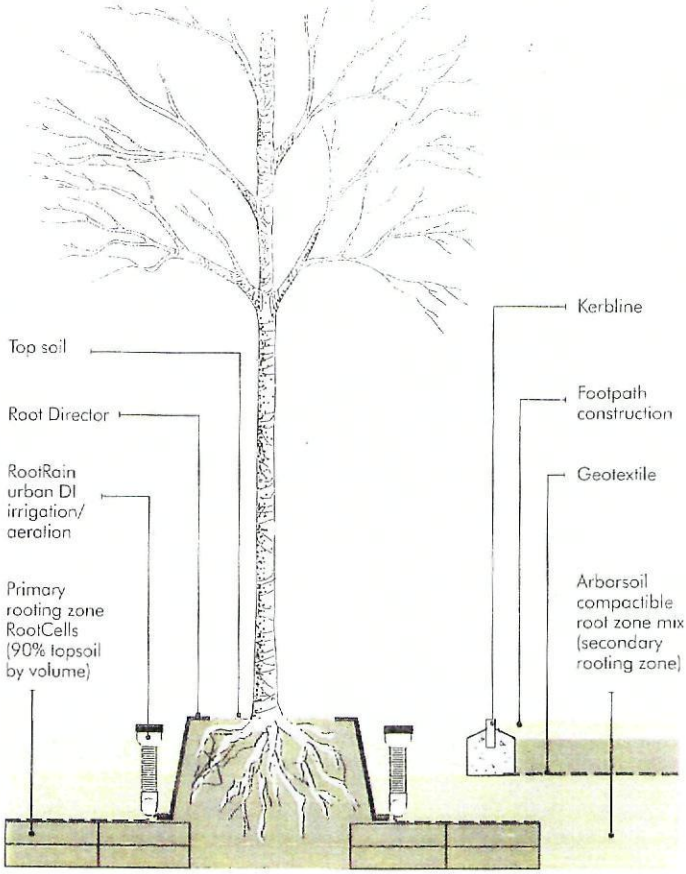
PLOT 2

WALNUT

HAWTHORNS x3

Grp2

ARBORSOIL
Compactible root zone material



Technical analysis

Ph	7.5
Phosphorous	20-50mg/100g
Potassium	10-20mg/100g
Magnesium	100-300mg/100g
Organic matter + a range of trace elements	4-6%

Please contact sales for prices and availability.





Arborsoil used as secondary rooting zone under paved pedestrian area.

Typical installation specification

Only specify Arborsoil in the secondary rooting area when having a compacted surface is unavoidable.

Ensure adequate drainage to areas using this material. It can act as a sponge, soaking up ground water and stagnating.

Accurate compaction levels are critical to the product's effectiveness. The trench or tree pit should be backfilled in layers 300mm thick, each layer being compacted to 1.5-2.0 mega pascals and checked with a penetrograph.

Specify an adequate irrigation/aeration system to the root zone such as Root Rain Precinct with two inlets per tree.

Arborsoil or other tree sand mixes will not prevent surface rooting. We suggest using in conjunction with Root Directors, ReRoot 300 or ReRoot 600 to divert roots into the preferred rooting area, preventing root heave problems later on in the tree's life.

Compatible 'Arborsystem' products

- Root Director, see pages 10-11
- ReRoot root barriers, see root management products section, pages 3-11
- Greenleaf cast iron/fabricated tree grilles and guards, see pages 37-43
- Underground guying system, see pages 34-35
- Arboresin porous bound gravel, see pages 44-45
- RootCell load bearing soil module, see pages 24-25

Standard tree pit details

To clearly illustrate correct product application, please refer to our standard tree pit details ref: GLTP16 (see page 65).

Aquaflow Block and Tree Soil





Tree soil applications

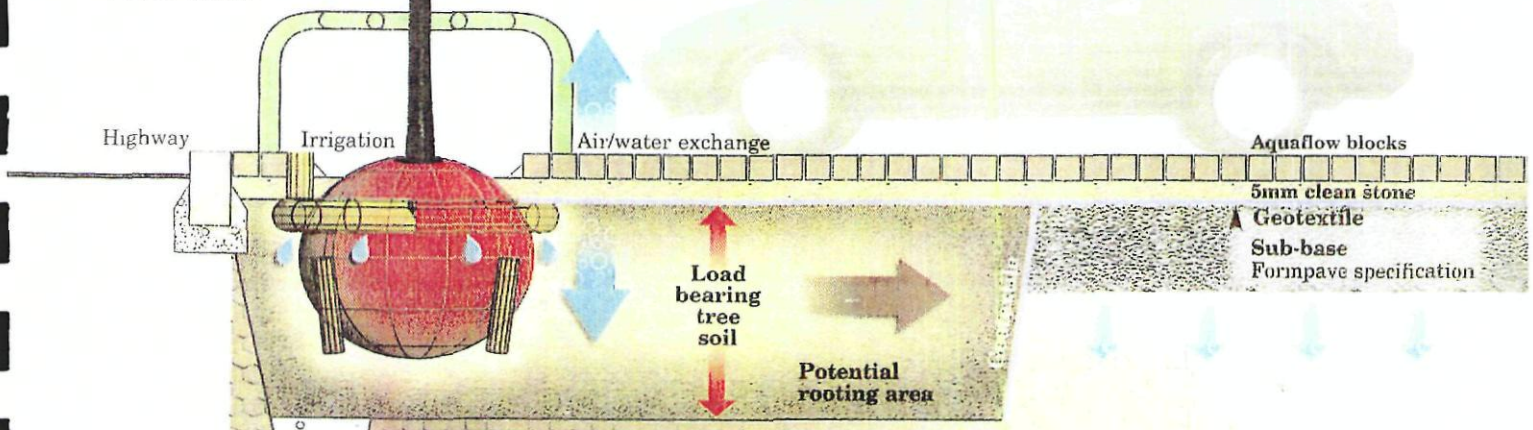




Detail around existing trees

Formpave

Where a tanked sub-base system is used the system is covered by patent: PCT/GB99/01844

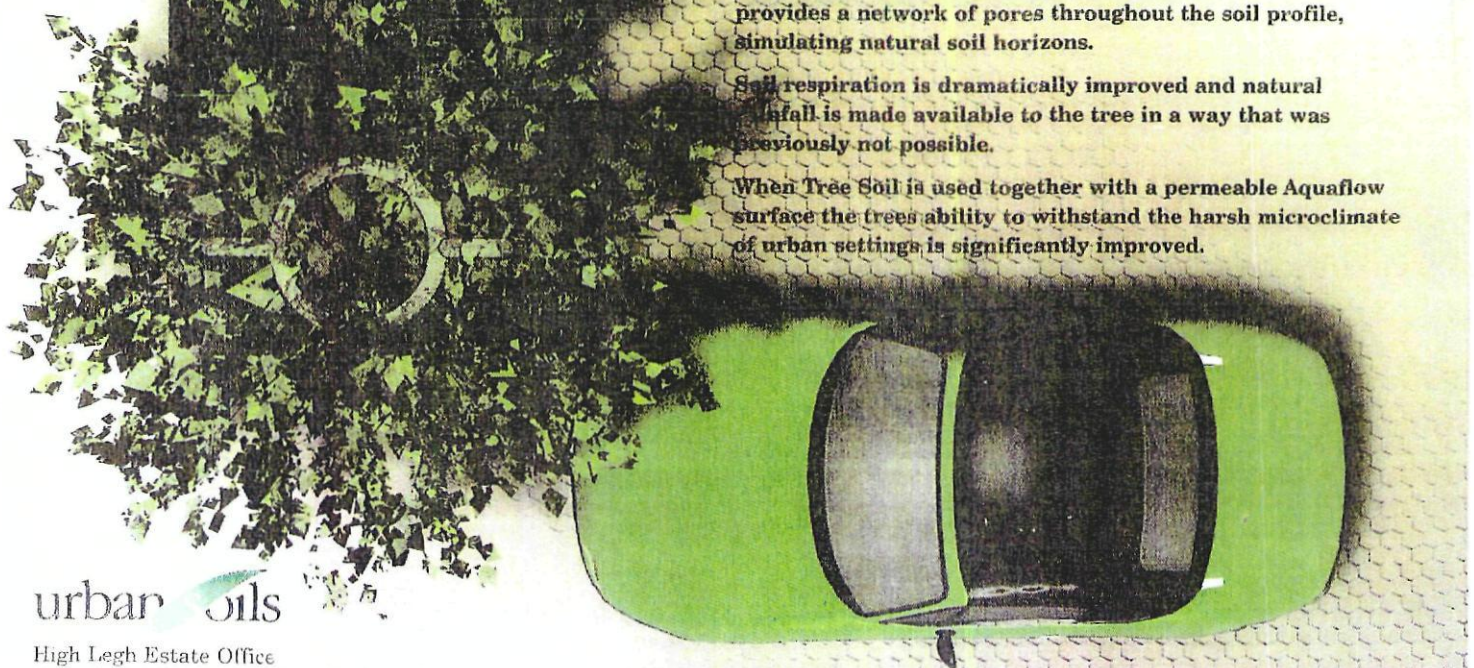


Soil respiration and moisture availability are key elements in the successful establishment and future growth of street trees. Until now, the only access for air and water has been through the tree grill or irrigation system.

The use of Aquaflow blocks, in combination with Tree Soil provides a network of pores throughout the soil profile, simulating natural soil horizons.

Soil respiration is dramatically improved and natural rainfall is made available to the tree in a way that was previously not possible.

When Tree Soil is used together with a permeable Aquaflow surface the trees ability to withstand the harsh microclimate of urban settings is significantly improved.



urban soils

High Legh Estate Office
Knutsford, Cheshire WA16 0QS Telephone: 01925 757800 Fax: 01925 756599 E-mail urbansoi@globalnet.co.uk

Standard scaffold poles

1. Uprights to be driven into the ground
2. Panels secured to uprights with wire ties and where necessary standard scaffold clamps
3. Weldmesh wired to the uprights and horizontals
4. Standard clamps
5. Wire twisted and secured on inside face of fencing to avoid easy dismantling
6. Ground level
7. Approximately 0.6m driven into the ground

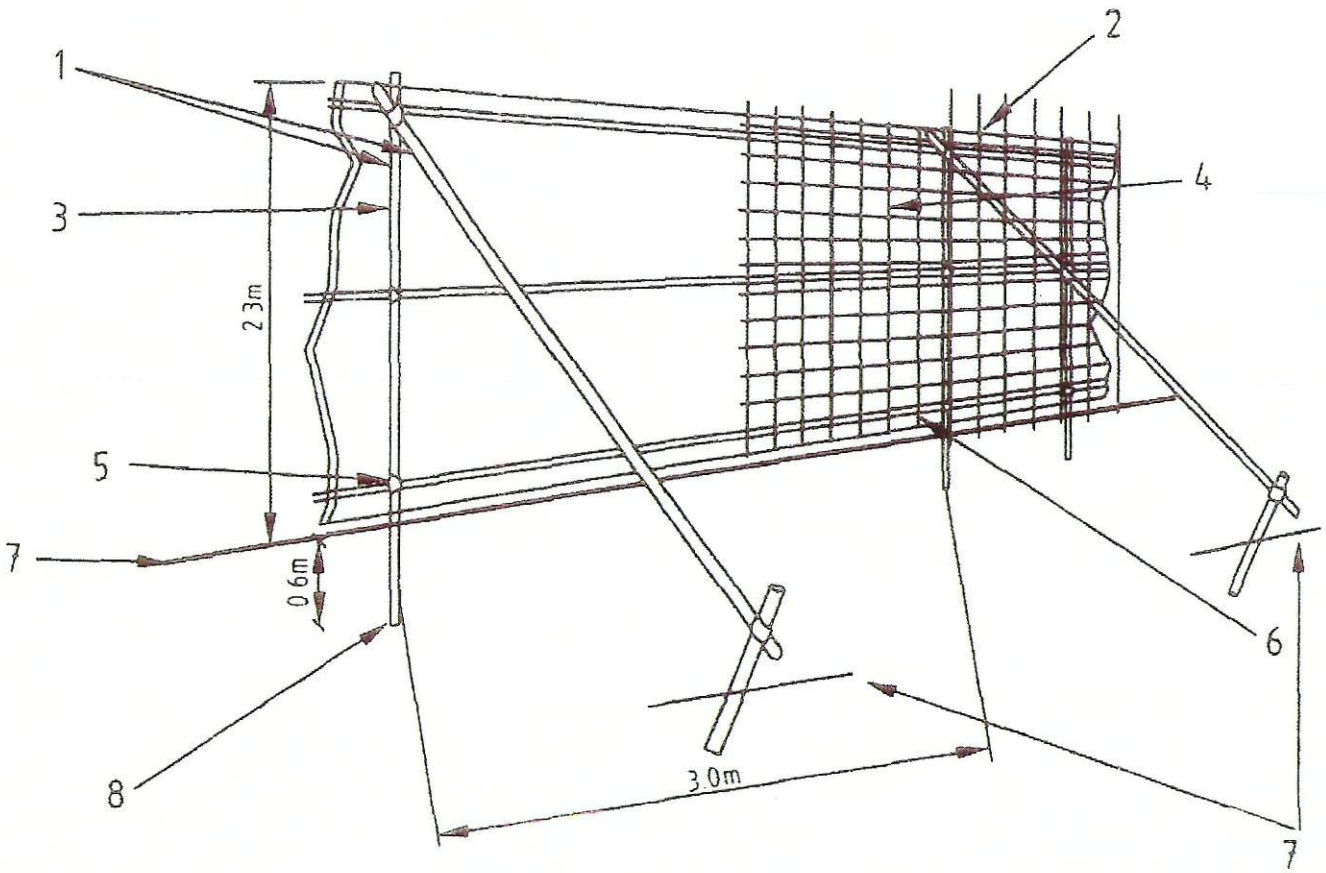


Figure 2 - Protective Barrier

Extract taken from BS5837:2005

9.2 Barriers

9.2.1 Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). On all sites, special attention should be paid to ensuring that barriers remain rigid and complete.

9.2.2 In most cases, barriers should consist of a scaffold framework in accordance with Figure 2. comprising a vertical and horizontal framework, well braced to resist impacts, with vertical tubes spaced at a maximum interval of 3m. Onto this, Weldmesh panels should be securely fixed with wire or scaffold clamps. Weldmesh panels on rubber or concrete feet are not resistant to impact and should not be used.

NOTE The above is preferred because it is readily available, resistant to impact, can be re-used and enables inspection of the protected area.

9.2.3 It may be appropriate on some sites to use temporary site office buildings as components of the tree protection barriers.

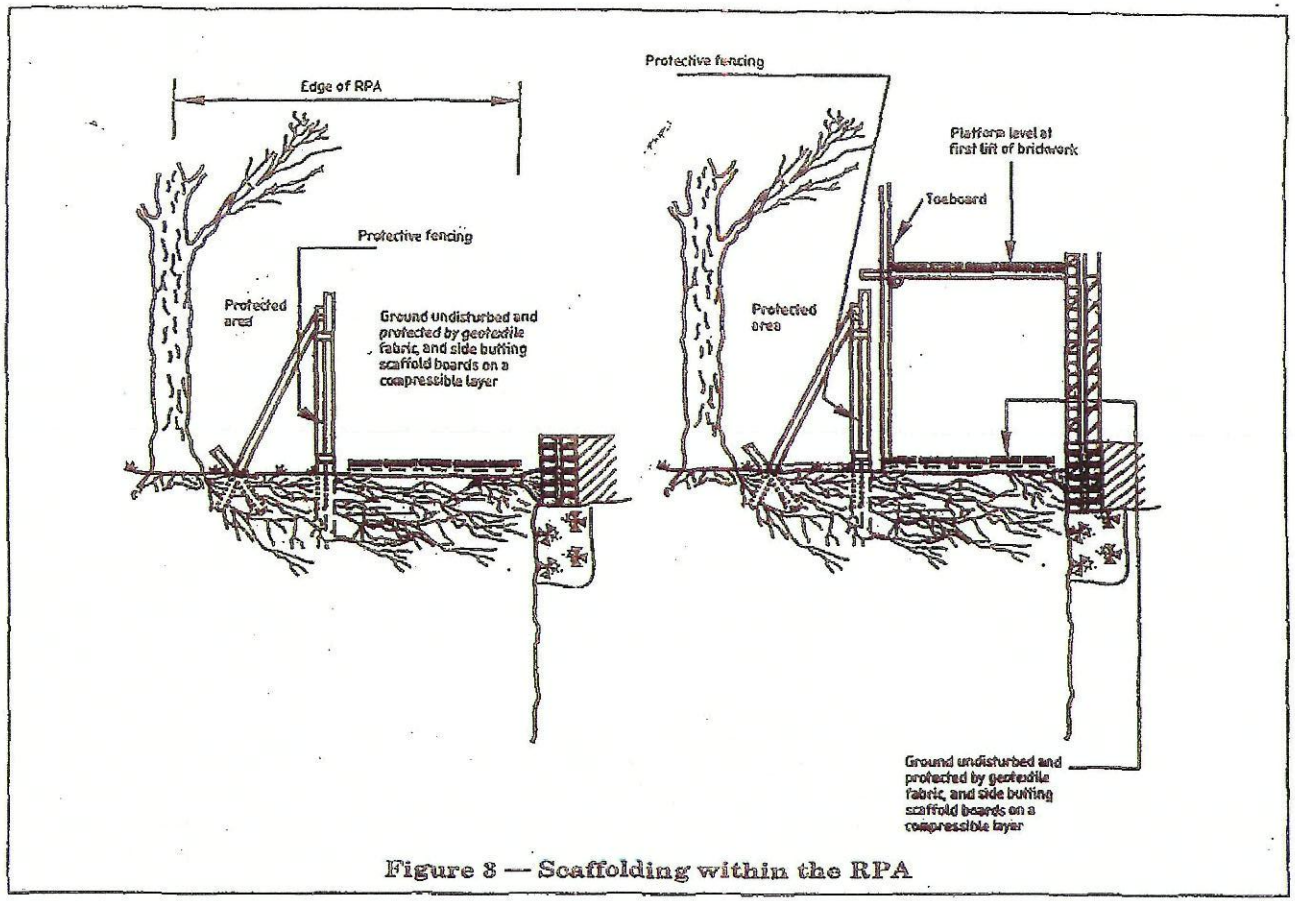


Figure 3 — Scaffolding within the RPA

Extract taken from BS5837:2005

9.3 Ground Protection

9.3.1 Where it has been agreed during the design stage, and shown on the tree protection plan, that vehicular or pedestrian access for the construction operation may take place within the root protection area (RPA), the possible effects of construction activity should be addressed by a combination of barriers and ground protection. The position of the barrier may be shown within the RPA at the edge of the agreed working zone, but the soil structure beyond the barrier to the edge of the RPA should be protected with ground protection.

9.3.2 For pedestrian movements within the RPA the installation of ground protection in the form of a single thickness of scaffold boards on top of a compressible layer laid onto a geotextile, or supported by scaffold, may be acceptable (see Figure 3).

9.3.3 For wheeled or tracked construction traffic movements within the RPA the ground protection should be designed by an engineer to accommodate the likely loading and may involve the use of proprietary systems or reinforced concrete slabs (see **11.8 and 11.9**).

BJH.0227

TREE PROTECTION AREA

KEEP OUT

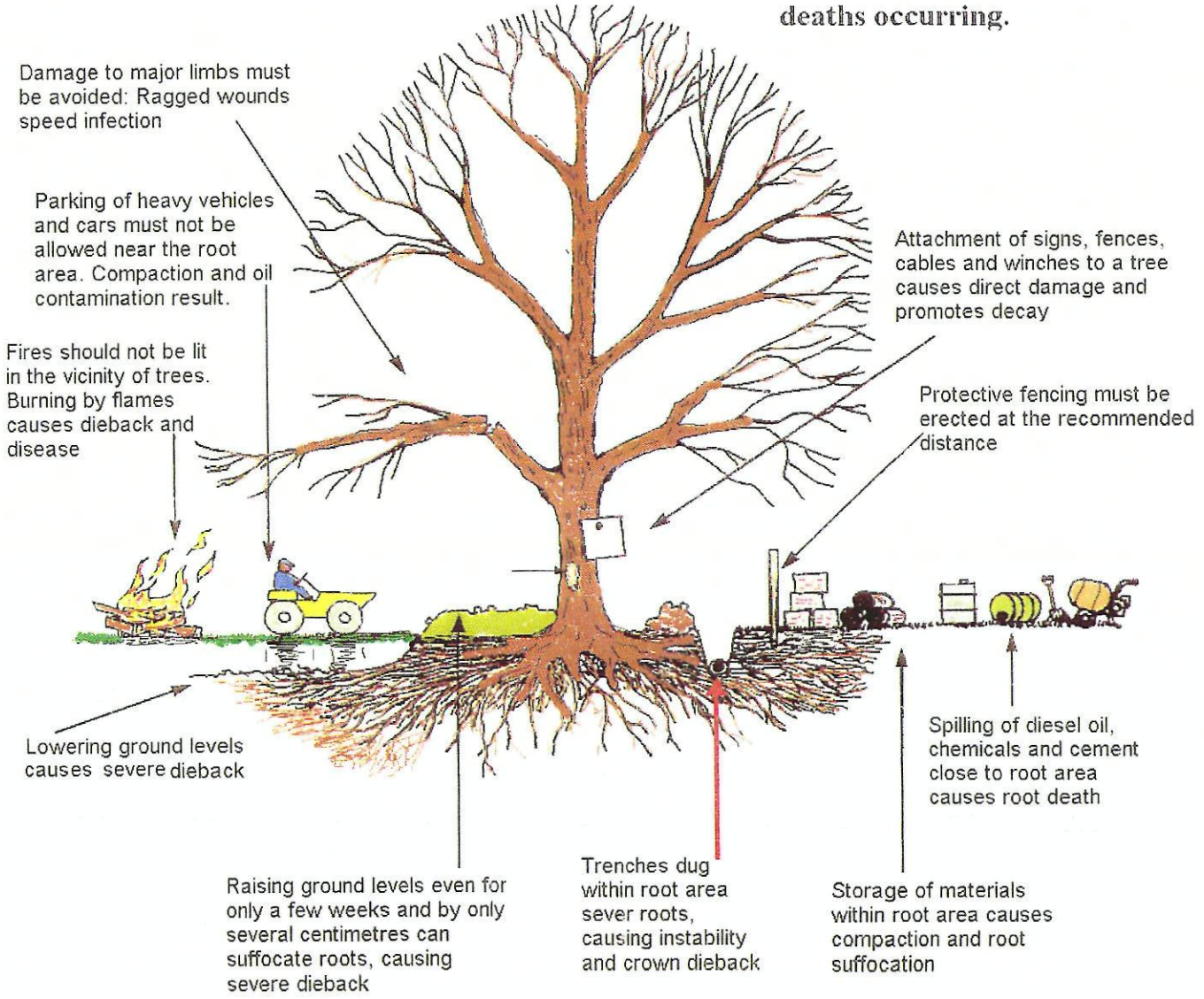
- NO EXCAVATION OR TRENCHING WORKS PERMITTED
- NO STORAGE OF PLANT OR MATERIALS PERMITTED
- NO VEHICLE ACCESS PERMITTED
- NO FIRE LIGHTING PERMITTED
- NO CHEMICAL HANDLING
- VEHICLES WORKING CLOSE TO PROTECTIVE FENCING MUST AVOID CONTACT WITH OVERHANG FROM TREE CANOPY

REPORT DAMAGE TO TREES OR FENCING IMEDIATELY

Common causes of Tree Death

(Source: Arboricultural Information Exchange website, 2005)

The use of properly positioned protective fencing can prevent tree deaths occurring.



BH 6

BS 5837:2005 Extracts

Table 3 - Sections 13, 14 and 15

& NJUG 10 Extracts

Extract taken from BS5837:2005

Table 3 – Minimum distance (m) between young trees or new planting and structures to avoid direct damage to a structure from future growth.

Type of Structure	Diameter of stem at 1.5m above ground level at maturity		
	<30cm	(30-60) cm	>60cm
Buildings and heavily loaded structures	-	0.5	1.2
Lightly loaded structures such as garages and porches	-	0.7	1.5
Drains and underground services:			
<1m deep	0.5	1.5	3.0
>1m deep	-	1.0	2.0
Masonry boundary walls[a]	-	0.5	1.0
	-	(1.0)	(2.0)
In situ concrete paths and drives[a]	-	0.5	1.5
	(0.5)	(1.0)	(2.5)
Paths and drives with flexible surfaces or paving slabs[a]	-	0.5	1.0
	(0.7)	(1.5)	(3.0)

[a] **These distances assume that some movement and minor damage might occur. Guidance on distances which will generally avoid all damage is given in brackets.**

Extract taken from BS5837:2005

13 Design considerations for new planting

13.1 General

13.1.1 The purpose of proposed new planting should be understood from the start of the design process so that appropriate choices of structure, location and species can be made. Advice on detailed design should be sought from a landscape architect or other competent person experienced in landscape design.

13.1.2 Trees may perform a variety of roles, both aesthetic and functional:

- shelter planting to benefit buildings, people, crops or stock;
- screen planting to hide the unsightly or create privacy;
- planting to define or divide spaces, or to define or direct routes or views;
- specimens or groups can be used for architectural effect to complement buildings;
- for their inherent aesthetic qualities;
- providing character or sense of place;
- softer, natural elements to counter the artificial lines of the built environment;
- for their contribution to nature conservation, biodiversity and biomass;
- reducing air pollution; providing shade and controlling erosion.

13.1.3 All new tree planting proposals should take into consideration the future use, layout and design of a development site, constraints of soil and climate, the local landscape character and the contextual surroundings. As trees generally form the dominant elements of the long-term landscape structure of a site, careful consideration should be given to their ultimate height and spread, form, habit and colour, density of foliage and maintenance implications.

13.2 Planting adjacent to buildings

13.2.1 On all soils, it is inadvisable to plant trees at distances closer to a structure than those shown in Table 3 unless special precautions have been taken. Paths, patios and driveways, where they are not constructed to appropriate standards (see **10.3 and [14]**) can be vulnerable to damage by trees with surface rooting characteristics. In addition, on shrinkable soils account should be taken of the foundation construction of existing and proposed nearby structures; planting should not compromise the structural performance of the foundation.

13.2.2 The effect of shade created by new trees and the likely extent and density of the tree crown when fully grown should be taken into consideration before new planting adjacent to buildings. Careful design and species selection should allow residents to enjoy reasonable light and the trees to develop into mature specimens. Special care should be exercised when considering planting large and/or fast growing evergreen trees as screens or hedging as these can be particularly oppressive, obstructing light all year round and requiring frequent maintenance to restrict their growth.

NOTE For information on planting adjacent to boundaries see Annex A and [6], [12] and [13].

13.3 Planting adjacent to roads

Roadside trees can make a significant contribution to the character of new developments. Their siting and species selection should be carefully co-ordinated at an early stage with other highway design considerations and, in the case of adopted roads, with the agreement of the relevant highway authority.

Sight line requirements, lighting schemes, CCTV, underground and overhead service routes and avoidance of physical obstruction or damage should all be taken into account with due consideration for future growth and periodic maintenance requirements.

13.4 Planting in the vicinity of services

Trees should not be planted where they might obstruct overhead power lines or cables. In new developments, underground services should be ducted or otherwise protected at the time of construction to enable trees to be planted nearby without conflict (see utilities guidance documents [17]). Root barriers should be constructed, where considered necessary, under expert advice to reduce the risk of tree root intrusion into service runs.

Extract taken from BS5837:2005

14 Ground works and preparation for new planting

NOTE BS 4428 contains recommendations and guidance on general landscape operations with sections on preliminary investigation, drainage, grading and cultivation, tree planting and woodland planting.

14.1 Drainage

New development may have an effect on the existing drainage pattern and ground water levels of a site, due to increased areas of hard surface and consequential drainage requirements. Existing trees may suffer due to an alteration in the supply of groundwater, whilst younger specimens and new plantings may be more likely to adapt to the changed conditions. Expert advice on both drainage and trees should be taken where ground water conditions are liable to such change.

14.2 Soil conditions

Before any of the landscape operations listed in BS4428 are undertaken and where contamination is apparent, soils in areas to be planted should be analysed for structure and content by a specialist laboratory and expert advice taken on remediation measures for new planting if this is required. If contaminants (e.g. oil or diesel fuel, toxic materials, heavy metals, etc.) are present, soils should either be removed to the full depth for planting and new soil imported or expert advice obtained on remediation measures, which may include limiting the choice of species for planting. Where the structure of the soil is in an unsuitable condition to encourage growth, a number of remediation measures may be required including physical decompaction by mechanical plant or compressed air injection, the incorporation of bulky additive materials and new drainage systems. The advice of an arboriculturist should be sought for all works in the root protection area.

14.3 Surfaces around newly planted trees

NOTE BS4428 provides recommendations for the treatment of soft surfaces, but excludes hard surfaces.

14.3.1 Where surfaces are paved, the settlement of the soil in tree pits which occurs gradually after planting may cause movement of the paved areas. This may involve the partial collapse or instability of paving or disruption of flexible surfaces, where these are laid over prepared pits. The unpaved area around new plantings should, therefore, be of an adequate size to enable surrounding paving to be retained by a conventional edging and foundation (e.g. brick, concrete, stone or treated timber) set at a distance where it is unlikely to be affected by settlement. It may be appropriate for the outer edges of the backfilled area to be treated as a transition zone using interlocking surface reinforcement grids backfilled with a surface dressing of a permeable, granular material (e.g. gravels, shingles and other aggregates) which can be topped up if required. Due allowance should be made for future growth of stem and roots of a tree when considering the finished dimensions and the design of edge or kerb treatments of tree pits and planted areas.

Where load-bearing paving is to be laid over pits, it should either:

a) be laid when the soil has settled and the level made good; or:

b) be laid on a supported foundation that spans the tree pit; or:

NOTE Such foundation may be constructed from reinforced concrete, or comprise bearers made from steel or concrete.

c) incorporate a tree grille with appropriate support around the edges.

d) utilise structural soil.

14.3.2 Where there is any risk of a tree pit receiving surface water run off that may be contaminated, for example by rock salt, fuel spillage or other materials that may be toxic or harmful to plants, paving should be designed and laid to fall away from the pit.

Extract taken from BS5837:2005

15 Post development management

15.1 Existing trees

15.1.1 Trees growing on a site before development takes place may, if adversely affected, be in decline over a period of several years before they die. This varies greatly depending on the age, species and condition of the tree, the soil conditions, climate and the extent of damage incurred during development. A programme of inspections and necessary work for the treatment of symptoms as they develop should be drawn up in conjunction with an arboriculturist. This programme may include recommendations for frequency of inspection and/or beneficial tree work and should take the form of an arboricultural management plan.

15.1.2 Where the trees in question are protected by planning controls, the planning authority should be informed and any necessary agreements obtained prior to such work.

15.1.3 Prior to handover, following completion of development, the arboriculturist should look for signs of intolerance to change in conditions and the effect of the development and any accidental damage to identify the need for further tree works in addition to those originally specified at the beginning of the development process.

15.1.4 An arboriculturist, should consider appropriate cultural operations. These may include irrigation, or measures to enhance the soil structure and organic nitrogen levels in the soil.

15.1.5 Where the development design incorporates the need for active management intervention following the completion of construction works, a tree or landscape management plan should be prepared and a copy supplied to all parties who may have an interest in the future management of the site or parts of it.

15.2 New plantings

Maintenance of newly planted trees is of particular importance during the critical establishment period, of at least two years and may, where required by planning conditions, be five years or more following planting. A detailed maintenance schedule covering the establishment period should be prepared in conjunction with the landscape design proposals and appropriate arrangements made for its implementation.

-EXTRACTS TAKEN FROM-

NJUG 10

NATIONAL JOINT UTILITIES GROUP

GUIDELINES FOR THE PLANNING, INSTALLATION AND MAINTENANCE OF UTILITY SERVICES IN PROXIMITY TO TREES

GAS - ELECTRICITY - TELECOMMUNICATIONS - WATER

UNDERGROUND SERVICES

2. HOW ROOTS ARE DAMAGED

2.1 Contrary to popular belief, the root system of a tree is not a mirror image of the branches, nor is there usually a 'tap root'. The majority of the root system of any tree is in the surface 600mm of soil, extending radially in any direction for distances frequently in excess of the tree's height. Excavation or other works within this area are liable to damage roots.

The root system

2.2 The base of the trunk typically flares out in buttresses, with these extending into the main lateral structural roots. These rapidly subdivide into the mass of smaller roots which serve to anchor the tree into the soil, and to conduct water and nutrients. Even a short distance (3m) from a large mature tree, most roots will be less than 10mm in diameter, but these may extend to well beyond the branch spread of the tree. A mass of fine roots, less than 1mm diameter, develop off all parts of this root system. These fine roots absorb the water and nutrients which are essential for the growth of the tree.

2.3 The main structural roots (close to the trunk) develop as the tree grows in response to the need for the tree to have physical stability. Beyond these major roots, root growth is influenced by the availability in the soil of water, air and nutrients. The cultivation of soil provides ideal conditions for root growth. Services are often cooler than surrounding soil, encouraging moisture within the soil to condense on the surface, thereby encouraging roots to grow close to the service. For all these reasons, root growth is often most prolific within the backfilled trench and in the soil around the services. The variability of soil conditions and the presence of obstacles to root growth results in a very variable and unpredictable distribution of the roots within the general guidance in para 2.1.

4 HOW TO AVOID DAMAGE TO TREES

4.1 This section gives general guidance on methods of work to minimise damage top trees which should be adopted by utilities. The local authority (or for privately owned trees, the owner or his advisor), should be informed about planned work at an early stage prior to commencement.

4.2 Wherever trees are present, precautions should be taken to minimise damage to the root system. As the shape of the root system is unpredictable, there should be careful control and supervision of any excavation, particularly if this involves digging through the surface 600mm where the majority of roots develop.

4.3 The precautions advocated in this section are applicable to any excavations or other works occurring within a distance from the tree equal to 4 times the circumference of the trunk (circumference measured around the trunk at a height of 1.5m above ground level; distance measured from the centre of trunk to nearest part of any excavation or other work). This area around the trunk is referred to as "the precautionary area" hereafter.

4.4 Although, ideally, services should be diverted or re-aligned outside the precautionary area, it is recognised that this will not always be practicable. Where works are required for the laying or maintenance of any service within the precautionary area, there are various techniques to minimise the damage. The appropriate method of laying will depend on the circumstances, such as:

- scope of the works (one off repair, or part of an extensive operation)
- degree of urgency (for restoration of supplies)
- soil conditions
- amenity value of tree
- cost

Acceptable techniques in order of preference are:-

1. **Trenchless**
2. Broken trench – hand dug
3. Continuous trench – hand dug

Excavation of open trenches by machine is totally unacceptable within the precautionary area.

4.5 Trenchless

4.5.1 Wherever possible trenchless techniques should be used. The pit excavations for starting and receiving the machinery should be located outside the precautionary area.

4.5.2 IN order to avoid damage to roots by the **mole**, it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the mole with materials other than water (e.g. oil, bentonite)
should be avoided, unless precautions are taken to ensure that there is no contamination of the soil within 600mm of the surface within the precautionary area.

4.6 Broken Trench

4.6.1 This technique combines hand dug trench sections with trenchless techniques. If excavation is unavoidable, it should be limited to practical access and installation around/below the roots. The trench is excavated by hand with precautions taken as for continuous trench below. Open sections of the trench should only belong enough to allow access for linking to the next section. The length of sections will be determined by local conditions, especially soil texture and cohesiveness, as well as the practical needs for access. In all cases the open sections should be kept as short as possible.

Fernie Harverson

BH 7

Qualifications & Experience

Bernie Harverson

QUALIFICATIONS AND EXPERIENCE

- My name is Bernie Harverson and I am a self employed independent arboricultural consultant in private practice. I take instructions primarily in the South of England but also on occasions work nationwide and abroad and have offices at : –

  3 Foxcombe Cottages, South Harting, West Sussex GU31 5PL and also at Cedar Court, 5 College Street, Petersfield GU31 4AE
- I hold the following arboricultural qualification - **Master of Arboriculture** (Royal Forestry Society – 1976)
- I have over **thirty eight** years of practical and managerial experience in the arboricultural industry including periods in both the public and private sectors.
- My Local Government sector experience comprises one year as a tree surgeon with Brighton Parks and nine years spent in Arboricultural Officer posts with both Westminster City Council and Portsmouth City Council
- My past practical experience in the private sector includes two years at Tilhill Forest Nursery and over ten years for various companies as a Climbing Arborist/Tree Surgeon.
- Managerial work in the private sector includes two years as manager of Beechings tree surgery company and twelve years with CBA Trees as an Arboricultural Consultant.
- As an independent self employed Arboricultural Consultant I now provide a comprehensive range of services including :-

  tree surveys, appraisals, assessments and inspections with particular reference to planning and development and tree safety audits with a service offered as a climber to undertake full climbing inspections to better understand the condition of a given tree before prescribing a management strategy.
  - I also undertake litigation work appearing as an Expert Witness in Court Actions and at Planning Appeals, Hearings and Public Local Inquiries.

4.7 **Continuous Trench**

4.7.1 The object of the exercise is to use manual excavation so as to retain as many roots as possible, bearing in mind the need for working space, access to the service in question and room to install the new service. Hand digging needs to be undertaken with great care and for this reason is likely to require closer supervision than normal operations and an understanding by all operatives and staff as to exactly what is expected.

4.7.2 After careful removal of the hard surface material, digging should proceed with hand tools. All roots greater than 25mm diameter should be retained and worked around. Where clumps of smaller roots (including fibrous roots) are found these should also be retained. During the excavation great care should be taken to minimise damage to retained roots, including the bark around the roots. Roots with a diameter in excess of 25mm must not be severed without the advice of the owner of the tree or the local authority arboriculturist, who should respond within one working day. If severance is unavoidable, roots must be cut back using a sharp tool (as listed below), leaving the smallest wound.

Suggested tools required: fork, breaker bar, secateurs, handsaw (folding, silky or bow saw), post hole shoveller and hand fork and trowel.

4.8 **Backfilling**

4.8.1 Any reinstatement must comply with the requirements of street works in Great Britain must comply with the requirements of the code of practice approved under the New Roads and Street Works Act 1991 (Specification for the Reinstatement of Openings in Highways). Without prejudice to the requirements of this code as to the specification of materials to be used and the standards of workmanship to be observed, backfilling of any excavation should be carefully carried to avoid direct damage to the retained roots and excessive compaction of the soil around them.

4.8.2 The backfill should, where possible, include the placement of an inert granular material mixed with top soil or sharp sand (not builders sand) around the retained roots. This should allow the soil to be compacted for resurfacing without damage to the roots, and should secure a local aerated zone enabling the root to survive in the longer term.

4.8.3 Backfilling outside the highway limits should be carried out using the excavated soil. This should not be compacted but lightly "tamped" and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.

4.8.4 Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them, e.g. winter diurnal temperatures. It is important, therefore, to protect exposed roots where a trench is to be left open overnight when there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled.

4.10 Special Considerations when planning service routes

4.10.1 The potential for future conflict with trees cab be reduced at the stage of initial planning approval by the appropriate alignment of services and the provisions for future tree and shrub planting. Appropriate and separate space should be provided for each. Local authorities should liaise with developers.

4.10.2 If planning requirements and site constraints dictate that trees (existing or to be planted) and services share the same area, consideration should be given to increasing the depth of services, if possible to a minimum of 600mm, and to laying the service in ducts which will resist root penetration but allow replacements to be laid without extensive excavation. As this may incur additional costs, allowance must be made for these costs and the responsibility for meeting them at the planning stage.

4.10.3 When laying new services or replacements, to avoid risk of future direct damage, allowance should be made for future root growth.

4.10.4 Services laid in clay or peat should be constructed to tolerate movements associated with swelling or shrinking of the subsoil cause by root activity. Special precautions for differential movement should be incorporated where services join rigid structures founded at a different depth to the service.