

BJH.0288



BS 5837: METHOD STATEMENT & TREE PROTECTION PLAN

for

24/26 Hollow Lane, Hayling Island

- prepared on behalf of Mr A Edwards-

Bernie Harverson M.Arb.

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**SITE SPECIFIC -
ARBORICULTURAL METHOD STATEMENT
- SITE CLEARANCE & CONSTRUCTION PHASES -**

Client	Mr A Edwards
Site Location	24/26 Hollow Lane Hayling Island
Project Arboricultural Consultant:	Bernie Harverson <i>M.Arb.</i> ,
Date MS Prepared	October 2008

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1.0 INTRODUCTION

- 1.1 The proposal involves the re-development of this site with the existing building (No.26) retained and a new one constructed in the garden area to the west side (to be known as No.24) with associated porous car parking provision and hard and soft landscaping.
- 1.2 The site is in everyday use as a residential dwelling with existing soft landscaping and car parking provision.
- 1.3 Existing tree cover is concentrated to the perimeters of the site and is mostly comprised of mature trees and shrubs planted as part of the landscaping of the site when it was originally laid out for its current use.
- 1.6 The plans and application for the re-developed site have been previously submitted and approved and the object of the current exercise is to renew that consent but under the auspices of the new BS5837 recommendations. In this context the car parking has been slightly revised by the project Architect – Peter Walker under my advice and guidance but essentially the position of the building remains the same.

2.0 CLIENTS BRIEF

- 2.1 I am instructed in this instance directly by the site owner – Mr Adam Edwards.
- 2.2 I have been commissioned to prepare a Method Statement and Tree Protection Plan Report pulling all the previously generated tree data together into one report to satisfy planning requirements.
- 2.3 Providing details of phasing and any need for ground protection measures as appropriate.

3.0 DOCUMENT DISCLOSURE

- 3.1 The finalised and approved layout has been made available to me in hard copy format:-
Ref: Stephen Jupp OTH.6.03-02 RevC – Aug2003 at 1:250 scale.
- 3.3 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
1	Common Beech	A	M	800	8.0	201.1	8m to new building 8m to new drive access	YES (1)
2	Pedunculate Oak	A	S	800	9.6	289.6	13m to new building 9.6m to new drive access	YES

4.5 YES

Tree 2 – **Pedunculate Oak** can be retained and fully protected in accordance with BS5837 recommendations.

4.6 YES (1)

Tree 1 – **Common Beech** can be retained with some basic precautionary measures applied in accordance with BS5837 recommendations. The new building will be right on the limit of the protection area so it will be essential to provide a 2m clearance to allow for scaffold erection and standard building techniques that will not result in crown damage. I have therefore recommended pre-development facilitation pruning in accordance with BS5837 recommendations. This will not affect the trees amenity value or its vigour and vitality but will facilitate a clearance that should ensure that the tree is not ‘accidentally’ damaged during the construction process. The pruning will also encourage a more upswept future growth habit so that there is not a continual need for repeat pruning operations. Ground protection measures will provide a cushion to support the scaffolding and at the same time protect the ground beneath from compaction and consolidation.

5.0 PHASING OF OPERATIONS

Phase 1 - Pre-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-Construction Protective Fencing 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
- In addition to the above, further precautions are necessary adjacent to retained trees:-
 - A 10m separation distance shall be observed (measured from the centre of any retained tree) and substances injurious to tree health, including fuels, oil and bitumen.
 - Cement (including cement washings), builders' sand, concrete mixing and other noxious chemicals.

No fire shall be lit such that flames come within 5m of tree foliage; this should be taken to mean a fire separation distance of 20m from any tree's canopy.

Phase 3 – Landscaping Works

- The new access drive will be outside of the protection zones for both of these trees but in accordance with the original approval it is intended that a cellular polymer grid system will be laid with a porous sub-base and also porous infill material so that the trees can benefit from this with future root growth encouraged.
- 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 confirmed but it is probable that they would link in with the existing service runs out to Hollow Lane with no impact on retained trees.

- 6.2 This matter will no doubt be dealt with to satisfy a Condition of Planning and it can be worded to allow for the need for a further Method Statement and Protection Plan if required prior to undertaking any excavations for the implementation of service runs.
- 6.3 In the interim details of NJUG 10 Guidelines are included (at [appendix BH6](#)) as a basis for further discussion in the unlikely event that it should prove necessary to run service routes through tree protection zones.

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 with the said Condition requiring agreement of a set schedule of operations and timings prior to undertaking works on site; this can be provided on request and in agreement with the client.

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

- Provided that the methodology prescribed in this statement is strictly adhered to I would expect the retained trees to survive the development and to continue to grow on safely and healthily in the future.
- This is therefore a project which is fully supportable in arboricultural terms.

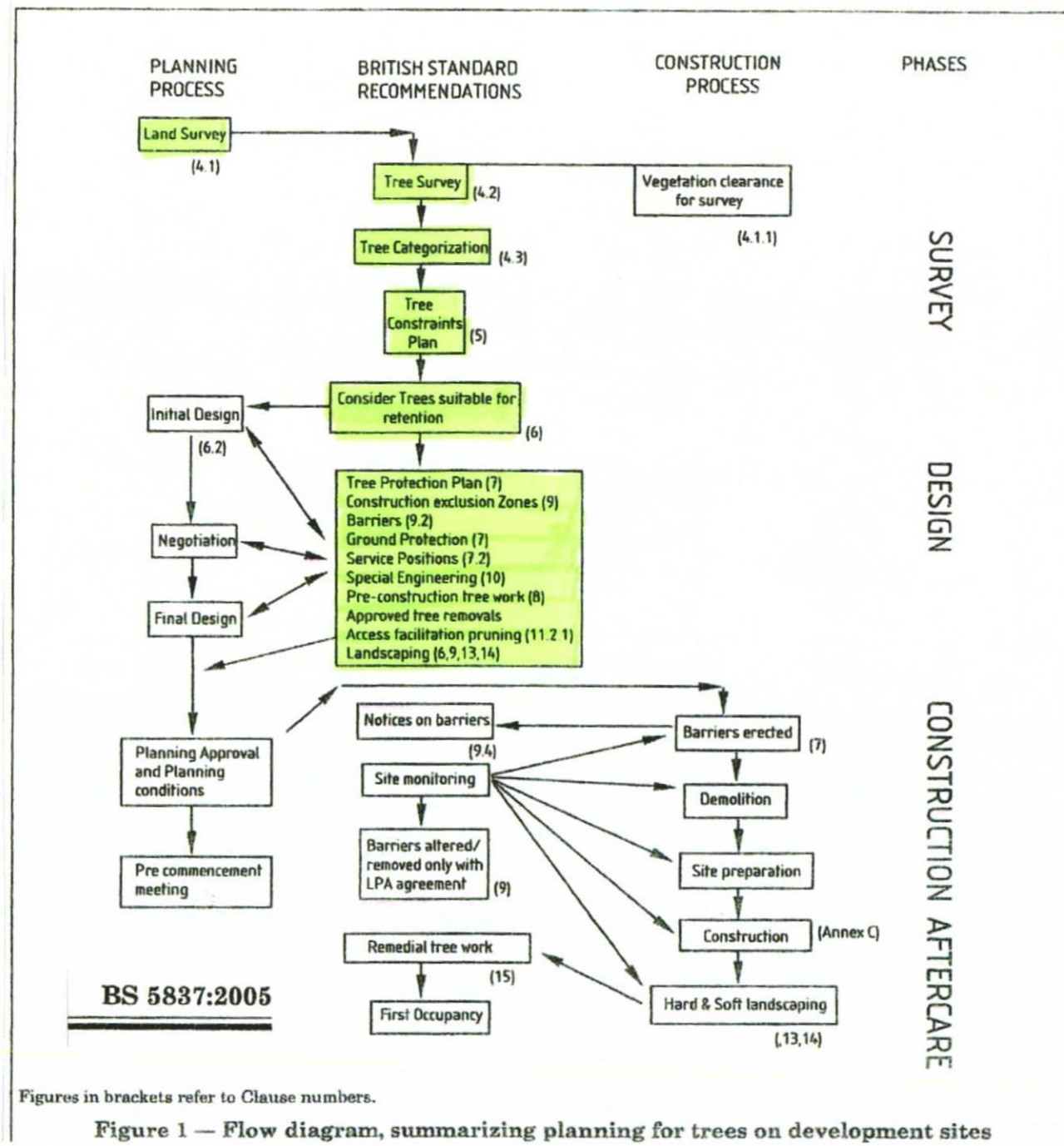


BH 1

- Tree Survey Schedule

(in accordance with Table 1 of BS5837)

+ Tree Survey Notes & Flow Diagram



Figures in brackets refer to Clause numbers.

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



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 (**Trnk 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 (**G 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 (**F**) 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); **L** (light green); **B** (mid-blue) and **G** (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 than 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				



TREE SURVEY SCHEDULE

Client : Mr A Edwards

Site Location : 24 Hollow Lane, Hayling Island

Surveyor : Bernie Harverson *M.Arb.*

Date Surveyed : 16th October 2008

Notes:

1. The abbreviations used in the header block below are fully explained within the attached Tree Survey Notes.
2. 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.
3. Group details/dimensions are recorded as an average

No.	Species	Ht m	S / M	Trunk Diam mm	Brch Sprd m	Grd Cl m	Age	Fm	Condition Comments	Preliminary Management Recommendations	Rem Cont yrs	Cat
1	Common Beech <i>Fagus sylvatica</i>	14	M	800	N8 E9 S8 W7	3	M	G	Bifurcated at 1m above ground and multi-stemmed at 2.5m with tight forks and included bark-minor deadwood-leans to the south-previously crown lifted to 5m-old pruning wounds occluded-surface roots exposed in grass to south side-low branches obscure street lamp column-good shape and form overall	Crown raise to clear around street lamp	>40	A1
2	Pedunculate Oak <i>Quercus robur</i>	15	S	800	N7 E10 S9 W7	4	M	G	Major deadwood and stubs-minor deadwood throughout-previously crown lifted to 4m on north side only-low branching habit on south side-metal ladder embedded in trunk on north side	Cut ladder flush with bark	>40	A1



BH 2

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



BJH 0288

ROOT PROTECTION AREA SCHEDULE

Client : Mr A Edwards

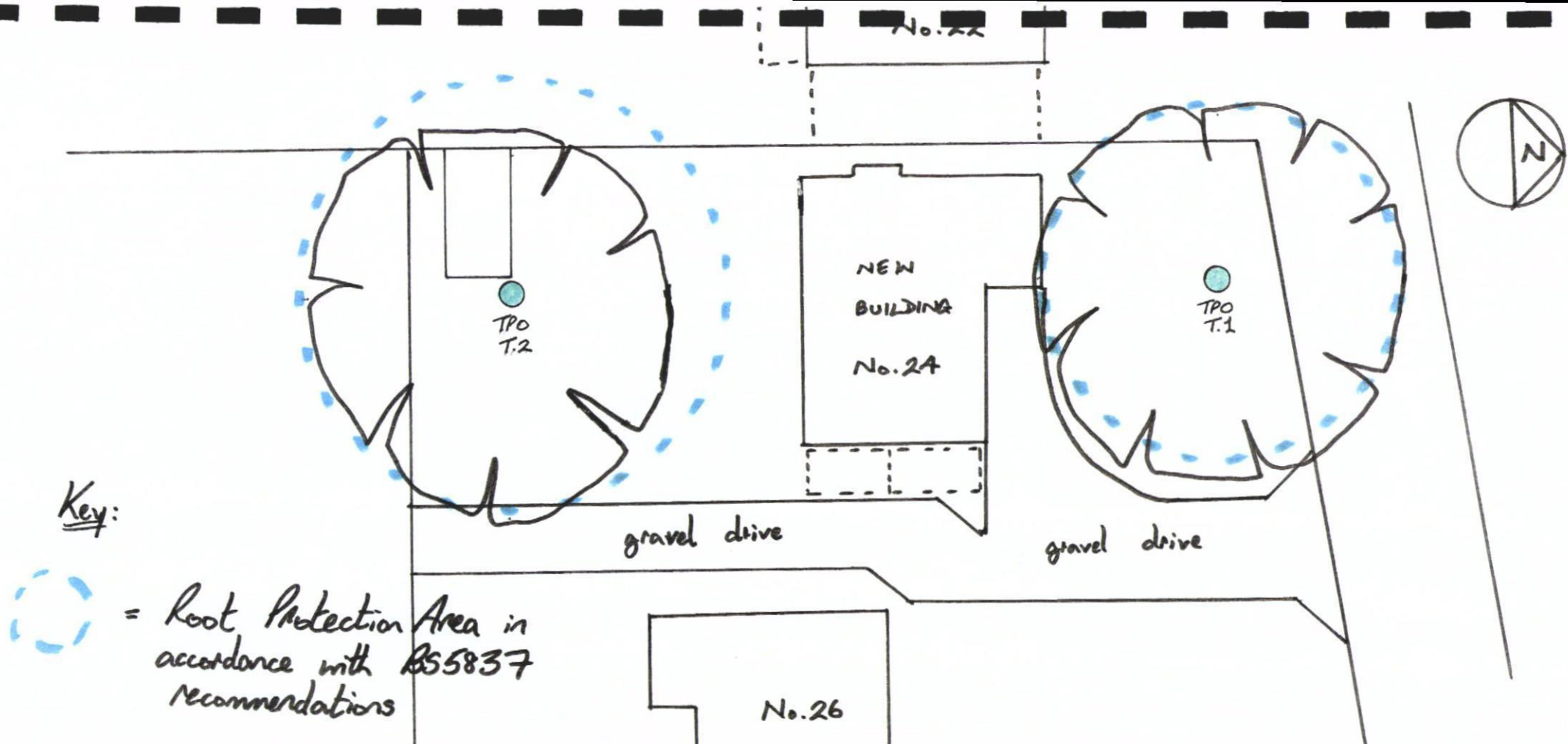
Site Location : 24 Hollow Lane, Hayling Island

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
1	Common Beech <i>Fagus sylvatica</i>	A1	M	800	8.0	201.1	NO – free rooting to all directions
2	Pedunculate Oak <i>Quercus robur</i>	A1	S	800	9.6	289.6	NO – free rooting to all directions



BH 3

- Tree Survey & Constraints Plan BH01/02



project:	24/26 Hollow Lane Hayling Island			
client:	Mr A Edwards			
drawing title:	Tree Survey & Constraints Plan			
drawing no:	scale:	job no:	date:	drawn by:
BH01/02	1:250	0288	October 2008	bjh

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BH 4

- Pre-Development Facilitation
Tree Works Schedule



TREE WORK SPECIFICATION

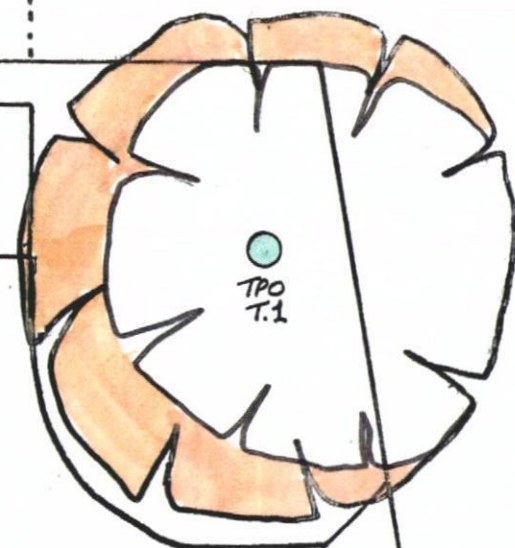
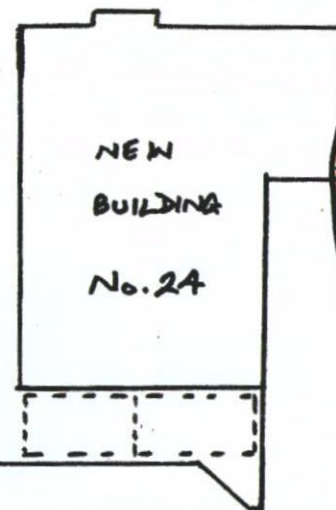
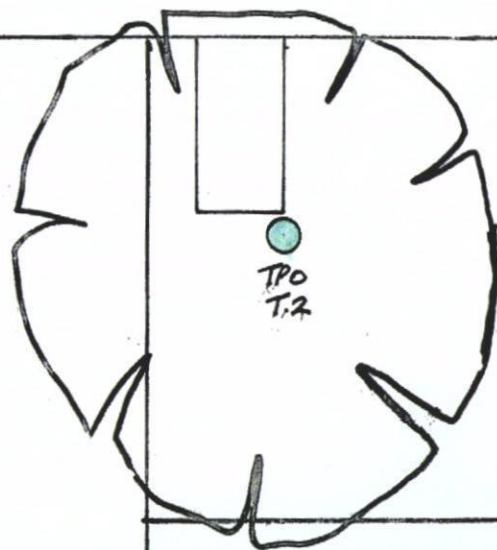
Client : Mr A Edwards

Site Location : 24/26 Hollow Lane, Hayling Island

Notes:

1. The abbreviations used in the header block below are fully explained within the attached Tree Survey Notes.
2. 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.
3. Group details/dimensions are recorded as an average.
4. *Attention is drawn to the fact that some of the 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
TPO T1	Common Beech <i>Fagus sylvatica</i>	• Crown lift and reshape on the west side to take the crown clear of the light throw of the lamp column • Reduce and reshape on the inner south face only by reducing laterals by between 2m to 2.5m • Following this operation lightly tip back the next tier of branches up to give a more upswept form
TPO T2	Pedunculate Oak <i>Quercus robur</i>	• Remove major deadwood only

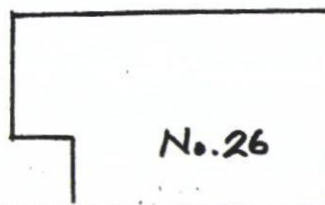


Key:

 = Extent of pruning recommended

gravel drive

gravel drive



project:	24/26 Hollow Lane Hayling Island			
client:	Mr A Edwards			
drawing title:	Tree Pruning Plan			
drawing no:	scale:	job no:	date:	drawn by:
BH04	1:250	0288	October 2008	bjh

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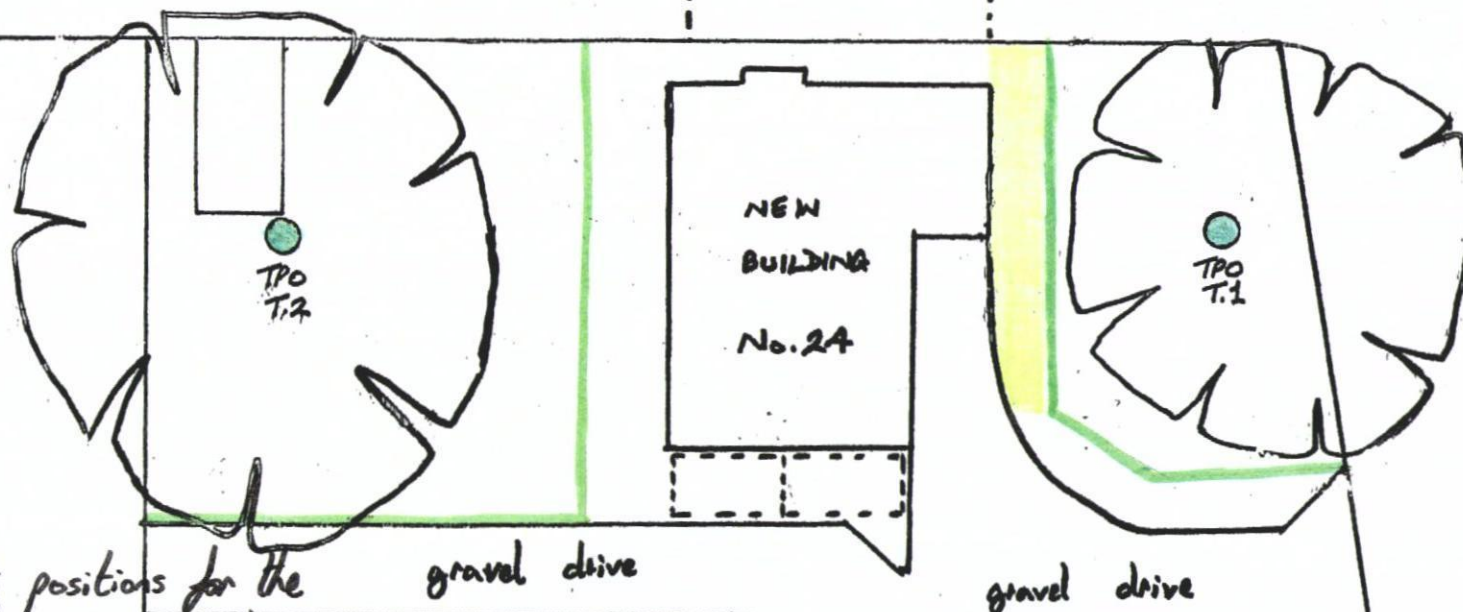
BH 5

- Tree Protection Plan BH03

Key:

= Setting out positions for the
protective fencing in accordance
with BS5837 Section 9.2 & Fig. 2

= Ground protection measures in
accordance with BS5837 - Section 9.3
& Fig. 3



	project:		24/26 Hollow Lane Hayling Island		
	client:		Mr A Edwards		
	drawing title:		Tree Protection Plan		
	drawing no:	scale:	job no:	date:	drawn by:
BH03	1:250	0288	October 2008	bjh	

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

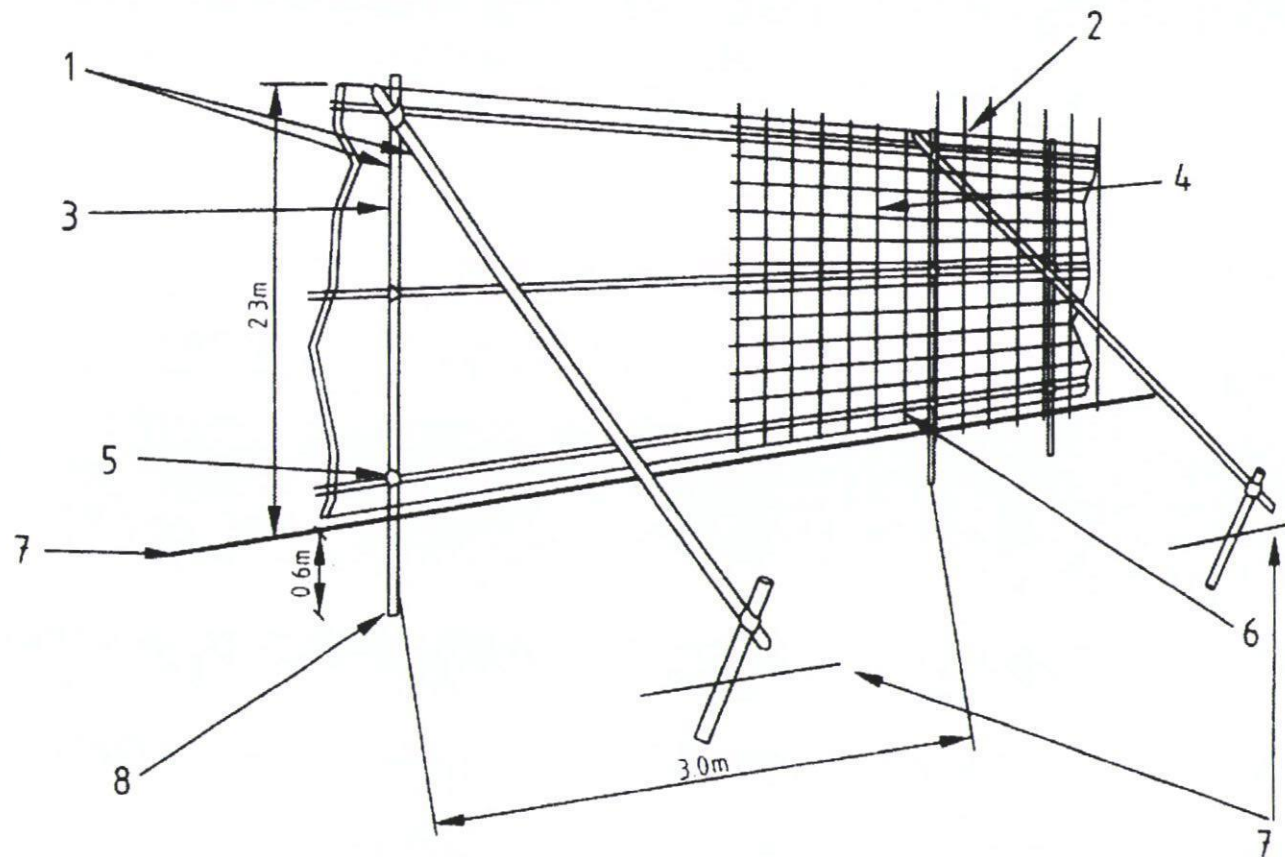


Figure 2 - Protective Barrier

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.

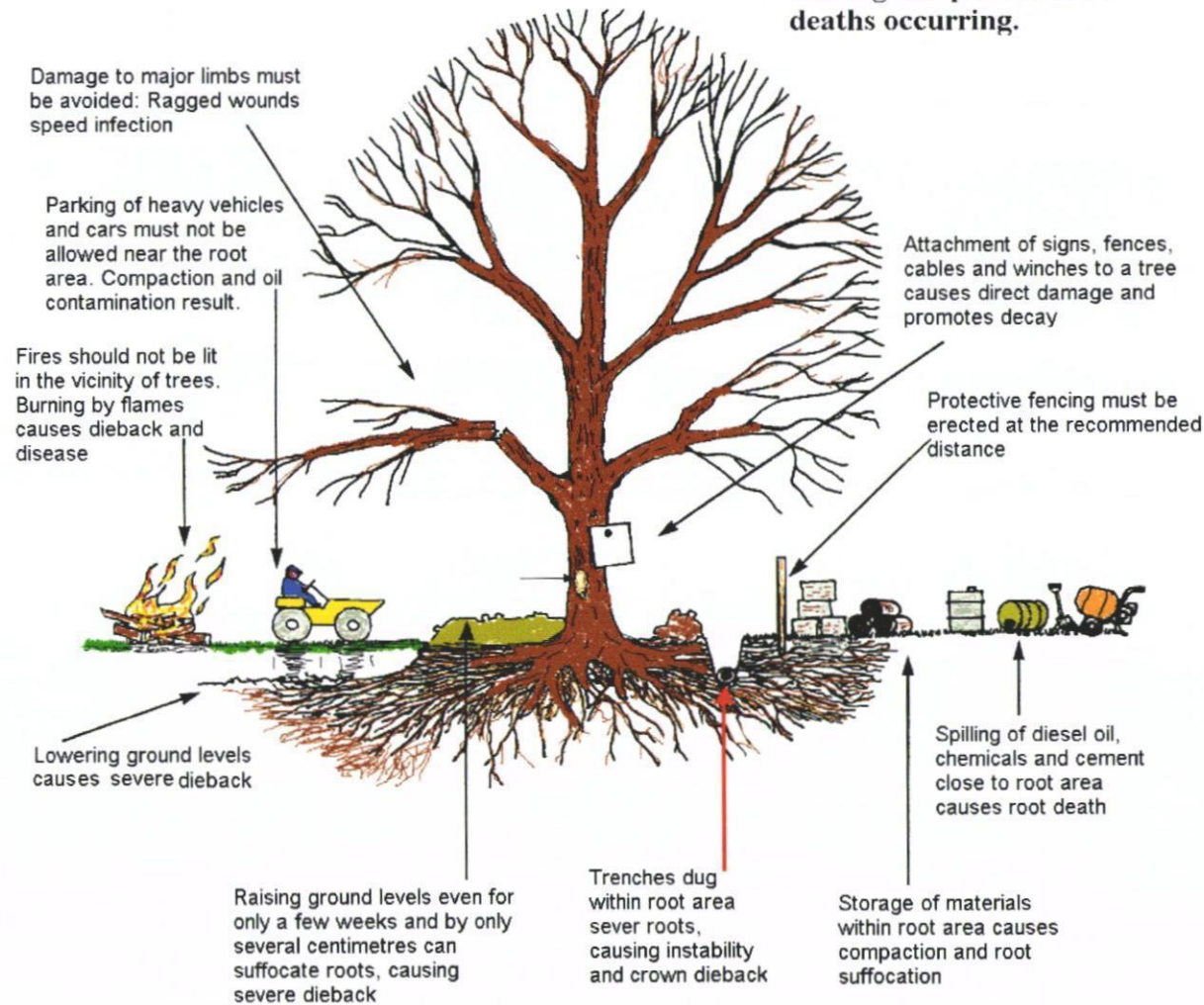
NOTE The above is preferred because it is readily available, resistant to impact, can be re-used and enables inspection of the protected area.

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

Common causes of Tree Death

(Source: Arboricultural Information Exchange website, 2005)

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





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 IMMEDIATELY**



BH 6

- BS 5837:2005 Extracts

Table 3

Sections 13,14 and 15
& NJUG 10 Extracts

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.

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.

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.

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.

Types of damage

2.4 Root systems can be damaged by:-

- The severance of a root, for example by trenching, which will destroy all parts of the root beyond that point. Even roots less than 10mm diameter may be serving the fine roots over a wide area. The larger the root severed, the greater the impact on the tree.
- Damage to the bark on the root. The bark protects the root from decay, and is also essential for further root growth. It is loosely attached and easily damaged. If damage to the bark extends around the whole circumference, the root beyond that point will be killed.
- Compaction of the soil. Compaction which is avoidable may occur from storage of material or passage of heavy equipment over the roots. This can restrict or even prevent gaseous diffusion through the soil, and thereby asphyxiate the roots. The roots must have oxygen for survival, growth and effective functioning.
- Alterations in soil level. Lowering the level will strip out the mass of roots near the surface. Raising levels will have the same effect as soil compaction.
- Incorrect application of herbicide.
- Spillage of oils or other harmful materials.

2.5 If roots are damaged:-

1. close to the trunk, the anchorage and stability of the tree can be adversely affected.
2. anywhere along their length, all of the fine roots which they serve will be destroyed.

Damage to the fine roots by severance of a main root, or by compaction or alteration in levels, will prevent these fine roots from absorbing the water and nutrients which are essential for the well-being and growth of the tree. The effects of damage from different causes, for instance by successive excavations for different services, or by excavation in one part and compaction in another part of the system, will be cumulative.

2.6 If the root system is damaged, new roots must develop to sustain the tree. These may develop from damaged root or by increased growth of other parts of the system. It may take years to replace all the lost roots. Vigorous young trees are the most likely to be capable of rapid root regeneration, but mature trees find it very difficult to recover from major root damage, if at all. While roots may regenerate, they will not necessarily provide their original anchorage.

2.7 Trees with damage may not show any immediate symptoms. If the root system is capable of rapid regeneration the tree may recover without any noticeable ill-effects, but usually the symptoms will take several years to develop. Such symptoms may range from only minor branch dieback to deterioration and ultimate death of the tree, dependant on the severity of damage and the ability of the roots to regenerate.

2.8 There is frequently a need for operational land (e.g. substations) to be kept clear of weed growth for safety and as a fire precaution. Herbicides provide an efficient method of killing both herbaceous and woody weeds. There are several types of herbicide with different modes of action and persistence. The most attractive chemicals are those that can be applied to the ground, usually as a granule, and which remain active in the soil for long periods. The wide-ranging root system of a tree may extend into the operational land from adjoining properties, and may absorb some types of herbicides which have been applied to the ground. Material absorbed in one part of the root system can kill the whole tree.

2.9 Other materials which can leach into the soil can also damage the root system. For instance, oil spilled into the soil is broken down by soil bacteria which deplete the soil of oxygen and so asphyxiate the roots. Other materials may have a direct toxic effect on roots.

4 HOW TO AVOID DAMAGE TO TREES

4.1 This section gives general guidance on methods of work to minimise damage to 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 be long 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.

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.

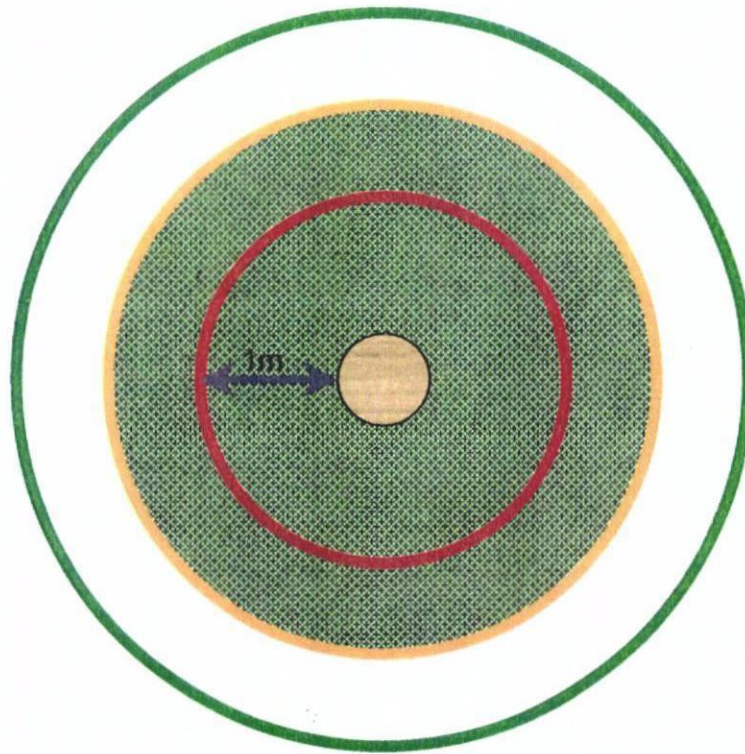
4.10 Special Considerations when planning service routes

4.10.1 The potential for future conflict with trees can 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 caused by root activity. Special precautions for differential movement should be incorporated where services join rigid structures founded at a different depth to the service.



TREE PROTECTION ZONE

Key to Diagram



Trunk of Tree



Spread of canopy or branches



PROHIBITED ZONE – 1m from trunk. Excavations of any kind must not be undertaken within this zone unless full consultation with Local Authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.



PRECAUTIONARY ZONE – 4 x tree circumference. Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with Local Authority Tree Officer if in any doubt.



PERMITTED ZONE – outside of precautionary zone. Excavation works may be undertaken within this zone however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.



BH 7

- Qualifications & Experience



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.

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