

Appendix: ARBORICULTURAL IMPACT ASSESSMENT & METHOD STATEMENT (*Tree Survey & Constraints Plan*)

Demolition of existing bungalow & Construction of two single storey
dwellings: 84 Flansham Lane Bognor Regis Ref FP/180/17/PL



David Meagher Environment
(BA Hons Landscape Architecture, PGCE, Prince2, Land Inst. Part II)
Landscape Architects, Ecological & Arboriculture Consultants.
15 Glenwood Avenue Bognor Regis PO22 8BS



Appendix -	Contents
Appendix 1	Tree Schedule Criteria
Appendix 2	Tree Survey Schedule
Appendix 3	RPA Radii Table
Appendix 4	Tree Constraints Plan
Appendix 5	Geotextile Root Protection System
Appendix 6	Tree protection – Fencing and signage
Appendix 7	New tree and shrub planting protection -fencing
Appendix 8	Access and excavation advice
Appendix 9	Use of herbicides to prevent root and basal sucker growth
Appendix 10	Proposed Tree and Landscape Planting
Appendix 11	New Tree Planting and staking
Appendix 12	Suggested replacement trees in lieu of Norway Maples (Option 2)
Appendix 13	Tree Planting Specifications
Appendix 14	Hurstwood Residents Association Letter
Appendix 15	Methodology
Appendix 16	Caveats
Appendix 17	Tree Preservation Orders, Legal and Bibliography
Appendix 18	David Meagher Environment Qualifications and Experience

Appendix 1:

Tree schedule

Criteria used in conjunction with Tree Schedule/Tree Survey

Key:	<u>Measurements</u>	<u>Age – Class</u>	<u>Overall Condition</u>	<u>BS 5837 2005 : Cascade Chart for Quality Assessment/Retention Category</u>	<u>Symbols:</u>
	MS – Multi-stemmed	YNG-MAT-Young Mature	G – Good	A – High	< = less than
	Ht - Height in metres	SM – Semi-mature	F – Fair	B – Moderate	~ = approximately
	Stem – Stem Diameter at 1.5m in mm	Mat – Mature	P – Poor	C - Low	> = greater than
	Crown – Crown spread in metres	OM – Over mature	D - Dead	R – Trees for Removal	
	TD - Trunk division (height in metres)	<u>Est Life Yrs</u> – estimate of good healthy years remaining (>40 years; 20 –40 years; <20 years)		<u>Sub-categories:</u> 1 = mainly arboricultural values 2 = mainly landscape values 3 = mainly cultural values.	

RPA = Root protection area (equivalent to a circle with a radius 12 x the stem diameter for single stem trees and 10 x the basal diameter for trees with more than one stem arising below 1.5m above ground level).

Appendix 2

Tree survey schedule:

84 Flansham Lane

Tree	Species	Height m	Stem dbh m	Stem Girth m	Branch Spread m	Height of Crown Clearance m	Age Classes	Physiolo- gical condition	Structural condition	notes	Estimated remaining contribution	BS5837 grading	RPA DIA (M)
T1	Acer platanoides (possibly Crimson King) Norway Maple	7	0.45	1.45	N4 E4 S4 W5	2.4	Y	Good	Good	Historical evidence of crown lifting with the removal of several lower limbs particularly over service road. Callousing evident, poor cuts lacking collar.	20-40	B	5.25
T2	Acer platanoides Norway Maple	7	0.35	1.05	N 4 E 3 S 3 W 4	2.4	Y	Good	Good	As above	20-40	B	4.25

Appendix 3

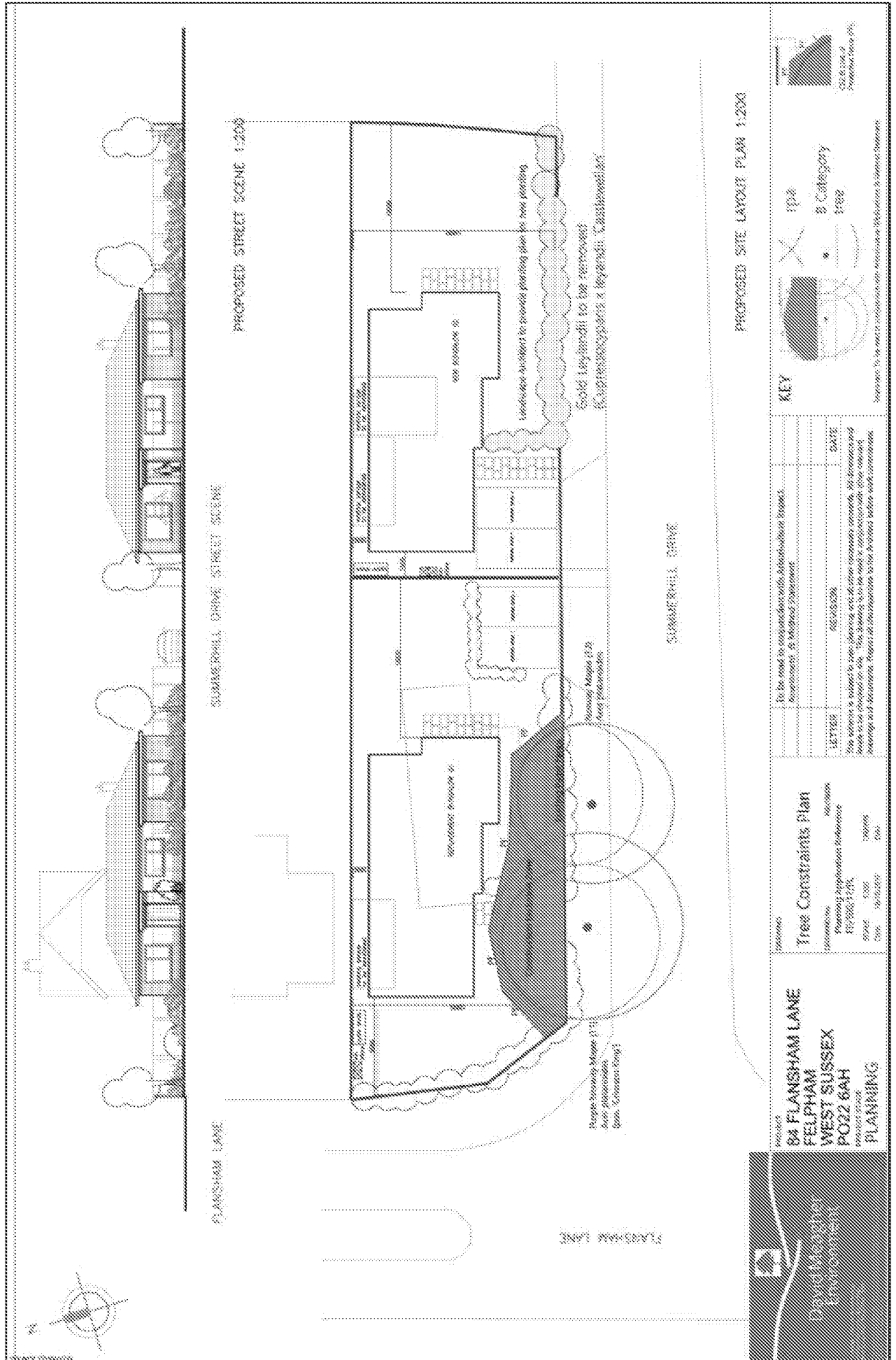
RPA Radii Table

Root Protection Area radii in ½ metre graduations

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

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

Appendix 4 Tree Constraints Plan





Search:

[Applications](#) [Products](#) [Downloads](#) [About TERRAM](#) [Contact Us](#)

TREE ROOT PROTECTION GEOCELL

Description

Buy Online

Download Data

Products : Terram Geocell 25/10 & 22/20

The Terram geocell is a cellular confinement system that is used to protect tree roots from damage caused by heavy vehicles, particularly where a Tree Protection Order (TPO) is in force. Conventional construction would be invasive and trees are sensitive to disturbance.

The geocell is manufactured from one of the Terram geotextiles range which means that air and water are free to move across the root area from cell to cell. The geocell supplied in the form of flat-packed panels which expanded on site to form a much larger honeycomb area of interconnected cells. The panels are secured to the ground using steel pins which are also available to purchase.

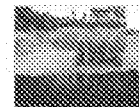
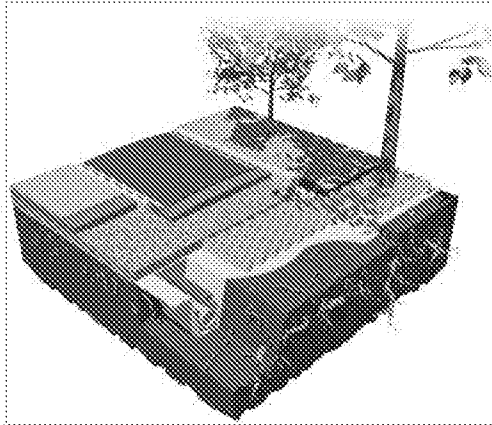
The road or parking area can be constructed once the roots have been covered by the geocell and filled with a granular material. The geocell ensures that axle loads are spread laterally rather than applied vertically. This also minimises compaction beneath the traffic line which would be harmful to the roots as they could become starved of oxygen and moisture. Without the cellular system, loads would be transferred to the roots resulting in damage and the possible loss of trees.

A Terram tree-root-protection geocell is suitable for:

- Access roads and parking areas
- Driveways & paths
- Permanent woodland trails

If system is also suitable for the construction of temporary solutions where vehicular access to a site is limited by the presence of trees. Once operations are complete, the installation can be removed with the roots undamaged.

In recognition of the fact that trees are sensitive to disturbance, the British Standards Institution has published recommendations on how to protect them during their development. BS 5837:2005 recommends that there should be a



In 2007 the Arboricultural Advisory and Information Service published Arboricultural Practice Note 12: Driveways Close to Trees (APN12) which suggested that driveways could be installed within the root protection area subject to roots and the soil not being damaged. APN12 advises that an above-ground, no-dig construction should be used. This advice was incorporated into the recent British Standard which recommended that the most effective

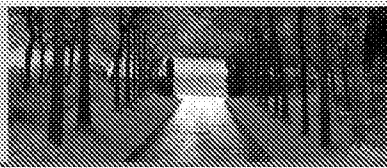


10 YEARS OF SERVICE



Geosynthetics

CellWeb



Tel: 01455 617139
Fax: 01455 617140
sales@geosyn.co.uk

CellWeb 100

Product Page

Unleash

NO. 1001 1001 1001 1001 1001 1001

Tree Root Protection System

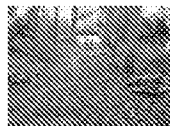
Devotee Tree Root Protection System provides a flexible and permeable solution for protecting tree roots, creating a robust and stable platform for constructing vehicular access paths whilst the root protection area is existing base.

CellWeb TPO Cellular Confinement System, with its unique cellular structure and perforated cell walls, reduces the risk of root damage on access to tree roots and prevents damage. With CellWeb geocell installed in situ, the roots can remain in the ground to continue healthy, undisturbed growth.

With no-dig problems being the preference option, CellWeb TPO is ideal as only the surface vegetation need be removed. As well as a no-dig solution to the root protection construction, this and roots.

CellWeb geocell can be reduced significantly by using the CellWeb TPO in root areas that can be as much as 50% providing further cost savings. The use of CellWeb TPO also prevents surface runoff, increasing the long-term performance and aesthetics of the final surface.

Geosynthetics provide a full design service including site surveys, structural designs. CAD drawings are installed in supervision at no cost to the client.



APPLICATIONS

- Paved and unpaved roads
- Commercial, domestic parking areas
- Tree root protection
- Temporary site access (Accessways)

NO. 1001

1001 1001 1001 1001 1001 1001

1001 1001 1001 1001 1001 1001

Notes



Devotee Tree Root Protection System is covered by the Queen.

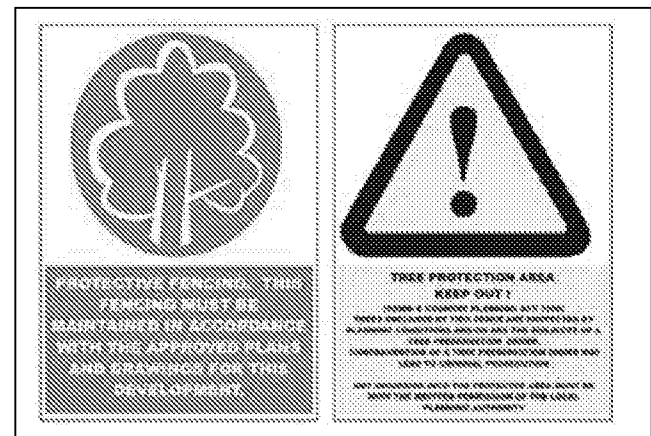
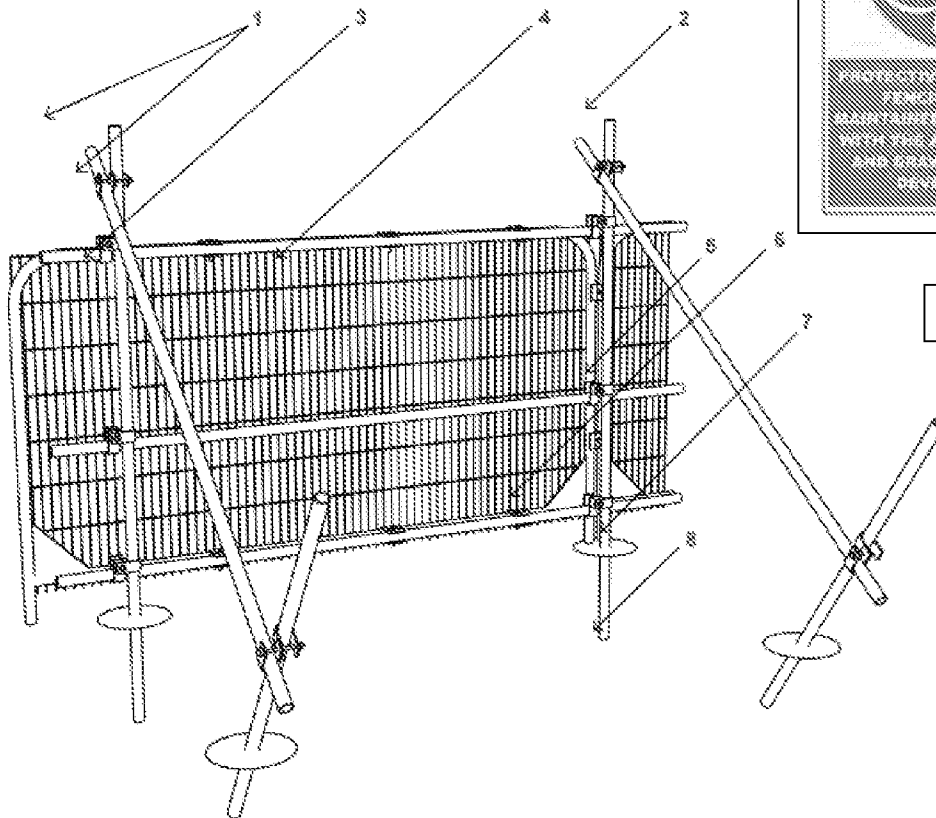
Page 1/1

Geosynthetics Ltd
Devotee Tree Root Protection System Ltd
Devotee Tree Root Protection Ltd

Tel: 01455 617139 Fax: 01455 617140

sales@geosyn.co.uk

Appendix 6 Tree Protection



Warning attached to RPA fencing



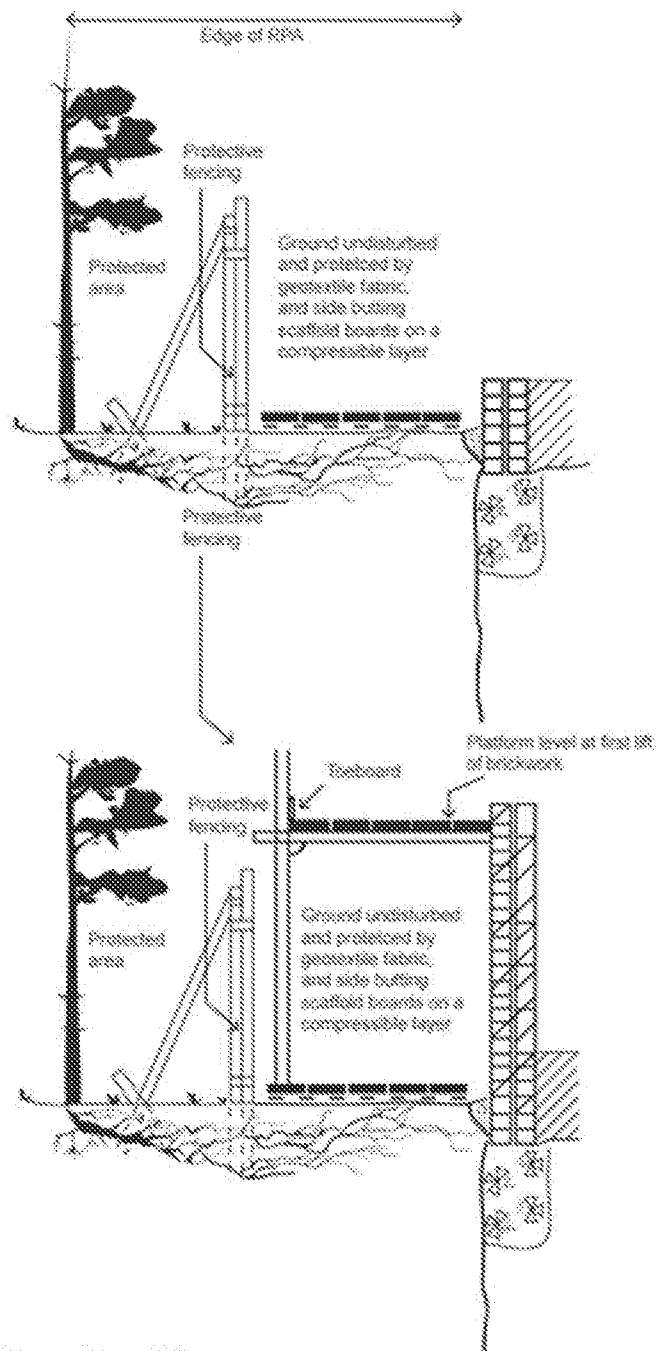
Figure 10: Protective barrier

- 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 Approx 0.6m driven into the ground

Preferred RPA barriers



Appendix 6 Tree Protection



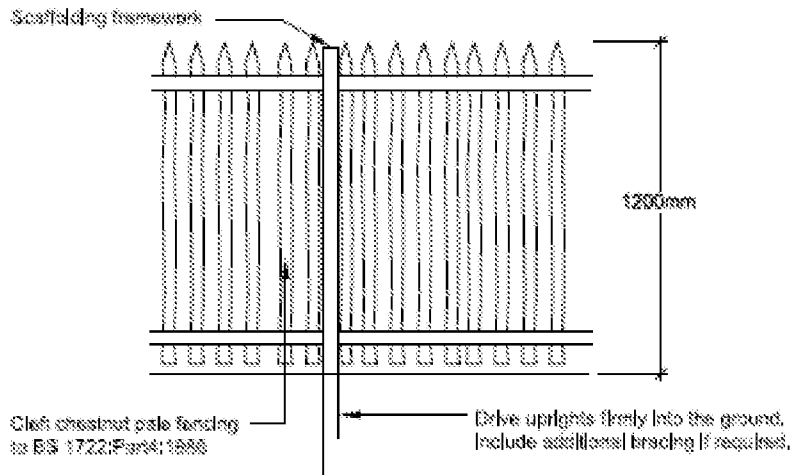
Tree protection
outside the RPA to
protect from
compaction

Figure 11: scaffolding within the RPA

Appendix 7

protection for new planting

All hard surfacing within the protection fencing to be removed by hand operated machinery only.



General protection requirements in accordance with BS 5837. In compliance with good practice, during construction works the following precautions will be taken to avoid damage to plants:

- No traffic over the root system.
- No soil, debris or building materials to be deposited against the trunk of a tree.
- No excavation within branch spread of trees unless otherwise agreed.
- No services branches cutting roots.
- Cultivation works beneath trees prior to planting to be carried out by hand.
- No fires to be lit below branches.
- No generators or static machinery to be operated below branches.
- No raising or lowering of levels beneath the spread of tree unless otherwise agreed.
- No cutting of branches or roots except by a specialist firm.
- No tree to be used as an anchor for winching purposes.
- All trees to be retained to be protected by fencing as shown in this detail, located at the outer limit of the branch spread or a distance of one half the height of the tree, whichever is the greater.

Dead, diseased and dying branches will be removed from trees to be retained and where necessary crowns will be thinned to reduce weight and improve shape all in accordance with BS 3996 (1986) Recommendations for Tree / Work. Tree Surgery work to trees to be retained will be carried out towards the end of the construction contract.

Note:

The Condition of All Proposed Planting Stock is to be in accordance with BS 3636:1992 and BS 5236.

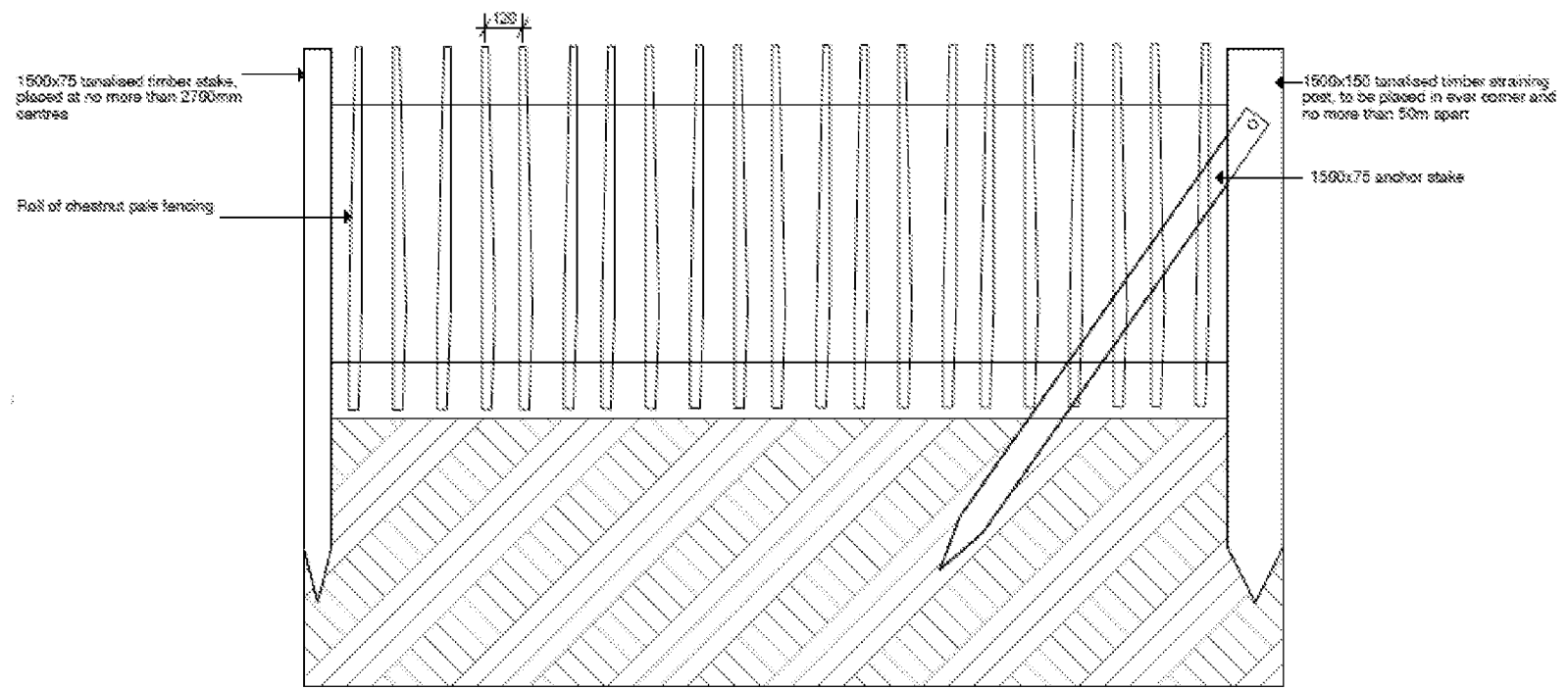
All Rootballed trees are to be planted between mid-October and early April. Outside of this period, all Rootballed trees are to be replaced with Containerised Stock.

All woodland trees and shrubs to be of local provenance stock.

All grass seed mixtures to be of local provenance stock.

Chestnut Pile Fencing – hedge protection

Appendix 7
protection for new planting



D-37 Chestnut pale fencing

Fencing of the Protected Zone during construction

Fencing should be robust and not easily removable. Robustness is related to local conditions such as aspect and soil conditions which will influence the extent to which a fence will remain upright. Most fences should be a minimum of **1.2 metres** tall and should comprise a lattice of vertical and horizontal scaffolding supporting cleft chestnut pale fencing or chain link fencing. If the tree is particularly fragile, a fence of at least **2.4 metres** is recommended to support man-made boards of **20mm**. The fence must be in place prior to commencement of work and should be clearly signed indicating that it should not be removed. Fencing may only be removed with the consent of the planning authority; fence removal does not signal that construction work is allowed in the protected zone of the tree.

Temporary Access through protection zone

If temporary access through the protected zone is absolutely necessary a series of reinforced concrete slabs or similar. More substantial boarding may be required to support heavier loads.

Compaction of soil must be avoided as this destroys the soil's pore structure which in turn alters the trees' ability for water uptake. Compaction can be caused by the storage of materials, machinery and soil and by the use of an area as a thoroughfare by people and vehicles and for temporary constructions such as site huts.

Fencing of the Protected Zone during construction

Fencing should be robust and not easily removable. Robustness is related to local conditions such as aspect and soil conditions which will influence the extent to which a fence will remain upright. Most fences should be a minimum of **1.2 metres** tall and should comprise a lattice of vertical and horizontal scaffolding supporting cleft chestnut pale fencing or chain link fencing. If the tree is particularly fragile, a fence of at least **2.4 metres** is recommended to support man-made boards of **20mm**. The fence must be in place prior to commencement of work and should be clearly signed indicating that it should not be removed. Fencing may only be removed with the consent of the planning authority; fence removal does not signal that construction work is allowed in the protected zone of the tree.

Excavation for foundations and utilities must be considered in relation to the welfare of root systems. It is a common misconception that the root system of a tree extends in a narrow, deep band directly below the trunk. In reality the roots extend a large distance laterally at a shallow depth, often at approximately 60cm. Shallow foundations thus impact on the root systems. The closer the excavation is to the tree the greater the chance of damage. Construction, therefore, should not be within the protected zone of the tree. This also benefits the building as roots can damage foundations. Where foundations are to be located near major roots they should carefully bridge them. Construction also has an impact on the hydrological cycle with compaction of soils and the laying of tarmac reducing infiltration rates and increasing runoff. This affects water available for tree growth.

Ground level change should acknowledge the location of tree roots.

Reduction in ground level causes the severance of roots and an alteration of drainage rates which affect water availability. Increases in ground level causes compaction and can suffocate and damage shallow and fragile roots.

Excavation for foundations and utilities must be considered in relation to the welfare of root systems. It is a common misconception that the root system of a tree extends in a narrow, deep band directly below the trunk. In reality the roots extend a large distance laterally at a shallow depth, often at approximately 60cm. Shallow foundations thus impact on the root systems. The closer the excavation is to the tree the greater the chance of damage. Construction, therefore, should not be within the protected zone of the tree. This also benefits the building as roots can damage foundations. Where foundations are to be located near major roots they should carefully bridge them. Construction also has an impact on the hydrological cycle with compaction of soils and the laying of tarmac reducing infiltration rates and increasing runoff. This affects water available for tree growth.

Ground level change should acknowledge the location of tree roots.

Reduction in ground level causes the severance of roots and an alteration of drainage rates which affect water availability. Increases in ground level causes compaction and can suffocate and damage shallow and fragile roots.

Stump and Root Treatment:

Treating stumps of felled tree with herbicide to prevent re-growth. Reason: where stumps are to be left in situ, it is sometimes desirable to treat the stumps to prevent them re-growing. This re-growth is more likely in some species than others, for example poplar, willow, lime and sycamore which will often shoot again from the stump, whereas this rarely occurs in conifer species. Stump treatment should not be undertaken where there is a group of trees of the same species growing together, as the herbicide may be translocated from the stump to the roots of a live tree via a root graft. This could potentially kill a neighbouring tree. Specification: this should be undertaken as soon as possible after the tree has been felled to be effective. Approved stump killing herbicide must be applied in accordance with the manufacturer's specifications by suitably trained and qualified personnel in possession of a current certificate of competence under the control of pesticides regulations 1986. It should be applied by drilling holes in the outer cambium layer of the stump, which should then be bunged or covered to keep water out to prevent the chemical being diluted

Chemical control:

Sever the root to isolate the sucker from the parent tree and then carefully treat the sucker with either stump and root killers containing glyphosate (e.g. Scotts Roundup Tree Stump & Rootkiller, Bayer Tree Stump Killer, Doff Tree Stump & Tough Weedkiller and William Sinclair Deep Root Ultra Tree Stump & Weedkiller) or triclopyr (Vitax SBK Brushwood Killer). The health or stability of the tree may be affected if several large roots are severed. If treating many suckers that are still attached to a tree, be cautious, as sufficient chemical may be absorbed to cause harm to the tree. These chemicals may also kill surrounding plants if spray is allowed to drift onto beds or borders. Triclopyr (Vitax SBK Brushwood Killer) does not kill grass.

After felling Chemicals should be applied to stumps as soon after felling as possible. Solutions or crystals of the chemical should be applied particularly to the outer part of the cut stump surface, and the bark.

NOTE there is a range of chemicals suitable for killing tree stumps. Chemicals currently used for poisoning stumps and roots include:

- a) triclopyr; [2006]
- b) Ammonium sulphamate; [2006]
- c) Glyphosate;
- d) 2,4,5-T.

After treatment, cut stumps should be covered to prevent dilution and dispersion of the chemical by precipitation. Please check current regulations and licenses before work is carried out as laws might change. Please check availability and legality of using toxic materials. (Before work commences please refer to BS3998 2010 Tree Work – Recommendations).

Trees

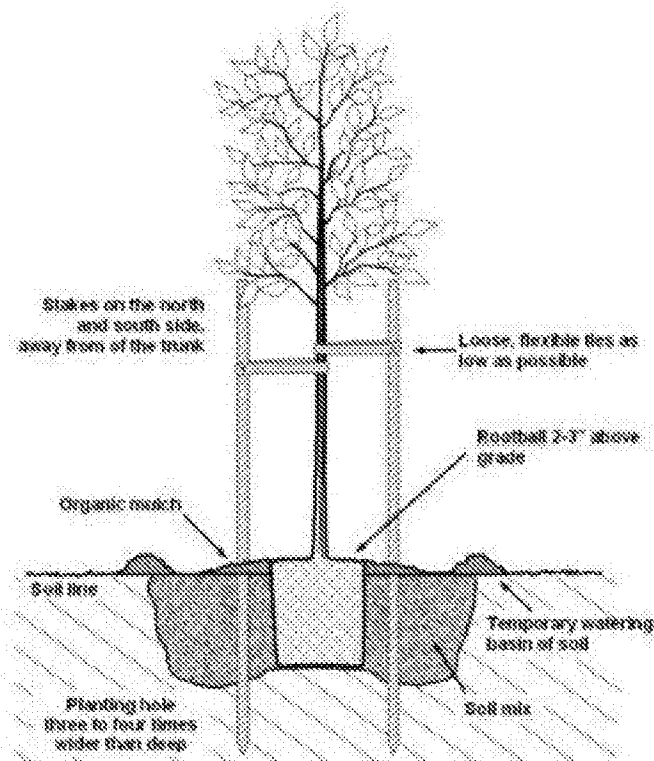
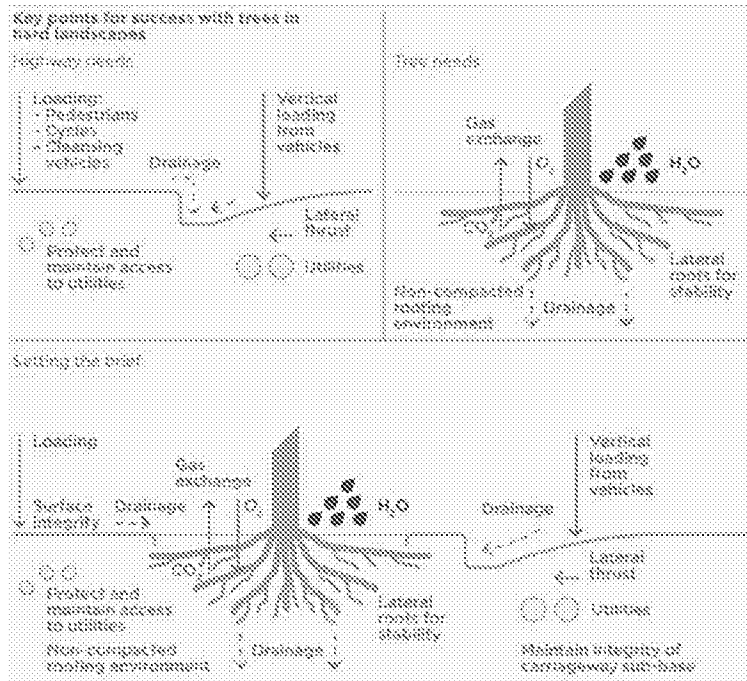
- *Crataegus laevigata* (hawthorn) – thorny, deciduous, white to pink flowers in spring, red fruit, H & S 8m (25ft)
- *Prunus pissardii nigra* deciduous, H 5 m S spread 5 m purple leaves
- *Crataegus x persimilis* 'Prunifolia' AGM – deciduous, leaves turn orange-red in autumn, white flowers in spring, red berries, H 8m S 10m
- *Sorbus aucuparia* (rowan) – dark green leaves turning yellow-orange in autumn, white flowers spring, red berries, H 15m S 7m
- *Malus tschonoskii* autumn colour upright habit H 5 m S 3 m

Trees/shrubs for new landscape planting

- *Euonymus japonicus* (Japanese spindle) – dense bushy evergreen, good for hedging H 4m (12ft), S 2m (6ft)
- *Olearia macrodonta* AGM – vigorous, evergreen, daisy-like fragrant flowers in summer, H 6m (20ft), S 5m (15ft)
- *Rosa rugosa* – vigorous, deciduous, fragrant carmine-red flowers followed by orange-red hips, good for hedges H & S 1-2.5m (3-8ft)
- *Elaeagnus x ebbingei* – dense evergreen shrub with dark or metallic sea-green leaves, H & S 4m (12ft)
- *Berberis darwinii* AGM – evergreen, spiny, orange flowers in spring H & S 3m (10ft)
- *Cotoneaster simonsii* AGM – deciduous or semi-evergreen, leaves turn red in autumn, red fruit, H 2.5m (8ft), S 2m (6ft)
- *Escallonia rubra* – evergreen, pink flowers in summer, H & S 5m (15ft)
- *Fuchsia magellanica* – deciduous, upright arching shrub, small red flowers in summer, milder areas only, H 3m (10ft), S 2-3m (6-10ft)
- *Griselinia littoralis* AGM – evergreen, glossy bright green leaves, H 8m (25ft), S 5m (15ft)
- *Pittosporum tenuifolium* AGM – evergreen glossy leaves, H 4-10m (12-30ft), S 2-5m (6-15ft)

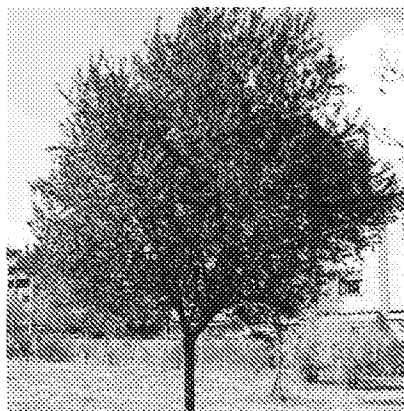
Ornamental Shrubs for open situations

- *Arbutus unedo* AGM - evergreen, white flowers in autumn, red fruit, H & S 8m (25ft)
- *Ceanothus* 'Gloire de Versailles' AGM – deciduous, pale blue flowers in late summer H & S 1.5m (5ft)
- *Cistus x purpureus* AGM – evergreen, dark pink flowers in summer, not fully hardy, H & S 1m (3ft)
- *Cytisus x praecox* AGM (broom) – deciduous, arching shoots, yellow flowers in spring, H 1.2m (4ft), S 1.5m (5ft)
- *Lavandula angustifolia* 'Hidcote' AGM (lavender) – more compact cultivar, evergreen, grey green foliage, fragrant blue flowers in summer, needs good drainage, H 60cm (24in), S 75cm (30in)
- *Phlomis fruticosa* AGM – evergreen, grey-green leaves, yellow flowers in summer, H 1m (3ft), S 1.5m (5ft)
- *Cotoneaster simonsii* Evergreen glossy green leaves, small white flowers followed by red berries H 1m S 1.2



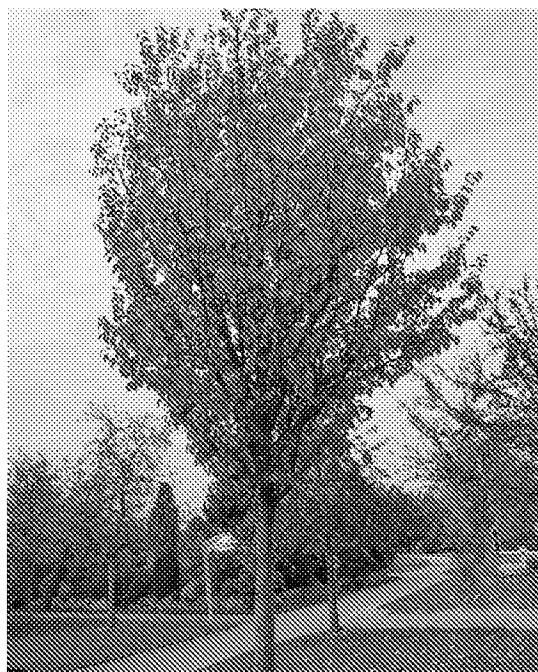
Appendix 12 Suggested replacement trees in lieu of Norway Maples (Option 2)

Prunus pissardii nigra



Appendix 12 Suggested replacement trees in lieu of Norway Maples (Option 2)

Malus tchonskil



Appendix 13 Tree Planting Specification

Tree Planting specification and planting methods relating to Option 2

Planting of additional trees

Total number of trees 2

a. Species selections / size

1 No. *Prunus pissardii nigra*

1 No. *Malus tchonoskil*

Standard Container grown trees in 10L bare root 8-10 cm girth 3 m Ht

Staking to windward with suitable stakes and ties at no more than 1/3 height to encourage stem strength and root development.

Planting:

Trees: excavations to pot depth and diameter backfilled with weed free topsoil to original containerised level.

tree stakes and ties regularly inspected and adjusted in response to growth.

Stakes and ties must be removed once trees have established on or three years following planting.

Annual weed control should be carried out around new plantings with

mulch material used - composted wood bark, to prevent weed growth and conserve moisture.

Mulch spread to a depth of 4-6cm, to form a circle with a 500mm radius, topped up on maintenance visits at least three times per year.

Weed control by hand to prevent strimmer damage. Mulch mats are a suitable alternative to prevent weed growth.

Watering to 'field capacity' at the time of planting and regular watering during dry periods. If the verge is transferred and in ownership of the new householders that the new owners will take up this responsibility.

Hurstwood Residents' Association may wish to take responsibility for the verge. The trees to be replaced should they fail.

Shrub Planting as directed by landscape architect planting plans specification and schedule.

Appendix 14 Letter Hurstwood Residents Association

Mr M Lewin, Chairman, Hurstwood
Residents Association
4 Grafton Avenue
Felpham
Bognor Regis
West Sussex
PO22 6AR

Your Ref: OWPG15631
Our Ref: FP/180/17/PL 20-07-2017
Please ask for:
Mr S Davis

20th September 2017

Dear Sir/Madam

Town & Country Planning Act 1990 (as amended)
Town and Country Planning (Development Management Procedure) (England) Order 2015

Demolition of 1 No. dwelling & erection of 2 No. dwellings.
84 Flansham Lane Felpham

Thank you for your internet representation made on 19th September 2017 which has been recorded as 'support' with the comments as follows:

Planning Application FP180/17/PL

Reference the above application.

I wish to comment on behalf of the Association on the application to build two new bungalows on the area of land where 84 Flansham Lane currently stands.

Firstly, I am chairman of the Hurstwood Resident's Association which for your information is only responsible for the preservation and maintenance of the Estate roads, common parts and amenities of the estate, for the benefit of all members. The Resident's Association maintains the verges and conifer hedge in Summerhill Drive adjacent to the new property and also Summerhill Drive over which access to the properties will be achieved. Summerhill Drive is not public highway and is privately owned.

The Residents Association is interested in the grass verge and conifer hedge in Summerhill Drive adjacent to the property and over which two vehicular access drives will be constructed to serve two on site parking spaces for each property. For the record this area of land does not form any part of 84 Flansham Lane and has been maintained by the Resident's Association for many years.

Firstly no detail has been shown on the plans of the two mature trees and the conifer hedge that are growing in the verge in Summerhill Drive. This is necessary to assess how the grass verge, trees and conifer hedge will be treated and also for that matter the type of boundary to be provided between the bungalows and the grass verge. This is very important as the Residents Association is keen to work with the developer on improving the visual aspect of the access into the estate as, I assume, these two properties will be included with an address in Summerhill Drive.

On the previous application for the site the Residents Association were keen to protect the conifer hedge and a condition was placed on that application to preserve the hedge. Given that two bungalows are now proposed on the development site the Residents Association are happy for the conifer hedge to be removed and the frontage of the bungalows to be visible from Summerhill Drive which will incorporate the properties better into the street scene. In these circumstances it is important that the boundary provided is a dwarf wall similar to that provided for other adjacent properties and elsewhere on the Estate. It is also important that the verge is suitably landscaped with trees/shrubs to aesthetically enhance the development.

inset:06

Survey Objectives

This tree survey has been carried out with the objective of:

- Identifying the individual tree species present at the site by means of visual inspection;
- defining the approximate age, condition and canopy spread of all individual mature trees identified and the value of these within the development context;
- Recommend resilient new planting to withstand climate conditions for a site which will suffer the extremes of climate due to a hostile environment of hard surfaces and the demands of urban living.

Survey Methodology

The survey broadly assessed the condition and arboricultural and landscape value of the trees and existing ornamental hedges within the development site area, paying particular attention to any mature individual trees present within or adjacent to the development site area, in order to prepare an assessment in accordance with BS 5837 Trees in Relation to Construction (2005).

The methodology set out below is a detailed summary of the suggested approach to tree assessment as described in British Standard 5837 Trees in Relation to Construction (2005). This report has applied the methodology to all significant individual trees or groups of trees present on the site.

Assessment criteria

Trees have been broadly assessed based in line with guidance set out within the British Standard BS 5837: (2005) Trees in Relation to Construction – Recommendations. This standard provides recommendations and guidance on the principles to be applied to achieve successful integration of development with trees, shrubs and hedgerows. Where development (including demolition) is to occur, the standard provides guidance on the approach needed to decide which trees are appropriate for retention, and the means for protecting these trees during the development (including demolition and construction work) and the means of incorporating trees into the developed landscape.

Tree Categories

Trees on the site have been divided into one of four categories (based on the cascade chart for tree quality assessment). These are classed as A, B, C or R (Section 4.3 of BS5837) within the table in Appendix 1. This gives an indication as to the tree's importance in relation to the site, the local landscape and, also, the value and quality of the existing trees on site. This assists informal decisions concerning which trees should be removed or retained should development occur. For a tree to qualify under any given category it should fall within the scope of that category's definition (see below). Categories A, B and C cover trees that should be a material consideration in the development process, each with three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural (nature conservation) values. Category R trees are those which would be lost in the short term for reasons connected with their physiology or structural condition. They are, for this reason not considered in the planning process. In assigning trees to the A, B or C categories the presence of any serious disease or tree – related hazard is taken into account. If the disease is considered fatal and / or irreparable, or likely to require sanitation for the protection of other trees it may be categorised as R, even if they are otherwise of considerable value.

Category (A): Trees whose retention is most desirable and are of high quality and value. These trees are considered to be in such a condition as to be able to make a lasting contribution (a minimum of 40 years) and may comprise:

- (i) Trees which are particularly good examples of their species especially 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).

- (ii) Trees, or groups of trees which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particular visual importance (e.g. avenues or other arboricultural features assessed as groups).
- (iii) Trees or groups of significant conservation, historical, commemorative or other value (e.g. Veteran or wood-pasture trees).

Category (B): Trees whose retention is considered desirable and are of moderate quality and value. These trees are considered to be in such a condition as to make a significant contribution (a minimum of 20 years) and may comprise:

- (i) Trees that might be included in the high category but because of their numbers or slightly impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage), are downgraded in favour of the best individuals.
- (ii) Trees present in numbers such that they form distinct landscape features and attract a higher collective rating than they would as individuals. Individually these trees are not essential components of formal or semi-formal arboricultural features, or trees situated mainly internally to the site and have little visual impact beyond the site.
- (iii) Trees with clearly identifiable conservation or other cultural benefits.

Category (C): Trees that could be retained and are considered to be of low quality and value. These trees are in an adequate condition to remain until new planting could be established (a minimum of ten years) or are young trees with a stem diameter below 150mm and may comprise:

- (i) Trees not qualifying in higher categories;
- (ii) 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.
- (iii) Trees with very limited conservation or other cultural benefits.

Category (R): Trees for removal are those trees in such a condition that any existing value would be lost within 10 years and which should in the current context be removed for reasons of sound arboricultural management. Trees within this category are:

- (i) Trees that have a serious irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category R trees;
- (ii) Trees that are dead or are showing signs of significant, immediate or irreversible overall decline.
- (iii) Trees infected with pathogens of significance to the health and or/safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality.

Species have been recorded by common and botanical name. Height has been estimated in metres and stem diameter measured at 1.5 metres in centimetres unless impractical. If access to the base of the tree was not possible for any reason, the diameter has been estimated.

Health and Vigour

In the assessment particular consideration has been given to:

- (a) The health, vigour and condition of each tree;
- (b) The presence of any structural defects in each tree and its life expectancy;
- (c) The size and form of each tree and its suitability within the context of the proposed scheme;
- (d) The location of each tree relative to existing site features, e.g. its value as a screen or as a skyline feature. (Aesthetic/amenity value).

Age class is assessed according to the age class categories referred to in BS 5837.

YNG: Young trees age less than 1/3 life expectancy.

SM: Middle age trees 1/3 – 2/3 life expectancy.

M: Mature trees over 2/3 life expectancy.

OM: Over mature – declining or moribund trees of low vigour.

The overall condition of any individual tree, or group of trees, has been referred to using one of the definitions listed below. A more detailed description of condition has been noted in the Tree Schedule.

G Good: A sound tree or trees needing little, if any, attention

F Fair: A tree or trees with minor but rectifiable defects or in the early stages of stress, from which it may recover

P Poor: A tree or trees with major structural and physiological defects or stressed such that it would be very expensive and inappropriate to retain

D Dead: A tree or trees no longer alive. However, this could also apply to those trees that are dying and will be unlikely to recover, or are becoming or have become dangerous

Major defects or diseases and relevant observations have also been recorded. Dead wood is recorded as major or minor but in this instance is absent. The survey was completed from ground level only. Aerial inspections were not undertaken. Evaluations of tree conditions given within this assessment apply to the date of survey and cannot be assumed to remain unchanged, and it may be necessary to review these within 24 months, in accordance with sound arboricultural practice. Disease and defects

Site Plan & Tree schedules

The positioning of the individual trees and groups of trees has been done as accurately as possible using the topographical site plan supplied as a base. Where the topographical survey did not record individual tree positions these have been estimated and individual positions have been placed as best as possible in relation to surrounding features present and by use of aerial photography.

A summary table that includes the individual trees on the site, included in this appendix details information on each tree. Within the summary table maximum RPA's (m²) for estimated tree diameters have been included where appropriate, as well as a calculated corresponding radius of the circle for that RPA. The Root Protection Areas are formulated as described below and assist when designing layouts in relation to trees. A schedule that includes the individual trees surveyed on the site, outlined in the report provides detailed information on each tree, related to the summary table of maximum RPA's (m²) for estimated tree diameters. These have been calculated for the corresponding radius which describes the RPA. The Root Protection Areas are formulated and depicted on the tree constraints plan to assist in site construction design and for maximum tree protection.

Tree protection measures

The BS5837 gives a root protection area [RPA] for each retained tree by reference to Table 2 in the BS. The RPA is usually described as a circle with a radius of the prescribed distance within which no unspecified activity should occur, though the shape and position of the RPA can be modified by an arboriculturist to meet individual site conditions according to the probable distribution of the tree roots found in this appendix for RPA equivalent radii. This area is to be fenced off prior to and for the duration of all construction work with tree protection barriers [TPB] as described in figure 2 of the BS. Intrusion into the RPA can take place only where the ground is adequately protected in accord with the requirements of section 9.3 of the BS. The barriers are to carry waterproof warning notices denying access within the RPA.

Root Protection Area (RPA)

Below ground constraints to development are represented by the root plate around a tree which needs protecting in order for the tree to be incorporated into a proposed scheme, without adverse harm to the tree or structural integrity of the proposed footpath or bridge abutments. This area is illustrated by the Root Protection Area (RPA) and is calculated according to the formula set out in Clause 5, BS 5837 (2005). This area is equivalent to a circle with a radius 12x the stem diameter for single stem trees and 10x the basal diameter for trees with more than one stem arising less than 1.5 metres above ground level.

Table 1: Formula for calculating Root Protection Area

$$RPA (m^2) = (\text{stem diameter (mm)} \times 12 / 1000)^2 \times 3.142$$

This figure should be capped to 707m², that is, equivalent to a circle with a radius of 15m, or a square with approximately 26m sides

Table 2: Calculating the RPA, BS5837 (2005). See appendix 3

Tree Names

Species have been recorded by common and botanical name. Height has been estimated in metres and stem diameter measured at 1.5 metres in centimetres unless impractical. *Photographic records* were taken with a Motorola digital camera (see section 22). The tree condition, in terms of Category Grading, was judged visually using the guidelines produced later in the report. The physiological and structure condition of each tree was assessed using the surveyor's skills and experience. Age class was estimated from an examination of the trees in question. The data collected is attached. The comments and recommendations for tree work were compiled using the data collected and the surveyors training and experience, together with his personal library of technical publications. *Wildlife and nesting:* Prior to any tree work is carried out trees must be inspected for nests and wildlife in particular bat roosts. This is a requirement relating to the Wildlife and Countryside Act.

Appendix 16 Caveats

Caveats

This report is the intellectual property of David Meagher Environment and is for use by the client and client's agents for use of the purposes as a submission document required by local authority planning. Use of this document may be granted by written permission of the author.

The arboricultural report is in the context of site trees only. The author takes no responsibility for comments relating to buildings, structural health of trees, soil and bedrock composition and aspects of engineering. This is not a full arboricultural health and safety survey or arboricultural method statement and does not give a warranty on the health of the trees listed herein. All tree inspections were visual and undertaken from ground level. For the purposes of this survey all dimensions of trees and their associated parts are based on estimation unless otherwise stated. Where access site to trees were not possible the data has been estimated. Trees are growing and living organisms, the structural state and state of health changes all the time, for these reasons the comments within this report are valid for one year from the date of site inspection. Trees can never be declared absolutely safe due to the unpredictable weather, and the influences of nature or man. Any alteration to the site and any subsequent development proposals will invalidate this report and its conclusions or recommendations. Regular inspections should be made to any site where trees are present to identify potential problems before they become dangerous or unsound. If the report lacks recommendations site trees cannot be deemed to be safe. If recommendations are made and followed it should not be concluded that site trees have been made safe following treatment work.

Appendix 17 Tree Preservation Orders, Legal and Bibliography

Tree Preservation Orders (TPO)

A tree preservation order, referred to as a 'TPO', is an order made by a local planning authority ('LPA') in respect of trees or woodlands. The principal effect of a TPO is to prohibit the: Cutting down, uprooting, topping, lopping, wilful damage, or wilful destruction of trees without the LPAs consent. The cutting of roots is potentially damaging and so, in the Secretary of State's view, requires the LPAs consent. Anyone who, in contravention of a TPO, wilfully damages a tree in a way that is likely to destroy it is guilty of an offence. Anyone found guilty of this offence is liable, if convicted in the Magistrates Court, to a fine of up to £20,000. In serious cases a person may be committed for trial in the Crown Court and, if convicted, is liable to an unlimited fine.

Legislation & Bibliography

Town & Country Planning Act 1990

Town & Country Planning (Tree Preservation) (England) Regulations 2012

Health & Safety at Work Act 1974

Construction (Design & Management) Regulations 1994

BS 5837:2012 'Trees in relation to design, demolition and construction –
Recommendations'

BS 3998:2010 'Tree Work – Recommendations'

Appendix 18 David Meagher Environment (Landscape Arboriculture & Ecology)

Qualifications and experience

David Meagher Environment is a local practice consulting on the following aspects of environment and planning: Landscape Architecture, Planning, Arboriculture and Ecology. Early career Cannizaro Park & Gardens Grade 2 listed garden. Arboriculture Hammersmith Borough Council Ravenscourt Park.

With a track record of over twenty years in practice, working throughout the home counties, projects and clients have included RAF, Architects, developers and private clients with experience of working with local authorities, statutory organisations and government departments, charities, and environmental organisations such as wildlife trusts, and the National Trust.

Recent projects in West Sussex include the regeneration of key strategic sites within Bognor Regis Town Centre, housing developments in and round West Sussex including within radius of SAC SSSI and the South Downs National Park. Recently the consultancy has been offering services which includes project 8.0 Surveyor Experience

David began work with MAFF carrying out ecological surveys throughout England involving marine and riverine habitats. Following this he began working for the Department of the Environment working for Kew managing the wood museum and special reference collection where he learnt most of his trees and plant vocabulary. Following a degree in landscape architecture he went on to teach landscape arboriculture and countryside management students at Merrist Wood College working under heads of department Geoff Ace and Peter Annett alongside colleagues Glynis Maynard and John Arnott. During this time, he set setting up a consultancy in Surrey in the '80's offering from countryside stewardship and tree planting grants advice, carrying out tree and plant surveys.

The consultancy carried out commissions in landscape design, ecology and tree consultancy work - completing ecological surveys and appraisals, tree surveys and reports, preparing documentation for local planning authorities in these disciplines. He worked with Graham Stewart Thomas on garden surveys and restoration schemes. Following a spell building show gardens, and teaching at Surrey University David was employed as a manager of a Hampshire Council covering the borough's trees, countryside and parks. He is founder of the SSSI Test's tributary 'The River Anton Improvement Plan' – a project restoring the river ecosystem and its associated riverine habitats. David worked as parks and countryside manager for six years at Test Valley Borough Council. As head of parks and countryside, he was responsible for the borough's trees, engaging arboriculture consultants and contracting out major tree works. Partnership projects include working with Wildlife Trusts, Environment Agency and the National Trust as director of the North Chilterns Trust (part funded by Chilterns AONB) managing countryside and horticulture projects across the Chilterns, Bedfordshire and Luton. As a former lecturer at the University of Surrey in sustainable landscape design. David was commissioned by WWF to present a sustainable wildlife garden at the Hampton Court Flower Show and has since been working on regeneration projects on the south coast, carrying out tree surveys, phase I habitat surveys and schemes for housing and redevelopment of Bognor Regis for ten years. When projects merit it he calls in the services of experts in areas where further experience and knowledge is required for example when bat or amphibian surveys are required, or special structural advice is needed on veteran oak and beech. BA(Hons) PGCE Prince 2 Project Management. Landscape Degree with Ecology (Greenwich) under Peter Hunt Marion Thompson and Michael Lancaster Tom Turner with Sir Geoffrey Jellicoe. Mentor Graham Stuart Thomas.