Ashplats House, East Grinstead

Arboricultural Impact Assessment and Method Statement

Revision A

April 2019

Client	Bos
Job name	Ashplats House, East Grinstead
Report title	Arboricultural Impact Assessment and Method Statement
File reference	18-646-Report-A

	Name	**Position**	**Date**
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Report Contents

1 Introduction

1.1 Site Description

Ashplats House, East Grinstead (the ''site'') is situated approximately a mile and a half northeast of the centre of East Grinstead. The site is predominately flat and is bounded to the north, east, south and west by residential dwellings.

A number of trees within the site are protected by Tree Preservation Order (TPO), reference number 7, 1990.

1.2 Proposed Works

The demolition of the existing buildings and the construction of thirty new dwellings with associated access road and car parking are proposed. Works that are likely to affect retained trees include the construction of hard surfaces and the movement of construction machinery.

1.3 Aims of Study

To inform an outline planning application, Canopy Consultancy has been commissioned by Bos to undertake a tree survey of the site, in accordance with British Standard (BS) 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations".

The aim of this report is to present the results of the survey, including a Tree Survey Schedule (TSS), an Arboricultural Implications Assessment (AIA), and an Arboricultural Method Statement (AMS). A Tree Protection Plan (TPP) has also been produced and accompanies this report as a separate drawing.

This report in no way constitutes a health and safety survey report. Where concerns for tree health and safety exist, the necessary and appropriate tree inspections should be carried out.

2 Methodology

The trees were inspected from ground level by consultant arboriculturist Neil Taylor on the 30th July 2018 and measurements taken in accordance with the recommendations set out in the BS 5837:2012. Canopy spreads were measured and plotted to the four compass points. Where direct access was not possible measurements have been estimated. The surveyed trees are colour coded on the accompanying tree survey drawing according to their relevant BS category.

The tree data collected is used to enable the current canopy spread of the surveyed trees and the Root Protection Area (RPA) to be plotted on the accompanying TPP. The RPA is defined by the formula in paragraph 4.6 from the BS 5837:2012 and may be refined by taking into account current on-site constraints to root activity such as buildings, earthworks and hard paving. This forms part of the design process for the proposed development.

3 Assessment

3.1 Tree Character Groups

The detailed results of the tree survey are provided in the TSS, in Appendix 1. In summary, the trees on the site are in a good condition and vary in terms of amenity value provided to the wider landscape. The trees can be divided into three distinct character groups as follows:

1. The first character group includes the large, mature trees found growing on or adjacent to the site's boundaries. In the main, the trees in this character group are in a good condition and provide significant amenity to the local area.

2. The second character group includes the medium sized, middle-aged trees found growing across the site. In the main the trees in this character group are in a good condition and provide a screen to the site. A number of trees in this character group are non-native conifers, some of which are dead or in a state of decline.

3. The third character group includes the smaller, garden scale trees found growing across the site. The majority of the trees are in a good condition but due to their size are of limited amenity value to the local area.

4 Arboricultural Implications Assessment (AIA)

4.1 Methodology

The AIA uses the information obtained in the tree survey to identify areas where the proposed construction may be at odds with accepted standards, in terms of a tree's requirements for space in which to maintain existing roots and shoots, and space for future growth.

The quality and relative importance of each tree is illustrated as a coloured polygon. The colour used relates to the BS categories as follows: A - green, B - blue, C - grey and R - red (see accompanying drawing reference 18-646-TPP-A). In general the design process will try to retain A and B category trees. Proposed construction will therefore normally be excluded from the RPA of A and B category trees. Red trees are discounted as they are recommended for removal.

Details of the trees surveyed are given in the TSS (Appendix 1). The juxtaposition of the proposed development in relation to existing tree locations are shown on the accompanying TPP drawing, reference 18-646-TPP-A.

The AIA considers existing site conditions and the effect that they may have on the development of the surveyed trees root systems. Hard structures such as building and paved roads and paths can influence the root activity of trees by reducing the availability of both moisture and nutrients.

4.2 Assessment

Refer to the accompanying TPP, drawing, reference 18-646-TPP-A, for the relationship between the proposed development and the trees on and adjacent to the site.

- The following trees and groups of trees will be removed for arboricultural reasons:

  T19, T29, T42, T43, G6 and G12

- The following trees will be removed to enable the proposed development:

T4	to enable the construction of a driveway
T5	to enable the construction of a driveway
T6	to enable the construction of a dwelling
T7	to enable the construction of a dwelling
T8	to enable the construction of a dwelling
T9	to enable the construction of an access road
T10	to enable the construction of an access road

T11	to enable the construction of a dwelling
T12	to enable the construction of a dwelling
T14	to enable the construction of a dwelling
T15	to allow space for a garden
T16	to enable the construction of a dwelling
T17	to enable the construction of a dwelling
T20	to enable landscape improvements
T21	to enable landscape improvements
T22	to enable the construction of a car parking space
T23	to enable the construction of a car parking space
T25	to enable the construction of a car parking space
T26	to enable the construction of a car parking space
T28	to enable the construction of an access road
T31	to enable the construction of a dwelling
T44	to enable landscape improvements
T47	to enable landscape improvements
T50	to enable the construction of a car port
T54	to enable the construction of a dwelling
T55	to enable the construction of a dwelling
T56	to enable the construction of a dwelling
T58	to enable landscape improvements
T59	to enable landscape improvements
T61	to enable the construction of a car parking space
T62	to enable landscape improvements
T63	to enable the construction of a dwelling
T64	to enable the construction of a dwelling
T65	to enable the construction of a dwelling
T66	to enable the construction of a car parking space
T67	to enable the construction of an access road
T68	to enable the construction of an access road
T69	to enable the construction of an access road
T70	to enable the construction of an access road
T71	to allow space for a garden
Part of G1	to enable the construction of dwellings and a footpath. Conifers will be removed to allow replanting of native species
G2	to enable the construction of an access drive
G3	to enable landscape improvements

Part of G4	to enable the construction of a footpath. Conifers will be removed to allow replanting of native species
G5	to enable landscape improvements
G7	to enable landscape improvements
G8	Remove conifers to allow replanting of native species
G9	to enable landscape improvements
G10	to enable the construction of dwellings
G11	to enable the construction of an access road
G13	to enable landscape improvements

H2	enable the construction of a footpath
H3	to enable the construction of an access road
H4	to enable the construction of a dwelling
H6	to enable the construction of dwellings
H7	to enable the construction of dwellings
H8	to allow space for a garden

The removal of the majority of the conifers on the site boundaries was discussed with the tree officer during a site meeting. It was agreed that the removal of the conifers would allow the replanting of native species that would be more suitable to the setting.

- The following trees will require pruning prior to the start of the proposed development:

  T38 reduce eastern and southern laterals by 2 meters

- There will be no demolition within the RPA of a retained tree.

- The following trees will be affected by the construction of new hard surfaces within the RPA:

  T3, T13, T18, T24, T27, T30 and T40

  Where the proposed new car parking spaces and footpath are within the RPA of a retained tree, the new hard surface will be constructed in accordance with the 'no dig' principles outlined in APN12 and utilise a cellular confinement system such as Cell Web as a sub base. Refer to Section 5.3 below for details.

Above Ground Considerations

- The proposed dwellings have been located so that the retained trees on and adjacent to the site will not have a negative impact on the future residents. As such, the likelihood of any future pressure to prune or remove trees is considered to be low.

4.3 Replacement Planting

The removal of the conifers on the site boundaries provides a good opportunity to plant more suitable trees which will provide a better quality screen and back drop to the new dwellings.

Replacement trees should include, but not be limited to, the following species:

Field maple (Acer campestre)
Hawthorn (Crataegus monogyna)
Blackthorn (Prunus spinosa)
Cherry plum (Prunus ceracifera)
Crab apple (Malus sylvestris)
Hazel (Corylus avellana)
Holly (Ilex aquifolium)
Rowan (Sorbus aucuparia)
Whitebeam (Sorbus aria)
Scotts pine (Pinus sylvestris)
Oak (Quercus robur)
Hornbeam (Carpinus betulus)

5 Arboricultural Method Statement (AMS)

5.1 Methodology

The AMS provides the means by which retained trees and hedges can be protected throughout the development.

The movement of demolition and construction machinery in close proximity to trees may cause compaction of the soil which affects the tree's ability to absorb moisture and nutrients. The RPAs of retained trees and hedges will be protected by a tree protection barrier as described in paragraph 5.5 below and shown on the accompanying TPP, drawing number 18-646-TPP-A.

5.2 Demolition within the RPA of Retained Trees

There will be no demolition within the RPA of a retained tree.

5.3 Construction within the RPA of Retained Trees

Construction of Hard Surfaces

Construction of the car parking areas and footpaths that are within the RPA of retained trees will incorporate the 'no dig' principles set out in Arboricultural Advisory and Information Service guidance note APN12 and utilise a cellular confinement system, such as cell web, as a sub base. The new hard surface will be constructed on top of the existing ground level and no excavations will take place to level the ground. Guidance on the form of construction necessary to avoid root damage and loss is provided in the form of an extract of the Cell Web Product brochure for their cellular confinement system at Appendix 3. The extent and nature of hard paved surfaces within the RPA of retained trees will determine the level of construction required. The installation of the hard surface should proceed in the following order:

- Kill ground vegetation and gather dead organic matter. Care must be taken to select a herbicide that will not affect tree roots.
- Remove major projections such as stumps and rocks. Stumps must be removed with a stump grinder so as to minimise ground disturbance.
- Fill major hollows with sharp sand.
- Lay geotextile membrane over the soil and pin into place
- Lay cellular confinement system (such as Cell Web) as specified by engineer and pin into place.

- Fill the cellular confinement system with a 'no fines' aggregate to engineer's specification. Work must be carried out progressively so that any machinery used only moves on the laid surface.
- Install haunched kerb on existing ground level or timber sleeper as specified by landscape architect or engineer.
- Lay geotextile membrane over filled cellular confinement system.
- Lay finished surface as specified by landscape architect or engineer. If the installed hard surface covers more than 20% of the RPA or is more than three meters in width, a porous surface will be required. Porous wearing courses include resin bonded grave, large aggregate asphalt, perforated concrete or pavers/slabs laid on a dried bed and dry grouted.

Where the proposed new hard surface is to be installed on the existing soft landscape, allowances will be made for the increase in level which can be graded out across the remainder of the new hard surface.

No materials or spoil is to be stored within the RPA of a retained tree.

In order to avoid damage to the retained trees the tree surgery and felling work identified in the accompanying tree survey schedule will be carried out prior to the occupation of the site by the building contractor. The work will be carried out in accordance with BS 3998:2010.

5.4 Services

The proposed locations of service runs is not known at this stage but are likely to be located outside the RPA of the trees on and adjacent to the site. Where it is not possible to achieve this, the section of service run which passes within the RPA of a tree will be hand dug in accordance with 'broken trenches' described in NJUG 4 Section 4, an extract of which can be found in Appendix 4. This will ensure that tree roots are not damaged during the installation of the service. All root pruning will be agreed beforehand with the named Arboriculturist in consultation with the local authority Arboricultural officer. All root pruning will be in accordance with current best working practice. All routes for overhead services will aim to avoid the trees. Where this is unavoidable any tree work will be agreed prior to commencement with the Council's Arboricultural Officer.

If the conditions are suitable on site and there is sufficient space, underground services may cross the RPA if a low impact method is used. Such low impact methods include: moleing, directional drilling and thrust boring. It is important that all entry and exit pits remain outside of

the RPA and the services are installed at a sufficient depth (at least 600mm) so as to avoid the tree rooting system.

5.5 Tree Protection

All trees that are to be retained on the site will be protected by the use of a tree protection barrier erected in the location shown on the accompanying TPP, drawing number 18-646-TPP-A. The fence will consist of "Heras" type panels or similar braced at appropriate intervals and secured to keep in place. The tree protection barrier will be erected prior to the occupation of the site by the building contractor and will only be removed once the construction phase is complete.

Where specified on the accompanying TPP drawing, reference 18-646-TPP-A, the ground between the tree protection barrier and the new buildings will be protected by geotextile fabric and side butting scaffold boards or thick plywood fit for purpose, on a compressible layer (e.g. 100mm layer of woodchip over a geotextile membrane). A single thickness of boarding will provide sufficient protection for pedestrian load. The boarding will be left in place until the building works are complete.

5.6 Site Monitoring and Supervision

The process of reporting to the client and LPA/Tree Officer will be by emailing the checklist form at Appendix 2. Site monitoring is to be at a frequency agreed and approved by the LPA. It will involve a site visit by the arboriculturist at selected intervals to ensure that the appropriate tree protection measures, as detailed in the approved drawings and method statements, are continually adhered to

6 Conclusion

Canopy Consultancy was commissioned by Bos to carry out a tree survey at the site. The results of the survey indicate that the trees within the survey area vary in terms of condition and contribution to the wider landscape.

Although a number of trees will be removed to enable the proposed development, they are either internal to the site or conifers on the site's boundaries with a limited life expectancy.

The construction of the proposed development provides an opportunity to plant more suitable trees as plant of a landscape scheme. This in turn will improve the species diversity and age range of trees in the local area as well as enhancing the tree cover on the site. This includes the replacement of the conifers on the site boundaries with native species.

Through the specified tree protection measures and construction techniques, it will be possible to minimise the impact of the proposed development on the retained trees.

Overall, there are no known overriding arboricultural constraints which would prevent the proposed development from going ahead, subject to the protection measures and construction methodologies specified within this report being correctly implemented.

7 Appendices

Appendix 1: Tree Survey Schedule

Project:	Ashplats House, East Grinstead			BS 5837 2012 Trees in relation to design, demolition and construction-recommendations				Surveyed by	NAT	CANOPYCONSULTANCY		
Ref:	17-476-TSS-A							Weather	Overcast			
Date:	30.07.18							Tagged	No			
Client:	Bos											
				Canopy Spread								
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T1	sweet gum (Liquidamber styraciflua)	12	425	4	4	4	4	2	1.5	MA	Good	Fair - twin stem with weak union	Reduce sub-dominant stem by 20%	20-40	B2
T2	cider gum (Eucalyptus gunnii)	6	310	1	5	3	5	1	2	MA	Fair - topped	Good	None	10-20	C1
T3	bue atlas cedar (Cedrus atlantica 'Glauca')	12	890	10	9	10	8	1	1	M	Good	Fair - decay pockets at major scaffold unions	None	20-40	B2
T4	ash (Fraxinus excelsior)	8	160	2	2	2	3	1	2	Y	Fair - die back	Good	None	10-20	C1
T5	ash (Fraxinus excelsior)	9	170	2	2	2	2	1	2	Y	Fair - die back	Good	None	10-20	C1
T6	willow leaved pear (Pyrus salicifolia)	4	280	2	3	3	3	1	2	MA	Good	Good	None	20-40	C1
T7	ash (Fraxinus excelsior)	8	270	3	3	3	4	1	2	Y	Good	Good	None	40+	C1
T8	ash (Fraxinus excelsior)	7	208	2	3	3	3	2	2	Y	Fair - die back	Good	None	10-20	C1
T9	ash (Fraxinus excelsior)	8	340	3	3	2	4	1	2	Y	Good	Fair - stem divides at 2 metres	None	20-40	C1
T10	cherry (Prunus sp.)	3	100	4	3	3	3	1	1	Y	Fair - die back	Good	None	10-20	C1

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Client:	Bos			

Tree No.	Species	Height (m)	DBH (mm)	Canopy Spread N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T11	Douglas fir (Pseudotsuga menziesii)	14	810	4	4	5	5	1	1.5	M	Good	Good	None	20-40	B2
T12	Douglas fir (Pseudotsuga menziesii)	14	660	4	4	2	4	1	2	M	Fair - thinning canopy	Good	None	10-20	C1
T13	Douglas fir (Pseudotsuga menziesii)	12	460	3	3	3	3	1	4	MA	Good	Good	None	40+	B2
T14	silver birch (Betula pendula)	11	400	1	5	6	3	1	3	MA	Good - crown bias to south	Good	None	20-40	B2
T15	apple (Malus sp.)	5	330	2	2	4	4	1	2	M	Good	Good	None	10-20	C1
T16	apple (Malus sp.)	4	550	3	4	5	4	1	2	M	Good	Fair - decay on stem	None	10-20	C1
T17	apple (Malus sp.)	4	170	1	2	2	1	1	2	MA	Good	Good	None	10-20	C1
T18	oak (Quercus robur)	8	750	6	5	3	3	1	2	M	Good - reduced. Dead wood	Good	None	40+	B2
T19	ash (Fraxinus excelsior)	14	650	4	7	7	8	1	2	M	Poor - die back and chlorotic foliage	Poor - decay at base on northern side	Remove	0-10	U
T20	Douglas fir (Pseudotsuga menziesii)	12	520	1	5	3	3	1	2	M	Good - ivy	Good	None	20-40	B2

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Client:	Bos			

				Canopy Spread											
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T21	Douglas fir (Pseudotsuga menziesii)	12	360	2	4	3	4	1	2	MA	Fair - suppressed	Good	None	10-20	C1
T22	Douglas fir (Pseudotsuga menziesii)	14	480	4	4	3	4	1	5	M	Good	Good	None	20-40	B2
T23	Douglas fir (Pseudotsuga menziesii)	16	600	3	5	3	3	1	5	M	Good	Good	None	20-40	B2
T24	oak (Quercus robur)	14	750	7	4	6	7	1	2	M	Good - crown bias to west	Good	None	40+	B2
T25	Douglas fir (Pseudotsuga menziesii)	16	640	3	5	3	4	1	2	M	Good	Good	None	20-40	B2
T26	Douglas fir (Pseudotsuga menziesii)	15	760	3	8	3	3	1	1.5	M	Good	Good	None	20-40	B2
T27	ash (Fraxinus excelsior)	14	560	4	2	7	6	1	3	MA	Good - crown bias to south and west	Good	None	20-40	B2
T28	Douglas fir (Pseudotsuga menziesii)	15	510	3	6	3	3	1	2	M	Good	Good	None	20-40	B2
T29	Douglas fir (Pseudotsuga menziesii)	14	480	3	5	4	3	1	2	M	Good	Poor - Phaeolus schweinitzii fruiting bodies on root plate to north	Remove	0-10	U
T30	ash (Fraxinus excelsior)	14	590	4	5	5	4	1	1.5	M	Good	Good	None	20-40	B2

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Client:	Bos			

				Canopy Spread											
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T31	plum (Prunus domestica)	3	190	2	4	2	1	4	4	MA	Good - stems grown from stump	Good	None	10-20	C1
T32	hazel (Corylus avellana)	5	500	4	6	3	3	Multi	0	MA	Good - coppice	Good	None	10-20	C1
T33	Norway spruce (Picea abies)	8	280	3	1	2	3	1	1	Y	Good	Good	None	40+	C1
T34	Norway spruce (Picea abies)	8	200	1	2	2	2	1	1	Y	Good	Good	None	40+	C1
T35	Indian horse chestnut (Aesculus indica)	10	400	6	5	4	2	1	2	MA	Good	Good	None	20-40	B2
T36	Indian horse chestnut (Aesculus indica)	10	200	3	3	1	1	1	2	MA	Fair - suppressed	Good	None	10-20	C1
T37	Indian horse chestnut (Aesculus indica)	10	430	3	5	3	2	1	2	MA	Good	Good	None	20-40	B2
T38	Indian horse chestnut (Aesculus indica)	10	480	3	6	5	1	1	2	MA	Good - one sided canopy	Good	None	20-40	B2
T39	Indian horse chestnut (Aesculus indica)	10	670	3	3	5	5	1	2	MA	Good	Good	None	20-40	B2
T40	white willow (Salix alba)	11	610	7	4	5	5	1	2	M	Fair - thinning crown	Good	None	20-40	B2

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Tree No.	Species	Height (m)	DBH (mm)	Canopy Spread N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T41	sycamore (Acer pseudoplatanus)	6	273	3	6	3	5	4	0	MA	Good - coppice	Good	None	20-40	C1
T42	Lawson's cypress (Chamaecyparis lawsoniana)	12	450	2	1	2	2	1	2	MA	Dead	_	Remove	0	U
T43	Lawson's cypress (Chamaecyparis lawsoniana)	11	440	2	2	3	3	3	1	MA	Dead	_	Remove	0	U
T44	bue atlas cedar (Cedrus atlantica 'Glauca')	9	520	4	7	4	4	1	1.5	MA	Good	Fair - leans east, possible historic root heave	Monitor	10-20	C1
T45	Norway maple (Acer platanoides)	8	200	5	3	2	3	1	2	Y	Good	Good	None	40+	C1
T46	oak (Quercus robur)	10	200	5	4	4	3	1	4	MA	Good	Good	None	40+	B2
T47	Colorado spruce (Picea pungens)	10	180	2	2	1	1	1	3	Y	Fair	Good	None	10-20	C1
T48	copper beech (Fagus sylvatica 'Purpurea')	12	640	7	6	5	6	1	1	M	Good	Good	None	40+	B2
T49	silver birch (Betula pendula)	11	370	3	3	3	3	1	4	MA	Good	Good	None	20-40	B2
T50	red horse chestnut (Aesculus x carnea)	6	380	5	6	1	3	1	1	MA	Fair - early bacterial canker	Good	None	10-20	C1

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Client:	Bos			

				Canopy Spread											
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T51	beech (Fagus sylvatica)	15	877	7	7	3	5	4	1	MA	Good - possible bundle planting	Good	None	20-40	B2
T52	beech (Fagus sylvatica)	10	394	3	2	4	3	3	1	MA	Good - possible bundle planting	Good	None	20-40	B2
T53	weeping willow (Salix x chrysocoma)	6	240	5	5	3	3	1	0	MA	Good	Good	None	40+	B2
T54	hawthorn (Crataegus monogyna)	4	240	4	3	5	5	1	2	MA	Good	Good	None	20-40	C1
T55	silver birch (Betula pendula)	12	440	3	5	4	4	1	2	MA	Good	Good	None	40+	B2
T56	cider gum (Eucalyptus gunnii)	6	240	6	5	4	4	1	2	MA	Fair - thinning crown	Good	None	20-40	C1
T57	common lime (Tilia x europaea)	12	850	7	7	6	8	1	1	M	Good - scalped shallow roots	Good	None	40+	B2
T58	cider gum (Eucalyptus gunnii)	6	100	3	2	1	2	1	2	Y	Fair	Good	None	10-20	C1
T59	cider gum (Eucalyptus gunnii)	6	200	4	2	1	3	1	2	Y	Fair	Good	None	10-20	C1
T60	hawthorn (Crataegus monogyna)	4	300	3	3	2	3	Multi	1	MA	Good	Good	None	40+	C1

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				Canopy Spread											
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T61	goat willow (Salix caprea)	6	490	3	5	4	7	3	1	M	Good	Good	None	10-20	C1
T62	Lawson's cypress (Chamaecyparis lawsoniana)	4	200	2	2	2	2	1	0	Y	Good	Good	None	40+	C1
T63	chanticleer pear (Pyrus calleryana 'Chanticleer')	8	170	3	2	3	4	1	2	Y	Good	Fair - stem divides at 2 metres, poor union	None	10-20	C1
T64	chanticleer pear (Pyrus calleryana 'Chanticleer')	6	122	3	2	4	2	2	2	Y	Good	Good	None	20-40	C1
T65	ash (Fraxinus excelsior)	7	170	0	3	5	2	1	1	Y	Good	Fair - grown at angle out of group	None	10-20	C1
T66	bay (Laurus nobilis)	9	600	3	3	3	3	Multi	0	MA	Good	Good	None	20-40	B2
T67	cherry (Prunus sp.)	4	297	5	5	4	4	2	2	MA	Fair - die back	Good	None	10-20	C1
T68	box elder (Acer negundo)	4	120	1	1	2	2	1	2	Y	Good	Good	None	40+	C1
T69	apple (Malus sp.)	4	70	3	2	1	3	1	2	Y	Fair - suppressed	Good	None	10-20	C1
T70	corksrew willow (Salix babylonica 'Tortuosa')	8	140	2	4	1	1	1	3	Y	Fair - die back	Good	None	10-20	C1
T71	Lawson's cypress (Chamaecyparis lawsoniana)	8	350	1	1	2	3	1	0	MA	Good	Good	None	20-40	C1

Project:	Ashplats House, East Grinstead	BS 5837 2012 Trees in relation to design, demolition and construction- recommendations	Surveyed by	NAT	CANOPYCONSULTANCY
Ref:	17-476-TSS-A		Weather	Overcast	
Date:	30.07.18		Tagged	No	
Client:	Bos				

Tree No.	Species	Height (m)	DBH (mm)	Canopy Spread N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
G1	Norway spruce, oak, larch, holly, ash, hazel, Leyland cypress, Lawson's cypress	Up to 14	Varied							Y-M	Good - boundary group, some dead conifers	Good	Remove dead conifers	40+	B2
G2	hawthorn, ash, hazel, service tree, Persian ironwood	Up to 5	Varied							Y	Good - semi ornamental group	Good	None	40+	C1
G3	Lawson's cypress	Up to 12	Varied							MA	Fair - some die back	Good	Remove dead stems	20-40	C1
G4	western red cedar, holly, hazel, rhododendron, oak	Up to 6	Varied							Y	Good - boundary group	Good	None	40+	C1
G5	Leyland cypress	Up to 10	Varied							MA	Good - boundary group	Good	None	20-40	C1
G6	Lawson's cypress	Up to 8	Varied							MA	Dead	_	Remove	0	U
G7	Leyland cypress, holly, hazel	Up to 12	Varied							MA	Good - boundary group	Good	None	20-40	C1
G8	Lawson's cypress, hawthorn	Up to 10	Varied							MA	Fair - garden group, dead conifers	Good	Remove dead conifers	10-20	C1
G9	western red cedar	Up to 15	Varied							MA	Good - boundary group	Good	None	20-40	B2

Project:	Ashplats House, East Grinstead	BS 5837 2012 Trees in relation to design, demolition and construction- recommendations	Surveyed by	NAT	CANOPYCONSULTANCY
Ref:	17-476-TSS-A		Weather	Overcast	
Date:	30.07.18		Tagged	No	
Client:	Bos				

Tree No.	Species	Height (m)	DBH (mm)	Canopy Spread N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
G10	Lawson's cypress	Up to 12	Varied							MA	Fair - section of dead trees. Eastern extent of group forms boundary screen	Fair - some collapsed stems	Remove dead and collapsed trees	20-40	B2
G11	magnolia, Norway maple, yew, ash	Up to 12	Varied							MA -M	Fair - garden group	Good	None	20-40	C1
G12	Lawon's cypress	Up to 10	Varied							MA	Poor - drought stressed trees	Fair - recently exposed	Remove	0-10	U
G13	Leyland cypress, Lawson's cypress	Up to 14	Varied							MA	Good - boundary group	Good	None	20-40	B2
G14	Lawson's cypress	Up to 14	Varied							MA	Good - boundary group	Good	None	20-40	B2
H1	Leyland cypress	Up to 3	Varied							Y	Good - off site boundary hedge	Good	None	40+	C1
H2	Leyland cypress	Up to 2	Varied							Y	Good - internal hedge	Good	None	40+	C1
H3	Leyland cypress	Up to 3	Varied							Y	Good - boundary hedge	Good	None	40+	C1
H4	beech, holly	Up to 3	Varied							MA	Good - internal hedge	Good	None	40+	C1
H5	western red cedar	Up to 3	Varied							MA	Good - boundary hedge	Good	None	40+	C1

Project:	Ashplats House, East Grinstead	BS 5837 2012 Trees in relation to design, demolition and construction- recommendations	Surveyed by	NAT
Ref:	17-476-TSS-A		Weather	Overcast
Date:	30.07.18		Tagged	No
Client:	Bos			

				Canopy Spread											
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
H6	yew	Up to 2	Varied							MA	Good - internal hedge	Good	None	40+	C1
H7	yew	Up to 1	Varied							MA	Good - internal hedge	Good	None	40+	C1
H8	box honeysuckle	1	Varied							MA	Good - internal hedge	Good	None	40+	C1

Appendix 2: Programme of Site Monitoring

Ashplats House, East Grinstead
Site Monitoring Form

To be completed by the named arboriculturist and emailed to the client and tree officer at the completion of each operation.

Arboriculturist……

Client……

Project Manager……

Tree Officer……

(The above to be filled in with names and contact numbers)

OPERATION	TIMING	DATE	COMMENTS
Pre-commencement meeting or contact with project/site manager.	Before any works or pre-works on site, including storage of materials		
Spot check of protective fencing	Before demolition begins		
Spot check of 'no dig' hard surface installation	During construction		
Completion of development	Once all construction activity has been completed		

Appendix 3: Extract from the Cell Web product brochure

CellWeb

Tree Root Protection System

CellWeb Tree Root Protection System provides a flexible and permeable solution for protecting tree roots while creating a strong stable surface for traffic.

With increased urbanisation and more redevelopments of existing properties, the need to be mindful of the impact on the surrounding environment is more important than ever.

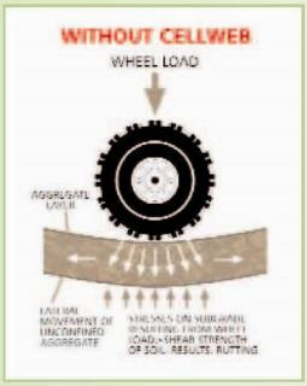
The demand for building site access, driveways and parking around existing trees can have a potentially fatal impact on the tree if carried out incorrectly. Tree preservation orders (TPO's) ensure that trees are not wilfully damaged. However the need for vehicle access over and around tree roots can still cause the following problems:

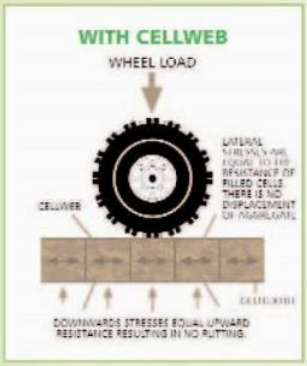
Problems:

- Compaction of subsoils (especially by construction traffic) causing oxygen and nutrient depletion
- Creating an impermeable surface that prevents water reaching the roots
- Changes in ground level and water table
- Damage caused during excavation
- Contamination of the subsoil

By using CellWeb Tree Root Protection System you can avoid these problems and ensure the tree's long-term future. BS 5837:1991 (revised 2005) and APN 1 provide information for the protection of trees during the construction process, and CellWeb is a well-established solution that conforms to these guidelines.

Product features

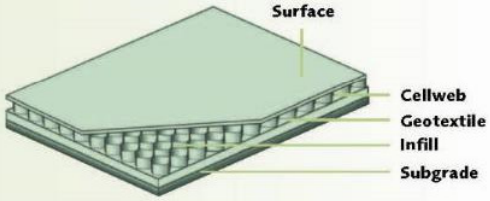




Cellweb's patented design with its unique cellular structure and perforated cell walls reduces the vertical load pressure on tree roots and prevents damage. With clean granular materials as infill, air and moisture can reach the roots to encourage healthy growth.

With no-dig solutions being the preferred option of most Arboricultural Consultants and Tree Officers, CellWeb is ideal as only the surface vegetation need be removed. As well as avoiding disruption to the roots this reduces installation time and saves money.

What's more CellWeb also cuts down the depth required for the sub base – in most cases by 50% for further cost savings. CellWeb also significantly reduces surface rutting, increasing the long-term performance of the finished surface.



Using CellWeb for tree root protection gives you these benefits:

- Reduced depth of excavation required
- Preventing the compaction of subsoils
- Preventing oxygen and nutrient depletion
- Environmentally sound
- Quick, easy and cost-effective installation
- Free technical support available

CellWeb gives you the cost-effectiveness you need at the same time as helping to preserve trees.

Geosynthetics Ltd is a leading dis

Please call
01455 617 139
or email sales@geosyn.co.uk
for further information.

Wide product range

Large stock holding

Next day delivery

Access road for the National Lake District Parks Authority.

Site before construction pictured above.

CellWeb during installation.

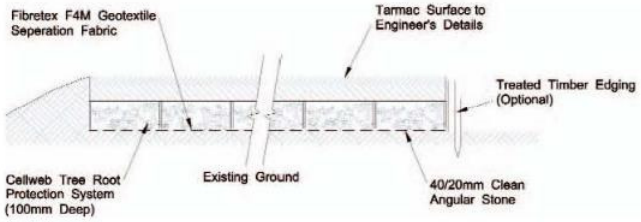
Final surfacing.

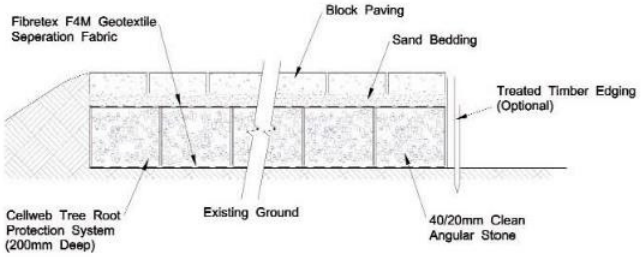
Final surfacing

The CellWeb Tree Root Protection is totally confined within the clean stone sub base, therefore you can choose whichever surface materials are most appropriate for your installation. Some materials are more suitable than others and serious consideration should be given to the porosity of the surface for continued healthy growth of the tree. An ideal surfacing are DuoBlocks: a grass reinforcement and gravel retention system. Geosynthetics can supply these systems for a visually attractive surface that also has the advantage of being fully porous.

Loose or bonded gravels can be used as an alternative hard landscaping and CellWeb can also be used with block paviors whose porous joints will permit moisture and air transfer to the roots. Where planning allows, porous asphalt is yet another possible surfacing treatment.

Call our sales office on 01455 617 139 for more information.





Appendix 4: Section 4, extracted from NJUG 4

4. HOW TO AVOID DAMAGE TO TREES

This section gives general guidance on methods of work to minimise damage to trees. The local authority (or for privately owned trees, the owner or their agent), should be consulted at an early stage prior to the commencement of any works. This will reduce the potential for future conflict between trees and apparatus.

4.1 Below Ground

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

4.1.1 **Fine Roots**
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. frost and extremes of heat. It is therefore important to protect exposed roots where a trench is to be left open overnight where 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.

4.1.2 **Precautions**
The precautions referred to in this section are applicable to any excavations or other works occurring within the Prohibited or Precautionary Zones as illustrated in Figure 1 – 'Tree Protection Zone'.

4.1.3 **Realignment**
Whenever possible apparatus should always be diverted or re-aligned outside the Prohibited or Precautionary Zones. Under no circumstances can machinery be used to excavate open trenches within the Prohibited Zone.

The appropriate method of working within the Precautionary Zone should be determined in consultation with the local authority (or for privately owned trees the owner or their agent) and may depend on the following circumstances;

- the scope of the works (e.g. one-off repair or part of an extensive operation)
- degree of urgency (e.g. for restoration of supplies)
- knowledge of location of other apparatus
- soil conditions
- age, condition, quality and life expectancy of the tree

Where works are required for the laying or maintenance of any apparatus within the Prohibited or Precautionary Zones there are various techniques available to minimise damage.

Acceptable techniques in order of preference are;

a) Trenchless
Wherever possible trenchless techniques should be used. The launch and reception pits should be located outside the Prohibited or Precautionary Zones.
In order to avoid damage to roots by percussive boring techniques it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the equipment with materials other than water (e.g. oil, bentonite, etc.) must not be used when working within the Prohibited Zone. Lubricating materials other than water may be used within the Precautionary Zone following consultation and by agreement.

b) Broken Trench - Hand-dug
This technique combines hand dug trench sections with trenchless techniques if excavation is unavoidable. Excavation should be limited to where there is clear access around and below the roots. The trench is excavated by hand with precautions taken as for continuous trenching as in (c) 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 and outside of the Prohibited Zone.

c) Continuous Trench - Hand-dug
The use of this method must be considered only as a last resort if works are to be undertaken by agreement within the Prohibited Zone. The objective being to retain as many undamaged roots as possible.

Hand digging within the Prohibited or Precautionary zones must be undertaken with great care requiring closer supervision than normal operations.

After careful removal of the hard surface material digging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Throughout the excavation works great care should be taken to protect the bark around the roots.

All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed without first consulting the owner of the tree or the local authority tree officer / arboriculturist. If after consultation severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound.

4.1.5 **Backfilling**

- Any reinstatement of street works in the United Kingdom must comply with the relevant national legislation (see: **Volume 6 – 'Legislation and Bibliography'**). In England this relates to the requirements of the code of practice – 'Specification for the Reinstatement of Openings in Highways' approved under the New Roads and Street Works Act 1991. Without prejudice to the requirements relating to the specification of materials and the standards of workmanship, backfilling should be carefully carried out to avoid direct damage to roots and excessive compaction of the soil around them.

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

- Backfilling outside the constructed 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.

4.1.6 **Additional Precautions near Trees**

- Movement of heavy mechanical plant (excavators etc.) must not be undertaken within the Prohibited Zone and should be avoided within the Precautionary Zone, except on existing hard surfaces, in order to prevent unnecessary compaction of the soil. This is particularly important on soils with a high proportion of clay. Spoil or material must not be stored within the Prohibited Zone and should be avoided within the Precautionary Zone.

- Where it is absolutely necessary to use mechanical plant within the Precautionary Zone care should be taken to avoid impact damage to the trunk and branches. A tree must not be used as an end-stop for paving slabs or other materials nor for security chaining of mechanical plant. If the trunk or branches of a tree are damaged in any way advice should be sought from the local authority tree officer / arboriculturist.

See TABLE 1 –'Prevention of Damage to Trees Below Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

TABLE 1 - Prevention of Damage to Trees Below Ground

Causes of Damage	Type of Damage	Implications to Tree	Precautions
Trenching, mechanical digging etc.	Root severance	• The tree may fall over • Death of the root beyond the point of damage • Potential risk of infection of the tree The larger the root the greater the impact on the tree.	Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm in diameter use a sharp tool and make a clean cut leaving as small a wound as possible.
Trenching, mechanical digging, top soil surface removal etc.	Root bark damage	• The tree may fall over • If the damage circles the root it will cause the death of the root beyond that point • Potential risk of infection of the tree The larger the root the greater the impact on the tree.	Do not use mechanical machinery to strip the top soil within the Precautionary Zone. Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm use a sharp tool and make a clean cut leaving as small a wound as possible.
Vehicle movement and plant use. Material storage within the precautionary area.	Soil compaction & water saturation	Restricts or prevents passage of gaseous diffusion through soil, the roots are asphyxiated and killed affecting the whole tree.	Prevent all vehicle movement, plant use or material storage within the Precautionary Zone.
Top-soil scouring, excavation or banking up.	Alterations in soil level causing compaction or exposure of roots.	Lowering levels strips out the mass of roots over a wide area. Raising soil levels asphyxiates roots and has the same effect as soil compaction.	Avoid altering or disturbing soil levels within the Precautionary Zone.
Use of herbicides.	Poisoning of the tree via root absorption	• Death of the whole tree • Death of individual branches Damage to leaves and shoots.	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.
Spillage of oils or other materials.	Contamination of soil	Toxic and asphyxiation effects of chemicals, oils, building materials (cement, plaster, additives etc.) on the root system can kill the tree.	Never store oils, chemicals or building materials within the Precautionary Zone or within the branch spread of a tree, which ever is the greater.
Placement or replacement of underground apparatus.	Various	Death of all or part of the tree.	Effective planning and liaison with local authority tree officer, taking into consideration the position of trees, and their future growth potential and management

4.2 Above Ground

4.2.1 Damage by Pruning

Trees (including shrubs and hedges) can be damaged by inappropriate or excessive pruning. Reference should be made to the Energy Networks Association (ENA) document "Engineering Technical Report 136 Vegetation Management near Electricity Equipment – Principles of Good Practice" (see section 8 – 'Other Useful Publications') or appropriate company specific documentation for guidance on pruning.

See TABLE 2 – 'Prevention of Damage to Trees Above Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

TABLE 2 - Prevention of Damage to Trees Above Ground

Causes of Damage	Type of Damage	Implications for the Tree	Precautions
Impact by vehicle or plant Physical attachment of signs or hoardings to the trunk Storage of materials at base of tree Rubbing by winch or pulling cables	Bark bruising, bark removal, damage to the wood, damage to buttress roots, abrasion to trunk	Wounding with the potential for infection ultimately resulting in death of all or part of the tree. Structural failure of the tree	Surround the trunk with protective free-standing barrier. Exclude vehicles, plant or material storage from the Precautionary Zone. Ensure sufficient clearance of cables or ropes.
Impact by vehicle or plant Rubbing by overhead cables	Bark damage to branches, breakage and splitting of branches, abrasion to branches	Structural failure of the branch. Wounding or loss of a branch with the potential for infection ultimately resulting in death of all or part of the branch or tree.	Exclude vehicles, plant or material storage from the Precautionary Zone. Ensure sufficient clearance of cables or ropes. All pruning should be carried out in accordance with BS3998 *(prune affected branches to give appropriate clearance from cables)*
Inappropriate siting of overhead apparatus, such as CCTV, lighting fixtures and communications masts and dishes.	Inappropriate pruning, unnecessary tree removal	Severely pruning tree to acquire line of sight signal for communications dish etc.	Effective planning and liaison with local authority tree officer / arboriculturist, taking into consideration the position of trees, and their future growth potential and management.
Lack of forethought in design and location of apparatus and services entries on new developments	Complete tree removal	The tree is removed unnecessarily	Agree the location and installation of services at the design stage. Consideration should be given to the creation of dedicated service routes wherever possible.
Use of herbicides	Poisoning of the tree via absorption through bark, leaves and shoots	Death of the whole tree, death of individual branches, damage to leaves and shoots	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.