12/00429/FUL

ARBORICULTURAL IMPACT ASSESSMENT

To include

TREE REPORT
ARBORICULTURAL METHOD STATEMENTS
TREE PROTECTION MEASURES

35 London Hill
Rayleigh
Essex

OS 695-13-Doc1
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Revised Plans
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Report written by
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1.0 FOREWORD

Paragraph 1.1 – 1.2 sets out the purpose of this report and the requirements of the various parties involved with the design and construction of the development including any requirements to carry out any demolition operation.

1.1 British Standard; BS 5837:2012 Trees in Relation to Design, Demolition and Construction - Recommendations (BS 5837:2012)

i) BS 5837:2012 is normally considered as the lead document when new development is proposed in close proximity to existing trees.

ii) It is stated within the scope of BS 5837:2012 the following:

'This British Standard gives recommendations and guidance on the relationship between trees and design, demolition and construction processes.

It sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and structures.

The standard is applicable whether or not planning permission is required.'

iii) The British Standard is a recommendation and not a requirement and as such the Local Planning Authority **(LPA)** may or may not adhere fully to its contents.

iv) It is a requirement to include a range of tree related documents as part of the planning application submission. BS 5837:2012 Annex B: 'Trees and the planning system' states:

'The nature and level of detail of information required to enable a local planning authority to properly consider the implications and effects of development proposals varies between stages and in relation to what is proposed. (The following table) Table B1 provides advice to both developers and local authorities on an appropriate amount of information. The term 'minimum detail' is intended to reflect information that local authorities are expected to seek, whilst the term 'additional information' identifies further details that might reasonably be sought, especially where any construction is proposed within the RPA.'

Not all information will be provided by the arboricultural consultant, Architects, Landscape Architects, Engineers, Soil scientist etc. may all need to input suitable information to fulfil the requirements of BS 5837:2012 and to successfully navigate an application through the planning system.

Stage of process	Minimum detail	Additional information
Pre-application	• Tree survey	• Tree retention/removal plan (draft)
Planning application	• Tree survey (in the absence of pre-application discussions). • Tree retention/removal plan (finalised). • Retained trees and RPA's shown on proposed layout. • Strategic hard and soft landscape design, including species and location of new tree planting. • Arboricultural Impact Assessment.	• Existing and proposed finished levels. • Tree Protection Plan. • Arboricultural Method Statements – heads of terms. • Details of all special engineering within the RPA and other relevant construction details.
Reserved matters/ planning conditions	• Alignment of utility apparatus (including drainage), where outside the RPA or where installed using a trenchless method. • Dimensioned tree protection plan. • Arboricultural method statement – detailed. • Schedule of works to retained trees, e.g. access facilitation pruning. • Detailed hard and soft landscape design.	• Arboricultural site monitoring schedule. • Tree and landscape management plan. • Post-construction remedial works. • Landscape maintenance schedule.

Table 1
BS 5837:2012 Table B1 - Delivery of tree-related information into the planning system

iv) If this document or any other tree related document is approved by the LPA as part of the submission for full planning permission or to fulfil the requirements of a planning condition or to discharge reserved matters, non-compliance may lead to an enforcement notice being served. It is therefore essential that this and associated documents are strictly adhered to.

1.2 BS 5837:2012 – General requirements for developers

BS 5837:2012 contains three main areas for the developer to consider.

1.2.1 Feasibility, planning, concept and design (RIBA work stages A-D)

To support the production of documents, as outlined in table 1, the following may need to be carried out.

i) Topographic survey to include:
- Spot levels at the base of trees and throughout the site.

- Position of all trees within the site with a stem diameter of 75mm or more when measured at 1.5m above ground level.
- Position of all trees with a stem diameter of 75mm or greater measured at 1.5m above ground level overhanging the site or growing adjacent to the site within a distance up to 12 times their estimated stem diameter.
- Other relevant landscape features and artefacts.

ii) Soil assessment to be carried out by a competent person to include: whether the soil is shrinkable, soil structure, composition and ph.

iii) Tree survey.

iv) Identifying above and below ground constraints.

v) Arboricultural impact assessment **(AIA)**.

vi) Tree protection plan **(TPP)**.

vii) Consideration of new planting design and associated landscape operations.

1.2.2 Detailed and technical design (RIBA work stages E-G)

To support the production of documents, as outlined in table 1, the following may need to be carried out.

i) Arboricultural method statement **(AMS)** to include the following:
- Demolition.
- Permanent hard surfaces.
- Design recommendations.
- Edge supports
- Foundations
- Subterranean construction.
- Underground and above-ground utility apparatus.

ii) Tree protection plan (Detailed).

iii) Site monitoring requirements.

1.2.3 Site works, landscape operations and management (RIBA work stages H-L)

To support the production of documents, as outlined in table 1, the following may need to be carried out.

i) Drainage requirements.

ii) Topsoil quality and amelioration.

iii) Soil compaction and remediation measures.

iv) Use of mulch.

v) Hard surfaces adjacent to newly planted trees.

vi) Use of herbicides.

vii) Tree management schedule.

2.0 INSTRUCTIONS

Open Spaces Landscape and Arboricultural Consultants Limited **(Open Spaces)** have been instructed by Mr B Gunner to produce reports for trees growing within/adjacent to the proposed development site at 35 London Hill, Rayleigh, Essex. All reports, plans and other tree related documentation will be in accordance with BS 5837:2012.

2.1 The following documents may be provided

2.1.1 Pre application

i) No pre-application documents provided

2.1.2 Planning application

i) Tree survey

ii) Tree retention/removal plan.

iii) Retained trees and RPA's shown on proposed layout.

iv) Arboricultural Impact Assessment.

v) Tree protection plan.

vi) Arboricultural method statements – heads of terms.

vii) Special engineering and other relevant construction details.

2.3 Arboricultural Consultant

Graeme Drummond is a Fellow of the Arboricultural Association (FArborA) and a Chartered Landscape Architect (CMLI).

3.0 LIMITATIONS

3.1 Trees are living organisms whose health and condition can change rapidly. This assessment in accordance with BS 5837:2012 is valid for a period of 2 years from the date of the tree report. This period of time may be reduced if there is any change to the immediate surroundings of the tree, after any storm or if the development deviates from the approved drawings on which this report is based upon.

3.2 A tree may be protected in various ways such as by a Tree Preservation Order (**TPO**) or because it is growing within a Conservation Area. The tree may be protected for a period of time (usually not longer than 5 years) by Planning Conditions or there may be a restrictive covenant on the tree. Before any tree work is carried out on a tree or any development actively carried out with the tree's Root Protection Area (**RPA**) or crown, it should be determined whether the tree is protected or not. **It is a criminal offence to carry out work on a protected tree without consent or agreement of the Local Planning Authority.**

3.3 Open Spaces has not contacted any Local Planning Authority to ascertain if any tree growing within or immediately adjacent to the proposed development site is protected by a Tree Preservation Order or is growing within a Conservation Area or is protected by any Planning Condition or Restrictive Covenant.

3.4 Trees have been inspected from ground level only. Should a more detailed survey or climbing inspection be required, this will be highlighted within the recommendations.

3.5 Where ivy is growing over the tree or any part of it or if the tree is obscured by dense vegetation, fencing etc or cannot be accessed due to impenetrable vegetation or is growing within neighbouring land, it may not be possible to fully survey the tree. This will be highlighted within the Tree Report. A tree which cannot be fully surveyed may have structural defects, decay or disease which has not been identified.

3.6 Where it is not possible to fully access the tree, estimates of key dimensions will be made to include trunk diameter and crown spread.

3.7 Trees have been surveyed in accordance with BS 5837:2012 for the purpose of supporting a planning application and for no other purpose.

3.8 No information relating to any soil sampling or any soil analysis including the testing of pH levels is included within these reports.

3.9 Open Spaces has not carried out any topographical survey, recorded levels or interpolated levels as contours. Levels will not be shown on any plan unless supplied in a suitable format and specifically requested.

3.10 No design or specification for any hard or soft landscape feature or soil is included within these reports.

3.11 No design of any utility layout is included within these reports and no utility will be shown on any plan.

3.12 No shadow calculation has been carried out.

3.13 Copyright

4.0 IN GENERAL

4.1 Any proposed tree work will be carried out by a competent tree surgeon that holds Public Liability Insurance. All tree work must be carried out to British Standard 3998:2010 **(BS 3998:2010)** Tree Work - Recommendations.

4.2 If any tree identified for retention is implicated by the proposed development as identified within the Arboricultural Impact Assessment **(AIA)**, suitable Arboricultural Method Statements **(AMS)**, as approved by the Local Planning Authority **(LPA)** will be provided.

4.3 The RPA is an area which will be protected throughout the whole course of the development as it is this area which, in accordance with BS 5837;2012 is identified as containing the majority of roots needed to sustain the tree and to ensure its long term viability.

4.4 The RPA is normally ascertained by multiplying the diameter of a single trunk tree, measured at 1.5m above ground level, by 12 and for trees with more than one stem, the RPA will be calculated in accordance with paragraph 4.6 of BS 5837:2012. This resulting figure is converted into a radius centred on the middle of the tree's trunk to form a circle. This circle becomes the RPA. The maximum radius for an RPA irrespective of trunk diameter is 15m.

4.5 Where it is determined that rooting has occurred asymmetrically, the RPA may be converted into a polygon of an equivalent area.

4.6 Trees to be retained will require protecting in accordance with BS 5837:2012 and will be clearly set out within the Arboricultural Method Statements and the Tree Protection Plan.

5.0 FINDINGS

i) The tree survey was carried out on Monday 18th March 2013.

ii) The key explains the main headings within the tree report.

5.1 Key

Tree reference No.		Identifies tree on plan.
Tag No.		Number embossed on a metal disc attached to the tree
Tree species		Common name.
Height		Estimated height of tree (m).
Stem diameter		Diameter of trunk measured at approximately 1.5m above ground level (mm).
Branch spread		Overall size of crown N, E, S, W (m).
Height to first branch and orientation		Clear distance between ground level to approximate first significant branch including direction of growth.
Ht of crown clearance		Clear distance between ground level to approximate height to base of crown.
Age class	Y	Young: 0-10% of expected life
	SM	Semi-mature: 10-30% of expected life
	M	Mature: 30-80% of expected life
	OM	Over-mature: 80-100% of expected life
	V	Veteran: >100% of expected life
Physiological Condition		General overview of the tree's systems.
	G	Good — Above average
	N	Normal — Average
	P	Poor — Below average
	D	Dead

Estimated remaining contribution	Approximate length of time the tree will provide a contribution in years.
Category grading	General quality of the tree in relation to its condition and setting including an estimation of the tree's remaining contribution. Based on BS 5837: 2012
A	High quality and value. (Min of 40yrs value remaining). RPA shown green on Tree Protection Plan, Tree Retention/Removal Plan.
B	Moderate quality and value. (Min of 20yrs value remaining). RPA shown blue on Tree Protection Plan, Tree Retention/Removal Plan.
C	Low quality and value (Min of 10yrs value remaining). RPA shown grey on Tree Protection Plan, Tree Retention/Removal Plan.
U	Less than 10yrs value and therefore could be removed.
1	Mainly arboricultural values
2	Mainly landscape values
3	Mainly cultural/conservation values
Root protection area	Area around the base of the tree to be protected during construction and identified as a radius centred on the tree and as metres squared.
General observations	Physical condition including the presence of defects.
Proposed tree work	Works to be carried out.

# Indicates that the given measurement has been estimated.

5.2 Tree Report

Set out in accordance with BS 5837:2012

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N	E	S	W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T1	---	Yew	5.0	220#	2.5#	2.5#	2.5#	2.5#	1.0 NSEW	1.0	M	Normal	>20	B1	2.7	23

General Observations
- Growing within raised bed adjacent to wall and entrance gate
- Unable to access and therefore unable to fully survey

Proposed Tree Works
- --

T2	724	Walnut	13.0	240# 500#	5.0#	5.0#	7.0#	6.0#	2.0 E	3.0	M	Normal	>20	B1	6.9	150

General Observations
- Secondary trunk originates at 1.2m with cavity at union with main trunk
- Wooden fence rails attached to tree
- Minor storm damage throughout crown

Proposed Tree Works
- Remove dead branch at 3m facing south
- Remove secondary branch

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N	E	S	W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T3	---	Holly	12.0	100 260	2.5	2.5#	1.0	2.5	2.0 NSEW	2.0	M	Normal	>20	B1	3.6	41
General Observations • Growing within adjacent garden area Proposed Tree Works • ---																
S1	---	Mixed ornamental shrubs	1.0-5.0	---	Extent of shrub group as shown on Tree Constraints Plan				---	---	M	Normal	---	---	---	---
General Observations • --- Proposed Tree Works • ---																

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N E S W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
S2	---	Mixed ornamental shrubs	1.0-5.0	---	Extent of shrub group as shown on Tree Constraints Plan	---	---	M	Normal	---	---	---	---

General Observations
- ---

Proposed Tree Works
- ---

T4	---	Purple plum	5.0	80	1.0	1.5	1.5	1.5	1.5 NSEW	1.5	Y	Normal	>20	B1	1.2	5.0

General Observations
- Good condition tree

Proposed Tree Works
- ---

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N	E	S	W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
H1	---	Leyland Cypress x 3	12.0	330 max.	Extent of hedge as shown on Tree Constraints Plan				0	0	M	Normal	>20	C1	4.8	---

General Observations
- Beginning to become visually porous in lower 2-3m

Proposed Tree Works
- ---

T5	---	Lawson cypress (pisifera)	14.0	350	2.0	1.5	1.0	1.0	1.5 NSEW	1.5	M	Normal	>20	C1	4.2	55

General Observations
- Ivy clad to 3m and therefore unable to fully survey
- Obvious kink in mid trunk

Proposed Tree Works
- ---

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N	E	S	W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T6	---	Maple	7.0	130	3.5	2.0	2.0	2.0	2.0 E	3.0	M	Normal	>20	C1	1.8	10

General Observations
- Growing to top of earth bank
- Ivy clad and therefore unable to fully survey
- Tree growing towards east

Proposed Tree Works
- ---

T7	---	Spruce	12.0	180	1.0	1.0	1.0	1.0	3.0 S	3.0	M	Normal	>20	C1	2.4	18

General Observations
- Ivy clad and therefore unable to fully survey
- Growing on short steep slope

Proposed Tree Works
- ---

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N	E	S	W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T8	---	Holly	10.0	380 160 150	2.0	2.0	2.0	2.0	2.0 NSEW	1.5	M	Normal	>20	C1	5.4	92
General Observations • Multi-stem tree from 1m above ground level • Growing on a short slope Proposed Tree Works • ---																
T9	---	Magnolia	6.0	90 100 140	---	2.5	2.5	2.5	0	1.5	M	Normal	>20	C1	2.4	18
General Observations • Fair condition • Minor damage to branch within upper crown Proposed Tree Works • ---																

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N	E	S	W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T10	---	Holly	12.0	240 270 170 170# 190#	2.5#	2.5#	2.5#	2.5#	3.0 NSEW	3.0	M	Normal	>20	C1	5.7	102

General Observations
- Tree growing towards south
- Co-dominant stems originate at ground level

Proposed Tree Works
- ---

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N	E	S	W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T11	---	Birch	15.0	500# 500#	8.0#	8.0#	7.0#	7.0#	4.0 NSEW	4.0	OM	Poor	<10	U	---	---

General Observations
- Co-dominant stems originate at ground level
- Ivy clad to 5m and therefore unable to fully survey
- Tree is in decline
- Large cavity at 3.5m (storm damaged branch)
- Large amounts of deadwood within crown
- Bacterial flux exuding from cavity at 2m
- Cavity at 8m at site of storm damaged branch

Proposed Tree Works
- Remove tree

S3	---	Mixed ornamental shrubs	1.0-5.0	---	Extent of shrub group as shown on Tree Constraints Plan	---	---	M	Normal	---	---	---	---

General Observations
- ---

Proposed Tree Works
- ---

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N	E	S	W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T12	718	Maple	7.0	210 70 100 240	2.5	3.0	2.5	3.0	1.0 NSEW	2.0	M	Normal	>20	C1	4.2	55
General Observations • --- Proposed Tree Works • ---																
T13	---	Birch	15.0	380#	3.0	4.0	1.5	2.0	3.5 NSEW	3.0	M	Normal	>20	C1	4.8	72
General Observations • Ivy clad to 4m and therefore unable to fully survey • Growing on a short steep bank Proposed Tree Works • ---																

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N E S W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
S4	---	Mixed ornamental shrubs	1.0-6.0	---	Extent of shrub group as shown on Tree Constraints Plan	---	---	M	Normal	---	---	---	---
General Observations • Proposed Tree Works •													
S5	---	Mixed ornamental shrubs	1.0-6.0	---	Extent of shrub group as shown on Tree Constraints Plan	---	---	M	Normal	---	---	---	---
General Observations • --- Proposed Tree Works • ---													

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N E S W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
H2	---	Leyland cypress	13.0	250#	Extent of hedge as shown on Tree Constraints Plan	0	0	M	Normal	>20	C1	3.0	---
General Observations • Boundary hedge (not topped) • Growing to bottom of steep bank Proposed Tree Works • ---													
G1	713	Maple x 2, Lawson's cypress x 1	6.0	100 110 50 + 80 + 130	Ex tent of group as shown on Tree Protection Plan	0	0	M	Normal	>20	C1	2.4	---
General Observations • Generally in fair condition Proposed Tree Works • ---													

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N	E	S	W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T14	---	Maple	6.0	110	2.0	3.0	0.5	0	1.0 NSEW	1.5	M	Normal	>20	C1	1.5	7
General Observations • Fair condition Proposed Tree Works • ---																
G2	---	Golden cypress, golden western red cedar	9.0	250 Av.	Extent of group as shown on Tree Protection Plan				0	0	M	Normal	>20	C1	3.0	---
General Observations • --- Proposed Tree Works • ---																

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N E S W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
S6	---	Mixed ornamental shrubs	2.0-3.0	---	Extent of shrub group as shown on Tree Constraints Plan	---	---	M	Normal	---	---	---	---
General Observations • --- Proposed Tree Works • ---													
G3	---	Conifers including cedar, Lawson's cypress, spruce, cypress	8.0-15.0	Av. 300	Extent of group as shown on Tree Protection Plan	1.0 NSEW	1.0	M	Normal	>20	C1	3.6	---
General Observations • Poor to fair condition Proposed Tree Works • ---													

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N	E	S	W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
H3	---	Leyland cypress	12.0	250 Av.	Extent of hedge as shown on Tree Constraints Plan				2.0 NSEW	2.0	M	Normal	>20	C1	3.0	---

General Observations
- Boundary hedge
- Visually porous to 3.0-4.0m

Proposed Tree Works
- ---

T15	711	Pear	10.0	310	2.0	2.5	2.0	2.0	1.0 S	1.0	OM	Normal	>10	C1	3.9	48

General Observations
- Fair condition
- Historically lopped

Proposed Tree Works
- ---

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N	E	S	W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T16	---	False acacia	9.0	190	3.0	3.5	4.0	2.0	---	---	---	Dead	0	U	2.4	18
General Observations • Dead tree Proposed Tree Works • Remove tree																
H4	---	Hazel	8.0	M/S 60 x. many	Extent of hedge as shown on Tree Constraints Plan				0	0	M	Normal	>20	C1	2.4	---
General Observations • Coppiced hazel Proposed Tree Works • ---																

Tree Reference No.	Tag No.	Tree Species	Height (m)	Stem Diameter (mm)	Branch Spread (m) N E S W	Height to First Branch and orientation (m)	Height of Crown Clearance (m)	Age class	Physiological Condition	Estimated remaining contribution (yrs)	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
S1	---	Laurel	6.0	---	Extent of shrub group as shown on Tree Constraints Plan	0	0	M	Normal	---	---	---	---

General Observations
- ---

Proposed Tree Works
- ---

Table 2
Tree report

6.0 ARBORICULTURAL IMPACT ASSESSMENT

Evaluation of the direct and indirect effects of the proposed design and where necessary to propose mitigation. The following headings have been taken directly from BS 5837:2012.

6.1 Constraints posed by existing trees

6.1.1 Current and ultimate height and spread of the trees.

Refer to table 3.

6.1.2 Species characteristics

Key

Species	Common name
Characteristics	General tree characteristics.
Water demand	Water demand as described within NHBC Chapter 4.2 Building near trees. L Low M Moderate H High
Ultimate tree height	Maximum height the tree is expected to grow to when fully mature.
Ultimate tree spread	Maximum crown spread the tree is expected to grow to when fully mature.
Deciduous/Evergreen	D Deciduous E Evergreen

Species	Characteristics	Water Demand	Ultimate tree height (m)	Ultimate crown spread (m)	Deciduous/evergreen
Birch	• Short lived tree (<100 yrs)	L	14	10	D
Cypress (Lawson)	• AYR Dense foliage • Potential neighbourly dispute tree	H	18	8	E
Cypress (Leyland)	• AYR Dense foliage • Potential neighbourly dispute tree	H	20	8	E
Hazel		L	8	5	D
Holly	• AYR Dense foliage • Thorny leaves	L	12	5	E
Maple (Japanese)		M	18	10	D
Magnolia		L	9	8	D
Pear	• Fruit fall	M	12	8	D
Plum	• Fruit fall • Produces suckering shoots	M	10	8	D
Spruce		M	18	10	E
Walnut	• Fruit fall	M	18	15	D
Yew	• AYR Dense foliage • Potentially poisonous fruits	M	12	10	E

Table 3
Tree Characteristics

6.2 Factors taken into account during the design process

6.2.1 Presence of Tree Preservation Orders

Refer to paragraph 3.3.

6.2.2 Potential incompatibilities between the layout and trees proposed for retention.

All incompatibilities have been addressed.

6.2.3 The working and access space needed for the construction of the proposed development.

Suitable working and access space is available for the construction of the proposed development.

6.2.4 The effect that construction requirements might have on the amenity value of trees, both on and near the site, including the effects of pruning to facilitate access and working space.

i) As 'amenity' has not been defined either within BS 5837:2012 or the current TPO legislation, it can, therefore, only be defined as part of a subjective opinion. In the opinion of Open Spaces 'amenity' has been defined as 'something which is enjoyed by members of the public' and therefore a substantial part of the tree must be able to be seen from a public place. From this statement, some of the trees can be seen from a public footpath and therefore have amenity value.

ii) The requirements for construction will affect the amenity value of trees growing on the site in the following ways

- Removal of T1 at site entrance will require mitigation within new landscape planting

iii) It is intended that all retained trees are protected throughout the duration of the development and in a manner which will allow the agreed development to take place, refer to paragraph 8.2.

6.2.5 The requirement to protect the overhanging canopies of trees where they could be damaged by machinery, vehicles, barriers or scaffolding, where it will be necessary to increase the extent of the tree protection barriers to contain the canopy.

Where feasible, tree protection barriers are proposed, as a minimum, to the edge of the retained tree's canopy or edge of the RPA, whichever is greatest. Refer to the tree protection plan for precise details. Where construction works or other related activities are necessary within the crown spread of a retained tree, mitigation as set out below is proposed or the construction activity poses no threat to the overhanging canopy.

6.2.6 **Infrastructure requirements in relation to trees, e.g. easements for underground or above-ground apparatus: highway safety and visibility splays: and other infrastructure provisions, such as substations, refuse stores, lighting, signage, solar collectors, satellite dishes and CCTV sightlines:**

Refer to layout drawings.

6.2.7 **The proposed end use of the space adjacent to retained trees.**

- Hard paving surfaces for pedestrians.
- Hard paving surfaces for vehicles.
- Residential houses.
- Garden areas.

6.2.8 **The potential for new planting to provide mitigation for any losses.**

There is potential for new planting.

6.2.9 **The proximity of structures to trees.**

Refer to tree protection plan.

6.3 **Additional elements to be included within the Arboricultural Impact Assessment**

6.3.1 **The tree survey**

Refer to paragraph 5.2.

6.3.2 **Trees selected for retention.**

The following trees will be retained:

T2, T3, T4, T13, T14, G1, H2, H3, G2.

Refer to tree retention and removal plan.

6.3.3 Trees to be removed

The following trees will be removed:

T1, T5-T12, T15, T16, G3 (partial), H1, H4, S2, S3, S6 (partial), S7.

Refer to tree retention and removal plan.

6.3.4 Trees to be pruned.

There is no intention to prune any tree.

6.3.5 Areas designated for structural landscaping that needs to be protected from construction operations.

Refer to layout drawings.

6.3.6 Evaluation of impact of proposed tree losses.

Trees within the proposed development will be removed as shown on the Tree Retention and Removal Plan. In general there are 'C' category trees, with two trees being 'U' category. It is intended to remove a 'B' category yew tree growing at the proposed site entrance. Removed trees can be mitigated by the planting of new trees within the proposed development which would provide a sustainable and long-term tree cover within the locality.

Tree Category	Tree Reference No.
A	-
B	T1
C	T5, T6, T7, T8, T9, T10, T12, T15, H4, G3 (partial)
U	T11, T16

6.3.7 Evaluation of tree constraints and draft tree protection plan.

All tree related constraints have been addressed.

6.3.8 Issues to be addressed in the AMS. (Where necessary in conjunction with input from other specialists)

a) Site construction access.

b) The intensity and nature of the construction activity.

c) Contractors car parking.

d) Phasing of construction works

e) The space needed for foundation excavations and construction works.

f) The availability of special construction techniques to include:

- Demolition of buildings or structures.
- Removing existing hard surfaces.
- Excavating trenches to determine the presence of roots.
- Constructing foundations
- Constructing Hard Standing/Roadways/Pathways etc.
- Constructing external walls
- Constructing retaining walls
- Erecting fencing, railings and gates.
- Decompacting underlying soils
- Laying below ground utilities.

g) Location and space needed for all temporary and permanent apparatus and service runs.

h) Changes in ground level including the location of retaining walls, steps and their foundations.

i) Working space for cranes, plant, scaffolding and access during works.

j) Space for site huts, temporary toilet facilities (including their drainage) and other temporary structures.

k) The type and extent of landscape works which will be needed within the protected areas and the effects these will have on the root system.

l) Space for storing materials, spoil and fuel and the mixing of cements and concrete.

m) The effects of slope on the movement of potentially harmful liquid spillages towards or into protected areas.

n) Preparatory works for new landscaping.

o) Auditable system of arboricultural site monitoring.

p) List of contact details for the relevant parties.

6.3.9 Justification for tree removal and construction works in close proximity to trees.

T1 **Yew tree -** Tree recommended for removal as it is growing within the proposed vehicular entranceway. The proposed entranceway has been realigned to provide a clear and safe route into and out of the site.

T2 **Walnut tree** – Construction works to include for a re-aligned vehicular entranceway is proposed in close proximity to the tree. An existing vehicular access is currently sited near to the tree. In mitigation, the proposed driveway will be constructed with no-dig methodology with rain water shed onto the proposed shrub border where the tree is growing.

T5-T9 **Various tree species** – Recommended for removal as they are growing within the footprint of proposed buildings and vehicular access driveways. All trees are C category and have no amenity value.

T10 **Holly tree** – Tree to be replaced with new planting. Tree has no amenity value.

T11 **Birch tree** – U category.

T12 **Maple tree** - Recommended for removal due to close proximity to existing house.

T15 **Pear tree –** Fair condition but with no amenity value and no long term prospect.

T16 **False acacia** – U category tree.

H1 **Leyland cypress** – Visually porous hedge to be replaced with new planting.

H4 **Hazel coppice** – Recommended for removal due to location within proposed vehicular driveway.

G3 **Various tree species** – Partial removal of group to allow for the construction of the proposed house.

S2, S3, S6 (part of), S7 –
Recommended for removal to allow for new landscaping or as general tiding up of unkempt shrub beds.

7.0 ARBORICULTURAL METHOD STATEMENTS

7.1 Site construction access.

Access to the site will be from the adjacent road via existing hard surfaces / roadways and temporary ground protection.

7.2 The intensity and nature of the construction activity.

It is intended to carry out the following operations to complete the agreed development:

- Erection of tree protection methods.
- Carry out site clearance operations.
- Carry out demolition works.
- Set up or identify site facilities, site hut, toilet facilities, storage areas and mixing areas as required. The order will rely on the sequence of works.
- Carry out development to include:
  - Construction works
  - Drainage works
  - Installation of underground services
  - Ground works
- Remove tree protection measures.
- Carry out soil de-compaction within the RPA of retained trees
- Implement soft landscaping works.

7.3 Contractors car parking.

No car parking will occur within the RPA of any retained tree other than on existing hard surfaces, roads or ground protection.

7.4 Phasing of construction works

Refer to the Contractor's time frame for construction works.

7.5 The space needed for foundation excavations and construction works.

i) Refer to construction/layout drawings.

ii) Where vehicular or plant access is required within the CEZ or any personnel required to work within the CEZ, temporary ground protection will be used to work off. Refer to clause 8.3.

7.6 The availability of special construction techniques to include:

7.6.1 Demolition of Buildings or Structures

No demolition is proposed within the CEZ.

Should there be a requirement to carry out any demolition works within the RPA of retained trees, the following methodology will be adhered to:

i) Demolition works within the exposed RPA of any tree to be retained will not be carried out until suitable tree protection methods have been installed.

ii) No material, waste or otherwise will be stored within the RPA of any tree to be retained unless suitable tree protection methods have been installed.

iii) All demolition works will be carried out either by hand or with machinery sited outside of the RPA or by working off existing hard surfaces, including temporary ground plates; refer to paragraph 8.3, which can take the weight of all plant or machinery without distorting or compacting the underlying soil. All demolition work to buildings or structures will involve pulling the walls etc. into the footprint of the building (also known as 'top down, pull back') and not allowing any material to fall within the exposed RPA of any retained tree.

iv) No vehicle or equipment used during any demolition operation will interfere with, touch or damage any part of a retained tree including any branch, trunk or root.

7.6.2 Removing Existing Hard Surfaces

No hard surface will be removed within the CEZ.

Should there be a requirement to remove any existing hard surface within the RPA of retained trees, the following methodology will be adhered to:

If any existing hard surface requires removal, it can be pulled out with either of the following methodologies:

i) Remove wearing course and any base or sub-base with the use of hand tools only.

ii) Remove wearing course and any base or sub-base with the use of a wide, non-toothed bucket attached to an extending arm of an excavator. The excavator must work either off the hard surface and gently scrape any construction material (not soil or turf) towards itself, or, if the excavator is sited outside of the RPA, it may operate as normal but must not excavate into any soils with the RPA.

iii) All removed materials will be stored or placed outside of the RPA of any retained tree or, if stored or placed within the RPA of any retained tree, on ground protection plates suitable to carry the load of any spoil or vehicle without compacting the underlying soils.

7.6.3 Excavating Trenches to Determine the Presence of Tree Roots

If an exploratory trench is required to determine the presence of tree roots, it is to be excavated in accordance with the following:

i) All trenching to be carried out with the use of hand tools only. On no account will any mechanical or powered excavator be used. An air spade approved for such works may be used.

ii) Trenches to be excavated to a minimum depth of 600mm.

iii) Refer to paragraph 7.15 which must be complied with if any root greater than 25mm in diameter is encountered.

7.6.4 Constructing Foundations

No foundation is proposed within the RPA of existing trees.

i) No strip foundation will be laid within the RPA of any retained tree unless following the footprint of an existing strip foundation.

ii) If piled foundations are approved, they will be inserted into the ground with a cross beam or similar to carry additional weight of the above ground construction. The cross beam will sit above the ground level and no part of the beam will touch the ground or compact the

ground in any way. No anti-heave material will be in contact with the underlying soil. On no account will any weight or material which prevents the clear flow of air and water through the soil or into the soil or any compaction which results in any damage to the RPA be allowed except with the agreement of the LPA. Should any such compaction occur, the compacted area will be de-compacted by using a gas or similar soil de-compactor and carried out by an approved contractor (refer to paragraph 7.14 for soil de-compaction).

iii) Trial hole to a depth of 600mm to be excavated by hand to ascertain the presence of tree roots. If no tree roots are found, piles may be inserted. If roots are found, refer to paragraph 7.15. If roots greater than 25mm are found, the roots are to be carefully moved to one side to allow the pile to be inserted. Roots must be protected from damage during this process. If roots greater than 25mm cannot be moved to one side, the pile will be moved.

iv) The choice of piling rig will need to be considered if it is to be used within the crown spread of a retained tree. In general, no piling rig will be allowed to touch any branch, trunk etc. If a branch is required to be removed to allow piling to take place, the approval of the LPA will be required prior to carrying out the operation.

7.6.5 Constructing Hard Standing/Roadways/Pathways etc.

Should there be a requirement to construct hard-standing areas within the RPA of retained trees, the following methodology will be adhered to:

i) All surfacing and re-surfacing works must be agreed with the LPA prior to starting and to be in accordance with BS 5837:2012.

ii) It will be possible within turf areas to remove the upper humus layer to include loose organic matter and turf (max. 25mm) prior to laying the base course using hand tools or a mechanised soil stripping machine only.

iii) Construction of any hard surface is to be carried out by working off the existing hard surface and as the new surface is laid, this may be driven on or worked off.

iv) Construction of hard-standing within the RPA must be carried out using a no-dig method, incorporating a free draining base of open gravel without fines. The wearing course should allow the free passage of air and rainwater but must not contain any fines. Refer to Arboricultural Advisory and Information Service (AAIS) Practice Note APN 12 'Through the trees to development'.

v) Once the humus layer has been removed, a permeable geotextile membrane must be laid over the exposed soil to prevent any mixing of the imported base or sub-base material from mixing with the underlying soil.

vi) A cellular containment system will be laid over the geotextile membrane with no-fines gravel laid to fill the voids of the containment cells.

vii) A second permeable geotextile layer is laid over the cellular containment system to prevent any mixing of the no-fines gravel and the material used as the base for the wearing course e.g. sharp sands, mortars, gravels before laying the wearing course.

viii) The wearing course must be permeable thereby allowing air and water to penetrate to the underlying rooting area.

ix) A rigid edge may be required to contain the hard standing such as a wooden edge pegged to the ground, a railway sleeper pinned to the ground or a gabion.

7.6.6 Constructing External Walls

No external wall is proposed within the CEZ.

Should there be a requirement to construct an external wall within the RPA of retained trees, the following methodology will be adhered to:

i) Where an external wall is constructed along the line of a previous wall, the original foundation will be removed by hand.

ii) All construction works within the RPA of retained trees to be carried out by working off suitable ground plates or running boards laid adjacent to the line of the wall.

iii) All removed materials will be stored or placed outside of the RPA of any retained tree or, if stored or placed within the RPA of any retained tree, on ground protection plates suitable to carry the load of any spoil or vehicle without compacting the underlying soils.

iv) A non-permeable lining sheet will be placed into the open trench prior to the pouring of any concrete to ensure that wet concrete does not come into contact with any tree root. The lining sheet may need to cover the sides, ends and base of the trench.

v) No mixing of any concrete or storage of any material to occur within the RPA of any retained tree.

vi) If any root greater than 25mm diameter is encountered during the excavating of the wall foundations and is growing across the line of the proposed wall and if it is agreed that the root is to be retained by either the arboricultural consultant or LPA, a rigid plastic pipe of a suitable diameter to accommodate future root expansion growth will be slit along its length and the root carefully inserted into the pipe. The pipe will extend a minimum of 100mm beyond the proposed foundation or wall. Prior to the pouring of any concrete or construction of the wall, the ends of the pipe will be temporarily stopped up to prevent access of any building material. At no point will the root come into contact with any concrete, mortar or cement.

vii) If any root is encountered which has a diameter, including additional room to accommodate future root expansion, too great to fit into a rigid pipe, the foundation will be stopped at a distance to accommodate future root expansion and the wall bridged across the root using a suitable lintel.

7.6.7 Constructing Retaining Walls

No retaining wall is proposed within the CEZ.

Should there be a requirement to construct a retaining wall within the RPA of retained trees, the following methodology will be adhered to:

i) Where a retaining wall is constructed along the line of a previous wall, the original foundation will be removed by hand.

ii) All construction works within the RPA of retained trees to be carried out by working off suitable ground plates or running boards laid adjacent to the line of the wall.

iii) All removed materials will be stored or placed outside of the RPA of any retained tree or, if stored or placed within the RPA of any retained tree, on ground protection plates suitable to carry the load of any spoil or vehicle without compacting the underlying soils.

iv) A non-permeable lining sheet will be placed into the open trench or adjacent to any soil prior to the pouring of any concrete to ensure that wet concrete does not come into contact with any tree root. The lining sheet may need to cover the sides, ends and base of the trench.

v) No mixing of any concrete or storage of any material to occur within the RPA of any retained tree.

vi) All retaining walls to be constructed with suitable drainage e.g. weep holes, drainage pipe and/or gravels to the rear of the wall and will be sealed against the flow of any soil water through the wall. The wall drainage system will be designed to prevent pooling, ponding or saturation of soil water to the rear of the wall.

vii) If any root greater than 25mm diameter is encountered during the excavating of the wall foundations and is growing across the line of the proposed wall and if it is agreed that the root is to be retained by either the arboricultural consultant or LPA, a rigid plastic pipe of a suitable diameter to accommodate future root expansion growth will be slit along its length and the root carefully inserted into the pipe. The pipe will extend a minimum of 100mm beyond the proposed foundation or wall. Prior to the pouring of any concrete or construction of the wall, the ends of the pipe will be temporarily stopped up to prevent access of any building material. At no point will the root come into contact with any concrete, mortar or cement.

7.6.8 Erecting Fencing, Railings, Gates or Bollard

No fencing, railing, gate or bollard is proposed within the CEZ.

Should there be a requirement to erect any fence, railing, gate or bollard within the RPA of retained trees, the following methodology will be adhered to:

i) Trial holes to determine the presence of tree roots to be hand dug to a depth of 600mm at the location of each post or bollard. Roots with a diameter greater than 25mm to be cut in accordance with paragraph 7.15. Roots with a diameter greater than 50mm will require the agreement of the LPA prior to removal or will require the post to be moved thereby missing the tree root altogether, refer to paragraph 7.15.

ii) All fencing/railing works within the RPA of retained trees to be carried out by working off suitable ground plates or running boards laid adjacent to the line of the fencing or railing.

iii) All removed materials will be stored or placed outside of the RPA of any retained tree or, if stored or placed within the RPA of any retained tree, on ground protection plates suitable to carry the load of any spoil or vehicle without compacting the underlying soils.

iv) No mixing of any concrete or storage of any material to occur with the RPA of any retained tree.

7.6.9 Laying Below Ground Utilities.

No below ground utility is proposed within the CEZ.

Should there become a need to install any underground cable or other service within the RPA of a retained tree, the guidelines as set out within BS 5837:2012 (paragraph 7.7) will be adhered to. Refer also to paragraph 7.7of this report. In general the following must be adhered to:

- Below ground services to be contained within a single duct.
- Inspection chambers will be sited outside of the RPA.
- For shallow service runs, excavating of trenches to be in accordance with paragraph 7.15.
- For all other services refer to BS 5837:2012 Table 3.

7.7 Location and space needed for all temporary and permanent apparatus and service runs.

i) Refer to site layout drawings for location of service runs, gulleys, drains, pipes, cables, cabinets, below ground boxes, etc within the RPA of retained trees.

7.8 Changes in ground level including the location of retaining walls, steps and their foundations.

i) There will be no unapproved alteration of the existing ground (soil) level within the RPA of any retained tree by either the addition or removal of material. It is acceptable to grade soil from existing levels to the upper limit of no-dig constructed hard surfaces.

7.9 Working space for cranes, plant, scaffolding and access during works.

If there is a requirement to use any crane, plant or scaffolding within the RPA of any retained tree, they will work off existing road and/or other hard surfaces or off temporary ground plates.

7.10 Space for site huts, temporary toilet facilities (including their drainage) and other temporary structures.

7.10.1 Site hut

No site hut will be set up within the exposed RPA of any retained tree unless the following is strictly adhered to:

i) The site hut is set onto a suitably hard surface which will not result in compaction of the underlying soil.

ii) The site hut is set onto wooden bearers approximately 250 x 250 x 2000mm which have been laid approximately 2m apart. The bearers will be laid on 25-50mm bed of sharp sand over a geotextile membrane to take up any undulation within the existing surface. The bearers will take the full weight of the site hut and the site hut will have no direct contact with the ground.

iii) With the approval of the LPA, the site hut may form part of the tree protection fencing.

iv) No part of the site hut will damage any root or branch.

7.10.2 Site Toilet

Site toilet will be set up outside the exposed RPA of any retained tree unless placed on ground plates. No pipe or pit will be laid or excavated within the RPA of a retained tree.

7.11 The type and extent of landscape works which will be needed within the protected areas and the effects these will have on the root system.

i) Refer to the approved landscape plan.

7.12 Space for storing materials, spoil and fuel and the mixing of cements and concrete.

i) All materials spoil and fuel storage will be outside of the RPA of any retained tree.

ii) The mixing of cement and concrete will occur within an area to be designated but outside of the RPA of any retained tree.

iii) If, during the course of the works, it becomes necessary to store material, or mix cement or concrete within the RPA of a retained tree, the following will be adhered to:

a) No material will have direct contact with the ground
b) All storage/mixing will be carried out on suitable ground plates – Refer to paragraph 8.3.

7.13 The effects of slope on the movement of potentially harmful liquid spillages towards or into protected areas.

i) If there is any doubt that spillage of any material, liquid or chemical may occur, dams or similar will be erected prior to the start of the operation.

ii) Dams will be formed from sand bags.

iii) Any liquid spillage will, in the first instance be soaked up with sand or other suitable material to prevent it spreading and to make its removal less complicated.

iv) The spilt liquid, sand etc will be removed from the RPA as quick and timely manner.

v) The site Forman will notify the arboricultural consultant at the first opportunity and will carry out any remedial works as the arboricultural consultant sees fit.

7.14 De-compacting Underlying Soils

i) On completion of construction works, but prior to soft landscape works, any area of the RPA which has suffered any compaction, will be de-compacted using a high pressure device. The lance of the device to be inserted into the ground to a minimum depth of 300mm. The de-compacting to be carried out by an approved contractor who has experience in carrying out such works.

ii) If any area within the RPA is compacted during the construction phase and cannot be de-compacted at the end of works, e.g. surfaces, driveways, paths etc. the underlying soil will be de-compacted immediately prior to any surface being laid over.

7.15 Roots cut during the works

i) There is no pre-intention to cut or sever any root of any tree to be retained.

ii) If, during the approved works any root from any tree to be retained requires removal, it will be paired back ideally to a suitable side shoot with a clean sharp knife, bypass secateurs or pruning saw.

iii) Any root to be removed greater than 25mm in diameter or any root less than 25mm in diameter but occurring in clumps will require the agreement of the Arboricultural Consultant.

iv) If, during the course of the approved works, it is necessary to expose any root greater than 25mm in diameter, clump of roots or any other root which is to be retained, the following procedure will be carried out at the first opportunity:

- All works to be carried out using hand tools only. On no account will machinery be used to carry out any excavation, back-filling or compaction work. On no account will any vehicle drive onto any exposed part of the RPA.
- All damaged and exposed roots within the excavated pits or trenches must be pared back, ideally to a side shoot. Sharp cutting implements must be used such as a clean sharp knife, bypass secateurs or pruning saw.
- Prior to back-filling, cover all exposed roots with Hessian sacking to prevent freezing and desiccation of the roots. Remove this sacking immediately prior to back-filling.
- Back-fill the open excavated pit or trench with an open structured top soil containing clean grit (builder's sand or other fine sands must not be used). Ensure that no air pockets are created during this process and allow for natural settlement of the soil.
- It will be necessary to top up after settlement has occurred to ensure that surface water can run off without collecting in the depression caused by settlement.
- If any wet concrete or other noxious substance is laid or poured onto or immediately adjacent to any tree root, the root will be covered with a waterproof vapour barrier or the concrete or other works isolated from the adjacent soil with an impermeable plastic barrier or sheet.

7.16 Preparatory works for new landscaping.

i) Cultivation of any proposed shrub bed within the RPA of any tree to be retained will be carried out using hand tools only.

ii) All planting works within the RPA of retained trees will be carried out by hand.

iii) Sub-soil areas will be broken up to a depth of 100mm by hand prior to spreading of top soil.

iv) Top soil may be spread over proposed soft landscape areas (previously covered by the concrete or other hard surface) and be graded to adjacent levels.

7.17 Auditable system of arboricultural site monitoring.

i) Graeme Drummond of Open Spaces Landscape and Arboricultural Consultants Limited Tel: 01277 356511 is the main point of contact for all arboricultural issues.

ii) The site is to be monitored for arboricultural related matters (this may be conditioned by the LPA)

iii) The Arboricultural Consultant should be consulted and attend site in relation to any of the following operations:

- Installation of tree protection measures including both protective barriers and temporary ground plates.
- Moving of any tree protection barrier or temporary ground protection.
- Opening up the construction exclusion zone to carry out approved works.
- Cutting of any root greater than 25mm diameter.
- Prior to carrying out tree surgery which is not included within the approved documentation.
- Immediately after any tree is damaged by any contractor, machinery, plant, vehicle or storm.

iv) As part of the auditable system, the arboricultural consultant will maintain a record of all tree monitoring visits including any advice

given, if required the monitoring records will be forwarded to the LPA.

v) Refer to Appendix A for a copy of the site monitoring form.

7.18 List of contact details for the relevant parties.

Job Position	Name	Company	Address	Contact Nr.
Client	Mr B Gunner	---	35 London Hill Rayleigh	---
Contractor	---			
Architect	Mr J Jackson	John R A Jackson LLP	Holly House 41 Woodlands Park Leigh on Sea Essex SS9 3TP	01702 556885
Arboricultural Consultant	Graeme Drummond	Open Spaces Landscape and Arboricultural Consultants ltd	Unit 11 Little Hyde Farm Little Hyde Lane Ingatestone Essex, CM4 0DU	01277 356511 gd@open-spaces.co.uk
Landscape Architect	Graeme Drummond	Open Spaces Landscape and Arboricultural Consultants ltd	Unit 11 Little Hyde Farm Little Hyde Lane Ingatestone Essex, CM4 0DU	01277 356511 gd@open-spaces.co.uk
LPA Tree Officer	---	Rochford District Council	Council Offices, South Street Rochford Essex SS4 1BW	01702 546366

Table 4
Contact details

8.0 TREE PROTECTION MEASURES

8.1 Construction Exclusion Zone

i) It is a requirement within BS 5837:2012, that an area identified as the Root Protection Area **(RPA)** together with an area comprising of the whole of the tree's canopy is protected during the course of the development. This area is called the Construction Exclusion Zone **(CEZ)** and will be protected from entry by pedestrians, vehicles, plant and other machinery with suitable rigid barriers unless prior agreement with the LPA is agreed.

ii) The CEZ is identified on the tree protection plan and may extend beyond the RPA and/or canopy of any retained tree.

iii) The CEZ may also extend beyond the area required to protect trees and their RPA's to areas of existing and proposed soft landscaping to ensure that these areas are afforded protection during the course of the works.

iv) The Main Contractor, Site Supervisor and anyone working on the site is to be informed of the required methodology to protect trees with rigid barriers as set out within this document. If there is any concern the arboricultural consultant will be informed and in accordance with paragraph 7.17, will visit the site to make, if required, recommendations to ensure the site complies with planning conditions, BS 5837:2012 and good arboricultural practice. In any event, the arboricultural consultant is required to carry out monitoring visits in accordance with paragraph 7.17.

v) The agreed 'Tree Protection Plan' is to be forwarded to the Main Contractor and Site Supervisor for their reference. A copy should be made available to all site workers.

vi) No vehicles will be driven over or pedestrians pass over the exposed RPA of any retained tree. If vehicles/pedestrians are required to cross the exposed RPA of any retained tree, suitable tree protection measures will have been put in place and approved by the arboricultural consultant. Such measures will include temporary ground plates which can support the load of all vehicles accessing that part of the site. Refer to paragraph 8.3.

vii) No equipment or materials to be stored or mixed within the RPA unless conforming to this Method Statement. All works are to be carried out using hand tools only or as specified within this Method Statement.

viii) Any alteration in soil level within the RPA must be agreed with the LPA. Normally, no change in soil levels will be acceptable.

ix) Protective barriers or temporary ground plates will be removed to allow approved construction operations within the CEZ to go ahead. On completion the tree protection barriers will be replaced or where appropriate placed to the edge of any new hard surface, constructed in such a way as to prevent compaction of the underlying soils.

x) If appropriate and with the agreement of the arboricultural consultant and/or the LPA, pre commencement tree works may be carried out prior to the erection of tree protection measures.

8.2 Tree Protection Barriers (TPB)

i) Tree protection barriers in accordance with paragraph 8.2 (iii) and figure 2 will be installed at the commencement of any works on site and will remain for the duration of works, excluding soft landscaping. The Main Contractor will be responsible for supplying all materials, erection and removal of all tree protection barriers.

ii) BS 5837:2012 states the default specification for rigid barriers should consist of the following. Refer also to figure 1.

- Vertical and horizontal scaffold framework which is well braced to resist impacts.
- The vertical tubes to be spaced at a maximum interval of 3m and driven securely into the ground.
- Weld-mesh panels to be securely fixed to the scaffold framework.
- Vertical poles should avoid underground services and structural roots.

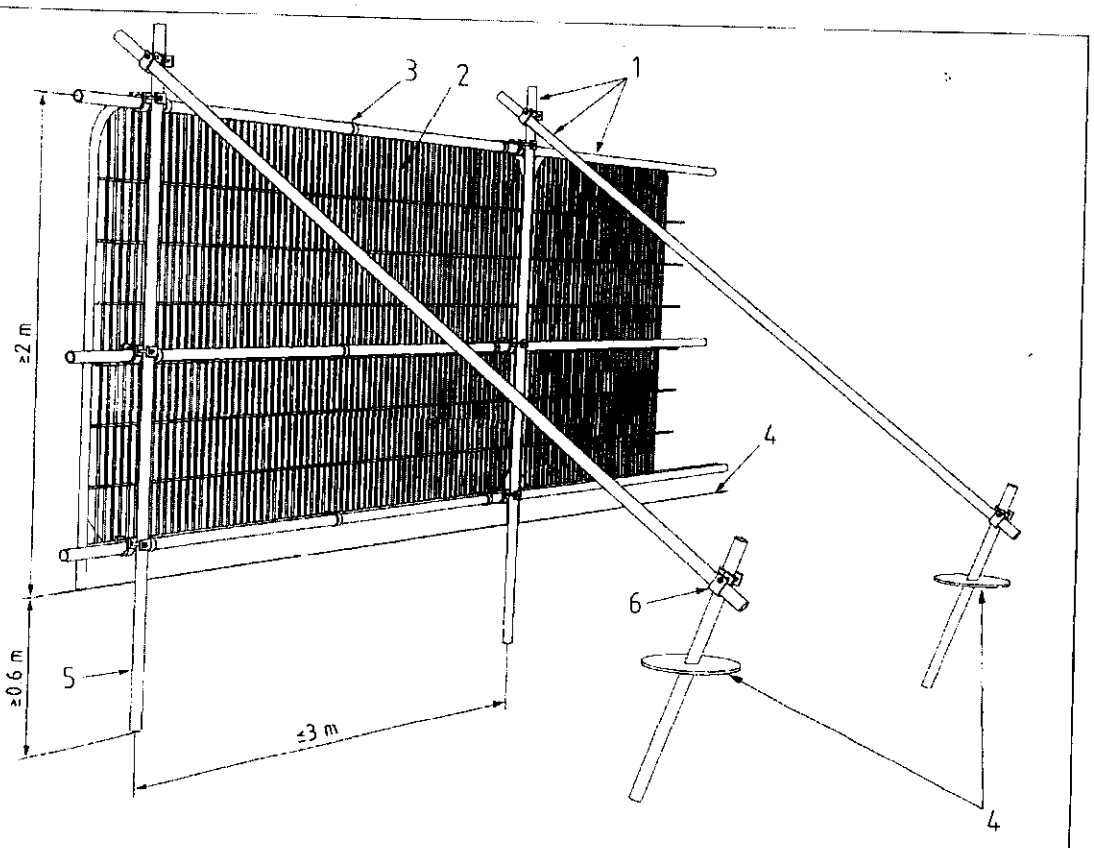
iii) Where the default specification is not necessitated due to a lower level of risk of incursion into the CEZ, the following specification may be agreed with the arboricultural consultant or LPA. Refer also to figure 2.

- 2m tall weld-mesh panels on rubber or concrete feet.
- A minimum of two anti-tampers couplers per panel to join adjacent panels together. Couplers to be attached so that they can only be removed from within the CEZ.
- Couplers to be attached 1m apart and uniformly along the barrier.
- The panels are to be supported on their inner side with stabiliser struts which is attached to a base plate secured with ground pins.

- Where the barrier is to be set up on a hard surface or where it is not feasible to use ground pins, the stabiliser struts should be mounted on a block tray.

iv) An all-weather notice should be attached to the barrier with the words: 'CONSTRUCTION EXCLUSION ZONE - NO ACCESS'

v) Tree protection barriers to be checked daily by the Site Supervisor. If any movement has occurred from that set out on the tree protection plan, the fencing will be re-aligned.



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Figure 1.
BS 5837:2012 Default Tree Protection Barrier

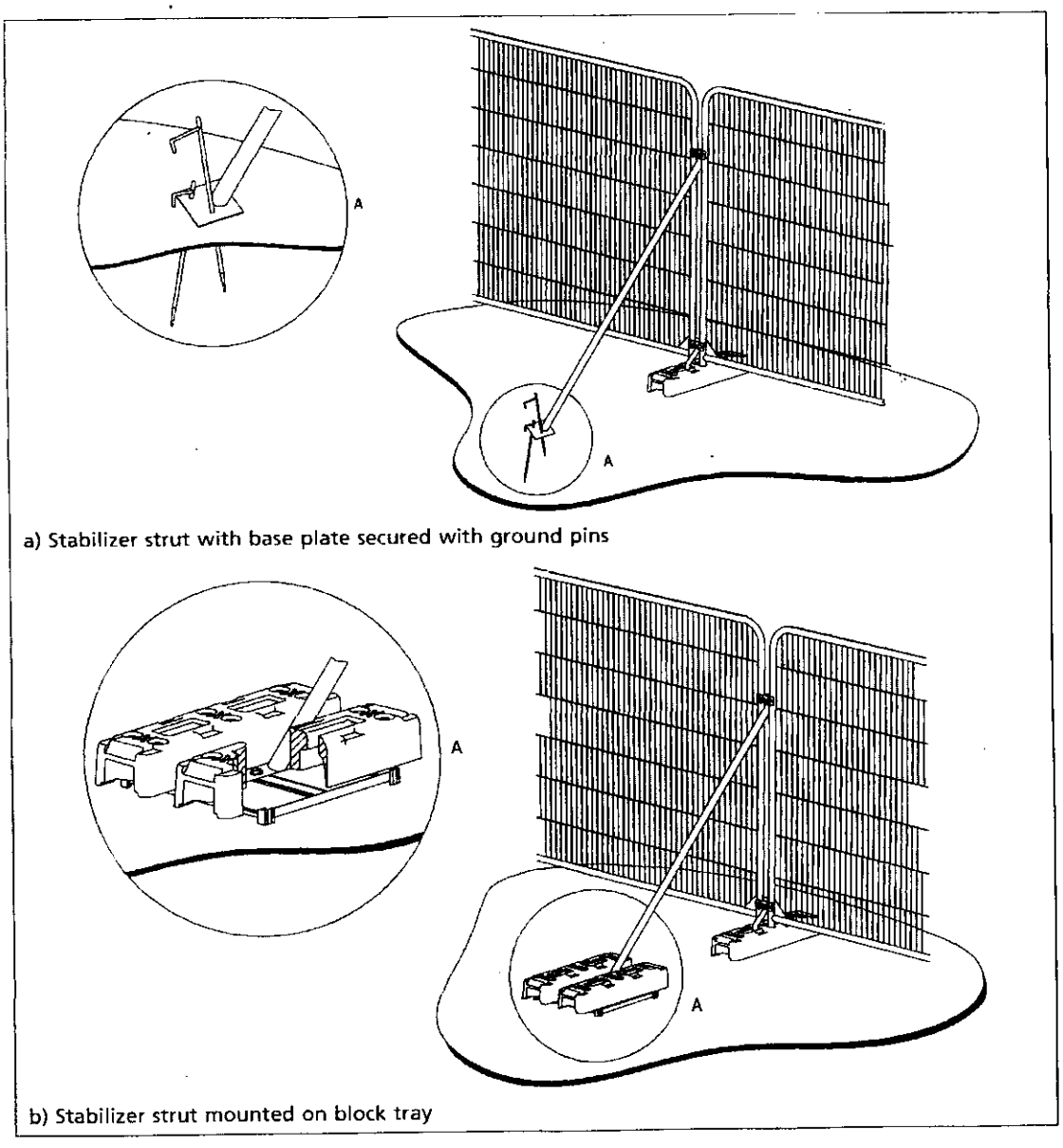


Figure 2.
BS 5837:2012 Alternative Tree Protection Barrier

8.3 Temporary Ground Protection

i) Where vehicular, plant or pedestrian access is required within the CEZ temporary ground protection will be used.

ii) Temporary ground protection will withstand the weight of all vehicles and plant accessing that part of the site without distorting or compacting the underlying soil.

iii) For pedestrian movements:

- A single thickness of scaffold boards placed either on top of a driven scaffold frame so, as to form a suspended walkway, or on top of a compression-resistant layer e.g. 100mm depth of woodchip laid over a geotextile membrane.

iv) For pedestrian operated plant up to a gross weight of 2t:

- Proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer e.g. 150mm depth of woodchip laid over a geotextile membrane.

v) For wheeled or tracked construction traffic exceeding 2t:

- A proprietary system or pre-cast reinforced concrete slabs to an engineering specification designed in conjunction with the arboricultural consultant to accommodate the likely loading to which it will be subjected.

vi) Tree protection barriers to be erected adjacent to and abutting the ground protection if required and in accordance with the tree protection plan.

vii) Should it be necessary to expose the RPA of a retained tree to carry out any approved works, ground plates will be re-laid over the exposed RPA immediately after the approved works are completed.

viii) Existing hard surfaces, where appropriate, should be retained as ground protection providing the surface can withstand the weight of all vehicles and plant entering the site without distorting or compacting the underlying soil.

8.4 Bonfires

i) Bonfires will not be lit if in a position whereby their flames can extend to within 10.0 metres of any foliage, branch, trunk or RPA

ii) No bonfire will be lit beneath any branch or within 10m of the crown spread.

iii) The distance between the fire and any part of the tree or its RPA may extend beyond 10m depending on the size of the fire, heat produced and wind direction.

iv) If a bonfire is lit it will be monitored at all times and suitable water hoses will be set out to dampen down as required or to prevent any spread of fire.

This report is dated 1st October 2013.

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Appendix A

Site Monitoring Form

Site Address		Purpose for Visit	Monitoring		
			Other		
Who visited		Arboricultural Consultant			
Job reference		Date of visit			

	Checked	Agree	Comments	Action
Protective Fencing				
Ground protection				
Compaction				
Potential threats to retained trees				
Cutting roots				
Opening CEZ				
Tree surgery				
Damage to retained trees				
Other				

Specification for Soft Landscape Works
5 year Maintenance Plan

35 London Hill
Rayleigh
Essex

Revised Plan
10 OCT 2013

OS 695-13-Doc2
October 2013

Open Spaces
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Specification for Soft Landscape Works

Setting Out

The Contractor is responsible for setting out of all plants in accordance with the contract drawings. The Contractor should ensure that his work will not interfere with, or damage any part of existing cables, pipes or other services, above or below ground level. Any damage to existing services caused by the Contractor must be rectified at his own expense.

Delivery of Plants

The Contractor shall ensure that adequate protection is given to all plants and their root systems to preclude failure due to lack of moisture or exposure during transportation to the site. Where plants cannot be planted immediately upon arrival, they shall be stored safely until required. Representatives of each plant species delivered to site shall be tagged with labels with the botanical name clearly printed thereon. Labels shall be removed after planting.

Plants - Generally

Plants to be in accordance with BS 3936-1:1992 'Specification for trees and shrubs' for nursery stock.

Plants shall be well branched and symmetrically shaped, of normal habit for particular species. All plants shall conform to the measurements and requirements in the plant list or within this Specification and shall be the minimum acceptable size for each species. All necessary pruning shall be carried out at the time of planting. All container grown plants must be well established in order that, on removal, the root ball remains intact through the planting operation.

Any stock which subsequently deteriorates in quality through mishandling or maltreatment shall be replaced by the Contractor at his own expense.

The Contractor shall be held fully responsible for the condition of all trees under his possession at all times.

Planting Generally

Plants shall be planted at the same depth at which they were previously growing. Care should be taken to avoid damage to the root system and stems when planting and the root ball around pot grown plants.

All plastic and other imperishable containers shall be removed before planting.

Any broken or damaged roots shall be cut cleanly back to sound growth. Backfill should be firmed as filling proceeds, layer by layer, care being taken to avoid damaging the roots.

Soil is to be firmed around plants to ensure that no voids are left.

Backfill once placed should not form an obvious mound around the base of any shrub or transplant. Any excess backfill, after planting shall be evenly distributed around the immediate vicinity of the plant.

Planting is to be carried out in suitable weather. On no account shall stock be planted in conditions of frost, frozen ground, strong winds or heavy rainfall that renders the soil water logged or in a "sticky" condition. All plants lifted during frosts should be re-firmed.

Planting of Trees

Trees should be well-branched trees with symmetrical crowns and straight stems and leaders. Trees of the same species shall be uniform in size, shape and in good condition. Root-balled trees shall have root balls that are fibrous and well consolidated.

All trees to be pit planted in accordance with the requirements of this Specification and the soil at the bottom of the pit is to be loosened to a depth of 150mm. Topsoil is to be used for backfill, firmed thoroughly during the planting operation. Remove all arisings.

Any dead, damaged or diseased branches or roots to be removed prior to planting using a sharp knife or secateurs. Pruning is to be carried out in such a manner as not to change the natural habit or shape of the trees. All tree work shall comply with the recommendations set down in BS 3998: 1989 'Recommendations for tree work'. Arisings from tree works shall be carted off site to tip at the Contractors own expense.

Tree Stakes and Ties

Trees should be staked with two: stout, round straight, pressure impregnated softwood stake of approx 1.5m length and 75mm diameter pointed at one end. The stakes are to be driven in vertically and to ensure that the stake penetrates no part of the root ball and in such a way as to hold the tree securely vertical.

The tree shall be secured to the stakes using 2 No. bio-degradable elastic ties. Ties to be fixed to stake with a minimum of 1 No. 50mm flat head galvanised nail.

Stakes must not chafe against any part of the tree or damage the roots during planting. Any excess length to the top of the stake should be removed to within 50mm above the tie.

Planting of Shrubs Including Herbaceous Plants and Climbers

Plants are to be positioned in the locations and numbers shown on the drawings and placed to achieve even spacing and proper matching of shapes.

Pits for shrubs shall be of a sufficient size to take rootlets without breaking them or roots without bending or cramping. Planting pits shall be excavated 100 mm wider than the root spread.

Planting of Bare root Whips/Transplants (Hedging)

The planting of whips and transplants are to conform to the mix, siting and spacing in accordance with planting plans.

The roots of all plants shall be kept moist at all times by heeling into a temporary storage area and regular watering prior to planting. In any event, temporary storage on site shall be limited to a maximum of 3 No. days.

Plants shall be notch planted into prepared ground and shall be firmed in and planted so as to adopt a truly vertical position. All plants shall withstand a firm but gentle pull and be planted at the same depth as their original growing position. Damaged or broken plants will be rejected from site and require immediate replacement with matching species.

Any surplus soil arising from planting operations shall be evenly distributed throughout the planted area.

Whips and transplants are to be protected with a biodegradable spiral guard, or a single plastic shelter-guard, 0.4m high, supported and secured in an upright position by the use of a single bamboo cane and tie.

Upper 1/3rd of transplants/whips to be removed after planting to promote branched growth.

Tree and Shrub Maintenance Prior to Practical Completion

Prior to the date of Certificate of Practical Completion, the Contractor shall maintain the works to the standards specified at no additional cost.

Mulching with Chipped Bark

A 75mm deep trench, 100 - 150mm wide will be formed at the edges of planting beds abutting paved areas prior to mulching so as to prevent mulch spilling off the plant beds. 75mm of semi-composted chipped bark to be laid.

Topsoil – Cultivation and Grading

Final grading of the top 150mm is to be carried out to ensure a true specified level and slope to avoid any dishing or other depression where water may collect. The level of the topsoil, at the time of spreading is to be at least 50mm above adjacent paved areas and kerbs etc. to allow for shrinkage and/or settlement. Slopes and banks shall, where space allows, be slightly concave in section and with well rounded shoulders and even transitions into adjacent levels and existing soiled or grass areas. Where possible, slopes are to even out into a flat area adjacent to kerbs, paved areas etc. in order to prevent soil washing onto areas of hard standing.

Cultivation of the top 50mm of topsoil should be carried out in accordance with BS 4428: 1984 'Code of Practice for general landscape operations excluding hard surfaces' to obtain a fine crumb size.

Amenity Grade Garden Turf

All turfing operations to conform with British Standard 3969:1998 'Recommendations for Turf for General Purposes'. Areas to be turfed to be rotovated to a depth of 150mm and all grass sods, stones greater than 38mm in any one dimension and any other item of rubbish to be carted off site to tip.

Additional top soil to be supplied and spread to make up levels and to create even falls, as required. Prior to the laying of turf, the area to be turfed shall be cultivated to a depth of 25mm to form a fine tilth and be dressed with 'Growmore' N7:P7:K7 fertiliser at a rate of 50g/m2.

Turf to be supplied in rolls, not dried out or yellowed. Turf will be laid on the day of delivery. Turf rolls are to be undamaged without holes or torn or ripped edges. Turf grown on any nylon matting will not be accepted and turf will be weed free and of a uniform size and thickness.

Turf must be laid from suitably sized running boards. Walking over or standing on the turves or prepared ground will not be allowed until fully established.

Final surface (after settlement) is to be 25mm above any adjacent hard surface.

Amenity Grass Seeded Areas

Grass seed mix to be Amenity grade, containing not less than 60% perennial rye grass.

Areas to be grass seeded shall be rotovated to a depth of 150mm. All grass sods, stones greater than 38mm in any one dimension and any other item of rubbish to be carted off site to tip.

Areas to have a 100mm minimum depth of topsoil. Areas to be raked and rolled to produce a firm and level seed bed. Final levels after settlement are to be 25mm above any adjacent paving, kerb, or other hard landscape edge.

Areas shall be cultivated to a depth of 25mm to a fine tilth.

Grass seeded areas to be dressed with a 'Growmore' N7:P7:K7 fertiliser at a rate of 50g/m2 and worked into the top 25mm of tilth 7 days prior to seeding and watered in well.

Grass seed is to be spread in two directions at a rate of 50g/m2. Grass seed areas to be lightly raked to ensure seed is evenly incorporated into the upper 10mm or soil and lightly raked.

Amenity Grass Maintenance Prior to Practical Completion

Grass seeded areas to receive a first cut when grasses are 100mm in height. The same area is to be lightly rolled during this operation.

Turfed areas to be inspected regularly for shrinkage in the first 4 weeks following laying. Any areas of shrinkage to be filled with a mix of clean sharp sand, compost and topsoil, cultivated to a fine tilth and spread with grass seed at a rate of 50g/m2. Turfed areas to receive a first cut when fully established and growing strongly and at such intervals as required to maintain a 75-100mm high sward until Practical Completion. At no time will turf areas be allowed to grow above 150mm in height.

Grass seeded and turfed areas to be watered using a fine spray whenever required to ensure continuing healthy growth until Practical Completion.

Implementation for Soft Landscape Works

i) Generally, the works will be implemented at the earliest opportunity after the completion of all construction works.

ii) Root balled plants, if specified, will be planted at any time ground and weather conditions allow, following completion of all construction works and in accordance with the Specification.

iii) Bare root whips and transplants will be planted in the first dormant season following the completion of all construction works.

iv) All planting works shall be in accordance with the Specification.

Maintenance Schedules

Maintenance Schedule - Establishment Period - Year 1

General Maintenance of Soft Landscape Works

General maintenance shall include regular watering, weeding, pruning, removal of litter from planted areas, repair of minor washouts and other horticultural operations necessary for the proper growth of the plants and for keeping the landscape areas neat in appearance.

No chemical weed killer, insecticide or fungicide shall be allowed in the first year, or subsequent 4 years of maintenance.

No strimmer shall be used within 1m of the base of any tree unless a suitable guard is in place.

Maintenance Schedule for Planted/Grass Areas

Items to be carried out as required:

i) Keep planted areas free from rubbish and weed growth. No chemical weed killer shall be allowed.

ii) Water sufficiently to allow water to fully penetrate the rooting zone.

iii) Fork over panned down soil in areas covered with chipped bark.

iv) Maintain mulched areas at specified depth, topping up as necessary to maintain a 75 mm cover of chipped bark.

v) Check that each plant is growing healthily and remove all dead wood, damaged or diseased branches, water shoots and reversion growth. Prunings to be removed off site to tip.

vi) Re-firm plants which have been loosened by wind or frost.

vii) Maintain amenity grass area to a height of between 50-100mm during the growing season.

Maintenance in Years 2 – 5

Maintenance operations for the following four years are as shown in the Maintenance Table for years 2-5.

Maintenance Schedule Years 2-5

Description	Operation
Newly planted trees	Remove stakes and ties at the end of year 2
Newly planted hedges	Maintain neat appearance with hedge trimmer or secateurs, facing up or trimming to encourage denser growth, and keep from encroaching onto hard landscape or grass areas. All work to be undertaken outside of nesting season
Shrubs and herbaceous	Trim mass planting of all species to keep within bounds of planting beds adjacent to hard landscape areas
Amenity Grass Areas	Cut to maintain in the growing season Trim edges as required
Mulched areas	Top up chipped bark mulch to 75mm as required