Arboricultural Impact Assessment

To Include

Tree Report

Arboricultural Method Statements

Tree Protection Measures

Proposed Development at:

Land adj. Old Cottage, Dunmow Road
Start Hill, Bishops Stortford

OS 2055-20-Doc1 Rvs C

October 2021

Open Spaces
Landscape Architects
LANDSCAPE ARCHITECTURE – TREES – ECOLOGY

Arboricultural Impact Assessment

for

Proposed Development at

Land adj. Old Cottage, Dunmow Road, Start Hill, Bishops Stortford

Written by:		Approved by:	
Signature:		**Signature:**	
Name:	Karolyn Mowll BSc (Hons) MSGD Cert Arb L4 (ABC)	**Name:**	Graeme Drummond CMLI FArborA
Title:	Arboricultural Consultant	**Title:**	Principal Arboricultural Consultant
Date:	29th October 2021	**Date:**	29th October 2021

Rvs No.	Description of changes	Date of revision	Status (Draft/ Approved)	Initials
A	Revised layout plan	15.6.23	Approved	KM
B	Revised layout plan	29.2.24	Approved	GD

For internal use only:
V1.5

Open Spaces Landscape & Arboricultural Consultants Limited is a Registered Practice of the Landscape Institute.

Open Spaces
Landscape & Arboricultural Consultants Limited
2 Monument Offices
Hall Farm
Maldon Road
Woodham Mortimer
Essex CM9 6SN
Tel: 01277 356511
os@open-spaces.co.uk

Registered in England No. 6519026

Table of Contents

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, 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 Spartan Group to produce reports for trees growing within/adjacent to the proposed development site at Old Cottage, Dunmow Road, Start Hill, Bishops Stortford. 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

No pre-application documents provided.

2.1.2 Planning application

i) Tree survey.

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

iii) Arboricultural Impact Assessment.

iv) Tree protection plan.

v) Arboricultural method statements.

vi) Special engineering and other relevant construction details.

2.2 Arboricultural Consultant

This report has been written by Karolyn Mowll BSc(Hons), Cert Arb L4 (ABC), MSGD who holds the ABC Level 4 Diploma in Arboriculture.

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 survey. This period of time may be reduced if there is any change to the immediate surroundings of the tree, after any storm or any damage to the tree 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 may be 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 No wildlife, ecological or habitat assessment has been carried out by Open Spaces as part of this tree survey. The client, developer, contractor or anyone else working on or accessing the site must be made aware that flora, fauna and habitats within the site, including bat roosts, nesting birds, badger sets etc. may be legally protected and it may be an offence to disturb, damage, harm or kill protected flora, fauna or habitat. Any Contractor carrying out tree work will need to determine whether any potential bat roost, nesting bird etc. is present and if so, request the required inspection to determine if tree works can proceed without causing disturbance, damage, harm or killing protected flora, fauna or habitat.

3.14 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, 20th September 2021.

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

5.1 Key

Tree Ref. 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.	
	Good	Above average
	Normal	Average
	Poor	Below average
	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 Ref. 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	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
G1	---	Lawson's cypress, juniper, birch, hawthorn, lilac, laurel, elder, mixed ornamental shrubs	1.5-8.0	175# Av.	Extent of tree group as shown on Tree Protection Plan				---	0	SM/M	Normal	>10	C1	2.1	---
General Observations • Roadside/internal vegetation including shrub species growing on a retained bank/slope • Vegetation is faced up to road side Proposed Tree Works • ---																
H1	---	Laurel	1.5-2.5	---	Extent of hedge as shown on Tree Protection Plan				---	0	M	Normal	---	---	---	---
General Observations • Semi-managed hedge faced up to road side Proposed Tree Works • ---																
T1	---	Hazel	7.0	500# @ base	3.5#	4.0	3.0	2.0	0.5 NESW	1.5	M	Normal	>20	C1	6.0	113
General Observations • Multi-stem near base Proposed Tree Works • ---																
G2	---	Blackthorn, hornbeam, birch, hawthorn	5.0-9.0	175# Av.	Extent of tree group as shown on Tree Protection Plan				---	0	SM/M	Normal	>20	C1	2.1	---
General Observations • Growing on a bank • Largest blackthorn within group has collapsed Proposed Tree Works • Remove collapsed blackthorn																

Tree Ref. 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	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T2	---	Oak	10.0#	375#	4.0#	4.0#	4.0#	4.0#	4.0 N	3.0	M	Normal	>40	B1	4.5	64
General Observations • Estimated position • Growing within G2 and therefore unable to access to fully survey Proposed Tree Works • ---																
T3	943	Oak	16.0#	400	4.0	2.5	5.0	5.0#	3.5 NESW	3.0	M	Normal	>40	B1	4.8	72
General Observations • Estimated position • Medium amounts of minor deadwood within lower crown • Unable to access to fully survey due to piles of building materials at base of tree Proposed Tree Works • Remove building materials from RPA																
G3	---	Oak	10.0-11.0	500# max. @ base	4.0	6.5	5.0	6.0#	0.5 NESW	2.0	M	Normal	>40	B1	6.0	---
General Observations • Estimated position • Two oak trees, one growing immediately adjacent to post & rail fence • Unable to access to fully survey due to piles of building materials at base of stems Proposed Tree Works • Remove building materials from RPA																

Tree Ref. 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	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T4	902	Birch	15.0#	270#	2.5	2.5	3.0	3.0#	4.0 NESW	3.5	M	Normal	>20	B1	3.3	34
General Observations • Growing within G4 therefore unable to access to fully survey • Piles of building materials at base of stems Proposed Tree Works • Remove building materials from RPA																
G4	---	Hawthorn, birch, oak, bramble	3.0-8.0#	90# Av.	Extent of tree group as shown on Tree Protection Plan				---	0	SM/ M	Normal	>20	C1	1.2	---
General Observations • Bramble infested understorey vegetation • Young birch and oak to southern end of group Proposed Tree Works • ---																
T5	907	Birch	13.0#	250	Extent of canopy as shown on Tree Protection Plan				3.5 NRSE	2.0	M	Normal	>40	B1	3.0	28
General Observations • Growing within G4 therefore unable to access to fully survey Proposed Tree Works • ---																
T6	922	Birch	13.0#	180	3.0	3.0	2.5#	2.0#	2.5 NESW	3.0	M	Normal	>40	B1	2.4	18
General Observations • Growing within G4 therefore unable to access to fully survey • Tree leans slightly towards south Proposed Tree Works • ---																

Tree Ref. 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	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T7	921	Oak	8.0#	190	2.0#	1.5#	2.5#	3.5	2.0 W	1.5	SM	Normal	>40	B1	2.4	18
General Observations • Growing within G4 therefore unable to access to fully survey Proposed Tree Works • ---																
T8	908	Birch	16.0#	260	3.5	3.5	4.0	4.0#	1.5 W	1.5	M	Normal	>40	B1	3.3	34
General Observations • Growing within G4 therefore unable to access to fully survey • Semi-torn/hung up dead branch to east side of tree Proposed Tree Works • Remove semi-torn/hung up branch																
G5	---	Hawthorn x 3, hornbeam x 1, elder x 1	4.0-5.0	175# Av.	Extent of tree group as shown on Tree Protection Plan				---	2.0	M	Normal	>20	C1	2.1	---
General Observations • Growing between 0.5 to 1.5m from small section of a post and rail fence Proposed Tree Works • ---																
T9	---	Goat willow	13.0#	350# 300#	5.0#	5.0#	5.0#	5.0#	2.0 NESW	5.0	M	Normal	>20	B1	5.7	102
General Observations • Estimated position • Possibly growing on adjacent land • Co-dominant stems originate at approximately 0.7m above ground level • Unable to access to fully survey due to a barrier formed by wire baskets • Medium amounts of minor and medium sized deadwood within crown Proposed Tree Works • ---																

Tree Ref. 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	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
G6	---	Hazel x 4, oak x 2	7.0-9.0	200# Av.	Extent of tree group as shown on Tree Protection Plan				---	1.0	SM/ M	Normal	>20	C1	2.4	---
General Observations • Estimated position • Slightly scattered group – etiolated form to oak Proposed Tree Works • ---																
T10	---	Hornbeam	12.0#	600 500 200 100	7.0#	7.0#	8.0#	8.0#	2.0 NESW	2.0	M	Normal	>20	B1	9.9	308
General Observations • Growing to the side of a bank and a water-filled ditch • Unable to access to fully survey • Multi-stem at base • Contorted form to base Proposed Tree Works • ---																
G7	---	Hawthorn, hazel	6.0-8.0	400# Av.	Extent of tree group as shown on Tree Protection Plan				---	1.0	M	Normal	>20	C1	4.8	---
General Observations • Estimated position • Growing to the side of a bank and a water-filled ditch • Unable to access to fully survey Proposed Tree Works • ---																

Tree Ref. 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	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T11	---	Elm	6.0	325#	1.0	1.0	1.0	1.0	---	3.0	M	Poor	<10	U	---	---
General Observations • Estimated position • Growing to the side of a bank and a water-filled ditch • Tree has recently been topped at 6m above ground level • Large amounts of deadwood within crown • A small elder is entwined at base Proposed Tree Works • ---																
T12	---	Elm (stump)	0.5-1.0	275# 300#	---	---	---	---	---	---	M	Poor	<10	U	---	---
General Observations • Multi-stemmed tree recently cut down to leave a 1m high stump which is now sprouting • On co-dominant stump is clearly rotten Proposed Tree Works • Remove tree																
T13	---	Oak	3.5	600#	---	---	---	---	---	---	M	Poor	>10	C1	7.2	163
General Observations • Estimated position • Growing immediately adjacent to a water-filled ditch • Tree has recently been topped at approximately 3.5m above ground level • Now sprouting in parts Proposed Tree Works • ---																

Tree Ref. 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	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T14	---	Hazel	2.5	200# @ base	0.5	1.25	1.25	1.25	---	0.5	M	Normal	>10	C1	2.4	18
General Observations • Estimated position • Multi-stem tree growing immediately adjacent to metal outbuilding Proposed Tree Works • ---																
T15	---	Cherry	8.0	420# @ base	3.5	4.0	4.0	3.0	1.0 NESW	1.5	OM	Normal	>10	C1	5.1	81
General Observations • Medium amounts of minor and medium sized deadwood within crown Proposed Tree Works • ---																
T16	---	Fig	2.5	180# @ base	2.5#	1.0#	1.5#	2.0#	---	0	M	Normal	>10	C1	2.4	18
General Observations • Growing immediately adjacent to pond area • Possibly multi-stem at base – unable to access to fully survey due to surrounding shrubbery Proposed Tree Works • ---																
T17	---	Ash	14.0#	350#	5.0#	4.0#	3.5#	4.5#	4.5 NESW	3.5	M	Normal	>20	B1	4.2	55
General Observations • Evidence of historical pruning throughout crown Proposed Tree Works • ---																

Tree Ref. 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	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T18	---	Holly	6.0	100# 120# 150#	2.5#	2.5#	2.5#	2.5#	---	0.5	M	Normal	>20	C1	2.7	23
General Observations • Multi-stem at base • Some decay at base of one of the stems • Unable to access to fully survey Proposed Tree Works • ---																
G8	---	Hazel, hawthorn	5.0-7.0	400# Av.	Extent of tree group as shown on Tree Protection Plan				---	0.5	M	Normal	>20	C1	4.8	---
General Observations • Estimated position • Growing to the far side of a water-filled ditch therefore unable to access to fully survey • Predominantly multi-stem hazel • Canopy overhangs proposed development site Proposed Tree Works • ---																
T19	---	Oak	17.0#	600#	9.0#	9.0	8.0#	10.0	4.5 N	4.5	M	Normal	>40	B1	7.2	163
General Observations • Estimated position • Growing to the far side of a water-filled ditch therefore unable to access to fully survey Proposed Tree Works • ---																

Tree Ref. 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	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
G9	---	Yew x 1, holly x 1	4.0-7.0	350# Av.	Extent of tree group as shown on Tree Protection Plan				---	1.5	M	Normal	>20	C1	4.2	---
General Observations • Estimated position • Yew is growing within neighbouring property therefore unable to access to fully survey • Yew has recently been topped at approximately 4m above ground level Proposed Tree Works • ---																
G10	---	Cherry x 2	2.0-3.0	200# Av. Max.	Extent of tree group as shown on Tree Protection Plan				1.2 NESW	1.5	M	Normal/ Poor	>10	C1	2.4	---
General Observations • Estimated position • Growing immediately adjacent to low retaining wall • Eastern-most tree has recently been heavily pruned to leave just a basic branch structure Proposed Tree Works • ---																
T20	---	Damson	2.5	140	1.5	1.0	1.0	1.0	1.5 NESW	1.2	M	Normal	>10	C1	1.8	10
General Observations • Estimated position • Poor quality tree Proposed Tree Works • ---																

Tree Ref. 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	Category Grading	Root Protection Area (radius m)	Root Protection Area (m2)
T21	---	Magnolia	2.0	175# @ base	1.0	1.0	1.0	1.0	---	0	M	Normal	>10	C1	2.1	14
General Observations • Estimated position • Multi-stem at base Proposed Tree Works • ---																
H2	---	Hornbeam, willow	1.5-3.0	---	Extent of hedge as shown on Tree Protection Plan				---	0	M	Normal	---	---	---	---
General Observations • Semi-mature boundary vegetation faced up to road side 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	Characteristic	Water Demand	Ultimate tree height (m)	Ultimate crown spread (m)	Deciduous evergreen
Ash		M	23	15	D
Birch	• Short lived tree (<100 yrs)	L	14	10	D
Blackthorn	• Thorny branches	M	8	10	D

Species	Characteristic	Water Demand	Ultimate tree height (m)	Ultimate crown spread (m)	Deciduous evergreen
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
Cherry (Orchard)	• Shallow rooting	M	12	10	D
Elder	• Fruit fall	L	10	5	D
Elm (English)	• Produces suckering shoots	H	24	5	D
Fig	• Fruit fall	L	8	5	D
Hawthorn	• Thorny branches	H	10	8	D
Hazel		L	8	5	D
Holly	• AYR Dense foliage • Thorny leaves	L	12	5	E
Hornbeam		L	17	12	D
Juniper		-	10	10	E
Magnolia		L	9	8	D
Oak (English)	• Fruit fall	H	20	20	D
Plum	• Fruit fall • Produces suckering shoots	M	10	8	D
Willow (Goat)	• Known to cause subsidence	H	15	10	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.

i) There are minor incursions posed by some buildings within the RPAs of G8, and T19 but as the water-filled ditch is located between the trees and the proposed buildings, and the trees are otherwise growing in 'open ground', no special foundation is proposed.

ii) A small part of the RPA of the multistemmed Hornbeam tree T10 sits within the footprint of a proposed house. This tree is growing in open ground and therefore it is unlikely that it will be impacted by the proposed house.

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, refer to the Tree Protection Plan and approved site layout plans.

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 Right of Way (PRoW) and therefore these trees have amenity value.

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

Some trees with some low amenity value (G1, T1) will be removed. Other trees proposed for removal have no amenity value.

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 8.0.

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 and associated outbuildings.
- Garden areas.
- Water courses, ponds etc

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

There is potential for new tree 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, G2-G4, G5 (partial), G6, G8, G9, G10, T3-T10, T13, T17-T21.

Refer to Tree Protection Plan.

6.3.3 Trees to be removed

The following trees will be removed:

T1, T11, T12, T14-T16, G1, G5 (partial).

Refer to Tree Protection Plan.

6.3.4 Trees to be pruned.

The following tree works will be carried out:

Tree Nr.	Tree Works
G8	• Cut back overhanging crowns to clear any part of proposed building by 2m.
T10	• Cut back overhanging crowns to clear any part of proposed building by 3m.
T19	• Cut back overhanging crowns to clear any part of proposed building by 2m. •

Table 4 Tree works

Refer to Tree Protection Plan and the tree report.

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.

There will be low impact from the loss of the trees proposed for removal as they have low amenity value. Refer to paragraph 6.2.4.

Tree Category	Tree Reference No.
A	---
B	---
C	T1, G1, T14, T15, T16, T20, T21, G5 (partial), G10.
U	T11, T12

Table 5 Tree removal summary

6.3.7 Evaluation of tree constraints and draft tree protection plan.

All tree related constraints have been addressed. Some trees are proposed for removal.

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
- Root barriers

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.

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, where required, soil de-compaction within the RPA of retained trees.
- Where required, 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 temporary 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 RPA or any personnel required to work within the RPA, temporary ground protection will be used to work off. Refer to paragraph 8.3.

7.6 The availability of special construction techniques to include:

7.6.1 Demolition of Buildings or Structures

Demolition of building or structures within the RPA or closely adjacent to the RPA of retained trees will adhere to the following methodology:

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

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 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

There is no proposal to construct any foundation within the RPA of any retained tree, save for the very minor incursions into the RPAs of T13 and T19. No special foundation design will be employed – refer also to paragraph 6.2.2.

7.6.5 Constructing Hard Standing/Roadways/Pathways etc.

Should the need arise to construct any hard standing, roadway or pathway within the RPA of any retained tree, the following methodology will be followed:

7.6.5.1 Proposed hard standing, roadway or pathway:

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

iii) Construction of any hard surface is to be carried out by working off the existing hard surface and/or temporary ground protection in accordance with paragraph 8.3. As the new surface is laid, this may be driven on or worked off providing there is no deforming of the surface or any compaction of the underlying soil.

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 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

Should the need arise to construct any external wall within the RPA of any retained tree, the following methodology will be followed:

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 temporary ground protection 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 temporary ground protection 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

Should the need arise to construct any retaining wall within the RPA of any retained tree, the following methodology will be followed:

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 temporary ground protection 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 temporary ground protection 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 Bollards

Should the need arise to erect any fencing, railing, gate or bollard within the RPA of any retained tree, the following methodology will be followed:

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 temporary ground protection 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 temporary

ground protection 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 within the RPA of any retained tree.

v) A non-permeable lining sheet will be placed into the open hole 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.

vi) All excavated post holes within the RPA of a retained tree will be lined with an impermeable flexible membrane prior to pouring any concrete or cement-based product to prevent leaching of any material into the rooting zone.

7.6.9 Laying Below Ground Utilities.

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.

7.6.10 Root Barriers

There is no intention to install any root barrier.

Should there become a need to install a root barrier, it will be installed in the location(s) shown on the layout drawings, in accordance with the manufacturer's/suppliers instructions.

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

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.

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 protection.

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 temporary ground protection. 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.

Refer to the approved layout 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 sandbags.

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 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 topsoil.

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

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

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

- Installation of tree protection measures including both protective barriers and temporary ground protection prior to the start of any site works. With the agreement of the arboricultural consultant and in accordance with this document, site clearance may be carried out prior to the installation of tree protection measures.
- 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.

vi) The contractor/Supervisor is required to comply with the following:

- Have regard to retained trees at all times.
- Install tree protection measures in accordance with the 'Tree Protection Plan' (TPP) and 'Arboricultural Method Statements'.
- Retain a copy of the TPP and AMS in the site office at all times.
- Make available a copy of the TPP and AMS to all site workers and visitors as required.
- Inform all site workers and visitors their responsibilities in relation to protected trees.
- Carry out pre-commencement site meeting with the 'Appointed Arboricultural Consultant' (**AAC**).
- Check the tree protection fencing and temporary ground protection daily to ensure that they are sited in full compliance with the TPP and AMS. If there is any deviation from the TPP and/or AMS, the Site Supervisor will re-align each.
- Inform the AAC, in accordance with the AMS, if any additional site monitoring/inspection visits are required.
- Carry out all site works in accordance with the TPP and AMS.

7.18 List of contact details for the relevant parties.

Job Position	Name	Company	Address	Contact Nr.
Architect	Mr J Bell	J Bell Design and Conservation Ltd	Suite G2 Holly House Business Centre 220-224 New London Road, Chelmsford CM2 9AE	07484 791794
Arboricultural Consultant	Karolyn Mowll	Open Spaces Landscape and Arboricultural Consultants Ltd	2 Monument Offices Hall Farm Maldon Road Woodham Mortimer Essex CM9 6SN	01277 356511 km@open-spaces.co.uk
LPA Tree Officer	---	Uttlesford District Council	Council Offices London Road Saffron Walden Essex CB11 4ER	01799 510510

Table 6 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 approved '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 protection 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 protection 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.

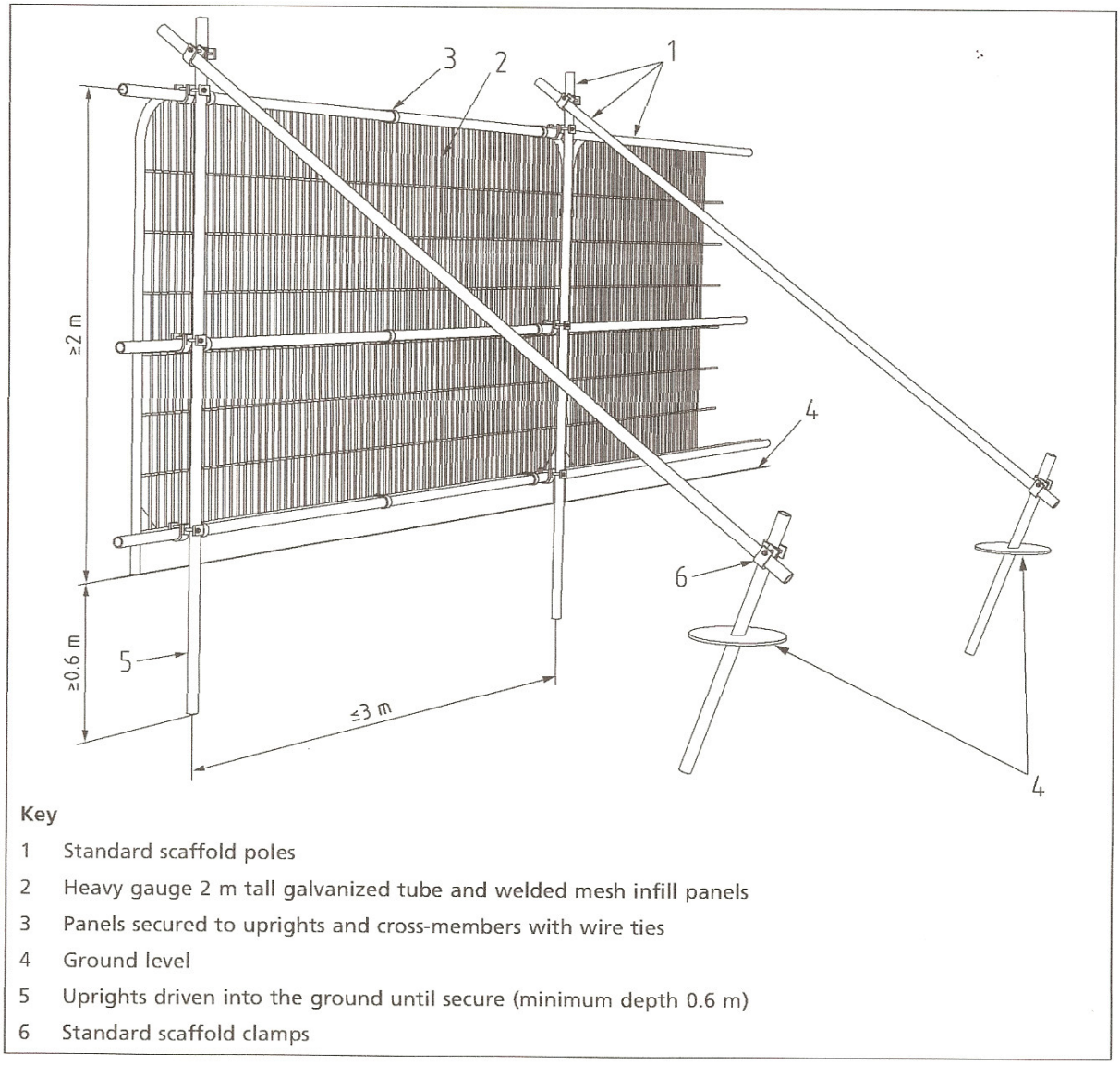
- Vertical and horizontal scaffold framework which is well braced to resist impacts.
- The vertical tubes to be spaced at a maximum interval of 3m and driven securely into the ground.
- Weld-mesh panels to be securely fixed to the scaffold framework.
- Vertical poles should avoid underground services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

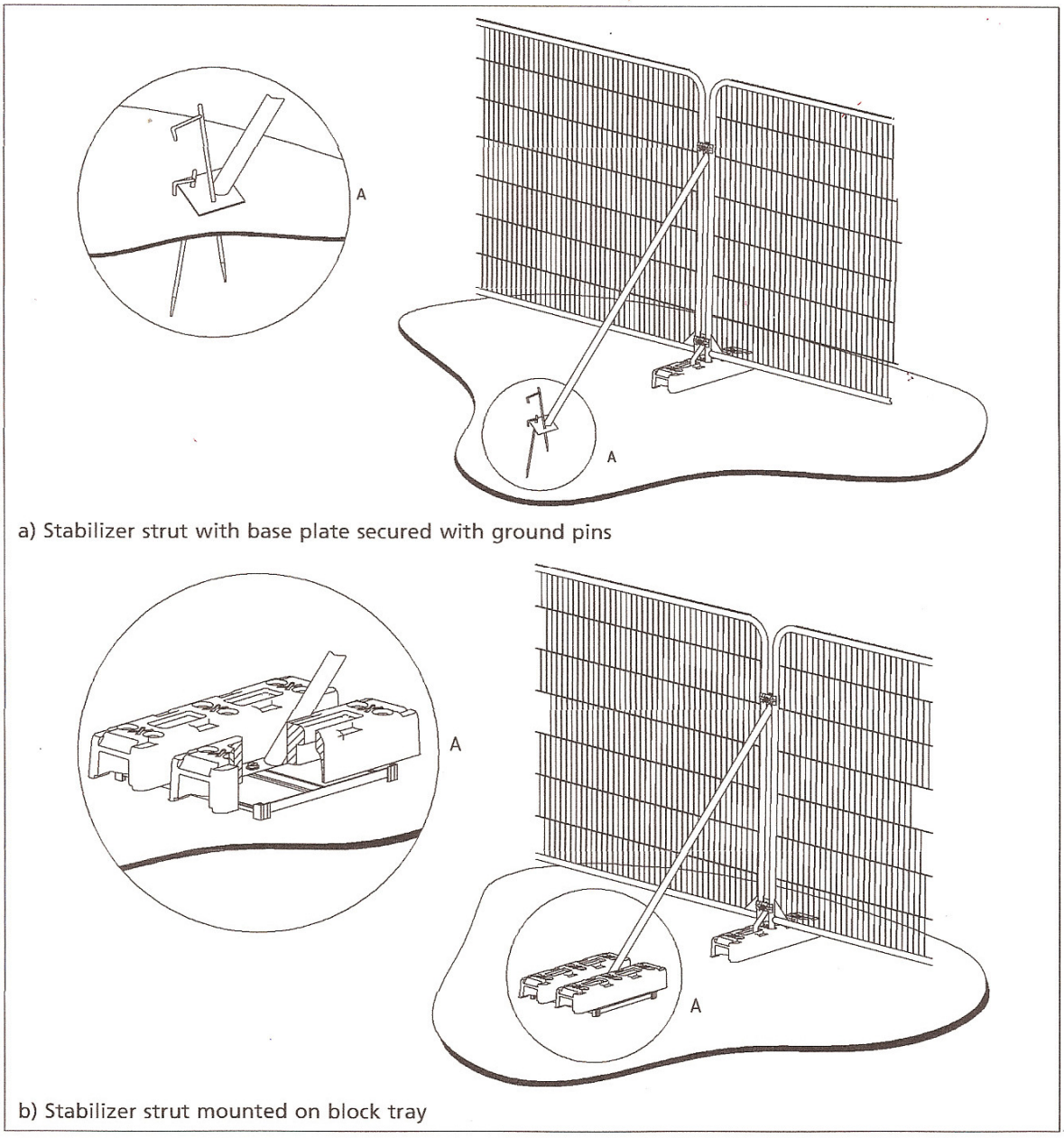


Figure 2. BS 5837:2012 Alternative Tree Protection Barrier

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.

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				