

**NORTHAW PLACE, COOPERS LANE, NORTHAW,  
POTTERS BAR, EN6 4NQ**

**BS5837 TREE SURVEY, ARBORICULTURAL IMPACT ASSESSMENT  
AND METHOD STATEMENT**



**Elizabeth Greenwood CMLI FArborA**  
[ms.ejgreenwood@gmail.com](mailto:ms.ejgreenwood@gmail.com)  
November 2014

## Contents

<b>1.0</b>	<b>Introduction.....</b>	<b>page 3</b>
	1.1. <b>Contacts</b>	
	1.2. <b>Instruction</b>	
	1.3 <b>Background</b>	
<b>2.0</b>	<b>Tree survey.....</b>	<b>page 4</b>
	2.1 <b>Tree Survey Criteria</b>	
	2.2 <b>British Standards: 5837:2012</b>	
	2.3 <b>Synopsis of Tree Survey</b>	
<b>3.0</b>	<b>Arboricultural Impact.....</b>	<b>page 7</b>
	3.1 <b>Issues considered</b>	
	3.2 <b>Arboricultural Assessment Impact</b>	
<b>4.0</b>	<b>Arboricultural Method of operations- Pre construction</b>	<b>page 10</b>
	4.1 <b>Setting Out</b>	
	4.2. <b>Tree Works</b>	
	4.3 <b>Protective Barriers/fencing</b>	
	4.4 <b>Ground Protection</b>	
<b>5.0</b>	<b>Method of construction for the development.....</b>	<b>page 13</b>
	5.1 <b>Hand dig</b>	
	5.2 <b>Surfacing within the Root Protection Area</b>	
	5.3 <b>Location of Underground Services</b>	
	5.4 <b>Contingency Plans</b>	
	5.5 <b>Site Supervision</b>	
<b>6.0</b>	<b>Post construction landscaping near trees. ....</b>	<b>page 14</b>
	6.1 <b>Removal of Ground Protection and Fencing</b>	
	6.2 <b>Permanent Surfacing within the Root Protection Areas</b>	
	6.3 <b>Remedial Works</b>	
	6.4 <b>Landscape Proposals</b>	
<b>Appendices</b>		
<b>A</b>	<b>Photographs .....</b>	<b>page 16</b>
<b>B</b>	<b>Tree Survey Sheets.....</b>	<b>page 21</b>
<b>C</b>	<b>Cascade Chart for Tree Quality Assessment.....</b>	<b>page 28</b>
<b>D</b>	<b>Protective Barrier.....</b>	<b>page 30</b>
<b>E</b>	<b>Indicative details for new surfacing.....</b>	<b>page 33</b>
<b>F</b>	<b>Arboricultural Supervision.....</b>	<b>page 35</b>
<b>G</b>	<b>Plan 513.14.1 Tree Constraints Plan .....</b>	<b>page 37</b>
<b>H</b>	<b>Plan 513.14.2 Tree Removal Plan .....</b>	<b>page 39</b>
<b>I</b>	<b>Plan 513.14.3 Tree Protection Plan .....</b>	<b>page 41</b>

## **1.0 Introduction**

### **1.1. Contacts**

Client - Mr. and Mrs. Holt email [holti@btinternet.com](mailto:holti@btinternet.com)

Architects - PNA, The Old Reading Room, 32 High Road, Essendon, Hatfield, Herts. AL9 6HW. **Tel:** 01707 276595 / 275684, **Fax:** 01707 260024 [paul@pna.eclipse.co.uk](mailto:paul@pna.eclipse.co.uk)

Arboriculturalist and Landscape Architect- Elizabeth Greenwood

Council. - Welwyn Hatfield Council

### **1.2. Instruction**

Instruction was received from PNA to provide an arboricultural method statement to facilitate construction of a new entrance and driveway in the vicinity of mature trees.

It is intended to be a working document to be used by the contractor and local authority to ensure the retention of the trees and provide a means of construction for the implementation of this proposed development.

The trees were surveyed on 13 November 2014. Plans showing the details as outlined in this method statement are included in the appendix to this report (Appendices G, H and I)

In the case of building within the vicinity of mature trees the owners must be made aware of their responsibility to maintain these trees in a safe condition. Their insurers should be made aware of the implications of the presence of these trees.

The survey is to take the form of a visual assessment of trees recording their measurement, describing their age, amenity, condition and recommending work. Trees have been plotted on plan and full details of survey work are included in the appendices.

Limitations of this tree survey would include the lack of visibility of every tree owing to dense undergrowth and the presence of climbing plants such as ivy. There may be restrictions to the access within the site or from neighbouring land, and, in the case of trees growing on the boundary of the site only one side of the tree may be visible.

### **1.3 Background**

1.3.1 The proposed realigned drive is to cross the band of trees which border Coopers Lane; this area of the ground is outside the garden boundary and fenced both along the edge of the lawns and along Coopers Lane with close boarded fences. The site is open at the bend in the drive, and the boundary with The Lodge is defined by low fencing.

1.3.2 According to the British Geological Survey the underlying geological formation is of London Clay Formation composed of clays, silts and sands.

Superficial deposits have not been recorded. Clay soils are prone to compaction with the overrun of vehicles.

- 1.3.3. The survey on the western side of the survey show levels of 49 metres above sea level with the ground gently rising towards Coopers Lane to a height just under 52 metres. A semi circular bank 700m high is present centrally within the enclosure, with an absence of ground flora indicative that this has only recently been constructed.
- 1.3.4 Some grassland is present along the western part of this site; under the mature trees ground flora is mostly absent.
- 1.3.5 Mature trees date from the nineteenth century, with a large ash which may date from an earlier period. Self set and younger trees are present within the lower canopy.
- 1.3.6 Trees within the grounds are not protected by tree preservation order, and the site lies outside a conservation area.

## **2.1 Tree Survey Criteria**

- 2.1.1 Photographs of many of the trees and full details of this tree survey are included on tree survey sheets. (Appendices A and B) Information recorded complies with BS5837:2012, and is outlined as follows:-
- The species (English names), size and position of the trees within the site.
  - The majority of large shrubs or trees with stem diameter of less than 150 mm have not been surveyed. According to the British Standard Recommendations these trees can be transplanted or replaced.
  - The dimensions of the trees are the height, and the girth measured at 1.5 metre above ground level. The spread is measured at the four points of the compass, and this is represented on plan. The lowest branch on the trunk is measured from ground level and the crown height is measured from the lowest point of the foliage.
  - The maturity is recorded and details of this classification are included on the tree survey sheets.
  - A description of the trees' condition includes any visual defects at the time of the survey. As this survey is conducted from ground level not all defects may be visible, and pathogens may not be apparent because of the season of inspection.
  - General recommendations for each tree are outlined, which may need to be reviewed once development proposals are finalized.

- Estimated remaining contribution in years in view of the existing site conditions is classified as (less than 10 years; 10 to 20 years, 20 to 40 years or more than 40 years).

2.1.2 Topographical survey layout has been provided by SDP Surveys, drawing number S13-277-100. Tree survey information has been added to this plan and details amended for the purpose of this report. On inspection additional trees were marked, plotted and surveyed, mainly those located on the northern side of the secondary proposed route of the drive, trees T42- T53. (Appendix G, H and I).

2.1.3 It is important to note that the trees are surveyed and their condition evaluated in the current site conditions. If there is a change in the site conditions and within the root protection area the trees may need to be re-surveyed and their potential longevity re-evaluated. In the event of adverse weather conditions the survey should be repeated. Regardless of the development proposals there should be regular inspection and monitoring of trees at a frequency dependent on their condition and age: as such this tree survey is only valid for a 3 year period.

## **2.2. BRITISH STANDARDS: Tree In relation to design, demolition and Construction- recommendations. 5837:2012**

2.2.1 **Assessment of the trees' amenity values** The British Standard Recommendations provide an assessment of trees on development sites and outlines four categories in which trees should be placed for assessment purposes. These assessment categories are reproduced in Appendix C, Table 1, "Cascade Chart for Tree Quality Assessment", and simplified as:-

- A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years
- B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years
- C **Trees of low quality**, with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter of below 150mm
- U **Trees which have limited prognosis.** Those in such a conditions that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

2.2.2 These categories are subdivided into three sub groups:-

1. Trees of arboricultural value, good examples of their species or unusual specimens
2. Mainly trees of landscape value, trees which are primarily of visual amenity
3. Trees with mainly conservational value for example veteran trees

2.2.3 **Tree root protection** - British Standard Recommendations 5837:2012 provide a formula for calculating the Root Protection Area (RPA) required to be

protected for existing trees that are to be retained. The area of the root protection area is calculated by multiplying the girth measured at 1.5 metre by 12. In the case of multi-stem trees the girth of the trunks is measured at 1.5 metres and a formula is outlined in BS5837:2012 (The square root of the combined squares of the girth gives the mean dimension of the girth- with a tree with 5 or more stems the mean girth of all stems is then calculated. The results of both equations are then multiplied by 12 to give the radius). Root protection areas are indicated as a radius on plan. In the event of root restrictions for example deep foundations or a retaining wall, topography, drainage, soil type or soil structure, or soil disturbance the approximate area is represented by a polygon, as dictated by this British Standard. In this site an assumption would be that the trees may be able to root under car park surface and footpath construction, but that a road would provide a barrier to root formation.

- 2.2.4 Within development sites the British Standard recommends that trees are fenced off to ensure the root protection area is not damaged by construction works. In compliance with the British Standards, protective fencing should be erected at the edge of the root protection area. If access is required within this area, then the ground should be protected. Construction techniques using geo-web and geo-textile, in accordance with BS recommendations might be used to minimize damage to trees and enable working space for demolition or construction within the root protection area of trees.
- 2.2.5 Drainage and service runs need to be identified at this stage to ensure that if new service runs are to be excavated they should be located outside the root protection zone of existing trees.
- 2.2.6 Building foundations can be specifically designed to reduce the impact of a building if there is a minor incursion into the root protection area of a tree.
- 2.2.7 **Other considerations-** In addition, the British Standard takes into account future growth of the crown of the tree, the spatial implications and its effects on light.
- 2.2.8 Existing levels within the root protection areas of trees should be retained.
- 2.2.9 Some tree work might be required to ensure that the crowns of trees are cut back from working space and to provide access for construction vehicles.
- 2.2.10 There are adequate areas within the site to ensure that handling and storage of materials can be accommodated well outside the root protection areas.

## **2.3 Tree Survey**

- 2.3.1 Of significance are the six mature horse chestnut trees (T16, T17, T18, T19, T46 and T50) planted along Coopers Lane, one of which is within the garden of The Lodge. As mature specimens planted over a century ago, their health is in decline; all have deadwood, with pruning wounds and decay visible throughout their canopies. As a structure, any tree can suffer failure, particularly if overstressed in times of storm; Horse chestnut is prone to shed branches without warning in mid-summer

- 2.3.2 Of these trees, two are classified as potentially defective; the red horse chestnut (T16) has severe canker partially girdling the stem; and the tree within the Lodge (T18), has a fungal pathogen at the base rendering it potentially unstable. Both trees should be removed. The other horse chestnuts are classified as of C2 quality, with limited prognoses, some specified tree surgery to address health and safety.
- 2.3.3 Smaller in diameter there are three medium size horse chestnut trees: T6 is a one side suppressed specimen growing close to an oak (T7) - its removal in favour of allowing the oak to develop could be considered. T23 has a suppressed crown formation with prolific ivy and T47 is growing under the canopy of the pine (T44); all of which are of C2 quality.
- 2.3.4 Other mature trees of note include the large ash, (T42) planted on a mound with basal growth, 30 metres in height with malformed crown structure and a large cavity on the lower southernmost lateral branch. With a large diameter deadwood in the canopy and widespread cavities, it is classified as of 'U' quality- however; if this area is left undisturbed its retention may be considered. A large oak (T43) is now dead.
- 2.3.5 Although the site includes some mature yews and hollies growing under the canopy of these horse chestnuts the remaining trees are of more recent origin; self set sycamores, Norway maples and ash none of which is of significance. Young trees are present along the garden boundary of which two oaks and an ash have been surveyed (T3, T4 and T5)
- 2.3.6 The two groups of trees on the verges of Coopers Lane have been described as groups of trees - trees 26-T30 are described as Group 1, 14 metres high, suppressed crown leaning over the road with prolific ivy, and trees 31-41, Group 2, 17metres high, also with prolific ivy and all classified as of 'C' quality.

### **3.0 Arboricultural Method Statement**

#### **3.1 Issues Considered**

This method statement includes details on the following

##### Pre construction works and site clearance

- Tree protection
- Tree surgery
- Protective fencing
- Methods of ground protection construction during works

##### Construction works

- Hand dig,
- Hard surfacing within the root protection area
- Location of underground services

**NORTHAW PLACE, COOPERS LANE, NORTHAW**  
Arboricultural Impact Assessment and Method Statement

- Contingency plans
- Site supervision

Post- Construction works

- Removal of protective barrier etc.
- New surfacing
- Remedial works
- Landscape works

**3.2 Arboricultural Impact Assessment**

3.2.1 The approved site layout has been provided by PNA drawing number 747/SP1 New Entrance and Lodge. The impact of these proposals is summarized in the following table:-

Tree number	SPECIES	EFFECT	Tree surgery	Protective barrier	MITIGATION		
					Ground protection	Construction for surfacing	Hand dig
T3, T4 and T5	Oaks and ash	Crown foliage within working space of drive	Tree surgery	X			
T19, T21, T22, T23, T24, T25	Horse chestnuts and Sycamores	With footprint of Gatehouse	REMOVE				
T9, T10, T11, T13	Ash, Elms, Yew	Within footprint of drive	REMOVE	X	X	X	X
G1	Sycamores	No 3 within footprint of drive splay	REMOVE				
T8, T14, T15 and T16, T17	Hawthorn, Hollies and Horse chestnut	RPA within footprint of drive	REMOVE				
T18	Horse chestnut	RPA with footprint of gatehouse, new drive and entrance walling	Remove with permission of owner or tree surgery	X	X	X	X
T45, T49, and T46	Yews and Horse chestnut	RPA within footprint of new entrance wall	Tree surgery	X	X	X	X
T44	Pine	RPA within footprint of drive	Tree surgery	X	X	X	X
T47	Horse chestnut	RPA within footprint of drive	Tree surgery	X	X	X	X
T53	Sycamore	RPA within footprint of drive	Tree surgery	X	X	X	X



3.2.2 Incursion of the development into the root protection area of trees and impact of overhanging branches within the development footprint are summarized by the following table:-

Tree no	. Species	Root protection area	incursion into RPA	% of incursion	Impact
T18	Horse chestnut	452	65	14%	New gate house, working space for drive and wall.
T44	Pine	137	32	24%	Working space for drive and wall and new drive surfacing
T45	Yew	46	5	11%	Working space for new wall
T46	Horse chestnut	238	5	2%	Working space for new wall
T47	Horse chestnut	29	1	3%	Working space for drive and new drive
T49	Yew	17	4	26%	Working space for wall and foundation of new wall
T53	Sycamore	62	6	10%	Working space for drive and new drive

3.2.3 It is noted that the Horse chestnut T18 is of poor quality severely decayed and a potential hazard. It should be removed; however if may not be under the client's ownership: if retained tree protection measures are shown on the tree protection plan

3.2.4 Mitigation and details to address the incursion into these trees' root protection areas are outlined as follows:-

- Protective barrier /fencing
- Ground protection within the area of proposed working space will partly address the impact of the development on the sycamore.
- Hand digging for foundation of paths and hard surfacing
- New hard surfacing

#### **4.0 Method of Operations- Pre Construction**

##### **4.1 Setting out**

4.1.1 The site can be set out by the contractor in accordance with the Tree Protection Plan from measurements as outlined on the plan. Placing of any site accommodation and storage of materials will be set out with agreement by the arboriculturalist outside the root protection zone of any of the trees. There will not be any bonfires within the vicinity of the trees.

4.1.2 Storage of contaminants and mixing of concrete must be carried out outside the root protection areas of all trees. An indicative area for this usage is marked on the plan (See appendix I). The ground should be protected with heavy duty plastic sheeting, e.g. 1200 gauge DPM, with edges secured and raised to prevent spillage and with a raised lip along the access point.

##### **4.2. Tree Works**

4.2.1 As part of the application for planning permission the following tree surgery is outlined. All works will be carried out by a fully insured and competent tree surgeon in accordance with BS3889:2010 "Tree Work". The timing of tree surgery should also be carried out in accordance with the Wildlife and Countryside Act and in view of the nesting season of birds within the sites.

Tree no	. Species	Category	Management recommendations
T8	Hawthorn	C2	REMOVE
T9, T12 T14, T15	Hollies	C2	REMOVE
T10, T11	Elms	C2	REMOVE
T13	Yew	B2	REMOVE
T16 and T22	Horse chestnut	U	REMOVE
T17, T19, T20, T23, T25	Horse chestnut	C2	REMOVE
T21, T24,	Sycamores	C2	REMOVE

**NORTHAW PLACE, COOPERS LANE, NORTHAW**  
Arboricultural Impact Assessment and Method Statement

Tree no	. Species	Category	Management recommendations
G1 (3 trees)	Sycamores	C2	Outside the clients ownership- Remove 3 trees, Clean the crown over site and the road of remaining trees
G2	Sycamore-	C2	Outside the clients ownership- Clean the crown over the site and the road
T3, T4, T5	Ash and oak	C2	Face back and crown lift over new railing and drive
T6	Horse Chestnut	C2	Remove in favour of oak as limited potential
T42	Ash	U	Monitor- reduce damaged branch- monitor for ash dieback disease, unlikely to be sound- if considered a safety hazard in this position REMOVE
T45 and T49	Yew	B2	Face back and crown lift over new wall to allow for 1.5 metre working space
T43	Oak	U	REMOVE
T44	Scots pine	B2	REVIEW-Tree to be retained- however monitor as the tree has a high crown and removal of adjacent trees will expose the pine to wind blow
T46	Horse Chestnut	C2	Clean- monitor- potential hazard, secondary stem
T47 and T50	Horse Chestnut	C2	Clean the crown monitor re conditions
T48	Hornbeam	C2	Poor form- coppice
T18	Horse chestnut	U	Outside the clients ownership- potentially a hazardous tree- REMOVE with permission ( or tree surgery to make safe)

**4.2.2 The total number of trees to be removed are as follows**

Category	Trees to be removed	Tree number	Species
<b>A</b>			
<b>B</b>	1	T13	Yew
<b>C</b>	17	T6, T8, T9, T10, T11, T12, T14, T15, T17, T17, T19, T20, T23, T25, G1 (3)	Oak, Hawthorn, Hollies, elms, Horse chestnut, Sycamores
<b>U</b>	4	T16, T18, T22 and T43	Horse chestnuts, Oak ( possibly also T42 Ash)
<b>TOTAL</b>	<b>22</b>	<b>Trees</b>	

**4.3 Protective Fencing/Protective Barrier**

Details of the fencing are shown in the appendices to this report and comply with British Standard recommendations. (See appendix D). All weather notices are to be affixed to this fencing with signage “**CONSTRUCTION EXCLUSION ZONE – NO ACCESS**”.

**4.4 Ground Protection**

In the vicinity of the temporary unit working space will mainly be confined to existing hard surfacing. Where additional working space is required for construction within the root protection areas of retained trees, the British Standard specifies the following type of ground protection.

- a) For pedestrian movements only, 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. 100 mm depth of woodchip), laid onto a geo-textile membrane;
- b) For pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geo-textile membrane;
- c) For wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

## **5.0 Methods of Construction for the Development**

### **5.1.1 Hand dig**

Hand digging will also be required for all works within root protection areas of trees, including removal of surfacing, trenches, excavation for fence posts, excavation for the proposed walling and for cultivation for soft landscape areas. All hand digging within the root protection areas of trees should be supervised by a competent arboriculturalist.

5.1.2 Within root protection areas all excavation should be hand dug. A trench should be hand dug near the trees to ascertain whether roots are present. If roots over 50mm are found these should, where possible, be bridged, and surrounded by sand- roots under this dimension should be cut to a clean cut and surrounded by sand. No roots are to be left exposed but covered with damp sand or hessian. The surface level of the path may need to be adjusted to retain these roots.

5.1.3 If on investigation of the hand dug trench there are no roots present mechanical excavation may be possible if a banksman is supervising the excavation to ensure that if roots are unearthed they can be protected and clean cut and surrounded by sand. Hand digging may need to be resumed to complete the excavation

5.1.4 This would include exploratory excavation by hand for the foundations of the paths and new hard surfacing within the root protection area of the trees.

## **5.2 Surfacing within the Root Protection Area**

Hand digging will also be required for surfacing within the root protection area of trees along the drive.

- a) Minimizing excavation within the root protection area by removing surfacing herbage and laying a geo-textile to stabilize the ground.
- b) Infill any irregularities with 50mm sharp sand
- c) On this lay a geo web, depth to be specified by the supplier to accommodate the proposed weight load.
- d) This will be filled with no fines gravel / stone 20-40mm
- e) Lay final wearing surface on top of this base- for example permeable paving or porous tarmac.
- f) Use timber edging to avoid excessive excavation to facilitate haunching of edging.

## **5.3 Location of Underground Services**

All drainage and below ground services will be designed to avoid tree protection zones. If there is no alternative but to site these within the root protection area

of trees, then trenches excavation should be hand dug and comply with 'Hand dug ' as outlined in section 5.1 or the NJUG regulations.

#### **5.4. Contingency Plans**

If vehicular access is necessary within the root protection zone of any of the trees, in response to chemical spillage, collision or emergency access, the ground will be protected by geo-textile or boarding as outlined in the British Standard. Spillage and ground contamination will be prevented and preparation of material carried out outside the root protection areas of tree.

#### **5.5 Site Supervision**

There will be full supervision on site from the site foreman and tree protection methods will be strictly adhered to. An arboricultural supervision schedule, if required by the local authority, is included in the appendices to this report.

#### **6.0 Post Construction and Landscaping near Trees.**

##### **6.1 Removal of fencing and ground protection**

On completion of works, protective fencing and the ground protection for temporary working space will be removed.

##### **6.2 Remedial works and soil improvement**

6.2.1 Exposed soils are easily compacted resulting in loss of water and gaseous exchange and leading to root deaths. To relieve ground compaction, which may have resulted from the overrun of vehicles or by storage of materials, the clay soils should be broken up to allow air to penetrate and for the soil structure to be restored.

There are various methods to achieve this which are outlined in the appendices to this report.

- Auguring the soil by hand combined with soil improvements
- Pneumatic excavation for example air spade and soil improvements

6.2.2 Within the tree root protection area improve the soil structure by incorporating a compost or mulch within the topsoil, of 75-100mm in depth. This can be spread over the surface and gently forked into the soil. If bark chip is used as mulch NPK fertilizer should be added to counteract the nitrogen depletion of the soil. There are options for additives of microrrhizal fungal which may also improve root function. Ground compaction will be addressed by either lightly forking over the area or by other techniques; for example use of tree spade soil aeration.

### **6.3 New surfacing**

Within the root protection areas the surface overlying the root protection areas of trees will be laid as outlined in section 5.2, on either the existing geo web base or on a new geo web base, with no excavation within these root protection areas.

### **6.4 New planting and soft landscape**

New planting within the root protection areas of trees should be carried out to avoid mechanical cultivation and for plants to be notch planted. Shrub beds are to be mulched, which, in addition to reducing weed growth, will enhance soil conditions round trees. Within grass areas, the height of mower blades are to be set above the level of surface tree roots to avoid damage and soil level raised above surface roots with a sandy composition of topsoil

## **References**

- British Standards 5837: 2012 Trees in relation to design, demolition and construction.
- British Standards 3998: 2010 Tree work
- Tree Preservation Orders - A Guide to Good Practice
- Diagnosis of ill health in trees - R G Sprouts and T G Winter - Forestry Commission Publication ISBN 0-11-753545-1
- Principles of tree hazard management - David Lonsdale - Forestry Commission Publication ISBN 0-11-753355-6
- The body language of trees - Claus Mattheck and Helge Breloer - Forestry Commission Publication ISBN 0-11-753067-0
- Arboriculture research and Information note 12 'Tree Root Systems'.
- Tree Roots and in the Built Environment John Roberts, Nick Jackson and Mark Smith. DCLG ISBN 13-978-0-11-753620-3
- Manual of Wood Decay Fungi- K. Weber and C. Mattheck - -The Arboricultural Association, ISBN 0- 900978
- Volume 4: NJUG Guidelines For The Planning, Installation And Maintenance Of Utility Apparatus In Proximity To Trees (Issue 2) – Operatives Handbook

**Appendix A**  
**Photographs of the site and trees**



**NORTHAW PLACE, COOPERS LANE, NORTHAW**  
Arboricultural Impact Assessment and Method Statement



**Above left-** the Norway maple (T1) within the corner of the garden. **Above centre-** the mature birch (T2) within the grounds of The Lodge. **Above-** the band of tree along Cooper Lane with the horse chestnut (T17) prominent in the foreground. **Below** - immature ash and oaks within the edge of the site.( T3, T4 & T5). **Bottom** - girdling canker on the horse Chestnut (T16)



**NORTHAW PLACE, COOPERS LANE, NORTHAW**  
Arboricultural Impact Assessment and Method Statement



Above and below left- a fungal pathogen and defective crown structure of the horse chestnut (T18). **Below right**- the basal growth and raised buttress of the ash (T42). **Bottom left & centre**- from afar the crown of the ash appears healthy. **Bottom right**- the cavity and the lowest lateral of the ash.



**NORTHAW PLACE, COOPERS LANE, NORTHAW**  
Arboricultural Impact Assessment and Method Statement



**Above** - the dead oak (T43) with good quality pine (T44) **Below left** - the leaning trunk of Horse chestnut (50). **Bellow centre-** the poorly formed hornbeam (T49). **Below right-** yews and hollies within the woodland. Bottom left -the tight fork of the twin stemmed horse chestnut (T46). **Bottom right-** the weeping buttress of the horse chestnut (T6 and oak (T7)



**NORTHAW PLACE, COOPERS LANE, NORTHAW**  
Arboricultural Impact Assessment and Method Statement



**Top left** - prolific ivy of the horse chestnut (T17 and T19) **Top right**- Immature trees, the dead oak (T43) and pine(T44). **Above and below left**- the two groups of trees (G1 and G2) both ivy covered sycamores growing along the road verge outside the site. Bottom centre and right- deadwood and storm damage limbs from horse chestnut tree (T17 and T18) overhanging Coopers Lane.- a potential hazard



## **Appendix B**

### **Tree Survey**

**NORTHAW PLACE, COOPERS LANE, NORTHAW**  
Arboricultural Impact Assessment and Method Statement

Tag	Tree	Age	Stem Diameter	Stem	Height	Lowest branch	lower crown	Category	North	South	East	West	condition		Recommendations	life expectancy	RPA
T1	Norway Maple <i>Acer platanoides</i>	M	350	1	12.4	2	2	B2	2.7	5.2	4.6	3.2	Good	Surface roots, cable and light fitment within the crown; some deadwood	crowns lift over drive and remove light fitting from tree	20 to 40	4.25
T2	Birch <i>Betula pendula</i>	M	220	1	14.8	3	3	B2	2.5	2.5	2.5	2	Good	within neighbouring garden- limited visibility		20 to 40	3
T3	Oak <i>Quercus robur</i>	S M	120	1	5.9	0.75	0.75		2.8	2.6	2.1	2.2	Good	Immature tree	Face back and crown lift over new railing and drive	40+	2
T4	Ash <i>Fraxinus excelsior</i>	Y	95	1	5.6	0.5	0.5	C2	2	1.5	1.7	2	Good	Immature tree	Face back and crown lift over new railing and drive	40+	2
T5	Oak <i>Quercus robur</i>	S M	125	1	5	1	1	C2	3.6	2	2.5	2.8	Good	Immature tree	Face back and crown lift over new railing and drive	40+	2
T6	Horse Chestnut <i>Aesculus hippocastanum</i>	M	340	1	11.5	1.5	2.5	C2	2.2	5.4	3.7	5.5	Fair	growing close to oak (T7), leaning to SW, surface roots- seem weeping of lower stem ( query pseudomonas infection)	REMOVE in favour of oak as limited potential	10 to 20	4
T7	Oak <i>Quercus robur</i>	M	340	1	13.4	2	2	B1	5.4	4.1	3.9	4.2	Fair	Close to horse chestnut, surface roots		20 to 40	4
T8	Hawthorn <i>Crataegus monogyna</i>	S M	90, 75	2	7	2	2	C2	2	1.1	0.6	3	Fair	Suppressed, hedgerow type tree	REMOVE	10 to 20	2

**NORTHAW PLACE, COOPERS LANE, NORTHAW**  
Arboricultural Impact Assessment and Method Statement

Tag	Tree	Age	Stem Diameter	Stem	Height	Lowest branch	lower crown	Category	North	South	East	West	condition		Recommendations	life expectancy	RPA
T9	Ash <i>Fraxinus excelsior</i>	S M	170	1	13	5	4	C2	2.5	2.3	0	5	Fair	Leaning tree	REMOVE	40+	2
T10	Elm <i>Ulmus glabra</i>	S M	150	1	13	4	4	C2	0.3	3	0	5	Fair	Sapling	REMOVE	10 to 20	2
T11	Elm <i>Ulmus glabra</i>	Y	80	1	10	2	2	C2	1.5	1.6	1.1	1.6	Fair	Sapling	REMOVE	11 to 20	3
T12	Holly <i>Ilex aquifolium</i>	S M	55, 80, 65	3	7	2.5	2.5	C2	1.9	1.8	1.6	2.2	Good	woodland tree originating from coppice stool	REMOVE	C2	2
T13	Yew <i>Taxus baccata</i>	S M	130	1	6	3	3	B2	3.3	1.8	1.5	2.3	Fair	Woodland tree, slight lean	REMOVE	20 to 40	2
T14	Holly <i>Ilex aquifolium</i>	S M	85, 100	2	7	2.5	2.5	C2	1.1	4.1	2.4	3.6	Fair	Woodland tree, slight lean	REMOVE	20 to 40	2
T15	Holly <i>Ilex aquifolium</i>	S M	100, 105	2	9	2.5	2.5	C2	3.6	2.4	2.3	4	Fair	Woodland tree, slight lean	REMOVE	20 to 40	2
T16	Horse Chestnut <i>Aesculus hippocastanum</i>	O M	710	1	19	5	5	U	7	2.7	12	4.3	Poor	re horse chestnut with severe canker on the trunk & discoloration- indicative of pseudomonas; ivy with fungal pathogen at the on stem ( oyster fungus)	Limited prognosis- investigate further re decay- REMOVE	less 10	8

**NORTHAW PLACE, COOPERS LANE, NORTHAW**  
Arboricultural Impact Assessment and Method Statement

Tag	Tree	Age	Stem Diameter	Stem	Height	Lowest branch	lower crown	Category	North	South	East	West	condition		Recommendations	life expectancy	RPA
T17	Horse Chestnut <i>Aesculus hippocastanum</i>	OM	995	1	30.4	5	6	C2	7.5	7.7	7.3	6.6	Fair	prolific ivy, major deadwood, lean-damage on the trunk. Storm damage	REMOVE	10 to 20	11.5
T18	Horse Chestnut <i>Aesculus hippocastanum</i>	OM	975	1	22.7	4	3	U	7.1	7	7.3	5	Fair	Storm damage, fungus at the base (possibly <i>ulmarius polyporus</i> ) Crown poorly formed from crown reduction; mal formed and with storm damage	With owner permission REMOVE	less 10	12
T19	Horse Chestnut <i>Aesculus hippocastanum</i>	OM	1000	1	26	2	1	C2	6.7	6.7	5.2	8.2		prolific ivy. Tree in decline	REMOVE	10 to 20	11.5
T20	Horse Chestnut <i>Aesculus hippocastanum</i>	SM	240	1	13.3	4	3	C2	4.4	1.8	1.2	4.4	Fair	One sided-suppressed from- little potential	REMOVE	10 to 20	3
T21	Sycamore <i>Acer pseudoplatanus</i>	SM	210	1	13.3	8	8	C2	3.7	0.7	1.5	3.4	Fair		REMOVE	10 to 20	
T22	Horse Chestnut <i>Aesculus hippocastanum</i>	Y	120	1	8	2	2	U	2.9	0.9	0.7	2.7	Poor	very poor suppressed	REMOVE	less 10	



**NORTHAW PLACE, COOPERS LANE, NORTHAW**  
Arboricultural Impact Assessment and Method Statement

Tag	Tree	Age	Stem Diameter	Stem	Height	Lowest branch	lower crown	Category	North	South	East	West	condition		Recommendations	life expectancy	RPA
T23	Horse Chestnut <i>Aesculus hippocastanum</i>	S M	320	1	8	2	2	C2	2.6	1.6	0	6	Fair	Poor form, suppressed, ivy with surface roots	REMOVE	10 to 20	4
T24	Sycamore <i>Acer pseudoplatanus</i>	S M	195	1	10	2	2	C2	0.7	3	0	6.2	Fair	Poor form	REMOVE	10 to 20	2.5
T25	Horse Chestnut <i>Aesculus hippocastanum</i>	Y	110	1	12	3	3	C2	0	2.8	0	2.5	Fair	Poor suppressed specimen	REMOVE	10 to 20	2
T42	Ash <i>Fraxinus excelsior</i>	O M	1.175	1	30.5	2	5	U C2	10	11	7.2	8.8	Poor	Planted on a mound, major storm damage, basal growth, deadwood, damage to the south west lateral, major cavities within the crown	Monitor- reduce damaged branch- monitor for ash dieback disease, unlikely to be sound- if considered a safety hazard REMOVE	less 10	13
T43	Oak <i>Quercus robur</i>	O M	1015	1	26.5	5	5	U	5.7	9.4	4.1	9.5	Poor	Major dieback in crown- little live wood	REMOVE	less 10	

**NORTHAW PLACE, COOPERS LANE, NORTHAW**  
Arboricultural Impact Assessment and Method Statement

Tag	Tree	Age	Stem Diameter	Stem	Height	Lowest branch	lower crown	Category	North	South	East	West	condition		Recommendations	life expectancy	RPA
T44	Pine <i>Pinus sylvestris</i>	M	550	1	22	15	15	B2	1.5	3.7	3	2.2	Fair	Specimen tree	REVIEW-Tree to be retained- however monitor as the tree has a high crown and removal of adjacent trees will expose the pine to wind blow	20 to 40	6.5
T45	Yew <i>Taxus baccata</i>	M	320	1	10.7	2	2	B2	4.5	3.3	4.5	4.1	Good	Branch stubs, slight lean	Clean	20 to 40	4
T46	Horse Chestnut <i>Aesculus hippocastanum</i>	M	340, 640	2	22	6	6	C2	6	5.1	8	5.6	Poor	Poor structure with twin stems a and tight fork, major deadwood	Clean- monitor- potential hazard, secondary stem	10 to 20	9
T47	Horse Chestnut <i>Aesculus hippocastanum</i>	M	380	1	18	5	4	C2	3.5	3.4	2.3	4	Fair	Suppressed, close to fence, limited potential	review- clean the crown	10 to 20	4.75
T48	Hornbeam <i>Carpinus betulus</i>	M	340	1	8	3	3	C2	4	5.6	5.4	3	Fair	Poor form, reduced at 3 metre	review- option coppice	10 to 20	4
T49	Yew <i>Taxus baccata</i>	S M	95, 100, 135	3	8	2	2	B2	3.6	2.6	3	1.7	Fair	On sided- woodland tree		20 to 40	2

**NORTHAW PLACE, COOPERS LANE, NORTHAW**  
Arboricultural Impact Assessment and Method Statement

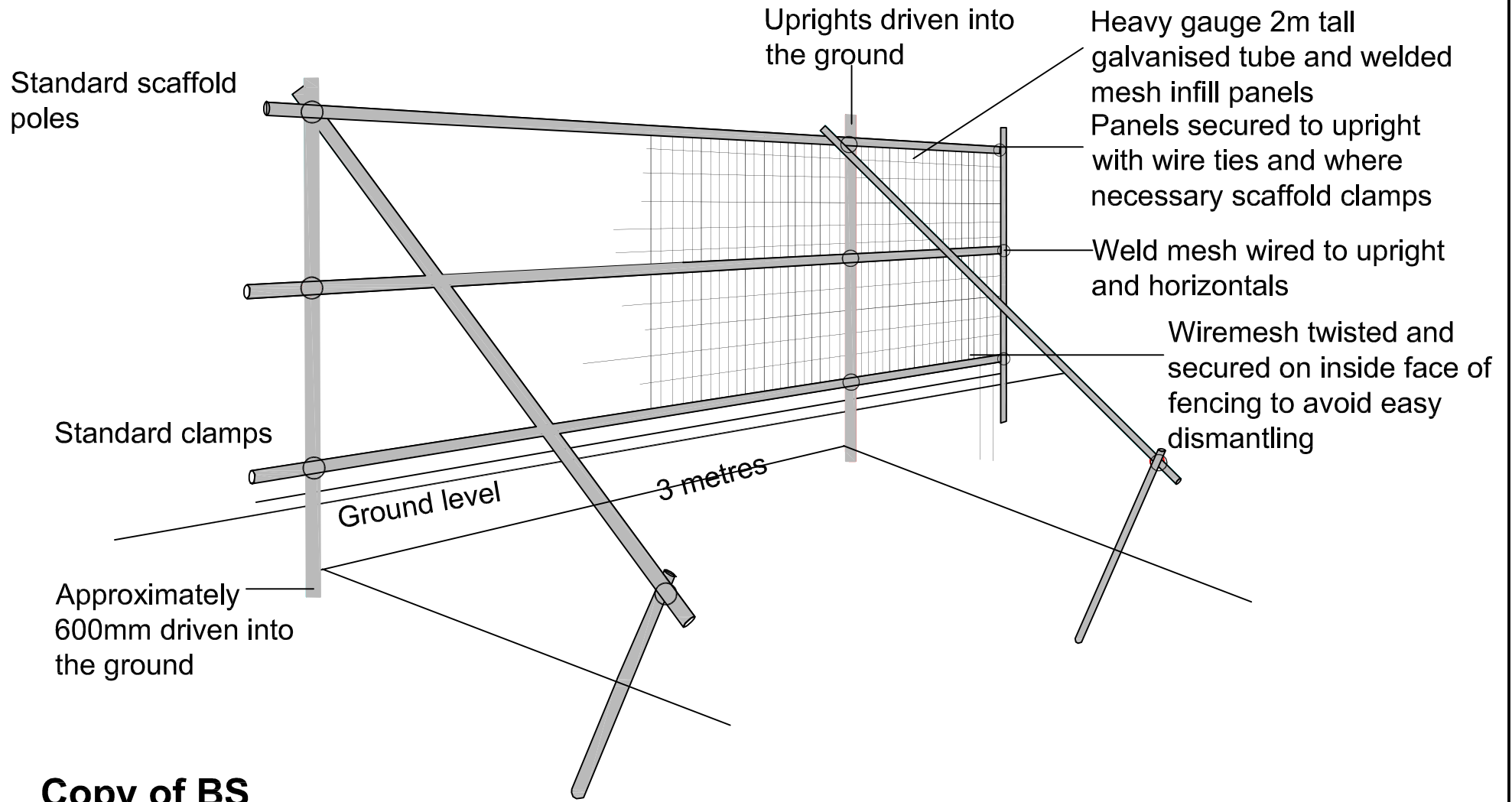
Tag	Tree	Age	Stem Diameter	Stem	Height	Lowest branch	lower crown	Category	North	South	East	West	condition		Recommendations	life expectancy	RPA
T50	Horse Chestnut <i>Aesculus hippocastanum</i>	OM	720	1	22	3	2	C2	7.1	3.2	5	5	Fair	Ivy ascending to upper crown, one sided, surface roots	Clean monitor re conditions	10 to 20	9
T51	Sycamore, <i>Acer pseudoplatanus</i> ,	M	280	1	19	6	6	B2	4.2	3	1.3	4.7	Fair	Etiolated form		20 to 40	3.5
T52	Norway Maple <i>Acer platanoides</i>	SM	210	1	14	3	3.5	C2	4.2	2	2	4.2	Fair		review	20 to 40	
T53	Sycamore, <i>Acer pseudoplatanus</i> ,	SM	370	1	16.7	4	3	B2	2.8	3.7	3.2	5.6	Fair	cavity in upper crown, surface roots		20 to 40	4.5
G1 T26 - T30	Sycamore, <i>Acer pseudoplatanus</i> , Ash <i>Fraxinus excelsior</i>	SM	200	1	14	3	3	C2	2	2	4	0	Poor	group of trees, T26-T30- ivy to 3 metre poor form with limited crown	Clean the crown and lean over the road	10 to 20	3
G2 T31 - T41	Sycamore <i>Acer pseudoplatanus</i> , Elm <i>Ulmus glabra</i>	M	300	1	17	4	4	C2	3	3	4	2	Fair	group of trees, T31-T41- ivy to 3 metre poor form with limited crown	Clean the crown and lean over the road	10 to 20	3.75

## **Appendix C**

### **Copy of BS5837:2012 Table 1 “Cascade Chart for Tree Quality Assessment”**

TABLE 1		Cascade Chart for Tree Quality Assessment- BS5837:2012 ( copies of table1 and 2)		
Category	Criteria			Identification on plan ( RAB subject to legibility of the plan)
<b>Category U</b>				
Those in such a conditions that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	Trees that have a serious, irremediable, structural defect, such a that their early loss is expected due to collapse including those that will become unviable after removal of other category U trees ( e.g. Where for whatever reason, the loss of companion shelter cannot be mitigated by pruning.) Trees that are dead or are showing signs of significant, immediate and irreversible overall decline. Trees infected with pathogens of significance to the health and/or so safety p of other trees nearby, or very low quality trees suppressing adjacent trees of better quality NOTE Category U trees can have existing or potential conservation value which might be desirable to			Dark red ( RAB 127-000-000)
<b>Trees to consider for retention</b>				
	1. Mainly arboricultural qualities	2. Mainly landscape qualities	3. Mainly Conservation qualities	
<b>Category A</b>				
<b>Trees of high quality</b> with an estimated remaining life expectancy of at least 40 years	<b>Trees that are particularly good examples</b> of their species, especially if rare or unusual; those that are essential components of groups or formal or semi formal arboricultural features ( e.g. The dominant and/or principal trees within an e avenue	<b>Trees, groups or woodlands or particular visual importance</b> as arboricultural and /or landscape features	<b>Trees, group or woodlands of significant conservation,</b> commemorative or other value (/e.g. Veteran trees or wood pasture)	Light Green (RAB 000-255-000)
<b>Category B</b>				
<b>Trees of moderate quality</b> with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but downgraded because of impaired cons conditions ( e.g. Presence of significant though remediable defects, including unsympathetic past management and storm damage) such as that they are unlikely to be suitable for retention beyond 40 years; or trees lacking the special quality necessary to merit category A designation	Tree present in numbers, usually growing in groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collections but situated a so as to make little visual contribution to the wider locality	Trees with materials conservation or other cultural c value	Mid blue (RAB -000-000-255)
<b>Category C</b>				
<b>Trees of low quality,</b> with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter of below 150mm	Unremarkable trees of limited merit such or such impaired condition that they do not qualify in higher categories.	Trees present in groups or woodlands but without this conferring on them significantly great collective landscape value; and/or tree offering low or only temporary/transient landscape benefits	Trees with no materials conservation or other cultural value	Grey (Rab 091-091-091)

**Appendix D**  
**Protective Barrier/ Fencing**

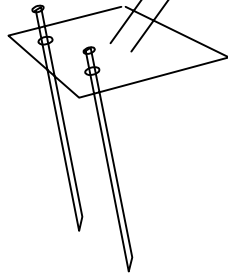


**Copy of BS  
5837:2012 Figure 2  
Protective barrier**

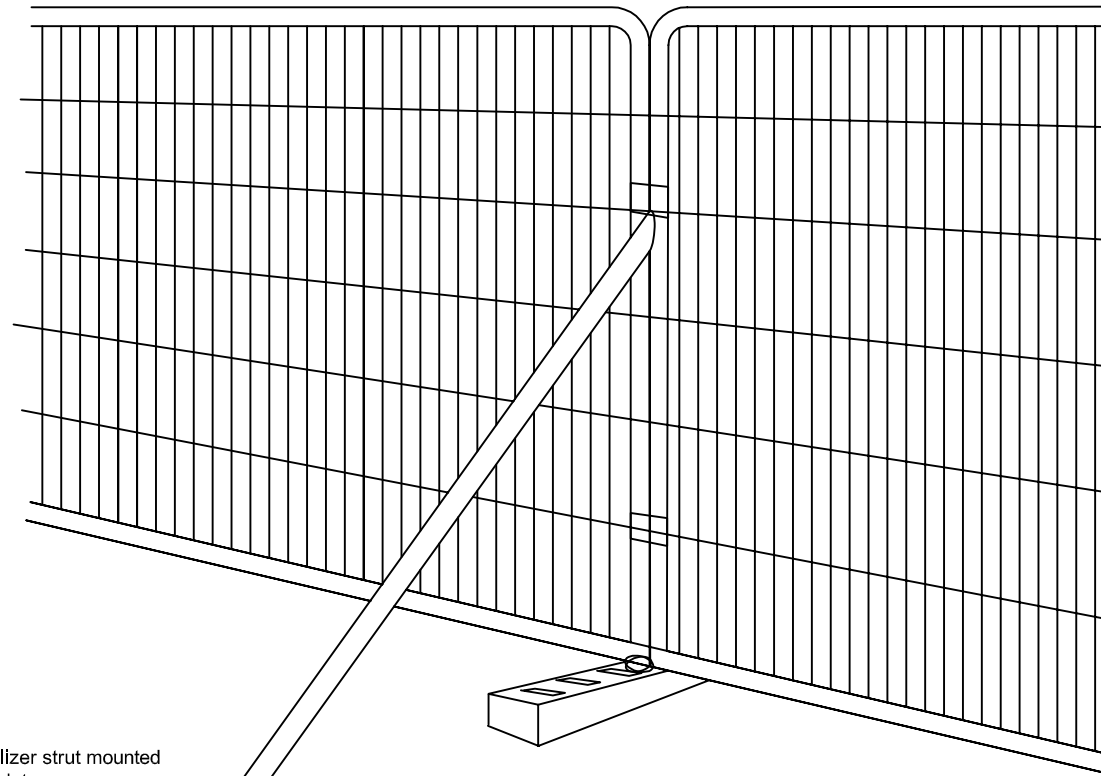
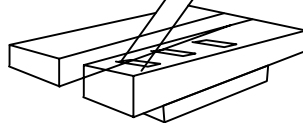
<p>Scheme <i>Copy of BS5837:2012 Tree Protection Details</i></p>	<p>Date <i>April 2012</i></p>
<p>Title <i>Protective Barrier</i></p> <p>Scale <i>A4. Not to scale</i></p>	<p>Drawn by <i>E.J.G</i></p> <p>Project no</p>
<p>Elizabeth Greenwood C.M.L.I., F.Arbor.A. 10 Knight Street, Sawbridgeworth, Herts, CM21 9AT. Tel 01279 722381 mobile 07746867402, email ms.ejgreenwod@gmail.com</p>	<p>Drawing number</p>

**Copy of BS 5837:2012  
Figure 3 Examples of  
above ground stabilizing  
systems (for Heras type  
fencing)**

a) stabilizer strut with base  
plate secured with ground  
pins



b) Stabilizer strut mounted  
on block tray.



<p>Scheme <i>Copy of BS5837:2012 Tree Protection Details</i></p>	<p>Date <i>April 2012</i></p>
<p>Title <i>Protective Barrie-Above Gound Stablization</i></p> <p>Scale <i>A4. Not to scale</i></p>	<p>Drawn by <i>E.J.G</i></p> <p>Project no</p>
<p>Elizabeth Greenwood C.M.L.I., F.Arbor.A. 10 Knight Street, Sawbridgeworth, Herts, CM21 9AT. Tel 01279 722381 mobile 07746867402, email ms.ejgreenwod@gmail.com</p>	<p>Drawing number</p>



**Appendix E**  
**Indicative Details for New Surfacing**

## Indicative Ground Protection during construction works

Construction details as outlined by 'Geosynthetics'

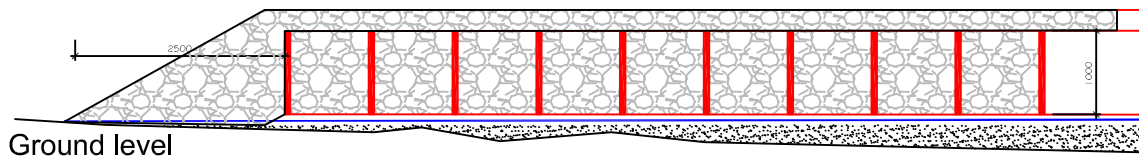
Remove turf by hand (50mm depth maximum)

Infill irregularities with 500mm sharp sand, Lay heavy duty geotextile (e.g.fibretext FEM geotextile)

Lay 200mm geo-web. Infill with no fines 20-40mm stone, and lay an additional 50mm depth of stone to act as wearing surface.

Allow stone to bank side of geo-web, with no edge restrainers.

This surface may be used as a base for the final surface.

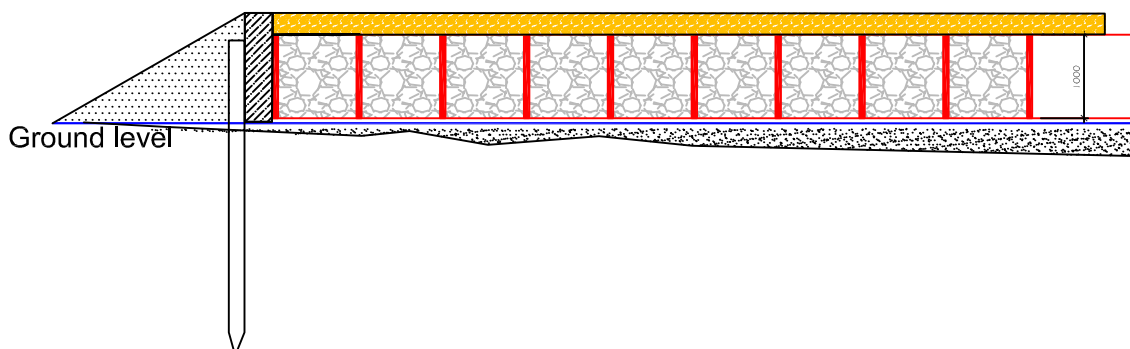


## Indicative Hard Surface Detail

Construction details as outlined by 'Geosynthetics'

Remove turf by hand (50mm depth maximum). Infill irregularities with 50mm sharp sand, Lay heavy duty geotextile (e.g. fibretext FEM geotextile). Lay 200mm geo-web. Infill with no fines 20-40mm stone,

Lay wearing course e.g tarmac or safety surface. Edge with timber edging and fix with timber pegs. Set edging 50mm from the edge of the hard surface. If the geo-web has been laid for construction works, remove surface, make up levels and lay proposed surface. Build up on the outer side of the edging with soil



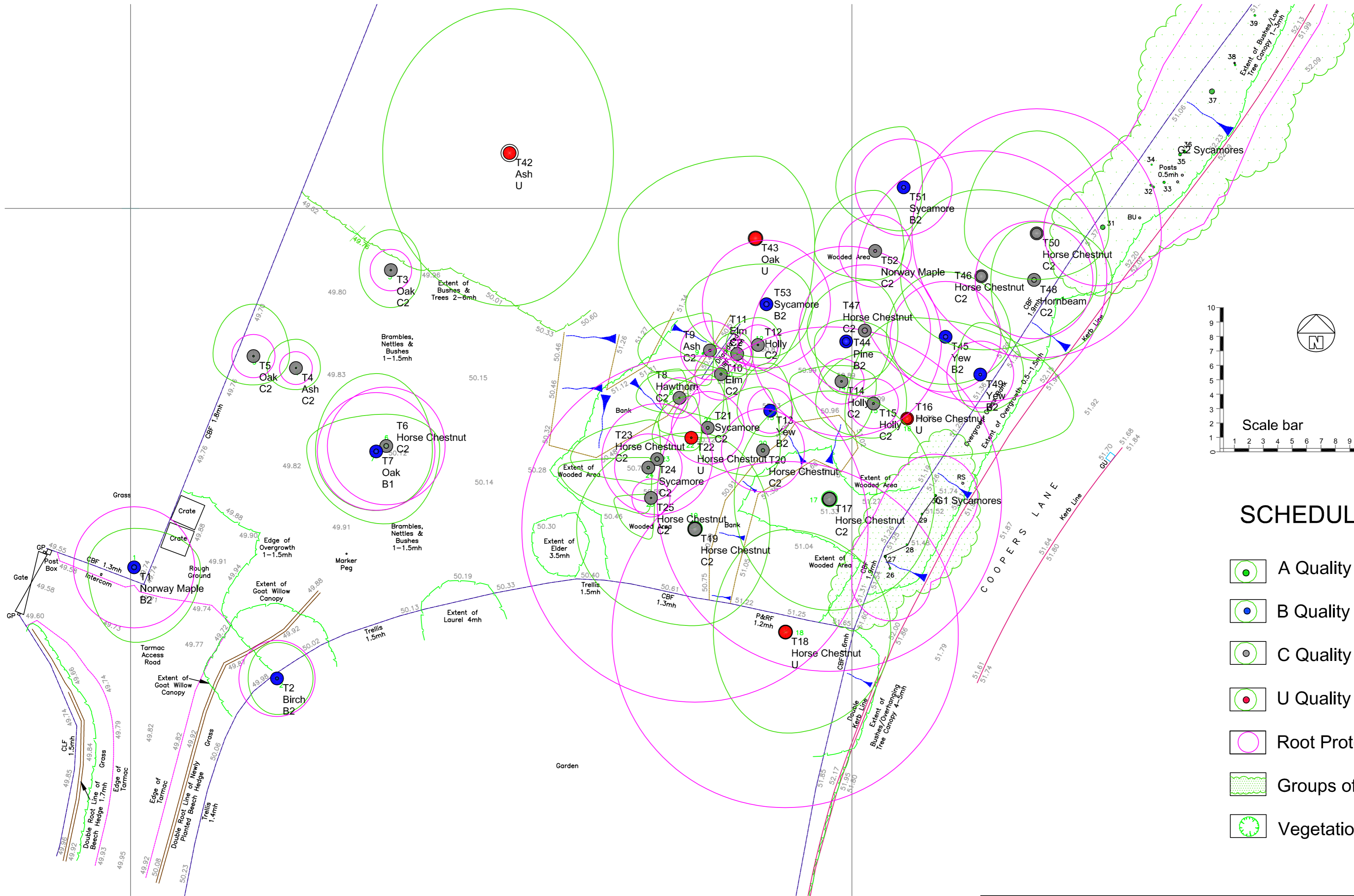
## **Appendix F**

### **Indicative Arboricultural Supervision**

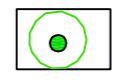
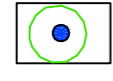
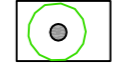
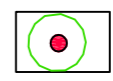
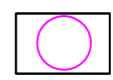
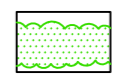
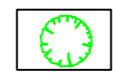
## Indicative Arboricultural Supervision

item	*Site supervision visit number	Estimated timing	Date of visit
Meet site foremen and discuss works and program. Marking trees to be removed; Setting out site and protective fencing, ground protection- site organization.	Visit 1	Prior to site clearance and demolition	
Setting out building, foundation excavation, trenches	Visit 2	Prior to construction	
Excavations/ changes of soil levels— and foundation and positioning of pile drivers details- inspect	Visit 3	During construction	
On completion- removal of tree protection, planting and remedial works- removal	Visit 4	Post completion	

**Appendix G**  
**Plan 513.14.1 Tree Constraints Plan**



### SCHEDULE

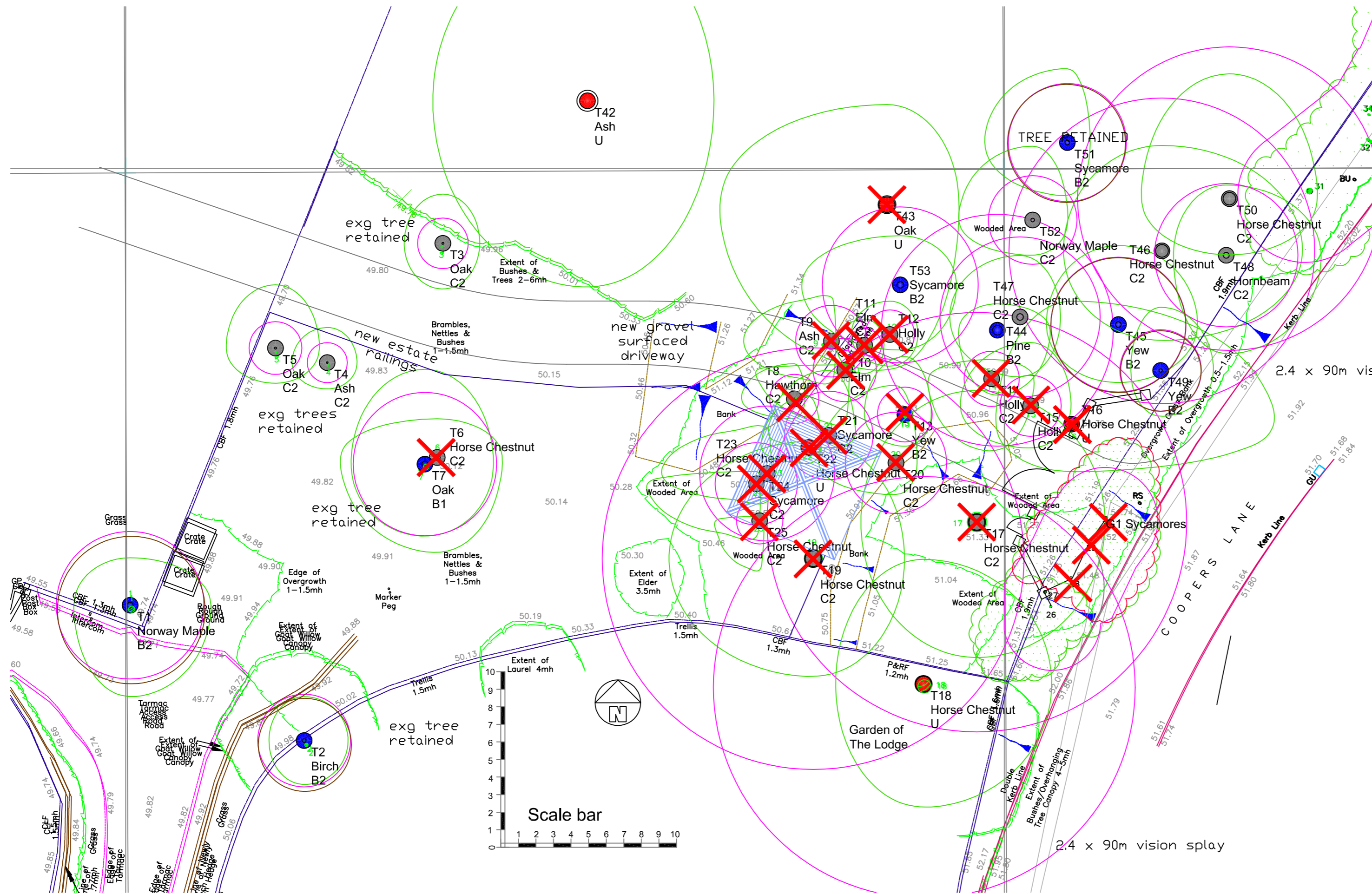
-  A Quality trees
-  B Quality trees
-  C Quality trees.
-  U Quality trees
-  Root Protection Areas (RPA)
-  Groups of trees
-  Vegetation not surveyed

This drawing is the copyright of Elizabeth Greenwood C.M.L.I., F.Arbor.A and may not be reproduced in whole or in part without written permission






Scheme <b>Northaw Place, Coopers Lane, Northaw</b>	Date <b>November 2014</b>
Title <b>Tree Constraints Plan</b>	Drawn by <b>E.J.G</b>
Scale <b>1:200 @ A2</b>	Job No <b>513.14</b>
Elizabeth Greenwood C.M.L.I., F.Arbor.A 10 Knight Street, Sawbridgeworth, Herts, CM21 9AT. Tel 01279 722381 mobile 07746867402, email ms.ejgreenwood@gmail.com	Drwg No <b>513.14.1</b> <b>Appendix G</b>

**Appendix H**  
**Plan 513.14.2 Tree Removal Plan**



Tree no	Species	Category	Management recommendations
T8	Hawthorn	C2	REMOVE
T9, T12, T14, T15	Hollies	C2	REMOVE
T10, T11	Elms	C2	REMOVE
T13	Yew	B2	REMOVE
T16 and T22	Horse chestnut	U	REMOVE
T17, T19, T20, T23, T25	Horse chestnut	C2	REMOVE
T21, T24	Sycamores	C2	REMOVE
G1 (3 trees)	Sycamores	C2	Outside the clients ownership- Remove 3 trees, Clean the crown over site and the road of remaining trees
G2	Sycamore-	C2	Outside the clients ownership- Clean the crown over the site and the road
T3, T4, T5	Ash and oak	C2	Face back and crown lift over new railing and drive
T6	Horse Chestnut	C2	Remove in favour of oak (T7) as limited potential
T42	Ash	U	Monitor- reduce damaged branch- monitor for ash dieback disease, unlikely to be sound- if considered a safety hazard in this position REMOVE
T45 and T49	Yew	B2	Face back and crown lift over new wall to allow for 1.5 metre working space
T43	Oak	U	REMOVE
T44	Scots pine	B2	REVIEW-Tree to be retained- however monitor as the tree has a high crown and removal of adjacent trees will expose the pine to wind blow
T46	Horse Chestnut	C2	Clean- monitor- potential hazard, secondary stem
T47 and T50	Horse Chestnut	C2	Clean the crown monitor re conditions
T48	Hornbeam	C2	Poor form- coppice
T18	Horse chestnut	U	Outside the clients ownership- potentially a hazardous tree REMOVE with permission ( or tree surgery to make safe)

### SCHEDULE

-  Trees to retain
-  Trees to remove
-  Root protection areas

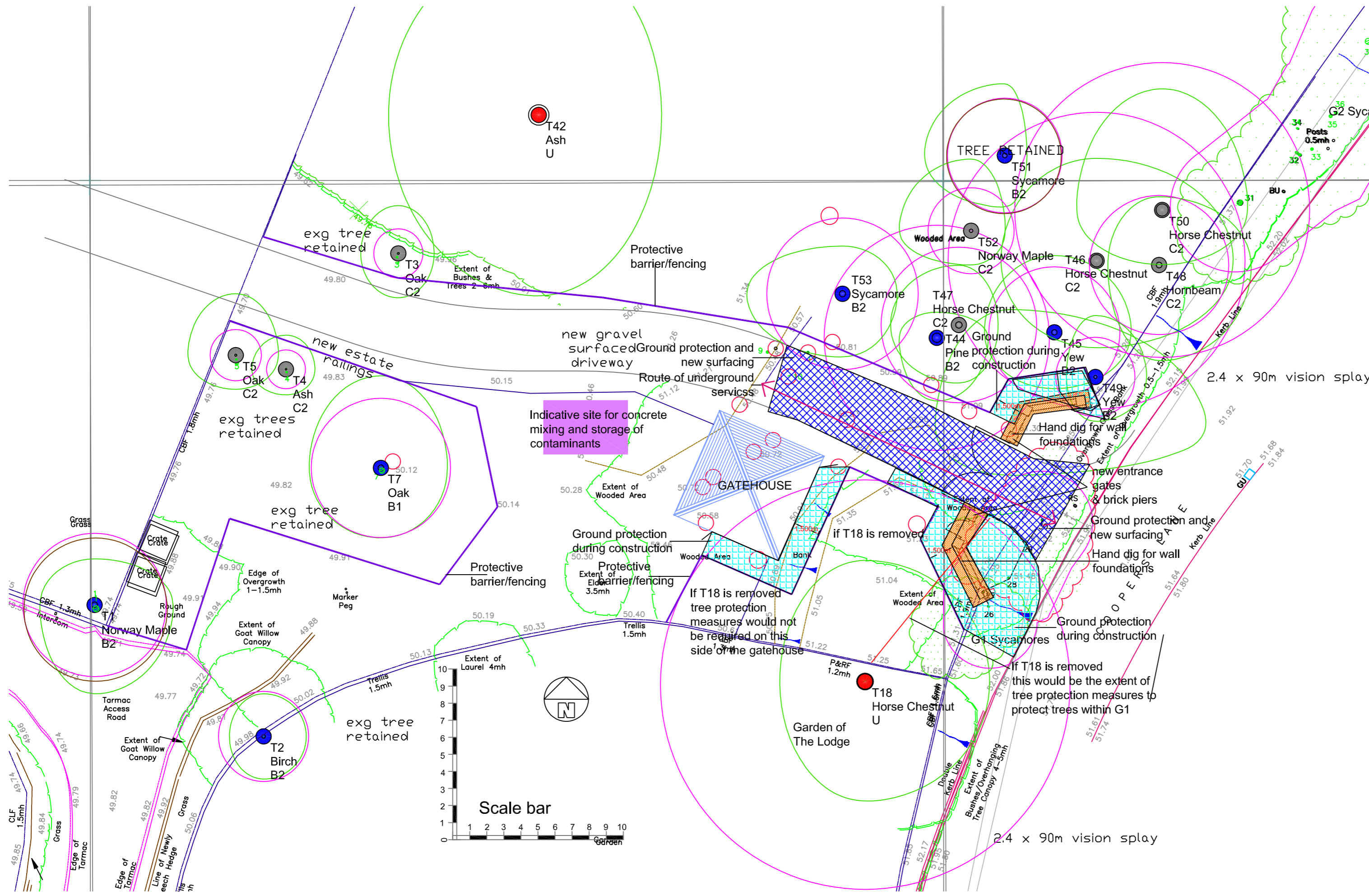
This drawing is the copyright of Elizabeth Greenwood C.M.L.I., F.Arbor.A and may not be reproduced in whole or in part without written permission



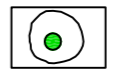

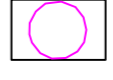
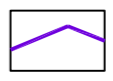
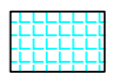
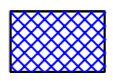
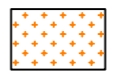


Scheme <b>Northaw Place, Coopers Lane, Northaw</b>	Date <b>November 2014</b>
Title <b>Tree Removal Plan</b>	Drawn by <b>E.J.G</b>
Scale <b>1:200 @ A2</b>	Job No <b>513.14</b>
Elizabeth Greenwood C.M.L.I., F.Arbor.A. 10 Knight Street, Sawbridgeworth, Herts, CM21 9AT. Tel 01279 722381 mobile 07746867402, email ms.ejgreenwood@gmail.com	Drng No <b>513.14.2</b> <b>Appendix H</b>



**Appendix I**  
**Plan 513.14.3 Tree Protection Plan**



### SCHEDULE

-  Trees to retain
-  Trees to remove
-  Root protection areas
-  Protective /barrier fencing
-  Ground protection during construction
-  Ground protection & new surfacing
-  Hand dig
-  Route of underground Services
-  Concrete mixing and storage of contaminants

This drawing is the copyright of Elizabeth Greenwood C.M.L.I., F.Arbor.A and may not be reproduced in whole or in part without written permission



Scheme <i>Northaw Place, Coopers Lane, Northaw</i>	Date <i>November 2014</i>
Title <i>Tree Protection Plan</i>	Drawn by <i>E.J.G</i>
Scale <i>1:200 @ A2</i>	Job No <i>513.14</i>
Elizabeth Greenwood C.M.L.I., F.Arbor.A. 10 Knight Street, Sawbridgeworth, Herts, CM21 9AT. Tel 01279 722381 mobile 07746867402, email ms.ejgreenwood@gmail.com	Drwg No <i>513.14.3</i> <i>Appendix 1</i>