

13 THE DRIVE, ICKENHAM, UB10 8AF

BS5837 TREE SURVEY, ARBORICULTURAL IMPACT ASSESSMENT AND METHOD STATEMENT.

Demolition of existing dwelling and construction of flats

Elizabeth Greenwood CMLI, F Arbor A.
ms.ejgreenwood@gmail.com



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Introduction

1.1 Contacts

1.0 Introduction

1.1. Contacts

Client - Mr. Mathew Singh 07476 100310 mathewsingh@gmail.com

Architects- Gillett Macleod Partnership

Arboriculturalist and Landscape Architect- Elizabeth Greenwood

Council. - Hillingdon Council

1.2 Testimonials

- 1.2.1 I am a Chartered Landscape Architect with 30 years of experience both in Local Government and in the private sector. My practice is registered with the Landscape Institute. I am also an arboriculturalist, holding the professional diploma in arboriculture. I am a Fellow of the Arboricultural Association.

1.3 Instruction

- 1.3.1 I have been instructed by Gillett Macleod Partnership to update the 2016 survey in view of amended proposals for the demolition of the two houses and construction of flats.

1.4 Scope

- 1.4.1 This report is carried out in accordance with BS5837. This document states the following with regard to scope:

'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.' (The British Standards Institution, 2012)

- 1.4.2 This report 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 the proposed development with minimal disturbance to trees and notable vegetation.
- 1.4.3. 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.
- 1.4.4. 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.

- 1.4.5. 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.

1.5 Background

- 1.5.1. The plot is set back from the road by a short drive, and the two dwellings are set centrally in a rectangular plot. Although surrounded on three sides by housing there is open space on the southern side between this garden and the M40,.
- 1.5.2. The levels survey shows that the plot is relatively level; from Ordnance Survey data the ground levels are between 55 and 60 metres above sea level. An artificial water feature has been constructed within the rear garden of the western house, a circular pool with rectangular ditchline with large pebbles
- 1.5.3 Most of both gardens are laid to lawn with trees present round the edges of the garden. Most trees appear to predate these later 21st century dwellings, and include a large weeping willow, and an unusual evergreen tree, a Pittosporum: this tree could be over a hundred years old
- 1.5.4 Two trees within these gardens are protected by 2000 dated Tree Preservation Order 464. These are the red oak TPO 8, and notated in this survey as T3, the weeping willow PTPO T9 notated as T1, and probably the Pittosporum, identified as TPO6 a Swamp cypress and numbered as T7. Also protected are the cypress trees along the drive, notated as TPOG1, and surveyed as G4. (See Appendix A)
- 1.5.5. An application to the local authority should be made and consent received prior to any tree works being carried out. If poor quality trees are to be removed, then adequate provision should be made for replacement planting as part of the design proposals.
- 1.5.6. Other trees within the grounds are currently not protected by a Tree Preservation Order; they are not growing within a Conservation Area and are not protected by any other Planning Legislation. This situation may change, and the client is advised to make further inquiries prior to any tree work.
- 1.5.7 Geological Description:
Bedrock Geology: According to the British Geological Survey the underlying geological formation is of London Clay of silts, sands, and clays.
Superficial Deposits: Superficial deposits have been recorded as Black Park Gravel Member of sand and gravel.
- 1.5.8. Soil
- o **Soilscape 17:**
Slowly permeable seasonally wet acid loamy and clayey soils
 - o **Texture:** Loamy and clayey
 - o **Drainage:** Impeded drainage
 - o **Fertility: low**
 - o **Habitats:** Seasonally wet pastures and woodlands
 - o **Water protection:** Main risks are associated with overland flow from compacted or poached fields. Organic slurry, dirty water, fertiliser, pathogens, and fine sediment can all move in suspension or solution with overland flow or drain water

1.6 Documentation

1.6.1. The following documents were provided Bu Gillet Macleod Partnership:

- 17/3101/1 B Existing site plan
- 17/3101/2 G Proposed site plan

1.6.2. Plans showing the details as outlined in this method statement are included in the appendix to this report (Appendices H, I and J)

1.7 Survey

- The site was visited on 22 October 2020
- Clear skies, sunny 16 degree and gentle breeze
- With good visibility
- Photographs were taken of the trees, which are included in Appendix A.
- The camera used to take these photographs was Lumix digital camera with a Leica zoom lens

1. Tree Survey Criteria

2.1 Outline

2.1.1. Photographs of many of the trees and full details of this tree survey are included on tree survey sheets. (Appendices B and C) The 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. (e.g. Y = young, SM = semi-mature, EM = early mature, M = mature, OM = over-mature);
- 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. Tree survey information has been added to the topographical survey plan and details have been amended for the purpose of this report. Appendix [G].

2.1.3. It is important to note that the survey and evaluation of trees is only relevant to site conditions at the time of survey. If there is any change in the site conditions, and especially within the root protection area the trees, the site may need to be re-surveyed and the

potential longevity of the trees re-evaluated. In the event of adverse weather conditions, the survey should be repeated or rescheduled.

- 2.1.4. Regardless of the development proposals there should be regular inspection and monitoring of trees at a frequency dependent on their condition and age. **This tree survey is only valid for a 3 year period from the date of the survey.**

2.2 Guidance

- 2.2.1. British Standard 5837:2012: 'Trees In relation to design, demolition and construction – Recommendations'.

2.2.2 Categories:

The aim of the guidelines is to provide an assessment of the amenity values of the trees. The recommendations provide four categories in which trees should be placed for assessment purposes. These assessment categories are reproduced in Appendix D, Table1, "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 condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

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. Root Protection Areas:

The British Standard Recommendations 5837:2012 provide a formula for calculating the Root Protection Area (RPA) required to be protected for existing trees that area to be retained.

- For single stem trees, the RPA (see 3.7) should be calculated as an area equivalent to a circle with a radius 12 times the stem diameter. For trees with more than one stem, one of the two calculation methods below should be used. In all cases, the stem diameter(s) should be measured in accordance with Annex C, and the RPA should be determined from Annex D. The calculated RPA for each tree should be capped to 707 m².
- For trees with two to five stems, the combined stem diameter should be calculated as follows:

$$\sqrt{(\text{stem diameter } 1)^2 + (\text{stem diameter } 2)^2 + \dots (\text{stem diameter } 5)^2}$$

- For trees with more than five stems (not illustrated in Annex C), the combined stem diameter should be calculated as follows: $\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$

Root protection areas are indicated as a radius on plan. In the event of root restrictions from, for example, deep foundations or a retaining wall, topography, drainage, soil type, soil

structure, or soil disturbance the approximate area is represented by a polygon, as dictated by this British Standard.

2.2.4. Protective Fencing and Root Protection:

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.

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.

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.

2.2.5. 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.

Existing levels within the root protection areas of trees should be retained.

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.

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. Tree Survey

2.1 Summary

- 2.1.1 The protected weeping willow (T1 and TPO 9) is over 19 metres high with a spread of on average 6 metres. There is ivy ascending on the lower part of the trunk. The trunk is twisted and is divided at 2 metres with included bark present, the secondary stem has been removed at 5 metres. On the eastern side there is discoloration of strip of bark descending from this stem division, which resounded as hollow when hit with a hammer. On the western side the pouch of discoloration is present below this division, with bulging and softness of bark, indicating possibly extensive decay. There is dieback and major deadwood in the crown and broken branches from storm damage. Tree surgery will be required to address safety. It is categorized as a 'C2' quality tree with a 12.25 metre radius root protection area.**
- 2.1.2. Three semi -mature trees are present along this western boundary: a good quality ash (T2), leaning and unbalanced red oak (T3) and a sucker from the multi-stem false acacia (T4) within the grounds of the neighboring property. Only the red oak is protected by this tree preservation order as a leaning tree it is classified as of 'C2' quality with a 2.6 metre radius root protection area.**
- 2.3.3 Four other trees are present in this western garden, a well-formed immature and probably self-set ash (T5), two cherry plums (G1) and a small Japanese maple (T6)- which although of**

slightly impaired form could be transplanted.

- 2.3.4 The large mature twin stemmed Pittosporum (T7) is 12.75 metres high with a tight fork between its co-dominant stems. There is damage on the buttress with a wound 500mm 500mm and exposed bark. There are pruning wounds within the lower canopy and some tree work would be advised to improve its form. Although not directly named within this tree preservation order, this is an unusual species, and it is probable that it is protected as being the swamp cypress. It has a 6.6 metre radius root protection area and but owing to its impaired condition it is categorized as a 'C' 2 tree.
- 2.3.5. The other protected trees are the group of beech and Lawson cypress (TPOG1 and notated as T13, T14, and G4 in this survey) which have been subject to poor quality tree surgery along the drive. They still provide some screen planting between properties and either there should be additional tree surgery to improve their form or they should be replaced.
- 2.3.6. Only one immature ash is present (T8), close to the eastern boundary of the property and close to the neighbouring house- with little potential as being potentially too large for this location, replacement with smaller trees or screen shrub planting would be advised . A further ash lies on the north eastern corner of the drive outside the site boundary (T12) Overgrown shrubs along this boundary (T9 and T10) and a holly provide some screening and should be retained.
- 2.3.7 Other trees surveyed include some laurel (G2), a bay (T11), and outside the boundary a multi-stem ash (T12): their root protection areas are shown on the tree constraints plan. Two Lawson cypresses (T15 and T16) within the adjacent garden have also been surveyed (See Appendix H).

3.2 Categories

- 2.3.8. The British standard categorization has been reproduced in appendix C of this report. The tree survey has identified the following trees in each category as follows: -

Category	Number of trees	Tag number	Species
A	0		
B	5	T2, T3, T4, T5, T12	Ash, red oak, False acacia, and Ash
C	11 and 4 groups	T1, T6, T7, T8, T9, T10, T13, T14, T15, and T16, G1, G2, G3 and G4	Weeping willow, red oak, ash, Japanese maple, ash trees, bay, Lawson cypresses and groups of cherry plum, laurel and holly, laurel, and beech and holly
U	0		
TOTAL	16 and 4 groups of trees		

4. Arboricultural Impact Assessment

4.1 Assessment

- 4.1.1 Demolition and the construction of the new flats will have an impact on the protected weeping willow. Mitigation will be required to minimise damage to this tree, however this tree is in an impaired condition and will require further inspection and tree work.

4.2 Mitigation

4.2.1 Summary of Impact

The impact of these proposals and mitigation requirements are summarized in the following table:

No.	Species	Effect	Tree Surgery	Protective Barrier	Mitigation			
					Ground Protection	Construction for Surfacing	Foundation Design	Hand Dig
T1	Weeping willow	Building within RPA	Tree surgery	Yes	Yes	Yes	yes	Yes

4.2.2 Incursion into RPA

The 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:

No.	Species	RPA	Incursion into RPA	% into RPA	Impact
T1	Weeping willow	245	14sqm	6%	Footprint of new building

- 4.2.3 Incursion into the root protection area of this tree is limited to 6 % of its root protection area with recommended mitigation by hand digging to minimise damage to this tree extensive root system

5 Arboricultural Method Statement

5.1 General

5.1.1 Issues Considered

Pre-construction works and site clearance:

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

Construction works:

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

- Site supervision

Post- Construction works:

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

5.2 Tree Works

5.2.1. 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.

5.2.2 Management:

Tag	Species	Category	Recommendations
T1	Salix X chrysocoma (Weeping Willow)	C2	Further aerial inspection to be carried out. Option-crown reduction up to 30 percent, reduce height to 15, spread to 5m- Long term prognosis poor-Option consider removal at this stage
T2	Fraxinus excelsior (Ash)	B2	Monitor for ash dieback disease
T3	Quercus rubra (Red Oak)	B2	
T4	Robinia pseudoacacia (False acacia Tree)	B2	
T5	Fraxinus excelsior (Ash)	B2	Monitor for ash dieback disease
T6	Acer palmatum (Japanese Maple)	C2	REMOVE-could be transplanted
T7	Pittosporum	C2	Review long term retention. Clean the crown removing branch stubs and deadwood
T8	Fraxinus excelsior (Ash)	C2	Review retention-This tree is potentially large and could be replaced. Monitor for ash dieback disease
T9	buddleia	C2	Retain to provide screening between properties
T10	Prunus laurocerasus (Cherry Laurel)	C2	Retain to provide screening between properties
T11	Laurus nobilis (Bay)	C2	Retain
T12	Fraxinus excelsior (Ash)	B2	Outside site boundary- Monitor for ash dieback disease
T13	Chamaecyparis lawsoniana (Lawson Cypress)	C2	Poor- review long term retention
T14	Chamaecyparis lawsoniana (Lawson Cypress)	C2	Poor- review long term retention
T15	Chamaecyparis lawsoniana (Lawson Cypress)	C2	Outside site, face back lower foliage overhanging the drive

Tag	Species	Category	Recommendations
T16	<i>Chamaecyparis lawsoniana</i> (Lawson Cypress)	C2	Outside site boundary
G1	<i>Prunus cerasifera</i> (Cherry Plum)	C2	REMOVE
G2	<i>Ilex aquifolium</i> (Holly), <i>Prunus laurocerasus</i> (Cherry Laurel), <i>Caenothus</i>	B2	Retain as screen planting
G3	<i>Prunus laurocerasus</i> (Cherry Laurel)	C2	
G4	<i>Fagus sylvatica</i> (Beech), <i>Ilex aquifolium</i> (Holly)	C2	Consider height management to 7 metre in the long term

5.2.3. Removal of Trees:

One Japanese maple (T6) will need to be removed, although there is an option that this tree could be transplanted. A group of two cherry plums (G1) will also require removal.

5.3 Tree Protection

5.3.1. 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".

5.3.2. 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.

- 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;
- 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. 150 mm depth of woodchip), laid onto a geo-textile membrane.
- For wheeled or tracked construction traffic exceeding 2t 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.

5.3.3. Demolition

- Prior to demolition the trees and hedges to be retained should be fenced off and ground protection installed within their root protection area.

- b) For the trees along the drive the crown should be faced back to ensure there is clearance under the canopy to remove building materials
- c) All heavy machinery and demolition vehicles should be positioned within the footprint of the building.
- d) No material should be stored under the tree canopies
- e) All hard surfacing to be removed by hand with care so as not to damage tree roots and stored outside the tree root protection areas.
- f) If temporary surfacing is required, this should be in accordance with ground protection outlined above.

5.4 Methods of Construction for Development

5.4.1. 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 post and for cultivation for soft landscape areas. All hand digging within the root protection areas of trees should be supervised by a competent arboriculturalist.

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 25mm 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.

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.

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.

5.4.2. Surfacing within the Root Protection Area

Hand digging will also be required for any excavations. The following measures should also be employed to minimise damage to tree roots.

- 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.

5.4.3. 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.

5.4.4. 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.

5.4.5 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.

5.5 Post Construction and Landscaping near Trees.

5.5.1. Removal of fencing and ground protection

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

5.5.2. Remedial works and soil improvement

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.

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 a mulch NPK fertilizer should be added to counteract the nitrogen depletion of the soil. There are options for additives of mycorrhizal 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.

5.5.3. 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

Appendix A: Tree Preservation Order 464.



tpo 464

Land at 15 The Drive,
Ickenham

Map Research 07/08/2000

1:1250



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- Unscheduled Trees
- Scheduled Trees
- current
- deleted/removed
- replaced
- TPO Boundaries
- area boundary
- group boundary
- t.p.o. boundary
- woodland boundary

Appendix B Photographs



Above and below- the protected weeping willow(T1) with indicative decay on the lower trunk and storm a damage and broken branches int eh crown- a tree beginning tot fail





Above left- the group of three trees along the western boundary (T2, T3 and T4) **Above centre-** the ash (T5) **Above right** the twin stemmed Japanese maple that could be transplanted. **Below left and centre-** the pittosporum (T7) and damaged buttress. **Below right** - the immature ash (T8)



Bottom left- the group of trees providing screen to the neighbouring garden (T8, T9 and T10). **Bottom right** the laurel (T10)





Above left - buddleia (T9) **Above right**- the line of holies and Laurel (G2) screening the neighbouring property. **Bottom left**- the twin stemmed ash (T12) **Bottom centre and right** - the line of beech and holies (G4) with the Lawson cypress (T15) within the adjacent garden



Appendix C: Tree Survey Sheets

Tag	Species	Age	Stem girth	Height	Lowest branch	Category	North	East	South	West	Condition	Life span	Notes	Recommendation	RPA radius	RPA sqm
T1	Salix X chrysocoma (Weeping Willow) Ptpo 9	OM	1020	19	5.75	C2	6.5	5.2	6.2	6	Fair	20+	The weeping willow (T1 and TPO 9) is over 19 metres high with a spread of on average 6 metres. There is ivy ascending on the lower part of the trunk. The trunk is twisted and is divided at 2 metres with included bark present, the secondary stem has been removed at 5 metres. On the eastern side there is discoloration of strip of bark descending from this stem division, which resounded as hollow when hit with a hammer. On the western side the pouch of	Further aerial inspection to be carried out. Option- crown reduction up to 30 percent, reduce height to 15, spread to 5m- Long term prognosis poor- Option consider removal at this stage	12.24	471

													discoloration is present below this division, with bulging and softness of bark, indicating possibly extensive decay. There is dieback and major deadwood in the crown and broken branches from storm damage. Tree surgery will be required to address safety. It is categorized as a' C2 'quality tree with a 12.25 metre radius root protection area.			
T2	Fraxinus excelsior (Ash)	EM	230	13	3	B2	3.4	3.5	2.6	2.5	Good	40+	slight lean north	Monitor for ash dieback disease	2.76	23.9
T3	Quercus rubra (Red Oak) Ptpo 8	EM	240	13.75	2.5	B2	4.5	5.6	2.8	2.4	Good	40+	lean east		2.88	26.1

Tag	Species	Age	Stem girth	Height	Lowest branch	Category	North	East	South	West	Condition	Life span	Notes	Recommendation	RPA radius	RPA sqm
T5	Fraxinus excelsior (Ash)	EM	200	12	1.8	B2	2	2.7	2	3.4	Good	40+		Monitor for ash dieback disease	2.4	18.1
T6	Acer palmatum (Japanese Maple)	M	125	5	1	C2	1.8	1.5	1.5	1.8	Good	40+	Tight fork, included bark	REMOVE-could be transplanted	1.5	7.07
T7	Pittosporum	M	550	12.75	3	C2	3.3	3	3	2.2	Fair	20+	Damage to base, decay northern side, exposed wood 500x500, branch stubs, divides at 1.5m to 3 stems, ivy, pruning wounds, basal growth	Review long term retention. Clean the crown removing branch stubs and deadwood	6.6	137
T8	Fraxinus excelsior (Ash)	SM	95	7	2.2	C2	1.2	1.6	1.3	1.9	Fair	20+		Review retention- This tree is potentially large and could be replaced. Monitor for ash dieback disease	1.14	4.08
T9	Buddleias	M	225	6	1.5	C2	1.5	1	1.7	1.8	Fair	20+	Twin stem, heavily reduced	Retain to provide screening between properties	2.7	22.9
T10	Prunus laurocerasus (Cherry Laurel)	EM	110	5.7	0	C2	1.3	1.3	1.6	1.2	Fair	20+		Retain to provide screening between properties	1.32	5.47
T11	Laurus nobilis (Bay)	M	115	5(0)	0	C2	2	2	2.5	2	Fair	20+		Retain	1.38	5.98

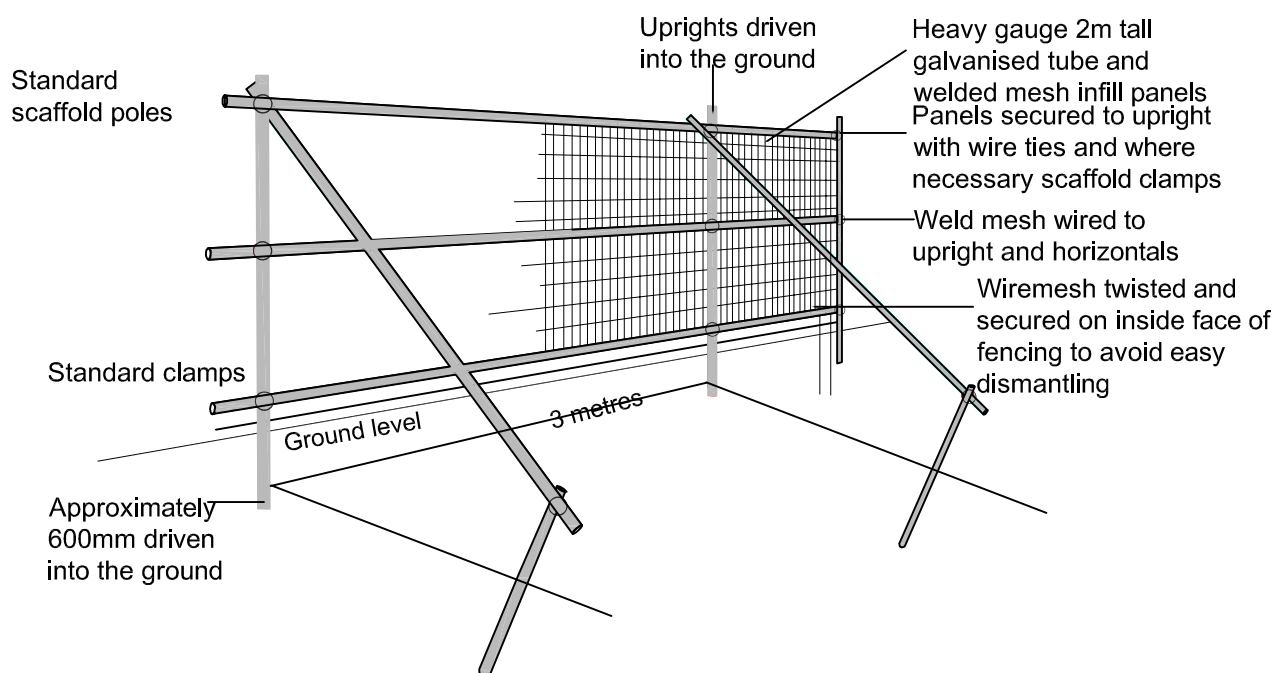
Tag	Species	Age	Stem girth	Height	Lowest branch	Category	North	East	South	West	Condition	Life span	Notes	Recommendation	RPA radius	RPA sqm
T12	Fraxinus excelsior (Ash)	M	304	14.5	3.5	B2	3.7	4.8	5	3.4	Good	40+	woodland tree, close to fence, pruning wounds,	Outside site boundary- Monitor for ash dieback disease	3.65	41.9
T13	Chamaecyparis lawsoniana (Lawson Cypress)	EM	230	11.75	1.5	C2	2.5	1.8	1.8	1.7	Poor	20+	poor form, reduced,	Poor- review long term retention	2.76	23.9
T14	Chamaecyparis lawsoniana (Lawson Cypress)	M	265	11.75	2.5	C2	1.5	1.8	1	1.8	Poor	20+	poor form, reduced at 3m with regrowth, damage on western side, callousing over	Poor- review long term retention	3.18	31.8
T15	Chamaecyparis lawsoniana (Lawson Cypress)	M	320	15	2	C2	3.1	3.5	3.5	3.1	Fair	20+	Tight forks, included bark, poor structure, no access- outside site boundary within 15 The drive	Outside site, face back lower foliage overhanging the drive	3.84	46.3
T16	Chamaecyparis lawsoniana (Lawson Cypress)	OM	320	12	1	C2	2.5	2.5	2.1	2	Fair	20+	No access, on fence, suppressed by willow,	Outside site boundary	3.84	46.3
G1	Prunus cerasifera (Cherry Plum)	M	200	8	1	C2	2.2	1.7	1.9	2	Fair	20+	Included bark present in fork. Crown distorted due to group pressure.	REMOVE	2.4	18.1

Tag	Species	Age	Stem girth	Height	Lowest branch	Category	North	East	South	West	Condition	Life span	Notes	Recommendation	RPA radius	RPA sqm
G2	Ilex aquifolium (Holly), Prunus laurocerasus (Cherry Laurel), Caenothus	M	200	6.5	0	B2	1	1	1	1	Fair	20+	Linear group, provide screening between properties-overhanging parking area	Retain as screen planting	2.4	18.1
G3	Prunus laurocerasus (Cherry Laurel)	M	269	7	0	C2	4	4	2	1.8	Fair	20+	Several multi stem laurels,		3.23	32.8
G4	Fagus sylvatica (Beech), Ilex aquifolium (Holly)	M	636	11	2	C2	2.5	3	2.5	3.7	Good	20+	Overgrown hedge	Consider height management to 7 metre in the long term	7.63	183

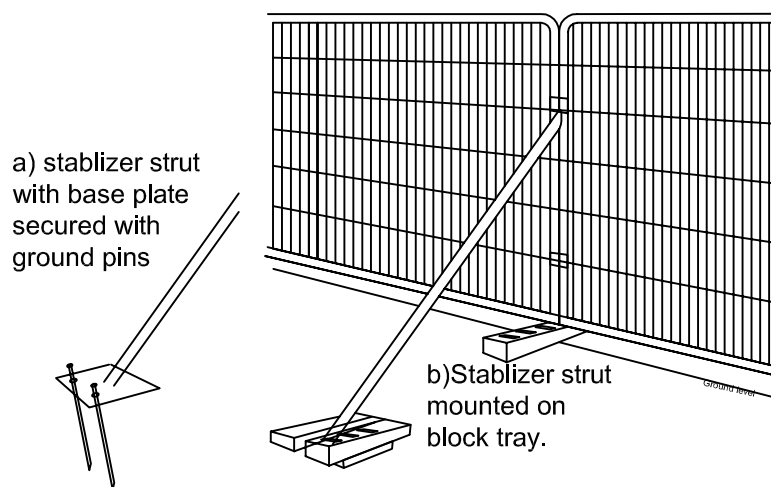
Appendix D: Copy of BS5837:2012 Table 1 “Cascade Chart for Tree Quality Assessment”

Category	Criteria			Identification on plan (RAB subject to legibility of the plan)
Category U (Formerly 'R')				
Those in such 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 preserve			Dark red (RAB 127-000-000)
Trees to consider for retention				
	1. Mainly arboricultural qualities	2. Mainly landscape qualities	3. Mainly Conservation qualities	
Category A				
Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples 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	Trees, groups or woodlands or particular visual importance as arboricultural and /or landscape features	Trees, group or woodlands of significant conservation, commemorative or other value (/e.g. Veteran trees or wood pasture)	Light Green (RAB 000-255-000)
Category B				
Trees of moderate quality 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)
Category 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	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 E: Protective Barrier and Fencing



**Copy of BS 5837:2012 Figure 2 (above) and Figure 3 (below)
Protective barrier, examples of above ground stabilizing
systems (for Heras type fencing) Total height 2.4metres
NOT TO SCALE**



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permission



Scheme <i>BS5837:2012</i>	Date <i>October 2017</i>
Title <i>Copy of Protective Barrier / Fencing</i> Scale <i>Drawings not to scale</i>	Drawn by <i>E.J.G</i> Job No
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	Drg No <i>Appendix</i>

Appendix F: Geo-web details



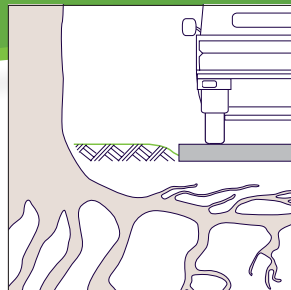
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GEOWEB®

TREE ROOT PROTECTION (TRP) SYSTEM

Powered by GEOSYSTEMS® technology.



defining **green** in cellular confinement

THE PROBLEM

CONSTRUCTION-RELATED TREE DAMAGE

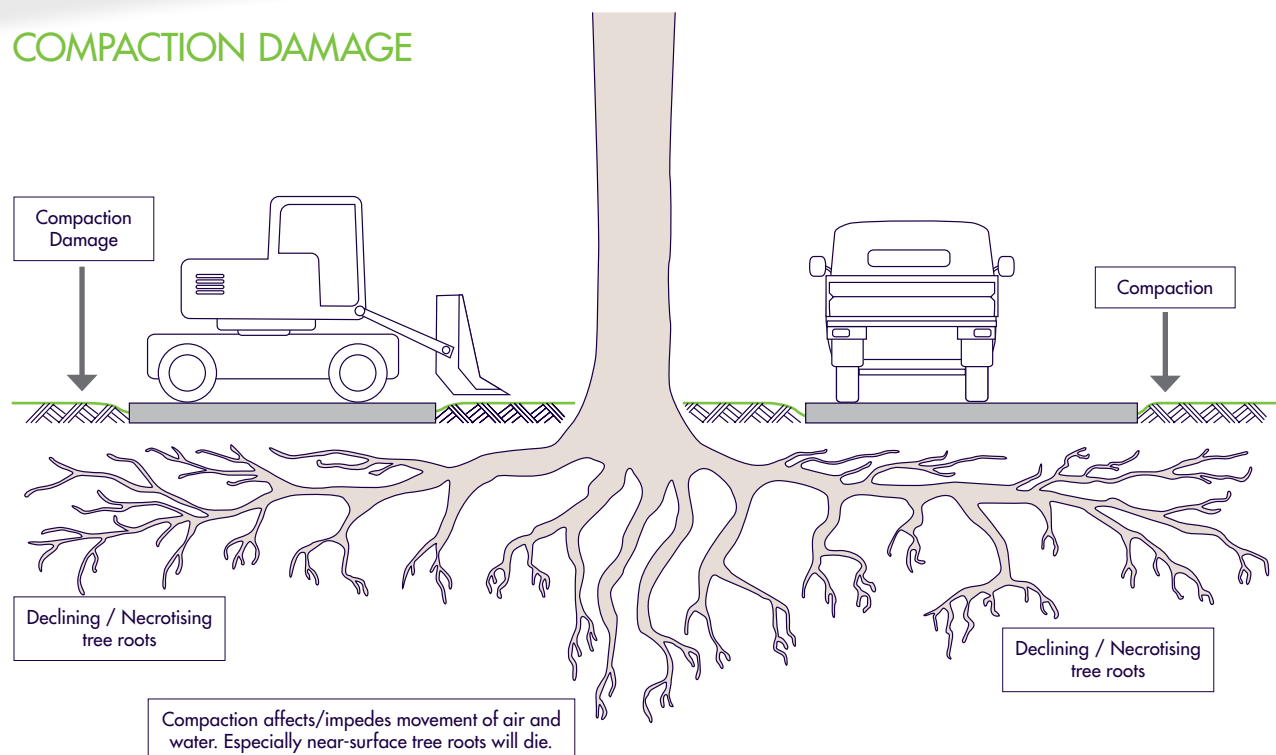
Critical Root Zone/Tree Protection Zone is the minimum area beneath a tree that must remain undisturbed to preserve a sufficient amount of root mass in order to give a tree a chance of survival.

When construction equipment and vehicles intrude a tree's Critical Root Zone, they can cause negative impacts to the soil environment including compaction of the soil, damage to near-surface roots and ultimately endanger the structural integrity of the tree. The majority of a tree's root system is contained within the top three feet of the surface, and construction excavation and compaction can damage or even destroy roots to the point where trees may not survive.

Tree Root Protection (TRP) systems should be eco-friendly as well as comply with local standards and regulations.



COMPACTION DAMAGE



THE GEOWEB® SOLUTION

TREE ROOT PROTECTION (TRP) SYSTEM

Used extensively in civil engineering construction for over 30 years, the GEOWEB® system is a three-dimensional structure that:

- provides strength to confined soils
- distributes loads laterally, not vertically
- reduces point loads
- reduces compaction of the subsoil

Manufactured from high quality, high-strength polyethylene with a textured surface and perforated walls, GEOWEB® cells with selected infill control shearing, lateral and vertical movement, and reduce subbase depth requirements.

The GEOWEB® system is a low impact development (LID) solution with exceptional load-bearing capabilities and environmental benefits. The system has a long history of solving heavy load support problems for roadways, road base support, parking lots, road shoulders, ports, trucking/intermodal terminals and railroads.

COST BENEFITS

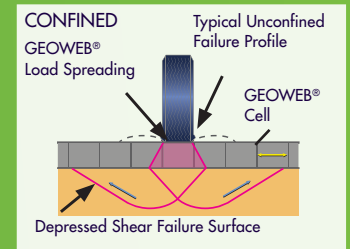
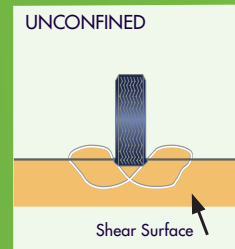
The GEOWEB® TRP system is an economical solution for reducing construction vehicle impact to the tree root zone compared with other methods. Once installed, the system has minimal-to-no visibility.

ENVIRONMENTAL BENEFITS

With permeable infill (topsoil/vegetation, aggregate, sand), perforated GEOWEB® cell walls offer environmental benefits:

- water infiltration
- lateral movement of air and water
- water and nutrient migration
- promotes root development

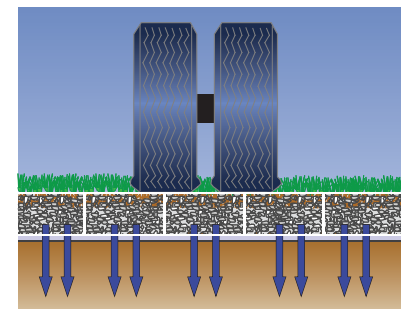
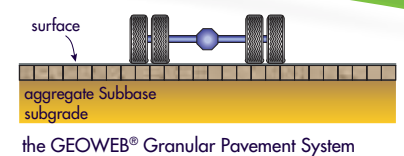
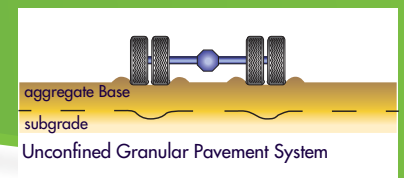
The tree root protection system can be a temporary or permanent solution.



LOAD DISTRIBUTION

By distributing and bridging applied loads, the GEOWEB® TRP system reduces vertical stresses that are typically applied to the underlying soil and root zone.

The GEOWEB® system is ideally suited for tree root protection applications where weak subsoil or no-dig restrictions exist.



GEOWEB®

TRP SYSTEM INSTALLATION

Step 1: Remove the upper grass and soft soils by hand or by machine if acceptable.

Step 2: Install a high-strength woven geotextile allowing adequate drainage as a separation layer between soft subgrade and GEOWEB® infill material.

Step 3: Expand GEOWEB® sections over the area to be protected and use temporary stakes or weights to hold sections open to prevent movement during infilling.

Step 4: Connect adjacent sections using ATRA® Keys. Position the sections so the slots are aligned, insert the key and turn 90 degrees locking the panels together. ATRA® Keys provide a long-term connection that is safer, quicker and stronger than staples or cable ties. In environmentally protected areas, ATRA® Keys can be used without the requirement for diesel-fueled compressors.

Step 5: For permeability, infill the fully connected GEOWEB® system with a well-graded, 25mm – 50mm granular, non-frost-susceptible quarried rock with no fines. Overfill by up to 50mm to allow for compaction.

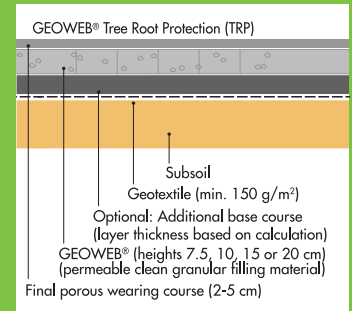
Step 6: Compact the fill material with conventional plant or non-vibratory plant when required. Fill should be maintained above the GEOWEB® system by a minimum of 10mm at all times or a permanent wearing course of blocks, porous asphalt or gravel installed.



DESIGN CONSIDERATIONS

It is important to ensure the correct GEOWEB® cell size and cell depth are specified and installed based on the anticipated pavement loads. These are calculated based on the following criteria:

- traffic type and loading
- frequency of traffic
- subgrade strength (typically CBR, Ev2, Cu or SPT values)
- infill type
- allowable settlement of the pavement



To assist you in determining the correct GEOWEB® solution for your application, Presto GEOSYSTEMS® or their network of distributors/representatives can assist with the calculation for your project. You can be confident that you will receive the most suitable and economical solution for your project.

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Presto GEOSYSTEMS® is committed to helping you apply the best solutions for your tree root protection needs. Our solutions-focused approach to solving problems adds value to every project. Rely on the leaders in the industry when you need a solution that is right for your application. Contact Presto GEOSYSTEMS® or our worldwide network of knowledgeable distributors/representatives for assistance.



PRESTO GEOSYSTEMS®

P.O. Box 2399
670 North Perkins Street
Appleton, Wisconsin 54912-2399, USA

P: 920-738-1328

TF: 800-548-3424

F: 920-738-1222

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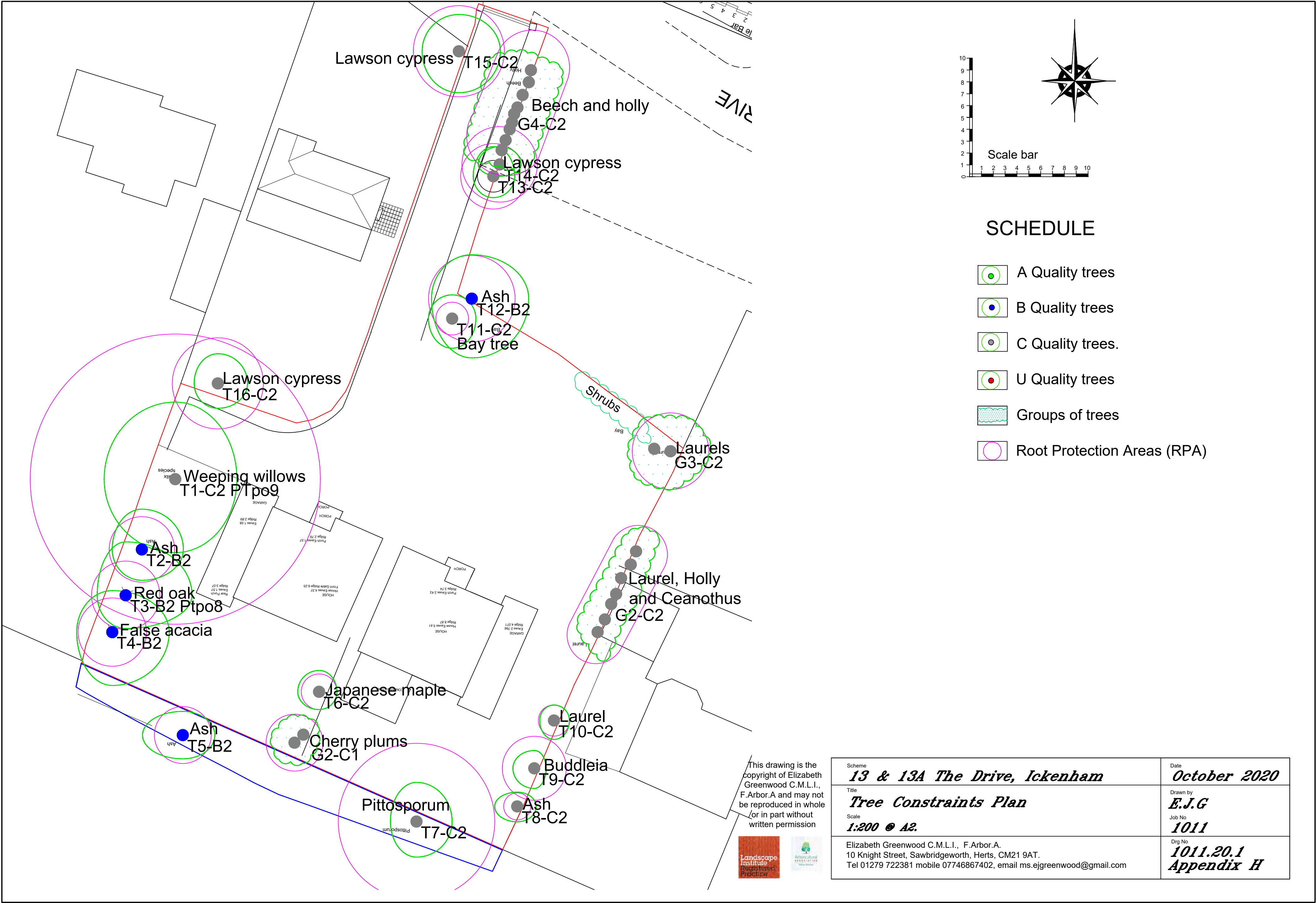
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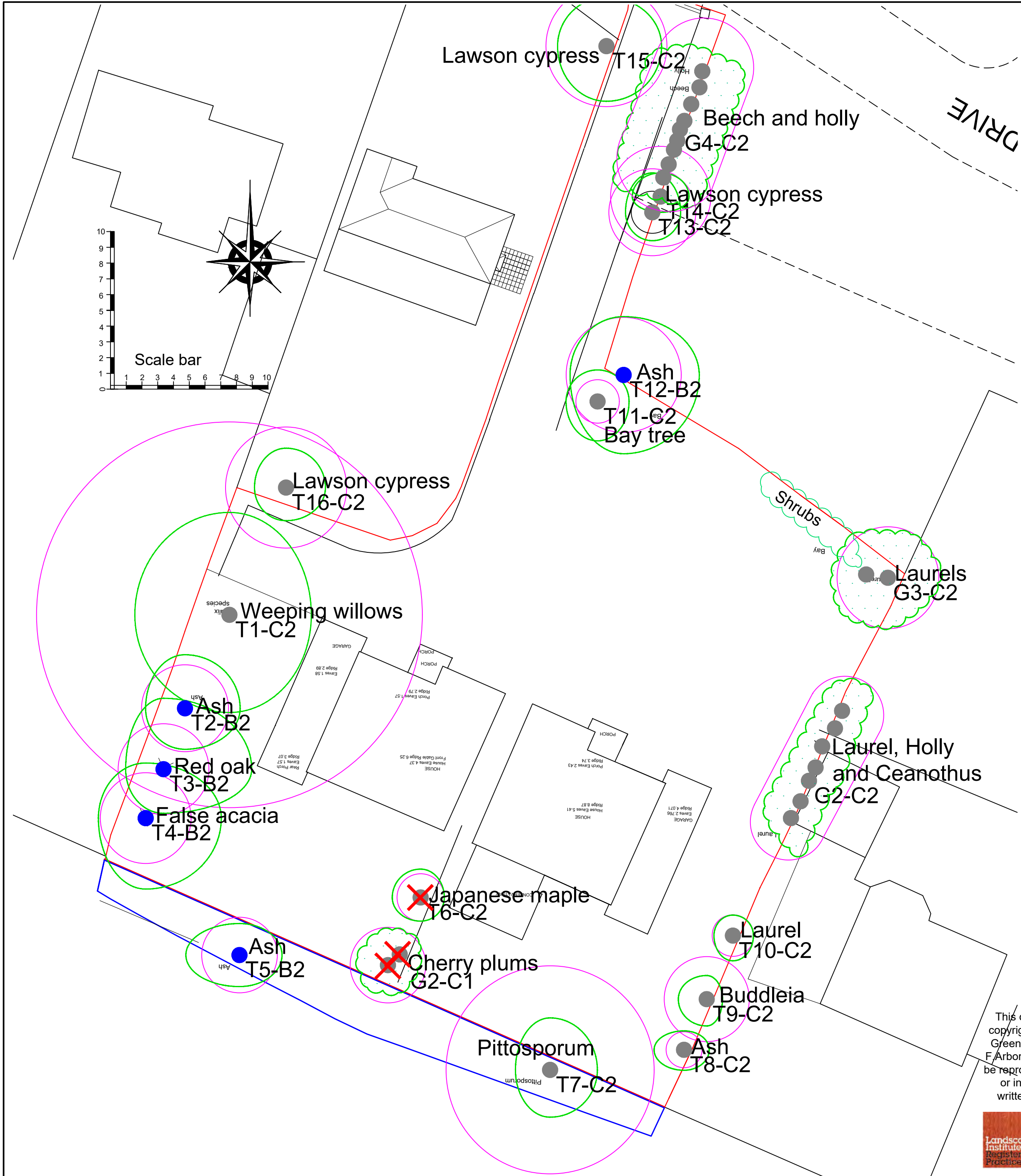
Appendix G: Indicative Arboricultural Supervision

Item	*Site Supervision Visit Number	Estimated Timing	Inspection	Date of Visit
Meet site foremen and discuss works and program. Setting out site and protective fencing, ground protection- site organization.	Visit 1	Prior to site clearance and demolition	1. Carry out tree removal and tree surgery and listed 2. Fence off all trees to be retained prior to demolition and site work 3. Provide and insert ground protection for the duration of construction works	
Setting out building, foundation excavation, trenches	Visit 2	Prior to construction	4. Carry out demolition and site clearance 5. Set up site working area	
Excavations/ changes of soil levels— and foundation and positioning of pile drivers details- inspect	Visit 3	During construction	6. Carry out construction 7. HAND DIG All excavation within the RPA of trees including foundation , fencing or new drain run as marked hand-dig within RPA of trees. 8. For new surfacing insert ground protection as above for use of site works	
On completion- removal of tree protection, planting and remedial works- removal	Visit 4	Post completion	9. On completion of works remove protective fencing and ground protection 10. Carry out remedial works as listed prior to landscape works 11. Carry out landscape works	

Appendix H: Plan 1011.20.1 Tree Constraints Plan



Appendix I: Plan 1011.20.2Tree Removals Plan



SCHEDULE

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

Tag	Species	Category	recommendation
T1	Salix X chrysocoma (Weeping Willow)	C2	Further aerial inspection to be carried out. Option- crown reduction up to 30 percent, reduce height to 15, spread to 5m- Long term prognosis poor-Option consider removal at this stage
T2	Fraxinus excelsior (Ash)	B2	Monitor for ash dieback disease
T3	Quercus rubra (Red Oak)	B2	
T4	Robinia pseudoacacia (False acacia Tree)	B2	
T5	Fraxinus excelsior (Ash)	B2	Monitor for ash dieback disease
T6	Acer palmatum (Japanese Maple)	C2	REMOVE-could be transplanted
T7	Pitisporum	C2	Review long term retention. Clean the crown removing branch stubs and deadwood
T8	Fraxinus excelsior (Ash)	C2	Review retention-This tree is potentially large and could be replaced. Monitor for ash dieback disease
T9	Budleia	C2	Retain to provide screening between properties
T10	Prunus laurocerasus (Cherry Laurel)	C2	Retain to provide screening between properties
T11	Laurus nobilis (Bay)	C2	Retain
T12	Fraxinus excelsior (Ash)	B2	Outside site boundary- Monitor for ash dieback disease
T13	Chamaecyparis lawsoniana (Lawson Cypress)	C2	Poor- review long term retention
T14	Chamaecyparis lawsoniana (Lawson Cypress)	C2	Poor- review long term retention
T15	Chamaecyparis lawsoniana (Lawson Cypress)	C2	Outside site, face back lower foliage overhanging the drive
T16	Chamaecyparis lawsoniana (Lawson Cypress)	C2	Outside site boundary
G1	Prunus cerasifera (Cherry Plum)	C2	REMOVE
G2	Ilex aquifolium (Holly), Prunus laurocerasus (Cherry Laurel), Caenothus	B2	Retain as screen planting
G3	Prunus laurocerasus (Cherry Laurel)	C2	
G4	Fagus sylvatica (Beech), Ilex aquifolium (Holly)	C2	Consider height management to 7 metre in the long term

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Scheme 13 & 13A The Drive, Ickenham	Date October 2020
Title Tree Surgery and Removal Plan	Drawn by E.J.G
Scale 1:200 @ A2.	Job No 1011
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	Drg No 1011.20.2 Appendix 1

Appendix J: Plan 1011.20.3 Tree Protection Plan

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. 100mm 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.

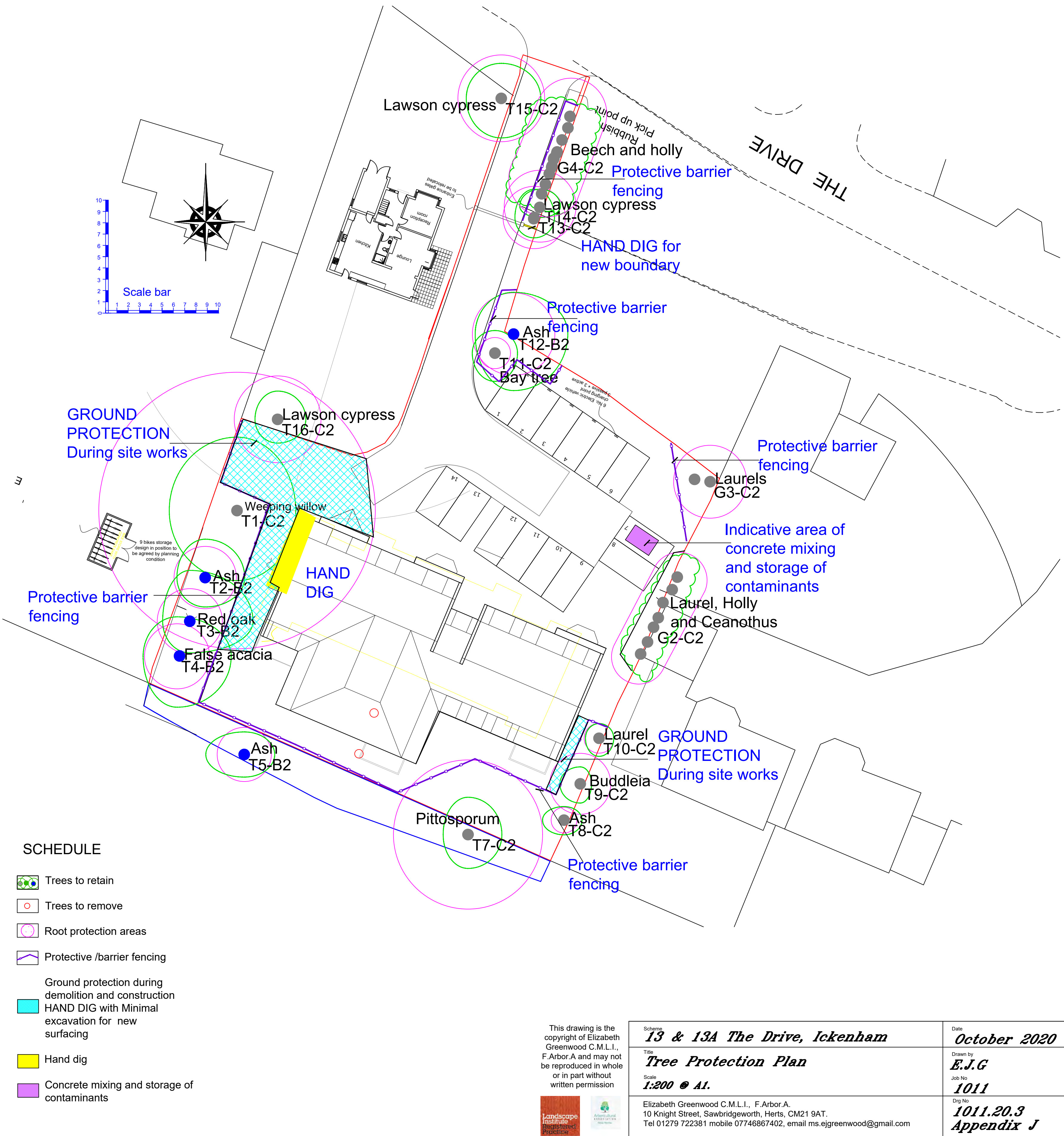
Hand dig

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

- a. 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.
- b. 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.
- c. 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.

Method of working

- 1. Carry out tree surgery and tree removal as outlined.
- 2. Fence off as shown with approved fencing
- 3. Lay ground protection as specified
- 4. Carry out demolition- do not store rubble within root protection area unless there is ground protection in situ
- 5. Excavation area for foundation of building by hand as indicated on plan.
- 6. Carry out any additional excavations within the root protection areas of tree by hand for car park area or use geo-web foundation
- 7. Remove tree protection fencing
- 8. Excavate by hand for new soft landscape area by hand, remove foundation of hard surfacing, break up the base of excavations and supplied and lay topsoil in accordance with BS3882, and lay ornamental bark mulch - landscape area as agreed with the LPA.



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