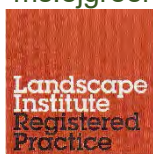


29 Broadwater Road, Welwyn. Herts AL7 3BQ

# PART 1 BS5837 TREE SURVEY, PART 2 INDICATIVE ARBORICULTURAL IMPACT ASSESSMENT AND METHOD STATEMENT.

**Demolition of the existing unit and proposed new  
residential development**

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## 1. Introduction

### 1.1 Contacts

- **Client:** Hightown Housing Association email [George.Edkins@hightownha.org.uk](mailto:George.Edkins@hightownha.org.uk)
- **Arboriculturalist:** Elizabeth Greenwood.
- **Council:** Welwyn Hatfield 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 appointed by Hightown Housing Association
- 1.3.2 The proposal is for demolition of the existing unit and development of the site for housing.

### 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 existing office building occupies the front of the site with a grass verge along the road planted with specimen trees. The extensive car park at the rear is bordered on the eastern side by a strip of planting and woodland
- 1.5.2. The topographical survey shows the ground levels are between 84 to 85 metre on a relatively flat site.
- 1.5.3. A wide grass verge borders the road. The hard surface car park occupies most of the ground to the rear with shrub beds on the northern side and with hedges defining the tree line strips of soft landscape along much of the eastern boundary
- 1.5.4. Several of the trees appear to predate the industrial development of the site with which include the two crack willows. The sycamores may have been self-seeded with field maples planted possibly originating as hedging stock
- 1.5.5. Welwyn Hatfield Council Tree Preservation Order titled 'Land adjoining car park off Peartree Lane & Broadwater Road Welwyn' number 780 and a dated 2018. The strip of planting to the rear of the car park is within the area marked G2, which is listed as 'Trees G2 Poplar, willow, lime, acers sp. maple, alder and hawthorn'. The number of trees protected is not given in this listing (See Appendix A)
- 1.5.6. Other trees within the site 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:** Lewes Nodular and Seaford Chalk Formation  
**Superficial Deposits:** the property lies on the Kesgrave formation of sands and gravels
- 1.5.8 Soil
  - **Soilscape 6:**  
Freely draining slightly acid loamy soils
  - **Texture:** Loamy.
  - **Drainage:** Freely draining
  - **Fertility:** Low
  - **Habitats:** Neutral and acid pastures and deciduous woodlands; acid communities such as bracken and gorse in the uplands
  - **Carbon:** Low
  - **Drains to:** Stream network
  - **Water protection:** Groundwater contamination with nitrate; siltation and nutrient enrichment of streams from soil erosion on certain of these soils

## 1.6 Documentation

- 1.6.1. The following documents were provided before the commencement of this report:
  - Topographical Survey drawing has been provided by Norman Stangroome Associates Drwg No 1263/1

- Welwyn Hatfield Council Tree Preservation Order titled 'Land adjoining car park off Peartree Lane & Broadwater Road Welwyn Garden City' number 780 (2018)

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

## 1.7 Survey

- The site was visited on 30/1/2019.
- Clear skies, sunny 4 degree and light breeze
- With good visibility
- Photographs were taken of the trees, which are included in Appendix A.
- The camera used to take these photographs was a Panasonic Lumix DC-TZ90 digital camera, with an 6.4-129 mm lens, and Samsung phone camera

## 2. 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 plan and details have been amended for the purpose of this report. Appendix [H].

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 m<sup>2</sup>.
- 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.

## **3. Tree Survey**

### **3.1 Summary**

- 3.1.1 A total of 14 individual trees and four groups of trees have been surveyed. Of these the five fastigate oaks (T8-T12) planted along Broadwater Road have been categorised as 'A' quality trees, all early mature with the potential for 40 to 50 years life expectancy.
- 3.1.2 The other trees surveyed are mature, and probably date from the mid to later twentieth century. Trees along the rear of the car park are all within the area marked as TPO G2 of Tree Preservation Order 780, however as there is some ambiguity with the numbers of trees protected the client is advised to regard all the trees along this boundary as protected by this tree preservation order.
- 3.1.3. Of the two groups of field maples, both of 'B2' quality, G1 lies close to the site boundary with root protection areas extending into the car park surface. The other group of four trees may originate from overgrown hedging stock planted along this car park.
- 3.1.4 Three of the Norway maples along this section (T1, T3, and T6) are also classified as 'B2' quality with prolific ivy within their crowns competing with the crown foliage. The group of mature trees, composed of both sycamore and Norway maple, lie on the corner of the site, (G3) have crown overhanging and root protection areas within the south east corner of the site.

- 3.1.5 Both the Norway maple (T4) and crack willow (T5) are of 'C2' quality. The Norway maple has an unbalanced and suppressed crown; the willow, which is growing close to the site boundary has storm damage and defective branches within the crown. A further crack willow (T7) is growing within the edge of the car park has been managed as a pollard.
- 3.1.6. Planted underneath part of the northern part of the structure there are two purple leaved plums, (T13 and T14) both classified as 'C2' quality which would need to be removed if the building is to be demolished.
- 3.1.7 Overgrown shrub including tamarisk (S1) are also plotted with a large *Viburnum tinus* (S2) growing close to outer stairs. Mixed shrub planting along the road frontage has not been individually surveyed and is marked as S3; it is probable that this would be removed with new amenity planting as part of any proposed development.
- 3.1.8. A hedge (H1) along the edge of the car park includes hawthorn, hazel, field maple, guelder rose, cherry plum and cherry laurel, and is faced back but not reduced in height.

## 3.2 Categories

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

### 3.2.2. Trees:

Category	Number of Trees	Tag Number	Species
A	5	T8, T9, T10, T11, T12	Fastigate oaks
B	3 and 3 groups	T1, T3, T6, G1, G2, G3	Norway maples, Sycamores and field maples
C	6	T2, T4, T5, T7, T13, T14	Cherry plum, Norway maple crack willow and purple leaved plums and groups of shrubs
U			
Total	14+ G3		

## 4. Arboricultural Impact Assessment

### 4.1 General

- 4.1. Draft proposals have been received from McBain's, reference BRW01-MCB-XX-00-DR-A-0006-S2-P1, showing a 'C' shaped 4 storey blocks of flat surrounding a central courtyard and amenity space. There is a basement car park. The building is set back and parallel to Broadwater Road, leaving a triangular wedge of open space along the eastern side and adjacent to the strip of woodland trees which form part of the Tree Preservation Order.
- 4.1.2 The impact of the building on this woodland is minimal, with working space for construction lying for the most part outside the root protection areas of these trees; the exception will be the south eastern corner of the site where there is existing hard surfacing underlying a group of trees which lie outside the site boundary.
- 4.1.3 The buildings are up to 14 metres in height will generate partial shade during parts of the day along this eastern boundary. This will have limited impact on the existing trees, as the

species mix includes field maple and Norway maple which would be able to sustain these conditions

## 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. An application to the LPA should be submitted for works on the protected trees and for any tree works on those trees outside the site boundaries

#### 5.2.2 Management:

No	Species	Category	Recommendations
T1	Acer platanoides (Norway maple) TPO G2	B2	Cut ivy to aid inspection of the crown; crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users
T2	Prunus cerasifera (Cherry Plum) TPO G2	C2	Remove and replace- Option- coppice and allow re-growth to development as part of new boundary planting

No	Species	Category	Recommendations
T3	Acer platanoides (Norway maple) TPO G2	B2	Cut ivy to aid inspection of the crown; crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users
T4	Acer platanoides (Norway maple) TPO G2	C2	REMOVE and replace
T5	Salix fragilis (Crack Willow) TPO G2	C2	REMOVE and replace
T6	Acer platanoides (Norway maple) TPO G2	B2	Cut ivy to aid inspection of the crown; crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users- cut back to give clearance for the streetlight
T7	Salix fragilis (Crack Willow) TPO G2	C2	REMOVE and replace
T8	Quercus robur 'Fastigiata' (Common Oak)	A2	
T9	Quercus robur 'Fastigiata' (Common Oak)	A2	
T10	Quercus robur 'Fastigiata' (Common Oak)	A2	
T11	Quercus robur 'Fastigiata' (Common Oak)	A2	
T12	Quercus robur 'Fastigiata' (Common Oak)	A2	
T13	Prunus cerasifera (Cherry Plum)	C2	REMOVE
T14	Prunus cerasifera (Cherry Plum)	C2	REMOVE
G1	Acer campestre (Field Maple) TPO G2	B2	Remove deadwood
G2	Acer campestre (Field Maple) TPO G2	B2	Face back and crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users

No	Species	Category	Recommendations
G3	Acer platanoides (Norway maple) and Acer pseudoplatanus (Sycamore) TPO G2	B2	Crown lift over the car park to 5 metres to enable access for construction vehicles- remove deadwood and defective branches which could cause a hazard to users-ensure adequate protection for root protection area
S1, S2 and S3	Mixed ornamental shrubs		REMOVE

### 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 E). 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. (See also Appendix F)

- 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.
- For the trees along the drive the crown should be faced back to ensure there is clearance under the canopy to remove building materials
- All heavy machinery and demolition vehicles should be positioned within the footprint of the building.
- 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 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.

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. (See Appendix G)

### **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 surfacing**

Within the root protection areas, the surface overlying the root protection areas of trees will be laid as outlined in section 5.4.2., on either the existing geo-web base or on a new geo-web base, with no excavation within these root protection areas.

#### **5.5.4. 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 is 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

**Elizabeth Greenwood C.M.L.I., F.Arbor.A**

**February and amended October and November 2019**

**Appendix A: Extract from Welwyn Hatfield Council Tree Preservation Order titled  
'Land adjoining car park off Peartree Lane & Broadwater Road Welwyn' 780 (2018)**

**TREE PRESERVATION ORDER****Town and Country Planning Act 1990**

**Land at :- Land adjoining car park off Peartree Lane & Broadwater Road Welwyn  
Garden City  
780 (2018)**

The **Welwyn Hatfield Borough Council**, in exercise of the powers conferred on them by section 198, of the Town and Country Planning Act 1990 make the following Order—

**Citation**

1. This Order may be cited as the **780 (2018)**

**Interpretation**

2. (1) In this Order “the authority” means the **Welwyn Hatfield Borough Council**  
(2) In this Order any reference to a numbered section is a reference to the section so numbered in the Town and Country Planning Act 1990 and any reference to a numbered regulation is a reference to the regulation so numbered in the Town and Country Planning (Tree Preservation)(England) Regulations 2012.

**Effect**

- 3.—(1) Subject to article 4, this Order takes effect provisionally on the date on which it is made.

(2) Without prejudice to subsection (7) of section 198 (power to make tree preservation orders) or subsection (1) of section 200 (tree preservation orders: Forestry Commissioners) and, subject to the exceptions in regulation 14, no person shall—

- (a) cut down, top, lop, uproot, wilfully damage, or wilfully destroy; or
- (b) cause or permit the cutting down, topping, lopping, wilful damage or wilful destruction of, any tree specified in the Schedule to this Order except with the written consent of the authority in accordance with regulations 16 and 17, or of the Secretary of State in accordance with regulation 23, and, where such consent is given subject to conditions, in accordance with those conditions.

**Application to trees to be planted pursuant to a condition**

4. In relation to any tree identified in the first column of the Schedule by the letter “C”, being a tree to be planted pursuant to a condition imposed under paragraph (a) of section 197 (planning permission to include appropriate provision for preservation and planting of trees), this Order takes effect as from the time when the tree is planted.

**Dated this 26th day of February 2018**

Signed on behalf of the **Welwyn Hatfield Borough Council**

A handwritten signature in black ink, appearing to be 'H. Kelly', written in a cursive style.

Authorised by the Council to sign in that behalf

### **CONFIRMATION OF ORDER**

This Order was confirmed by **Welwyn Hatfield Borough Council** without modification on the 15th day of June 2018

Signed on behalf of the **Welwyn Hatfield Borough Council**

A handwritten signature in black ink, appearing to be 'H. Kelly', written in a cursive style.

Authorised by the Council to sign in that behalf

## **FIRST SCHEDULE**

Article 3

### **SPECIFICATION OF TREES**

#### **TREES SPECIFIED INDIVIDUALLY (as circled in black on the plan)**


#### **TREES SPECIFIED BY REFERENCE TO AN AREA (within the dotted black line on the plan)**

#### **GROUP OF TREES (within broken black line on the plan)**

Reference on map	Tree Count	Description
G1		Lime
G1		London Plane
G1		Birch
G1		Pine
G1		Horse Chestnut
G1		Whitebeam
G2		Poplar
G2		Willow
G2		Lime
G2		Acer sp. [Maple]
G2		Alder
G2		Hawthorn
G3		Poplar
G3		Sycamore
G3		Hawthorn
G4		Sycamore
G4		Hornbeam
G4		Ash
G4		Willow
G4		Hawthorn
G4		Horse Chestnut
G4		Lime
G4		Beech

#### **WOODLANDS (within the continuous black line on the plan)**



 <b>WELWYN HATFIELD</b>  Council Offices, The Campus Welwyn Garden City, Herts, AL8 6AE	Title: Land adjoining car park off Peartree Lane & Broadwater Road Welwyn Garden City		Scale: 1:1500
	Project: TPO 780 (2018)		Date: 23-02-2018
	Drawing Number:		Drawn:
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## Appendix B: Photographs



**Above and below-** protected trees along the eastern boundary part of TPO G2. **Left-**The Norway maple with prolific ivy growth. **Right** the Norway maple and willow (T4 and T5)





**Above left-** the pollarded willow (T6). **Above right** - the group of sycamores and Norway maples (G2). **Below** – the two purple leaved plums (T13 and T14) planted on the northern side of the building. **Bottom-** the row of 5 fastigate oaks (T8, T9, T10, T11 and T12) planted along Broadwater Road





**Above left** - the plums (T13 and T14) and mixed shrub planting (S1 and S2).

**Above right** - the boundary planting mostly native along the edge of the car park which lies within the TPO G2.

## Appendix C: Tree Survey Sheets

No	Species	Age	Stem girth	Height	Lowest branch	Category	North	east	south	west	condition	life space	Comments	Recommendations	RPA radius (m)	RPA sqm
T1	Acer platanoides (Norway maple) TPO G2	M	410	15	2.5	B2	5.22	5	6.5	5.5	Good	40+	Ivy on tree. Paired with another Norway maple.	Cut ivy to aid inspection of the crown; crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users	4.92	76.06
T2	Prunus cerasifera (Cherry Plum) TPO G2	M	170	5	2	C2	3.1	1	0.5	2.5	Fair	20+	Ivy on tree. Stem divides below 1.5m. Leaning N. Ivy. Suppressed. Lift over car park.	Remove and replace- Option- coppice and allow re-growth to development as part of new boundary planting	2.04	13.08
T3	Acer platanoides (Norway maple) TPO G2	M	410	17	3	B2	5.5	5	6.5	3.2	Good	40+	Ivy on tree. Grown as a pair with T1. Slightly unbalanced.	Cut ivy to aid inspection of the crown; crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users	4.92	76.06

No	Species	Age	Stem girth	Height	Lowest branch	Category	North	east	south	west	condition	life space	Comments	Recommendations	RPA radius (m)	RPA sqm
T3	Acer platanoides (Norway maple) TPO G2	M	410	17	3	B2	5.5	5	6.5	3.2	Good	40+	Ivy on tree. Grown as a pair with T1. Slightly unbalanced.	Cut ivy to aid inspection of the crown; crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users	4.92	76.06
T4	Acer platanoides (Norway maple) TPO G2	EM	200	12	1	C2	3.4	0	3.1	3.8	Poor	20+	Part of linear group. Spindly. Ivy on tree. Unable to inspect stem due to Ivy. Fence attached to stem	REMOVE and replace	2.4	18.1
T5	Salix fragilis (Crack Willow) TPO G2	OM	400	13	1	C2	3.5	5	4.5	4.5	Poor	10+	Poor unbalanced shape & reduced form. Ivy on tree. Unable to inspect stem due to Ivy. Cavity on stem.	Remove and replace with owner agreement	4.8	72.39

No	Species	Age	Stem girth	Height	Lowest branch	Category	North	east	south	west	condition	life space	Comments	Recommendations	RPA radius (m)	RPA sqm
T6	Acer platanoides (Norway maple)) TPO G2	M	350	14	1	B2	6	3.6	4.6	6	Fair	20+	Ivy on tree. Unable to inspect stem due to Ivy. Stem divides above 1.5m. streetlight within canopy	Cut ivy to aid inspection of the crown; crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users- cut back to give clearance for the streetlight	4.2	55.42
T7	Salix fragilis (Crack Willow) TPO G2	M	400	14	1.5	C2	4.3	4.2	4	4.4	Fair	10+	Part of linear group. Pollard. Ivy on tree. Unable to inspect stem due to Ivy. Low branches over road/footpath. Re-growth 4-5 metres	REMOVE and replace	4.8	72.39
T8	Quercus robur (Common Oak) Fastigiata TPO G2	M	260	11	0.5	A2	1.6	1.6	1.6	1.6	Good	40+	Fastigate. Tight forks.		3.12	30.59

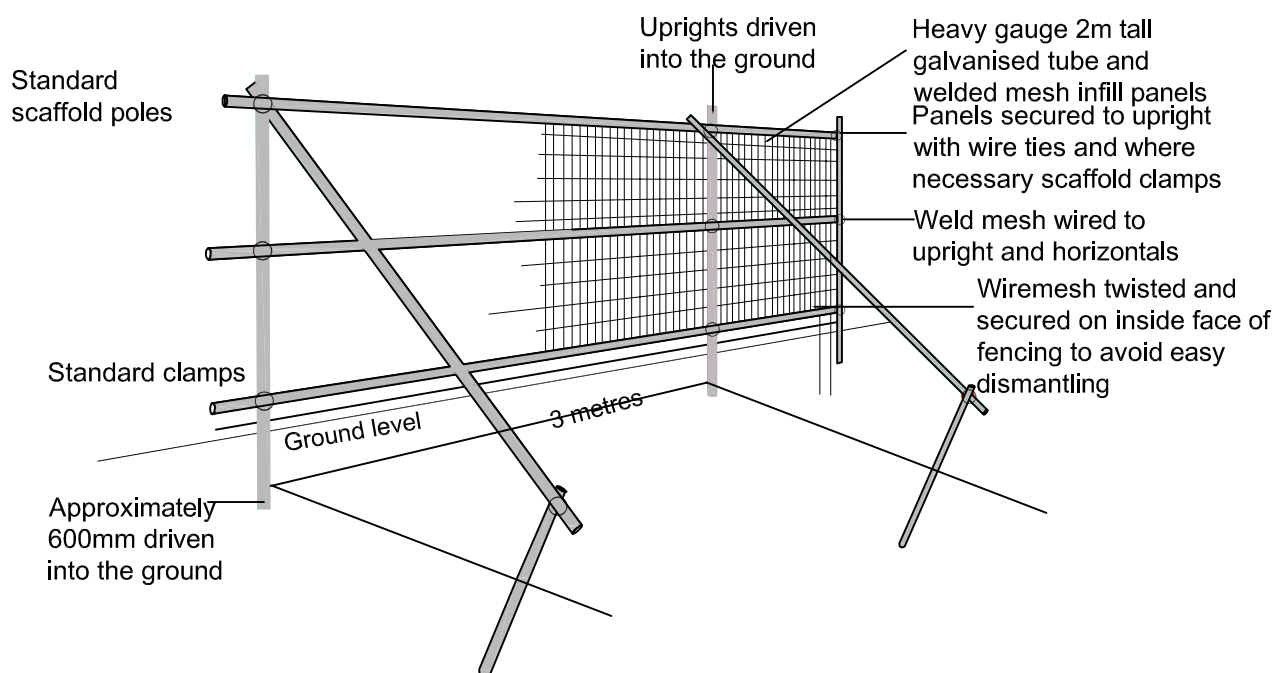
No	Species	Age	Stem girth	Height	Lowest branch	Category	North	east	south	west	condition	life space	Comments	Recommendations	RPA radius (m)	RPA sqm
T9	Quercus robur 'Fastigiata' (Common Oak)	M	290	10	1	A2	1.9	1.9	1.9	1.9	Good	40+	One of the five which is defoliated. Fastigate. Tight forks.		3.48	38.05
T10	Quercus robur 'Fastigiata' (Common Oak)	M	245	11	0.25	A2	1.2	1.2	1.2	1.2	Good	40+	Fastigate. Tight forks.		2.94	27.16
T11	Quercus robur 'Fastigiata' (Common Oak)	M	240	11	0.75	A2	1.25	1.25	1.25	1.25	Good	40+	Fastigate. Tight forks.		2.88	26.06
T12	Quercus robur 'Fastigiata' (Common Oak)	M	170	8.5	1.5	A2	1	1	1	1	Good	40+	Fastigate. Tight forks.		2.04	13.08
T13	Prunus cerasifera (Cherry Plum)	M	230	9	2.5	C2	3.3	2.5	2.6	2	Fair	20+	Leaning E. Tight fork. Under building.	REMOVE	2.76	23.93
T14	Prunus cerasifera (Cherry Plum)	M	220	7.5	2	C2	2	3.7	3	1.6	Fair	20+	Stem divides below 1.5m. Leaning NE.	REMOVE	2.64	21.9
G1	Acer campestre (Field Maple) TPO G2	M	520	9	1	B2	3	4	2	2.5	Good	40+	Camera in crown. Outside site. Planted as group.	Remove deadwood	6.24	122.34

No	Species	Age	Stem girth	Height	Lowest branch	Category	North	east	south	west	condition	life space	Comments	Recommendations	RPA radius (m)	RPA sqm
G2	Acer campestre (Field Maple) TPO G2	EM	420	9	1	B2	4	2.5	1	3	Fair	20+	Suppressed. Part of linear group. Overhanging hard surface.	Face back and crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users	5.04	79.81
G3	Acer platanoides (Norway maple) and Acer pseudoplatanus (Sycamore) TPO G2	M	400	16	1	B2	7.2	6.5	5.5	6.3	Fair	20+	Part of linear group. Branches restricting highway light. 3 trees part or group extending southwards with the crack willow with storm damage to south	Crown lift over the car park to 5 metres to enable access for construction vehicles- remove deadwood and defective branches which could cause a hazard to users- ensure adequate protection for root protection area	4.8	72.39

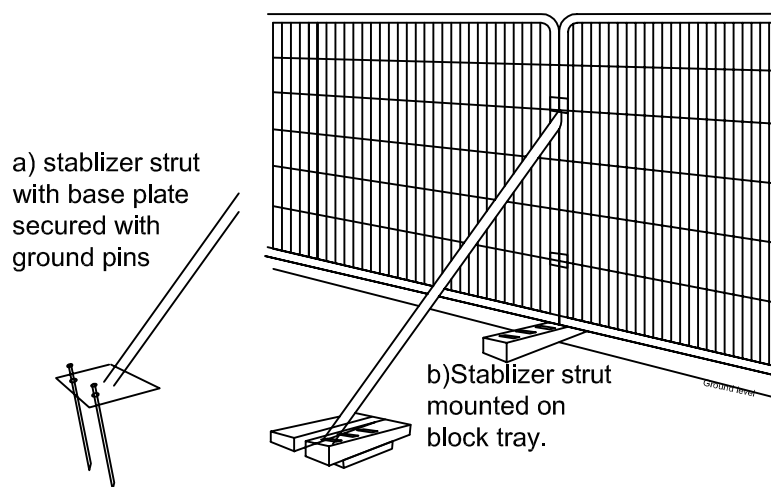
## Appendix D: Copy of BS5837:2012 Table 1 “Cascade Chart for Tree Quality Assessment”

Category	Criteria			Identification on plan (RAB subject to legibility of the plan)
Category U (Formerly 'R')				
Those in such a condition 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**



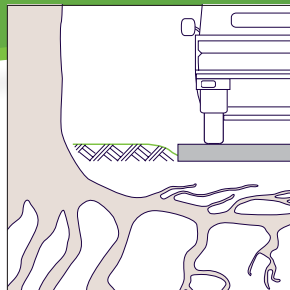
**GEOSYSTEMS®**



**GEOWEB®**

**TREE ROOT PROTECTION (TRP) SYSTEM**

Powered by GEOSYSTEMS® technology.



defining **green** in cellular confinement

# THE PROBLEM

## CONSTRUCTION-RELATED TREE DAMAGE

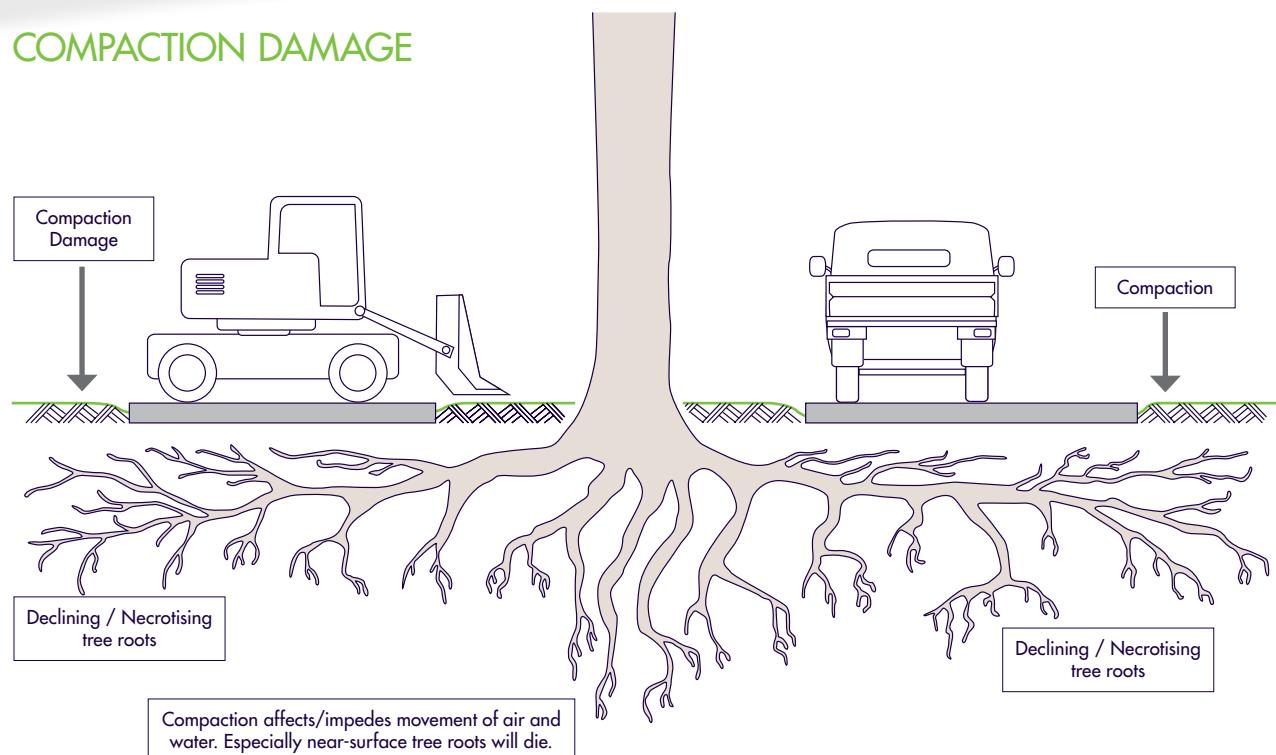
Critical Root Zone/Tree Protection Zone is the minimum area beneath a tree that must remain undisturbed to preserve a sufficient amount of root mass in order to give a tree a chance of survival.

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

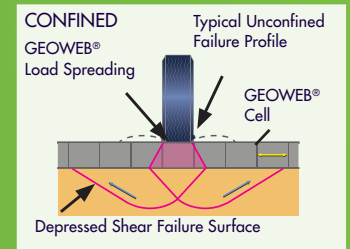
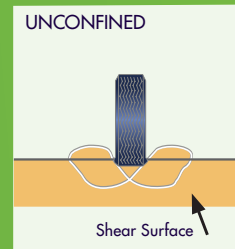
## TREE ROOT PROTECTION (TRP) SYSTEM

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.



## 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.

## COST BENEFITS

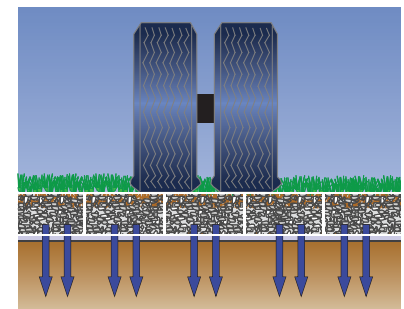
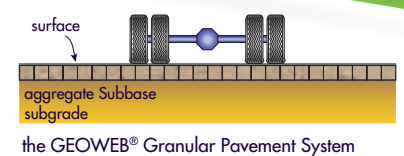
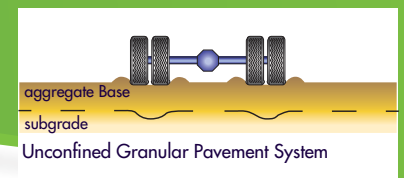
The GEOWEB® TRP system is an economical solution for reducing construction vehicle impact to the tree root zone compared with other methods. Once installed, the system has minimal-to-no visibility.

## 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.



# 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.

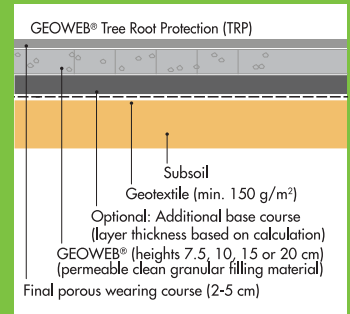
Step 6: Compact the fill material with conventional plant or non-vibratory plant when required. Fill should be maintained above the GEOWEB® system by a minimum of 10mm at all times or a permanent wearing course of blocks, porous asphalt or gravel installed.



## 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.

**PRESTO GEOSYSTEMS® COMMITMENT** — To provide the highest quality products and solutions.

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.



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[www.prestogeo.com](http://www.prestogeo.com)

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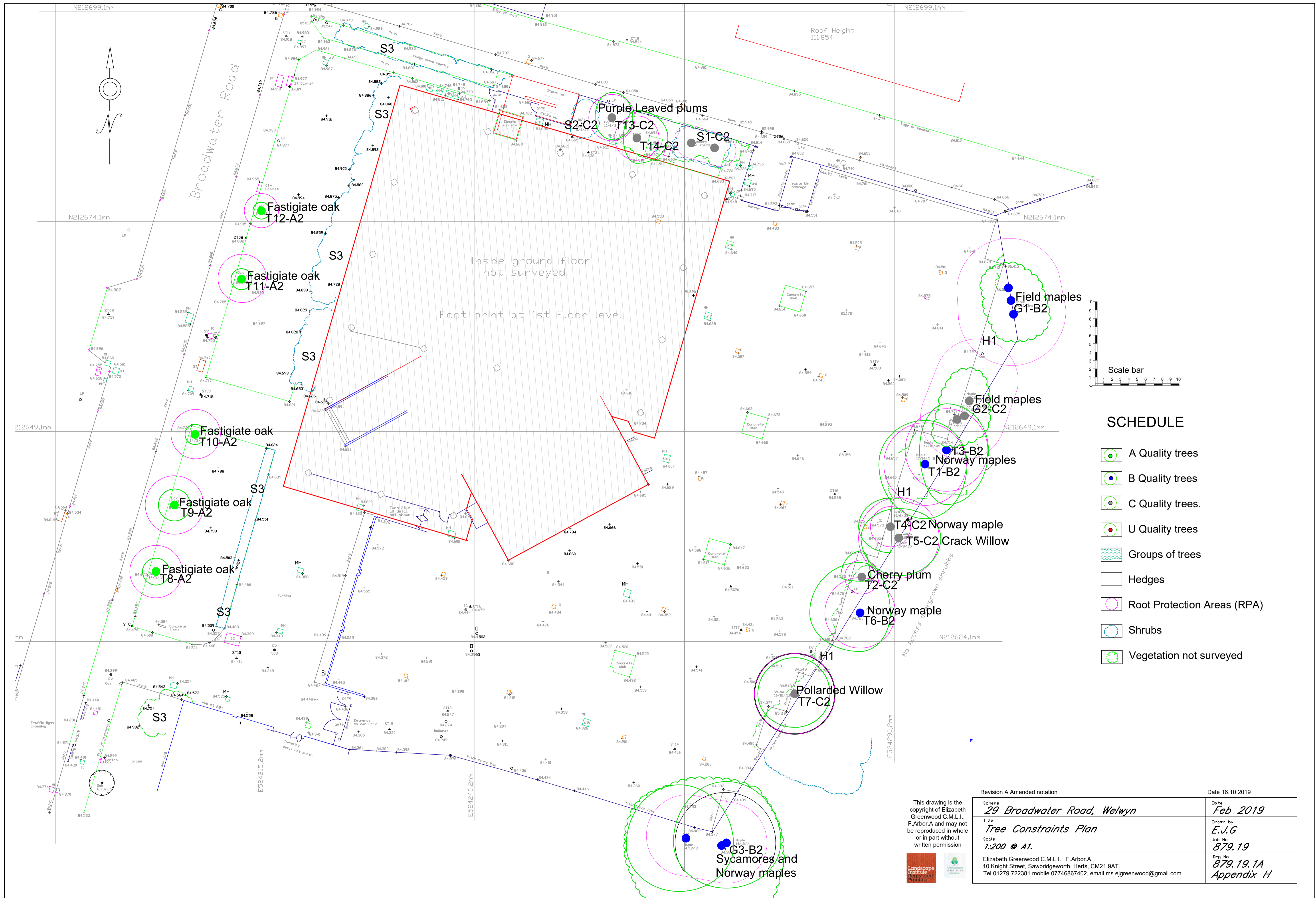
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AP-7417

## 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	Fencing off the trees as marked on plan with Heras style fencing in accordance with British Standard 5837- exclude any works from these area and mark as SITES EXCLUSION ZONES  Provide and insert ground protection for the duration of construction works; option use existing tarmac surfacing	
Setting out building, foundation excavation, trenches	Visit 2	Prior to construction	Carry out demolition and site clearance  Set up site working area	
Excavations/ changes of soil levels— and foundation and positioning of pile drivers details- inspect	Visit 3	During construction	Carry out construction  Hand dig within RPA of trees -For new drain runs and unavoidable excavation within the RPA HAND DIG  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	On completion of works remove ground protection and protective fencing and carry out additional remedial works.  Carry out landscape works- Cultivate by hand for all soft landscape works within the root protection areas of trees  Monitor the condition of trees an annual basis	

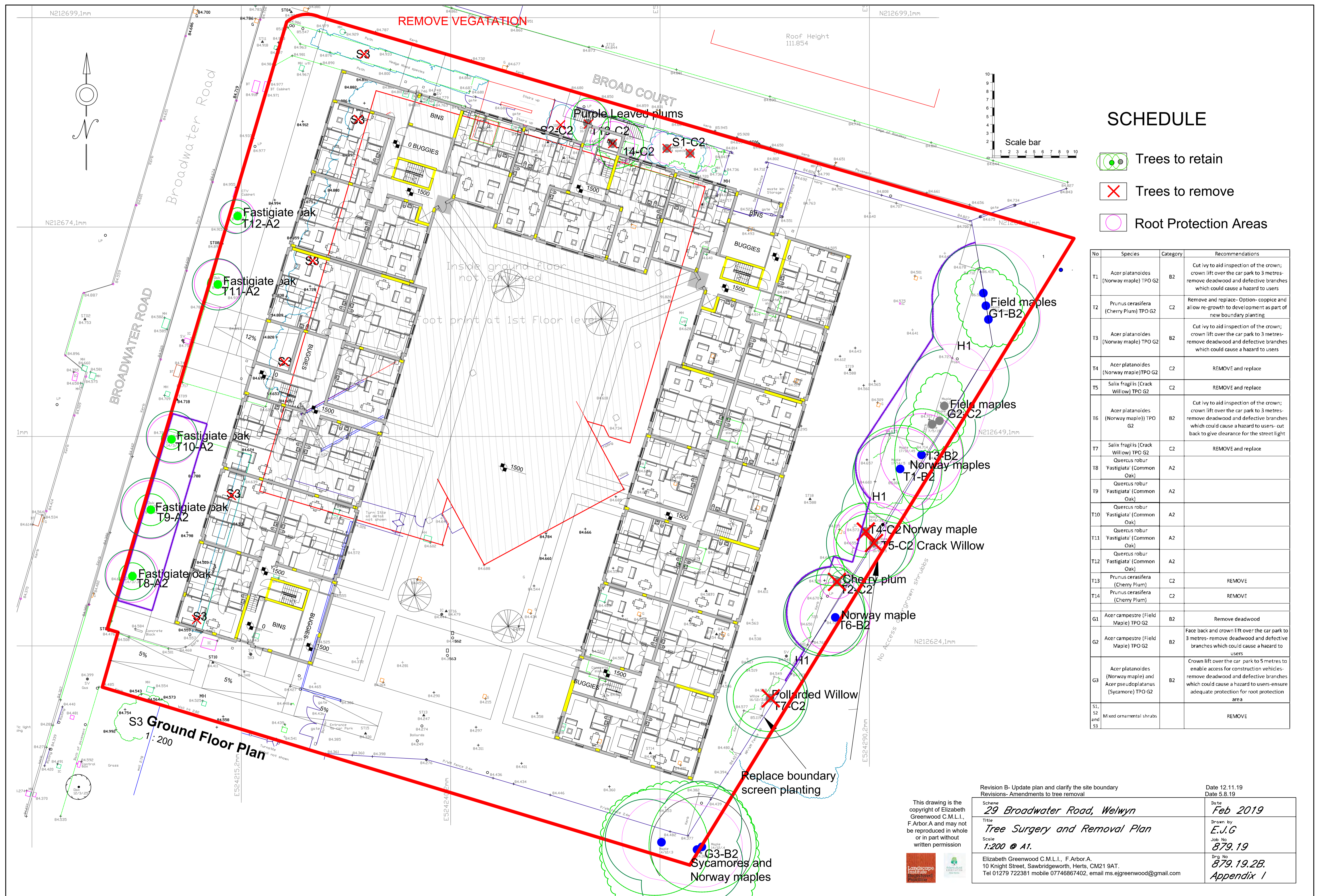
## **Appendix H: Plan 879.19.1A Tree Constraints Plan**



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

Revision A Amended notation		Date 16.10.2019
Scheme	29 Broadwater Road, Welwyn	Date Feb 2019
Title	Tree Constraints Plan	Drawn by E.J.G.
Scale	1:200 @ A1.	Job No 879.19
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 879.19.1A Appendix H

## Appendix I: Plan 879.19.2B Tree Surgery and Removal Plan



No	Species	Category	Recommendations
T1	Acer platanoides (Norway maple) TPO G2	B2	Cut ivy to aid inspection of the crown; crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users
T2	Prunus cerasifera (Cherry Plum) TPO G2	C2	Remove and replace- Option- coppice and allow re-growth to development as part of new boundary planting
T3	Acer platanoides (Norway maple) TPO G2	B2	Cut ivy to aid inspection of the crown; crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users
T4	Acer platanoides (Norway maple) TPO G2	C2	REMOVE and replace
T5	Salix fragilis (Crack Willow) TPO G2	C2	REMOVE and replace
T6	Acer platanoides (Norway maple) TPO G2	B2	Cut ivy to aid inspection of the crown; crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users- cut back to give clearance for the street light
T7	Salix fragilis (Crack Willow) TPO G2	C2	REMOVE and replace
T8	Quercus robur 'Fastigiata' (Common Oak)	A2	
T9	Quercus robur 'Fastigiata' (Common Oak)	A2	
T10	Quercus robur 'Fastigiata' (Common Oak)	A2	
T11	Quercus robur 'Fastigiata' (Common Oak)	A2	
T12	Quercus robur 'Fastigiata' (Common Oak)	A2	
T13	Prunus cerasifera (Cherry Plum)	C2	REMOVE
T14	Prunus cerasifera (Cherry Plum)	C2	REMOVE
G1	Acer campestre (Field Maple) TPO G2	B2	Remove deadwood
G2	Acer campestre (Field Maple) TPO G2	B2	Face back and crown lift over the car park to 3 metres- remove deadwood and defective branches which could cause a hazard to users
G3	Acer platanoides (Norway maple) and Acer pseudoplatanus (Sycamore) TPO G2	B2	Crown lift over the car park to 5 metres to enable access for construction vehicles- remove deadwood and defective branches which could cause a hazard to users- ensure adequate protection for root protection area
S1, S2 and S3	Mixed ornamental shrubs		REMOVE

## **Appendix J: Plan 879.19.3A Tree Protection Plan**



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