

1 MANOR HOUSE DRIVE, NORTHWOOD,
MIDDLESEX. HA6 2UJ

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

Demolition of the existing building and construction of a new building

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1. Introduction

1.1 Contacts

Client - Deepak Khullar, Krsna Property Solutions. deeps@kpsolution.co.uk

Architects- The Engineroom www.engineroom.company

Arboriculturalist and Landscape Architect- Elizabeth Greenwood

Council. -Three Rivers 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 Krsna Property Solutions
- 1.3.2 The development proposal is for demolition of the existing building and construction of a new building.

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. This large detached dwelling within a rectangular plot lies on the corner of Manor Park Drive and Ducks Hill Road. Brick walls define all the garden boundaries.
- 1.5.2. The front garden is paved, and the rear garden is laid to lawn. Of note is the veteran oak tree within the corner of the front garden; two Leyland cypress trees overhang the garden on the north eastern side and a row of Leyland cypresses have been planted outside the garden walls along Duck Hill Road. Recently planted ornamental pears are growing on the road verge to the side of the house along Manor House Drive.
- 1.5.3. The oak tree (T3) is protected as T6 of Tree Preservation Order 444 titled 66 to 76 Ducks Hill Road, Northwood. 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. (See Appendix A)
- 1.5.5. The Leyland cypress trees and ornamental pear trees 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.
- 1.5.6 Geological Description:
Bedrock Geology: London Clay Formation - Clay, silts and sands.
Superficial Deposits: these have not been recorded
- 1.5.7 Soil
- o **Soilscape 18:**
Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils
 - o **Texture:** Loamy and clayey
 - o **Drainage:** Impeded drainage
 - o **Fertility:** Moderate
 - o **Habitats:** Seasonally wet pastures and woodlands
 - o **Carbon:** Low
 - o **Drains to:** Stream network
 - 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 before the commencement of this report:
- A site layout plans has been provided by
 - The Engine Room plan 16-10-2019 Plans and elevations
 - BCA Associates Landscape concept plan reference 19 86_19-01B
 - Three Rivers Tree Preservation Order 444 titled 66 to 76 Ducks Hill Road, Northwood.
- 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 28 October 2016 and not re-surveyed for this report.
- Photographs were taken of the trees, which are included in Appendix A.
- The camera used to take these photographs was an Olympus Digital DC6V model

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 survey 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 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.

3. Tree Survey

3.1 Summary

- 3.1.1. A total of 2.3.1 The veteran oak tree (T3) is situated in the corner of the paved front garden within a semi-circular earth filled planting bed approximately 1.8metre in diameter. This tree has an 880mm diameter girth which would indicate that it is in the region of 250 years old.
- 3.1.2. With considerable peripheral dieback within the crown and large diameter deadwood the tree would be considered to be in declining health; however, given the longevity of oak, with mitigating remedial works to improve the rooting area of this tree, its prognosis could be improved.
- 3.1.3. Assessed as a veteran tree, it would be considered as an 'A3' quality tree. Tree surgery to ensure safety would result in removal of the dead wood and defective branches within the crown.
- 3.1.4. Planted above a low retaining wall there are two Leyland cypresses (T1 and T2) which overhang the site from the neighboring garden of 70 Ducks Hill Road, they both have divided trunks and multi-stems forming with tight forks. At 13 and 14.5 metres in height they appear to have been managed with some crown reduction.
- 3.1.5. The row of ten Leyland cypresses have been planted along the front boundary (T4-T13) and include 2 dead specimens. On average they are 13 metres high and some tree surgery will be required to lift the crowns above the road and the parking area.
- 3.1.6. A line of 4 ornamental pear trees (T14-T17) have recently been planted along the south western boundary within the grass verge of Manor House Drive. Planted one metre from the boundary wall the crowns of two of these trees overhang the house and may require cutting back prior to site works

3.1.7. The details of the hedges are as follows

	Hedge Species	height	Spread	Stem girth at base	RPA	Management
H1	Laurel	1.5-2.5	Up to 1metre	Up to 100mm	2 metres from hedge base	Recently planted-maintain at wall height of as directed by the client.

3.2 Categories

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

3.2.2. **Trees:**

Category	Number of trees	Tag number	Species
A	1	T3	Veteran oak
B	4	T14-T17	Chanticleer pears
C	17	T1, T2, T4-T6, and T9-T12	Leyland cypresses
U	2	T7 and T8	Leyland cypresses
	17	Total	

4. Arboricultural Impact Assessment

4.1.1 The approved site layout has been provided by The Engineer room number ER 03-10-19 revision A. The impact of these proposals is summarized in the following table: -

Tree number	SPECIES	EFFECT	Tree surgery	Protective barrier	MITIGATION		
					Ground protection	Construction for surfacing	Hand dig
T1 and T2	Leyland cypresses	New parking area	Tree surgery		X	X	X
T3	Oak	Alteration of parking area to soft landscape	Tree Surgery	X	X	X	X
T14, T15	Chanticleer pears	Demolition of existing building and new flats within RPA	Tree Surgery		X	X	X
T16	Chanticleer pear	New access	REMOVE				
H1	Laurel	New parking area	REMOVE				

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

Tree no	Species	Root protection area	incursion into RPA	% of incursion	Impact
T1 and T2	Leyland cypresses	150	69	46%	New parking area and planting bed
T3	Oak	353	27sqm	7.8 %	Extension of footprint of building
			202sqm	57%	New soft landscape

- 4.1.3 The change from a hard surface courtyard to a garden with salt landscape and planting areas will be beneficial to the oak, and result in more hospitable conditions for the rooting area of this tree.

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	Tree	Category	Recommendations
T1	Leyland cypress	C2	Crown lift over garden if required
T2	Leyland cypress	C2	Crown lift over garden if required
T3	Oak- TPO	B2	Improve rooting conditions- remove deadwood and defective branches, reduce back to sound wood and monitor
T4	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
T5	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
T6	Leyland cypress	C2	Crown lift to 3metre over drive and footpath- maybe outside clients' ownership
T7	Leyland cypress	U	REMOVE- maybe outside clients' ownership
T8	Leyland cypress	U	REMOVE- maybe outside clients' ownership
T9	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
T10	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
T11	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
T12	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
T13	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
T14	Chanticleer Pear	B2	Reduce crown and face back from building line of the proposed building
T15	Chanticleer Pear	B2	Reduce crown and face back from building line of the proposed building
T16	Chanticleer Pear	B2	REMOVE
T17	Chanticleer Pear	B2	
H1	Laurel hedge		Remove

5.2.3. Removal of Trees:

The two-trees specified for removal are poor quality Leyland cypresses which lie outside the site boundary. The other tree to be removed is a street tree, a Chanticleer pear (T16) growing outside the site along Manor House Road.

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.

- a) For pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geo-textile membrane;
- b) For pedestrian-operated plant up to a gross weight of 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;
- c) 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. (See also appendix F)

5.3.3. Demolition

- a) 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 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.

5.4.3. Surfacing within the Root Protection Area

For the new parking courtyard within the RPA of the two Leland cypresses (T1 and T2), the following specifications, with minimal hand dug or no excavation, have been provided by

Parking build up 1 – parking spaces

- 20 to 40mm permeable asphalt surface course
- 50 to 100mm binder course
- 70 to 150 base course
- Terram T1000 Geotextile
- 150mm sub-base Terram Geocell with steel fixing pins (suitable for lightweight vehicle)
- Terram T1000 Geotextile

2.) Parking area build up 2 – 8m by 8m turn square & drive

- 50mm / 60 / 80mm Marshalls permeable paving blocks
- 50mm clean grit course
- Terram T1000 Geotextile
- 250mm sub-base Terram Geocell with steel fixing pins (suitable for lightweight vehicle)
- Terram T1000 Geotextile

New garden area

For the new soft landscape area and associated path and patio the construction will require no excavation, and be a no dig construction above existing ground level using a cellular confinement system (150mm)

5.4.4. 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 Volume 4.

5.4.5. 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.

5.4.6 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 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

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October 2019

Appendix A: Extract of Tree Preservation Order 444

Titled 66 to 76 Ducks Hill Road, Northwood.

TOWN AND COUNTRY PLANNING ACTS 1971-74 (AS AMENDED)
LONDON BOROUGH OF HILLINGDON TREE PRESERVATION ORDER NO. 444

In respect of

Several trees situated on land at 66-76 Ducks Hill Road, Northwood

THE MAYOR AND BURGESSES of the LONDON BOROUGH OF HILLINGDON acting by the Council, in this order called "the authority", in pursuance of the powers conferred in that behalf by sections 60 and 61 of the Town and Country Planning Act 1971 (as amended by Section 10(1) of the Town and Country Amenities Act 1974), and subject to the provisions of the Forestry Act, 1967 hereby makes the following Order:-

1. In this Order -

"the Act" means the Town and Country Planning Act 1971; "owner" means the owner in fee simple, either in possession or who has granted a lease or tenancy of which the unexpired portion is less than three years; lessee (including a sub-lessee) or tenant in possession, the unexpired portion of whose lease or tenancy is three years or more; and a mortgagee in possession; and "the Secretary of State" means the Secretary of State for the Environment.

2. Subject to the provisions of this Order and to the exemptions specified in the Second Schedule hereto, no person shall, except with the consent of the authority and in accordance with the conditions, if any, imposed on such consent, cut down, top, lop, uproot, wilfully damage or wilfully destroy or cause or permit the cutting down, topping, lopping, uprooting, wilful damage or wilful destruction of any tree specified in the First Schedule hereto or comprised in a group of trees or in a woodland therein specified, the position of which trees, groups of trees and woodlands is defined in the manner indicated in the said First Schedule on the map annexed hereto which map shall, for the purpose of such definition as aforesaid, prevail where any ambiguity arises between it and the specification in the said First Schedule.

3. An application for consent made to the authority under Article 2 of this Order shall be in writing stating the reasons for making the application, and shall by reference if necessary to a plan specify the trees to which the application relates, and the operations for the carrying out of which consent is required.

4. - (1) Where an application for consent is made to the authority under this Order, the authority may grant such consent either unconditionally, or subject to such conditions (including conditions requiring the replacement of any tree by one or more trees on the site or in the immediate vicinity thereof), as the authority may think fit, or may refuse consent:

Provided that where the application relates to any woodland specified in the First Schedule to this Order the authority shall grant consent so far as accords with the principles of good forestry, except where, in the opinion of the authority, it is necessary in the interests of amenity to maintain the special character of the woodland or the woodland character of the area, and shall not impose conditions on such consent requiring replacement or replanting.

Note: If it is desired to fell any of the trees included in this Order, whether included as trees, groups of trees or woodlands, and the trees are trees for the felling of which a licence is required under the Forestry Act 1967, application should be made not to the authority for consent under this Order but to the Conservator of Forests for a licence under that Act (section 15(5)).

FIRST SCHEDULE

Trees Specified individually

(encircled in black on the map but excluding those shown encircled in black and coloured red)

<u>No. on Map</u>	<u>Description</u>	<u>Botanical Name</u>	<u>Situation</u>
T1	Scots Pine	Pinus sylvestris	) Land at
T2	Holly	Ilex aquifolium	) 76 Ducks Hill Road,
T3	Oak	Quercus robur	) Northwood
~~T4~~	~~Blue Atlas Cedar~~	~~Cedrus atlantica 'Glaucous'~~	~~Land at~~ 74 Ducks Hill Road, Northwood
T5	Scots Pine	Pinus sylvestris	Land on the boundary of 72-74 Ducks Hill Road, Northwood
T6	Oak	Quercus robur	Land on the boundary of 72-74 Ducks Hill Road, Northwood
~~T7~~	~~Norway Spruce~~	~~Picea abies~~	~~Land at~~ 72 Ducks Hill Road, Northwood
T8	Silver Birch	Betula pendula	) Land at
T9	Swamp Cypress	Taxodium distichum	) 70 Ducks Hill Road,
T10	Ash	Fraxinus excelsior	) Northwood
T11	Silver Birch	Betula pendula	) Land at
T12	Norway Spruce	Picea abies	) 68 Ducks Hill Road,
T13	Western Red Cedar	Thuja plicata	) Northwood
T14	Scots Pine	Pinus sylvestris	) Land at
T15	Silver Birch	Betula pendula	) 66 Ducks Hill Road, Northwood

Groups of Trees

(within a broken black line on the map)

<u>No. on Map</u>	<u>Description</u>	<u>Botanical Name</u>	<u>Situation</u>
G1 Consisting of:-			
	3 Norway Spruce	Picea abies	Land at 68 Ducks Hill Road, Northwood
G2 Consisting of:-			
	3 Norway Spruce	Picea abies	Land at 68 Ducks Hill Road, Northwood

Areas of Trees

None

Woodlands

None

0368(n)
(0305b)

46. - (5) If within the period referred to in subsection (2)(a) above no person claiming to be affected by such Order has given notice to the Secretary of State as aforesaid and the Secretary of State has not directed that such Order be submitted to him for confirmation, such Order shall, at the expiration of the period referred to in subsection (2)(b) of this section, take effect by virtue of this section and without being confirmed by the Secretary of State as required by section 45 of the Act.

46. - (6) This section does not apply to such Order revoking or modifying a consent granted or deemed to have been granted by the Secretary of State under Part III, Part IV or Part V of the Act.

THE COMMON SEAL of the MAYOR

AND BURGESSES of the

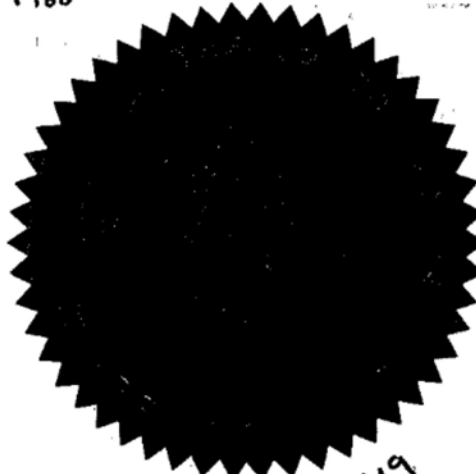
LONDON BOROUGH OF HILLINGDON

was hereunto affixed on the 11th November 1988

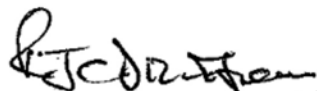
by order of:



MAYOR



23219


AUTHORISED OFFICER

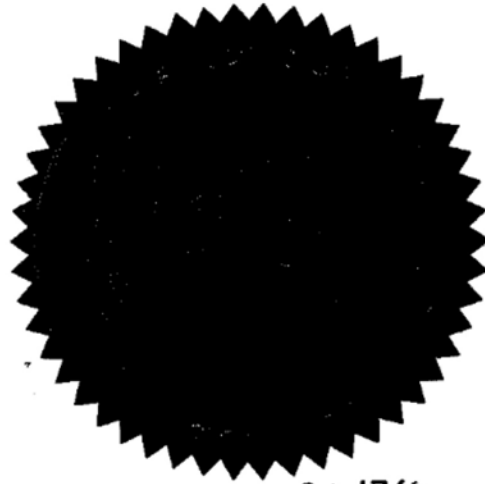
The Mayor and Burgesses of the London Borough of Hillingdon hereby confirmed the foregoing Order.

In witness whereof the Common Seal of the Mayor and Burgesses of the London Borough of Hillingdon
was in pursuance of a resolution of the Planning Committee of **20 MAR 1989** acting
under delegated powers hereunto affixed on **21 MAR 1989** by Order of:

MAYOR

K. T. G. [Signature]
MN [Signature]

~~AUTHORISED OFFICER~~
~~ASSISTANT DIRECTOR~~



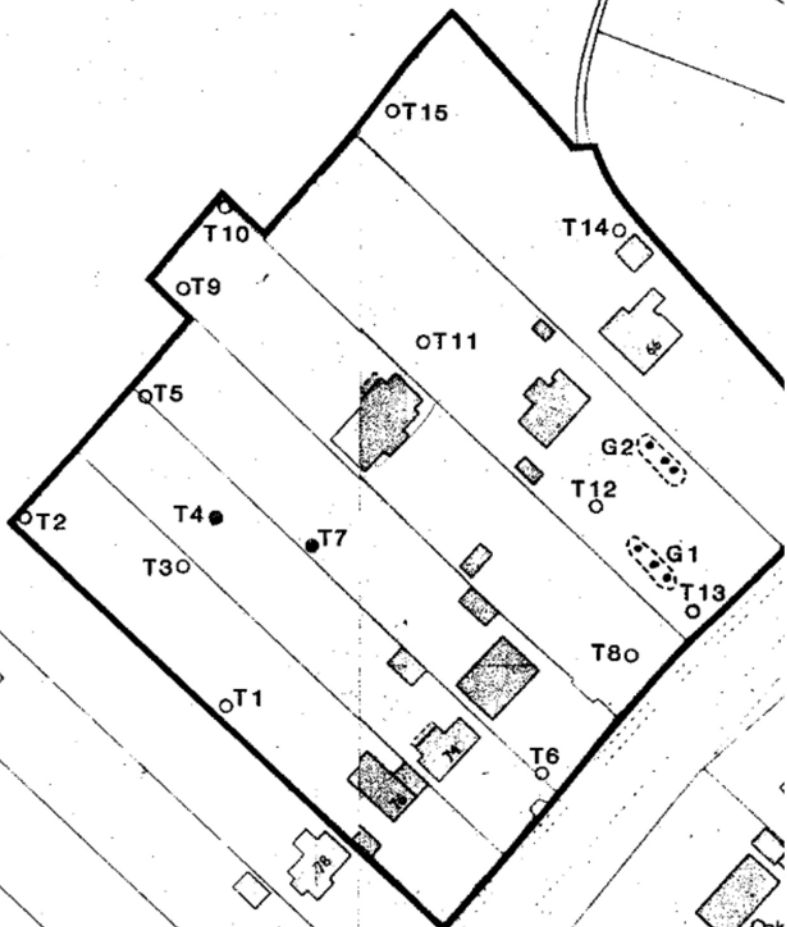
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RV/PB/22.20/



Pipe Line

Pond



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Dated 11th November 1988

TREE PRESERVATION ORDER NO. 444

made by the

MAYOR AND BURGESSES OF THE
LONDON BOROUGH OF HILLINGDON

in respect of

Several trees situated on land at:
66 - 76 Ducks Hill Road
Northwood

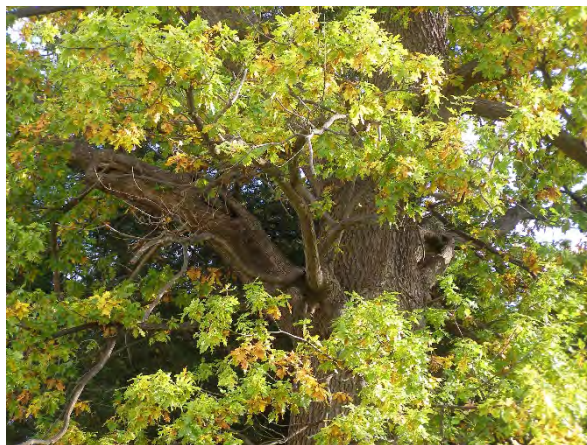
Under Section 60 and 61 of the Town and Country
Planning Act 1971, (as amended by Section 10(1)
of the Town and Country Amenities Act 1974).

Appendix B: Photographs



Above and below- the veteran and protect oak tree (T3)
storm damage and peripheral dieback

with



Bottom left -the two Leyland cypress trees overhanging the rear grade (T1 and T2)
Bottom right -the line of 10 Leyland cypresses (T4-T13) planted along the road verge





Above - the four chanticleer ornamental pears (T14-T17) along the road verge of
Manor House Drive



Appendix C: Tree Survey Sheets

Tag	Tree	Age	Stem Diameter	Stem	Height	Lowest branch	lower crown	Category	North	South	East	West	Structural	Physiological	Condition	Recommendations	life expectancy	RPA radius
T1	Leyland cypress	M	540	1	13	2	2	C2	3.5	3	2.8	3.5	Fair	Fair	Planted within adjacent land on retaining wall with love branches stem and tight fork- tree has been reduced	Crown lift over garden if required	10 to 20	7
T2	Leyland cypress	M	550	1	14.5	2	2	C2	3.5	4.2	4.5	3.1	Fair	Fair	Planted within adjacent land on retaining wall with love branches stem and tight fork- tree has been reduced	Crown lift over garden if required	10 to 20	7
T3	Oak	M	880	1	17.4	3	2	B2	2.9	3.6	3.5	3.8	Fair	Fair	Veteran tree of approximately 250 years in age- with in limited planting bed 1 metre from stem and paving forecourt. Tree has incurred storm damaged and has been reduced. Peripheral dieback and major deadwood	Improve rooting conditions- remove deadwood and defective branches and monitor	40+	10.5

Tree Survey, Arboricultural Impact Assessment and Method Statement.
1 MANOR HOUSE DRIVE, NORTHWOOD, MIDDLESEX. HA6 2UJ

Ref 935

Tag	Tree	Age	Stem Diameter	Stem	Height	Lowest branch	Lower crown	Category	North	South	East	West	Structural	Physiological	Condition	Recommendations	life expectancy	RPA radius
T4	Leyland cypress	M	500	1	13.5	0	0	C2	4.2	2.5	3.5	4	Fair	Fair	Outside site along Duck Hill Road. On corner at end of a line of trees- tight forks and planted close to the wall-	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership	10 to 20	6
T5	Leyland cypress	M	320	1	13.5	2	2	C2	2	3.4	2	2	Fair	Fair	Outside site along Duck Hill Road. End of a line of trees- tight forks and planted close to the wall- leaning trunk	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership	10 to 20	4
T6	Leyland cypress	M	340	1	14	2	2	C2	2.5	3	2	1.8	Fair	Fair	Mid row	Crown lift to 3metre over drive and footpath- maybe outside clients' ownership	10 to 20	4
T7	Leyland cypress	M	180	1	11.5	0	0	U	2	1.4	1.6	1	Poor	Poor	DEAD	REMOVE- maybe outside clients' ownership	less 10	
T8	Leyland cypress	M	265	1	11.5	0	0	U	2	1.4	1.6	1	Poor	Poor	DEAD	REMOVE- maybe outside clients' ownership	less 10	
T9	Leyland cypress	M	225		12.5	1	1	C2	2.4	1.2	1.7	1.4	Fair	Fair	Outside site along Duck Hill Road. End of a line of trees- planted close to the wall- l	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership	10 to 20	2.75

Tree Survey, Arboricultural Impact Assessment and Method Statement.
1 MANOR HOUSE DRIVE, NORTHWOOD, MIDDLESEX. HA6 2UJ

Ref 935

Tag	Tree	Age	Stem Diameter	Stem	Height	Lowest branch	Lower crown	Category	North	South	East	West	Structural	Physiological	Condition	Recommendations	life expectancy	RPA radius
T10	Leyland cypress	M	240	1	13	2	2	C2	2.6	1.2	1.6	2.5	Fair	Fair	Mid row	Crown lift to 3 metres over drive and footpath-maybe outside clients' ownership	10 to 20	3
T11	Leyland cypress	M	250	1	12.5	0	0	C2	2.6	1.8	2.1	2.6	Fair	Fair	Mid row	Crown lift to 3 metres over drive and footpath-maybe outside clients' ownership	10 to 20	3
T12	Leyland cypress	Y	105	1	9.5	0	0	C2	2.3	1.4	1.6	2	Poor	Poor	Immature specimen and suppressed	Crown lift to 3 metres over drive and footpath-maybe outside clients' ownership	10 to 20	2
T13	Leyland cypress	SM	220	1	11.5	0	0	C2	2.5	2.2	2	2.5	Fair	Fair	End of lines	Crown lift to 3 metres over drive and footpath-maybe outside clients' ownership	10 to 20	3
T14	Chanticleer Pear	SM	200	1	10	2	2	B2	2.2	2	2.5	2.6	Good	Good	With tree stake-overhanging property	Reduce crown and face back from building line of building	20 to 40	2.5

Tree Survey, Arboricultural Impact Assessment and Method Statement.
1 MANOR HOUSE DRIVE, NORTHWOOD, MIDDLESEX. HA6 2UJ

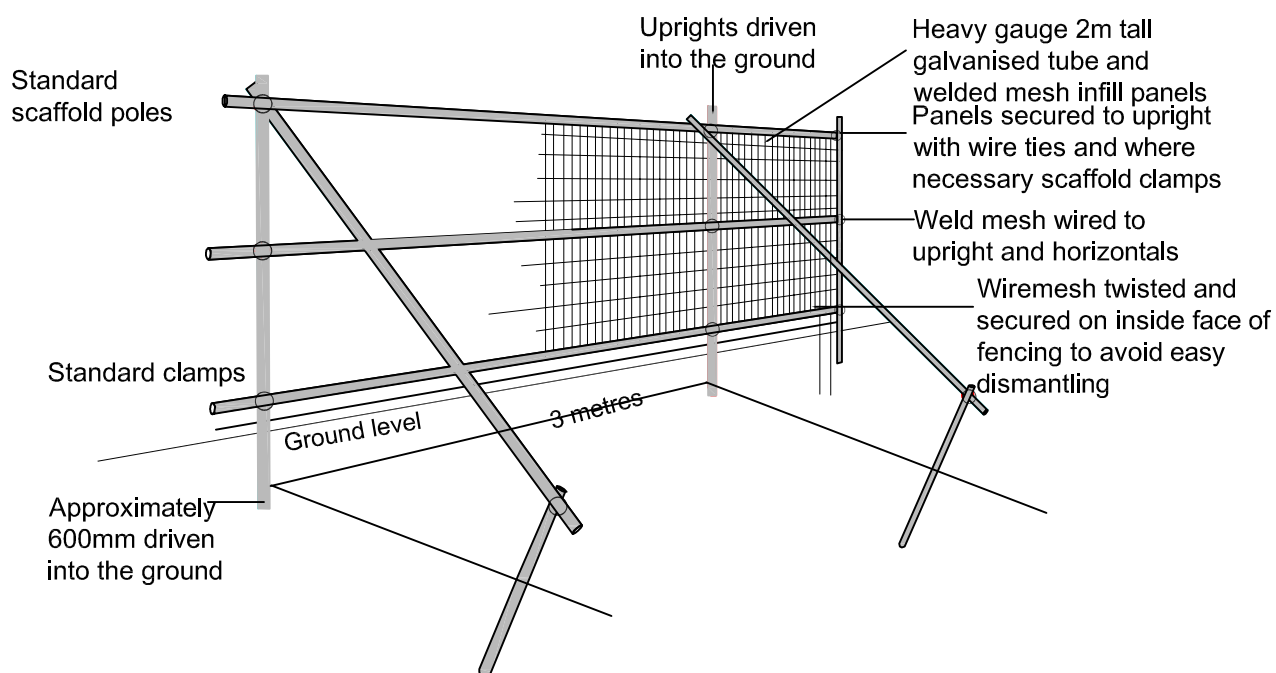
Ref 935

Tag	Tree	Age	Stem Diameter	Stem	Height	Lowest branch	Lower crown	Category	North	South	East	West	Structural	Physiological	Condition	Recommendations	life expectancy	RPA radius
T15	Chanticleer Pear	SM	100, 130	1	7.5	2	2	B2	1.6	1.9	2.3	1.5	Fair	Good	Crown overhanging property	Reduce crown and face back from building line of building	10 to 20	2
T16	Chanticleer Pear	SM	160	1	8	2	2	B2	1.4	2.6	2.4	1.6	Good	Good		REMOVE for new access	10 to 20	2
T17	Chanticleer Pear	SM	135	1	7.5	2	2	B2	1.7	1.7	1.9	1.9	Good	Good			10 to 20	2

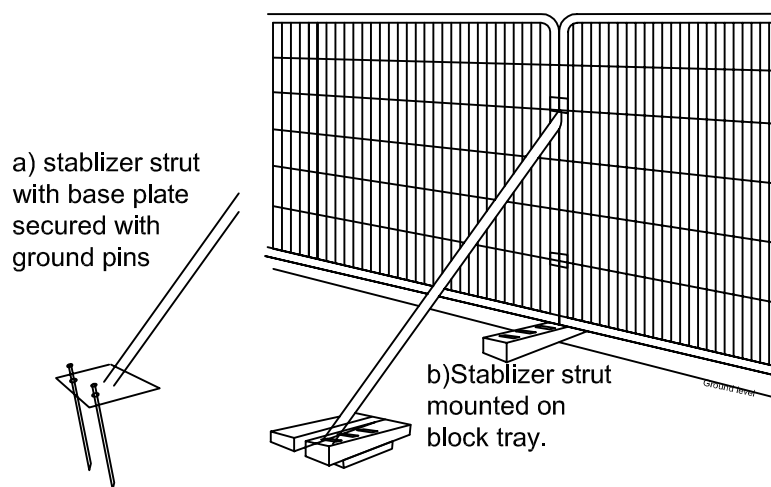
Appendix D: Copy of BS5837:2012 Table 1 “Cascade Chart for Tree Quality Assessment”

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 D</i>

Appendix F Geo-Web Details



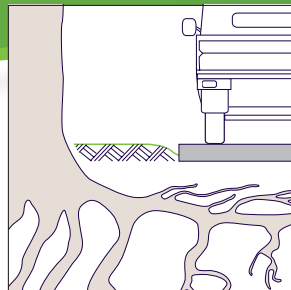
GEOSYSTEMS®



GOWEB®

TREE ROOT PROTECTION (TRP) SYSTEM

Powered by GEOSYSTEMS® technology.



defining **green** in cellular confinement

THE PROBLEM

CONSTRUCTION-RELATED TREE DAMAGE

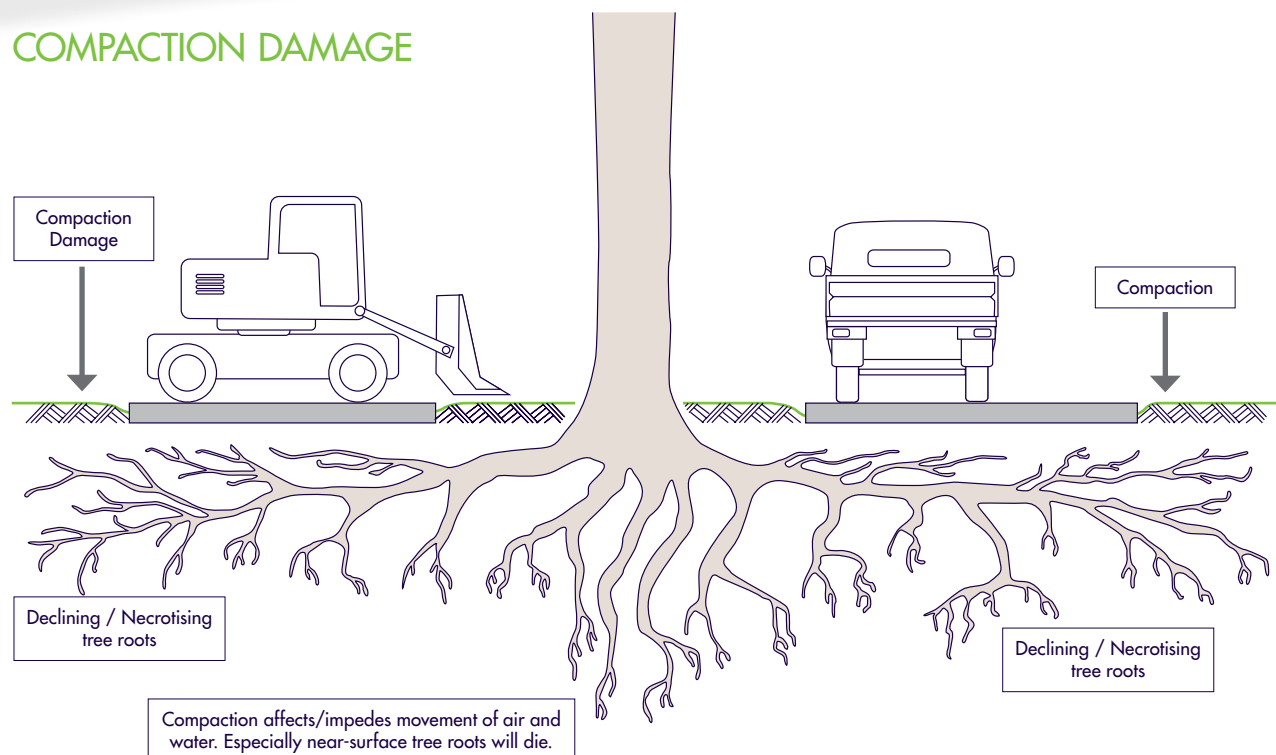
Critical Root Zone/Tree Protection Zone is the minimum area beneath a tree that must remain undisturbed to preserve a sufficient amount of root mass in order to give a tree a chance of survival.

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

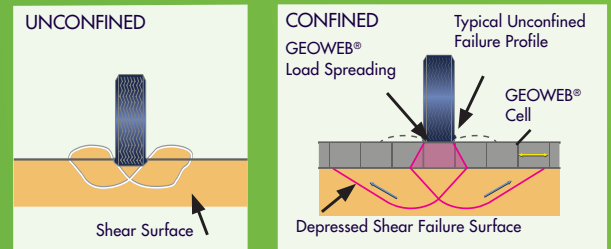
TREE ROOT PROTECTION (TRP) SYSTEM

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.



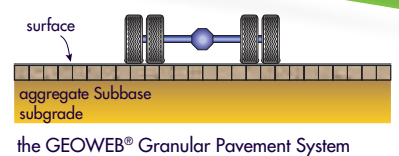
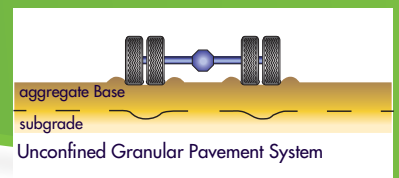
LOAD DISTRIBUTION

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.

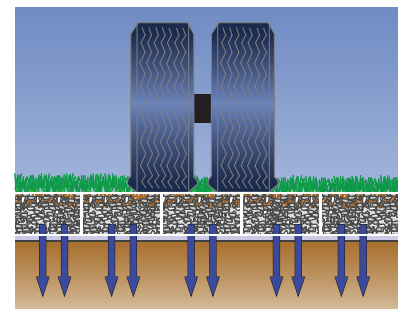


ENVIRONMENTAL BENEFITS

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.

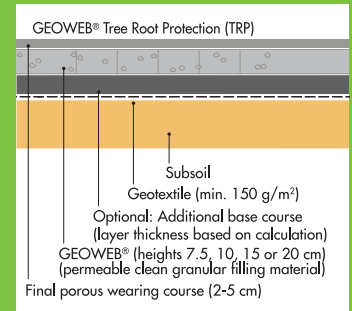
Step 6: Compact the fill material with conventional plant or non-vibratory plant when required. Fill should be maintained above the GEOWEB® system by a minimum of 10mm at all times or a permanent wearing course of blocks, porous asphalt or gravel installed.



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.



PRESTO GEOSYSTEMS®

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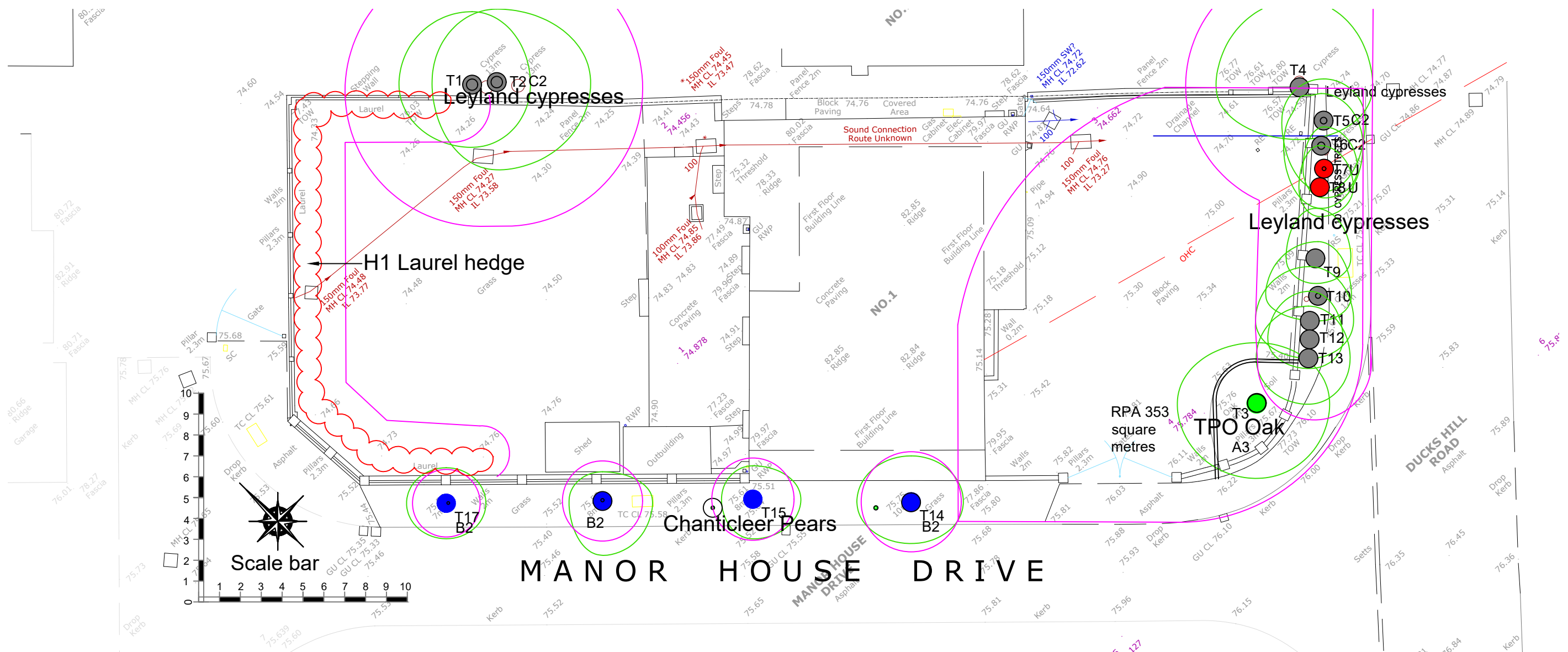
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AP-7417

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	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. For 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 935.19.1 Tree Constraints Plan



SCHEDULE

-  A Quality trees
-  B Quality trees
-  C Quality trees.
-  U Quality trees
-  Root Protection Areas (RPA)
-  Hedges

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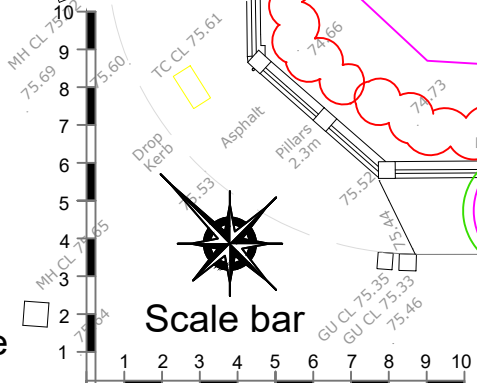


Scheme <i>1 Manor House Drive, Northwood</i>	Date <i>October 2019</i>
Title <i>Tree Constraints Plan</i>	Drawn by <i>E.J.G</i>
Scale <i>1:200 @ A3.</i>	Job No <i>935.19</i>
Elizabeth Greenwood C.M.L.I., F.Arbor.A. 10 Knight Street, Sawbridgeworth, Herts, CM21 9AT. Tel 01279 722381 mobile 07746867402, email ms.ejgreenwood@gmail.com	Drg No <i>935.19.1</i> <i>Appendix H</i>

Appendix I: Plan 935.19.2 Tree Surgery and Removal Plan

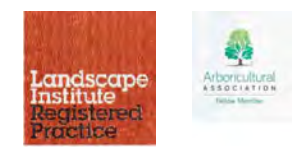
SCHEDULE

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



ag	Tree	Category	Recommendations
1	Leyland cypress	C2	Crown lift over garden if required
2	Leyland cypress	C2	Crown lift over garden if required
3	Oak- TPO	B2	Improve rooting conditions: remove deadwood and defective branches, reduce back to sound wood and monitor
4	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
5	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
6	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
7	Leyland cypress	U	REMOVE- maybe outside clients' ownership
8	Leyland cypress	U	REMOVE- maybe outside clients' ownership
9	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
10	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
11	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
12	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
13	Leyland cypress	C2	Crown lift to 3 metres over drive and footpath- maybe outside clients' ownership
14	Chanticleer Pear	B2	Reduce crown and face back from building line of the proposed building
15	Chanticleer Pear	B2	Reduce crown and face back from building line of the proposed building
16	Chanticleer Pear	B2	REMOVE
17	Chanticleer Pear	B2	
18	Laurel hedge		Remove

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Scheme <i>1 Manor House Drive, Northwood</i>	Date <i>October 2019</i>
Title <i>Tree Surgery and Removal Plan</i>	Drawn by <i>E.J.G</i>
Scale <i>1:200 @ A3.</i>	Job No <i>935.19</i>
Elizabeth Greenwood C.M.L.I., F.Arbor.A. 10 Knight Street, Sawbridgeworth, Herts, CM21 9AT. Tel 01279 722381 mobile 07746867402, email ms.ejgreenwood@gmail.com	Drg No <i>935.19.1</i> <i>Appendix 1</i>

Appendix J: Plan 935.19.3 Tree Protection Plan

Ground protection and new surfacing within RPA of trees- minimize excavation to remove only the topsoil, lay separation membrane and use geo-web material as a permeable formation for new parking area and the base of the cycle store

New soft landscape area- Remove paving, kerbs and foundation by hand or if machinery is used working backwards with machinery using paved surface for ground protection. Hand dig for any unavoidable excavation below the foundation level. De-compact the subsoil by hand before laying new soils for soft landscape with topsoil and bark mulch- plant as specified by hand with no mechanical cultivation. No additional excavation for new paths and paving; hand dig for installation of posts and seating

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. 100mm depth of woodchip), laid onto a geo-textile membrane;
- 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;
- 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.

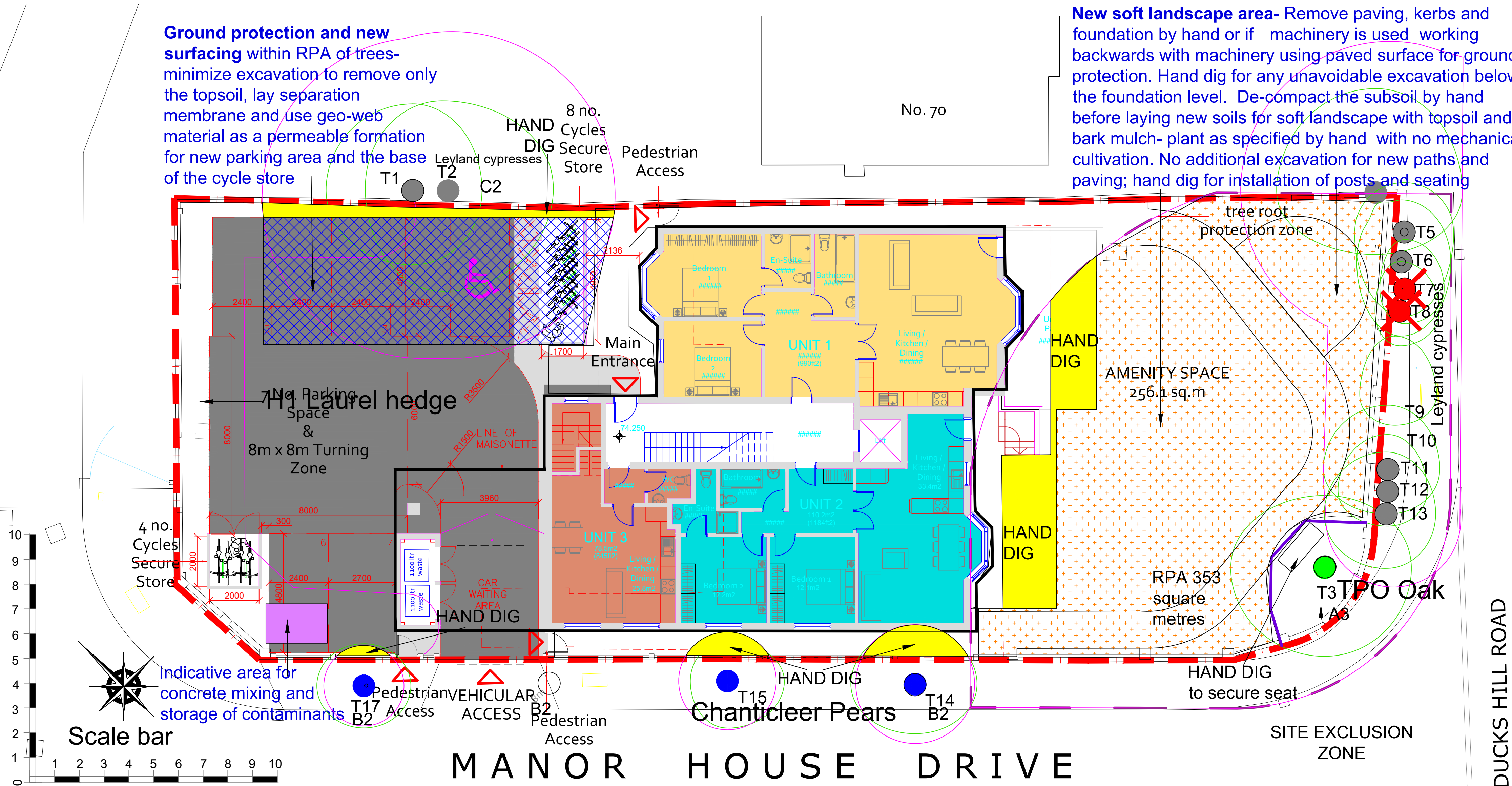
Hand dig

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.

- 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.

Method of working

- Carry out tree surgery and tree removal as outlined.
- Fence off as shown with approved fencing
- Lay ground protection as specified- use existing paved courtyard for access and building works.
- For new parking area and courtyard lay geo-web
- Carry out demolition- do not store rubble within root protection area unless there is ground protection in situ
- Excavation area for foundation of building by hand as indicated on plan.
- On completion of building works remove courtyard paving and foundation by hand or as specified. 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 round tree, lay path foundation on existing base- landscape area as agreed with the LPA.
- Remove tree protection fencing



DUCKS HILL ROAD

Protective barrier/fencing Not to scale
Copy of BS 5837:2012 Figure 3 Examples of above ground stabilizing systems (for Heras type fencing)
Total height 2.4metres

a) stabilizer strut with base plate secured with ground pins

b) Stabilizer strut mounted on block tray.

SCHEDULE

- Trees to retain
- Trees to remove
- Root protection areas
- Protective /barrier fencing

Ground protection and new surfacing within RPA of trees- minimize excavation to remove only the topsoil, lay separation membrane and use geo-web material as a permeable formation for new parking area and the base of the cycle store

HAND DIG

New soft landscape area- Remove paving, kerbs and foundation by hand or if machinery is used working backwards with machinery using paved surface for ground protection. Hand dig for any unavoidable excavation below the foundation level. De-compact the subsoil by hand before laying new soils for soft landscape with topsoil and bark mulch- plant as specified by hand with no mechanical cultivation. No additional excavation for new paths and paving; hand dig for installation of posts and seating

Concrete mixing and storage of contaminants

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Scheme <i>1 Manor House Drive, Northwood</i>	Date <i>October 2019</i>
Title <i>Tree Protection Plan</i>	Drawn by <i>E.J.G</i>
Scale <i>Plans 1:100 @ A1. Construction drawings not to scale</i>	Job No <i>935.19</i>
Elizabeth Greenwood C.M.L.I., F.Arbor.A. 10 Knight Street, Sawbridgeworth, Herts, CM21 9AT. Tel 01279 722381 mobile 07746867402, email ms.ejgreenwood@gmail.com	Drng No <i>935.19.1</i> <i>Appendix J</i>

References

- British Geological Survey. (2018, 02 01). *Geology of Britain Viewer*. Retrieved from British Geological Survey: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>
- Dobson, M. (1995). *Arboriculture Research and Information Note: Tree Root Systems*. Farnham: Arboricultural Advisory and Information Service.
- Forestry Commision. (1998). *Estimating the Age of Large and Veteran Trees in Britain*. Stockport: Forestry Commision. Retrieved from Forestry Commision: <https://www.forestry.gov.uk/website/publications.nsf/DocsByUnique/D4AEAEBBC8EE5FE1180257EBB0046FA7E>
- Lonsdale, D. (1999). *The Principles of Tree Hazard Assessment and Management*. London: Stationary Office Books.
- Mattheck, C. (1995). *The Body Language of Trees: A Handbook for Failure Analysis*. London: Stationary Office Books.
- NJUG. (2007). *Volume 4 Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees*. London: National Joint Utilities Group.
- Roberts, J., Jackson, N., & Smith, M. (2013). *Tree Roots in the Built Environment*. London: Stationary Office Books.
- Soilscapes. (2018, 02 06). *Soilscapes Map*. Retrieved from Soilscapes: <http://www.landis.org.uk/soilscapes/>
- Strouts, R., & Winter, T. (1994). *Diagnosis of Ill-Health in Trees*. London: Stationary Office Books.
- The British Standards Institution. (2010). *Tree Work*. Milton Keynes: BSI Standards Limited.
- The British Standards Institution. (2012). *Trees in Relation to Design, Demolition and Construction - Recommendations*. Milton Keynes: BSI Standards Limited.
- Weber, K., & Mattheck, C. (2003). *Manual of Wood Decay in Trees*. Stonehouse: The Arboricultural Association.