MARTIN DOBSON ASSOCIATES
ARBORICULTURAL CONSULTANCY

● Ivy House, 49 Liphook Road, Whitehill, Bordon, Hants, GU35 9DA
● Telephone: 01420 488342 ● Mobile: 07787 530983
● Email: info@martindobson.org.uk
● www.martindobson.org.uk

TREE SURVEY, ARBORICULTURAL IMPACT ASSESSMENT AND ARBORICULTURAL METHOD STATEMENT

A report to accompany a planning application for the construction of a lower ground floor extension beneath the existing building, and under the approved ground floor extension, at 34 Hollycroft Avenue, London, NW3 7QL.

Report by Dr Martin Dobson

BSc (Hons) Biol, DPhil, FArborA, MEWI
Registered Consultant of the Arboricultural Association

On the instructions of 5D Architects

1st September 2022

MDA reference R29

Contents

Part 1	Introduction	Page 3
Part 2	Tree survey	Page 4
Part 3	Soil assessment	Page 5
Part 4	Arboricultural impact assessment	Page 6
Part 5	Arboricultural method statement and tree protection plan	Page 8
Part 6	Conclusions	Page 13

There are six appendices

MD1	Tree survey schedule (BS5837:2012)	Page 14
MD2	Tree constraints plan	Page 15
MD3	Schedule of root protection areas	Page 16
MD4	Tree protection plan	Page 17
MD5	Induction sheet	Page 18
MD6	Qualifications and experience	Page 19

1. Introduction

1.1 Martin Dobson Associates Ltd was instructed by 5D Architects on 21st December 2021 to carry out a survey of trees at 34 Hollycroft Avenue, London, NW3 7QL. The purpose of the survey was to inform architects of potential tree-related constraints on the site and to provide advice on tree protection during the proposed construction of a basement extension beneath the existing house, and approved rear extension, and the creation of two lightwells at the front.

1.2 The British Standard 5837: 2012 *Trees in relation to design, demolition and construction – Recommendations* provides a framework for considering trees in the planning process. It gives guidance on categorising the qualities of trees in order to enable decisions to be made as to which trees are appropriate for retention within a development. It then advises on options for protecting trees to be retained during the development (at all stages including demolition, construction and hard landscaping), and the means of incorporating trees into the developed landscape. This report complies with the recommendations of BS5837: 2012.

1.3 The property is within the Redington Frognal Conservation Area and this means that all trees with a trunk diameter of 75mm or more benefit from statutory protection and no work can be carried out to them (including cutting roots or branches or felling) without statutory notification to the local planning authority. However, the granting of planning permission allows trees to be removed if they are shown as being removed on approved plans.

1.4 Three trees were surveyed and of these one is considered to be category A and of high value (T1 plane) and two are considered to be category B and of moderate value (T2 magnolia and T3 pear). Two crab apples were present at the front, a line of Portugal laurels at the rear and a line of birch trees at the rear boundary together with a pleached hedge on either side boundary all had stem diameters of less than 75mm, and are therefore not protected by the Conservation Area, and are not included in the BS5837: 2012 survey.

1.5 Permission was granted by the London Borough of Camden on 27th June 2022 for removal of the existing rear conservatory and replacement with a courtyard and erection of single storey side/rear extension under reference 2022/0800/P. The consent allowed for the removal of a line of small Portugal laurels (and one adjacent pine) on the rear patio. The current proposal does not extend beyond the existing footprint of the building and the approved extension, other than two small lightwells at the front.

1.6 The approved, and proposed, development enables the retention of T1 – T3.

1.7 The retained trees will be protected during development. Details of tree protection are contained in this report.

2. Tree survey

2.1 The tree survey was carried out by Martin Dobson on 24th January 2022.

2.2 Appended at **MD1** is the tree survey schedule which provides details of the three trees present within or immediately adjacent to the property (trees with trunk diameters less than 75mm diameter were excluded from the formal survey).

2.3 The site survey drawing appended at **MD2,** based on a supplied topographical survey, shows the positions of the surveyed trees and gives a reasonable indication of their comparative branch spreads. The drawing has been colour coded as follows:

A trees (high quality and value, minimum 40 years useful life)	LIGHT GREEN
B trees (moderate quality and value, minimum 20 years useful life)	MID BLUE
C trees (low quality and value, minimum 10 years useful life)	GREY
U trees (unsuitable or dead/dying/dangerous, less than10 years useful life)	RED

2.4 It should be understood that no individual safety inspection has been carried out on any tree. Similarly, any suggestions for tree work should not be taken as a specification for tree works.

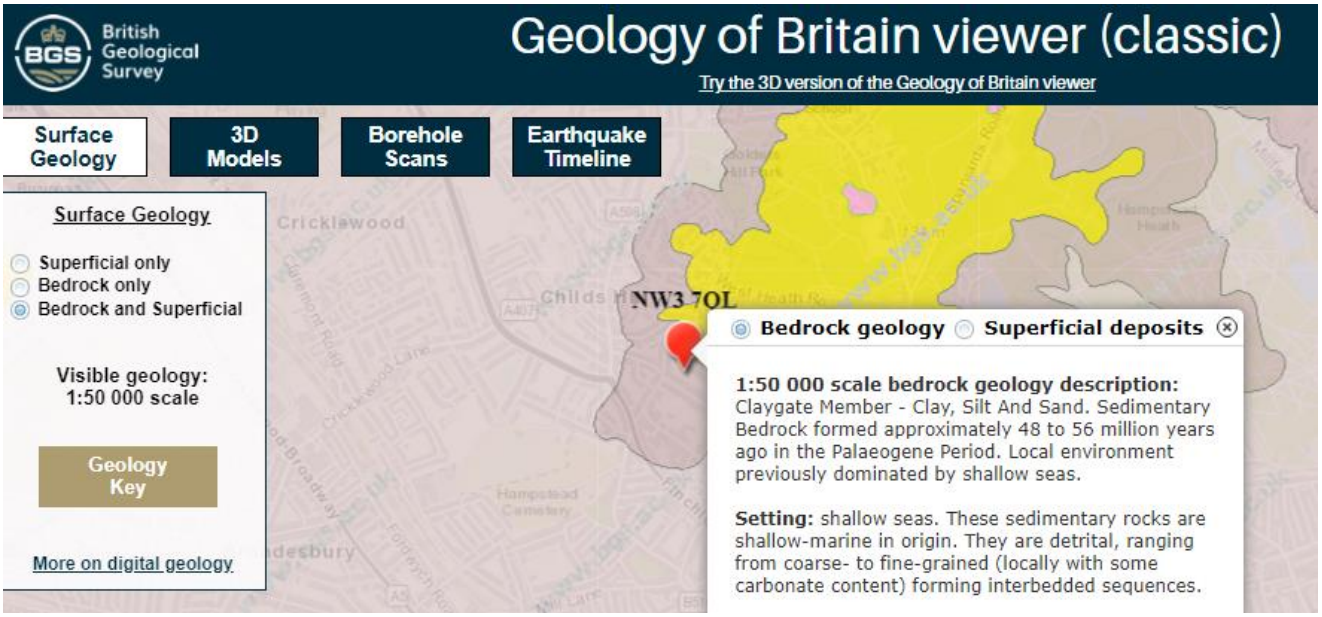
2.5 Adequate protection, both above and below ground, is essential for trees that are to be retained as part of a development. The British Standard BS5837: 2012 *Trees in relation to design, demolition and construction - Recommendations* advises that there should be a root protection area (RPA) around trees which is kept free of construction activities by means of an exclusion zone enforced by protective fencing and/or ground protection. The RPA is calculated as the area equivalent to a circle with a radius of 12 times the trunk diameter at a height of 1.5 m above ground level. Based on the tree survey data root protection areas (and radial distances from the trunk to be protected) have been calculated and these are shown as circles around the trees on the tree constraints plan at **MD2** and are tabulated at **MD3**.

3. Soil assessment

3.1 BS5837: 2012 advises that soil properties should be considered as part of a tree survey report. This is necessary because trees can cause damage to structures founded on soils that shrink and swell with changes in moisture content (principally clays). Such movement is exacerbated by the influence of trees and therefore if a shrinkable soil is suspected foundations should be designed to extend below the likely zone of seasonal moisture change.

3.2 The British Geological Survey 1: 50,000 scale map indicates that the underlying geology of the site is shrinkable Claygate Member – Clay, Silt and Sand (Figure 1). Thus, foundations will need to be deepened beyond the usual 1m to take account of trees. If site specific investigations confirm shrinkable clay then foundations should be designed with reference to the National House Building Council's Standards Chapter 4.2 *Building near trees*.

Figure 1. British Geological Survey 1: 50,000 scale map showing that the site is underlain by Claygate Member – Clay, Silt and Sand



4. Arboricultural impact assessment

4.1 The purpose of an arboricultural impact assessment (AIA) is to evaluate the direct and indirect effects of proposed development on trees and, where necessary, to consider appropriate mitigation. It should set out which, if any, trees are to be removed to facilitate the development and should consider the possible effects on retained trees of potentially damaging activities on the site (for example changes in ground level and installation of below ground services). Requirements for access around trees should be considered and potential conflicts identified, for example, where branches overhang the development area and may require pruning.

4.2 Mitigation for any issues identified should be proposed and addressed in the arboricultural method statement (AMS).

4.3 It should be noted that the proposed lower ground floor extension does not extend beyond the footprint of the existing building and the approved extension, other than the two new lightwells at the front.

Tree removals

4.4 The proposed development does not require the removal of any trees with a stem diameter of more than 75mm at 1.5m above ground level. However, a line of recently planted Portugal laurels, and one adjacent pine, located on the rear patio, will be removed to make way for the new extension.

Tree pruning

4.5 No pruning work is required to facilitate the proposed development as there is sufficient space between the building and retained trees for all works to take place without conflicts arising.

Tree protection

4.6 Trees T1 – T3, young birches planted against the rear boundary, and a pleached hedge against the side boundaries, will be protected from mechanical damage to their trunks, branches and roots by the installation of 2m high protective fencing to create a construction exclusion zone (CEZ) to exclude site workers, machinery and storage of materials. There is sufficient space outside the CEZ for all construction activities to take place without creating pressure on tree protection. A small area of the RPA of T2 will be required to access the new building and the ground in this area will be protected by retaining existing paving.

4.7 T1 plane at the front stands within the pavement and its RPA is completely under hard surfacing, which will prevent soil compaction. Its trunk will be protected from impact damage by hoarding.

4.8 The two small lightwells proposed at the front are contained behind existing retaining walls (Figures 2 and 3). The house is currently about 1m higher than the driveway and it is likely that the foundations of the retaining walls will be 600mm or more below driveway level. It is therefore highly likely that no significant roots of T1 (roots larger than 25mm diameter) will extend under the retaining walls and therefore installation of the lightwells will not cause any material harm to T1. It will be necessary to remove a short section of the yew hedge on the right hand boundary (about 1m). The existing parking space and steps will not be altered and therefore the present hard surfacing will protect roots beneath it from damage during construction.

Figure 2. Photograph of retaining wall at the left hand side of the parking space.

Figure 3. Photograph of retaining wall at the right hand side of the parking space.

5. Arboricultural method statement and tree protection plan

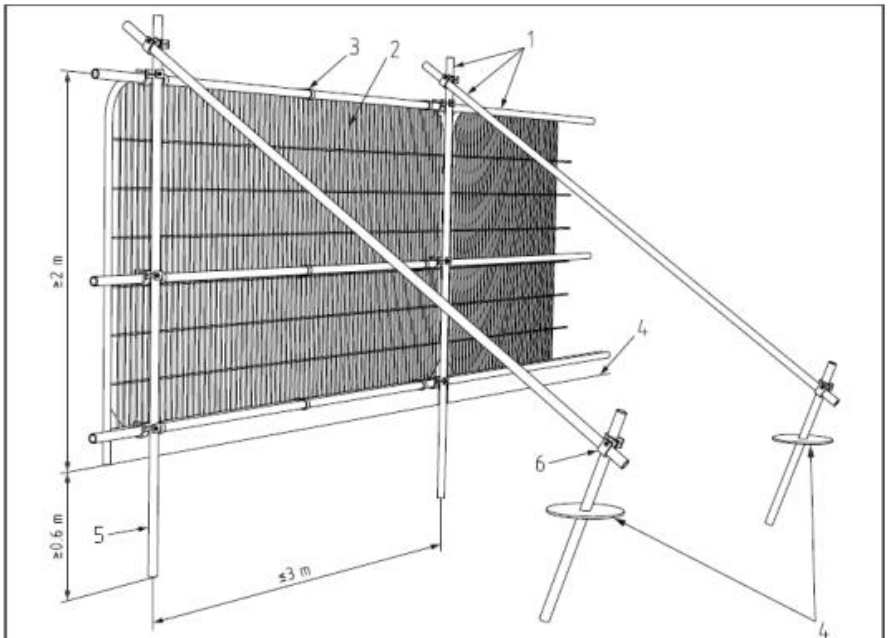
5.1 Trees can very easily be damaged during construction activities through their branches being broken by construction traffic passing close to the canopy or by root severance during the digging of foundation or service trenches. The majority of roots are to be found in the upper 600mm of soil and so even relatively shallow trenches can sever a significant number of roots growing across the direction of the trench. Similarly, the diameter of tree roots tapers sharply within a few metres of the trunk of a tree, so that what might seem to an uninitiated site worker to be an insignificant root (perhaps only a few centimetres in diameter) may actually be highly important.

5.2 Tree roots can also be damaged indirectly, often inadvertently, through soil compaction, which disrupts soil structure and can lead to root death through the development of anaerobic soil conditions. Spillage of toxic materials (e.g. oil or diesel) can also result in root damage and ultimately the death of a tree. Protection of the soil around trees by means of a construction exclusion zone (CEZ) is therefore vitally important in order to preserve roots undamaged.

Fencing and ground protection

5.3 Tree protection will comprise of 2 m tall fencing installed in the rear garden at the positions shown at **MD4** before demolition takes place or materials are delivered to site or construction commences. The fencing will consist of a scaffold framework, well braced to resist impacts, with vertical tubes spaced at a maximum interval of 3 m (Figure 4). Onto this, weld mesh panels or 2 m high shuttering board will be securely fixed with wire or scaffold clamps. Un-braced weld mesh panels on unsecured rubber or concrete feet will not be used as these are not resistant to impact and are too easily removed by site operatives. An alternative system of bracing which does not require a scaffold framework is shown in Figure 5.

Figure 4. Diagram to illustrate design of protective fencing with scaffolding anchored into the ground



Key
1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Figure 5. Diagram to illustrate alternative design of protective fencing

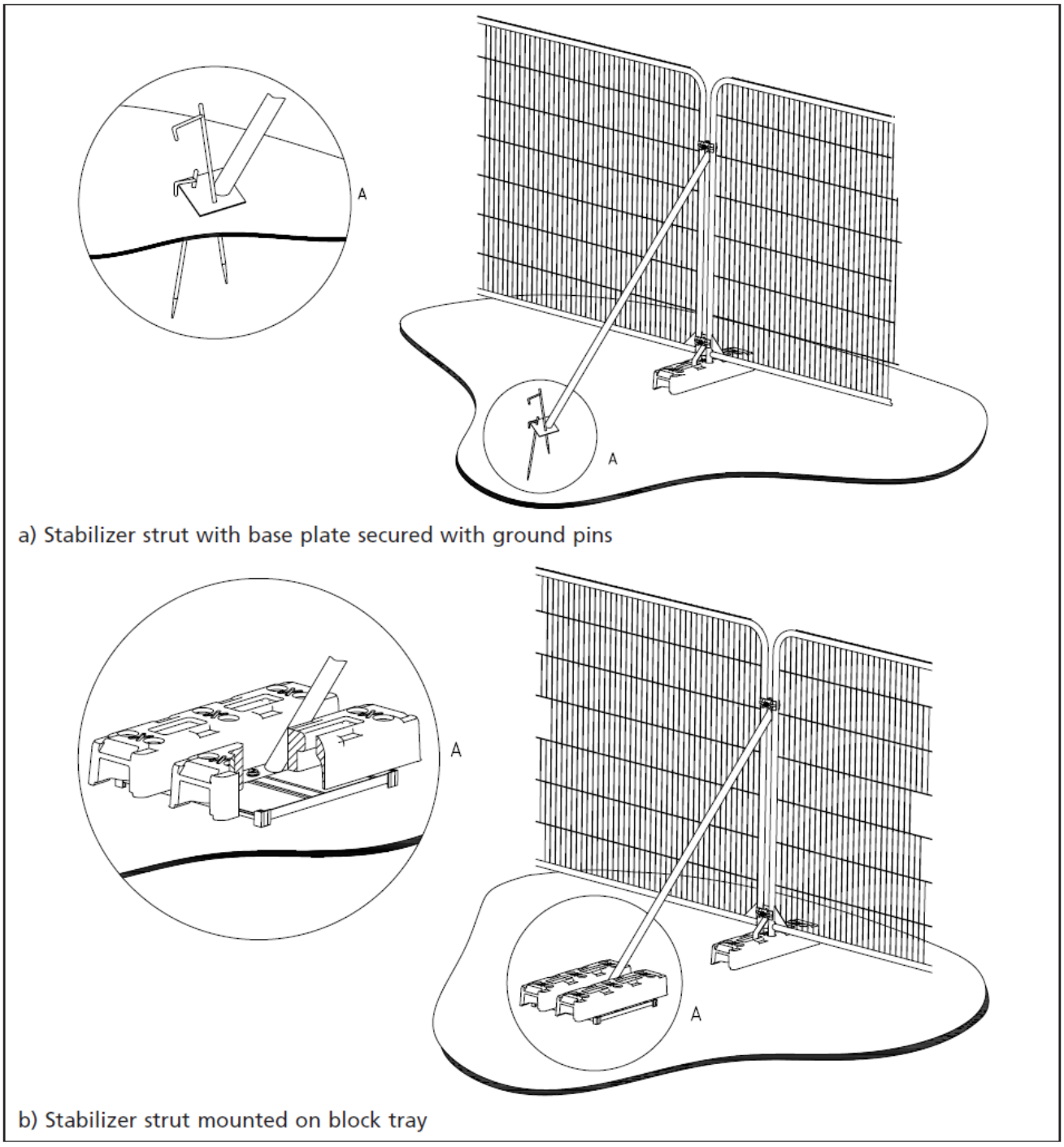


Figure 6. Photograph to illustrate installed protective fencing

5.4 High visibility all weather notices at a size no less than A3 will be securely attached to every second panel of the barrier around the CEZ with wording as shown in Figure 7.

Figure 7. Wording to be included in high visibility all-weather sign attached to protective fencing

5.5 The trunk of T1 plane at the front of the property will be protected by hoarding secured to a timber frame braced against the tree by cross struts (Figure 8).

5.6 Ground protection within the RPAs of T1 and T2 will be by means of retention of existing hard surfaces.

Figure 8. Photograph showing hoarding erected around the trunk of a tree to prevent inadvertent impact damage.

Arboricultural supervision

5.7 It is recommended that a project arboricultural consultant is appointed to oversee tree protection for the duration of the construction contract. If appointed, the project arboriculturist

will be consulted on any issues that may arise concerning trees and will visit the site as often as necessary to ensure that trees are protected and/or at the following key stages:

- Following installation of tree protection but prior to any works commencing on site to confirm that it is fit for purpose;
- At any time that there are potential conflicts with tree protection.

5.8 A pre-start meeting will be held on site with the project arboriculturist and the contractor's representative(s) so that tree protection can be confirmed as fit for purpose. At this meeting the site manager/foreman will be fully briefed on tree protection measures and procedures before any workers or sub-contractors are permitted onto the site. Following induction, a copy of the Induction Sheet (**MD5**) will be provided to and be signed by the site manager/foreman in recognition of acceptance of their role in enforcing day to day tree protection.

5.9 All contractors involved in the project have a duty to comply with all the specified tree protection measures and all workers will be provided with induction by the site manager/foreman and be required to sign an Induction Sheet confirming they have understood the protection measures. Signed sheets will be kept on site for inspection.

5.10 No enabling works will take place until after the meeting has been held and tree protection has been installed, inspected and approved as fit for purpose.

5.11 Fencing will not be removed under any circumstances during construction unless with the express approval of the local authority. If in any doubt the site manager must contact the nominated arboricultural consultant.

Burning of waste

5.12 No fires will be lit on site within 3 m of root protection areas due to the danger of scorching of leaves and branches of overhanging trees.

Space for machinery, parking of vehicles, storage of materials and site huts

5.13 All machinery required on site will operate outside of root protection areas or from the the driveway. Site accommodation, if required, will be located outside root protection areas.

5.14 Delivery vehicles will park in the drive or off site and storage of materials will be outside root protection areas. At each delivery, where materials are unloaded by crane, a banksman will be present to ensure that sufficient clearance is allowed for to avoid conflict with branches of T1. Any incidents must be reported to the project arboriculturist.

Services

5.15 It is anticipated that existing services will be routed from within the house, but if it proves necessary for a trench to be dug through an RPA a specific method statement will be required which will need to specify that the trench will be hand dug and that care will be taken to preserve all roots encountered which are larger than 25mm diameter.

Landscaping

5.16 Once construction has demonstrably finished (to the satisfaction of the project arboriculturist) fencing may be removed in order to allow final landscaping to be undertaken. Landscaping plans

will not involve any changes in soil levels, digging of any trenches or construction of masonry or retaining walls within root protection areas.

6. Conclusions

6.1 A BS5837: 2012 survey of three trees has been carried out at 34 Hollycroft Avenue, London, NW3 7QL. One tree is considered to be category A and of high value (T1 plane) and two are considered to be category B and moderate value (T2 magnolia and T3 pear).

6.2 The proposed development does not require the removal of any trees with a stem diameter of more than 75mm. A group of young Portugal laurels and one pine (diameter < 75mm) will be removed to make way for the proposed extension.

6.3 The trees to be retained will be protected during development and methods for ensuring their protection have been described.

6.4 It is considered that the proposed development will pose no threat to trees to be retained and is sympathetic to the character of the Conservation Area.

APPENDIX MD1

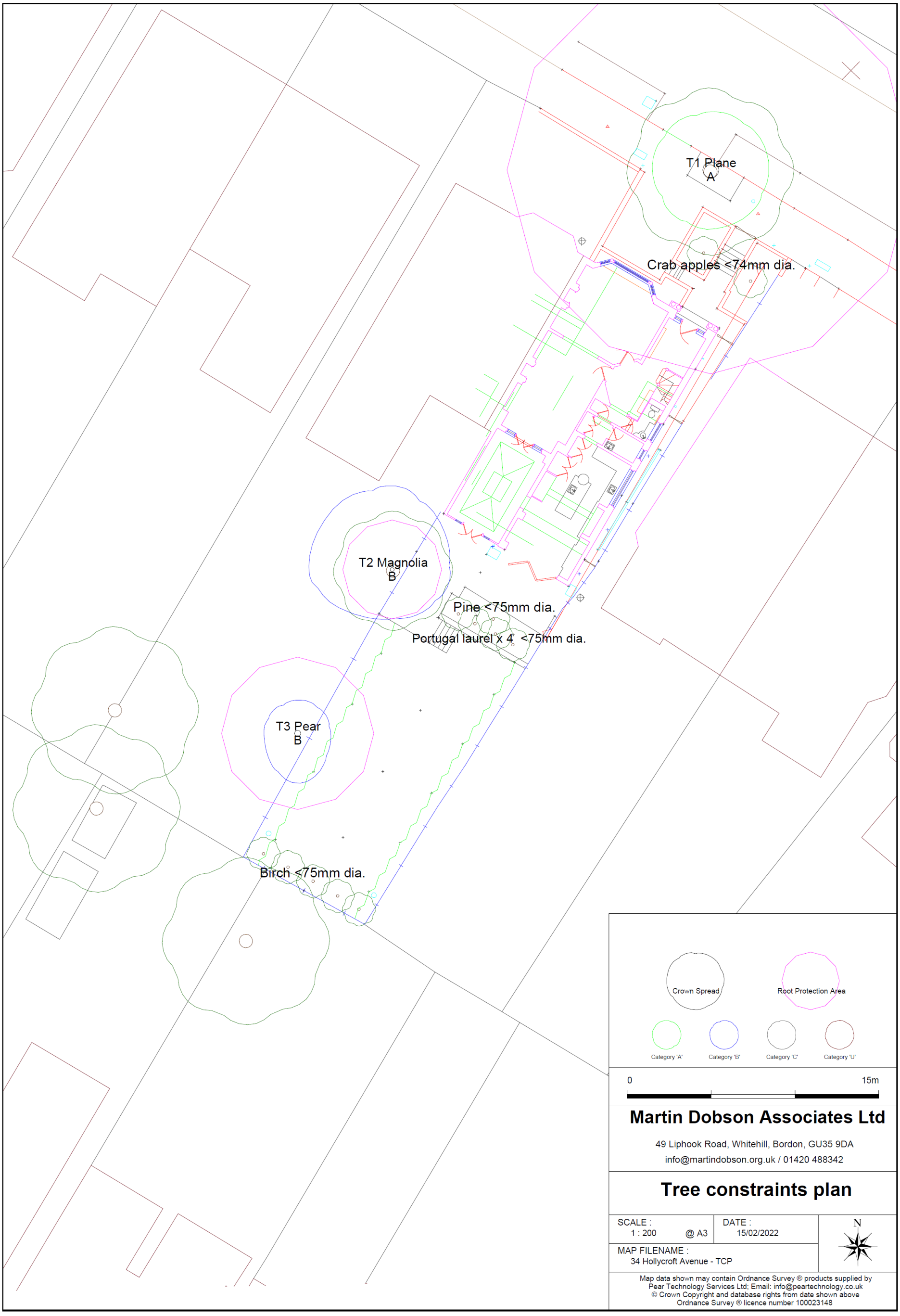
Tree survey schedule (BS5837: 2012)

Tree No.	Species	Height (m)	Trunk diameter (mm)	N (m)	E (m)	S (m)	W (m)	Height of crown clearance (m)	Age class	Physiological condition	Structural condition	Useful Life (y)	BS5837 Category	Comments
T1	Plane	15	990	3.5	3.5	3.5	3.5	10	M	Good	Good	40+	A	Previously pollarded at 12.4m
T2	Magnolia	7	230	5.0	3.5	3.0	5.0	3	MA	Good	Good	20-40	B	Neighbour's tree
T3	Pear	10	370	2.0	2.0	3.0	2.0	5	MA	Good	Good	20-40	B	Neighbour's tree. Ivy covered trunk.

Y= young (<one-third of life expectancy), MA = mid-aged (one-third to two-thirds of life expectancy), M = mature (> two thirds of life expectancy), OM = over-mature (reaching the end of life expectancy).

APPENDIX MD2

Tree constraints plan (TCP) showing existing plot layout with tree numbers, BS5837: 2012 colour codes (A – Green, B – Blue, C – Grey, U - Red) and root protection areas (magenta circles). The plan has been provided separately as a PDF at a scale of 1: 200 @ A3.



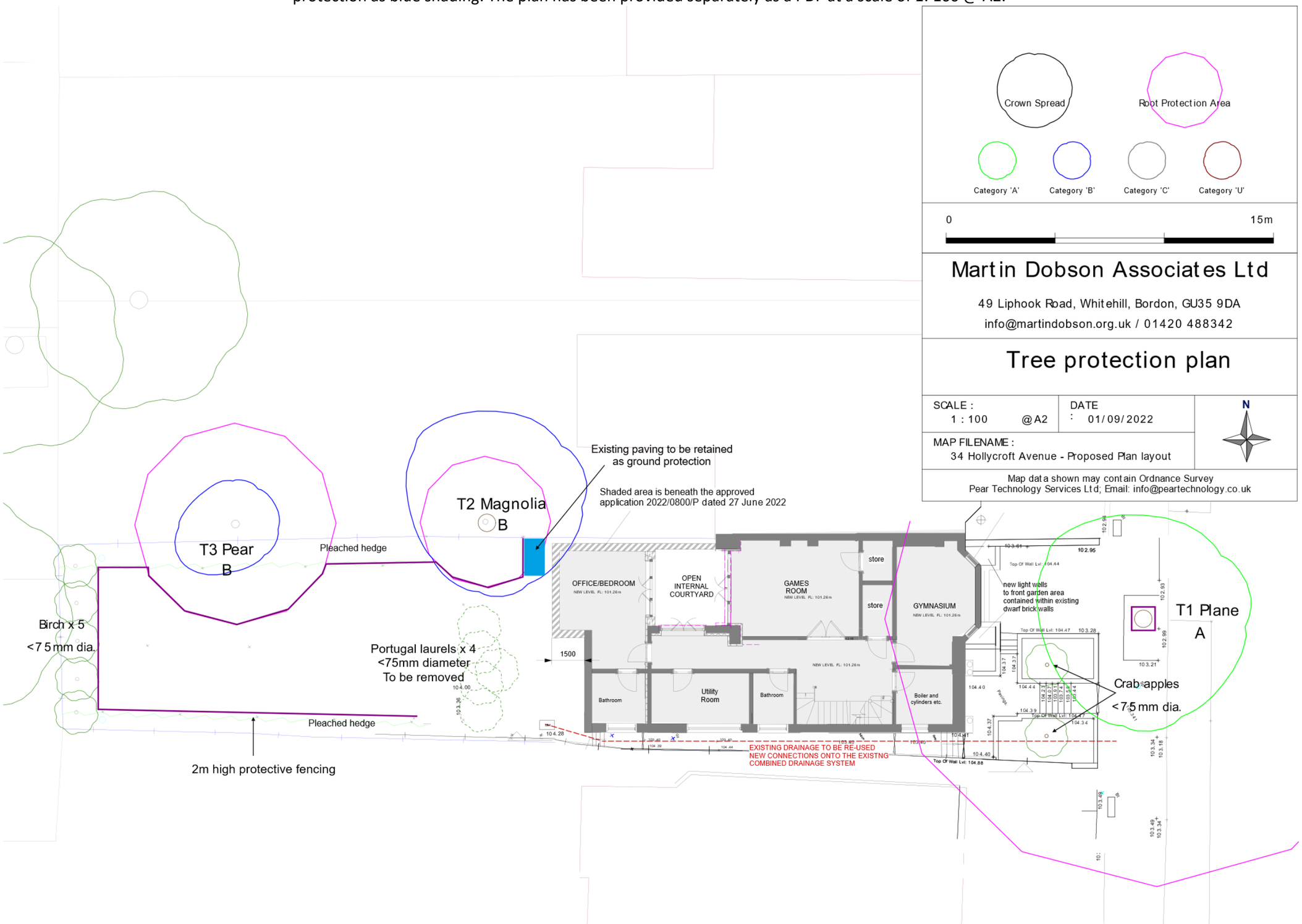
APPENDIX MD3

BS5837: 2012 schedule of root protection areas

Tree No.	Species	Trunk diameter (mm)	BS5837: 2012 Root protection area, RPA, (m^2)	BS5837: 2012 Radial protection distance (m)
T1	Plane	990	443.4	11.9
T2	Magnolia	230	23.9	2.8
T3	Pear	370	61.9	4.4

APPENDIX MD4

Tree protection plan (TPP) for lower ground floor showing retained trees, tree numbers and root protection areas (magenta circles). The location of protective fencing is shown as purple lines and ground protection as blue shading. The plan has been provided separately as a PDF at a scale of 1: 100 @ A2.



APPENDIX MD5

TREE AWARENESS – SITE INDUCTION SHEET

SITE NAME: 34 Hollycroft Avenue, London, NW3 7QL

Trees are an important part of this development and all trees noted on the Tree Protection Plan are protected by planning conditions and by virtue of being in a Conservation Area. Trees must not be damaged in any way, including indirectly through compaction/contamination of soil, so that they can fully integrate into the finished project and stay healthy well into the future. All persons working on this site have a responsibility to be aware of trees and to abide by tree protection procedures.

How can trees can be damaged?

Above the ground – contacts and impacts with branches and trunk (for example by machine operations: piling rigs, high-sided vehicles, crane use, fixings to trunk, unauthorised cutting back of branches). Make sure there is adequate clearance under the tree canopy and don't stray close to the trunk. Damage to bark allows infections to enter the tree.

Below the ground – roots spread out from the trunk horizontally at shallow depth and are therefore easily damaged. Vehicle and pedestrian movements and storage of materials on unprotected ground causes compaction, especially in wet weather, and must be avoided. Soil stripping during site clearance or landscaping is prohibited in root protection areas. The effects of root damage may take some time to become obvious, but can result in disfiguring dieback of leaves and branches, or even death.

Tree protection procedures

Provided that the simple steps below are followed most tree protection is straightforward:

- Stay out of tree Construction Exclusion Zones (CEZs). These are the areas of ground surrounding retained trees that are protected by barriers and/or ground protection. If you need to go into a CEZ, you must first gain authorisation from the Site Manager.
- No construction activity of any description within CEZs, e.g. soil stripping, cement mixing, services installation, storage of materials etc.
- No fires within 20m of trunk of any retained tree.
- If authorised to work within a CEZ, for example, for installation of an above-ground no-dig driveway you must follow the procedures set out in the **Arboricultural Method Statement.**
- If damage occurs, you must inform the Site Manager who must, in turn, inform the project arboriculturist.

Planning Authority enforcement action needs to be avoided:

- 'Breach of Conditions' notices can prevent a site from being signed-off.
- 'Temporary Stop Notices' halt site operations and result in associated high costs.
- Wilful damage/destruction of TPO/Conservation Area trees can result in company and/or individual prosecutions - fines can me anything up to £20,000 (County Court fines are unlimited). Remember that fines may apply to the person committing the offence as well as the site owner and main contractors!

I have received site induction in tree awareness and tree protection procedures

PRINT NAME

SIGN

DATE

APPENDIX MD6

Qualifications and Experience

Dr Martin Dobson has been engaged in research and advisory work on trees since graduating in 1986 with a BSc (Hons) Degree in Biology. Subsequent postgraduate research led to the award of a Doctor of Philosophy (DPhil) Degree in Tree Physiology in 1990.

Postgraduate studies began in 1986 at the University of Ulster and continued in 1987 at the Forestry Commission's Research Station in Hampshire and focussed on the influence of air pollution on trees. Upon completion of this research in 1989 Dr Dobson was employed by the Forestry Commission and worked in both the Tree Pathology and Environmental Research Branches carrying out research on air pollution, climate change, de-icing salt damage to trees, woodland establishment on landfills and tree root development. He has authored two books: *De-icing Salt Damage to Trees and Shrubs* and *The Potential for Woodland Establishment on Landfill Sites.* He concluded his time at the Forestry Commission with research into the interaction between trees, roots and clay soils which included laboratory investigations, testing of root barriers and a three-year field-scale monitoring programme investigating the influence of woodland and grassland on the moisture status of clay soils.

In 1995 Martin joined the Arboricultural Advisory and Information Service as a senior Arboricultural Advisor. The AAIS advised the (then) Department of the Environment on matters concerning amenity trees and was the principal source of technical advice and information to the arboricultural profession as well as landscape architects, engineers, the horticultural industry and private individuals. A large proportion of advisory work focussed on issues relating to tree diseases and interactions between trees and buildings.

In 1997 Martin started an arboricultural consultancy practice specialising in subsidence and tree root claims, planning and development, tree safety and disease diagnosis. He was a local authority retained consultant providing expertise on tree protection practice and legislation from 1999 - 2006 and has dealt with several thousand Tree Preservation Order and Conservation Area applications.

He has extensive experience as an Expert Witness in the High Court, County Court and Magistrates Court. Notable recent cases he has been involved in include Raphael v London Borough of Brent and Khan v London Borough of Harrow and Kane.

From 1995 to 2011 he was an examiner for the Professional Diploma in Arboriculture for the Royal Forestry Society/ABC Awards and he is currently the Lead Assessor and chairman of the Quality Assurance panel for the Arboricultural Association's Registered Consultant scheme. He has been a guest lecturer for the Middlesex University Countryside Management MSc course and for Portsmouth University. He teaches introductory and advanced courses on trees and subsidence and co-presents seminars on trees and climate change with Professor Andy Moffat for the Arboricultural Association.

In addition to over 30 publications in scientific and technical journals he is the author of Arboriculture Research and Information Note 130/95/ARB *Tree Root Systems*, and leading author of:

Driveways Close to Trees. Arboricultural Practice Note 1. AAIS, Farnham.
Trees in Dispute. Arboricultural Practice Note 3. AAIS, Farnham.
Root Barriers and Building Subsidence. Arboricultural Practice Note 4. AAIS, Farnham.

He is a Fellow and Registered Consultant of the Arboricultural Association and is a Member by examination of the Expert Witness Institute.