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 TREE PROTECTION PLAN

A report to accompany a planning application for the construction of a small extension, demolition and reconstruction of existing garage and internal refurbishments at 2A Kidderpore Gardens, London, NW3 7SR

Report by Dr Martin Dobson
BSc DPhil FArborA MEWI
Registered Consultant of the Arboricultural Association

On the instructions of Mr David Chatterjee

6 February 2015

MDA reference C8

Contents

1. Introduction

1.1 Martin Dobson Associates Ltd were instructed by Mr David Chatterjee on 23 January 2015 to carry out a survey of trees on or immediately adjacent to 2A Kidderpore Gardens, London, NW3 7SR. The purpose of the survey was to inform architects of potential tree-related constraints on the site and to provide advice on design options for the construction of one new detached house with garage and a semi-detached pair of houses.

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.

1.3 Eight trees (or large shrubs) were surveyed and out of these one considered to be category B and of moderate value (lime T1) and the remainder are small or young category C trees of low value.

1.4 In general category C trees should not be considered a material constraint to development.

1.5 The proposed development does not require the removal of any trees but it is proposed that a small (<1 m tall) holly (T7) and a viburnum shrub (T8) are removed as they provide little value and are to be replaced by new landscaping.

1.6 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 Dr Martin Dobson on 28 January 2015.

2.2 Appended at **MD1** is the tree survey schedule which provides details of the eight trees or large shrubs present within or immediately adjacent to the property.

2.3 The site survey drawing appended at **MD2** shows the positions of the trees surveyed 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.

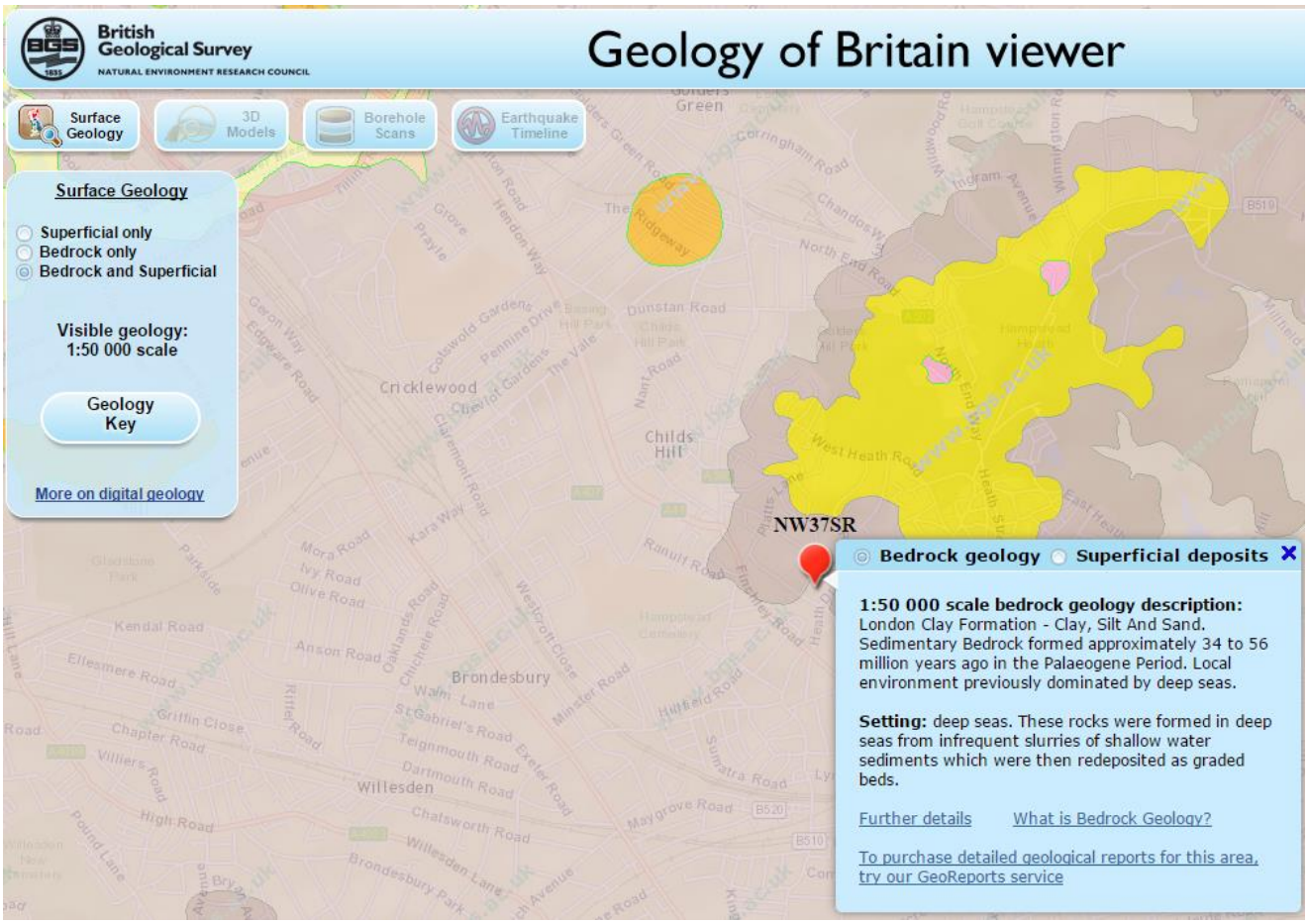
2.5 Adequate protection, both above and below ground, is essential for trees that are to be retained as part of a development. The British Standard BS5837: 2012 *Trees in Relation to Construction - Recommendations* advises that there should be a root protection area (RPA) around trees which is kept free 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 deigned 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 London clay (Figure 1). Thus, foundations will need to be deepened beyond normal depth to take account of trees. Foundations should be designed by an engineer 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 showing that the site is underlain by the shrinkable London clay.



4. Arboricultural Impact Assessment

4.1 The trees in and adjacent to this urban property are generally young and/or of poor quality. The exception is T1 lime which is located next to the entrance drive (Figure 2). The tree has been pollarded in the past but regrowth has more than doubled the size of the canopy. Re-pollarding will be required again in due course.

Figure 2. Lime T1 beside the entrance drive

4.2 Two items of woody vegetation are proposed to be removed as they are of little value, holly T7 (Figure 3) and viburnum T8 (Figure 4). Their removal will be mitigated by additional landscape planting.

Figure 3. Holly T7

Figure 4. Viburnum T8

4.3 The trees to be retained (T1 – T6) will be protected by means of protective fencing or ground protection. Details are provided below.

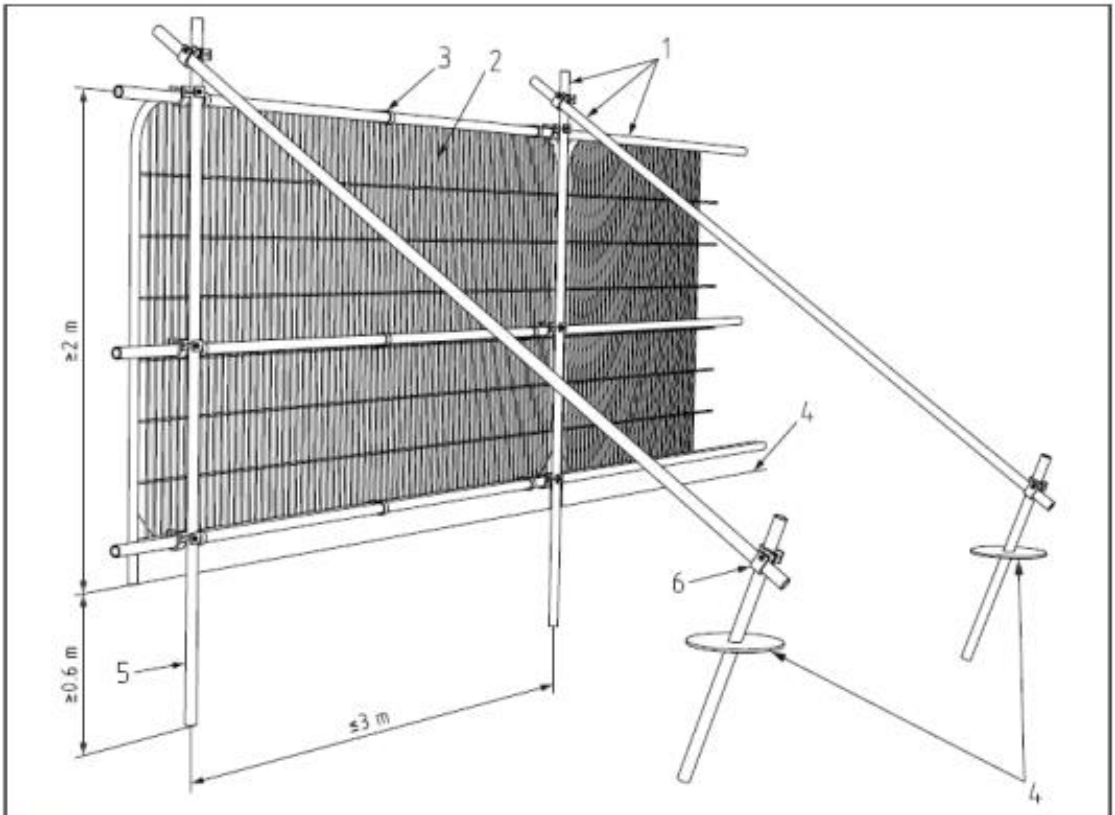
5. Tree Protection Plan

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 600 mm of soil and so even relatively shallow trenches can sever the majority 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 couple of 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.

5.3 Tree protection will comprise of 2 m tall fencing installed in the positions shown at **MD4** before 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 5). Onto this, weld mesh panels or 2 m high shuttering board will be securely fixed with wire or scaffold clamps. Weld mesh panels alone 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.

Figure 5. Diagram and photograph (over) to illustrate design of protective fencing



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

5.4 High visibility all weather notices will be securely attached to the barrier around each protection zone with wording as shown in Figure 6. Where long lengths of barrier are erected a sign will be attached at intervals of no less than 6 m.

Figure 6. Wording to be included in high visibility all-weather sign attached to protective fencing

5.5 Fencing will not be taken down under any circumstances during construction unless with the express approval of the local authority. If in any doubt the site manager must contact the project arboricultural consultant.

5.6 If the existing concrete driveway is to be removed, which has not been decided yet, it will be replaced with an above-ground no-dig driveway (shaded blue at **MD4**). The sequence of events is as follows:

5.7 Existing two linear strips of concrete will be removed using hand tools only. Stones, bricks and no more than 100 mm of topsoil will be removed from within the driveway area using hand tools and the area will be approximately levelled using hand tools only. Tracked or wheeled vehicles must not be used on unprotected ground.

5.8 Once soil has been levelled a layer of geotextile (e.g. Terram 2000) will be laid over the ground.

5.9 A cellular confinement system such as Geocell[1] or Geosythetics Cellweb[2] approximately 200 mm thick will be laid out and pegged in place. Wooden or concrete edging laid above ground will be used and may be anchored by the use of wooden or metal pegs driven into the ground.

5.10 The cellular confinement system will be filled with Type 1 no-fines roadstone. Filling must take place working from outside the root protection area (i.e. from the road) inwards so that any

[1] http://www.terram.com/products/geocells/tree-root-protection-geocell.html
[2] http://www.geosyn.co.uk/products/cellweb-trees.asp?product_id=21

machinery required works on filled rather than empty cells (Figure 7). Banked soil may be used outside the construction to mask retaining boards.

Figure 7. Photographs illustrating cellular confinement system used to form an above-ground no-dig driveway

5.11 A temporary wearing surface covering the cellular confinement system may be required for the duration of the works and this can comprise of plywood, metal or heavy duty plastic road plates.

5.12 Once construction works have been completed on the site the temporary wearing surface may be removed and can be replaced with a final surface of a porous material such as block paviours bedded on sharp sand.

5.13 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

5.14 No fires will be lit on site within 3 m of root protection areas, including the area of the no-dig driveway, 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

5.15 All machinery required on site will operate outside of root protection areas or from the ground protection. Site huts, if required, will be located outside root protection areas.

5.16 Delivery vehicles will park in the drive or off site and storage of materials will be outside root protection areas.

Services

5.17 No new services or drainage runs are required.

Landscaping

5.18 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 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 eight trees or large shrubs has been carried out at or adjacent to 2A Kidderpore Gardens, London, NW3 7SR.

6.2 One tree is considered to be category B and of moderate value (lime T1) and the remainder are low value category C trees.

6.3 T7 holly and T8 viburnum are to be removed as part of these proposals. Replacement planting and additional landscaping will be carried out.

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

6.5 It is considered that the proposed development will pose no threat to trees to be retained and is sympathetic to the leafy character of the area.

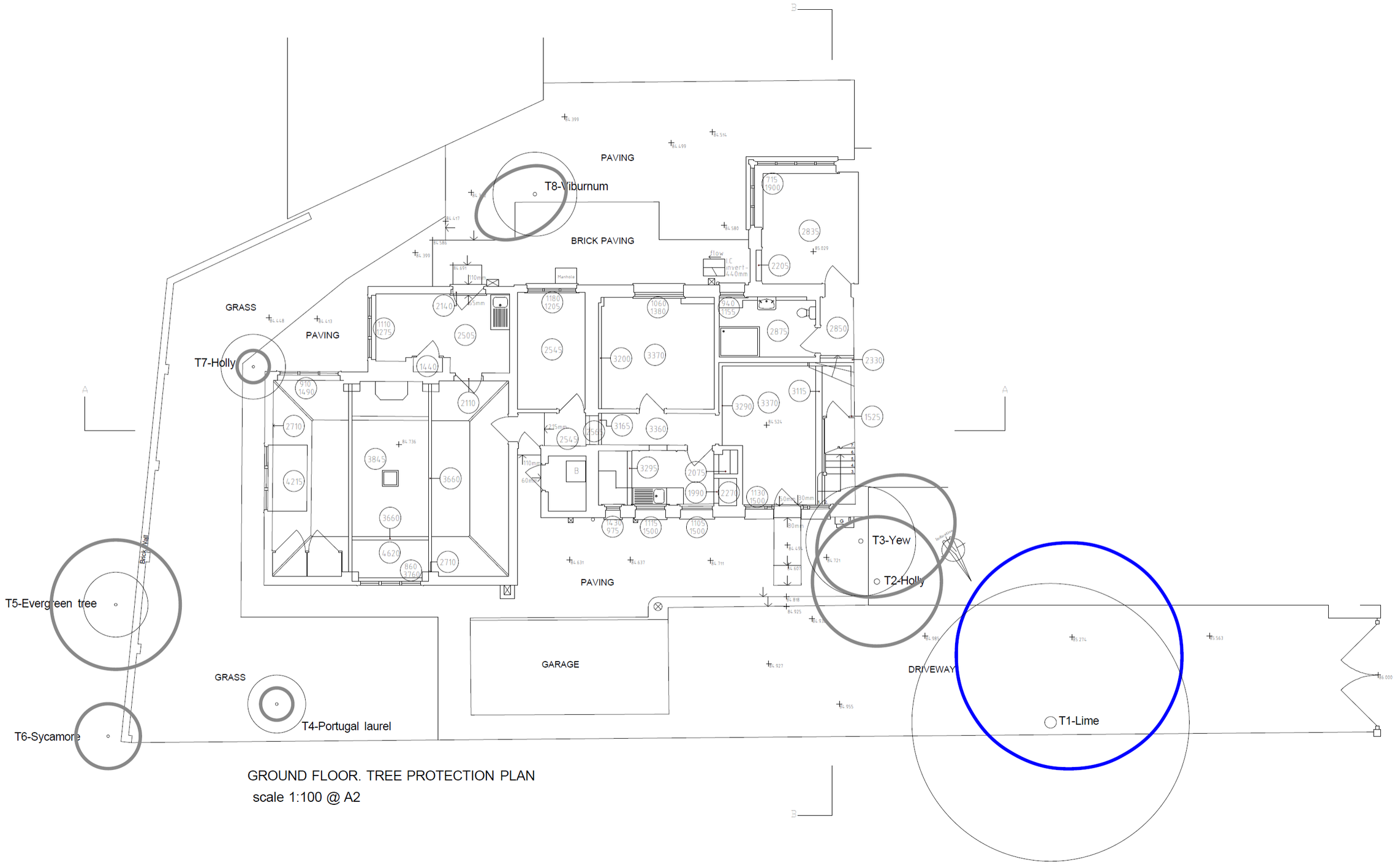
APPENDIX MD1
Tree survey schedule (BS5837: 2012)

Tree No.	Species	Height (m)	Trunk diameter (mm)	N (m)	S (m)	E (m)	W (m)	Height of crown clearance (m)	Age class	Physiological condition	Structural condition	Useful life	BS5867 Grade	Comments
T1	Lime	13	360	2	5	2	5	3	Y	Good	Good	20 to 40	B	Topped at 10m regrowth at 3m
T2	Holly	8	170	2	2	2	2	3	Y	Good	Good	20 to 40	C	In neighbours garden
T3	Yew	8	140	2	1.5	1.5	3	3	Y	Good	Good	<10	C	Too close to house
T4	Portugal Laurel^	4	90	1	1	1	1	1	Y	Good	Good	40+	C	
T5	Evergreen tree	6	80	2	2	2	2	2	Y	Fair	Good	<10	C	Bark damage, wall damage
T6	Sycamore	5	80	1	1	1	1	2	Y	Good	Good	20 to 40	C	Close to wall
T7	Holly	2	80	0.5	0.5	0.5	0.5	1	Y	Poor	Poor	<10	C	
T8	Viburnum	4	110	1	1	2	1	1	Y	Fair	Fair	<10	C	

* multi stem. ^ trunk measured at ground level. Age class: OM – over mature; M – mature; MA – mid-aged; Y - young

APPENDIX MD2

Tree constraints plan showing existing plot layout with tree numbers, BS5837: 2012 colour codes (A – Green, B – Blue, C – Grey, U - Red) and root protection areas (dashed circles)

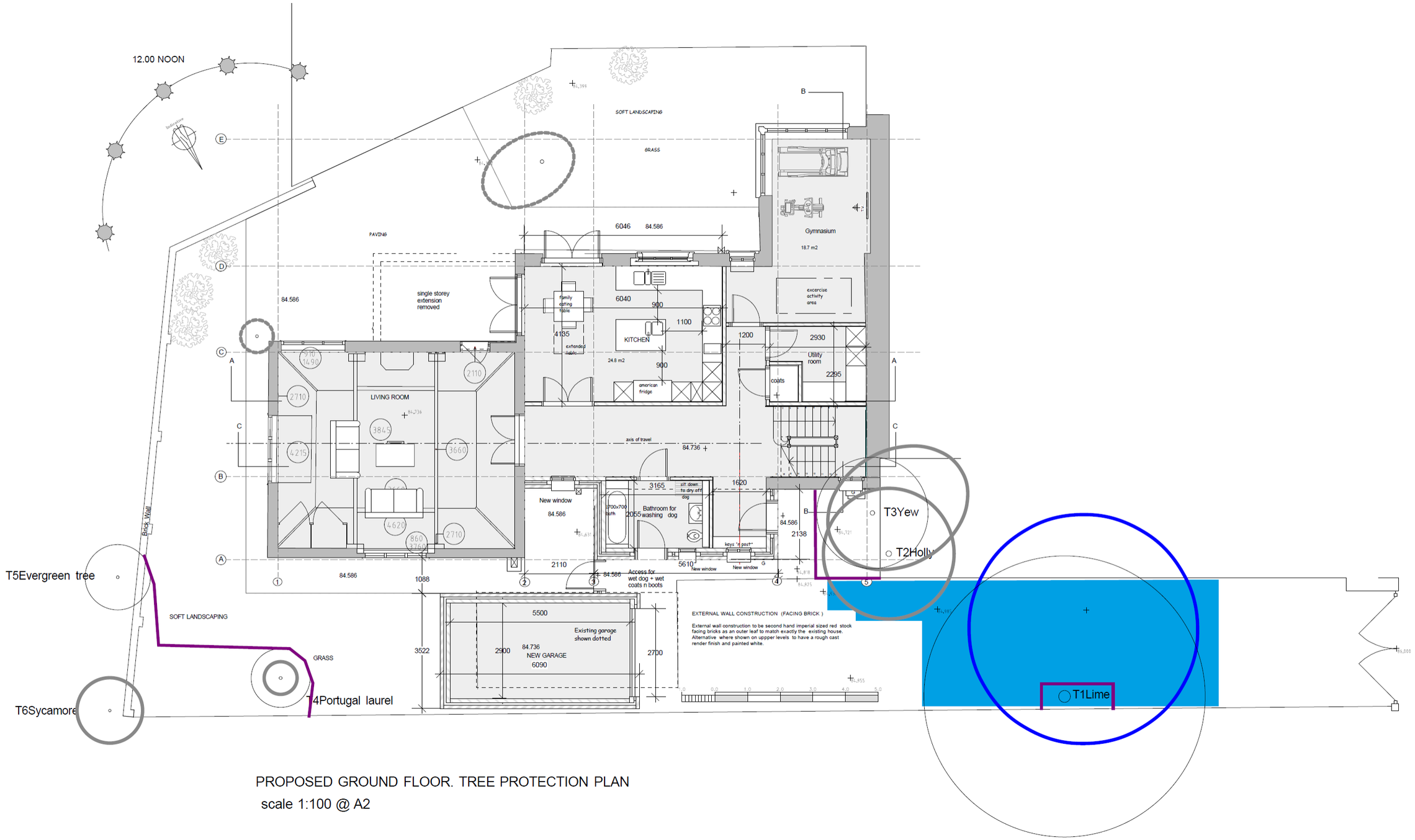


APPENDIX MD3
BS5837 schedule of protection areas

Tree No.	Species	Trunk diameter (mm)	BS5837: 2012 Root protection area, RPA, (m^2)	BS5837: 2012 Radial protection distance (m)
T1	Lime	360	58.6	4.3
T2	Holly	170	13.1	2.0
T3	Yew	140	8.9	1.7
T4	Portugal Laurel^	90	2.5	0.9
T5	Evergreen tree	80	2.9	1.0
T6	Sycamore	80	2.9	1.0
T7	Holly	80	2.9	1.0
T8	Viburnum	110	5.5	1.3

APPENDIX MD4

Tree protection plan showing retained trees, tree numbers and root protection areas (dashed circles). The location of protective fencing is shown as purple lines and above-ground no-dig driveway as blue shading.



PROPOSED GROUND FLOOR. TREE PROTECTION PLAN
scale 1:100 @ A2

APPENDIX MD5
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. During the next six years he was responsible for Department of Environment research contracts focussing on air pollution, climate change, de-icing salt damage to trees, woodland establishment on landfills and tree root research. 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 as Project Manager for 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 Robbins v London Borough of Bexley 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 an assessor for the Arboricultural Association Registered Consultant scheme. He has been a guest lecturer for the Middlesex University Countryside Management MSc course and for Portsmouth University. Together with Dr Giles Biddle he has devised and 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.