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TREE SURVEY AND ARBORICULTURAL IMPACT ASSESSMENT REPORT

A report to identify tree-related constraints to development on land behind The Dairy, The Street, Plaistow, Billingshurst, RH14 0NS

Report by Iain Waddell
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and

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On the instructions of Plaistow and Ifold Parish Council

16 December 2016

MDA reference F63

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Contents

There are four appendices

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1. Introduction

1.1 Martin Dobson Associates Ltd was instructed by the Clerk of Plaistow and Ifold Parish Council on 5 December 2016 to carry out a survey of trees on or immediately adjacent to land behind The Dairy, The Street, Plaistow, Billingshurst, RH14 0NS.

1.2 The purpose of the survey is to provide the Council with details of trees on the site; their location, size and quality so that constraints on potential future development of the site can be identified prior to considering it for inclusion in the Council's Local Plan.

1.3 The survey and report have been prepared in the context of guidance contained in British Standard 5837: 2012 *Trees in relation to design, demolition and construction – Recommendations*. This document provides a framework for considering trees in the planning process. It gives guidance on categorising the qualities of trees so that decisions can be made as to which trees are appropriate for retention within a development and which may be considered for removal. 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.

1.4 The survey site lies to the south of The Dairy and to the west of Rickmans Lane as shown in Figure 1. The site is predominantly outside the Plaistow Conservation Area (CA) but an area to the south of The Dairy adjacent to Rickmans Lane is within the CA. Trees within a Conservation Area benefit from statutory protection and cannot be pruned or felled without notification to the local planning authority. During the tree survey a request was made that an additional area adjacent to the road and to the south of the area marked in Figure 1 should be included.

Figure 1. Aerial photograph of survey site (bounded in red) provided by Plaistow and Ifold Parish Council

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1.5 Fourteen trees (T1 – T14) and two groups of trees (G1 and G2) were surveyed and out of these four are considered to be Category A and of high value (T1, T2, T4, T5) and four are considered to be Category B and of moderate value. The remainder are Category C and of low value. Whilst Category C trees should not be removed unnecessarily neither should they be considered a material constraint to development as they can relatively easily be replaced, or in some limited circumstances, be moved.

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2. Tree survey

2.1 The tree survey was carried out by Iain Waddell on 8 December 2016.

2.2 Appended at **MD1** is the tree survey schedule which provides details of the fourteen trees and two groups present within or immediately adjacent to the site.

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 a construction exclusion zone (CEZ) 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**.

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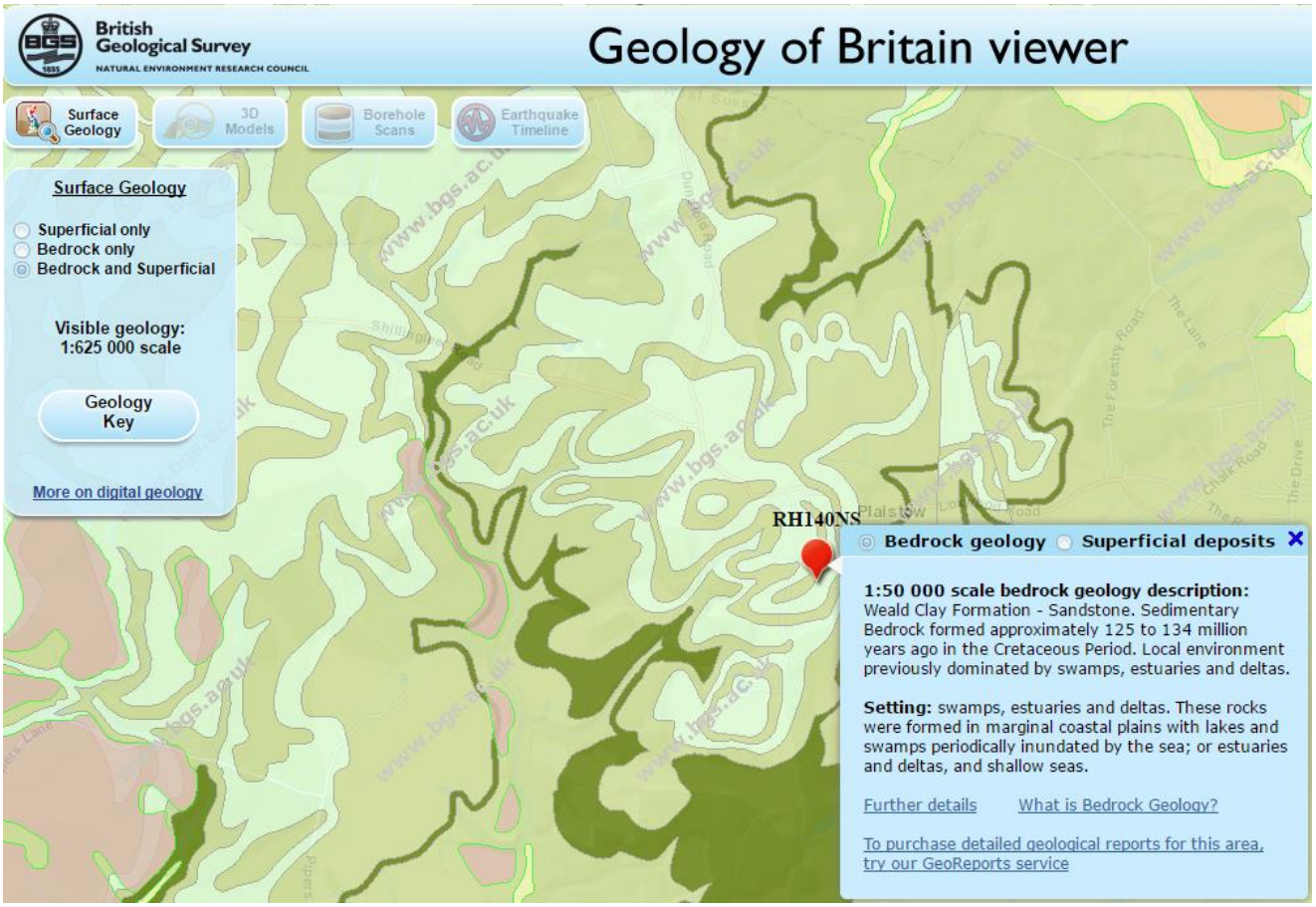
3. Soil assessment

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 Weald Clay Formation - Sandstone (Figure 2). Weald clay **is** generally considered to be a shrinkable clay soil and therefore site specific soil investigations will need to be undertaken. If the presence of shrinkable clay is confirmed, then foundations must be designed by an engineer with reference to the National House Building Council's Standards Chapter 4.2 *Building near trees*. NHBC separates trees into three water demand categories, high, moderate and low. Cypress, oak, and willow are regarded as high water demand species and the remainder are considered to be moderate water demand species.

Figure 1. British Geological Survey 1: 50,000 scale showing that the site is underlain by the Folkestone Formation - Sandstone.



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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.

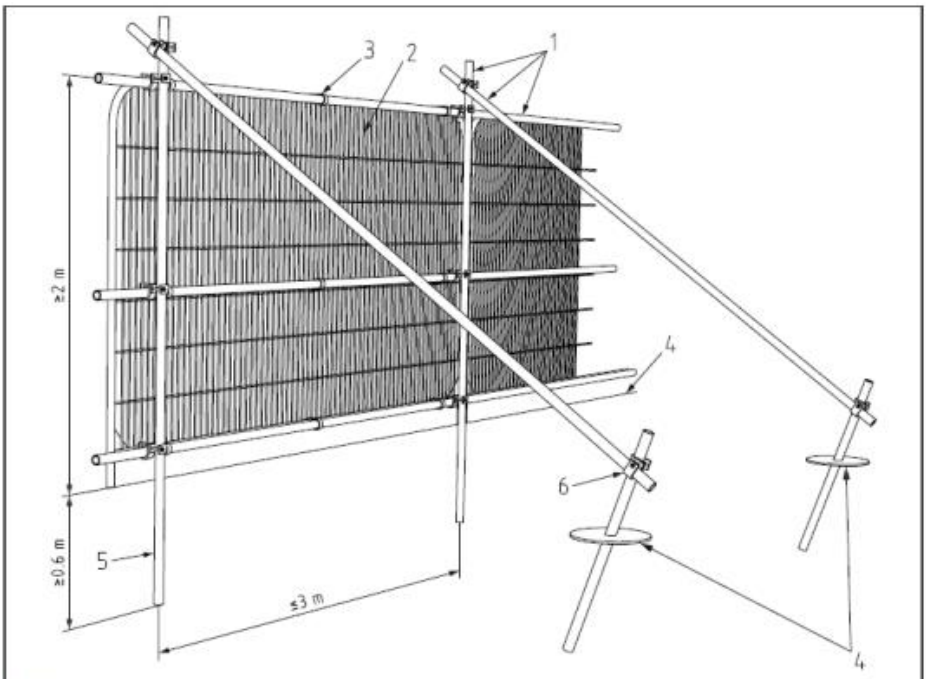
4.2 Mitigation for any issues identified should be proposed and addressed in the arboricultural method statement (AMS).

4.3 This report has been prepared in advance of any proposals and therefore the likely impact of future development cannot be assessed other than in general terms.

4.4 Root protection areas (RPA) are shown on the tree constraints plan at **MD3** and these should be regarded as construction exclusion zones. In general, this means that there should be no construction in this area, including building of houses, garages, boundary walls and hard surfacing. Ancillary works including digging of service trenches and drainage should also be excluded from the RPA.

4.5 The RPA should be sealed off with 2 m high continuous fencing braced to withstand impacts as shown in Figure 3 to prevent encroachment by site workers, machinery and materials.

Figure 3. Diagram to illustrate design of protective fencing with scaffolding anchored into the ground



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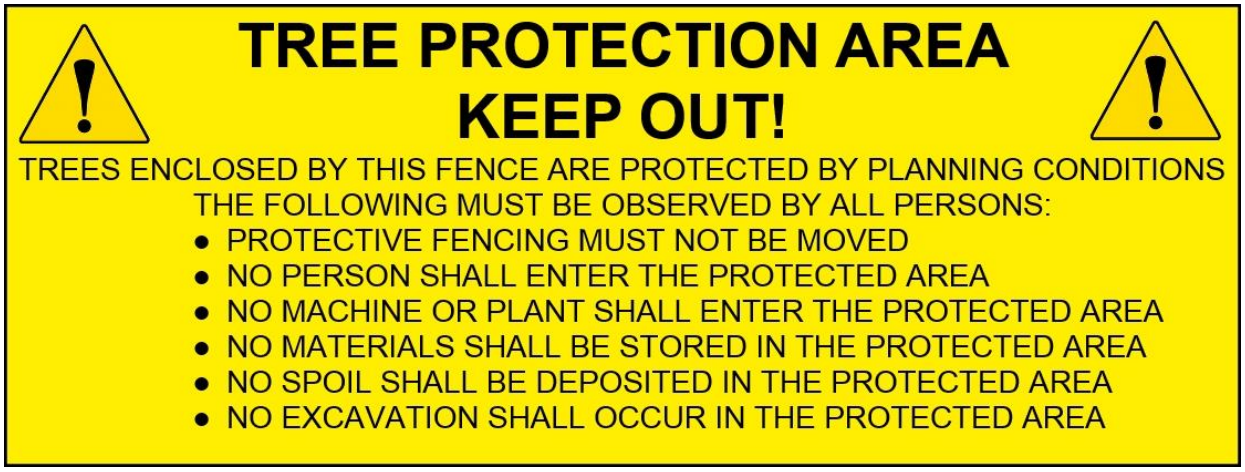
4.6 Fencing should be erected on site before any levelling of ground or stripping of soil takes place or materials are delivered to site and before any construction begins. It should be checked as fit for purpose by a competent person, preferably an arboricultural consultant. Fencing should consist of a scaffold framework, well braced to resist impacts, with vertical tubes spaced at a maximum interval of 3 m. 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.

4.7 High visibility all weather notices at a size no less than A3 should be securely attached to each panel of the barrier around the CEZ with wording as shown in Figure 4.

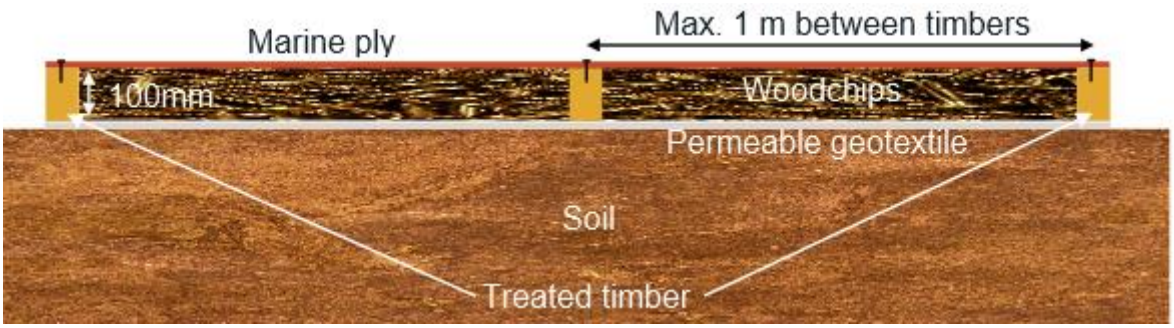
Figure 4. Wording to be included in high visibility all-weather sign attached to protective fencing



4.8 In some circumstances where construction takes place close to the boundary of the CEZ it may be necessary for fencing to be set back by 1 – 2 m to allow access for construction workers and scaffolding. If that is the case then that part of the RPA outside the fence must be protected from damage by the installation of ground protection. The purpose of ground protection is to prevent access to the soil and thereby to deter site workers from digging trenches etc which would sever roots, and just as importantly, to prevent compaction which squeezes air out of the soil and prevents rainfall percolating into it.

4.9 One possible means of protecting the ground is shown in Figure 5. The ground should first be covered by a geotextile and onto this 100mm thick treated timber bearers should be laid. The space between the bearers should be filled with a compressible layer such as woodchips before sealing with marine ply secured to the timbers.

Figure 5. Specification for ground protection



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4.10 If a driveway or access road should be required within the RPA of any tree this may be permissible provided an above-ground no-dig method of construction is used. The British Standard 5837 recommends that hard surfacing should occupy no more than 20% of the total RPA.

4.11 The principle of a no-dig construction is that soil and roots are not disturbed whilst creating a load bearing platform for vehicles to use. The sequence of events to be followed for installation of the above-ground no-dig driveway is as detailed below and should be installed as a preliminary to the main works so that it will form a ground protection layer:

- Stones, bricks and no more than 100 mm of topsoil will be removed from within the no-dig 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.

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

- A cellular confinement system such as Geocell or Geosythetics Cellweb up to approximately 200 mm thick (specific thickness to be designed by engineer to support expected loads) 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.

- The cellular confinement system will be filled with clean angular stone (20 – 40 mm to BSEN1342 or BSEN12620). The no fines material is to ensure high ratio void space which corresponds with ideal soil void ratios for tree root health. Crushed gravel is not permitted. Filling must take place working from outside the root protection area (i.e. from the road) inwards so that any machinery required works on filled rather than empty cells (Figure 6). Banked soil may be used outside the construction to mask retaining boards.

Figure 5. Photographs illustrating cellular confinement system used to form an above-ground no-dig driveway

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5. Conclusions

6.1 A BS5837: 2012 survey of fourteen trees and two tree groups has been carried out on land adjacent to land behind The Dairy, The Street, Plaistow, Billingshurst, RH14 0NS.

6.2 Four trees are considered to be Category A and of high value (T1, T2, T4, T5) and four are considered to be Category B and of moderate value. The remainder are Category C and are of low value.

6.3 Recommendations have been provided on general principles of tree protection if development should be applied for or permitted on the site.

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APPENDIX MD1
Tree survey schedule (BS5837: 2012)

Tree No.	Species	Height (m)	Trunk diameter (mm)	N (m)	E (m)	S (m)	W (m)	Height to lowest branch (m)	Age class	Physiological condition	Structural condition	Useful Life (y)	BS5867 Grade	Comments
T1	Oak	20	875	8	8	9.8	7.7	5 east	Mature	Good	Good	20 - 40	A	
T2	Oak	16	1025	7.2	7.4	8	9.1	2 west	Mature	Good	Good	>40	A	Old storm damage in upper crown
T3	Cherry	4.5	380	3.5	2.7	3.6	4.6	1 west	Mature	Good	Good	10 - 20	C	Stem leans to the west
T4	Oak	22	1110	9.5	8	7	8.4	6 south	Mature	Good	Good	20 - 40	A	Ivy on stem, cavities at the base
T5	Oak	22	1200	7.5	7	8.1	8	5 east	Mature	Good	Good	20 - 40	A	
T6	Oak	8	340	4.7	4	4	4.5	1 west	Mature	Good	Good	20 - 40	B	Suppressed by T4, ivy on the stem
G1	Mixed group	12	200	2.5	2.5	2.5	2.5	1		Good	Good	<10	C	Poplar, alder and elm
T7	Plane	11	450	5.5	4	3	3.4	2 north	Semi-mature	Good	Fair	10 - 20	B	Included union at 1m
T8	Willow	14	700	5	4	7	5	2.5 east	Mature	Good	Good	10 - 20	B	
T9	Apple	4	200	2.5	2.5	2.5	2.5	0.2 north		Good	Fair	10 - 20	C	Stem leans to the north
T10	Pine	9	310	2.3	2	2.5	2.5	0		Good	Good	10 - 20	C	
T11	Prunus	6	130	2	2	2	2	2 west	Young	Good	Poor	<10	C	
G2	Cypress	8	250	2	2	2	2	0			Good	10 - 20	C	Lawson cypress 6 stems
T12	Juniper	5	400	4	4	4	4	0	Mature	Good	Good	10 - 20	C	
T13	Willow	9	300, 270, 220	3.4	3	3.5	4.5	1 west	Semi-mature	Good	Good	<10	C	Damage to the base
T14	Oak	12	430	3.8	4	3.6	4	2.5 west	Mature	Good	Good	10 - 20	B	

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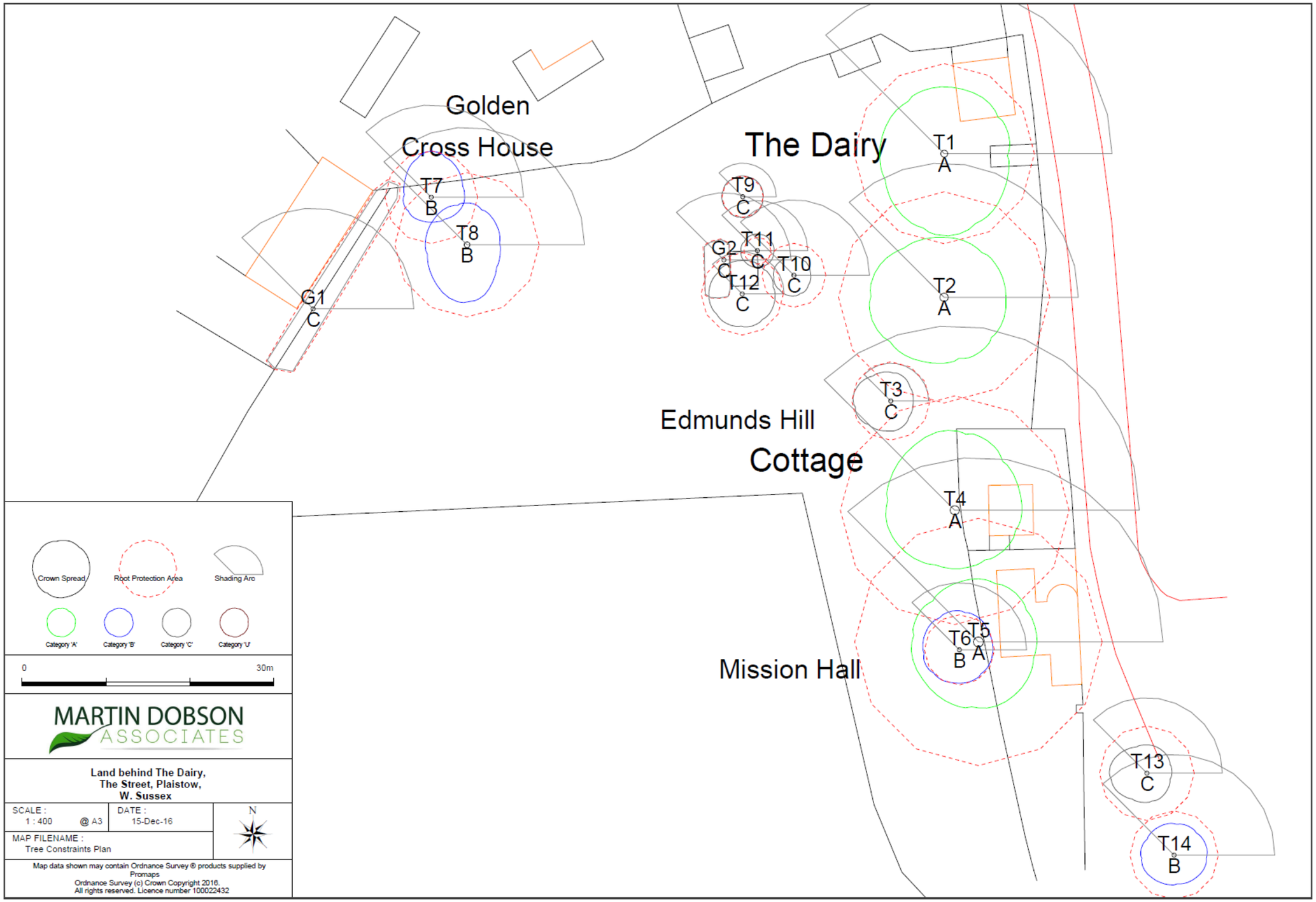
APPENDIX MD2

Tree constraints plan (TCP) showing plot layout with tree numbers, BS5837: 2012 colour codes (A – Green, B – Blue, C – Grey, U - Red) and root protection areas (dashed circles). The arcs represent the shadow pattern that may be caused by the trees in mid-summer as the sun tracks from east to west. Where trees are to be retained the root protection area should be regarded as a construction exclusion zone and secure 2 m high fencing should be erected at the perimeter of the each RPA. The plan has been provided separately as a PDF at a scale of 1: 400



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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	Oak	875	346.4	10.5
T2	Oak	1025	475.4	12.3
T3	Cherry	380	65.3	4.6
T4	Oak	1110	557.5	13.3
T5	Oak	1200	651.5	14.4
T6	Oak	340	52.3	4.1
G1	Mixed group	200	18.1	2.4
T7	Plane	450	91.6	5.4
T8	Willow	700	221.7	8.4
T9	Apple	200	18.1	2.4
T10	Pine	310	43.5	3.7
T11	Prunus	130	7.6	1.6
G2	Cypress	250	28.3	3.0
T12	Juniper	400	72.4	4.8
T13	Willow	460	95.7	5.5
T14	Oak	430	83.7	5.2

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APPENDIX MD4

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.

Qualifications and Experience

Iain Waddell

Iain Waddell has been working with trees since 2010 when he retired from a career of professional Ski Coaching in Canada and New Zealand.

He began his studies at Sparsholt College in Winchester where he gained a Level Three extended Diploma in Arboriculture. During his studies he worked for a Petersfield based firm – Sequoia Tree Services, starting as a groundsman but rapidly developing his skills to become a lead climber. After 4 years Iain became a Company Director and began to expand the business.

Whilst carrying out tree works at Sequoia Iain developed not only his skills with a chainsaw but also his interest in the legal side of tree management. This prompted him to attend an Arboricultural Consultancy course through Tree Life Training AC Ltd based at Westonbirt Arboretum which resulted in the attainment of a Level 6 Diploma in Arboriculture. His choice of subject of specialist research was the management of veteran trees.

Iain is a member of the Arboricultural Association and is enjoying working as a member of Martin Dobson Associates.

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