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ARBORICULTURAL
CONSULTANCY



ARBORICULTURAL SURVEY AND TREE PROTECTION PLAN 6 and 6a New Brighton Road, Emsworth, PO10 7PS

Report in support of an application to construct rear single storey extensions at 6
and 6a New Brighton Road

Report by Dr Martin Dobson

Report prepared on the instructions of Mr R Poikans

20 May 2013



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1 Introduction

- 1.1 Martin Dobson Associates Ltd was instructed by Mr R Poikans on 17 May 2013 to carry out a tree survey at 6 and 6a New Brighton Road, Emsworth, PO10 7PS. The aim of the survey was to provide information that would support Mr Poikan's application to build a single storey rear extension at each of the properties.
- 1.2 The British Standard 5837: 2012 *Trees in relation to design, demolition and construction – Recommendations* provides guidance on how to decide which trees are appropriate for retention within a development, the means of protecting trees to be retained during the development (which may include both demolition and construction work), and the means of incorporating trees into the developed landscape. This report complies with the recommendations of the British Standard.
- 1.3 Three Oak trees and one Hornbeam in the rear gardens were surveyed and it is proposed that all four trees will be retained and afforded appropriate protection during construction.

2. Tree survey

- 2.1 Number 6 New Brighton Road was, until recently, a large detached house which is part of a relatively new gated development. The house has now been divided into a semi-detached pair. The front of each property has a small garden and to the side there is a gate leading to a parking area and, for the right hand one of the pair, a double garage. The rear gardens are mostly laid to lawn and the left hand one of the pair contains one mid aged Oak tree, one young suppressed Hornbeam and one newly planted Oak. The right hand one of the pair contains one mature Oak.
- 2.2 On 20 May 2013 Martin Dobson Associates Ltd surveyed the trees in line with British Standard 5837: 2012 *Trees in relation to design, demolition and construction - Recommendations*.
- 2.3 Appended at **MD1** is a copy of the tree survey schedule which lists the four trees closest to the proposed development. Details of tree dimensions and condition are given along with an appraisal of the suitability of the trees for retention within the proposed development. The explanation of abbreviations used in the schedule is given at the end of the table.
- 2.4 Information from the survey enabled suitable root protection areas to be calculated for each tree and these are shown on the plan appended at **MD2** and in the schedule at **MD3**. The positions of the surveyed trees and a reasonable indication of their comparative branch spreads are shown on the plan. The drawing has been colour coded as follows:

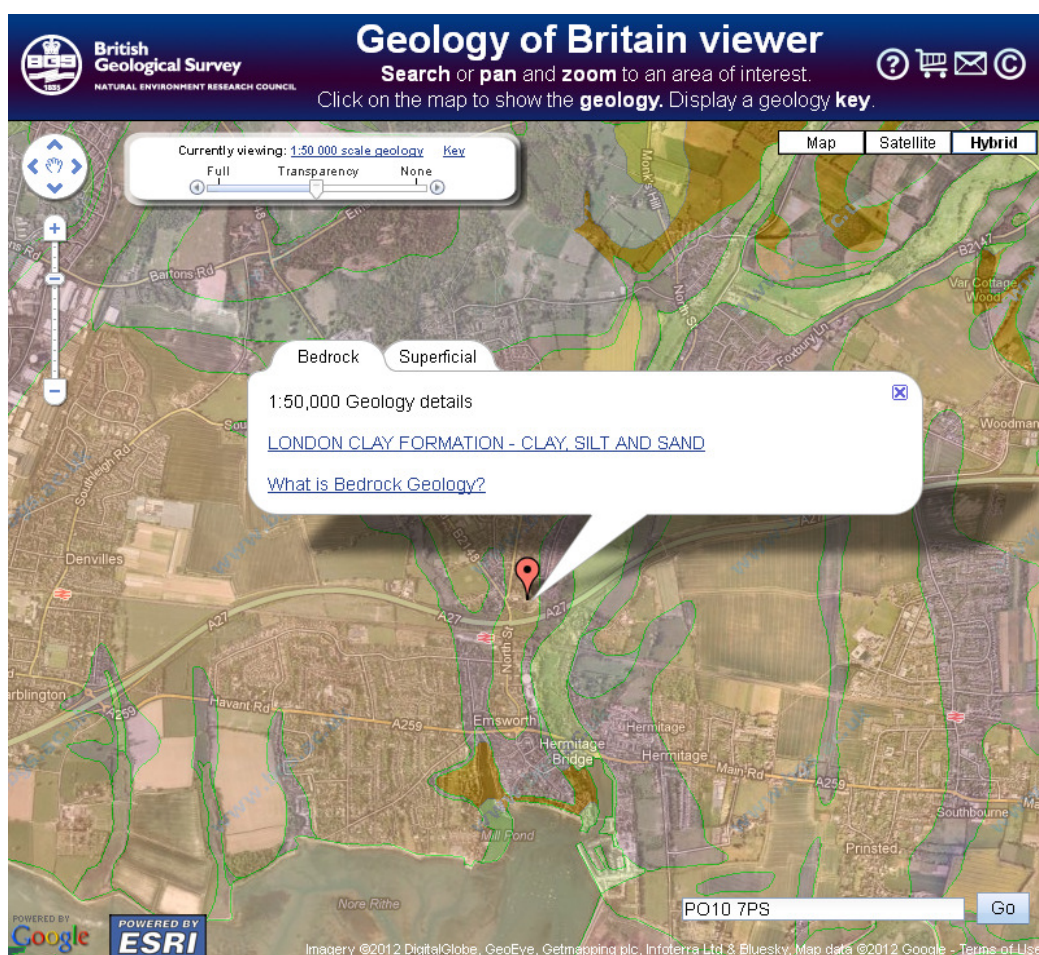
A trees (high quality and value, minimum 40 years useful life)	LIGHT GREEN
B trees (moderate quality and value, minimum 20 years useful life)	MID BLUE
C trees (low quality and value, minimum 10 years useful life) (Note: the British Standard advises that C grade trees should not be considered a material constraint to development)	GREY
U trees (unsuitable or dead/dying/dangerous, less than 10 years useful life)	RED

- 2.5 The Oak T1 is a large mid aged tree which appeared to be in good health and had a straight main trunk. It is considered to be a high value A grade tree. Some lower branches have been removed unsympathetically leaving long stubs. These should be pruned back to the main stem in the manner specified in BS3998: 2010 *Tree work – recommendations*. Beneath the canopy

of the Oak T1 there is a young Hornbeam T2 which had a stem wound on the lower trunk. There was some evidence of minor decay but the tree is not considered to be hazardous. The crown of the tree is suppressed by the Oak and therefore the stem has grown at an angle rather than vertical. The tree is therefore considered to be C grade. Oak T3 is a recently planted tree which has good future potential but is nonetheless considered to be a C grade tree. Oak T4 is mature and in reasonably good physiological condition with an expected useful contribution in excess of 20 years. However, the tree originally had twin stems at low level but one of these was cut back to a tall stump some years ago. The stump is decaying and there is probable decay in the remaining live stem where the two used to meet. It was not possible to probe the extent of the decay due to obstruction from the dead stump. Further investigation may be required and if the tree is found to be in a poor structural condition crown reduction (i.e. a reduction in the size of the canopy) may be needed.

- 2.6 The live stem was 'topped' at a height of about 7 m, i.e. most of its branches had been removed some time ago, but the crown has regrown substantially to its current dimensions and has regained a 'normal' appearance. It would be advisable to crown reduce the tree from time to time to contain its size and ensure its continuing safety. The Oak T4 has been categorised as a B grade tree meaning that it has a moderate quality and value
- 2.7 The British Standard advises that soil type should be considered when designing foundations. The British Geological Survey records that the soil in the vicinity of the Property is London Clay which is often highly shrinkable (Figure 1). Foundations which can withstand shrinkage and swelling of clay should therefore be carefully considered. The National House Building Council has provided guidance on appropriate foundations depths in its 2010 publication Chapter 4.2 'Building Near Trees' (Appendix **MD5**).

Figure 1. The property is on an area of shrinkable London clay. Design of foundations for the extensions should therefore take into account risks posed by trees through subsidence and/or heave.



- 2.8 Oak can grow to a height of 20 m and is considered to be a high water demand species. The London clay probably has a high shrinkage potential. The Oaks are 8 m from the extensions giving a D/H of 0.4. This means that foundations will need to be at least 2.5 m deep - but NHBC advises that they should be designed by an engineer.

3. Tree protection plan

- 3.1 Trees can very easily be damaged during construction activities through their branches being broken by machinery passing close to the canopy or by root severance during the digging of foundations 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 a large proportion of roots growing in the direction of the trench. Similarly, the diameter of 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. In general terms it should be considered that roots larger than 2.5 cm (25 mm) diameter are important.
- 3.2 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.
- 3.3 Adequate protection, both for branches above ground and roots below ground, is therefore essential for trees that are to be retained as part of a development.
- 3.4 The guidance contained in BS5837: 2012 recommends that there should be a root protection area (RPA) around trees which is kept free of all construction activities by means of an exclusion zone enforced through protective fencing 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 and is shown at **MD4**.
- 3.5 Protective fencing will consist of a scaffold framework, well braced to resist impacts, with vertical tubes spaced at a maximum interval of 3 m (Figure 2). Onto this, weld mesh panels or 2 m high plywood board will be securely fixed with wire or scaffold clamps. Weld mesh panels on rubber or concrete feet should not be used as these are not resistant to impact and are too easily moved by site operatives. It will be installed before any materials are delivered to site or construction work takes place.
- 3.6 High visibility all weather notices will be securely attached to the barriers with the words as shown in Figure 3.
- 3.7 Services have already been provided and therefore no new service runs are required.
- 3.8 No fires at all will be lit on the site as the heat rising from the fire may damage the branches of trees. All waste materials will therefore be removed from site and disposed of appropriately.
- 3.9 No materials of any kind will be stored within the root protection zone (especially not oil or diesel) and no mixing of potentially toxic materials (e.g. cement) will be carried out within the protection zone.
- 3.10 Fencing will not be removed until all construction activities on site have been completed and any debris has been removed. Only after internal and external finishes have been completed will fencing and ground protection be removed in order to allow final landscaping.

Figure 2. Diagram to illustrate design of protective fencing

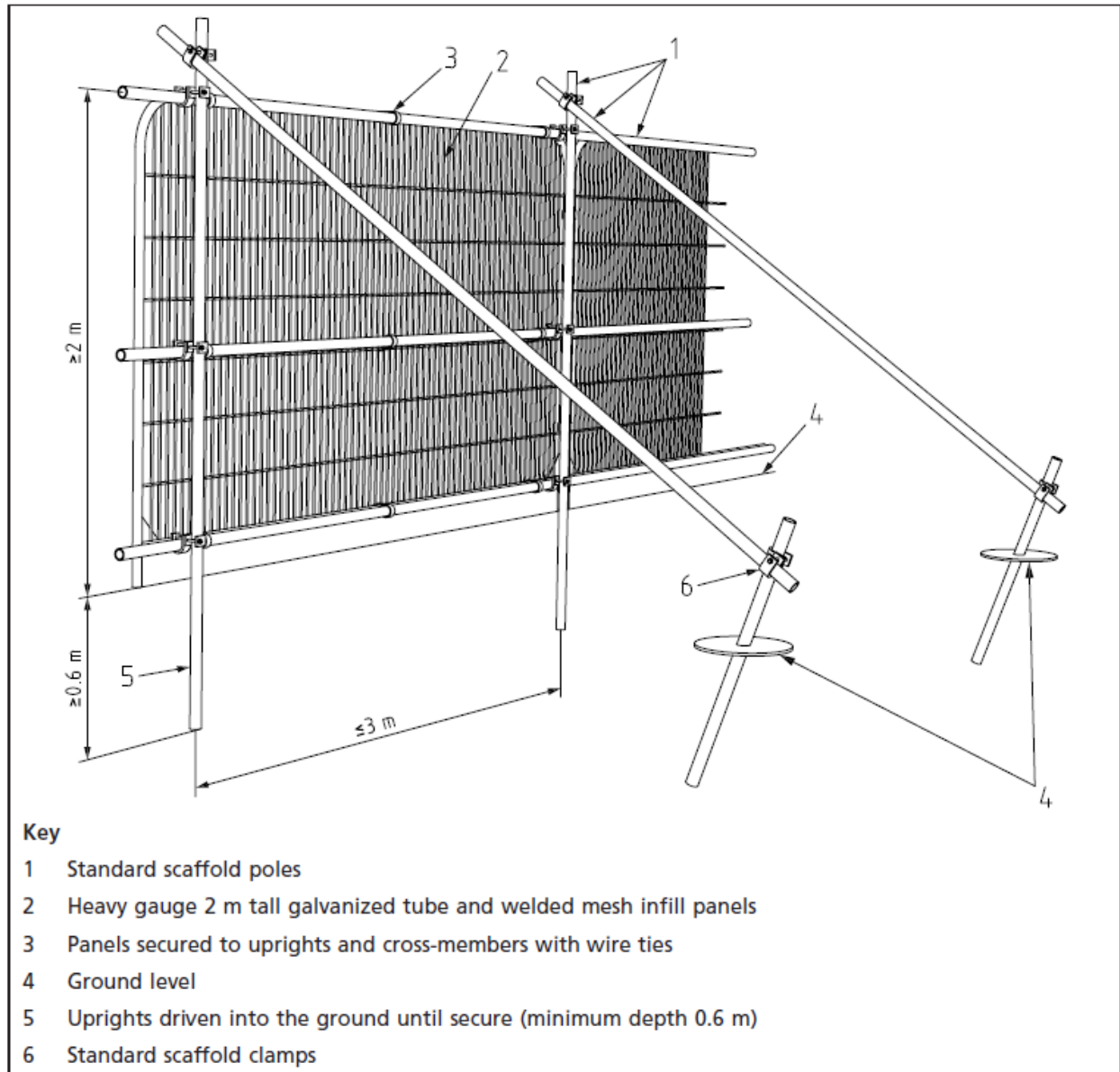


Figure 3. Wording to be included in high visibility all-weather sign attached to protective fencing

TREE PROTECTION AREA

KEEP OUT!

TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS.

THE FOLLOWING MUST BE OBSERVED BY ALL PERSONS:

- PROTECTIVE FENCING MUST NOT BE MOVED
- NO PERSON SHALL ENTER THE PROTECTED AREA
- NO MACHINE OR PLANT SHALL ENTER THE PROTECTED AREA
- NO MATERIALS SHALL BE STORED IN THE PROTECTED AREA
- NO SPOIL SHALL BE DEPOSITED IN THE PROTECTED AREA
- NO EXCAVATION SHALL OCCUR IN THE PROTECTED AREA

4. Conclusions

- 4.1 A survey of trees in the gardens of 6 and 6a New Brighton Road was carried out in accordance with the British Standard 5837: 2012 *Trees in relation to design, demolition and construction - recommendations*. One Oak (T1) is considered to be a high value A grade tree, one Oak (T4) is considered to be a moderate value B grade tree and two further trees, Hornbeam T2 and Oak T3, are considered to be low value C grade trees.
- 4.2 All four trees will be carefully protected during and after development. Methods for ensuring the protection of the trees have been described.
- 4.3 It is considered that the proposed development will not pose any threat to the health and safety of the four trees to be retained.

Dr Martin Dobson

BSc, DPhil, FArborA, MEWI

Registered Consultant of the Arboricultural Association

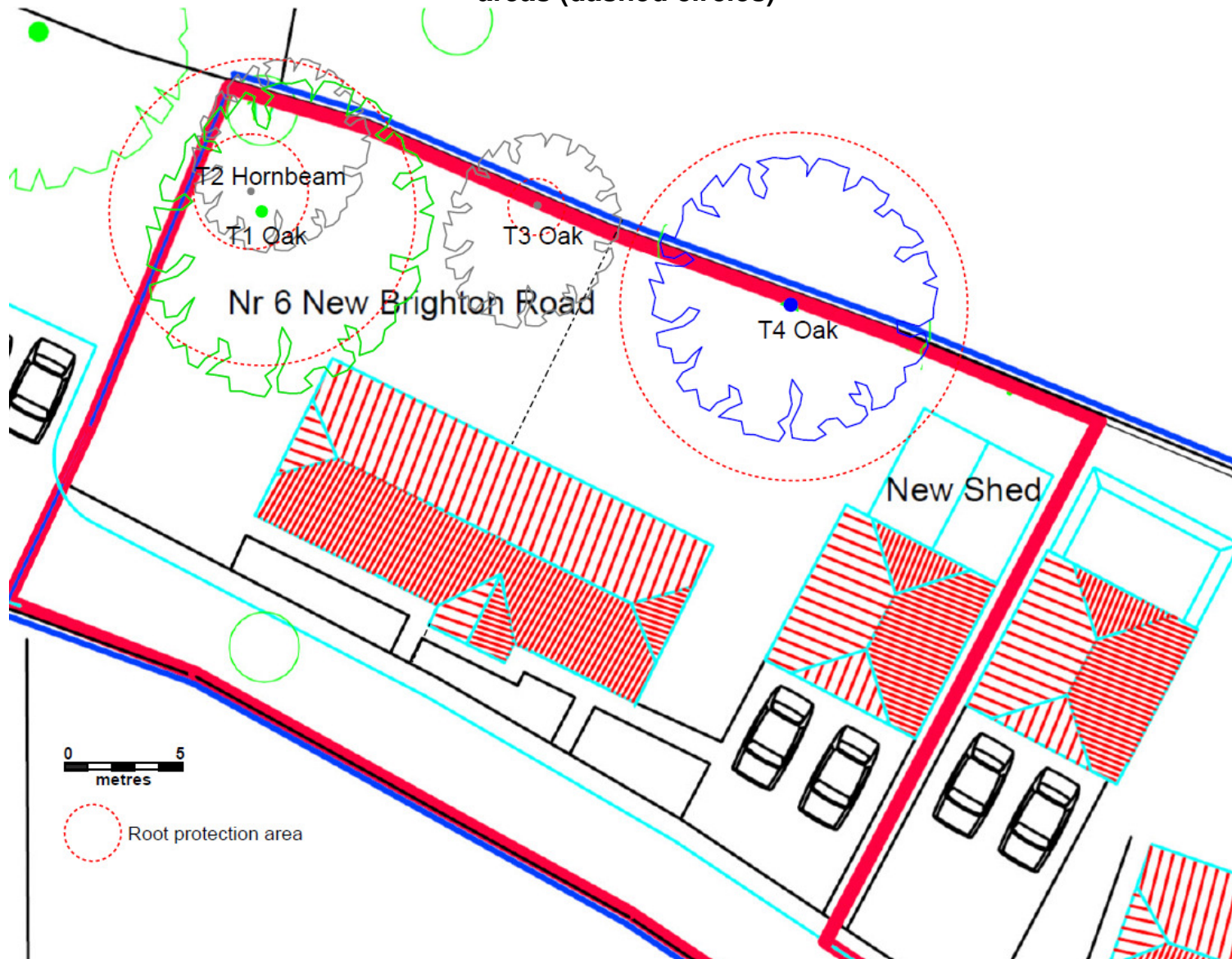
APPENDIX MD1
Tree survey schedule (BS5837: 2012) for 6 New Brighton Road, Emsworth

Tree No.	Species	Height (m)	Trunk diameter (mm)	Crown spread (m)	Height of crown clearance (m)	Age class¹	Physiological condition	Structural condition	Useful life (y)	Management notes	BS5837 Grade
T1	Oak	16	530	N 6.0 S 7.0 E 7.0 W 4.0	6	MA	Good	Good	40+	Tree in good condition and of good form.	A
T2	Hornbeam	8	200	N 6.0 S 2.5 E 4.5 W 4.0	4	Y	Good	Fair	20 – 40	Young tree suppressed by overhanging Oak – therefore deformed trunk	C
T3	Oak	6	100	N 1.5 S 2.0 E 2.0 W 1.5	2	Y	Good	Good	40+	Recently planted (within last 6 years) tree of good form.	C
T4	Oak	14	600	N 6.0 S 6.0 E 6.0 W 6.0	5	M	Good	Poor	20 – 40	Mature tree topped some years ago. Decaying main trunk possible hazard	B

¹ Y = Young (<1/3 life expectancy). MA = Mid aged (1/3 – 2/3 life expectancy). M = Mature (>2/3 life expectancy). OM = Over mature (reaching end of safe useful life)

APPENDIX MD2

Site survey drawing showing tree numbers, BS5837 colour codes (A – Green, B – Blue, C – Grey) and root protection areas (dashed circles)

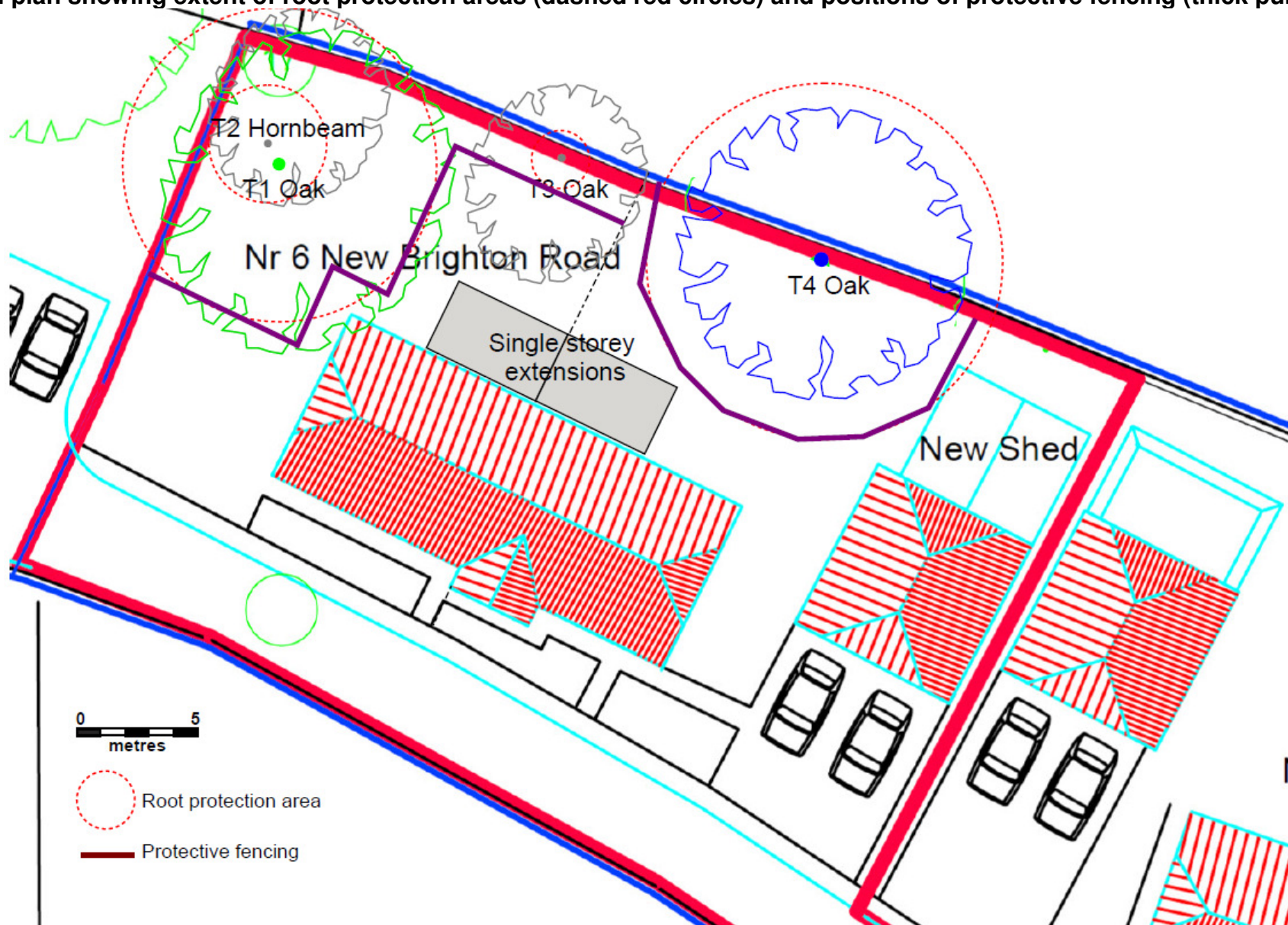


APPENDIX MD3
BS5837: 2012 schedule of root protection zones

Tree No.	Species	Trunk diameter (mm)	BS5837: 2012 Root protection area, RPA, (m²)	BS5837: 2012 Radial protection distance (m)
T1	Oak	530	127.1	6.4
T2	Hornbeam	200	18.1	2.4
T3	Oak	100	4.5	1.2
T4	Oak	600	162.9	7.2

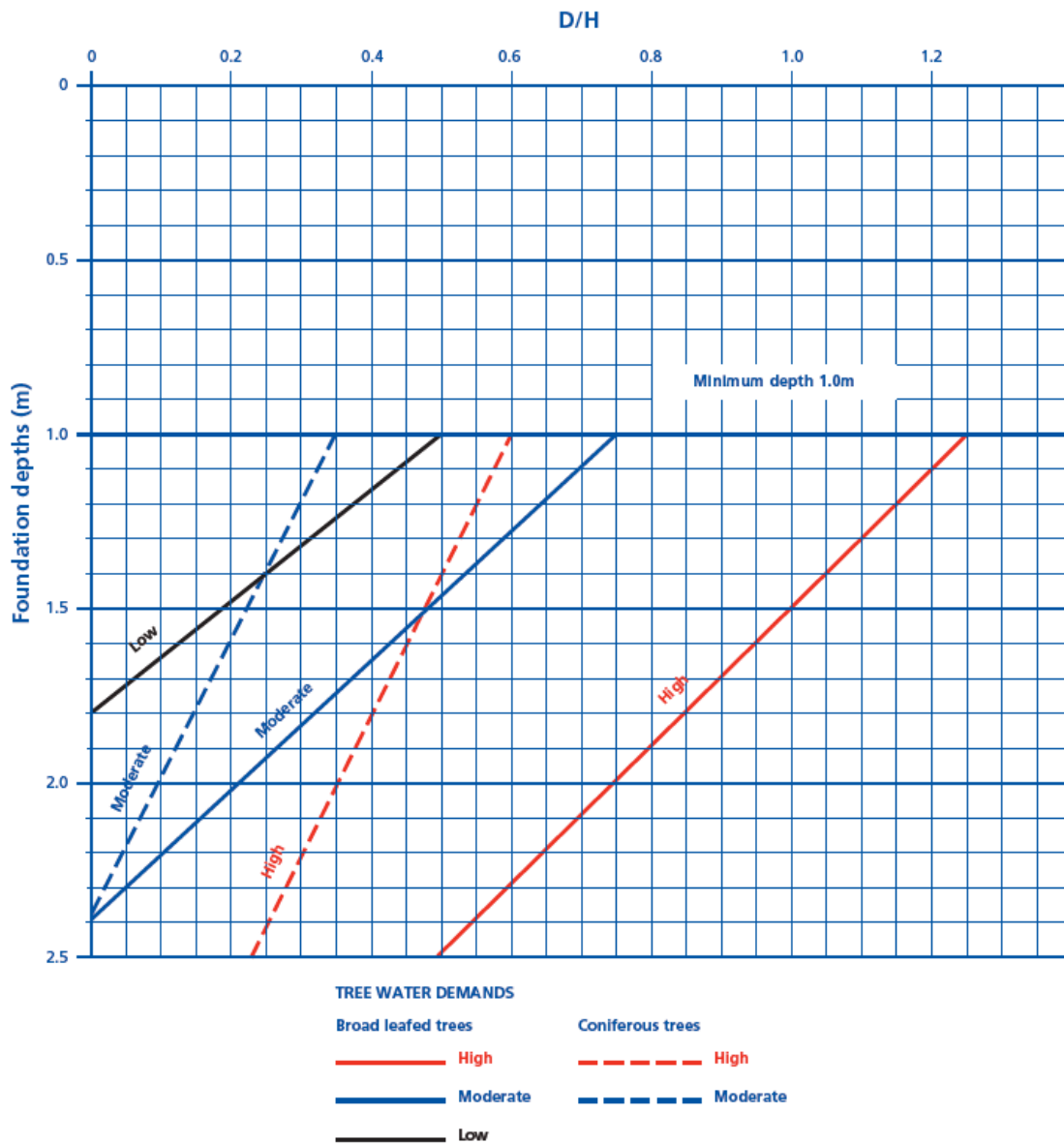
APPENDIX MD4

Proposed plan showing extent of root protection areas (dashed red circles) and positions of protective fencing (thick purple lines)



4.2 Building near trees

Chart 1 Soils with HIGH volume change potential: Modified Plasticity Index 40% or greater
(see Design clause D5(b))



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. 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 policy matters and is 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 focuses on issues relating to trees and buildings.

In 1997 he started an arboricultural consultancy practice specialising in subsidence and tree root claims, planning and development, tree safety issues and disease diagnosis. He has been 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.

He is an examiner for the Professional Diploma in Arboriculture for the Royal Forestry Society and has been a part-time lecturer for the Middlesex University Countryside Management MSc course. He has further significant experience lecturing at technical conferences and seminars.

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 a Member of the Expert Witness Institute.