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TREE SURVEY AND ARBORICULTURAL METHOD STATEMENT
9 Ellerdale Road, London, NW3 6BA

Report in support of an application for the construction of a basement extension under the existing house and internal refurbishment

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Report prepared for on the instructions of Lee Davidson (architect)

4 June 2013

Contents

1 Introduction

1.1 Martin Dobson Associates Ltd was instructed on 9 April 2013 by Lee Davidson (architect) to carry out a survey of trees within the grounds of or immediately adjacent to 9 Ellerdale Road, London, NW3 6BA. The aim of the survey was to provide information that would assist in creating an appropriate design for proposed development taking into account the presence of trees on or near to the property.

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 The proposal the subject of this report is to build a basement extension under the existing building and within the garden.

1.4 Thirteen trees adjacent to the proposed development were surveyed and it is considered that all of these are suitable for retention and should be afforded appropriate protection during development.

2. Tree survey

2.1 Development proposals relate to a substantial three storey Victorian property with partial basement occupying the corner plot between Ellerdale Road and Prince Arthur Road in the London Borough of Camden not far from Hampstead Heath. The area generally comprises of large properties within reasonably spacious plots benefitting from a mature landscape setting with a significant numbers of trees.

2.2 On 19 April 2013 Martin Dobson Associates Ltd carried out a survey of trees on and adjacent to the land. The survey was carried out in line with British Standard 5837: 2012 *Trees in relation to design, demolition and construction - Recommendations*. Appended at **MD1** is a copy of the tree survey schedule which lists thirteen trees adjacent 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.

2.3 Information from the survey enabled suitable root protection areas to be calculated for each tree and these are shown on the plans appended at **MD2/MD3** and in the schedule at **MD4.** 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 than10 years useful life)	RED

2.4 The garden of 9 Ellerdale Road is mostly paved and terraced with flagstones. There are borders at the edges near to the boundaries and these contain perennials, shrubs and small

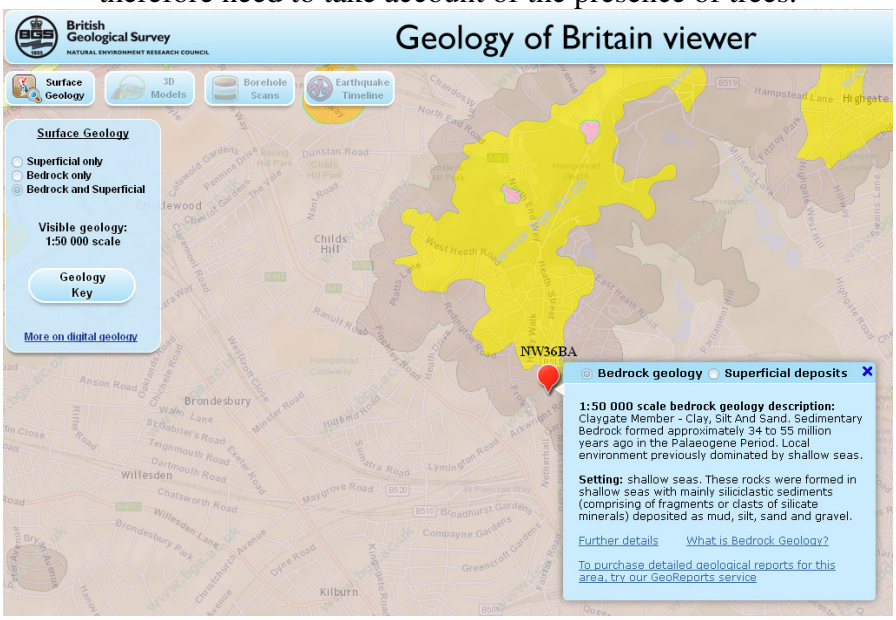
trees. Outside the property in the pavement along Ellerdale Road there is a row of pollarded Limes and in Prince Arthur Road there is also a pollarded Lime.

2.5 T1 is a small young Holly which provides boundary screening but otherwise is of no particular importance and is regarded as a low value C grade tree. T2 is a large Myrtle shrub growing in the border and is also regarded as being C grade. Magnolia T3 is a larger ornamental tree which has attractive spring flowers and grows over the pavement of Prince Arthur Road. It is in a prominent position, is easily visible and makes a useful contribution to the street scene. It has therefore regarded as being a moderate value B grade tree.

2.6 T4 is a young flowering Prunus which has been pruned poorly in the past and has no special merit. It is considered to be a low value C grade tree. T5 is a multi-stemmed Yew which has been pruned on a regular basis to maintain its size and shape. It provides an attractive evergreen feature within the garden but has no wider landscape importance and has therefore been graded C. A row of six Limes (T6 – T11) and one Acer (T12) are situated in the pavement of Ellerdale Road. They vary in size but have all been pollarded on a regular cycle to control their size (presumably also to reduce their water use and minimise subsidence risk). All of them are regarded as moderate value B grade trees other than T9 which is a much younger and smaller tree and has been graded C. The Lime in the pavement in Prince Arthur Road (T13) has not been pollarded so far and is regarded as a B grade tree.

2.7 The British Standard advises at 4.3.1 that soil type should be considered when designing foundations. It appears from the British Geological Survey map (Figure 1) that the site is underlain by potentially shrinkable clays of the Claygate Member and so foundation design will need to be influenced by the proximity of trees. The National House Building Council Chapter 4.2 *Building Near Trees* provides guidance.

Figure 1. Extract from British Geological Survey 1: 50,000 scale geological map indicating that the site is underlain by the Claygate Member (made up of clay, silt and sand). Foundation design will therefore need to take account of the presence of trees.



2.8 The detailed proposals for the design of the basement have assumed that all of the trees surveyed within and surrounding the site are worthy of retention and protection. Whilst the Prunus T4 is in a poor condition and could be removed development proposals have included it as being retained. The existing garage falls slightly within the root protection area of the Yew T5 but the side wall of the garage will form an effective root barrier meaning that there will be few, if any, roots beneath the existing garage. The proposed basement has been designed to provide good clearance of the retained trees and thus there will be no conflicts with root protection areas. As such the scheme will not require the removal of any existing trees, or works to trees, to enable the provision of the proposed basement extension. It is considered that the retained trees will not be harmed by the development process.

3. Tree Protection Plan

3.1 Trees can very easily be damaged during construction activities through their branches being broken by 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 few centimetres in diameter) may actually be highly important.

3.2 Tree roots can also be damaged indirectly, often inadvertently, through soil compaction which disrupts soil structure or by soil raising both of which can lead to root death through the development of anaerobic soil conditions (lack of oxygen). 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 above and below ground, is therefore 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 all 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 illustrated at **MD2/MD3** and tabulated at **MD4**.

Enabling works to trees

3.4 No enabling works are considered necessary but if tree pruning is to be undertaken it will be in compliance with BS3998: 2010 *Tree works – recommendations*.

Protective fencing and ground protection

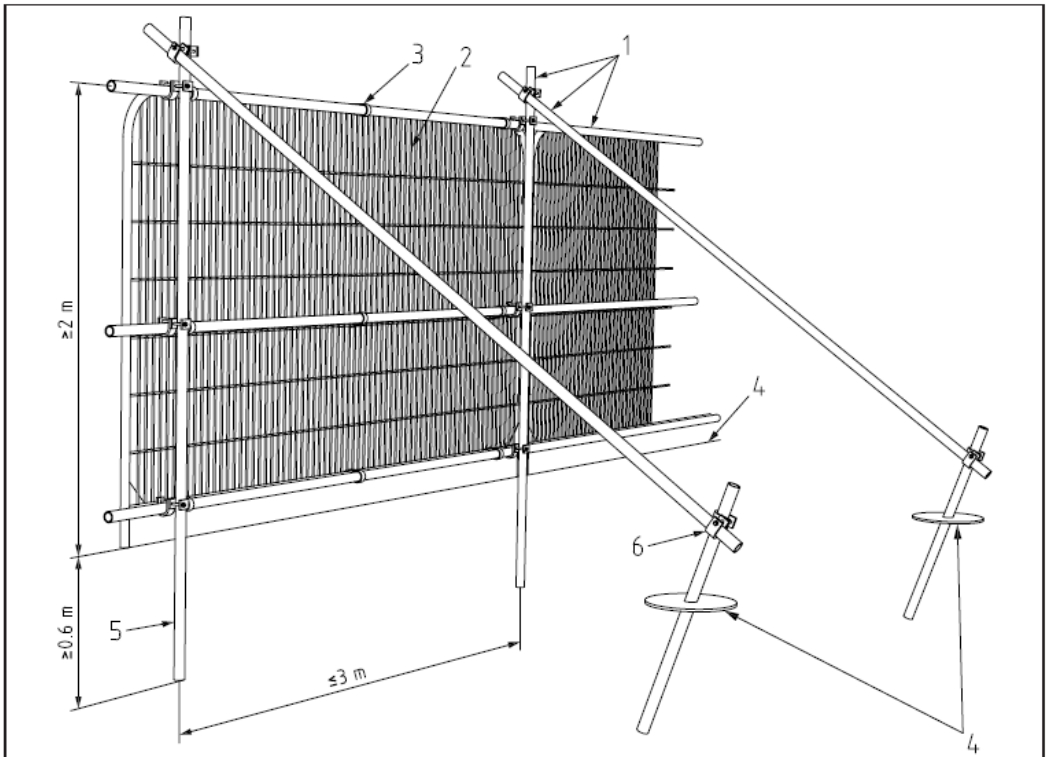
3.5 The positions of protective fencing are marked as purple lines at **MD5** (ground floor) and **MD6** (basement) and will be erected before any ground works are undertaken or any materials are delivered to site. Fencing will remain in place throughout the construction phase and will only be taken down to allow final landscaping.

3.6 The majority of root protection is related to trees that are growing in the pavement outside the property. Between the property and the trees there is a substantial retaining wall with the ground within the property being at a higher level than in the street. It is therefore likely that the retaining wall will act as a root barrier and it is probable that there will be few roots from the street trees growing under 9 Ellerdale Road. Whilst tree protection has been specified to take account of the possibility that roots may be present it is suggested that if trial pits were to be dug which revealed that there were few or no roots then protective fencing could be

targeted more specifically to protect only those trees actually on the site. However, departure from the proposed tree protection plans would only be considered with the advice of an arboriculturist and with the written approval of the council.

3.7 The 2 m high 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 shuttering board will be securely fixed with wire or scaffold clamps. Weld mesh panels on rubber or concrete feet will not be used as these are not resistant to impact and are too easily removed by site operatives. High visibility all weather notices will be securely attached to the barrier around each protection zone with wording as shown in Figure 3. Where long lengths of barrier are erected a sign will be attached at intervals of no less than 6 m.

Figure 2. Specification for 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

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**

3.8 The pedestrian access into the site will not be enclosed by fencing as the soil below it is protected by means of the existing hard landscaping. There are no proposals to remove this as part of the development and therefore it will continue to act as a form of ground protection.

Burning of waste

3.9 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.

Changes in level

3.10 There are no proposed changes in level within tree root protection areas.

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

3.11 Consideration should be given in the contractor's method statement of how to get machinery onto the site without damaging trees and how materials will be delivered to and stored within the site. Provision for site huts and the parking of vehicles outside root protection areas should also be considered in the method statement.

3.12 The existing garage which has an entrance at street level will be used for access onto the site.

3.13 No new services are proposed but if any services should need to be installed this will be outside root protection areas.

Site supervision

3.14 It is recommended that this report should be made available to and be read by all professionals involved with tendering for and implementing any planning consent obtained before any construction activities commence on site. The owner or site manager should inform site operatives of the content of this or any subsequent tree report and be responsible for implementing and enforcing its recommendations. Consideration should be given in cost estimates to engaging the services of a competent arboriculturist to be consulted on tree protection prior to the commencement of and for the duration of construction works.

3.15 It is further recommended that prior to works commencing on site a contractor's method statement should be prepared dealing with the procedures necessary to avoid damage to tree roots and/or branches. The method statement should deal with the timing and method of installation of tree protection and will need to state that this will be put in place and be checked by a competent person prior to the commencement of any construction works. It should also state that tree protection will not be removed under any circumstances until works on site have been completed to the satisfaction of a competent arboriculturist.

4. Conclusions

4.1 A survey of trees on or adjacent to 9 Ellerdale Road, London has been carried out in accordance with the British Standard 5837: 2012 *Trees in relation to design, demolition and construction - recommendations*. Thirteen trees were surveyed and out of these eight are considered to be moderate value B grade trees (T3 – T5, T8, T10, T11 and T13) and the rest are considered to be low value C grade trees (T1, T2, T4, T9 and T12).

4.2 All thirteen trees are proposed to be retained on the site will be carefully protected during and after development.

4.3 Methods for ensuring protection of the trees to be retained have been described.

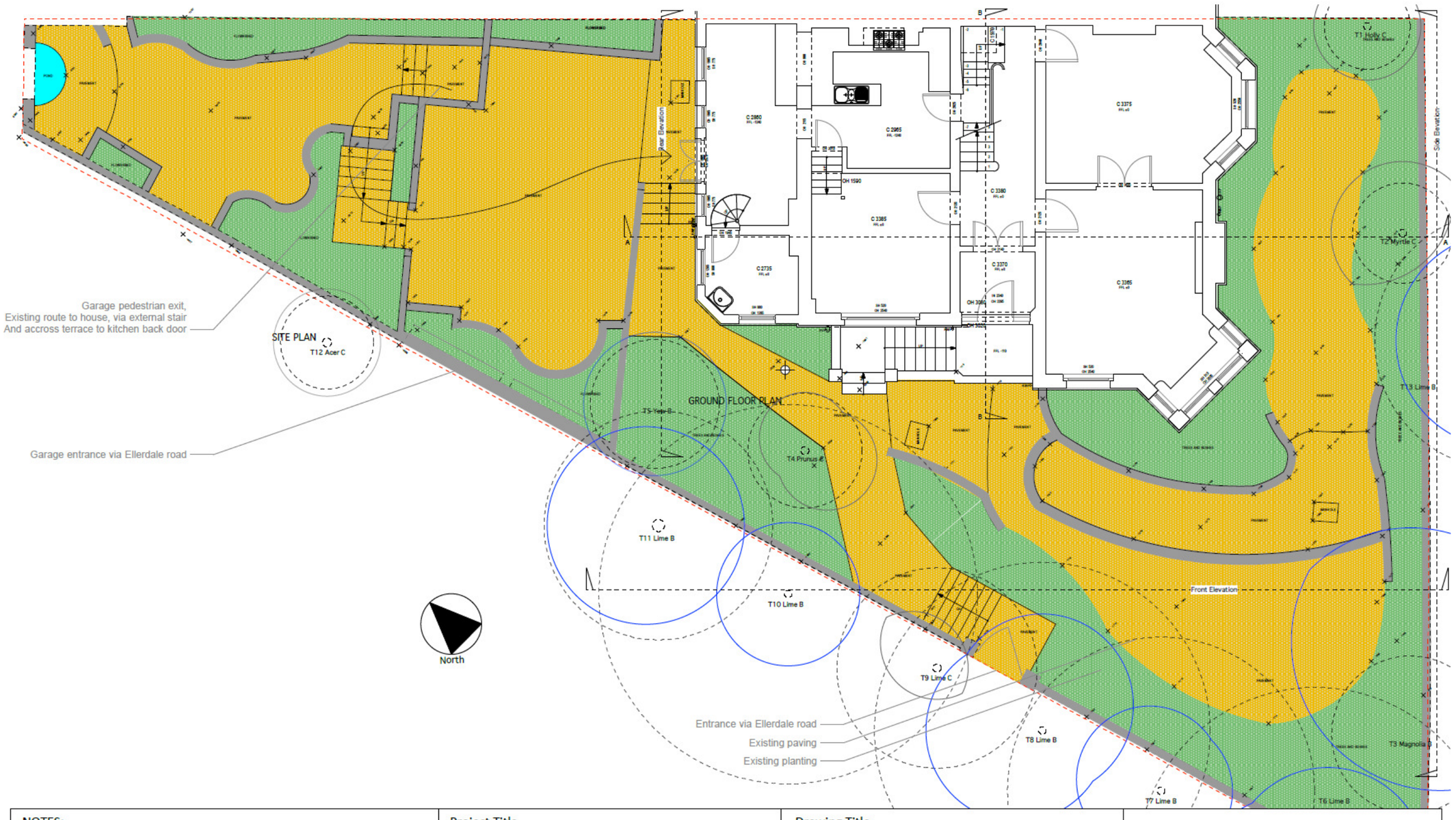
4.4 It is considered that the proposed development will not pose any threat to the health and safety of the trees to be retained.

APPENDIX MD1
Tree survey schedule (BS5837: 2012) for 9 Ellerdale Road

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	Holly	3.5	100	1.5	1.5	1.5	1.5	2	Y	Good	Good	10 to 20	C	Too close to boundary wall. Topped at 3 m.
T2	Myrtle	5	120	2	1	2	2	2	Y	Good	Good	20 to 40	C	Ornamental shrub
T3	Magnolia	7	286	4	4	4	3	2	MA	Good	Good	20 to 40	B	Two stems below 1.5 m. Close to boundary wall. Attractive and prominent.
T4	Prunus	4	130	1.5	2	1.5	1	3	Y	Good	Fair	10 to 20	C	Pruned poorly - of little value
T5	Yew	6	300	2	2	2	2	1.5	Y	Good	Good	40+	B	Trunk measured at ground level - multi stem
T6	Lime	11	520	2.5	3	3	4	7	MA	Good	Good	40+	B	Pollarded street tree
T7	Lime	10	360	2.5	2	2	2	8	MA	Good	Good	40+	B	Pollarded street tree
T8	Lime	10	390	3	2	3	3	7	MA	Good	Good	40+	B	Pollarded street tree
T9	Lime	8	230	2	1	1	1	6	Y	Good	Good	40+	C	Pollarded street tree - suppressed
T10	Lime	10	440	2	2	2	2	6	MA	Good	Good	40+	B	Pollarded street tree
T11	Lime	12	400	3	2.5	2.5	3	6	MA	Good	Good	40+	B	Pollarded street tree
T12	Acer	5	110	1.5	1.5	1.5	1.5	3	Y	Good	Good	40+	C	Pollarded street tree
T13	Lime	12	300	3	3	3	3	6	Y	Good	Good	40+	B	Pollarded street tree

APPENDIX MD2

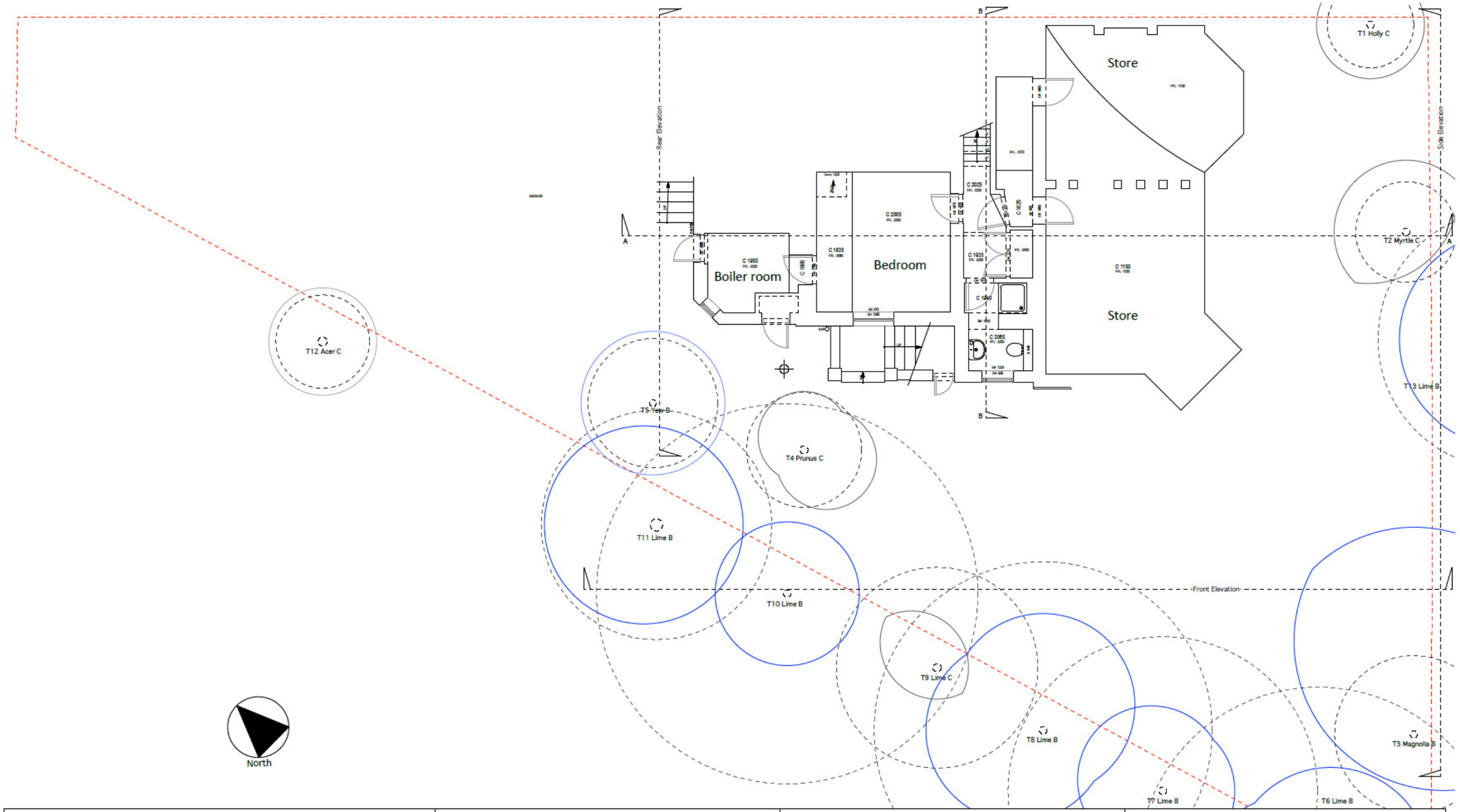
Existing site survey drawing (ground floor) showing tree numbers, BS5837 colour codes (A – Green, B – Blue, C – Grey, U - Red) and root protection areas (dashed circles)



NOTES: Do not scale from this drawing. All dimensions to be verified on site. Not for construction. Drawing to read in conjunction with other relevant consultants information and specification.	Project Title 9 Ellerdale Road, NW3 Drawing Scale 1:100 @ A3 Date 04.04.13 Drawing Status Planning	Drawing Title Existing Ground Floor Plan Drawing Number 002	Lee J Davidson RIBA Chartered Architect Email: ribalee@gmail.com Tel: 07884 006 129

APPENDIX MD3

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



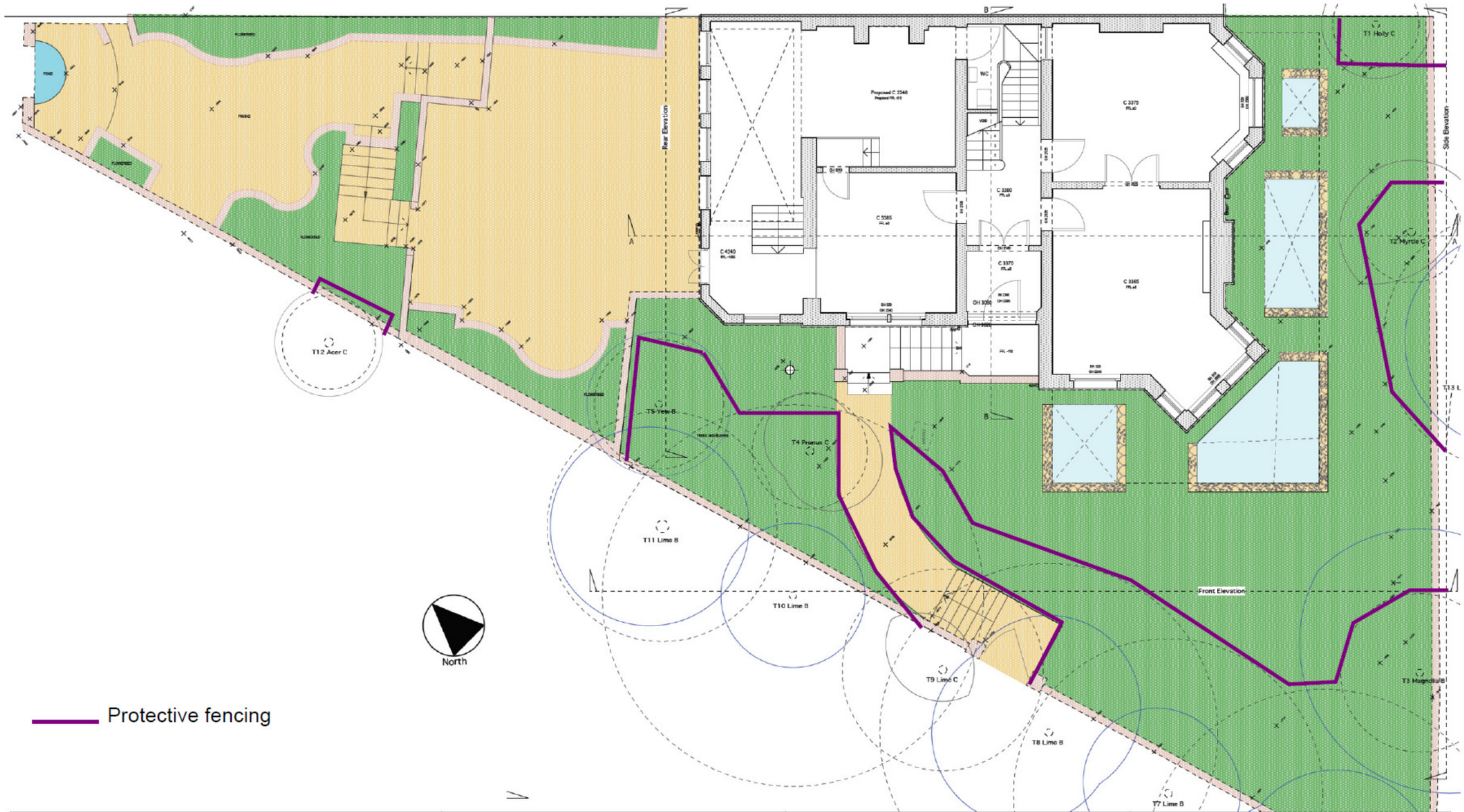
NOTES:	Project Title	Drawing Title	
Do not scale from this drawing. All dimensions to be verified on site. Not for construction. Drawing to read in conjunction with other relevant consultants information and specification.	9 Ellerdale Road, NW3 Drawing Scale 1:100 @ A3 Date 04.04.13 Drawing Status Planning	Existing Basement Plan Drawing Number 001	Lee J Davidson RIBA Chartered Architect Email: ribalee@gmail.com Tel: 07884 006 129

APPENDIX MD4
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	Holly	100	4.5	1.2
T2	Myrtle	120	6.5	1.4
T3	Magnolia	286	15.2	2.2
T4	Prunus	130	7.6	1.6
T5	Yew	300	28.3	3.0
T6	Lime	520	78.6	5.0
T7	Lime	360	58.6	4.3
T8	Lime	390	68.8	4.7
T9	Lime	230	23.9	2.8
T10	Lime	440	87.6	5.3
T11	Lime	400	32.2	3.2
T12	Acer	110	5.5	1.3
T13	Lime	300	40.7	3.6

APPENDIX MD5

Proposed tree protection plan (ground floor) showing extent of root protection areas (dashed circles) and positions of protective fencing (purple lines)

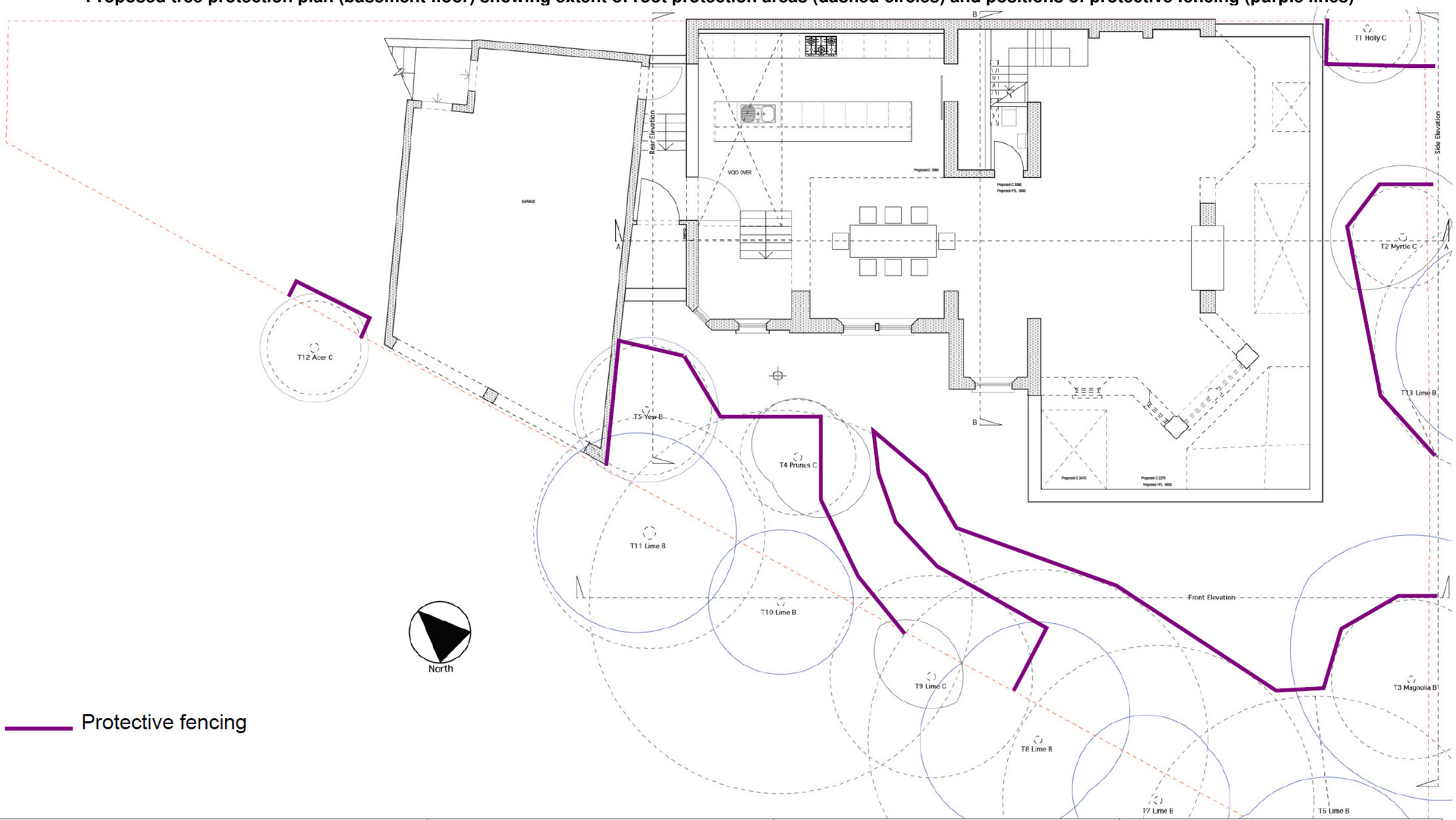


Protective fencing

NOTES: Do not scale from this drawing. All dimensions to be verified on site. Not for construction. Drawing to read in conjunction with other relevant consultants information and specification.	Project Title 9 Ellerdale Road, NW3 Drawing Scale 1:100 @ A3 Date 02.05.13 Drawing Status Planning	Drawing Title Proposed Ground Floor Plan Drawing Number 012	Lee J Davidson RIBA Chartered Architect Email: ribalee@gmail.com Tel: 07884 006 129

APPENDIX MD6

Proposed tree protection plan (basement floor) showing extent of root protection areas (dashed circles) and positions of protective fencing (purple lines)



NOTES:	Project Title	Drawing Title	
Do not scale from this drawing. All dimensions to be verified on site. Not for construction. Drawing to read in conjunction with other relevant consultants information and specification.	9 Ellerdale Road, NW3 Drawing Scale 1:100 @ A3 Date 18.05.13 Drawing Status Planning	Proposed Basement Plan Drawing Number 011	Lee J Davidson RIBA Chartered Architect Email: ribalee@gmail.com Tel: 07884 006 129

APPENDIX MD7
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.