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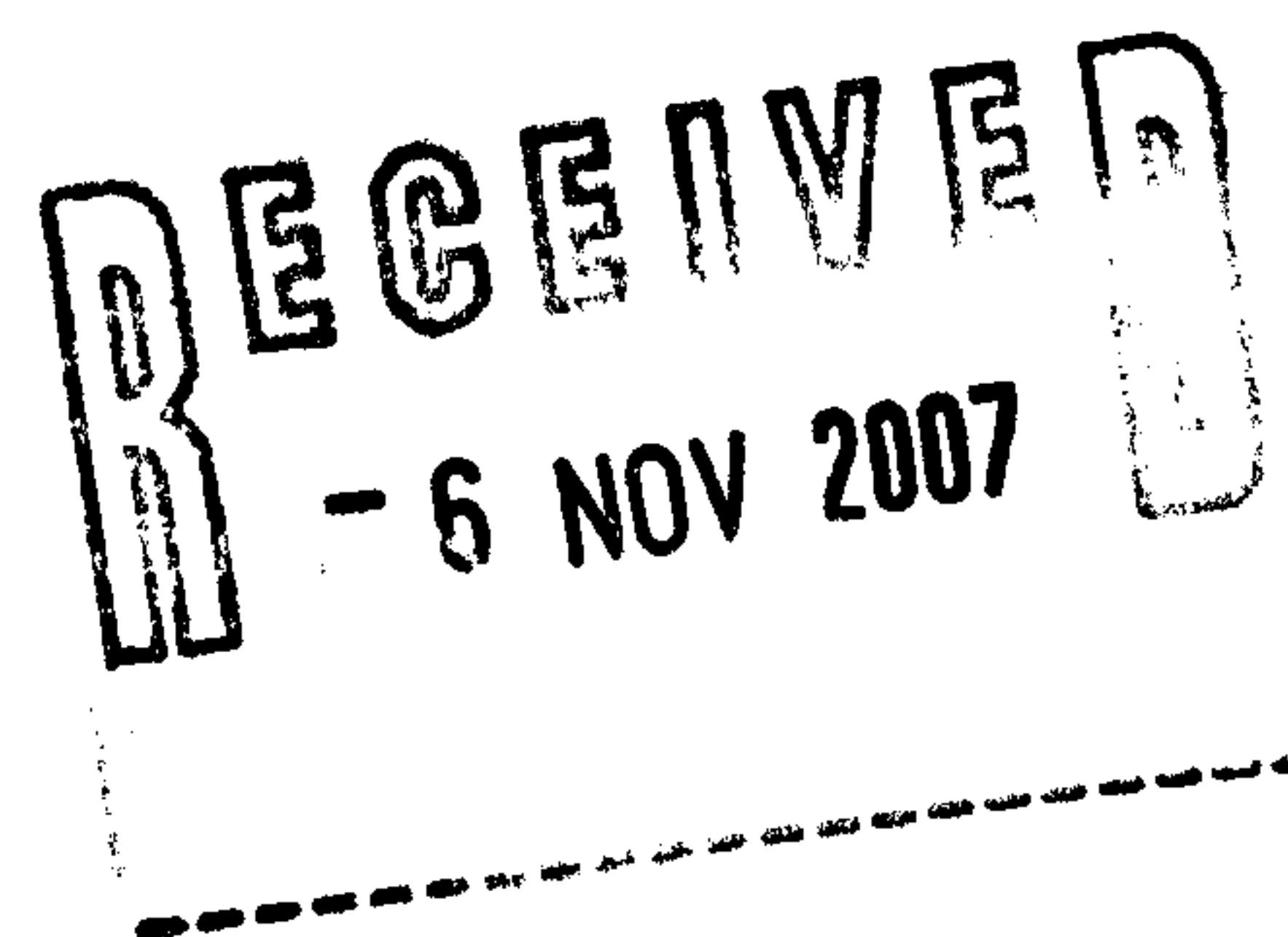


TREE SURVEY and ARBORICULTURAL METHOD STATEMENT

A report to accompany a Planning Application for
development on land at 19 Greenaway Gardens, London,
NW3 7DH

Report by Dr Martin Dobson

5 November 2007



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1 Introduction

- 1.1 Number 19 Greenaway Gardens, London, NW3 7DH is a detached two-storey dwelling located in a sought-after residential area of North West London.
- 1.2 In order to increase available living space it is proposed that a basement will be excavated beneath the footprint of the existing building and new habitable rooms will be constructed. Clearly this will involve a substantial amount of work and since there are a number of trees within the curtilage of the property and in neighbouring gardens a tree survey report has been commissioned in order to give details of tree species and how their roots will be protected during development.
- 1.3 It is the purpose of this report to demonstrate that trees on and adjacent to the site can be protected during and after development such that there would be no detriment to their health and vitality. This report fully adopts all relevant recommendations contained in the British Standard 5837: 2005 *Trees in relation to construction – recommendations* in order to ensure that soil, roots, trunk and branches will not be damaged.

2 Tree Survey

- 2.1 On 9th October 2007 Martin Dobson Associates carried out a survey of the trees on or adjacent to 19 Greenaway Gardens as instructed by Wolff Architects. The survey was carried out in line with British Standard 5837: 2005 *Trees in Relation to Construction - Recommendations*. Appended at **MD1** is a copy of the tree survey schedule, which lists 9 trees present within or adjacent to the land which could potentially be affected by 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.

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
R trees (unsuitable or dead/dying/dangerous, less than 10 years useful life)	RED
- 2.2 The site survey drawing appended at **MD2** shows the positions of the surveyed trees and gives a reasonable indication of the comparative branch spreads of the trees. The drawing has been colour coded as follows:
- 2.3 The information gathered from the survey has allowed a suitable root protection area to be calculated for each tree and the details of these are given below (**MD3** and **MD4**).
- 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.

3 Landscape Appraisal of the Site

- 3.1 To the rear of 19 Greenaway Gardens there is a modest sized garden mostly laid to lawn with some trees and shrubs at the edges near to the boundary with properties to the left, right and rear. T1 is a young Cherry with a trunk that bifurcates near to ground level. Its crown has been cut back so that there are few low branches which grow out over the rear garden. It has little public amenity value since it is small and relatively insignificant, but it provides screening

between the garden and the neighbouring property at No. 18. T1 has been given a C grading indicating that it is considered to be of low quality and value. T2 is a Cherry in the garden of the property to the rear. Again, it is of little importance other than for screening and has been given a C grading. The Yew T3 is also in the garden to the property backing onto No. 19 and since it is young and relatively small has been graded C. The Magnolia T4 has been cut back very substantially in the recent past and is now a relatively small tree. It has little amenity or screening value and hence has been graded C. The Contorted willow T5 is a larger tree and provides greater scale and thus screening. Since it can be seen from outside the property and thus has some amenity value it has been graded B.

- 3.2 To the front of the property there is a paved driveway to the left (when viewed from the road) and a planting bed to the right contained by a retaining wall on the house side. The planting bed contains a number of shrubs and two trees. The Bay T6 is a substantial tree and tends to dominate the front garden. It is evergreen and therefore provides year round foliage and screening. Since it is of reasonably good form and is visible from the road it has been graded B. The Cherry T7 which is also in the front planting bed appears to be past its prime. Cherry trees tend to be relatively short-lived and their appearance can easily be harmed through injudicious pruning, as is the case here. The tree has been graded C. The Cypress is a large specimen which has previously been topped to contain its size. It dominates the entrance to the drive and will become a nuisance in the foreseeable future due to its substantial growth rate and due to the propensity of its roots to disrupt paved or tarmacked surfaces. The tree may need to be removed in the foreseeable future as it is not well suited to its position and it has therefore been graded C. The Birch in the front garden of the neighbouring property at No. 18 is a healthy young tree with useful future landscape potential and has been given a B grading.

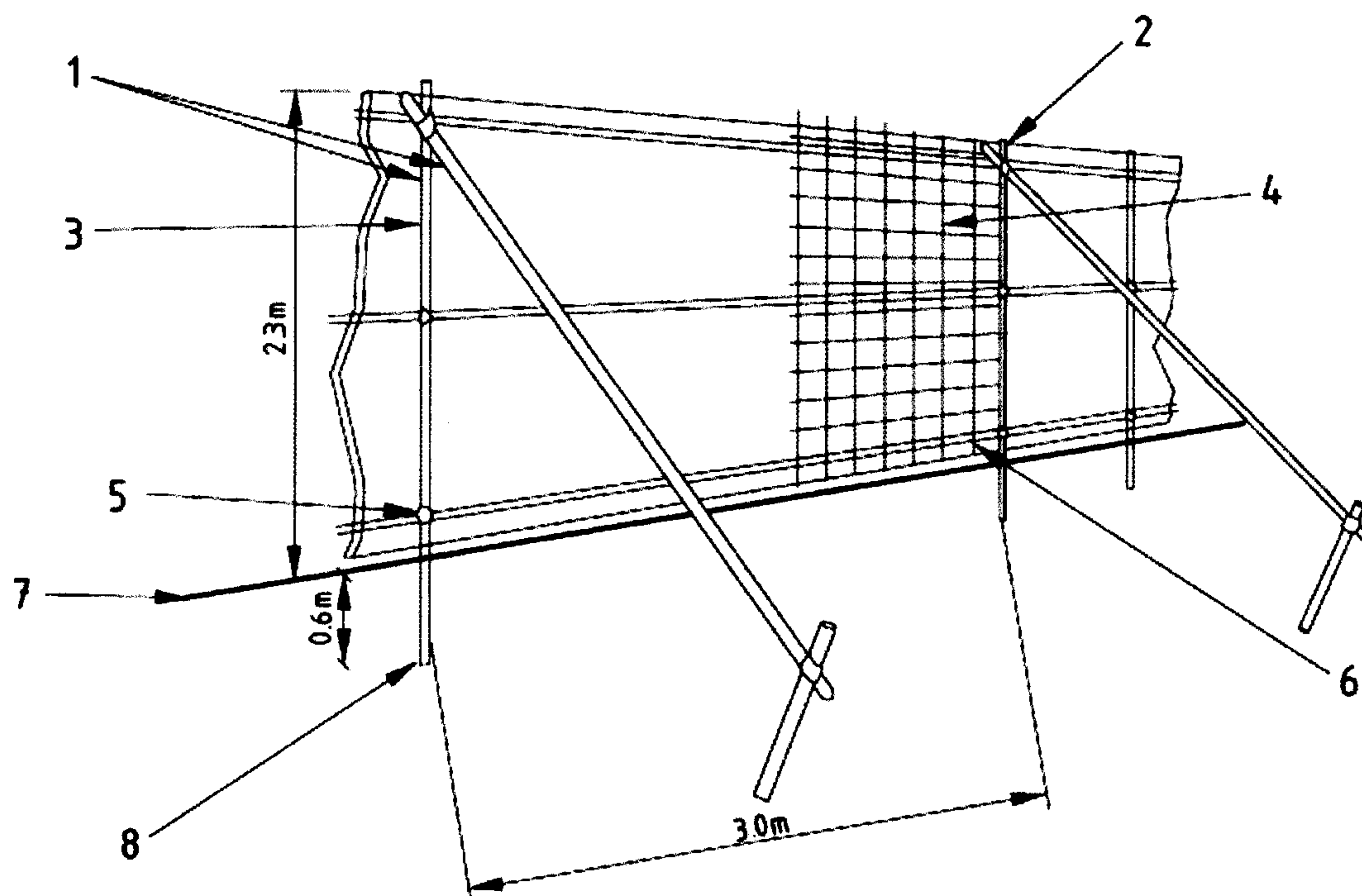
4. Root Protection Areas

- 4.1 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 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 couple of centimetres in diameter) may actually be highly important.
- 4.2 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.
- 4.3 Adequate protection, both above and below ground, is therefore essential for trees that are to be retained as part of a new development. The British Standard BS5837: 2005 *Trees in Relation to Construction - Recommendations* gives advice for ensuring that the negative impacts of development on trees are minimised.
- 4.4 Essentially the guidance 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, or for multi-stemmed trees 10 times the diameter at ground level. Based on the tree survey data root protection areas have been calculated and these are shown at MD3 and illustrated at MD2. The British Standard recommends that the position of protective fencing should be shown on development plans as polygons rather than circles and thus fencing to enclose root

protection areas illustrated at **MD2** (a thick black line for fencing) is shown using straight lines rather than curves, but nonetheless encompasses the requisite area.

- 4.5 The British Standard permits at paragraph 5.4.2 (a) that for open grown trees it may be possible to '*offset the distance from the trunk to the edge of the root protection area by up to 20% in one direction*'. Since the root protection area of the Willow (T5) comes close to the proposed excavation the root protection area has been moved by 20% to the east along the east-west axis, but has not reduced its area.
- 4.6 The British Standard permits at 5.2.4 that the shape of the root protection area may be changed from a circle or square but that its area should not be reduced. Given the position of the 1 m tall retaining wall near to the Bay (T6) and Cherry (T7) the most appropriate way of protecting roots of these trees would appear to be to protect the entire raised bed. It is likely that the most significant roots will be contained within the bed and few will be found at the lower level underneath the paving leading to the front door. Thus, the protection areas for each tree have been displayed as rectangles and the fencing has been positioned such that it encompasses the entire planting bed. Even so, roots outside the fencing should be protected in that the ground is covered with paving and will thus resist compaction.
- 4.7 For the Cypress (T8) and Birch (T9) the ground, and consequently roots, is protected by the paved driveway surface. Fencing is therefore not considered necessary, other than to protect the trunk of the Cypress, as it is not proposed to remove the driveway during construction. The bearing capacity of the drive will be assessed by digging a trial pit prior to construction activities commencing. If the paving and sub-base is found to be less than 300 mm thick an additional temporary 'load suspension layer' will be installed above the drive. The load suspension layer will be custom designed by an engineer and will comprise of a 100 – 200 mm thick cellular confinement system such as Geocell or Cellweb. The cellular confinement system will be placed above the existing driveway and be filled with sand or aggregate. Steel sheets will be placed above the cellular confinement system as a wearing and load spreading surface.
- 4.8 If the sub-base is found to be adequate then the driveway will be protected using steel sheets only, but no additional load suspension layer.
- 4.9 Fencing will consist of a scaffold framework (not wooden posts), well braced to resist impacts, with vertical tubes spaced at a maximum interval of 3 m (Figure 1). 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.
- 4.10 High visibility all weather notices will be securely attached to the barrier around the protection zone with the words '*Tree Protection Zone. No Construction Allowed – Keep Out*'. Where long lengths of barrier are erected a sign will be attached at intervals of no less than 6 m.
- 4.11 The barrier will remain in place throughout the succeeding construction phase and will not be removed without written permission from the Council under any circumstances until construction is completed.
- 4.12 No fires will be lit under the canopies of trees and any fires must be at least 4 m beyond the furthest branch tip. Likewise, potentially toxic liquids such as diesel will be stored at least 3 m away from the protective fencing.
- 4.13 Any new service runs will be positioned outside root protection areas. But it is anticipated that use will be made of existing services within the site.

Diagram to illustrate suitable protective fencing



- | | |
|--|---------------------------------------|
| 1 Scaffold poles | 5 Clamp |
| 2 Uprights, to be driven into ground | 6 Wire, twisted and secured |
| 3 Panels, secured to uprights with wire ties and where necessary scaffold clamps | 7 Ground level |
| 4 Weldmesh, wired to the uprights and horizontals | 8 Approx 0.6 m driven into the ground |

5. Method Statement

- 5.1 The sequence of events on site is described below and methods necessary to avoid damage to tree roots and/or branches are detailed.
- 5.2 Before any construction work takes place on site the protective fencing and ground protection will be installed in the positions shown at **MD3**. This will be approved and checked by a competent arboriculturist.
- 5.3 Once tree protection is in place then excavation and construction can begin. Fencing should not be taken down under any circumstances during construction unless with the express approval of the Council.
- 5.4 Once construction has demonstrably finished (to the satisfaction of a competent arboriculturist) the fencing and ground protection may be removed in order to allow final landscaping to be undertaken. Landscaping should not involve any changes in soil levels or the digging of any trenches.

6. Conclusions

- 6.1 A survey of trees in the garden of and adjacent to 19 Greenaway Gardens, London has been carried out. Nine trees were surveyed and out of these three were considered to be of moderate value (Willow T5, Bay T6 and Birch T9) and should be retained within the development. The remaining six trees were considered to be of low value (T1 – T4, T7 and T8). Nonetheless, all of these trees are to be retained and protected during development.
- 6.2 Methods for ensuring the protection of the nine trees to be retained have been described.
- 6.3 It is considered that the proposed development will pose no threat to the trees to be retained.

Dr Martin Dobson
5 November 2007

Tree No.	Species	Height (m)	Trunk diameter (mm)	Crown spread (m)	Height of crown clearance (m)	Age class ¹	Physiological condition	Structural condition	Useful life (y)	Management notes	BS5837 Grade
T1	Cherry	8.0	230 (at ground level)	N 3.0 S 2.0 E 3.0 W 3.0	2.0	Y	Good	One-sided due to pruning over garden to south	10 – 20		C
T2	Cherry	8.0	310	N 4.0 S 4.0 E 4.5 W 3.5	3.0	Y	Good	Fair	10 – 20		C
T3	Yew	13.0	380	N 3.5 S 3.0 E 3.0 W 3.0	2.0	Y	Good	Good	40+		C
T4	Magnolia	6.0	310	N 2.0 S 5.0 E 3.5 W 5.0	2.0	MA	Good	Substantially pollarded	10 – 20	Misshaped due to pollarding	C
T5	Contorted Willow	10.0	310	N 4.0 S 4.0 E 3.0 W 5.0	2.5	Y	Good	Good	20 – 40	Branches overhanging garden may need to be cut back	B
T6	Bay	11.0	500 (at ground level)	N 3.0 S 3.0 E 3.0 W 3.0	0.0	MA	Good	Good	40+	Remove basal suckers to contain size of tree	B
T7	Cherry	8.0	370	N 4.0 S 4.0 E 1.5 W 4.0	2.0	M	Fair	Heavily pruned	10 – 20		C

APPENDIX MD1
Tree survey schedule (BS5837: 2005) for 19 Greenaway Gardens

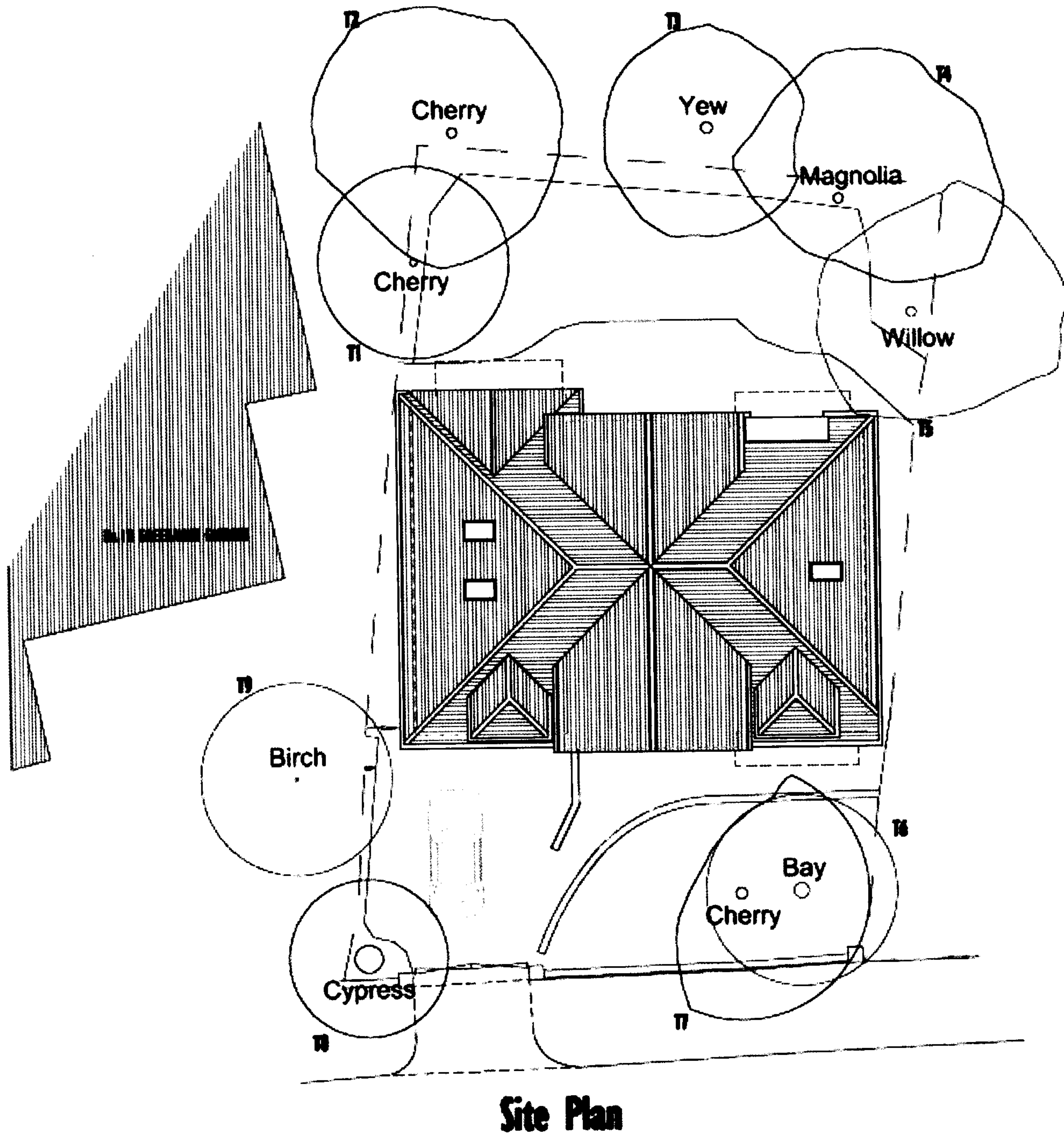
¹ Y = Young (<1/3 life expectancy). MA = Mid aged (1/3 – 2/3 life expectancy). M = Mature (>2/3 life expectancy). OM = Over mature (reaching end of safe useful life)

Tree No.	Species	Height (m)	Trunk diameter (mm)	Crown spread (m)	Height of crown clearance (m)	Age class ²	Physiological condition	Structural condition	Useful life (y)	Management notes	BS5837 Grade
T8	Cypress	10.0	450	N 2.5 S 2.5 E 2.5 W 2.5	2.0	MA	Good	Good	10 – 20		C
T9	Birch	11.0	300	N 3.0 S 3.0 E 3.0 W 3.0	7.0	Y	Good	Good	40+		B

² 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 and BS5837 colour codes (A – Green, B – Blue, C – Grey, R - Red),

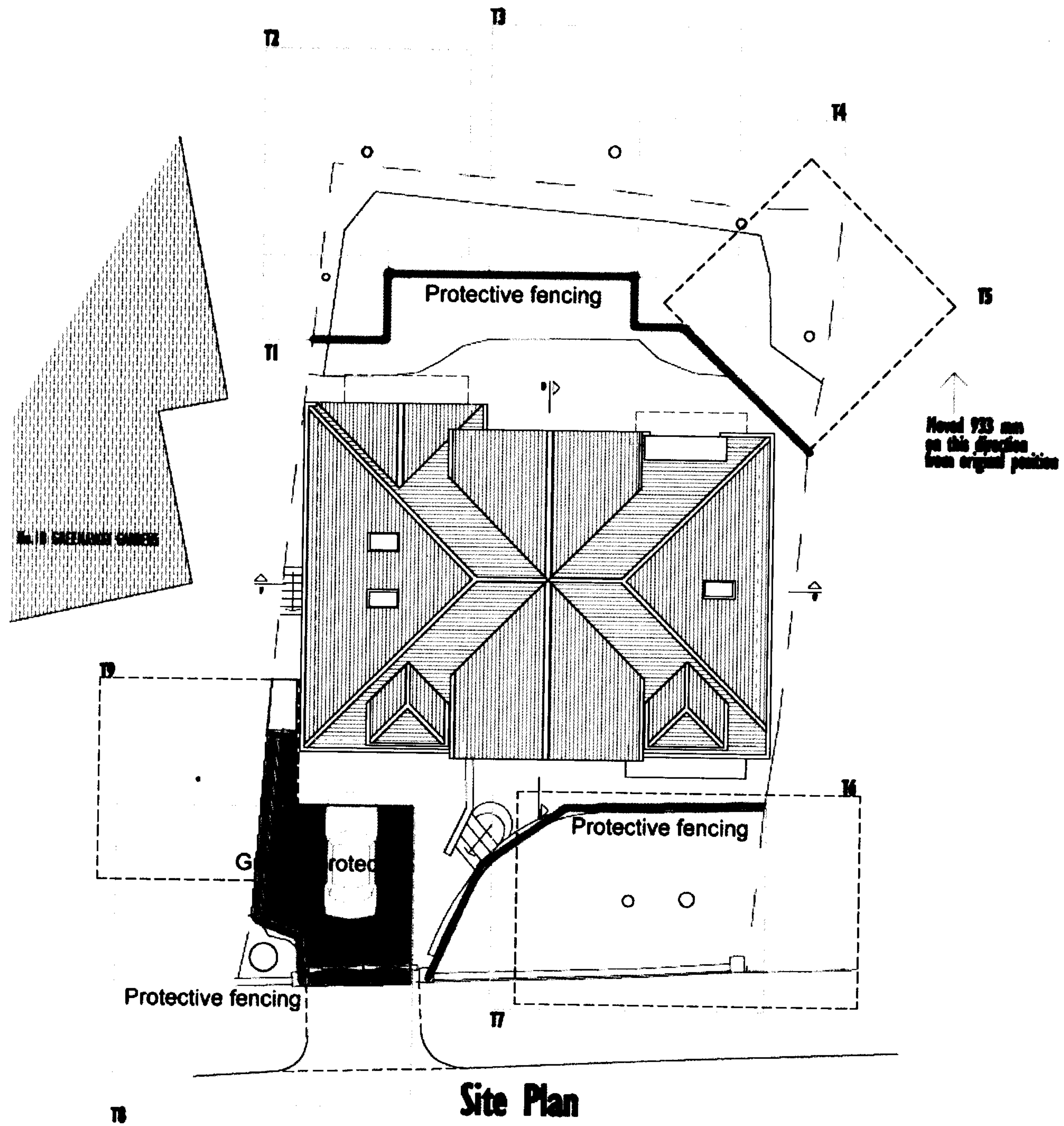


KEY

- BS Classification A
- BS Classification B
- BS Classification C
- BS Classification R

APPENDIX MD3

Proposed new layout and positions of root protection zones (dashed lines), protective fencing (thick black line) and ground protection zones (purple).



APPENDIX MD4
BS5837 schedule of protection zones

Tree No.	Species	BS5837: 2005 Root protection area, RPA, (m²)	BS5837: 2005 Radial protection distance (m)	BS5837: 2005 Diameter of RPA if represented as a square (m)
T1	Cherry	16.6	2.3	4.0
T2	Cherry	43.5	3.7	6.6
T3	Yew	65.3	4.6	8.0
T4	Magnolia	43.5	3.7	6.6
T5	Contorted Willow	43.5	3.7	6.6
T6	Bay	78.6	5.0	8.8
T7	Cherry	61.9	4.4	7.8
T8	Cypress	91.6	5.4	9.6
T9	Birch	40.7	3.6	6.4