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TREE SURVEY AND ASSESSMENT IN RELATION TO PROPOSED DEVELOPMENT AT 4 & 6 MANOR ROAD, TEDDINGTON, MIDDLESEX.

Revised January 2016.

Clive Fowler, Dip.Arb (RFS), F.Arbor.A, MCIHort, Tech. Cert.Arbor.A

Tree Survey and Assessment in Relation to Proposed Development at 4 & 6 Manor Road, Teddington, Middlesex.

1. I was previously instructed by Lulworth Homes to undertake an inspection of trees at the above site in connection with its redevelopment and carried out such inspection on the 29th November 2013. I also visited the site on the 3rd September 2014 and subsequently prepared a report dated January 2015 in relation to an earlier Planning Application. This report has been prepared to take into account the revised development proposals.

2. Before any works to trees specified within this report are undertaken it would be necessary to write to the Local Authority as I understand that trees at this site are the subject of protective legislation.

3. I have been supplied with a copy of the existing site survey and enclose a reduced copy of this drawing as appendix 'b' to this report which indicates the position of the trees with their respective identification numbers.

4. Details of individual trees are given in the attached schedule (appendix 'a'). Species are shown by their common names. All measurements are approximate and stem diameters are measured at 1.5 metres from ground level unless stated. All inspections were carried out from ground level only and no specialist decay detection equipment was used to assess internal wood quality. In some cases it was not possible to fully inspect the trees due to them being situated in neighbouring land.

5. The information contained within the schedule has been collected in accordance with recommendations given in BS 5837: 2012 'Trees in Relation to Design, Demolition and Construction - Recommendations'. I have also categorised each tree in accordance with the above Standard and they are colour coded on the enclosed site survey drawing (appendix 'b') to aid their recognition.

   The following categories apply;

   A - Trees of high quality. (Green)

   B - Trees of moderate quality. (Blue)

   C - Trees of low quality. (Grey)

   U - Trees in such a condition that they can not realistically be retained as living trees in the context of the current land use for longer than 10 years. (Red)

6. In addition to the above, each tree is assigned a subcategory (1 – 3) which are detailed in the table attached at appendix 'e'. It is intended that each subcategory

carries equal weight – for example an A 1 category tree would have the same retention priority as an A 2 tree.

7. The specification for pruning works are as per recommendations given in BS 3998 'Tree Work - Recommendations'.

General.

8. The tree cover at this site includes many young – middle aged specimens that appear to have long safe useful life expectancies and which should therefore be of long term benefit to the visual amenity of the site and surrounding area. To the south of the property and adjacent to the driveway are a number of well established young hornbeams (T.2 – 8) that were planted as semi mature stock and which provide screening between the site and adjacent properties.

9. An older ivy clad sycamore (T.9) is present in neighbouring land to the south east of the site and appears to have been suppressed in the past. To its east at the time of my inspection was a vigorous and severely unbalanced eucalyptus (T.10) with a lean towards the south east and a number of large trunk wounds. This tree has subsequently been removed as agreed by the Local Authority (Ref: 14/T0161/TCA).

10. A row of well established fastigiate oaks grow along the south eastern site boundary (group 1) and are an unusual landscape feature of long term potential. A group of low quality Leyland cypress (Group 2) are situated to the south east of numbers 1 & 2 Braemar Cottages and are an inappropriate species for the location due to their large growth potential. They have been heavily reduced in the past and a number of the trees are of poor form and future potential. It is recommended that this group are removed, regardless of the future use of the site.

11. To the east of the site and in neighbouring land are several further trees that include silver birch (T.13 – 16), a well established and balanced ash (T.17), and a cherry with a distorted lower stem (T.24). A middle aged sycamore (T.22) with a large area of diseased bark on its lower main stem and a potentially weak stem union grows in neighbouring land to the north east, in addition to a twin stemmed holly that provides some screening value (T.21).

12. Towards the central part of the surveyed area and between numbers 4 – 6 Manor Road are two newly established groups of Leyland cypress (Groups 3 & 4). Both groups are now at the stage where they should be pruned in order to create a semi formal screen and then subsequently regularly contained in size.

13. To the south west of the surveyed area and close to the boundary with Manor Road are two close growing hollies that form part of the lower level screening (T.27 & 28), a newly established cherry that has some suppression to its north west, and two middle aged beech trees (T.26 & 29). Copper beech tree T.26 was

previously suppressed to the south and has an unbalanced crown as a result. Fruiting bodies of the decay causing pathogen *Ganoderma* were found at its base and necessitate further investigation in the not too distant future using minimally invasive decay detection equipment.

Proposed Development/Methodology.

14. These revised proposals have been carefully considered with access to appropriate Arboricultural information being available from an early stage. I have also viewed and commented on a number of draft proposals, prior to the preparation of the submitted revised scheme. I have assessed the proposed site layout whilst having regard to tree protection measures recommended in BS 5837: 2012 'Trees in Relation to Design, Demolition and Construction - Recommendations' and taking into account the Root Protection Areas (RPA's) shown in appendix 'c'. I have also prepared a Tree Protection Plan which is enclosed as appendix 'f' to this report.

15. Trees that are proposed for removal, either as a direct result of the submitted scheme, or in accordance with good Arboricultural practice, are detailed in appendix 'c'. No trees which are placed within the higher retention categories in accordance with the above Standard ('a' & 'b') are proposed for removal as a result of this development.

16. With regard to the front (south west) of the site, beech trees T.26 & 29, which are situated close to the boundary with Manor Road, will be retained and unaffected by the development proposals. The row of hornbeams that grow to the south east of the access drive will be retained and protected with a combination of fencing and ground protection (which includes the retention of the existing hard surfacing) in full accordance with figure 3 and Section 6.2.3 of BS5837: 2012 (appendix 'c' & 'd').

17. To the east of the above row of hornbeams, tree T.8 is to be carefully relocated towards its east in order to allow the development to proceed. This relocation will be undertaken by a professional tree moving company (such as Ruskins or Civic Trees) and in full accordance with currently accepted good Arboricultural practice. As this specimen (and the remainder of this planting) was planted as semi mature stock and was consequently root pruned on several occasions, prior to planting at its current location, it is not anticipated that such works would be of long term detriment to its health or appearance. A regular maintenance contract will also be implemented so as to ensure that this tree quickly recovers from such works and continues to enhance the site and surrounding area.

18. To the south east of the site and within the RPA of sycamore T.9 it is proposed to install cycle and bin stores. These will be light structures and any necessary foundations will be designed and constructed so as to be in full accordance with Section 7.5 of BS5837:2012 as detailed below;

7.5.1 The use of traditional strip footings can result in extensive root loss and should be avoided. The insertion of specially engineered structures within RPAs may be justified if this enables the retention of a good quality tree that would otherwise be lost (usually categories A or B). Designs for foundations that would minimise adverse impact on trees should include particular attention to existing levels, proposed finished levels and cross-sectional details. In order to arrive at a suitable solution, site specific and specialist advice regarding foundation design should be sought from the project arboriculturalist and an engineer. In shrinkable soils, the foundation design should take into account the risk of indirect damage (see A.1.4).

7.5.2 Root damage can be minimised by using:

- **Piles, with site investigation used to determine their optimal location whilst avoiding damage to roots important for the stability of the tree, by means of hand tools or compressed air soil displacement, to a minimum depth of 600mm.**

- **Beams, laid at or above ground level, and cantilevered as necessary to avoid tree roots identified by the site investigation.**

7.5.3 Where a slab for a minor structure (e.g. shed base) is to be formed within the RPA, it should bear on existing ground level, and should not exceed an area greater than 20% of the existing unsurfaced ground.

7.5.4 Slabs for larger structures (e.g. dwellings) should be constructed with a ventilated air space between the underside of the slab and the existing soil surface (to enable gas exchange and venting through the soil surface). In such cases, a specialist irrigation system should also be employed (e.g. roof run-off redirected under the slab). The design of the foundation should take account of any effect on the load bearing properties of the underlying soil from the redirected roof run-off. Approval in principal for a foundation that relies on topsoil retention and roof run-off under the slab should be sought from the building control authority prior to this being relied on.

7.5.5 Where piling is to be installed near to trees, the smallest practical pile diameter should be used, as this reduces the possibility of striking major tree roots, and reduces the size of the rig required to sink the piles. If a piling mat is required, this should conform to the parameters for temporary ground protection given in 6.2.3. Use of the smallest practical piling rig is also important where piling within the branch spread is proposed, as this can reduce the need for access facilitation pruning. The pile type should be selected bearing in mind the need to protect the soil and adjacent roots from the potentially toxic effects of uncured concrete, e.g. sleeved bored pile or screw pile.

19. Also in this area it is proposed to install a new footpath within an area that is already largely covered by hard surfacing. In order to avoid any potential harm to this tree, the new path will be installed at the landscaping stage and in full accordance with the advice contained within Section 7.4 of BS 5837: 2012 and Arboricultural Practice Note 12 – 'Through the Trees to Development' (incorporating a three dimensional cellular confinement system if appropriate and ensuring that the natural ground levels below the existing hard surfacing are not disturbed).

20. In the northern part of the site it will be necessary to remove three groups of Leyland cypress in order to allow this development to proceed (groups 2, 3 & 4). Leyland cypress group 2 contains the largest specimens and these are of poor quality and form, either due to mutual competition, or as a result of previous heavy pruning works. As a result of the above, and the fact that they have outgrown their current situation, it is recommended that this group are removed regardless of the future use of the site. Groups 3 and 4 consist of close growing young trees that have been fairly recently established and which subsequently have very limited public amenity value. Replacement planting at the landscaping stage will readily mitigate such loss.

21. To the east of the site, group 1, which contains several close growing fastigiate oak trees, will be retained and has recently been extended by further planting of the same species / cultivar.

22. To the north east of the site some encroachment is required within the RPA's of Portugal laurel's T.18 & 19 which grow in neighbouring land close to the boundary. As these are low quality shrubs of limited aesthetic value they do not justify the use of specialist construction / protection methods. All other trees in neighbouring land to the north and north east of the site will be unaffected by the proposed development.

23. Careful demolition of the existing building adjacent to the north eastern boundary will be required and all such work will be undertaken in accordance with Section 7.3 of BS5837: 2012 as detailed below;

7.3.1 **Where demolition is proposed on a site where trees are to be retained, access facilitation pruning should be undertaken as necessary to prevent injurious contact between demolition plant and the tree (s). In some cases, working space may be provided by temporarily tying back tree branches. Pruning or tying should be undertaken in accordance with a specification prepared by an arboriculturalist.**

Note: The local authority will be able to advise whether trees are under statutory protection such that consent for the tree works might be required.

7.3.2 When demolishing a structure (including underground structures) within what would otherwise be the RPA, barriers should be erected, and ground protection installed (see 6.2.3), to protect the underlying soil to the edge of the structure.

7.3.3 All plant and vehicles engaged in demolition works should either operate outside the RPA, or run on the ground protection (see 6.2.3). Where such ground protection is required, it should be installed prior to commencement of operations.

7.3.4 Where trees stand adjacent to structures to be removed, the demolition should be undertaken inwards within the footprint of the building (often referred to as 'top down, pull back').

Note: Where there is a significant build up of dust on the foliage, it might be necessary to hose down the tree(s).

7.3.5 The advice of an arboriculturalist should be sought where underground structures are present within the RPA are, or will become, redundant. In general it is preferable to leave such structures in situ, as their removal could damage adjacent roots.

7.3.6 Where an existing hard surface is scheduled for removal, care should be taken not to disturb tree roots that might be present beneath it. Hand held tools or appropriate machinery should be used (under arboricultural supervision) to remove the existing surface, working backwards over the area, so that the machine is not moving over the exposed ground (see 7.2.2 for protection of exposed roots). If a new hard surface is to be laid, it might be preferable to leave any existing sub-base in situ, augmenting it where required.

24. The proposed location of all services and soakaways etc. will be carefully considered at an early stage so as to ensure that excavation within RPA's is avoided or kept to an absolute minimum. Where such works are unavoidable (and following consultation with an Arboriculturalist) any excavations in such areas must be carried out in strict accordance with Section 7.7 of BS5837: 2012 and the National Joint Utilities Group publication (Volume 4) 'Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees' and in the presence of a person suitably qualified and experienced in Arboriculture.

25. Landscaping works must also take into account the preservation of existing trees and it is important that soil levels are not altered within RPA's without prior consultation with an Arboriculturalist. Any proposed planting must be carried out carefully in such areas so as to avoid unnecessary root damage. Any works relating to the installation of new boundary treatment within RPA's must be

undertaken using hand held tools only and in full accordance with Section 7.2 of BS5837: 2012 as detailed below;

7.2.1 To avoid damage to tree roots, existing ground levels should be retained within the RPA. Intrusion into soil (other than piling) within the RPA is generally not acceptable, and topsoil within it should remain in situ. However, limited manual excavation within the RPA might be acceptable, subject to justification. Such excavation should be undertaken carefully, using hand held tools and preferably by compressed air soil displacement.

Note: Due to the demands that manual excavation places on a development project, and limitations arising from health and safety considerations, it is not realistic to plan for excavation using hand held tools where there is a need for trench shoring or grading the sides of the excavation to a stable angle of repose.

7.2.2 Roots, while exposed, should immediately be wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should be done as soon as possible.

7.2.3 Roots smaller than 25mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in clumps. Roots occurring in clumps or of 25mm in diameter and over should be severed only following consultation with an arboriculturalist, as such roots might be essential to the trees health and stability.

7.2.4 Prior to backfilling, retained roots should be surrounded with topsoil or uncompacted sharp sand (builders sand should not be used because of its high salt content, which is toxic to tree roots), or other loose inert granular fill, before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.

26. All tree protection will be installed prior to any site clearance works and must be maintained throughout the development process. Areas should also be designated for the delivery and storage of materials and site huts, avoiding tree protection zones (with the possible exception of the installation of carefully positioned site huts – subject to prior consultation with an Arboriculturalist and the Local Authority).

Conclusions.

27. This development has been carefully designed so as to take into account all trees of significance and providing the above guidelines in relation to BS 5837: 2012, APN12 and NJUG Volume 4 are followed and tree protection is installed prior to any development activity and maintained throughout the construction period, trees to be retained should be safely integrated within the proposals.

28. Prior to commencement of any tree works detailed in appendix 'a', it will be necessary to write to the Local Authority as trees at this site are the subject of protective legislation. Every effort should also be made to ensure that the protection afforded by the Wildlife and Countryside Act 1981 and the Countryside and Rights of Way Act 2000 in relation to nesting birds and disturbing or damaging bat roosts is fully complied with.

29. Any tree works which are undertaken should preferably be carried out by an Arboricultural Association Approved Contractor. Such works must be carried out to a minimum standard of BS3998 and in accordance with good Arboricultural practice.

C. Fowler.

C.E. Fowler Dip. Arb (RFS), F. Arbor.A, M.I. Hort, Tech. Cert. (Arbor.A).
January 2016.

Appendix ‘a’
Tree details

Clive Fowler Associates: Tree Survey at 4 & 6 Manor Road, Teddington, Middlesex.

No.	Species	Diameter @ 1.5 m (cm)	Age Class	Crown radius (m)	Height to 1st branch (m)	Crown height (m)	Height (m)	Condition / vitality	Estimated remaining contribution (years)	Category	Works	Notes.
1	Common lime	35 (est.)	mature	2.5	2.6 south	2.5	6.5	Good	20>	B 2 (est.)	No action - outside site.	Regularly pollarded at various levels with current regrowth now warranting further works. Forms part of a row of four of the species. Not fully inspected.
2	Hornbeam	11	young	2 north 2 east 2 south 2 west	1.7 north	1.5	6	Fair	10>	C 2	No action.	Slender tree which does not appear to have established as well as other specimens in planting. Some minor dieback in upper crown. Likely to improve in vigour in the future.
3	Hornbeam	20	young	2.5 north 3.5 east 3 south 3 west	1.5 south west	1.4	6	Good	20>	C 2	Formative prune - removing two or three lowest limbs on north side. Remove dead wood.	Well established tree planted as semi mature stock. Some damage on north west side from vehicular impact. Recommended works would be of long term benefit.
4	Hornbeam	15	young	3 north 3 east 3.5 south 2.5 west	2 north	1.7	6.5	Good - fair	20>	C 2	No action.	Broader tree in group with a small sunken area at base to the south. Some stubs to the north. Slightly unbalanced crown will benefit from careful reshaping at some point in the future.

Notes: Diameter at 1.5 metres refers to trunk diameter. Categories are as defined in BS 5837 (2012) - **A = High quality - B = Moderate quality - C = Low quality - U = Less than 10 years life expectancy - poor quality.** Crown height clearance / height to first branch = from ground level - Estimated remaining contribution = probable life expectancy as assessed at time of inspection. All measurements are approximate.

No.	Species	Diameter @ 1.5 m (cm)	Age Class	Crown radius (m)	Height to 1st branch (m)	Crown height (m)	Height (m)	Condition / vitality	Estimated remaining contribution (years)	Category	Works	Notes.
5	Hornbeam	16	young	2 north 2.5 east 2.5 south 2 west	1.9 north east	1.7	6	Good	20>	C 2	Formative prune - ensuring that the northern stems co-dominance is reduced.	Well established tree which unfortunately has a large column of diseased bark on its trunk to the east - reaching from ground level - 1.5 metres. Two main stems emerging at 3.5 metres which will create a congested / weak union as they develop further - hence the specified works.
6	Hornbeam	21 at 1.4 m	young	3 north 3.5 east 3 south 2 west	1.5 east	1.4	6.5	Good	20>	C 2	Formative prune - removing or reducing low branches over driveway - retaining a near to natural appearance.	One of the more well established trees in the planting which has a more columnar habit. Main crown framework arises at 1.45 metres. Some minor mechanical damage to the north.
7	Hornbeam	16	young	3 north 4.5 east 4 south 2.5 west	1.6 north east	1.3	6	Good	20>	C 2	Formative prune - removing crossing branches and lowest limb to the east.	Well established tree growing tight against a fence post. Low limb to the east at 1.5 metres should be removed before it develops further. Two main stems at 2.8 metres. Crossing branches to the east.
8	Hornbeam	20	young	3	1.6 north east	1.3	7.5	Good	20>	C 2	To be professionally relocated towards the east - so as to allow development.	Well established specimen forming its well balanced crown framework at a height of 1.65 metres. Some minor mechanical injuries. Crossing stem in lower crown to the north east.

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9	Sycamore	65 (est.)	mature	5 north 6.5 east 6.5 south 5 west	0.7 west (est.)	2	12	Good - fair	20>	C 1 (est.)	No action - in neighbouring ownership.	Ivy clad tree with an incline towards the south east. Possibly suppressed to the north west in the past. Main crown framework arises at around 4.5 metres. Not fully inspected.
10	Eucalyptus	63 (est.)	middle aged	5.5 north 7.5 east 6.5 south 3 west	3.8 north	1.5	11	Good	10>	C 1 (est.)	Removed as approved by the Local Authority - Ref: 14/T0161/TCA.	Vigorous tree of poor form which has a pronounced trunk incline towards the south east. Main crown framework arises at a height of approximately 4.5 metres and has been heavily reduced at a height of 6.5 metres with vigorous regrowth. Trunk wounds on east side which may allow the development of decay. Not possible to inspect south side of trunk due to proximity to boundary.
Group 1	Fastigiate oaks x 15	9 - larger tree	young	0.65 (av.)	0.2	0.2	6.5	Good	20>	B 2	No action.	Well established and unusual semi mature tree planting of good future potential.
11	Lawson cypress	9, 9, 5 & 4 (est.)	young	1	ground level	ground level	4.5	Good	20>	C 2 (est.)	No action - in neighbouring ownership.	Multi stemmed columnar cultivar in neighbouring land. Previously cut back to the north - leaving a bare area. Not fully inspected.

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Group 2	Leyland cypress x 4	37, 38 at 0.85 m, 39 at 1.1 m & 26 (east - west)	middle aged	4.5 (av.)	0.85 north	0.7	12	Good	20>	C 2	Remove.	Well established and effective screen but an inappropriate species for the location. Heavily reduced in the past at between 3.8 & 4.5 metres with numerous stumps and areas of dieback as a result. Tree at western end of row is of very poor form with its unbalanced crown having a severe lean to the north west (this tree also has large areas of missing bark). Adjacent tree has split limbs to the south west. Easternmost tree has possible early indications of a Coryneum canker infection.
12	Lawson cypress	18	middle aged	2 north 2 east 1.5 south 2 west	1.5 north	1.5	8	Good - fair	10>	C 2	No action.	Hemmed in by neighbouring trees. Dead wood in lower crown. Well defined main stem. Possible root damage to the south. May be vulnerable to wind throw if adjacent Leyland cypress's are removed.
13	Silver birch	28 (est.)	middle aged	4 north 3.5 east 4.5 south 4 west	3.2 south west	2.5	10	Good	10>	C 2 (est.)	No action - in neighbouring ownership.	Group tree with minor suppression to the north. Sinuous lower main stem. Not fully inspected.

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14	Silver birch	22 (est.)	middle aged	3.5 north 2 east 2.5 south 3.5 west	3 north west	3	9.5	Good	10>	C 2 (est.)	No action - in neighbouring ownership.	Slender group tree with a slight incline to the south east and a sinuous middle main stem. Drawn upper crown framework. Not fully inspected.
15	Silver birch	27 (est.)	middle aged	4 north 3.5 east 4 south 3.5 west	3.3 north	2.6	11	Good	10>	C 2 (est.)	As previous.	Group tree with a sinuous main stem at 3.8 metres and some suppression to the north west. Not fully inspected.
16	Silver birch	28 (est.)	middle aged	3.5 north 3.5 east 3 south 3.5 west	2.8 west	2.6	10	Good	10>	C 2 (est.)	As previous.	Forms a joint canopy with the previous birches and has a slight incline to the east. Large stem to the west at 2.8 metres. Not fully inspected.
17	Ash	35 (est.)	young	4 north 4.5 east 4 south 5 west	4.3 south west	3.8	12	Good	30>	B 2 (est.)	Reduce lateral growth to the west back to approximate boundary line - staggering cuts where possible to help maintain a natural appearance.	Well established and balanced tree that appears to have good future potential. Previously crown lifted. Not fully inspected.
18	Portugal laurel	26 at 1.2 m (est.)	middle aged	2	0.5	ground level	4	Good	20>	C 2 (est.)	Prune back to boundary line.	Large shrub in neighbouring land that forms part of screening. Pruning stubs to the west. Not fully inspected.
19	Portugal laurel	23 (est.)	middle aged	2	0.35	ground level	3.5	Good	20>	C 2 (est.)	As previous.	As previous.

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Group 3	Leyland cypress	14 - larger stem	young	2.5	ground level	ground level	7 - tallest	Good	20>	C 2	Remove to allow development.	Well established screen which should be regularly contained in size if retained. Smaller tree at northern edge of group has dieback and should be removed.
Group 4	Leyland cypress	11 - largest	young	2.5	ground level	ground level	5 - tallest.	Good	20>	C 2	Remove to allow development.	Fairly recently established trees that would be improved by regular containment works (if retained). Centre tree has a distorted main stem and excessive resin exudation. Grow close to boundary wall.
20	Beech	56	mature	6.5 north 6 east 8 south 5.5 west	3 south west	3	13	Good	20>	B 2 (est.)	No action - in neighbouring ownership.	One of a row of the species which is situated close to a brick garage. Two main stems arise at around 6 metres with branching below. Not fully inspected.
21	Holly	16 & 18	mature	4 north 3 east 3 south 4 west	1.5 west	1	5.5	Fair	20>	C 2 (est.)	No action - in neighbouring ownership.	Group tree with two main stems at close to ground level. Suppressed to the south east. Slightly reduced vigour. Not fully inspected.

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22	Sycamore	32 & 10	middle aged	4.5 north 4.5 east 3.5 south 5.5 west	0.4 south west	2.8	11.5	Poor	10>	C 2 (est.)	No action - in neighbouring ownership.	Group tree with a large low secondary stem to the south west. Suppressed to the south west. Pruning stubs in lower crown to the north. Large area of diseased bark on lower main stem to the north. Potentially weak main stem union at 2 metres from ground level. Not fully inspected.
23	Lombardy poplar	100	mature	6.5	3.8	3.8	18	Good	20>	B 2 (est.)	No action - in neighbouring ownership.	Large tree growing as one of a pair of the species in neighbouring land. Heavily reduced / pollarded in the distant past with its regrowth subsequently reduced. Not fully inspected.
24	Cherry	16 (est.)	young	3 north 3.5 east 4 south 4.5 west	2.6 north	2.4	7.5	Good	10>	C 2 (est.)	Prune western growth back to approximate boundary line - retaining a natural appearance.	Distorted lower stem with a constricting stake and tie still attached. Suppressed to the east with a subsequent incline to the west and over subject property. Not fully inspected.
25	Cherry	10	young	1.5 north 2 east 2.5 south 1.5 west	2 north west	1.8	5.5	Good	20>	C 2	No action.	Well established but planted close to a beech tree to the north west and partially suppressed as a result.

Notes: Diameter at 1.5 metres refers to trunk diameter. Categories are as defined in BS 5837 (2012) - **A = High quality - B = Moderate quality - C = Low quality - U = Less than 10 years life expectancy - poor quality.** Crown height clearance / height to first branch = from ground level - Estimated remaining contribution = probable life expectancy as assessed at time of inspection. All measurements are approximate.

No.	Species	Diameter @ 1.5 m (cm)	Age Class	Crown radius (m)	Height to 1st branch (m)	Crown height (m)	Height (m)	Condition / vitality	Estimated remaining contribution (years)	Category	Works	Notes.
26	Copper beech	55	middle aged	5.5 north 6 east 3.5 south 6 west	3.6 south	2.2	16.5	fair	10>	C 2	Undertake a more detailed inspection using minimally invasive decay detection equipment.	Crown forms at around 3.5 metres. Severely unbalanced due to previous suppression to the south. Grows close to boundary wall. Upper crown dieback. *Ganoderma* fruiting bodies at base to the north west indicate the presence of decay. Undertake a more detailed inspection in the not too distant future.
27	Holly	11	young	2.5	2.5 south	1.8	5.5	good	20>	C 2	Lightly crown lift over public footpath.	Self sown tree growing very close to boundary wall.
28	Holly	14	young	2.5	ground level	ground level	6.5	good	20>	C 2	Lightly crown lift over public footpath.	Forms part of joint canopy with previous tree.
29	Copper beech	61	middle aged	7 north 7.5 east 6 south 6.5 west	3.5 north	2.5	18	good	20>	B 2	Remove dead wood.	First main branch forms to the west at around 4 metres. Sinuous central main framework. Previously crown lifted. Grows close to boundary wall. Scattered dead wood and stubs.

Notes: Diameter at 1.5 metres refers to trunk diameter. Categories are as defined in BS 5837 (2012) - **A = High quality - B = Moderate quality - C = Low quality - U = Less than 10 years life expectancy - poor quality.** Crown height clearance / height to first branch = from ground level - Estimated remaining contribution = probable life expectancy as assessed at time of inspection. All measurements are approximate.

Appendix ‘b’
Tree Locations.

Notes

THIS SURVEY HAS BEEN PREPARED WITH A SCALING ACCURACY FOR A PLOT AT A SCALE OF 1/100

ALL LEVELS ARE IN METRES RELATED TO AN ORDNANCE DATUM LOCATED ON A BRICK WALL ON THE CORNER OF MANOR ROAD AND FERRY ROAD (value 5.83m).

THE CO-ORDINATE GRID IS RELATED TO NATIONAL GRID VALUES BY RESECTION USING ORDNANCE SURVEY DIGITAL DATA

ALL TREE HEIGHTS AND SPREADS ARE APPROXIMATE

WE HAVE TRIED TO IDENTIFY TREE TYPES, HOWEVER IF TREE SPECIES ARE CRITICAL SPECIALIST ADVICE SHOULD BE GAINED.

DRAINAGE PIPE SIZES HAVE BEEN MEASURED FROM THE SURFACE, CHAMBER ACCESS HAS NOT BEEN GAINED FOR SAFETY REASONS, THERFORE SIZES SHOULD BE REGARDED AS APPROXIMATE

bl bed level
cl cover level
il invert level
tl threshold level
utl unable to lift
wl water level

STATION	EASTINGS	NORTHINGS	LEVEL	TYPE
ST04	516608.998	171418.563	5.474	pin
ST05	516620.414	171429.757	5.195	pin
ST10	516599.689	171427.794	5.384	peg
ST12	516612.719	171438.953	5.169	hilti
ST13	516612.856	171417.497	5.399	pin
ST14	516582.890	171386.669	5.257	pin
ST15	516562.414	171375.904	5.287	pin
ST16	516547.308	171398.696	5.303	pin
ST17	516625.603	171418.702	5.248	hilti
ST18	516611.781	171402.125	5.332	pin

MANOR ROAD

No's 4 -6 (flats 1 to 8)

No 3, FERRY ROAD

No 9, FERRY ROAD

No 11, FERRY ROAD

No 13, FERRY ROAD

No 15, FERRY ROAD

No 17, FERRY ROAD

No 1 brick building

No 2 brick building

GRID NORTH

A
B
C
U

Tree Categories.

T.10 (Removed as per Local Authority Ref: 14/T0161/TCA).

R1:– SURVEY UPDATED 9/10/2013
R2:– DRAWING UPDATED 25/10/2013

job
No.2 MANOR ROAD
TEDDINGTON
TW11 8BG

client
Mr K. M. Symes

title	dwg no.
LAND SURVEY	16907A/1–R2
scale: 1/100	date: 26/10/06

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A member of The Survey Association

Appendix ‘c’
Recommended Root Protection Areas

Clive Fowler Associates : Recommended Root Protection Areas (Radius) at 4 & 6 Manor Road, Teddington, Middlesex.

Tree No	Species	Recommended Distances for Root Protective Areas (Metres).	Comments.
1	Common lime	4.25	Situated away from development area.
2	Hornbeam	1.5	Protect with a combination of fencing and ground protection as detailed in figure 3 and Section 6.2.3 of BS5837: 2012 (including the retention of the existing hard surfacing - reinforced if necessary).
3	Hornbeam	2.5	As previous.
4	Hornbeam	2	As previous.
5	Hornbeam	2	As previous.
6	Hornbeam	2.75	As previous.
7	Hornbeam	2	As previous.
8	Hornbeam	2.5	Tree to be professionally relocated towards the east - to allow the development to proceed.
9	Sycamore	8	Install new footpath surfacing upon existing hard surfacing at the landscaping stage in full accordance with Section 7.4 of the above Standard and Arboricultural Practice Note 12 - 'Through the Trees to Development'. Construct new cycle & bin stores using specialist foundations as detailed in Section 7.5 of BS5837:2012.
10	Eucalyptus	n/a	Removed - consent received from the Local Authority (Ref: 14/T0161/TCA).
Group 1	Fastigiate oaks x 15	1.25	Careful installation of new boundary treatment required in accordance with Section 7.2 of BS5837: 2012.
11	Lawson cypress	1.75	
Group 2	Leyland cypress x 4	n/a	Remove - poor form / inappropriate for location.
12	Lawson cypress	2.25	Low quality tree.
13	Silver birch	3.5	
14	Silver birch	2.75	
15	Silver birch	3.25	
16	Silver birch	3.5	
17	Ash	4.25	
18	Portugal laurel	3.25	Low quality shrub.
19	Portugal laurel	3	As previous.
Group 3	Leyland cypress	n/a	Remove to allow development.

Note 1. Root Protection Area Radii are shown in ¼ metre graduations. Note 2. It should be emphasised that the above relates to the distance from the centre of the tree to protective fencing.
Note 3. With appropriate precautions, temporary site works can occur within the protected area, e.g. for access for scaffolding (see BS 5837 - 2012).
Note 4. N/a = not applicable.

Clive Fowler Associates : Recommended Root Protection Areas (Radius) at 4 & 6 Manor Road, Teddington, Middlesex.

Tree No	Species	Recommended Distances for Root Protective Areas (Metres).	Comments.
Group 4	Leyland cypress	n/a	Remove to allow development.
20	Beech	6.75	Located away from development area.
21	Holly	3	
22	Sycamore	4	
23	Lombardy poplar	12	
24	Cherry	2	
25	Cherry	1.25	Tree located away from development area.
26	Copper beech	6.75	As previous.
27	Holly	1.5	As previous.
28	Holly	1.75	As previous.
29	Beech	7.5	As previous.

Note 1. Root Protection Area Radii are shown in ¼ metre graduations. Note 2. It should be emphasised that the above relates to the distance from the centre of the tree to protective fencing.
Note 3. With appropriate precautions, temporary site works can occur within the protected area, e.g. for access for scaffolding (see BS 5837 - 2012).
Note 4. N/a = not applicable.

Appendix ‘d’
Extracts from BS5837: 2012

Extracts from BS5837: 2012.

6.2 Barriers and ground protection

6.2.1 General

6.2.1.1 All trees that are being retained on site should be protected by barriers and/or ground protection (see **5.5**) before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers should be erected to create a construction exclusion zone. Where, due to site constraints, construction activity cannot be fully or permanently excluded in this manner from all or part of a tree's RPA, appropriate ground protection should be installed (see **6.2.3**).

6.2.1.2 Areas of retained structural planting, or designated for new structural planting, should be similarly protected, based on the extent of the soft landscaping shown on the approved drawings.

6.2.1.3 The protected area should be regarded as sacrosanct, and, once installed, barriers and ground protection should not be removed or altered without prior recommendation by the project arboriculturist and, where necessary, approval from the local planning authority.

6.2.1.4 Where required, pre-development tree work may be undertaken before the installation of tree protection measures, with the agreement of the project arboriculturist or local planning authority if appropriate (see also **8.8.1**).

6.2.1.5 It should be confirmed by the project arboriculturist that the barriers and ground protection have been correctly set out on site, prior to the commencement of any other operations.

6.2.2 Barriers

6.2.2.1 Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). Barriers should be maintained to ensure that they remain rigid and complete.

6.2.2.2 The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated in Figure 2. The vertical tubes should be spaced at a maximum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.

6.2.2.3 Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification should be prepared by the project arboriculturist and, where relevant, agreed with the local planning authority. For example, 2 m tall welded mesh panels on rubber or concrete feet might provide an adequate level of protection from cars, vans, pedestrians and manually operated plant. In such cases, the fence panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the

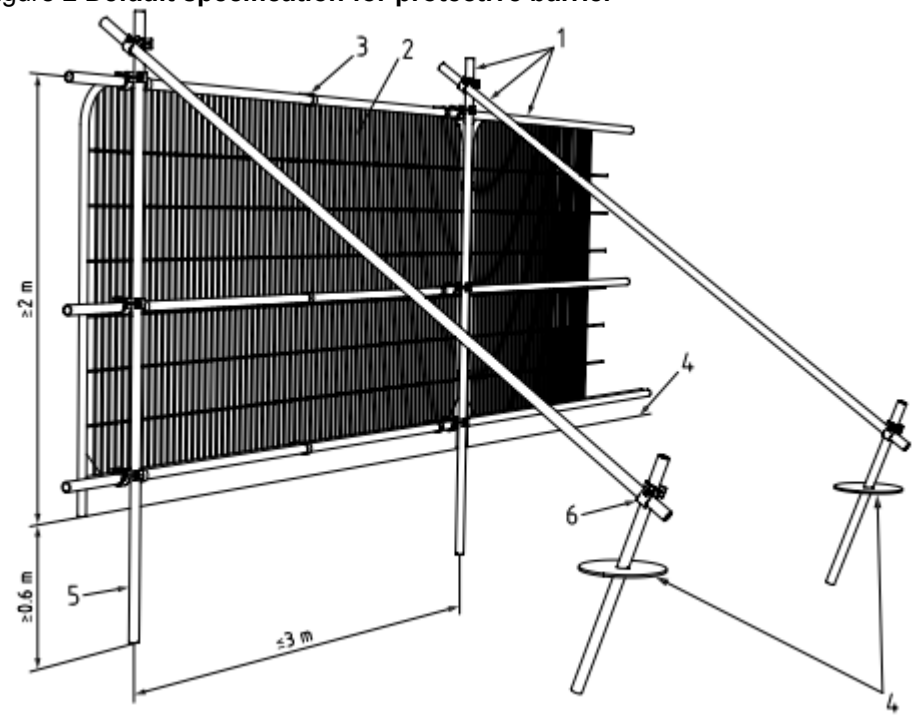
fence. The distance between the fence couplers should be at least 1 m and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (Figure 3a). Where the fencing is to be erected on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabilizer struts should be mounted on a block tray (Figure 3b).

NOTE 1 Examples of configurations for steel mesh perimeter fencing systems are given in BS 1722-18.

NOTE 2 It might be feasible on some sites to use temporary site office buildings as components of the tree protection barriers, provided these can be installed and removed without damaging the retained trees or their rooting environment.

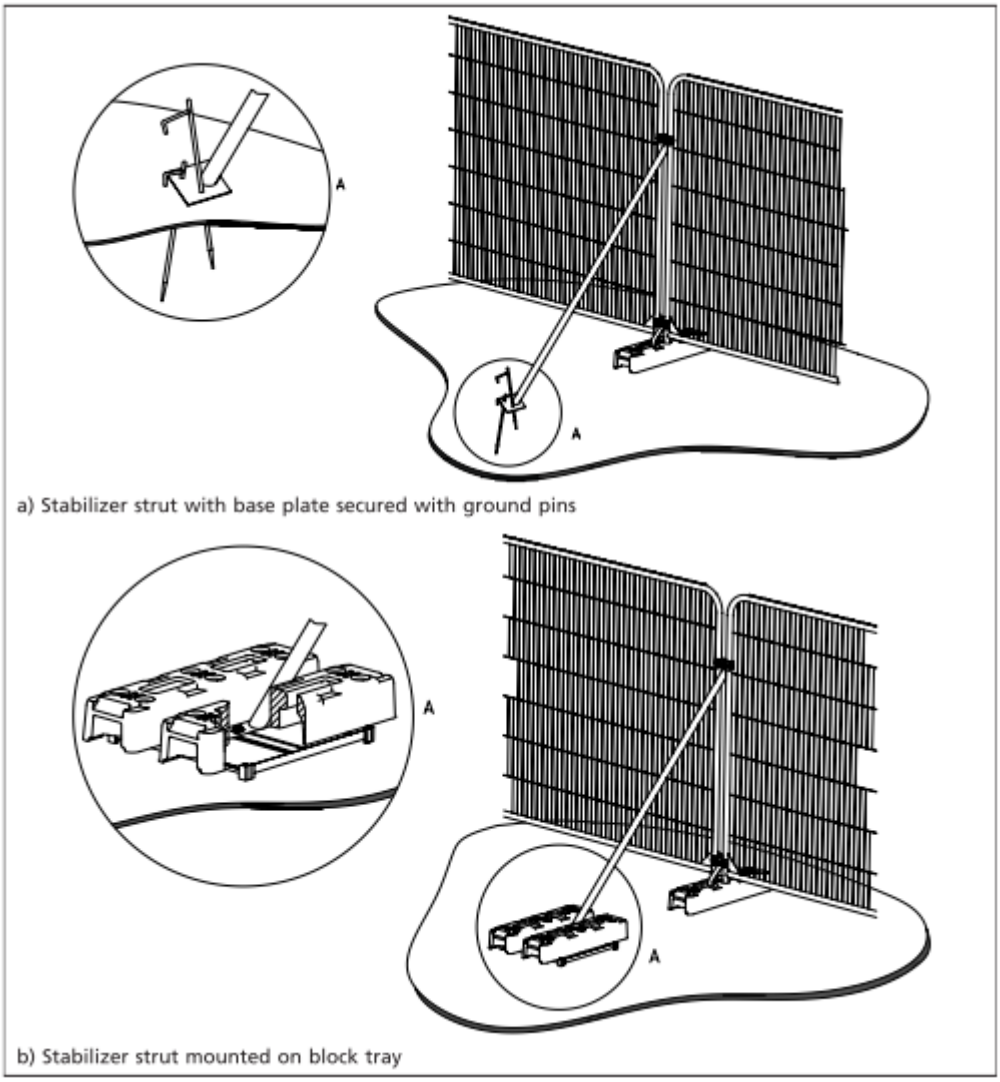
6.2.2.4 All-weather notices should be attached to the barrier with words such as: "CONSTRUCTION EXCLUSION ZONE – NO ACCESS".

Figure 2 **Default specification for protective barrier**



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 **Examples of above-ground stabilizing systems**



6.2.3 Ground protection during demolition and construction

6.2.3.1 Where construction working space or temporary construction access is justified within the RPA, this should be facilitated by a set-back in the alignment of the tree protection barrier. In such areas, suitable existing hard surfacing that is not proposed for re-use as part of the finished design should be retained to act as temporary ground protection during construction, rather than being removed during demolition. The suitability of such surfacing for this purpose should be evaluated by the project arboriculturist and an engineer as appropriate.

6.2.3.2 Where the set-back of the tree protection barrier would expose unmade ground to construction damage, new temporary ground protection should be installed as part of the implementation of physical tree protection measures prior to work starting on site.

6.2.3.3 New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.

NOTE The ground protection might comprise one of the following:

a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;

b) for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;

c) for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

6.2.3.4 The locations of and design for temporary ground protection should be shown on the tree protection plan and detailed within the arboricultural method statement (see **6.1**).

6.2.3.5 In all cases, the objective should be to avoid compaction of the soil, which can arise from the single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain unimpaired.

Appendix ‘e’
Table 1 from BS5837: 2012

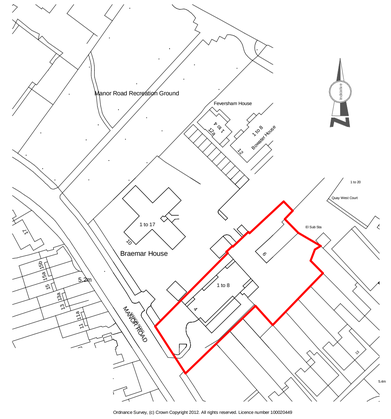
Table 1 **Cascade chart for tree quality assessment**

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see **4.5.7**.*			See Table 2
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

Appendix 'f'
Tree Protection Plan.

Do not scale from this drawing

1 Roof and Context Plan
1 : 200



2 Site Location Plan
1 : 1250

Site Areas (Approx)		
Number	Area m²	Area ft²
Site Area - 4 Manor Road	895 m²	9634 ft²
Site Area - 6 manor road	993 m²	10692 ft²
Site Area - Driveway	77 m²	830 ft²
	1965 m²	21155 ft²

indicated@A1

Scale Bar

5 meters 20 meters

PLANNING

Rev	Description	Issued	Dwn	Chk

Client
Lulworth Homes

Project
4 + 6 Manor Road
Teddington
TW11 8BG

Drawing
Site and Context Plan

Scale	Date	Drawn	Checked
As indicated@A1	Aug '15	AWS	IF

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4707	3	50	Rev. No.

Tree Protection Plan.
Originally produced in colour.
January 2016.