Landmark Trees

**ARBORICULTURAL IMPACT ASSESSMENT REPORT:**

The Waterhouse,
Millfield Lane,
London
N6 6HT

**REPORT PREPARED FOR:**

SHH architects + interiors + design consultants,
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**REPORT PREPARED BY**

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**Ref:** SHH/WHS/AIA/01 Rev C

**Date:** 30th June 2011

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**Caveats**

This report is primarily an arboricultural report. Whilst comments relating to matters involving built structures or soil data may appear, any opinion thus expressed should be viewed as qualified, and confirmation from an appropriately qualified professional sought. Such points are usually clearly identified within the body of the report.

It is not a full safety survey or subsidence risk assessment survey. These services can be provided but a further fee would be payable. Where matters of tree condition with a safety implication are noted during an inspection they will of course appear in the report.
Inherent in tree inspection is assessment of the risk associated with trees close to people and their property. Most human activities involve a degree of risk, such risks being commonly accepted if the associated benefits are perceived to be commensurate.

Risks associated with trees tend to increase with the age of the trees concerned, but so do many of the benefits. It will be appreciated, and deemed to be accepted by the client, that the formulation of recommendations for all management of trees will be guided by the cost-benefit analysis (in terms of amenity), of tree work that would remove all risk of tree related damage.

Prior to the commencement of any tree works, an ecological assessment of specific trees may be required to ascertain whether protected species (e.g. bats, badgers and invertebrates etc) may be affected.

## Tree Constraints & Protection Overview

| **Client:** | SHH | **Case Ref:** | SHH/WHS/ AIA/01 C |
|---|---|---|---|
| **Local Authority:** | LB Camden | **Date:** | 30/6/11 |

Site Address: The Waterhouse, Millfield Lane, London, N6 6HT

Proposal: demolition of existing house and replacement with a new contemporary home of 1-2 storeys.

| **Report Checklist** | **Y/N** | | **Y/N** |
|---|---|---|---|
| Arboricultural constraints on site | Y | Trees removed | N |
| Tree Survey | Y | Topographical Survey | Y |
| BS5837 Report | Y | Conservation Area | Y |
| Tree Preservation Orders | ? | | |
| Tree Protection Plan: | N/a | (include In future method statement) | |
| Tree Constraints Plan: | Y | | |
| Arboricultural Impact Assessment: | Y | | |

**Site Layout**

| Site Visit | Y | Date: 4/11/10 | Access Full/Partial/None | F |
|---|---|---|---|---|
| Trees on Site | Y | | Off site Trees | Y |
| Trees affected by development | Y | | O/s trees affected by development | Y |
| Tree replacement proposed | Y | | On or off-site trees indirectly affected by development | Y |

**Trees with the potential to be affected**

Removal of trees 10a, 12 and 20 (all C category)

Encroachment of trees 1, 5, 11, 15, 17,18 & G21 by the proposed footprint and additional landscaping. Most impacts are <10% of RPA, excepting trees 1 & 15 at 13% & 26%, respectively. Half the impact to T15 will be no-dig construction.

**Comments**

Impacts are rated low and can be further mitigated through planting and constructional variation.

**Recommendations**

| | | |
|---|---|---|
| 1 | Proposal will mean the loss of important trees (TPO/CA) | N |
| 2 | Proposal has sufficient amelioration for tree loss | Y |
| 3 | Proposals provide adequate tree protection measures | Y |
| 4 | Proposal will mean retained trees are too close to buildings | N |
| 5 | Specialist demolition / construction techniques required | Y |
| 6 | The Proposal will result in significant root damage to retained trees | N |
| 7 | Further investigation of tree condition recommended | Y |

RPA= Root Protection Area
TPP= Tree Protection Plan
AMS= Arboricultural Method Statement
AIA = Arboricultural Implication Assessment
BS5837: 2005 'Trees in relation to construction – recommendations'

## 1. SUMMARY


1.1 This report comprises an arboricultural impact assessment of the proposals for The Waterhouse, Millfield Lane, London, N6 6HT, reviewing any conflicts between the proposals and material tree constraints identified in our survey. This revision (C) extends the survey to include off-site trees along the eastern boundary. These six extra trees are unaffected by the proposals.

1.2 There are 28 surveyed trees on or near the site of which one, T5 is category 'A' (High Quality). There are seven 'B' category (Moderate Quality) trees: 11, 15, 17 & 18, and the remaining nineteen trees are 'C' category (Low Quality), excepting one poor quality ('R' category) tree i.e. 19. In general, the proposals have taken into account and preserve, the existing tree population, removing three C category trees only.

1.3 The principal primary impacts in the current proposals are the removal of trees 10a, 12 and 20. The removal of all these trees is sustainable, given their low quality and value. Further impacts to retained trees comprise the encroachments of trees 1, 5, 11, 15, 17 and 18 by the proposed footprint and additional landscaping. Most are <10% of RPA and rate very low impact, excepting trees 1 & 15 at 13% & 26% RPA, respectively. Tree 13 is a C category mulberry, which could simply be removed, but is preferred for retention. T15 is a B category birch, and although the impacts exceed 20%, they are of low intensity 13% no-dig paving and 13% out-building extension.

1.4 Secondary impacts due to the proposed footprint require pruning to facilitate construction and maintain convenient canopy clearance: the overhanging canopy of neighbouring beech tree 18 will require a 1-2m lift to clear the single-storey cinema elevation, as will onsite sycamore tree 11 and selective birch trees within G21 & T11. Tree 1 mulberry will be crown reduced by 30%. These works can be achieved without significant injury to the trees.

1.5 Tree losses can be mitigated with new landscape proposals. Subject to the effect of site levels (on e.g. tree 18), it should be possible to mitigate the RPA encroachments with low-invasive foundation / no-dig designs. Alternatively, the foundation lines will need to be trial excavated under arboricultural supervision and the roots hand-pruned, subject to size and significance.

1.6 Thus, with suitable mitigation and supervision the scheme is viable.

## 2. INTRODUCTION

2.1 Terms of reference

2.1.1 LANDMARK TREES were asked by SHH Architects, to undertake an arboricultural planning survey of the site: 25 Grange Avenue, London N20 8AA. The report is to accompany a planning application. This revision (C) extends the survey to include off-site trees along the eastern boundary.

2.1.2 The proposals are for the demolition of existing house and replacement with a new contemporary home of 1-2 storeys. This report will assess the impact on the trees and their constraints, identified in our survey. Although the proposals were known at the time of the survey, Landmark Trees endeavour to survey each site blind, working from a topographical survey, wherever possible, with the constraints plan informing their evolution.

2.1.3 I am a Registered Consultant and Fellow of the Arboricultural Association and a Chartered Forester, with a Masters Degree in Arboriculture and 20 years experience of the landscape industry - including the Forestry Commission and Agricultural Development and Advisory Service. I am a UK Registered Expert Witness, trained in single joint expert witness duties. I am also Chairman of the UK & I Regional Plant Appraisal Committee, inaugurated to promote international standards of valuation in arboriculture.

2.2 Drawings supplied

2.2.1 The drawings supplied by the client and relied upon by Landmark Trees in the formulation of our survey plans are:
Topographical survey – 633(SK)001 (A) Existing Site Plan *
Proposed ground floor – 633-Waterhouse-110512-Proposed Site Plan

*In the absence of a full topographical survey, tree positions may be approximate only.

## 2.3 Scope of survey

2.3.1 As Landmark Trees' arboricultural consultant, James Bell surveyed the trees on site on 4th November 2010, recording relevant qualitative data in order to assess both their suitability for retention and their constraints upon the site, in accordance with British Standard 5837:2005 Trees in relation to construction – Recommendations [BS5837]. The additional 6 off-site trees were surveyed by remote survey only (peering over 3m fence and estimating size and location) on 16th June 2011.

2.3.2 Our survey of the trees, the soils and any other factors, is of a preliminary nature. The trees were inspected on the basis of the Visual Tree Assessment method expounded by Mattheck and Breloer (The Body Language of Trees, DoE booklet Research for Amenity Trees No. 4, 1994). I have not taken any samples for analysis and the trees were not climbed, but inspected from ground level.

2.3.3 The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.

## 2.4 Survey data & report layout

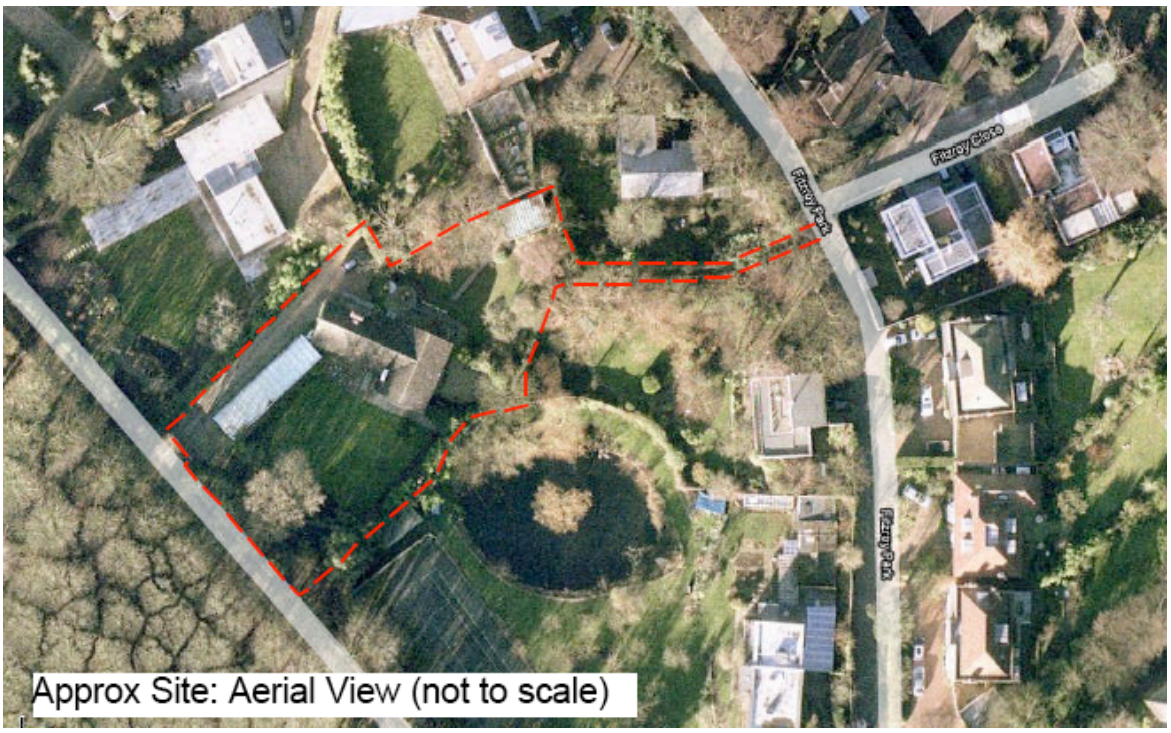
2.4.1 Detailed records of individual trees are given in the survey schedule in Appendix 1 to this report.

2.4.2 A site plan identifying the surveyed trees, based on the client's drawings / topographical survey is provided in Appendix 4.

2.4.3 This plan also serves as the Tree Constraints Plan with the theoretical Recommended Protection Areas (RPA's), tree canopies and shade constraints, (from BS5837: 2005) overlain onto it. These constraints are then overlain in turn onto the client's proposals to create an Arboricultural Impact Assessment Plan in Appendix 5. General observations and discussion follow, below.

## 3.0 OBSERVATIONS

3.1 Site description




3.1.1 The site is a spacious detached residential property of contemporary design that stands on the eastern side of Millfield Lane between that road and Fitzroy Park on the eastern edge of Hampstead Heath. The property stands within gardens largely laid down to grass to front and rear. The most significant tree on site is a prominent oak that stands near the front (western) boundary of the property and the crown of this tree is contiguous with boundary trees, which themselves form part of the wooded edge on the eastern banks of Kenwood Ladies Pond. The adjoining network of gardens and woodland provides an exceptional degree of tranquility and greenery. The site slopes markedly from east to west.

3.1.3 In terms of the Soil Survey of England and Wales, the soil lies within the unsurveyed area of Greater London where the soils are generally, highly shrinkable clay. Such soils are prone to compaction during development. A structural engineer may be able to advise further on the local geology and its implications for development.

## 3.2 Subject trees

3.2.1 Of the 28 surveyed trees on or near the site, only one, T5 is category 'A' (High Quality). There are seven 'B' category (Moderate Quality) trees: 11, 15, 17 & 18, and the remaining nineteen trees are 'C' category (Low Quality), excepting one poor quality ('R' category) tree i.e. 19.

3.2.2 In terms of age demographics the majority of surveyed trees are mature with some early mature trees also present. There are few young or semi mature trees present on site.

3.2.3 Surveyed trees are predominantly present to front (west) and rear (east) of the existing property, growing nearer the boundaries of the site around areas of lawn or pond. The frontage of the site is dominated by the prominent, post mature English oak (T5), which is the feature tree on site. This tree stands with ash, hawthorn, horse chestnut, willow and eucalyptus, and this screen is contiguous with the woodland edge to the east of Kenwood Ladies Pond on the western side of Millfield Lane. The eastern garden contains several mature trees including a prominent sycamore (T11), silver birch (T15) and hornbeam (T17).

3.2.4 Significant amenity value is conferred to the site by the prominent English oak (T5), which is a fine specimen, although it should be noted that observed defects will require ongoing monitoring and consideration of appropriate management options. Substantial amenity is also provided by trees 11, 15 & 17 predominantly although other surveyed trees do contribute usefully to the garden. The following sections provide detail on selected, surveyed trees:

3.2.5 Tree 1 is an early mature black mulberry that has a poor form with decay present in the trunk. The tree contributes functionally to the lawn edge area but is of limited quality and value.

3.2.6 Trees 2, 3 ,4, 6 & 7 form the boundary screen of the front garden with Millfield Lane. These are mixed broadleaves of again indifferent individual quality and value.

3.2.7 Tree 5 is an imposing post-mature 20m tall English oak with an average crown spread of 8/9m and a stem diameter at 1.5m of 129cm. The tree has marked defects with a large cavity at the base and clear areas of decay present in the trunk. The crown of the tree is vigorous and no obvious major dieback is evident. On the basis of the noted decay, consideration should be given to the size of the crown and for a crown reduction to reduce the possibility of large crown branches failing from regions of decay in the main trunk.

3.2.8 Trees 8 & 9 are two early mature eucalypts that have now reached a height of circa 20m. The trees have a safe useful life expectancy of greater than 20 years but do not sit comfortably with the overarching native woodland surroundings.

3.2.9 Tree 11 is an early mature 15m tall multi-stemmed sycamore with a balanced 6m-crown spread radius. The tree is prominent in the southern corner of the site and merits a 'B' category.

3.2.10 Trees 15 & 17, a birch and hornbeam are prominent in the eastern (rear) garden standing near the outhouse. These are mature trees of moderate quality and value with safe useful life expectancies of greater than twenty years. Both have no obvious major defects and been given 'B' categories.

3.2.11 Tree 18 is a common beech that stands in the adjoining garden. The southwestern crown of this tree extends 6m over the rear garden of The Waterhouse. No close examination of the base of the tree was possible and it has been given a 'B' category subject to further investigation if deemed necessary.

3.2.12 Off-site trees along the eastern boundary are mostly semi-mature willows, which are generally considered robust trees.

## 3.3 Planning Status

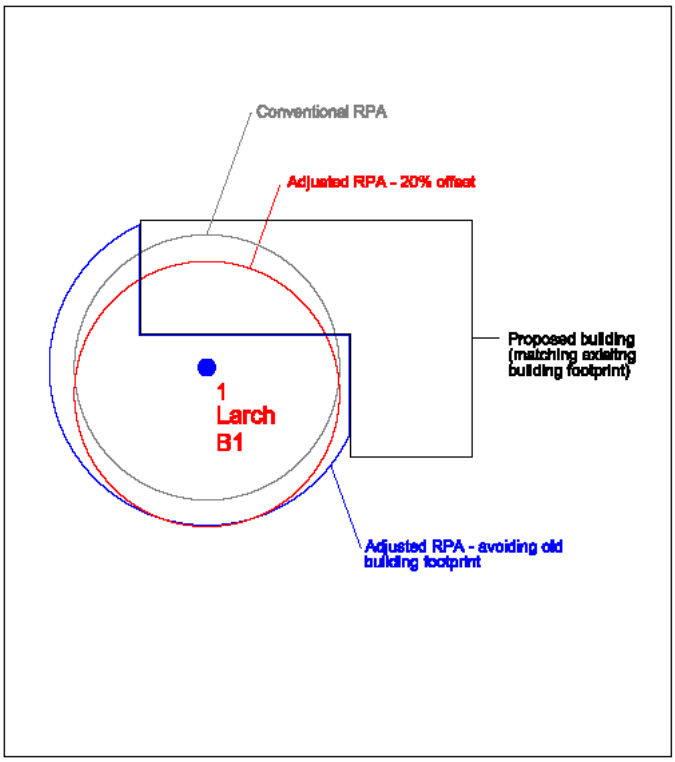
3.3.1 We are not aware of the existence of any Tree Preservation Orders, but understand the site to stand within the Highgate Conservation Area, which will affect trees on the site. It is a criminal offence to damage such trees without permission from the local authority.

## 4.0 DEVELOPMENT CONSTRAINTS

4.1 Primary constraints

4.1.1 BS5837: 2005 gives Recommended Protection Areas (RPA's) for any given tree size. The individual RPA's are calculated in the Tree Schedule in Appendix 1 to this report, or rather the notional radius of that RPA, based on a circular protection zone. The prescribed radius is generally 12-x stem diameter at 1.5m above ground level, except where basal diameters are used in the case of multi-stemmed trees, and the radius is set at 10x the diameter.

**4.1.2** Circular RPA's are appropriate for individual specimen trees grown freely such as these, but where there is ground disturbance, the morphology of the RPA can be modified to an alternative polygon, and where appropriate shifted 20% in the direction of undisturbed ground, as shown in the diagram below. In less fanciful terms, one needs to remember that RPA's are area-based and not linear. **No modifications have been made in this instance.**



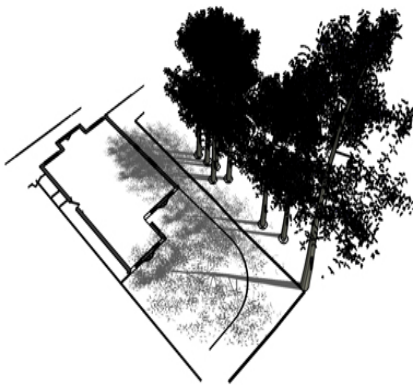
4.1.3 R Category trees are discounted from the process. Category-C trees would not normally constrain development individually, unless they provide some external screening function. As discrete, internal trees, their removal will not affect the wooded envelope that encloses much of the site.

4.1.4 "Care should be exercised over misplaced tree preservation. Attempts to retain too many or unsuitable trees on a site are liable to result in excessive pressure on the trees during development work and subsequent demands for their removal. The end result is usually fewer and less suitable trees than would be the case if proper planning, selection and conservation had been applied from the outset." (BS5837: 2005).

4.1.5 In this instance, there are no internal site trees and therefore few significant primary constraints upon development, provided it will not be necessary to build right up to the boundaries. The root protections areas of significant trees such as T5, T11, T15 & T17 should be observed (or any significant, proposed encroachment appropriately mitigated) through the course of development and that adequate crown separation be allowed between significant trees and any proposals. The additional six off-site trees will not constrain development.

## 4.2 Secondary Constraints

4.2.1 The second type of constraint produced by trees that are to be retained is that the proximity of the proposed development to the trees should not threaten their future with ever increasing demands for tree surgery or felling to remove nuisance shading, honeydew deposition or perceived risk of harm.



4.2.3 The shading constraints are crudely determined from BS5837 by drawing an arc from northwest to east of the stem base at a distance equal to the height of the tree, as shown in the diagram opposite. Shade is less of a constraint on non-residential developments, particularly where rooms are only ever temporarily occupied. This arc represents the effects that a tree will have on layout through shade, based on shadow patterns of 1x tree height for a period May to Sept inclusive 10.00-18.00 hrs daily.

4.2.4 Secondary constraint would be shading on to the site from trees along the south and west boundaries. It appears likely that any shading is unlikely to be substantively more than exists now. General building-canopy juxtaposition may be an issue.

*Note: Sections 5 & 6 will now assess the impacts upon constraints identified in Section 4. Table 1 in Section 5 presents the impacts in tabular form (drawing upon survey data presented in Appendices 1 & 2). Impacts are presented in terms of whole tree removal and the effect on the landscape or partial encroachment (% of RPA) and its effect on individual tree health. Section 6 discusses the table data, elaborating upon the impacts' significance and mitigation.*

# 5.0 Table 1: Arboricultural Impact Assessment for Retained Trees

Hide irrelevant | Show All Trees

(Impacts assessed prior to mitigation and rated with reference to From Matheny & Cark (1998))

| B.S. Cat. | Tree No. | Species | Impact | Tree / RPA Affected | Age | Growth Vitality | Species Tolerance | Impact on Tree Rating | Impact on Site Rating | Mitigation |
|---|---|---|---|---|---|---|---|---|---|---|
| C | 1 | Mulberry, Black | New building: 5.5m2 of which 0.5m2 is existing building<br><br>Demolition: 2.5m2<br>New building within canopy | 5 $m^2$<br>12.99 % | Early Mature | Normal | Moderate | Low | N/A | Low-invasive foundations<br>Controlled demolition<br><br>Remedial tree surgery (see Rec. Works) |
| A | 5 | Oak, English | New building: 71m2 of which 25m2 is existing building<br><br>Extension to drive: 4.5m2<br>Drive resurfacing: 25m2 | 51 $m^2$<br>6.77 % | Post-Mature | Normal | Moderate | Low | N/A | Low-invasive foundation design<br><br>No-dig construction |
| C | 10a | Laurel, Portugese | Felled to Facilitate Development | $m^2$<br>N/A % | Early Mature | Normal | N/A | N/A | Very Low | New planting / landscaping |
| B | 11 | Sycamore | New building: 15m2<br><br>New building adjoining canopy | 20 $m^2$<br>7.86 % | Early Mature | Normal | Moderate | Very Low | N/A | Low-invasive foundation design<br><br>Remedial tree surgery (see Rec. Works) |
| C | 12 | Apple, Cultivated | Felled to Facilitate Development | $m^2$<br>N/A % | Mature | Normal | N/A | N/A | Very Low | New planting / landscaping |
| C | 13 | Hawthorn, Common | New hard standing: 3.5m2 | 3.5 $m^2$<br>7.32 % | Mature | Moderate | Good | Very Low | N/A | No-dig construction |

# 5.0 Table 1: Arboricultural Impact Assessment for Retained Trees

Hide irrelevant | Show All Trees

(Impacts assessed prior to mitigation and rated with reference to From Matheny & Cark (1998))

| B.S. Cat. | Tree No. | Species | Impact | Tree / RPA Affected | Age | Growth Vitality | Species Tolerance | Impact on Tree Rating | Impact on Site Rating | Mitigation |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 15 | Birch, Silver | Extension to outbuilding: 11.5m2<br><br>New hard standing: 11m2 | 22.5 $m^2$<br>25.69 % | Mature | Normal | Poor | Medium | N/A | Low-invasive foundation design<br><br>No-dig construction |
| B | 17 | Hornbeam | Extension to outbuilding: 18m2<br><br>New hard standing: 4.5m2 | 22.5 $m^2$<br>12.14 % | Mature | Normal | Moderate | Low | N/A | Low-invasive foundation design<br><br>No-dig construction |
| B | 18 | Beech, Common | New building: 5.5m2<br><br>New path to side of building | 5.5 $m^2$<br>7.6 % | Early Mature | Normal | Poor | Low | N/A | Low-invasive foundation design, if possible<br><br>No-dig construction |
| C | 20 | Magnolia (M. X soulangiana) | Felled to Facilitate Development | $m^2$<br>N/A % | Semi-mature | Normal | N/A | N/A | Low | New planting / landscaping |
| C | G21 | Birch, Himalayan | Garage Construction within Canopy of 1-3 trees | $m^2$<br>N/A % | Semi-mature | Normal | N/A | N/A | Very Low | Remedial tree surgery (see Rec. Works)<br><br>(Could be relocated) |

## 6.0 DISCUSSION

6.1 Rating of Primary Impacts

6.1.1 The principal primary impacts in the current proposals are the removal of trees 10a, 12 and 20. The removal of all these trees is sustainable, given their low quality and value.

6.1.2 Further impacts to retained trees comprise the encroachments of trees 1, 5, 11, 15, 17 and 18 by the proposed footprint and additional landscaping. Most are <10% of RPA and rate very low impact, excepting trees 1 & 15 at 13% & 26% RPA, respectively. Tree 13 is a C category mulberry, which could simply be removed, but is preferred for retention. T15 is a B category birch, and although the impacts exceed 20%, they are of low intensity 13% no-dig paving and 13% out-building extension.

6.1.3 The six extra off-site trees along the eastern boundary (surveyed 2011) are unaffected by the proposals.

6.1.4 The principal of RPA encroachment is established within BS5837 and supported by the source document, National Joint Utilities Guidelines 10 / Vol. 4 1995 / 2010. NJUG introduced the x12 diameter *Precautionary Zone* for supervised working and *Prohibited Zone* at a universal 1m from the base of the tree. RPA's are frequently misinterpreted as *Root Prohibition Areas*.

6.1.5 An RPA encroachment of <20% of RPA may be considered as low impact, given the permissive references to 20% RPA relocation and impermeable paving within BS5837 and other published references to healthy trees tolerating up to 30-50% root severance (Coder, Helliwell and Watson in CEH 2006). The trees in question are relatively healthy specimens of species with a good resistance to development impacts, and quite capable of tolerating these low impacts

6.1.6 The condition of T5 requires further investigation to establish its stability, especially in the light of the proposed RPA impact.

## 6.2 Rating of Secondary impacts

6.2.1 Secondary impacts due to the proposed footprint require pruning to facilitate construction and maintain convenient canopy clearance: the overhanging canopy of neighbouring beech tree 18 will require a 1-2m lift to clear the single-storey cinema elevation, as will onsite sycamore tree 11 and selective birch trees within G21 & T11. Tree 1 mulberry will be crown reduced by 30%. These works can be achieved without significant injury to the trees.

## 6.3 Mitigation of Impacts

6.3.1 All plant and vehicles engaged in demolition works should either operate outside the RPA, or should run on a temporary surface designed to protect the underlying soil structure. The demolition of the building should proceed inwards in a "pull down" fashion. Hard surfacing can be lifted with caution by a skilled machine operator again working away from the tree.

6.3.2 The building encroachments will require the use of specialised foundation techniques, such as mini-piling or pad and raised beam (where levels permit). The foundation pits within the RPA should be trial-excavated by hand using a double-headed spade ("shove-holer") or similar to minimise breadth of hole required for inspection.

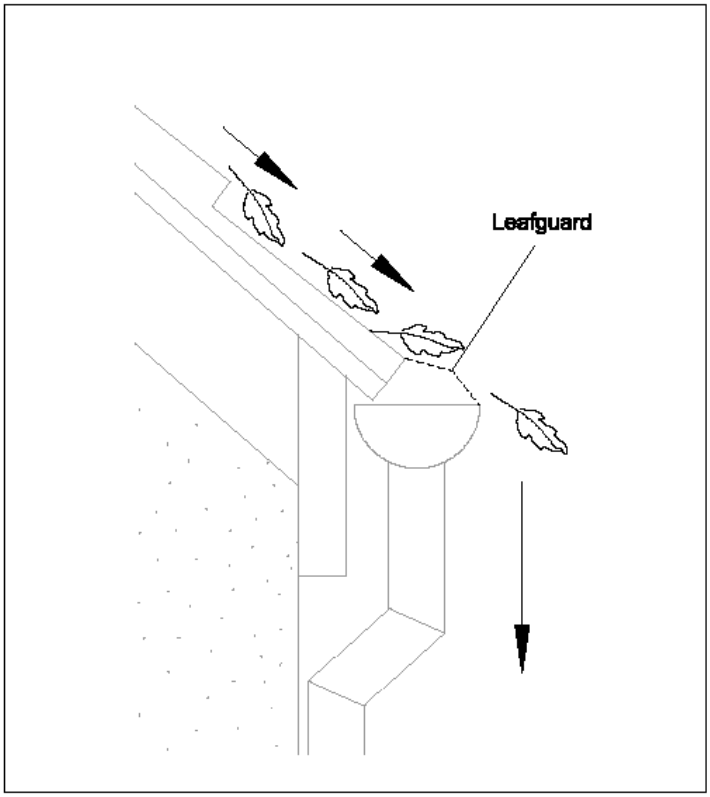
6.3.3 The paving encroachment will require a no-dig construction technique, using a cellular confinement system with no fines aggregate for the sub-base. The degree of encroachment (<20% of RPA) means that a permeable paving surface (e.g. gravel or block paving) is not required (but nonetheless, recommended here).

6.3.4 The finished section is likely to be c.150mm above grade, depending on final specification, which will need to be factored into the overall finished site levels. The cellular confinement system with a temporary hard surface (e.g. road stone) can be used for site access during construction and the surface material replaced on completion of construction.

6.3.5 The immediate canopy encroachments can be avoided with respective crown reduction and lift of relevant branches of the crowns of tree 1, 11, 15, 18 & G21 respectively, effecting 1-2m clearances.

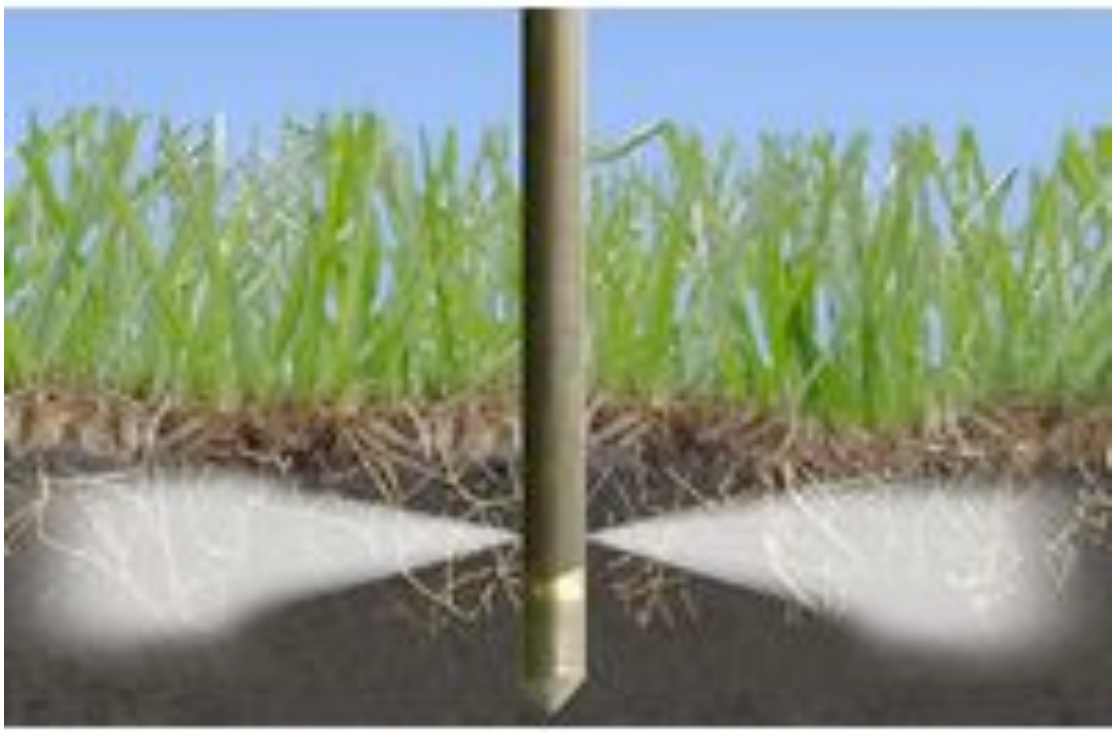
6.3.5 Nuisance deposition can be mitigated with regular crown cleaning and filtration traps on the guttering. Alternatively, a green roof construction might be considered.

6.3.4 The landscape impact of tree losses can be offset by the landscape proposals, ideally involving new planting of ornamental varieties of native species, and where appropriate with columnar or compact form. A selection of columnar tree species cultivars for constricted sites is provided in Appendix 3.




Filtration traps, as shown above, could be fitted on the gutters which can easily be maintained at 2-3m above ground.

6.3.4 The potential root damage from the construction impacts (foundations) can be partly mitigated by soil treatment and light pruning (crown cleaning). The former involves soil fertiliser injection / root inoculation and decompaction: a suitable low nitrate, low phosphorous fertilizer and mycorrhizal spores are introduced to the soil profile through compressed air injection. The spores are mixed with a stimulant, which helps them colonise the roots. A combination of these treatments can relieve the immediate effects of construction damage / disturbance and compaction, though long term environmental deficiencies should be addressed culturally. The case for short-term mitigation through fertiliser application and light pruning is more proven (CEH 2006) than that of the other treatments, which remain anecdotal. Soil injection is not necessarily more effective at delivering fertilizer than broadcast application, but becomes cost-effective where already recommended for decompaction treatments.



## 7.0 CONCLUSION

| | |
|---|---|
| 7.1 | The potential impacts of development are all relatively low in terms of both tree removals and RPA encroachments. |
| 7.2 | The full potential of the impacts can be largely mitigated through design and precautionary measures. These measures can be elaborated in Method Statements in the discharge of planning conditions. |
| 7.3 | The species affected are generally tolerant of root disturbance / crown reduction and the retained trees are generally in fair-good health and capable of sustaining these reduced impacts. |
| 7.4 | The trees that are recommended for felling are of little individual significance, such that their loss will not affect the visual character of the area |
| 7.5 | Therefore, the proposals will not have any significant impact on either the retained trees or wider landscape. |

## 8.0 RECOMMENDATIONS

### 8.1 Specific Recommendations

8.1.1 Tree works recommendations are found in Appendix 2 to this report, with a selection of columnar tree species cultivars for constricted sites provided in Appendix 3. Any tree removals recommended within this report should only be carried out with local authority consent.

8.1.2 It is strongly recommended that the decay within oak tree 5 is investigated further, to determine the status of the tree and its management requirements.

8.1.2 Excavation and construction impacts within the RPA's of trees identified in Table 1 above, will need to be controlled by method statements specifying mitigation methods suggested in para 6.3 above and by consultant supervision as necessary. These method statements can be provided as part of the discharge of conditions.

8.1.3 Replace felled trees with 3 x native rowans and 2 native pear trees pit-planted as 12-14 cm girth nursery stock under current best practice; i.e. conforming to and planted in accordance with the following:

- BS 3936:1980 Nursery Stock;
- BS 4043:1966 Transplanting Semi-Mature Trees; and
- BS 5236:1975 Cultivation and Planting of Trees in the Advanced Nursery Stock Category.
- All replacement stock should be planted and maintained as detailed in BS 4428:1989 (Section 7): Recommendations for General Landscape Operations.

## 8.2 General Recommendations

8.2.1 Any trees which are in close proximity to buildings proposed for demolishing should be protected with a Tree Protection Barrier (TPB). This TPB should comprise steel, mesh panels 2.2m in height ('Heras') and should be mounted on a scaffolding frame (shown in Fig 2 of BS5837). The position of the TPB can be shown on plan as part of the discharge of conditions, once the lay out is agreed with the planning authority. The TPB should be erected prior to commencement of works, remain in its original form on-site for the duration of works and removed only upon full completion of works.

8.2.2 A TPB may no longer be required during soft landscaping work but a full arboricultural assessment must be performed prior to the undertaking of any excavations within the RPA of a tree. This will inform a decision about the requirement of protection measures. It is important that all TPBs have permanent, weatherproof notices denying access to the RPA.

8.2.3 The use of heavy plant machinery for building demolition, removal of imported materials and grading of surfaces should take place in one operation. The necessary machinery should be located above the existing grade level and work away from any retained trees. This will ensure that any spoil is removed from the RPAs. It is vital that the original soil level is not lowered as this is likely to cause damage to the shallow root systems.

8.2.4 Any pruning works must be in accordance with British Standard 3998:2010 Tree work [BS3998].

8.2.5 Where sections of hard surfacing are proposed in close proximity to trees, it is recommended that "No-Dig" surfacing be employed in accordance with BS5837:2005 and 'The Principles of Arboricultural Practice: Note 1, Driveways Close to Trees, AAIS 1996 [APN1]'.

8.2.6 Where scaffolding installation is required within the RPA the provisions of Figure 3 of BS5837 with regard to ground protection must be employed.

8.2.7 If the RPA of a tree is encroached by underground service routes then BS5837 and NJUG Vo. 4 provisions should be employed. If it is deemed necessary, further arboricultural advice must be sought.

8.2.8 Numerous site activities are potentially damaging to trees e.g. parking, material storage, the use of plant machinery and all other sources of soil compaction. In operating plant, particular care is required to ensure that the operational arcs of excavation and lifting machinery, including their loads, do not physically damage trees when in use.

8.2.9 To enable the successful integration of the proposal with the retained trees, the following points will need to be taken into account:

1) Plan of underground services.
2) Schedule of tree protection measures, including the management of harmful substances.
3) Method statements for constructional variations regarding tree proximity (e.g. foundations, surfacing and scaffolding).
4) Site logistics plan to include storage, plant parking/stationing and materials handling.
5) Tree works: felling, required pruning and new planting. All works must be carried out by a competent arborist in accordance with BS3998.

6) Site supervision: the Site Agent must be nominated to be responsible for all arboricultural matters on site. This person must:

* be present on site for the majority of the time
* be aware of the arboricultural responsibilities
* have the authority to stop work that is causing, or may cause harm to any tree
* ensure all site operatives are aware of their responsibilities to the trees on site and the consequences of a failure to observe these responsibilities.
* make immediate contact with the local authority and/or a retained arboriculturalist in the event of any tree related problems occurring.

8.2.10 These points can be resolved and approved through consultation with the planning authority via their Arboricultural Officer.

8.2.11 The sequence of works should be as follows:

* initial tree works: felling, stump grinding and pruning for working clearances
* installation of TPB for demolition & construction
* installation of underground services
* installation of ground protection
* main construction
* removal of TPB
* soft landscaping

## 9.0 REFERENCES


- British Standards Institute. 2005. Trees in Relation to Construction BS 5837: 2005 HMSO, London.
- Barlow JF & Harrison G. 1999. Shade By Trees, Arboricultural Practice Note 5, AAIS, Farnham, Surrey.
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- Thomas P, 2000. Trees: Their Natural History, Cambridge University Press, Cambridge.

**APPENDIX 1**

TREE SCHEDULE - Notes for Guidance

| | |
|---|---|
| Dm - | is the diameter of the trunk in millimetres at 1.5m above ground level. |
| Spread - | is in metres at the points of the compass relevant to the woodland boundary |
| Class/Colour - | refers to the retention classifications in Section 5.2 BS5837: 2005 and colouring on the site map - Highly High Quality (A) (Green), Moderate Quality (B) (Blue), Low Quality (C) (Grey), Poor Quality (R) (Red) |

**Landmark Trees Ltd**
**Tel: 020 7851 4544**

# BS5837 Tree Constraints Survey Schedule



**Site: The Waterhouse, Millfield Lane, London, N6 6HT**

**Surveyor(s): James Bell**

**Date: 4th November 2010**

**Ref:**

| Tree No. | English Name | Height | Crown Spread | Ground Clearance | Age Class | Stem Diameter | Protection Multiplier | Protection Radius | Growth Vitality | Structural Condition | Landscape Contribution | B.S. Cat | Sub Cat | Useful Life | Observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Mulberry, Black | 8 | 3233 | 1.7 | Early Mature | 350 e | 10 | 3.5 | Normal | Fair | Low | C | 2 | 20-40 | Decay in trunk<br>Poor form; trunk initialially runs along ground - appears to be twin stemmed but isn't |
| 2 | Ash, Common | 15 | 7534 | 4 | Early Mature | 300 | 12 | 3.6 | Normal | Good | Low | C | 1,2 | 20-40 | Ivy clad |
| 3 | Chestnut, Horse | 12 | 4644 | 2.5 | Early Mature | 530 | 10 | 5.3 | Normal | Good | Low | C | 2 | 20-40 | Leaf/shoot disorders |
| 4 | Hawthorn, Common | 6 | 1222 | 2.5 | Mature | 300 | 12 | 3.6 | Normal | Good | Low | C | 2 | 10-20 | Ivy smothered<br>Twin stem |
| 5 | Oak, English | 20 | 8999 | 1.5 | Post-Mature | 1290 | 12 | 15.5 | Normal | Poor | Medium | A | 3 | >40 | Decay in trunk and at trunk base 122cm basally<br>Reduction should be considered in light of crown size & decay near separation point at 6/7m |
| 6 | Hawthorn, Common | 7 | 2222 | 2.5 | Mature | 270 | 12 | 3.2 | Normal | Fair | Low | C | 2 | 10-20 | Ivy smothered |
| 7 | Willow, Weeping | 10 | 3353 | 4 | Early Mature | 230 | 12 | 2.8 | Normal | Good | Low | C | 1,2 | 20-40 | |

**Notes:**

1. Height describes the approximate height of the tree measured in meters from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is expressed as an average of NSEW aspect if symmetrical.
3. Ground Clearance is the height in meters of crown clearance above adjacent ground level.
4. Stem Diameter is the diameter of the stem measured in millimeters at 1.5m from ground level for single stemmed trees or at ground level for multi-stemmed trees. Stem Diameter may be estimated where access is restricted.
5. Protection Multiplier is 12 for single stemmed and 10 for multi-stemmed trees and is the number used to calculate the tree's protection radius and area.
6. Protection Radius is a radial distance measured from the trunk centre.
7. Growth Vitality - Normal growth, Moderate (below normal), Poor (sparse/weak), Dead (dead or dying tree).
8. Structural Condition - Good (no or only minor defects), Fair (remediable defects), Poor - Major defects present.
9. Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
10. B.S. Cat refers to (British Standard 5837:2005 Table 1) and refers to tree/group quality and value; 'A' - High, 'B' - Moderate, 'C' - Low, 'R' - Remove.
11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservational, Historic and Commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.

**Landmark Trees Ltd**
**Tel: 020 7851 4544**

# BS5837 Tree Constraints Survey Schedule



**Site: The Waterhouse, Millfield Lane, London, N6 6HT**

**Surveyor(s): James Bell**

**Date: 4th November 2010**

**Ref:**

| Tree No. | English Name | Height | Crown Spread | Ground Clearance | Age Class | Stem Diameter | Protection Multiplier | Protection Radius | Growth Vitality | Structural Condition | Landscape Contribution | B.S. Cat | Sub Cat | Useful Life | Observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Eucalyptus | 20 | 2333 | 8 | Early Mature | 530 | 10 | 5.3 | Normal | Good | Medium | C | 2 | 20-40 | |
| 9 | Eucalyptus | 20 | 6244 | 2.5 | Early Mature | 760 | 10 | 7.6 | Normal | Good | Medium | C | 2 | 20-40 | 4 stems |
| 10 | Birch, Silver youngii | 2.5 | 3222 | 1 | Early Mature | 100 | 12 | 1.2 | Normal | Good | Low | C | 1 | 10-20 | Garden ornamental |
| 10a | Laurel, Portugese | 7 | 1111 | 0 | Early Mature | 140 | 10 | 1.4 | Normal | Good | Low | C | 2 | 10-20 | Screen separating front from rear garden |
| 11 | Sycamore | 15 | 6666 | 3 | Early Mature | 900e | 10 | 9.0 | Normal | Good | Medium | B | 1 | 20-40 | Multi stem - 5 |
| 12 | Apple, Cultivated | 10 | 4534 | 2.5 | Mature | 340 | 12 | 4.1 | Normal | Fair | Medium | C | 1 | 10-20 | Decay in trunk |
| 13 | Hawthorn, Common | 10 | 3333 | 2 | Mature | 390 | 10 | 3.9 | Moderate | Fair | Medium | C | 1 | 10-20 | Ivy smothered creeper in crown |

**Notes:**

1. Height describes the approximate height of the tree measured in meters from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is expressed as an average of NSEW aspect if symmetrical.
3. Ground Clearance is the height in meters of crown clearance above adjacent ground level.
4. Stem Diameter is the diameter of the stem measured in millimeters at 1.5m from ground level for single stemmed trees or at ground level for multi-stemmed trees. Stem Diameter may be estimated where access is restricted.
5. Protection Multiplier is 12 for single stemmed and 10 for multi-stemmed trees and is the number used to calculate the tree's protection radius and area.
6. Protection Radius is a radial distance measured from the trunk centre.
7. Growth Vitality - Normal growth, Moderate (below normal), Poor (sparse/weak), Dead (dead or dying tree).
8. Structural Condition - Good (no or only minor defects), Fair (remediable defects), Poor - Major defects present.
9. Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
10. B.S. Cat refers to (British Standard 5837:2005 Table 1) and refers to tree/group quality and value; 'A' - High, 'B' - Moderate, 'C' - Low, 'R' - Remove.
11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservational, Historic and Commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.

**Landmark Trees Ltd**
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# BS5837 Tree Constraints Survey Schedule



**Site: The Waterhouse, Millfield Lane, London, N6 6HT**

**Surveyor(s): James Bell**

**Date: 4th November 2010**

**Ref:**

| Tree No. | English Name | Height | Crown Spread | Ground Clearance | Age Class | Stem Diameter | Protection Multiplier | Protection Radius | Growth Vitality | Structural Condition | Landscape Contribution | B.S. Cat | Sub Cat | Useful Life | Observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | Ash, Common | 13 | 2242 | 2 | Semi-mature | 200 | 12 | 2.4 | Normal | Good | Low | C | 1 | 10-20 | Swept stem |
| 15 | Birch, Silver | 19 | 5645 | 4 | Mature | 440 | 12 | 5.3 | Normal | Good | Medium | B | 1 | 20-40 | Ivy obscures base |
| 16 | Mulberry, Black | 7 | 3333 | 2 | Early Mature | 200e | 12 | 2.4 | Normal | Fair | Low | C | 1 | 20-40 | Offsite; draped onto rear wall of studio |
| 17 | Hornbeam | 17 | 8877 | 3 | Mature | 640 | 12 | 7.7 | Normal | Good | Medium | B | 1,2 | 20-40 | Deadwood (minor) in crown |
| 18 | Beech, Common | 12 | 5824 | 3 | Early Mature | 400e | 12 | 4.8 | Normal | Fair? | Medium | B | 1,2 | 20-40 | Offsite; southern crown extends 6m over property |
| 19 | Plum, Purple | 5 | 1.5 | 2.5 | Mature | 360 | | 0.0 | Poor | Poor | Low | R | | <10 | Dead/dying<br>Decay in trunk |
| 20 | Magnolia (M. X soulangiana) | 5 | 1.5 | 2.5 | Semi-mature | 150 | 12 | 1.8 | Normal | Good | Low | C | 1 | 20-40 | Garden ornamental |

**Notes:**

1. Height describes the approximate height of the tree measured in meters from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is expressed as an average of NSEW aspect if symmetrical.
3. Ground Clearance is the height in meters of crown clearance above adjacent ground level.
4. Stem Diameter is the diameter of the stem measured in millimeters at 1.5m from ground level for single stemmed trees or at ground level for multi-stemmed trees. Stem Diameter may be estimated where access is restricted.
5. Protection Multiplier is 12 for single stemmed and 10 for multi-stemmed trees and is the number used to calculate the tree's protection radius and area.
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9. Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
10. B.S. Cat refers to (British Standard 5837:2005 Table 1) and refers to tree/group quality and value; 'A' - High, 'B' - Moderate, 'C' - Low, 'R' - Remove.
11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservational, Historic and Commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.

**Landmark Trees Ltd**
**Tel: 020 7851 4544**

# BS5837 Tree Constraints Survey Schedule



**Site: The Waterhouse, Millfield Lane, London, N6 6HT**

**Surveyor(s): James Bell**

**Date: 4th November 2010**

**Ref:**

| Tree No. | English Name | Height | Crown Spread | Ground Clearance | Age Class | Stem Diameter | Protection Multiplier | Protection Radius | Growth Vitality | Structural Condition | Landscape Contribution | B.S. Cat | Sub Cat | Useful Life | Observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G21 | Birch, Himalayan | 6 | 1.5 | 2.5 | Semi-mature | 80 | 12 | 1.0 | Normal | Good | Low | C | 1,2 | 20-40 | 6 in irregular row |
| 22 | Apple, Cultivated | 6 | 3 | 2 | Early Mature | 200 e | 12 | 2.4 | Moderate | Fair | Low | C | 2 | 20-40 | Ivy clad<br>Remote Survey Only |
| 23 | Willow, White | 12 | 7 | 2 | Mature | 600 e | 10 | 6.0 | Moderate | Fair | Medium | B | 2 | 20-40 | Co-dominant stems<br>A sparser than normal canopy<br>Remote Survey Only |
| 24 | Willow, White | 14 | 6 | 2 | Mature | 500 e | 10 | 5.0 | Moderate | Fair | Medium | B | 2 | 20-40 | Multi stem<br>A sparser than normal canopy<br>Remote Survey Only |
| G25 | Willow, White (x 2-3) | 6 | 3 | 2 | Semi-mature | 300 e | 10 | 3.0 | Moderate | Fair | Low | C | 2 | 20-40 | Multi stem<br>Remote Survey Only |
| G26 | Cherry, Flowering (x 2-3) | 4 | 1.5 | 2 | Semi-mature | 100 e | 12 | 1.2 | Poor | Fair | Low | C | 2 | 10-20 | A sparser than normal canopy<br>Dying back (lower branches)<br>Remote Survey Only |
| 27 | Walnut, Common | 15 | 6 | 2 | Mature | 600 e | 12 | 7.2 | Normal | Good | Medium | B | 2 | >40 | Remote Survey Only |

**Notes:**

1. Height describes the approximate height of the tree measured in meters from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is expressed as an average of NSEW aspect if symmetrical.
3. Ground Clearance is the height in meters of crown clearance above adjacent ground level.
4. Stem Diameter is the diameter of the stem measured in millimeters at 1.5m from ground level for single stemmed trees or at ground level for multi-stemmed trees. Stem Diameter may be estimated where access is restricted.
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9. Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
10. B.S. Cat refers to (British Standard 5837:2005 Table 1) and refers to tree/group quality and value; 'A' - High, 'B' - Moderate, 'C' - Low, 'R' - Remove.
11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservational, Historic and Commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.

**APPENDIX 2**

RECOMMENDED TREE WORKS

**Landmark Trees Ltd**
**Tel: 0207 851 4544**

# Recommended Tree Works

Hide irrelevant | Show All Trees



**Site: The Waterhouse, Millfield Lane, London, N6 6HT** **Surveyor(s): James Bell**

**Date: 4th November 2010** **Ref:**

| Tree No. | English Name | Height | Stem Diameter | Crown Spread | Recommended Works | Comments/ Reasons |
|---|---|---|---|---|---|---|
| 1 | Mulberry, Black | 8 | 350 e | 3233 | CR30% | Decay in trunk<br>Poor form; trunk initialially runs along ground - appears to be twin stemmed but isn't<br>Recommended to permit development |
| 5 | Oak, English | 20 | 1290 | 8999 | FInv<br>Resitograph inspection | Decay in trunk and at trunk base<br>122cm basally<br>Reduction should be considered in light of crown size & decay near separation point at 6/7m<br>Advisable for good arboricultural practice |
| 10a | Laurel, Portugese | 7 | 140 | 1111 | Fell | Screen separating front from rear garden<br>Recommended to permit development |
| 11 | Sycamore | 15 | 900e | 6666 | CL5m | Multi stem - 5<br>Recommended to permit development |
| 12 | Apple, Cultivated | 10 | 340 | 4534 | Fell | Decay in trunk<br>Recommended to permit development |
| 15 | Birch, Silver | 19 | 440 | 5645 | CL5 | Ivy obscures base<br>Recommended to permit development |
| 17 | Hornbeam | 17 | 640 | 8877 | CR15% CCL | Deadwood (minor) in crown<br>Recommended to permit development |
| 18 | Beech, Common | 12 | 400e | 5824 | CL5m | Offsite; southern crown extends 6m over property<br>Recommended to permit development |

**Notes:**

CB - Cut Back to boundary/clear from structure.
CL# - Crown Lift to given height in meters.
CT#% - Crown Thinning by identified %.
CCL - Crown Clean (remove deadwood/crossing and hazardous branches and stubs).
CR#% - Crown Reduce by given maximum % (of outermost branch & twig length)
DWD - Remove deadwood.
Fell - Fell to ground level.
FInv - Further Investigation (generally with decay detection equipment).
Pol - Pollard or re-pollard.
Mon - Monitor ongoing condition (annually by staff / owners & every 2-3 yrs by consultant).
Svr Ivy / Clr Bs - Sever ivy / clear base and re-inspect base / stem for concealed defects.

Landmark Trees Ltd
Tel: 0207 851 4544

# Recommended Tree Works

Hide irrelevant | Show All Trees



**Site: The Waterhouse, Millfield Lane, London, N6 6HT** **Surveyor(s): James Bell**

**Date: 4th November 2010** **Ref:**

| Tree No. | English Name | Height | Stem Diameter | Crown Spread | Recommended Works | Comments/ Reasons |
|---|---|---|---|---|---|---|
| 19 | Plum, Purple | 5 | 360 | 1.5 | Fell | Dead/dying<br>Decay in trunk<br>Advisable for good arboricultural practice |
| 20 | Magnolia (M. X soulangiana) | 5 | 150 | 1.5 | Fell | Garden ornamental<br>Recommended to permit development |
| G21 | Birch, Himalayan | 6 | 80 | 1.5 | S Fell<br>Fell 2 trees opposite proposed garage | 6 in irregular row<br>Recommended to permit development |

**Notes:**

CB - Cut Back to boundary/clear from structure.
CL# - Crown Lift to given height in meters.
CT#% - Crown Thinning by identified %.
CCL - Crown Clean (remove deadwood/crossing and hazardous branches and stubs).
CR#% - Crown Reduce by given maximum % (of outermost branch & twig length)
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Pol - Pollard or re-pollard.
Mon - Monitor ongoing condition (annually by staff / owners & every 2-3 yrs by consultant).
Svr Ivy / Clr Bs - Sever ivy / clear base and re-inspect base / stem for concealed defects.

## APPENDIX 3: TREE SELECTION FOR CONSTRICTED SITES

Table 4: Rosaceous Tree Species for Constricted Planting Sites

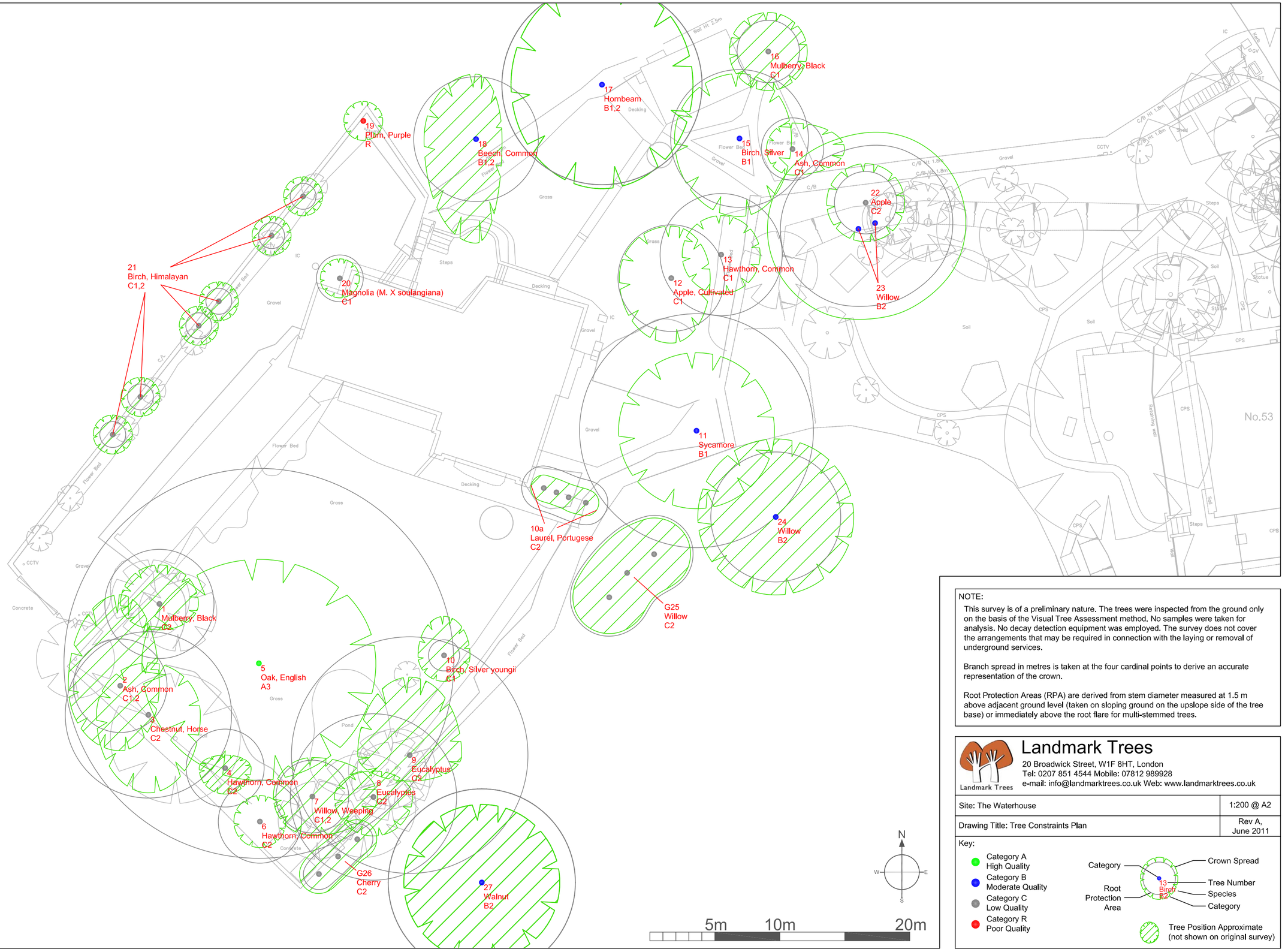
| Common Name | Species | Selected Form |
|---|---|---|
| Hawthorn | Crataegus monogyna | Stricta |
| Cockspur | Crataegus prunifolia | Splendens |
| Cherry | Prunus x hillieri | Spire |
| Bird cherry | Prunus padus | Albertii |
| Rowan / Mountain ash | Sorbus aucuparia | Cardinal Royal |
| Rowan / Mountain ash | Sorbus aucuparia | Rossica Major |
| Rowan / Mountain ash | Sorbus aucuparia | Sheerwater Seedling |
| Swedish whitebeam | Sorbus intermedia | Brouwers |
| Bastard whitebeam | Sorbus x thuringiaca | Fastigiata |

Table 5: Specimen Tree Species for Constricted Planting Sites

| Common Name | Species | Selected Form |
|---|---|---|
| Chinese red bark birch | Betula albosinensis | Fascination |
| Swedish birch | Betula pendula | Dalecarlica |
| Hornbeam | Carpinus betulus | Fastigiata Frans Fountaine |
| Turkish Hazel | Corylus colurna | |
| Maidenhair tree | Gingko biloba | |
| Pride of India | Koelreuteria paniculata | Fastigiata |
| European larch | Larix decidua | Sheerwater Seedling |
| Tulip tree | Liriodendron tulipfera | Fastigiata |

**APPENDIX 4**

TREE CONSTRAINTS PLAN




NOTE:

This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.

Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.

Root Protection Areas (RPA) are derived from stem diameter measured at 1.5 m above adjacent ground level (taken on sloping ground on the upslope side of the tree base) or immediately above the root flare for multi-stemmed trees.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| | |
|---|---|
| Site: The Waterhouse | 1:200 @ A2 |
| Drawing Title: Tree Constraints Plan | Rev A, June 2011 |

Key:

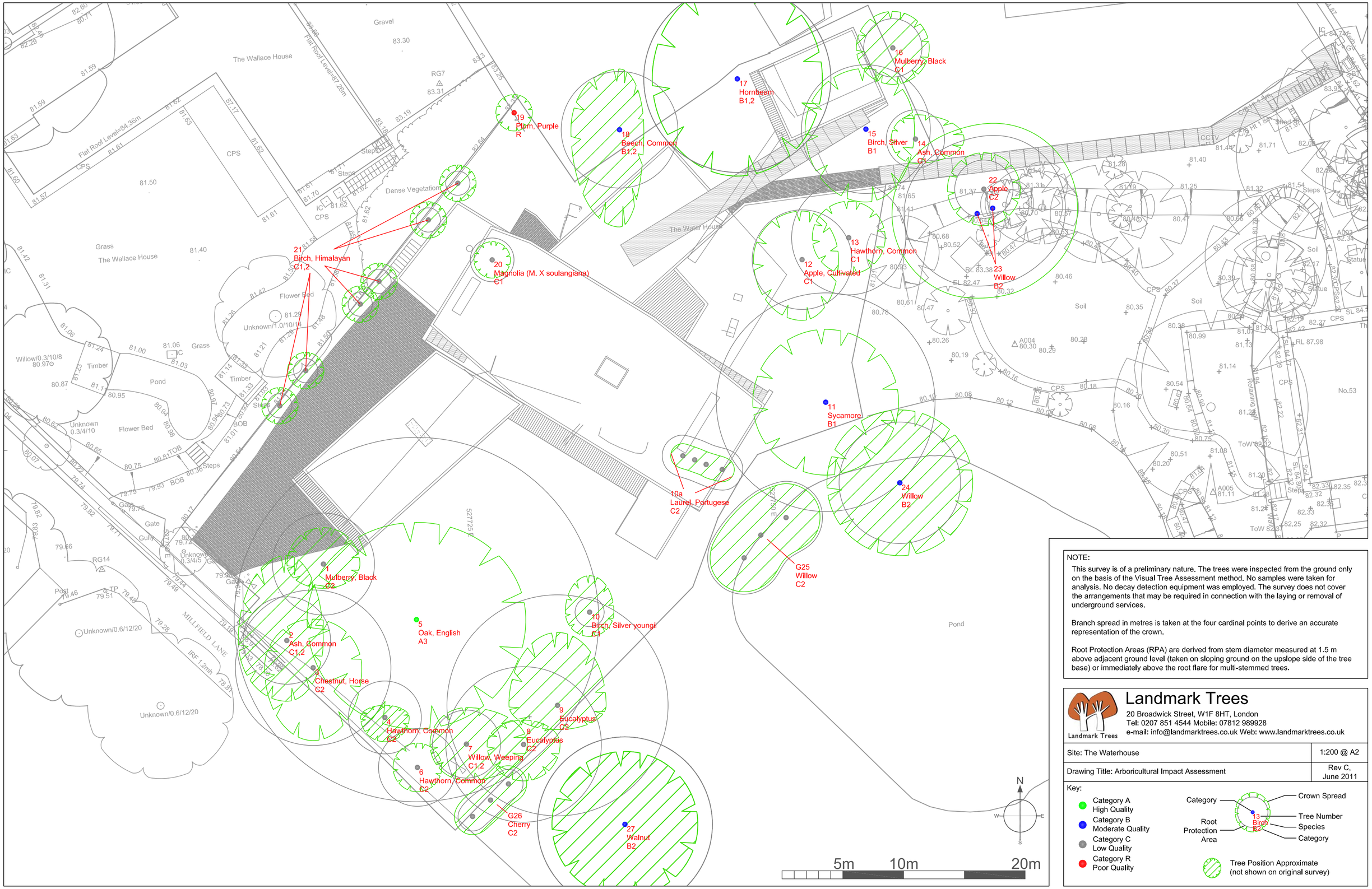
- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category R Poor Quality




Tree Position Approximate (not shown on original survey)

**APPENDIX 5**

ARBORICULTURAL IMPACT ASSESSMENT PLAN




NOTE:

This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.

Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.

Root Protection Areas (RPA) are derived from stem diameter measured at 1.5 m above adjacent ground level (taken on sloping ground on the upslope side of the tree base) or immediately above the root flare for multi-stemmed trees.


# Landmark Trees

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| | |
|---|---|
| Site: The Waterhouse | 1:200 @ A2 |
| Drawing Title: Arboricultural Impact Assessment | Rev C, June 2011 |

Key:

- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category R Poor Quality

Category — Crown Spread
Root Protection Area — Tree Number, Species, Category (13 Birch B2)

Tree Position Approximate (not shown on original survey)