Landmark Trees

ARBORICULTURAL IMPACT ASSESSMENT REPORT FOR:

28 Redington Road

London

NW3 7RB

INSTRUCTING PARTY:

The Linton Group

8 Headfort Place

Belgravia

London

SW1X 7DH

REPORT PREPARED BY

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MSc ARB MICFor FArbor A MRICS C Env

Ref: JCA/28RDR/AIA/01a

Date: 13th May 2016

PART 1: MAIN TEXT

PART 2 - APPENDICES

PART 3 - PLANS

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 a survey they will of course appear in the report.

A tree survey is generally considered invalid in planning terms after 2 years, but changes in tree condition may occur at any time, particularly after acute (e.g. storm events) or prolonged (e.g. drought) environmental stresses or injuries (e.g. root severance). Routine surveys at different times of the year and within two - three years of each other (subject to the incidence of the above stresses) are recommended for the health and safety management of trees remote from highways or busy access routes. Annual surveys are recommended for the latter.

Tree works recommendations are found in the Appendices to this report. It is assumed, unless otherwise stated ("ASAP" or "Option to") that all husbandry recommendations will be carried out within 6 months of the report's first issue. Clearly, works required to facilitate development will not be required if the application is shelved or refused. However, necessary husbandry work should not be shelved with the application and should be brought to the attention of the person responsible, by the applicant, if different. Under the Occupiers Liability Act of 1957, the owner (or his agent) of a tree is charged with the due care of protecting persons and property from foreseeable damage and injury.' He is responsible for damage and/or nuisance arising from all parts of the tree, including roots and branches, regardless of the property on which they occur. He also has a duty under The Health and Safety at Work Act 1974 to provide a safe place of work, during construction. Tree works should only be carried out with local authority consent, where applicable.

Inherent in a tree survey 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 Instructing Party, 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.

1.0 SUMMARY

Instructing Party:	The Linton Group	**Case Ref:**	JCA/28RDR/AIA/01a
Local Authority:	LB Camden	**Date:**	13/05/16
Site Address: 28 Redington Road, London NW3 7RB			
Proposal: Proposed redevelopment of the site to provide flats including basement car parking spaces (following part demolition of existing house).			

Report Checklist	**Y/N**		**Y/N**
Arboricultural constraints on site	Y	Trees removal proposed	Y
Tree Survey	Y	Topographical Survey	Y
BS5837 Report	Y	Conservation Area	Y
Tree Preservation Orders	Y	5H T60 (T1) & C847 (T8 – T10)	
Tree Protection Plan:	N/a	(Include in future method statement)	
Tree Constraints Plan:	Y		
Arboricultural Impact Assessment:	Y		

Site Layout				
Site Visit	Y	Date: 04 & 13/08/16	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: (T2 to be felled for good husbandry reasons)	Y		On or off-site trees indirectly affected by development	N

Trees with the potential to be affected

Front garden: T1 (TPO) car lift/basement encroachment rated as a low impact (trial pits undertaken support this assessment); piling works to avoid canopy; changes to drive layout within RPA requires no-dig/porous surfaces; Off-site T6 & T7 – theoretically low impact from new landscaping (proposed pedestrian entrance and steps).
Rear garden: Trial pit evidence used to position basement – remaining theoretical impacts rated as low; recommendation to retain raised bed to avoid excessive disturbance to roots of beech trees T8 – 12 (note: TPO C847 protecting T8 – T10). Basement line to be manually excavated under arboricultural supervision.
Construction of ground level floors and above within RPA of T13 – trial pit evidence confirms low impact. Manual excavation required within RPA.
Minor remedial works to G18 to cut back from construction area.

Comments

Recommended works for 26 of the 40 trees surveyed regardless of development, but also pertinent to maintaining a safe work site. Application 2015/5968/T provides for the felling of T29 and crown reduction of T27.

Recommendations

1	Proposal will mean the loss of important trees (TPO/CA)	N
2	Proposal has sufficient amelioration for tree loss	N/a
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: 2012 'Trees in relation to design, demolition and construction – Recommendations'

2. INTRODUCTION

2.1 Terms of Reference

2.1.1 LANDMARK TREES were asked by The Linton Group to provide a survey and an arboricultural impact assessment of proposals for the site: 28 Redington Road, London NW3 7RB. The report is to accompany a planning application.

2.1.2 The proposals are for the redevelopment of the site to provide flats including basement car parking spaces, following part demolition of existing house.

2.1.3 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.

2.1.4 I am a Registered Consultant and Fellow of the Arboricultural Association and a Chartered Forester, with a Masters Degree in Arboriculture and 25 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 and 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 Instructing Party and relied upon by Landmark Trees in the formulation of our survey plans are:

Existing site survey:1384-28 (Issue Drawing 2015.08.12)*

Proposals: JCA-RR-PR-010 Lower ground floor

JCA-RR-PR-011 Ground Floor

*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' (LT) arboricultural consultant, I surveyed the trees on site on 4th and 13th August 2015, recording relevant qualitative data in order to assess both their suitability for retention and their constraints upon the site, in accordance with British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations [BS5837:2012].

2.3.2 Our survey of the trees, the soils and any other factors, is of a preliminary nature. The trees were SURVEYED 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). LT have not taken any samples for analysis and the trees were not climbed, but inspected from ground level.

2.3.3 A tree survey is generally considered invalid in planning terms after 2 years, but changes in tree condition may occur at any time, particularly after acute (e.g. storm events) or prolonged (e.g. drought) environmental stresses or injuries (e.g. root severance). Routine surveys at different times of the year and within two - three years of each other (subject to the incidence of the above stresses) are recommended for the health and safety management of trees remote from highways or busy access routes. Annual surveys are recommended for the latter.

2.3.4 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. General husbandry recommendations are distinguished at Appendix 2 from the minimum requirements to facilitate development / form part of the planning application at Appendix 3. The former may still be relevant to providing a safe site of work, of course. Similarly, if for whatever reason the development does not go ahead, our recommendations in Appendix 2 would still apply.

2.4.2 A site plan identifying the surveyed trees, based on the Instructing Party's drawings / topographical survey is provided in Part 3 of this report.

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: 2012) overlain onto it. These constraints are then overlain in turn onto the Instructing Party's proposals to create a second Arboricultural Impact Assessment Plan in Part 3. General observations and discussion follow, below.

3.0 OBSERVATIONS

3.1 Site Description

Photograph 1: 28 Redington Road, London NW3 7RB (Source: Google Maps)

3.1.1	This property is located on the northern side of Redington Road. It is a large detached property with a substantial rear garden and smaller front garden area with the existing drive.
3.1.2	The site levels vary significantly with the existing hard landscaping and raised beds, with a 2 meter difference between the trees and ground level in some areas.
3.1.3	In terms of the British Geological Survey, the site overlies the Claygate Member / Beds (see dark area on plan extract overleaf). As the youngest part of the London Clay, they form a transition between the clay and the sandier Bagshot Beds above (shown in yellow). Unlike the Bagshot Beds, more typical of Hampstead Heath, the associated soils are generally, highly shrinkable clay; e.g. slowly permeable seasonally waterlogged fine loam over clay. Such highly plastic soils are prone to movement: subsidence and heave.
3.1.4	The actual limits of soil series are not as clearly defined on the ground as on plan and there may be anomalies between them. Further advice from the relevant experts on the specific soil properties can be sought as necessary.
3.1.5	Clay soils are prone to compaction during development. Damage to soil structure can have a serious impact on tree health. Design of foundations near problematic tree species will also need to take into consideration subsidence risk.

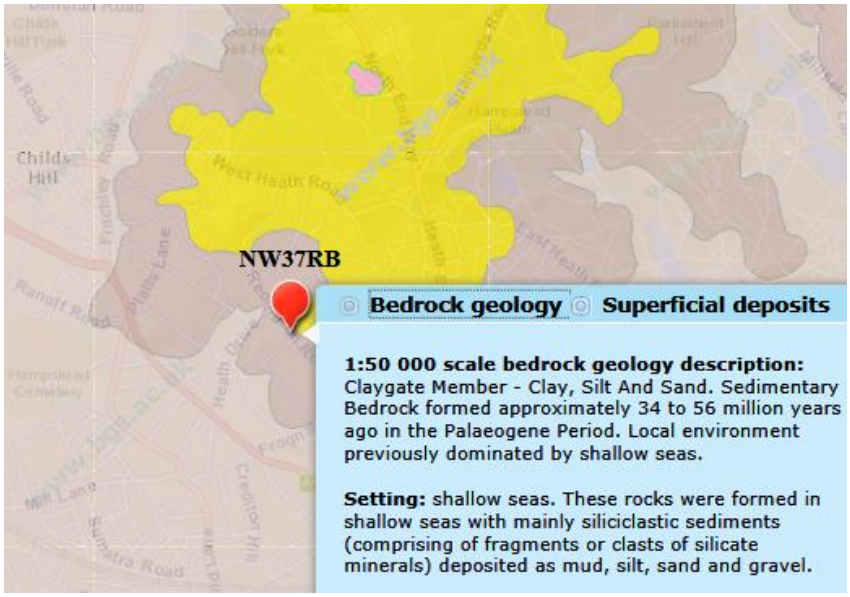

Figure 1: Extract from the BGS Geology of Britain Viewer

3.2 Subject Trees

3.2.1	Of the 40 surveyed trees 4 is A category *(High Quality), 16 are B category *(Moderate Quality), 13 are C category *(Low Quality), 1 is C/u category (Low Quality/Unsuitable for Retention), 4 are U category *(Unsuitable for Retention) and 2 are habitat stumps.
3.2.2	The tree species found on site comprise mainly common beech and sycamore, with some English oak, Scots pine, flowering cherry, horse chestnut, Lawsons cypress, holly, common ash, copper beech, silver birch, Atlantic cedar, London plane, laurel & laburnum.
3.2.3	In terms of age demographics there is a preponderance of early mature and mature trees on the site with a few young, semi-mature, post-mature and veteran trees in the population.

3.2.4	Full details of the surveyed trees can be found in Appendix 1 of this report.
3.2.5	There are recommended works for 26 trees, including the felling of T2, T4, T5, T16, T29 and T33, in addition to the removal of the stump T37. The further investigation of decay and other abnormalities is recommended for 10 trees, including 8 climbing inspections. These and other works are listed in Appendix 2.

3.3 Planning Status

3.3.1	We have contacted Camden's tree preservation team and ascertained that the following TPOs are in existence on the site: • 5H T60 – 1 beech (T1) in 28 Redington Road (front garden), confirmed 16/10/1956 • C847 – 3 x beech (T8 – T10) in 28 Redington Road (rear garden) confirmed 13/04/2010

3.3.2	The site stands within the Redington / Frognal Conservation Area, which will affect all of the subject trees: it is a criminal offence to prune, damage or fell such trees without permission from the local authority. The most recent permission was received in December 2015 for the following works: 2015/5968/T: REAR GARDEN: Chestnut (T29) - Fell as polyporus decay fungi on stem, major decay on base, fire damaged, leaning stem (category U) Ash (T27) - Crown Reduce by 30% / 5m as major asymmetry, major deadwood, long etiolated crown, low live ratio with Daldinia fungus along lower half. These works must be undertaken within two years from the 23/10/15.

4.0 DEVELOPMENT CONSTRAINTS

4.1 Primary Constraints

4.1.1 BS5837: 2012 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 12-x stem diameter at 1.5m above ground level, except where composite formulae are used in the case of multi-stemmed trees.

4.1.2 Circular RPA's are appropriate for individual specimen trees grown freely, but where there is ground disturbance, the morphology of the RPA can be modified to an alternative polygon, as shown in the diagram below (Figure 2). Alternatively, one need principally remember that RPA's are area-based and not linear – notional rather than fixed entities.

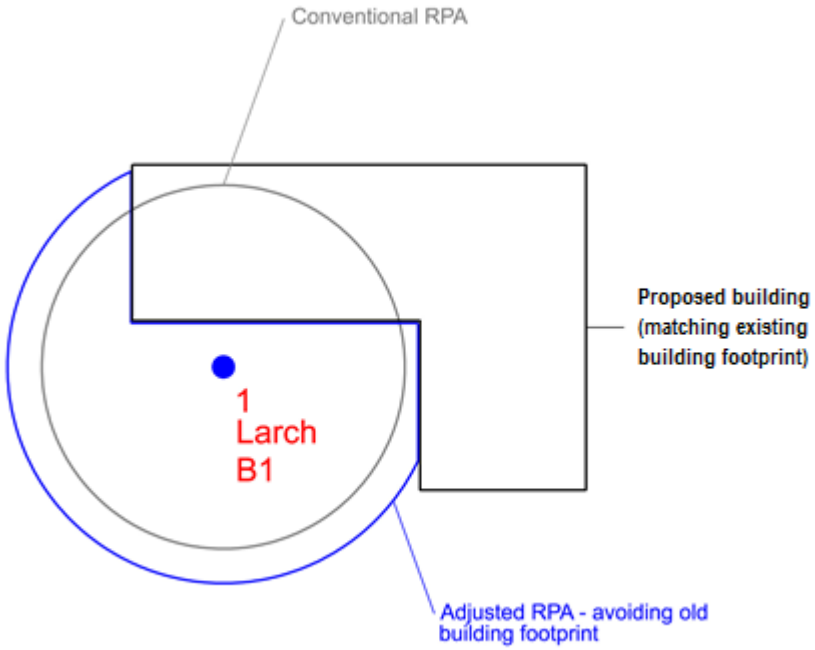

Figure 2 – Generic BS 5837 RPA Adjustments

4.1.3 In BS5837, paragraph 4.6.2 states that RPA's should reflect the morphology and disposition of the roots; where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution.

4.1.4 **No *a priroi* modifications have been made in this instance, though further investigations have been undertaken (see Appendix 5), where the proposals encroach / come near RPAs and therefore have a bearing on the impact assessment**.

4.1.5 The position and extent of these pits has been agreed with the Tree Officer, Nick Bell. In total 9 Trial Pits have been excavated, with three additional pits excavated specifically in accordance with the Tree Officer's request. The findings are provided in Appendix 5, with the basement outline tailored within these findings.

4.1.6 The quality of trees will also be a consideration: U Category trees are discounted from the planning process in view of their limited service life. Again, Category-C trees would not normally constrain development individually, unless they provide some external screening function.

4.1.7 At paragraph 5.1.1. BS5837: 2012 notes that "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 demolition or construction work, or post-completion demands on their removal."

4.1.8 In theory, only moderate quality trees and above are significant material constraints on development. However, the low quality trees would comprise a constraint in aggregate, in terms of any collective loss / removal, where replacement planting would be appropriate, though no such collective impact is proposed.

4.1.9 In this instance, there are potentially significant primary constraints upon development, which have been tested with comprehensive trial pits. The trial pits have determined that the existing rooting restriction (for example existing development, hard surfaces, raised bed and level changes) have minimised root colonisation within the proposed development area.

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 (Figure 3), honeydew deposition or perceived risk of harm.

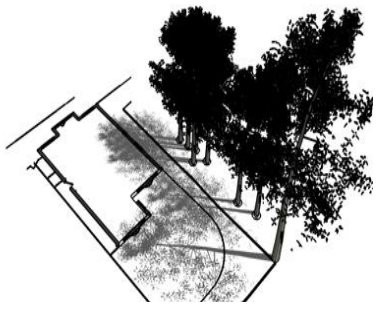

Figure 3 –
Generic Shading Constraints

4.2.2 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.

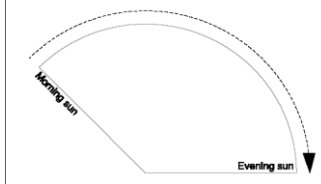

Figure 4 – Shading Arc

4.2.3 This arc (see Figure 4) 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 The proximity and southerly orientation of some existing on-site trees increases the potential to provide a variety of secondary constraints, including shading, organic deposition and the potential need to maintain crown clearance in the future. The significance of these constraints will vary depending on the location and proximity to the proposed re-development.

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

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

Hide irrelevant | Show All Trees

Ref: JCA/28RDR/AIA

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	1	Beech, Copper (TPO)	Removal of existing hardstanding LFG/car lift encroachment (7% - no roots in TP1, TP2 or TP9; New hardstanding	32.1 m^2 7.24 %	Mature	Moderate	Poor	Low	N/A	Airspade / manual excavation No-dig/porous surfaces for replacement surfaces
U	2	Cherry, Flowering	Recommendation to fell on good husbandry grounds	3.3 m^2 11.67 %	Early Mature	Poor	N/A	N/A	N/A	To be felled on the grounds of sound husbandry
B	6	Plane, London	New hard landscaping (note: off-site tree behind wall) Excavations 2m from stem	m^2 N/A %	Mature	Normal	Good	Low	N/A	Airspade / manual excavation Pre-emptive root pruning
B	7	Sycamore	New hard landscaping (note: off-site tree behind wall) Excavations 2m from stem	m^2 N/A %	Mature	Normal	Moderate	Low	N/A	Airspade / manual excavation Pre-emptive root pruning
B	8	Beech, Common TPO	Removal/ alteration of existing hard landscaping Basement/upper floors construction within RPA/canopy	17.5 m^2 13.77 %	Mature	Normal	Poor	Low*	N/A	*Trial pits confirmed low impact. Airspade / manual excavation - retain raised bed Hand dig top 750mm of basement line thro' RPA; remedial tree works
B	9	Beech, Common TPO	Removal/ alteration of existing hard landscaping Basement/upper floors construction within RPA/canopy	0.3 m^2 .39 %	Early Mature	Normal	Poor	Low*	N/A	*Trial pits confirmed low impact. Airspade / manual excavation - retain raised bed Hand dig top 750mm of basement line thro' RPA; remedial tree works

5.0

Table 1: Arboricultural Impact Assessment

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

Hide irrelevant | Show All Trees

Ref: JCA/28RDR/AIA

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	10	Beech, Common TPO	Removal/ alteration of existing hard landscaping Basement/upper floors construction within RPA/canopy	m^2 N/A %	Early Mature	Normal	Poor	Low*	N/A	*Trial pits confirmed low impact. Airspade / manual excavation - retain raised bed Hand dig top 750mm of basement line thro' RPA; remedial tree works
B	11	Beech, Common	Removal/ alteration of existing hard landscaping Basement/upper floors construction within RPA/canopy	12.7 m^2 12.44 %	Mature	Normal	Poor	Low*	N/A	*Trial pits confirmed low impact. Airspade / manual excavation - retain raised bed Hand dig top 750mm of basement line thro' RPA; remedial tree works
C	12	Beech, Common	Removal/ alteration of existing hard landscaping Basement/upper floors construction within RPA/canopy	15.7 m^2 10.68 %	Mature	Normal	Poor	Low*	N/A	*Trial pits confirmed low impact. Airspade / manual excavation - retain raised bed Hand dig top 750mm of basement line thro' RPA; remedial tree works
A	13	Oak, English	Ground level floor & above - construction within RPA Trial pit T8 determined low impact	24.8 m^2 5.48 %	Veteran	Moderate	Moderate	Low*	N/A	*Trial pits confirmed low impact. Airspade / manual excavation.
C	G18	Holly & Laurel	Construction within canopy	m^2 N/A %	Semi-mature	Normal	Good	Low	N/A	Remedial tree surgery (see Rec. Works)

6.0 DISCUSSION

6.1 Rating of Primary Impacts

6.1.1 The principal impacts in the current proposals have been minimised by the use of trial pits to determine the likelihood of significant roots within the built development areas. Furthermore, category U tree T2 is to be removed on the grounds of sound husbandry, therefore any impacts from the proposals are irrelevant. The impact to the theoretical RPA of the category B tree T1 from the car lift/basement encroachment is around 7%, therefore rated as a low impact. Trial pits TP1, TP2, TP3 and TP9 support this assessment (see Appendix 5), with manual excavation of the basement line proposed as a precautionary measure. It is also important that piling works avoid the canopy of T1. Furthermore, any changes to drive layout within T1's RPA will require no-dig construction methods and porous replacement surfaces.

6.1.2 The proposals for a pedestrian access and steps will affect the theoretical RPAs of the off-site category B trees T6 & T7; this has been rated as a low impact due to the level differences between the sites, the intervening boundary wall and the 2m distance from the stems. Any excavations should be undertaken manually, with pre-emptive root pruning if required.

6.1.3 In the rear garden, trial pits have confirmed that the root colonisation of the category B beech trees T8 – T12 has been restricted by the existing landscaping and level differences. This trial pit evidence has been used to position basement, ensuring that low theoretical impacts will be low in practice. It is recommended that the existing hard landscaping around the tree roots is retained to avoid excessive disturbance to roots of beech trees T8 – 12. The basement line should also be manually excavated under arboricultural supervision. The canopy encroachment from the proposed elevations will require some minor remedial works to all 4 beech trees, to be undertaken sensitively (note: TPO C847 protects T8 – T10 therefore remedial works must protect the amenity of these trees).

6.1.4 The construction of ground level floors and above within RPA of the category A tree T13 will have a low theoretical impact (5.5%), which has also been tested with trial pits to confirm this low impact. Manual excavation of the foundations will be required.

6.1.5 There will also be a requirement for minor remedial works to G18, to cut back overhanging branches from the construction area.

6.1.6 The principal of RPA encroachment is established within BS5837:2012 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 confused with the NJUG Prohibited Zone, when they clearly correlate with the NJUG Precautionary Zone.

6.1.7 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 BS5837:2012 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 healthy specimens of species with a good resistance to development impacts, and quite capable of tolerating these low impacts.

6.1.8 "**In practice 50% of roots can sometimes be removed with little problem**, provided there are vigorous roots elsewhere. Inevitably, this degree of root loss will temporarily slow canopy growth and even lead to some dieback" (Thomas 2000). LT do not recommend annexing such high proportions of the root system; rather that within the context of the published science, planning should not be unduly concerned by impacts that are well below the subcritical threshold – *tree health is not at stake.*

6.1.9 BS5837 recommends (at 5.3.a) that if operations within the RPA are proposed, the project arboriculturist should demonstrate that the tree(s) can remain viable and that the area lost to encroachment can be compensated for elsewhere, contiguous with its RPA. On the basis of Thomas et al, above, it is possible to demonstrate that the trees can remain viable, and on the basis that the trees will be rooting no less freely in the garden / lawn / border /pavement than within the proposed footprint, with the RPA encroachment compensated elsewhere on contiguous land. The guide also recommends (at 5.3.b) the arboriculturist propose a series of mitigation measures (to improve the soil environment that is used by the tree for growth). These are provided at 6.3 below.

6.2 Rating of Secondary Impacts

6.2.1 The principal, secondary impact would be the additional canopy encroachment of the beech trees T8 – T12. This will require minor remedial works to cut-back the canopies (note: T8 – T10 protected by TPO C847, therefore amenity of these trees must be safeguarded by sensitive pruning works).

6.2.2 Due to the orientation of the trees in the rear garden, the shading impacts will be minimal, with organic deposition much as it is today. The trees in the front garden have the potential to provide shading, although this will actually be reduced with the requirement to remove T2 on the grounds of sound husbandry. Organic deposition will need to be managed, although this is a negligible impact.

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 within a RPA should be lifted manually with caution.

6.3.2 The path of foundations through RPAs will be manually excavated to 750mm depth under arboricultural supervision; any roots encountered within the trenches / pits will be cleanly pruned back to an appropriate junction with a sharp pruning saw or secateurs back to a junction. Roots larger than 25mm diameter may only be cut in consultation with an arboriculturalist. It is recommended that the existing raised beds around T8 – T12 are retained in the future, therefore require incorporating into the proposed landscaping scheme.

6.3.3 The driveway 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 required. The finished section is likely to be 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.

6.3.4 The immediate canopy encroachment can be avoided with minor tree works to cut-back the overhanging branches.

6.3.5 Nuisance deposition can be further mitigated with routine maintenance, light pruning / deadwooding and the fitting of filtration traps on guttering (see Figure 5 below).

6.3.6 The landscape impact of tree losses on the grounds of sound husbandry 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 4.

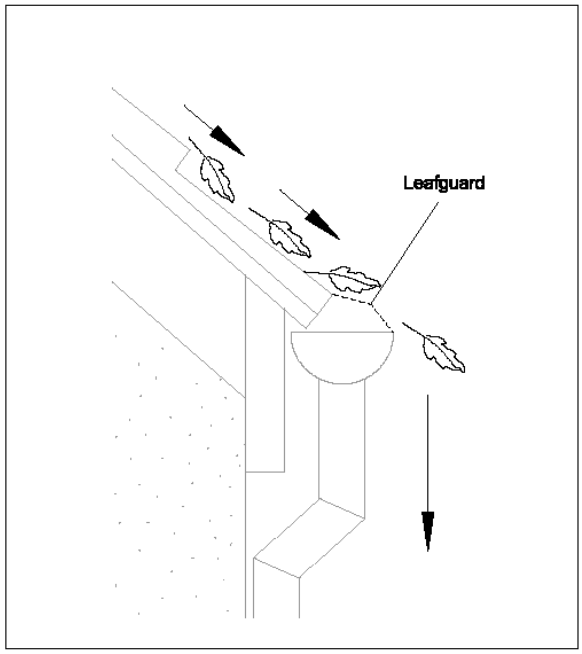

Figure 5: Filtration traps, as shown, could be fitted on the gutters which can easily be maintained at 2-3m above ground.

6.3.8 The potential root damage from the construction impacts (drive and piling excavation) can be partly mitigated by soil treatment and light pruning / dead wooding. 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 (see Figure 6). 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.

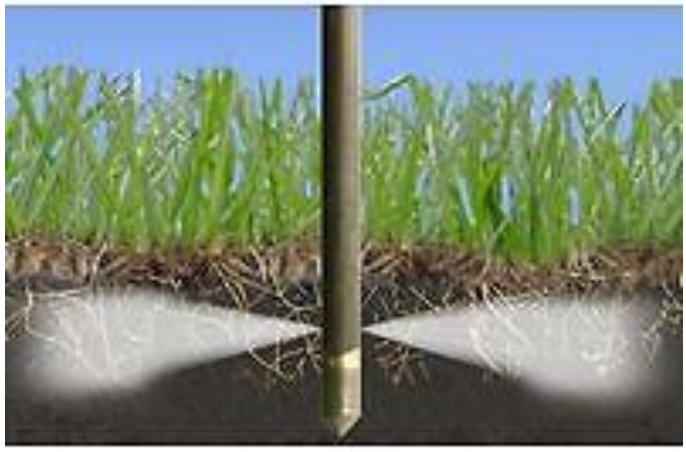

Figure 6: Soil fertiliser Injection

7.0 CONCLUSION

7.1	The extensive investigations with trial pits (see Appendix 5) have ensured that the potential impacts of development are all relatively low in terms of the RPA encroachments of the surveyed trees.
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	Therefore, the proposals will not have any significant impact on either the retained trees or wider landscape. Thus, with suitable mitigation and supervision the scheme is recommended to planning.

8.0 RECOMMENDATIONS

8.1 Specific Recommendations

8.1.1 Current tree works recommendations are found in Appendix 2 to this report, with works to facilitate development in Appendix 3 and a selection of columnar tree species cultivars for constricted sites provided in Appendix 4. Any tree removals recommended within this report should only be carried out with local authority consent.

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.

8.2 General Recommendations for Sites Being Developed with Trees

8.2.1 Any trees which are in close proximity to the proposed development should be protected with a Tree Protection Barrier (TPB). Protective barrier fencing should be installed immediately following the completion of the tree works, remaining in situ for the entire duration of the development unless otherwise agreed in writing by the Council. It should be appropriate for the intensity and proximity of the development, usually comprising steel, mesh panels 2.4m in height ('Heras') and should be mounted on a scaffolding frame (shown in Fig 2 of BS5837:2012). The position of the TPB can be shown on plan as part of the discharge of conditions, once the layout 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 be 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 BS5837:2012 and 'The Principles of Arboricultural Practice: Note 1, Driveways Close to Trees, AAIS 1996 [APN1]'.

8.2.6 If the RPA of a tree is encroached by underground service routes then BS5837:2012 and NJUG VOLUME 4 provisions should be employed. If it is deemed necessary, further arboricultural advice must be sought.

8.2.7 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.

8.2.8 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.

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

8.2.10	The sequence of works should be as follows:	
	i)	initial tree works: felling, stump grinding and pruning for working clearances;
	ii)	installation of TPB for demolition & construction;
	iii)	installation of underground services;
	iv)	installation of ground protection;
	v)	main construction;
	vi)	removal of TPB;
	vii)	soft landscaping.

9.0 REFERENCES

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Landmark Trees

PART 2 – APPENDICES

APPENDIX 1

TREE SCHEDULE

Botanical Tree Names

Ash, Common	: Fraxinus excelsior	Cypress, Lawson	: Chamaecyparis lawsonia
Beech, Common	: Fagus sylvatica	Holly, Common/English	: Ilex aquifolium
Beech, Copper	: Fagus sylvatica f. purpurea	Laurel	: Laurocerasus spp
Birch, Silver	: Betula pendula	Oak, English	: Quercus robur
Cedar, Atlantic	: Cedrus atlantica	Pine, Scots	: Pinus sylvestris
Cherry, flowering	: Prunus spp	Plane, London	: Platanus acerifolia
Chestnut, Horse	: Aesculus hippocastanum	Sycamore	: Acer pseudoplatanus

Notes for Guidance:

1. Height describes the approximate height of the tree measured in metres 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 metres of crown clearance above adjacent ground level.
4. Stem Diameter (Dm) is the diameter of the stem measured in millimetres at 1.5m from ground level for single stemmed trees. BS 5837:2012 formula (Section 4.6) used to calculate diameter of multi-stemmed trees. Stem Diameter may be estimated where access is restricted and denoted by '#'.
5. Protection Multiplier is 12 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 5837:2012 section 4.5) and refers to tree/group quality and value; 'A' – High, 'B' - Moderate, 'C' - Low, 'U' - Unsuitable for retention. The following colouring has been used on the site plans:
    - High Quality (A) (Green),
    - Moderate Quality (B) (Blue),
    - Low Quality (C) (Grey),
    - Unsuitable for Retention (U) (Red)
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

Site: 28 Redington Road
Date: 4 & 13/8/15

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd
020 7851 4544
Surveyor(s): Adam Hollis
Ref: JCA/28RDR/AIA

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
1	Beech, Copper	13	7	4.0	990	Mature	11.9	Moderate	Fair	B	2	20+	A sparser than normal canopy Restricted rooting, poor root flare Possible cavity openings in pruning wounds on road side
2	Cherry, Flowering	8	5,4,5,3	2.0	250	Early Mature	3.0	Poor	Poor	U		<10	Bacterial canker Dying back (unilateral)
G3	Cypress, Lawson variety	4	1	0.0	98	Semi-mature	1.2	Normal	Good	C	2	>40	A tree with insignificant defects
4	Cherry, Flowering	7	4343	3.0	227	Early Mature	2.7	Moderate	Fair	C	2	10+	Decay in trunk Long low lateral branch over road
5	Laburnum	9	1311	2.5	300	Early Mature	3.6	Moderate	Poor	U		<10	Canker in main fork Included bark in main stem unions
6	Plane, London	14	2535	3.5	707	Mature	8.5	Normal	Fair	B	2	>40	Co-dominant stems Remote survey only (RS) Lesser level to site with intervening retaining wall

Landmark Trees

Site: 28 Redington Road
Date: 4 & 13/8/15

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Ref: JCA/28RDR/AIA

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
7	Sycamore	15	6266	3.0	608	Mature	7.3	Normal	Fair	B	2	>40	Multi stem weakness Remote survey only (RS) Lesser level to site with intervening retaining wall
8	Beech, Common	16	5535	2.0	530	Mature	6.4	Normal	Good	B	1	20+	Restricted rooting Terraced 2m drop to W, 1m to E Honey fungus 'endemic:' beech stump 3m to S
9	Beech, Common	16	5666	2.0	410	Early Mature	4.9	Normal	Fair	B	2	20+	Same comments as T8 Co-dominant stems Ivy clad
10	Beech, Common	16	4163	2.0	340	Early Mature	4.1	Normal	Fair	C	2	20+	Same comments as T8 Suppressed by nearby tree Lost leader / crossing branches in upper crown
11	Beech, Common	16	5666	2.0	475	Mature	5.7	Normal	Fair	B	2	20+	Same comments as T8 Co-dominant stems terracing to S and E. Lost leader / crossing branches in uppe crown
12	Beech, Common	18	4466	2.0	570	Mature	6.8	Normal	Fair	C	2	20+	Same comments as T8 Decay in trunk (c. 100mm cavity) Further decayed wound on lower trunk N

Landmark Trees

Site: 28 Redington Road
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Appendix 1

BS5837 Tree Constraints Survey Schedule

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Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
13	Oak, English	17	8	5.0	1000	Veteran	12.0	Moderate	Fair	A	3	>40	A sparser than normal canopy Restricted rooting Remote survey only (RS) Growing out of terrace wall
14	Beech, Common	16	5633	2.0	300	Early Mature	3.6	Normal	Fair	B	2	>40	Restricted rooting N Slightly kinked stem
15	Beech, Common	16	3444	2.5	230	Semi-mature	2.8	Normal	Fair	C	2	20+	Restricted rooting N Suppressed by nearby tree
16	Beech, Common	18	4	5.0	480	Early Mature	5.8	Dead	Fair	U			Recently died: shrivelled leaves
17	Birch, Silver	19	4	2.5	470	Mature	5.6	Normal	Fair	C	1	10+	Decay at trunk base Ivy clad base Taps hollow in limited area of cavity opening
G18	Holly & Laurel	6	3	2.0	150	Semi-mature	1.8	Normal	Fair	C	2	20+	Evergreen boundary screening

Landmark Trees

Site: 28 Redington Road
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Appendix 1

BS5837 Tree Constraints Survey Schedule

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Ref: JCA/28RDR/AIA

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
19	Oak, English	17	2419	7.0	830	Veteran	10.0	Poor	Poor	A	3	>40	Asymmetry (major) to neighbor's Cavity in trunk Significant dead wood and decay / wildlife habitat
20	Pine, Scots	17	1536	10.0	540	Mature	6.5	Moderate	Fair	B	3	20+	Dying back (unilateral) Low live crown ratio Woodpecker holes at 8m abg Dead limb East at 10m over path
21	Sycamore	20	3544	1.5	430	Early Mature	5.2	Normal	Fair	B	2	20+	2 x pruning cavities at 6m abg
22	Pine, Scots	19	3121	16.0	400	Early Mature	4.8	Moderate	Poor	C	2	10+	Low live crown ratio Deadwood (minor) throughout crown Crowding T23. Woodpecker holes at 8m abg
23	Oak, English	19	8977	7.0	1200	Veteran	14.4	Moderate	Fair	A	3	>40	Remote survey only (RS) Deadwood throughout crown Significant dead wood and decay / wildlife habitat
24	Holly	9	2	0.0	200	Early Mature	2.4	Normal	Good	C	1	>40	A tree with insignificant defects

Landmark Trees

Site: 28 Redington Road
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Appendix 1

BS5837 Tree Constraints Survey Schedule

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Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
25	Holly	7	3432	0.0	139	Early Mature	1.7	Normal	Fair	C	2	20+	Multi stem weakness Included bark in main stem unions
26	Chestnut, Horse	19	7, 7, 10, 10	2.0	1030	Post-Mature	12.4	Moderate	Fair	B	3	20+	Multiple pruning cavities c. 8m abg Deadwood (minor) throughout crown
27	Ash, Common	20	3,3, 10, 10	5.0	1100	Veteran	13.2	Moderate	Poor	B	3	20+	Asymmetry (major) Decay at trunk base (major) Major deadwood, long etiolated crown, low live ratio with Daldinia fungus along lower half
28	Sycamore	17	6244	10.0	300	Early Mature	3.6	Normal	Fair	C	2	>40	Low live crown ratio RS
29	Chestnut, Horse	12	5352	1.5	420	Early Mature	5.0	Poor	Poor	U		<10	Fire damaged, leaning stem Polyporus decay fungi on stem Major decay in base
30	Holly	7	2	0.0	110	Early Mature	1.3	Normal	Good	C	1	>40	A tree with insignificant defects

Landmark Trees

Site: 28 Redington Road
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Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd
020 7851 4544
Surveyor(s): Adam Hollis
Ref: JCA/28RDR/AIA

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
31	Cedar, Atlantic	10	0		760	Post-Mature	9.1	Dead	Fair				Habitat stump
32	Sycamore	20	8686	12.0	707	Mature	8.5	Normal	Fair	B	2	>40	Co-dominant stems Ivy clad RS
33	Sycamore	18	3325	2.0	410	Early Mature	4.9	Poor	Fair	C/u	2	20+	Squirrel damage Dying back (lead stem /centre)
34	Holly	10	3	0.0	354	Early Mature	4.2	Normal	Good	B	2	20+	Co-dominant stems Grafted together Reasonably strong unions
35	Sycamore	20	6788	10.0	651	Mature	7.8	Normal	Fair	B	2	>40	Co-dominant stems Good union Girdling root S
36	Birch, Silver	19	5335	6.0	380	Mature	4.6	Moderate	Fair	B	2	20+	Kinked stem above wound Decay in wound Top over path

Landmark Trees

Site: 28 Redington Road

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Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Adam Hollis

Ref: JCA/28RDR/AIA

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
37	Pine, Scots	10	0		390	Post-Mature	4.7	Dead	Poor				Habitat stump Significantly decayed
38	Sycamore	20	5263	10.0	380	Early Mature	4.6	Normal	Fair	B	2	>40	Asymmetry (minor) Suppressed by nearby tree Limited view of crown through canopy
39	Sycamore	20	6788	10.0	760	Mature	9.1	Normal	Fair	A	2	>40	Ltd viewing as per T38
G40	Birch, Silver	18	2	10.0	150	Semi-mature	1.8	Moderate	Fair	C	2	20+	Suppressed by nearby tree Several hollies 8/2/1/100/c

APPENDIX 2

RECOMMENDED TREE WORKS

Notes for Guidance:

Husbandry 1 - Urgent (ASAP), 2 - Standard (within 6 months), 3 - Non-urgent (2-3 years)

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 - Check / monitor progress of defect(s) at next consultant inspection which should be <18 months in frequented areas and <3 years in areas of more occasional use. Where the Owner/Instructing Party retain their own ground staff, we recommend an annual in- house inspection and where practical, in the aftermath of extreme weather events.
Svr Ivy / Clr Bs - Sever ivy / clear base and re-inspect base / stem for concealed defects.

*Not generally specified following BS3998:2010

Landmark Trees

Site: 28 Redington Road
Date: 4 & 13/8/15

Surveyor(s): Adam Hollis
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Appendix 2

Recommended Tree Works

Hide irrelevant
Show All Trees

Tree No.	English Name	B.S. Cat	Height	Ground Clearance	Crown Spread	Recommended Works	Comments/ Reasons
1	Beech, Copper	B	13	4.0	7	FInv Climbing inspection	A sparser than normal canopy Restricted rooting, poor root flare Possible cavity openings in pruning wounds on road side Recommended husbandry 3
2	Cherry, Flowering	U	8	2.0	5,4,5,3	Fell	Bacterial canker Dying back (unilateral) Recommended husbandry 2
4	Cherry, Flowering	C	7	3.0	4343	Fell	Decay in trunk Long low lateral branch over road Recommended husbandry 2
5	Laburnum	U	9	2.5	1311	Fell	Canker in main fork Included bark in main stem unions Recommended husbandry 2
8	Beech, Common	B	16	2.0	5535	Mon Re-inspect in Autumn	Restricted rooting Terraced 2m drop to W, 1m to E Honey fungus 'endemic:' beech stump 3m to S Recommended husbandry 2
9	Beech, Common	B	16	2.0	5666	Mon Svr Ivy Re-inspect in Autumn	Same comments as T8 Co-dominant stems Ivy clad Recommended husbandry 2
10	Beech, Common	C	16	2.0	4163	Mon Re-inspect in Autumn	Same comments as T8 Suppressed by nearby tree Lost leader / crossing branches in upper crown Recommended husbandry 2

Landmark Trees

Site: 28 Redington Road
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Appendix 2

Recommended Tree Works

Hide irrelevant
Show All Trees

Tree No.	English Name	B.S. Cat	Height	Ground Clearance	Crown Spread	Recommended Works	Comments/ Reasons
11	Beech, Common	B	16	2.0	5666	Mon Re-inspect in Autumn	Same comments as T8 Co-dominant stems terracing to S and E. Lost leader / crossing branches in upper crown Recommended husbandry 2
12	Beech, Common	C	18	2.0	4466	FInv Further Investigation	Same comments as T8 Decay in trunk (c. 100mm cavity) Further decayed wound on lower trunk N Recommended husbandry 2
13	Oak, English	A	17	5.0	8	FInv	A sparser than normal canopy Restricted rooting Remote survey only (RS) Growing out of terrace wall Recommended husbandry 3
16	Beech, Common	U	18	5.0	4	Fell	Recently died: shrivelled leaves Recommended husbandry 2
17	Birch, Silver	C	19	2.5	4	FInv Svr Ivy	Decay at trunk base Ivy clad base Taps hollow in limited area of cavity opening Recommended husbandry 2
19	Oak, English	A	17	7.0	2419	FInv DWD Climbing inspection with view to cabling / lessening overhang, but keep live crown. Modest deadwooding	Asymmetry (major) to neighbor's Cavity in trunk Significant dead wood and decay / wildlife habitat Recommended husbandry 2
20	Pine, Scots	B	17	10.0	1536	FInv DWD Climbing inspection DWD = reduce dead limb to stub	Dying back (unilateral) Low live crown ratio Woodpecker holes at 8m abg Dead limb East at 10m over path Recommended husbandry 2

Landmark Trees

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Appendix 2

Recommended Tree Works

Hide irrelevant
Show All Trees

Tree No.	English Name	B.S. Cat	Height	Ground Clearance	Crown Spread	Recommended Works	Comments/ Reasons
21	Sycamore	B	20	1.5	3544	FInv Climbing inspection	2 x pruning cavities at 6m abg Recommended husbandry 2
22	Pine, Scots	C	19	16.0	3121	Mon Re-inspect in 2-3 years	Low live crown ratio Deadwood (minor) throughout crown Crowding T23. Woodpecker holes at 8m abg Recommended husbandry 3
26	Chestnut, Horse	B	19	2.0	7, 7, 10, 10	FInv Climbing inspection	Multiple pruning cavities c. 8m abg Deadwood (minor) throughout crown Recommended husbandry 2
27	Ash, Common	B	20	5.0	3,3, 10, 10	FInv CR30% Climbing and basal decay inspection - CAN 2015/5968/T approved to crown reduce by 30%/5m	Asymmetry (major) Decay at trunk base (major) Major deadwood, long etiolated crown, low live ratio with Daldinia fungus along lower half Recommended husbandry 1
29	Chestnut, Horse	U	12	1.5	5352	Fell CAN 2015/5968/T approved to fell	Fire damaged, leaning stem Polyporus decay fungi on stem Major decay in base Recommended husbandry 2
31	Cedar, Atlantic		10		0	Mon Monitor ongoing condition	Habitat stump Recommended husbandry 3
33	Sycamore	C/u	18	2.0	3325	Fell	Squirrel damage Dying back (lead stem /centre) Recommended husbandry 2

Landmark Trees

Site: 28 Redington Road
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Appendix 2

Recommended Tree Works

Hide irrelevant
Show All Trees

Tree No.	English Name	B.S. Cat	Height	Ground Clearance	Crown Spread	Recommended Works	Comments/ Reasons
34	Holly	B	10	0.0	3	Mon Monitor ongoing condition	Co-dominant stems Grafted together Reasonably strong unions Recommended husbandry 3
36	Birch, Silver	B	19	6.0	5335	FInv Climbing inspection Fell option	Kinked stem above wound Decay in wound Top over path
37	Pine, Scots		10		0	Fell	Habitat stump Significantly decayed Recommended husbandry 2
38	Sycamore	B	20	10.0	5263	Mon Re-inspect in Winter	Asymmetry (minor) Suppressed by nearby tree Limited view of crown through canopy Recommended husbandry 2
39	Sycamore	A	20	10.0	6788	Mon Re-inspect in Winter	Ltd viewing as per T38 Recommended husbandry 2

APPENDIX 3

RECOMMENDED TREE WORKS TO FACILITATE DEVELOPMENT (See Table 1)

Notes for Guidance:

RP - Pre-emptive root pruning of foundation encroachments under arboricultural supervision.
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 - Check / monitor progress of defect(s) at next consultant inspection which should be <18 months in frequented areas and <3 years in areas of more occasional use. Where the Owner/Instructing Party retain their own ground staff, we recommend an annual in- house inspection and where practical, in the aftermath of extreme weather events.
Svr Ivy / Clr Bs - Sever ivy / clear base and re-inspect base / stem for concealed defects.

*Not generally specified following BS3998:2010

Landmark Trees

Site: 28 Redington Road
Date: 4 & 13/8/15

Surveyor(s): Adam Hollis
Ref: JCA/28RDR/AIA

Appendix 3

Recommended Tree Works To Facilitate Development

Hide irrelevant
Show All Trees

Tree No.	English Name	B.S. Cat	Height	Ground Clearance	Crown Spread	Recommended Works	Comments/ Reasons
8	Beech, Common TPO	B	16	2.0	5535	CB Cut back to facilitate construction	Restricted rooting Terraced 2m drop to W, 1m to E Honey fungus 'endemic:' beech stump 3m to S To facilitate development
9	Beech, Common TPO	B	16	2.0	5666	CB Cut back to facilitate construction	Same comments as T8 Co-dominant stems Ivy clad To facilitate development
10	Beech, Common TPO	C	16	2.0	4163	CB Cut back to facilitate construction	Same comments as T8 Suppressed by nearby tree Lost leader / crossing branches in upper crown To facilitate development
11	Beech, Common	B	16	2.0	5666	CB Cut back to facilitate construction	Same comments as T8 Co-dominant stems terracing to S and E. Lost leader / crossing branches in upper crown To facilitate development
12	Beech, Common	C	18	2.0	4466	CB Cut back to facilitate construction	Same comments as T8 Decay in trunk (c. 100mm cavity) Further decayed wound on lower trunk N To facilitate development
G18	Holly & Laurel	C	6	2.0	3	CB Cutback to facilitate construction	Evergreen boundary screening To facilitate development construction

APPENDIX 4

TREE SELECTION FOR URBAN LOCATIONS

Table A4.1: Small Ornamental Tree Species

Common Name	Species	(Columnar Form for discrete usage)
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
Swedish whitebeam	Sorbus intermedia	Brouwers
B. whitebeam	Sorbus x thuringiaca	Fastigiata

Table A4.2: Medium Specimen Tree Species

Common Name	Species	(Columnar Form for discrete usage)
Chinese red bark birch	Betula albosinensis	Fascination
Mongolian lime	Tilia mongolica	
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

Table A4.3: Larger Specimen Tree Species

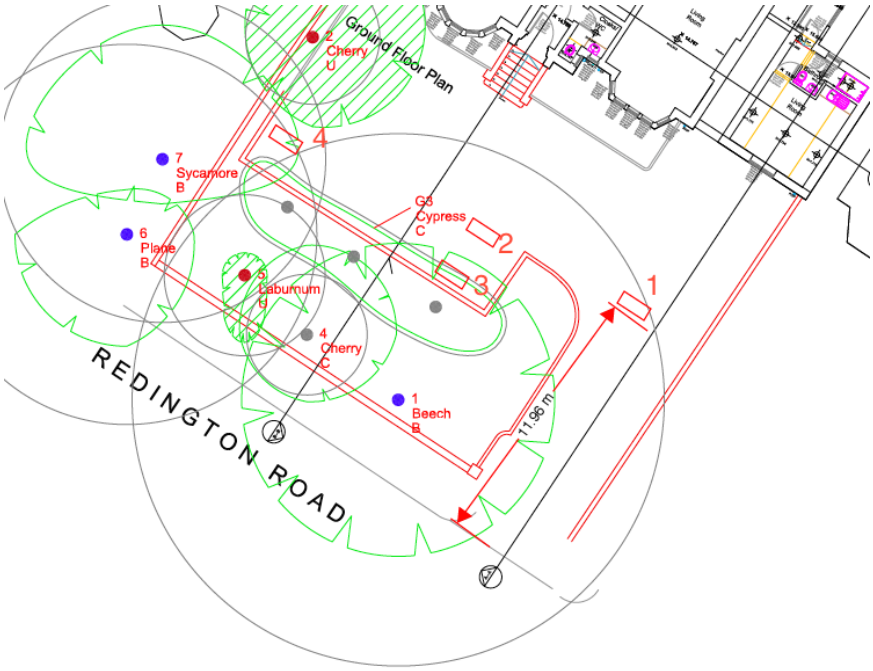
Common Name	Species	(Columnar Form for discrete usage)
English oak	Quercus robur	f. Koster
American elm	Ulmus americana Princeton	
Cedar of Lebanon	Cedrus libani	

APPENDIX 5

TRIAL PIT RESULTS

1.0 Introduction

1.1	6 trial pits were excavated by Graham Penney and David Abbott from ArborAeration on the 29th and 30th September 2015 (see Plan Extracts 1 and 2 below). A further 3 trial pits were excavated by Graham Penney from ArborAeration on the 3rd of November 2015 (see Plan Extract 3 below). Plots were excavated using an air spade and manual digging tools.



Plan Extract 1: Trial pits 1 – 4 dug on 29th and 30th September 2015

Plan Extract 2: Trial pits 5 – 6 dug on 29th and 30th September 2015

Plan Extract 3: Trial pits 7 – 9 dug on 3rd of November 2015

2.0 Results

2.1 The results from the 9 trial pits are provided in Table A5, with the photographs from ArborAeration of each Trial Pit provided below.

Table A5: Results of the Trial Pits

Trial Pit No:	Dimensions and Results
Trial Pit 1	40cm Wide, 1.2m Long, 75cm Deep. No Roots
Trial Pit 2	40cm Wide, 1.5m Long, 75cm Deep. No Roots
Trial Pit 3	40cm Wide, 1.5m Long, 75cm Deep. 1x35mm root 1x30mm root
Trial Pit 4	40cm Wide, 1,5m Long, 75cm Deep. 1x25-35mm root (Cypress)
Trial Pit 5	40cm Wide, 1.5m Long, 75cm Deep. 1x10mm root 1x15mm root 1x25mm root
Trial Pit 6	40cm Wide, 1,5m Long, 75cm Deep. 1x10mm root
Trial Pit 7 (Joined TP5 and TP6)	30cm Wide, 3.8m Long, 70cm Deep. A number of roots under 20mm
Trial Pit 8	30cm Wide, 1.m Long, 70cm Deep. 2 x roots under 15mm
Trial Pit 9	30cm Wide, 1.5m Long, 70cm Deep. No Roots

Photographic Evidence

Trial Pit 1

Trial Pit 2

Trial Pit 3

Trial Pit 4

Trial Pit 5

Trial Pit 6

Photographic Evidence

Trial Pit 7


5
7
6

Trial Pit 8

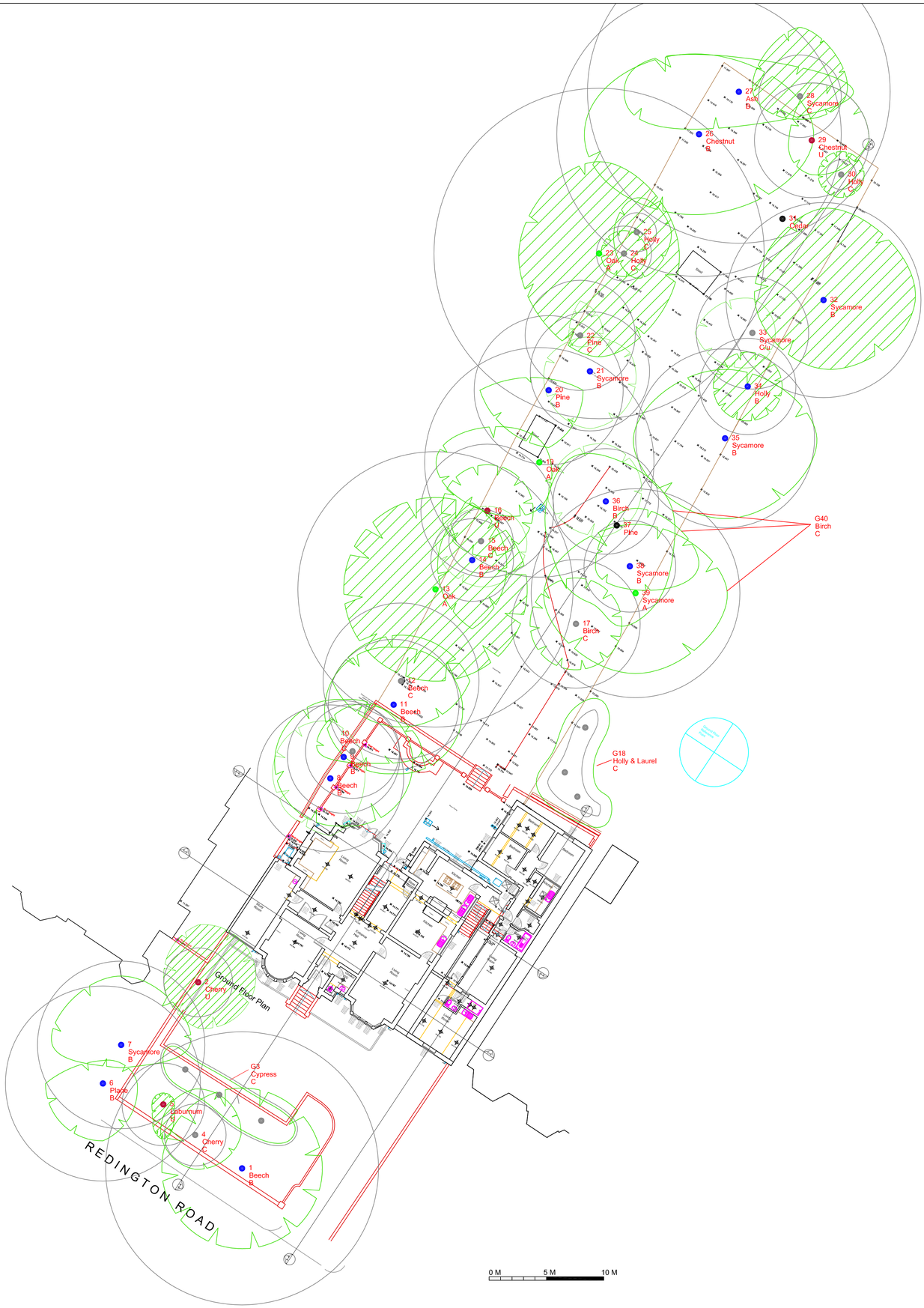
Trial Pit 9

Landmark Trees

PART 3 – PLANS

PLAN 1

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).

Landmark Trees

20 Broadwick Street, London, W1F 8HT
Tel: 0207 851 4544 Mobile: 07812 989928
e-mail: info@landmarktrees.co.uk Web: www.landmarktrees.co.uk

Site: 28 Redington Road	1:200@ A1
Drawing Title: Tree Constraints Plan	August 2015

Key:

- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category U Trees Unsuitable for Retention

Category · Crown Spread · Tree Number · Species · Category · Root Protection Area

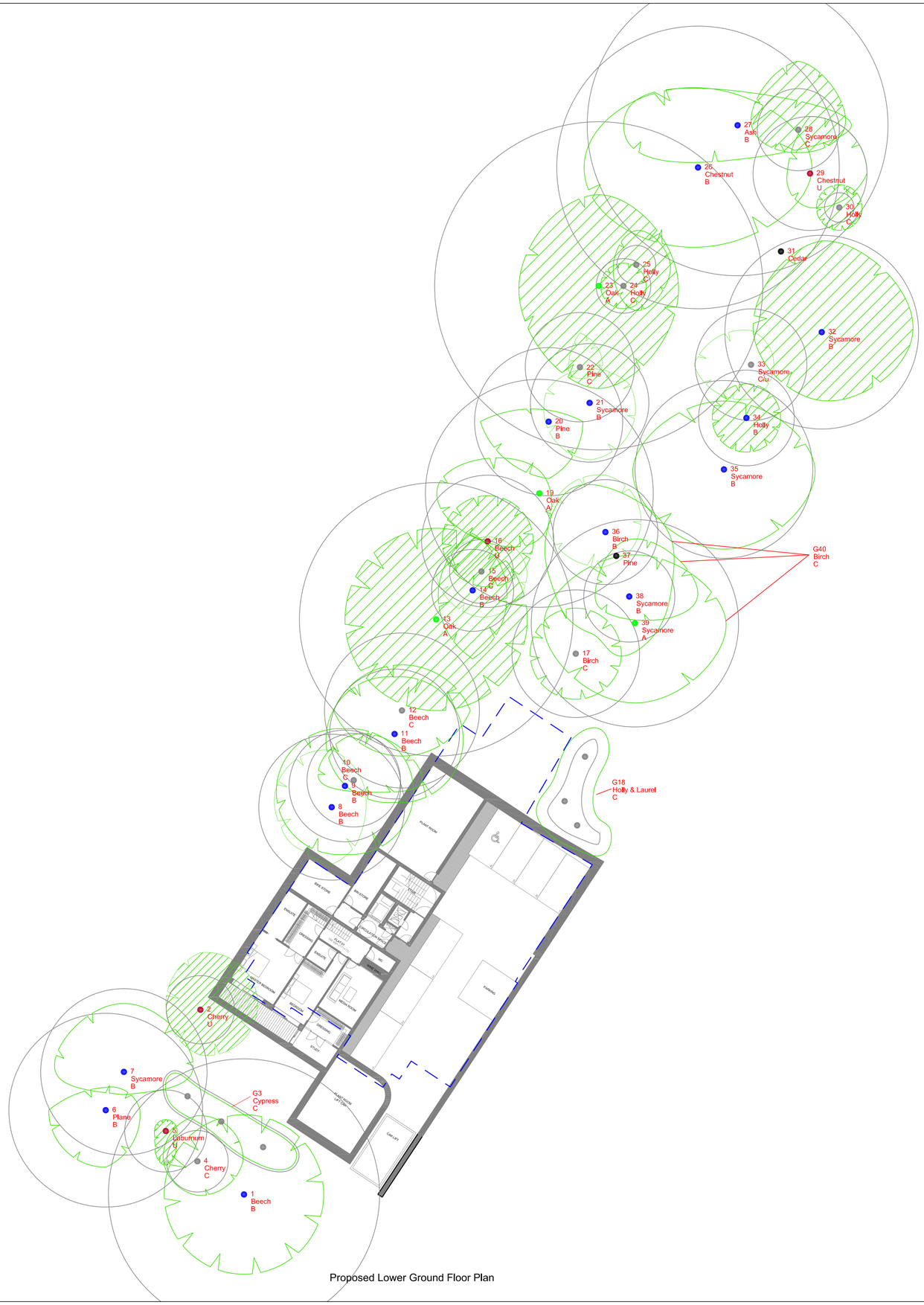
13 Birch B2

Tree Position Approximate (not shown on original survey)

PLAN 2

ARBORICULTURAL IMPACT ASSESSMENT PLANS

i. Lower Ground Floor
ii. Ground Floor



Proposed Lower Ground Floor 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).

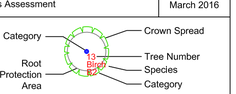
Landmark Trees

20 Broadwick Street, London, W1F 8HT
Tel: 0207 851 4544 Mobile: 07812 989928
e-mail: info@landmarktrees.co.uk Web: www.landmarktrees.co.uk

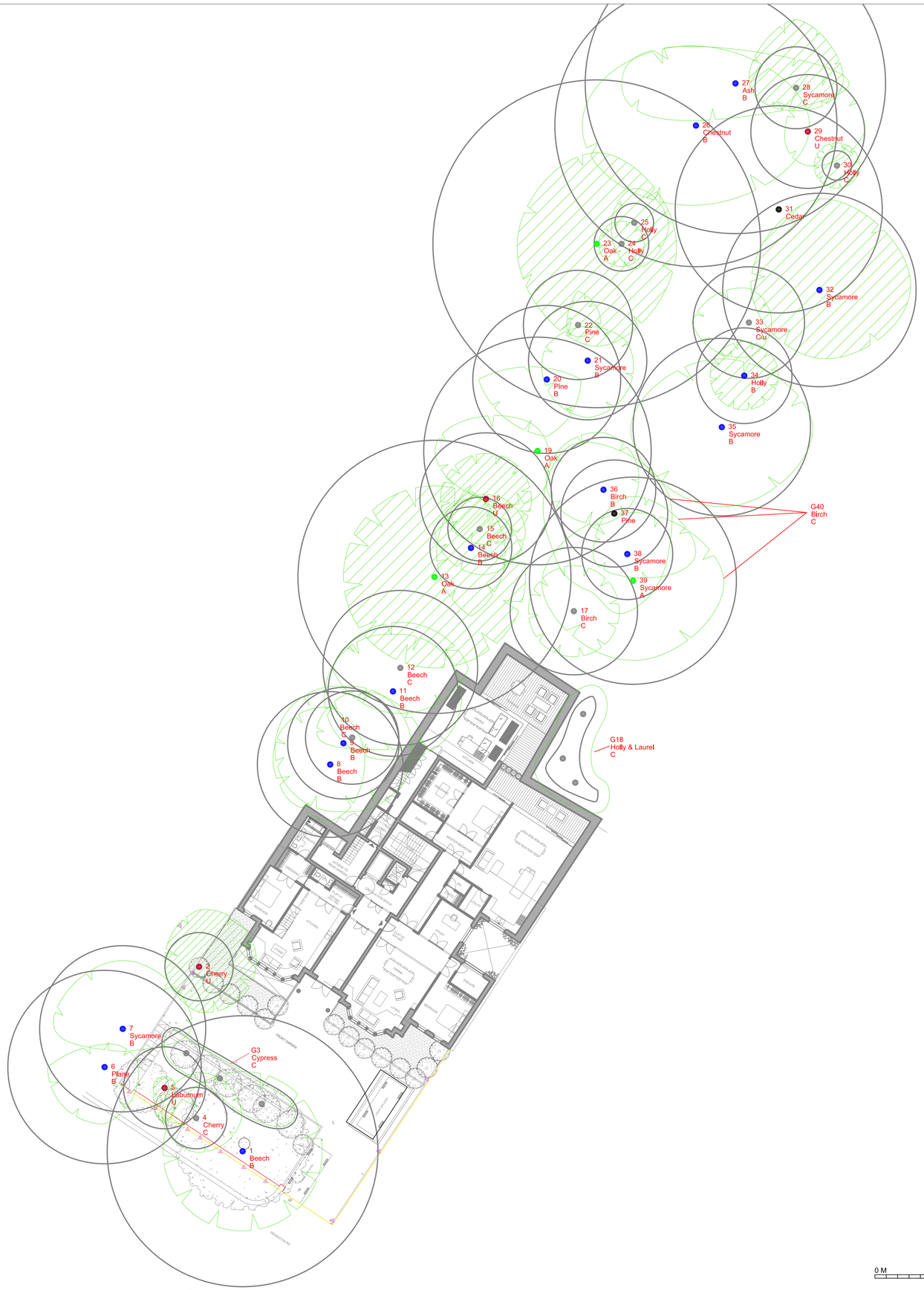
Site: 28 Redington Road	1:200@ A1
Drawing Title: Arboricultural Impacts Assessment	March 2016

Key:

- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category U Trees Unsuitable for Retention



Tree Position Approximate (not shown on original survey)



Proposed Ground Floor 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).

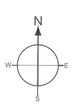
Landmark Trees

20 Broadwick Street, London, W1F 8HT
Tel: 0207 851 4544 Mobile: 07812 989928
e-mail: info@landmarktrees.co.uk Web: www.landmarktrees.co.uk

Site: 28 Redington Road	1:200@ A1
Drawing Title: Arboricultural Impacts Assessment	May 2016

Key:

- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category U Trees Unsuitable for Retention



Tree Position Approximate (not shown on original survey)