Landmark Trees

ARBORICULTURAL IMPACT ASSESSMENT REPORT:

53 Fitzroy Park

London

N6 6JA

REPORT PREPARED FOR:

Smarter Building and Construction Limited

17 Willifield Way

London

NW11 7XU

REPORT PREPARED BY

Adam Hollis

MSc ARB MICFor FArbor A MRICS C Env

Ref: WFA/53FZP/AIA/01D

Date: 12th December 2014

APPENDICES

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 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:	Smarter Building and Construction Limited	**Case Ref:**	WAL/53FP/AIA/01D
Local Authority:	LB Camden	**Date:**	12th December 2014
Site Address: 53 Fitzroy Park, London N6 6JA			
Proposal: Demolition of existing property and replacement with detached dwelling with basement			

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	(Ref C6 – trees to the front of the property)	
Tree Protection Plan:	Y	(Include in Outline Method Statement WFA/53FZP/AMS/01b)	
Tree Constraints Plan:	Y		
Arboricultural Impact Assessment:	Y		

Site Layout				
Site Visit	Y	Date: 12/09/13	Access Full/Partial/None	F
Trees on Site	Y		Off-site Trees	N
Trees affected by development	Y		O/s trees affected by development	N
Tree replacement proposed:	Y		On or off-site trees indirectly affected by development	N

Trees with the potential to be affected

Removal of 4 category C trees (T3, T18, T19 & T20). Demolition of existing building within RPA of T22 (mitigation available – low impact). Removal/replacement of existing hard surfaces within RPA of T1 & 2 (beyond retaining wall – very low/negligible impact)

Comments

All works permitted under Tree Works Applications 2013/6828/T (approved 16/12/13) and 2013/6725/T (No objection) have been undertaken. Replacement trees conditioned under 2013/6828/T will be incorporated into the proposed landscape scheme (See Proposed Landscaping Plan in Appendix 4))

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	N

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'

1. SUMMARY

1.1 This report comprises an arboricultural impact assessment of the revised proposals for 53 Fitzroy Park, London N6 6JA, reviewing any conflicts between the recent revisions and material tree constraints identified in our survey. The revisions have moved the proposed building 1.25m south and reduced the height by 450mm.

1.2 During the initial survey in September 2013, it was noted that the site was overgrown and the garden had generally been left in what could arguably be described as an unusable state. Accordingly, Tree Works Applications were submitted (Refs: 2013/6828/T & 2013/6725/T) in liaison with LB Camden Tree Section to remove 17 poor quality/supressed and dead trees (coloured red and purple on the AIA plan in Appendix 6). The applications were approved and the trees have been felled. The 12 retained trees comprise 3 'B' category *(Moderate Quality) trees and 9 'C' category *(Low Quality) trees. 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.

1.3 The principal primary impacts in the current proposals are the felling of T3, T18, T19 and T20. The overall loss of these 4 trees is rated as a low impact, with no significant effect on the visual character of the local conservation area. The removal of these trees was consented under a previous scheme (2011/1682/P). The proposed replanting scheme is shown in Appendix 4 of this report, which will include 22 new trees. This replanting will also include the two small leaved limes (Tilia Cordata) specified in condition 3 of 2013/6828/T.

1.4 Other primary impacts comprise the demolition of the existing building within a small area of T22's theoretical RPA, therefore mitigation has been proposed to reduce the potentially low impacts. Further low impacts include alterations to the existing hard landscaping and the replacement path/pedestrian access. The revisions have ensured that there are no RPA encroachments from the new dwelling. Low impacts are theoretically possible from the removal and replacement of existing hard standing for driveway access within the RPA's of T1 & T2; however, the rooting area of these trees will have been restricted by the retaining walls and will likely be confined to the raised area. The likely impacts are therefore very low/negligible and will be mitigated in accordance with the Method Statement.

1.5 Secondary impacts will be low/negligible, comprising organic deposition only. The recent tree works and minor changes to the position of the building will ensure that the secondary impacts are lower than exist today.

1.6 The site has potential for development without impacting significantly on the wider tree population or local landscape. Thus, with suitable mitigation and supervision the scheme is viable.

* British Standards Institute: Trees in relation to design, demolition and construction BS 5837: 2012 HMSO, London

2. INTRODUCTION

2.1 Terms of reference

2.1.1 LANDMARK TREES were asked by Smarter Building and Construction Limited to provide a survey and an arboricultural impact assessment of proposals for the site: 53 Fitzroy Park, London N6 6JA. The report is to accompany a planning application.

2.1.2 The recently revised proposals are for the demolition of an existing dwelling and replacement with a new sustainable family house, built in a mixture of high quality traditional and contemporary materials. The proposal will comprise a basement, lower ground, ground and first floor, with the revisions moving the building 1.25m south and reducing the height by 450mm. Two external parking spaces will be provided on the north east side of the building in line with the existing provision. New landscaping is proposed as part of the application, as shown on the plan within Appendix 4 of this report.

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 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:

Existing site survey: 11589B-TOPO

Proposals: 1317-PL-212-lower ground floor-WORKING

2.3 Scope of survey

2.3.1 As Landmark Trees' (LT) arboricultural consultant, I surveyed the trees on site on 12th September 2013, 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.

2.4.2 A site plan identifying the surveyed trees, based on the client's drawings / topographical survey is provided in Appendix 5.

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 client's proposals to create an Arboricultural Impact Assessment Plan in Appendix 6. General observations and discussion follow, below.

3.0 OBSERVATIONS

3.1 Site description

Photograph 1: Aerial view from the east of 53 Fitzroy Park, London N6 6JA

3.1.1	The existing property is situated off Fitzroy Park, which is a private road located in the north-eastern boundary of Hampstead Heath. The current residential dwelling is developed over 3 storeys, two of these above street level and a lower ground floor at the back garden level. The current dwelling is dilapidated.
3.1.2	There are significant changes of level with the site sloping away from east to west, requiring a number of retaining features.
3.1.3	In terms of the British Geological Survey, the site overlies the London Clay Formation (see indicated location on Fig.1 plan extract below). 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. The actual distribution of the soil series are not as clearly defined on the ground as on plan and there may be anomalies in the actual composition of clay, silt and sand content.
3.1.4	Clay soils are prone to compaction during development with damage to soil structure potentially having a serious impact on tree health. The design of foundations near problematic tree species will also need to take into consideration subsidence risk. Further advice from the relevant experts on the specific soil properties can be sought as necessary.

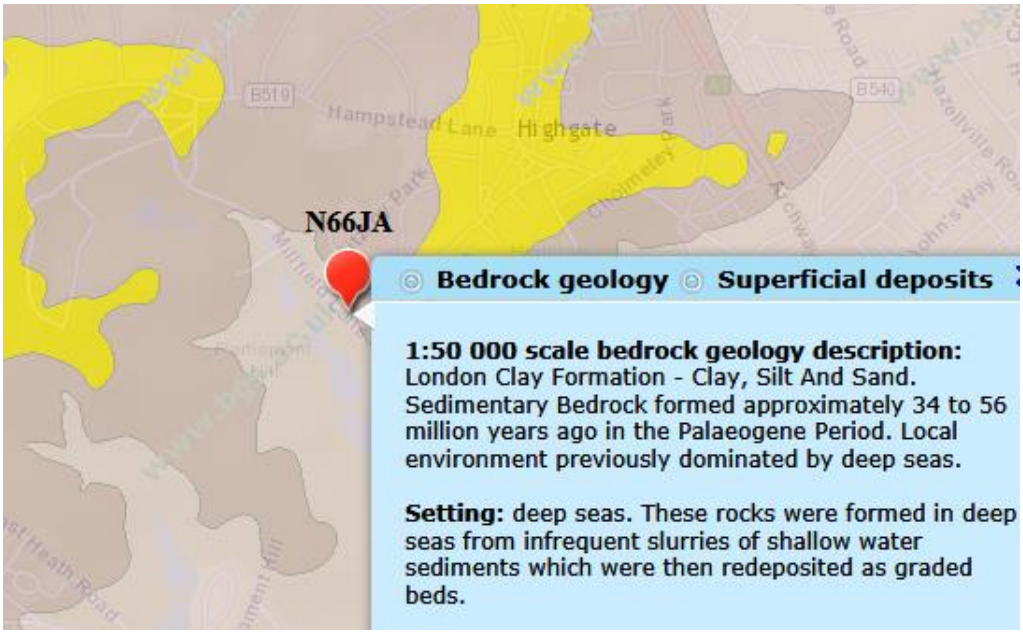

Figure 1: Extract from the BGS Geology of Britain Viewer

3.2 Subject trees

3.2.1	Of the 12 retained trees 3 are 'B' category (Moderate Quality) and 9 are 'C' category (Low Quality) trees. The tree numbering remains the same from the original survey (see Tree Constraints Plan in Appendix 1).
3.2.2	The tree species found on site comprise sycamore, common lime and wild cherry.
3.2.3	In terms of age demographics there is a preponderance of early-mature and mature trees on the site, with one semi-mature tree in the population.

3.2.4	Full details of the surveyed trees can be found in Appendix 1 of this report.
3.2.5	The arboricultural works required within the existing tree population are listed in Appendix 2. Following the recent tree works applications (see below), the works comprise the monitoring of the existing condition of 7 trees only.

3.3 Planning Status

3.3.1	Following the recent Applications for Works to Trees (Ref: 2013/6725/T & 2013/6828/T) the trees G1, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13, T14, T15, T16 T17, T23 and T26 have been felled (coloured red and purple on the AIA plan in Appendix 6). The proposed replanting scheme will include the two small leaved limes (Tilia Cordata) specified in condition 3 of 2013/6828/T (see proposed landscaping plan in Appendix 4).

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. **No modifications have been made in this instance (please see overleaf).**

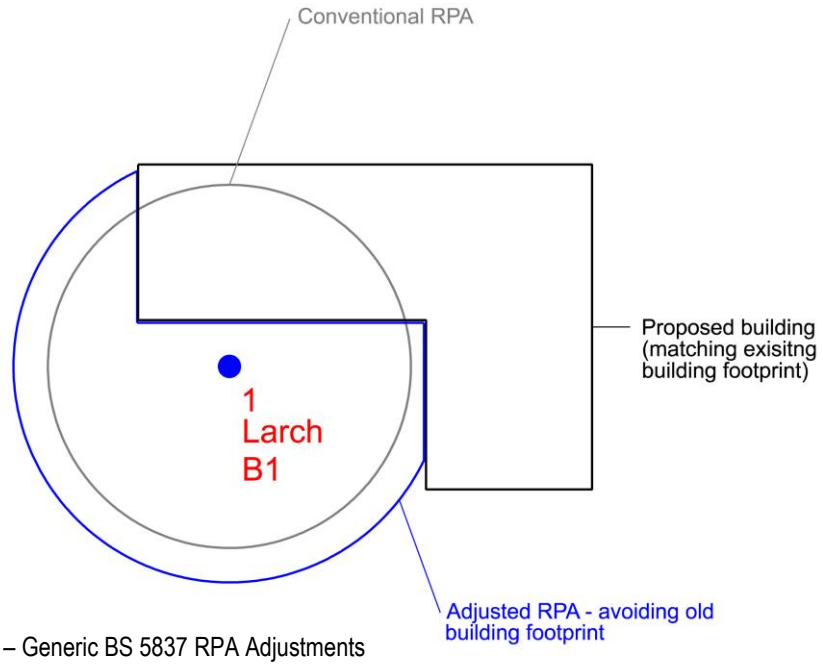

Figure 2 – Generic BS 5837 RPA Adjustments

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. Not infrequently, LT are requested by LPA Tree Officers to modify the RPA's to reflect their assumptions that e.g. a road will have drastically limited root growth.

4.1.4 Such assumptions cannot be proved without prior site investigations / trial pits. Where it is not always possible to conduct site investigations (e.g. below busy roads), we can always look to the published science. There seems little support for the popular myth that roads and services will curb root growth: research for the International Society of Arboriculture by Kopinga J (ISA 1994), found that "a constant high moisture content of the soil directly underneath the pavement surface can be considered as a major soil factor in attracting the trees' roots to develop there." By contrast, grass in lawns may actively antagonise tree roots with natural pathogens. Similarly, Professor F Miller (ISA 1994) found that service trenches at > 3m distances from trees had minimal impact on growth or crown shape.

4.1.5 A key misunderstanding, even among professionals, is that we conflate the RPA with the actual root system: RPA's are *prima facie* a notion / convention / treaty and almost entirely theoretical, but readily calculable. Conversely roots are a "known unknown," spatial entity that we predict at our folly. Yet, many are quick to do so.

4.1.6 LT favour the neutrality of a circular RPA, because in a difference of opinion, the tree officer will always have the prerogative to dictate the final modification of shape. With the best will in the world, the free allowance of modifications will tend to lead to inequitable outcomes, prejudicing the applicant and the practice is in our view, best avoided. The neutral circle dispenses with this inequity.

4.1.7 Ultimately, the point of the circular RPA is to illustrate areas of concern. The purpose of this report is to consider areas of concern (not to modify them to suit our argument or findings). Therefore, no modifications are made here to the RPA's, regardless of roads etc.

4.1.8 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.

4.1.9 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."

4.1.10 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.

4.1.11 In the light of the recent tree works, the main potential constraints to development are the 3 category B trees. These trees are located on the boundary of the site.

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.

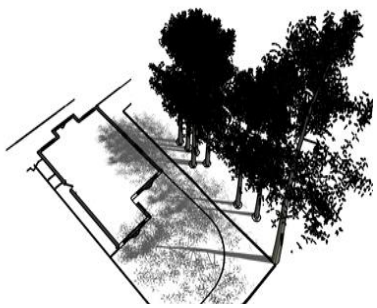

Figure 3 –
Generic Shading Constraints

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.

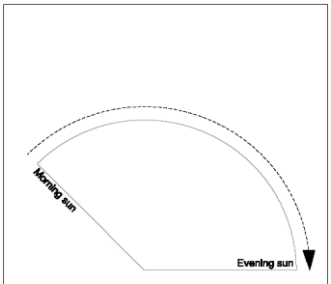

Figure 4 – Shading Arc

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 orientation of the retained on-site trees T1 and T2 have the potential to provide minor shading constraints. The leaf and honey-dew deposition have been reduced by the recent tree works, with future development unlikely to increase these secondary impacts.

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

Hide irrelevant | Show All Trees

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

Ref: WFA/53FZP/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	Sycamore	Replacement drive/hard surfacing - all existing (wall to be retained)	m^2 N/A %	Early Mature	Normal	Moderate	Very Low	N/A	No-dig construction (use existing sub-base)
B	2	Sycamore	Replacement drive/hard surfacing - all existing (wall to be retained)	m^2 N/A %	Early Mature	Normal	Moderate	Very Low	N/A	No-dig construction (use existing sub-base)
C	3	Lime, Common	Felled to Facilitate Development	m^2 N/A %	Mature	Moderate	N/A	N/A	Low	New planting / landscaping
C	18	Sycamore	Felled to Facilitate Development	m^2 N/A %	Early Mature	Normal	N/A	N/A	Low	New planting / landscaping
C	19	Sycamore	Felled to Facilitate Development	m^2 N/A %	Early Mature	Normal	N/A	N/A	Low	New planting / landscaping
C	20	Cherry, Wild (Gean)	Felled to Facilitate Development	m^2 N/A %	Mature	Moderate	N/A	N/A	Low	New planting / landscaping
C	22	Sycamore	Demolition of existing building in RPA (10m2)	10 m^2 7.05 %	Mature	Moderate	Moderate	Low	N/A	Pull-back method with light plant only

6.0 DISCUSSION

6.1 Rating of Primary Impacts

6.1.1 The principal primary impacts in the current proposals are the felling of T3, T18, T19 and T20. The overall loss of these 4 trees is rated as a low impact, with no significant effect on the visual character of the local conservation area. The removal of these trees was consented under a previous scheme (2011/1682/P). The proposed replanting scheme is shown in Appendix 4 of this report, which will include 22 new trees. This replanting will also include the two small leaved limes (Tilia Cordata) specified in condition 3 of 2013/6828/T.

6.1.2 Other primary impacts comprise the demolition of the existing building within a small area of T22's theoretical RPA, therefore mitigation has been proposed to reduce the potentially low impacts. Further low impacts include alterations to the existing hard landscaping and the replacement path/pedestrian access. The revisions have ensured that there are no RPA encroachments from the new dwelling. Low impacts are theoretically possible from the removal and replacement of existing hard standing for driveway access within the RPA's of T1 & T2; however, the rooting area of these trees will have been restricted by the retaining walls and will likely be confined to the raised area. The likely impacts are therefore very low/negligible and will be mitigated in accordance with the Method Statement.

6.1.3 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.

6.1.4 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.

6.1.5 "**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.*

6.2 Rating of Secondary impacts

6.2.1 Secondary impacts will be low/negligible, comprising organic deposition only. The recent tree works and minor changes to the position of the building will ensure that the secondary impacts are lower than exist today.

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 replacement paving/hard landscaping will require a no-dig construction technique, either using a cellular confinement system with no fines aggregate for the sub-base or simply building upon the existing sub-base without disturbing the ground below. Choice of construction method will initially depend upon root penetration within the existing sub-grade. The key principle is not to excavate in the presence of roots and to provide a porous surface to promote healthy soil water relations for future root growth.

6.3.4 The immediate canopy encroachment can be avoided with a crown lift of T22's lower limbs, affecting a 6-7m ground clearance. Some minor works may also be required to T21, cutting back overhanging branches from the basement piling line.

6.3.5 Nuisance deposition can be mitigated with regular crown cleaning and filtration traps on the guttering (see Figure 5 below). Alternatively, elements of green roof construction might be considered, where applicable.

6.3.6 The landscape impact of tree losses can be offset by the landscape proposals contained in Appendix 4.

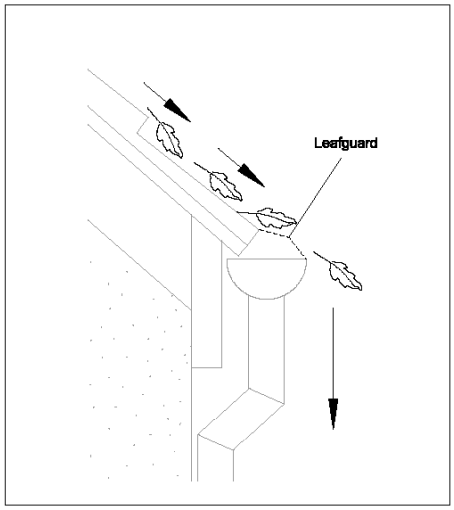

Figure 5: Filtration traps, as shown, could be fitted on the gutters which can easily be maintained at 2-3m above ground.

7.0 CONCLUSION

7.1 The potential impacts of development are all relatively low in terms of both quality of trees removed and also RPA encroachments of trees retained.

7.2 The full potential of the impacts can be largely mitigated through design and precautionary measures. These measures are contained within the Outline Method Statement (WFA/53FZP/AMS/01B) to assist with 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 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. The proposed replanting scheme (Appendix 4) will provide suitable replacements, including those specified under the recent tree works application.

7.5 Therefore, the proposals will not have any significant impact on the retained trees, with considerable benefit to the wider landscape.

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 the proposed landscaping plan contained 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 be controlled by the method statement WFA/53FZP/AMS/01B, which specifies mitigation methods suggested in para 6.3 above and by consultant supervision as necessary. This method statement can be used for the discharge of arboricultural conditions.

8.1.3 The felled trees are to be replaced by within the landscaping scheme contained in Appendix 4. This replanting will also include the two small leaved limes (Tilia Cordata) specified in condition 3 of 2013/6828/T. The replacement trees will conform to and be 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 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 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 BS5837:2012 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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APPENDIX 1

TREE SCHEDULE

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: 53 Fitzroy Park, London N6 4JA

Date: 12 09 2013

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd
Tel: 020 7851 4544
Surveyor(s): Adam Hollis

Ref: WFA/53FZP/AIA

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Clear Stem Height	Stem Diameter	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
1	Sycamore	18	2334	2.0	2.0	380.0	Early Mature	4.6	Normal	Fair	B	2	20-40	Leaning (slightly) W Restricted rooting in terrace bed
2	Sycamore	16	3233	3.0	3.0	430.0	Early Mature	5.2	Normal	Fair	B	2	20-40	Restricted rooting in terrace bed FMaple 6h/100dm/3204sp/Cat C to NE: sparse crown / lean to W
3	Lime, Common	16	8246	3.0	5.0	540.0	Mature	6.5	Moderate	Poor	C		10-20	Lapsed pollard / high end weight Leaning (significantly) N Small cavity on western stem Unsuitable for lawn location
18	Sycamore	19	8246	4.0	0.5	551.0	Early Mature	6.6	Normal	Fair	C	2	10-20	Multi stem weakness Restricted rooting on embankment Unsuitable fro retention within garden interior
19	Sycamore	19	3556	3.0	1.5	489.9	Early Mature	5.9	Normal	Fair	C	2	10-20	Multi stem weakness Restricted rooting on embankment Unsuitable fro retention within garden interior
20	Cherry, Wild (Gean)	16	2444	10.0	10.0	350.0	Mature	4.2	Moderate	Fair	C	2	10-20	Unprofessionally topped/lopped Suppressed by nearby tree Asymmetry (minor); Co-dominant limbs with included bark
21	Ash, Common	14	1312	4.0	3.0	150.0	Semi-mature	1.8	Moderate	Fair	C	2	>40	Suppressed by nearby tree Asymmetry (minor)

Landmark Trees

Site: 53 Fitzroy Park, London N6 4JA

Date: 12 09 2013

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd
Tel: 020 7851 4544
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Ref: WFA/53FZP/AIA

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Clear Stem Height	Stem Diameter	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
22	Sycamore	19	2756	3.0	1.5	560.0	Mature	6.7	Moderate	Fair	C	2	10-20	Unprofessionally topped/lopped Co-dominant limbs Included bark in branch unions Low live crown ratio
24	Sycamore	19	3458	8.0	8.0	470.0	Mature	5.6	Moderate	Fair	C	2	>40	Suppressed by nearby tree Located on top of steep bank
25	Sycamore	10	3242	2.0	2.0	170.0	Semi-mature	2.0	Moderate	Fair	C	2	>40	Suppressed by nearby tree Located on top of steep bank
27	Lime, Common	10	5101	3.0	3.0	180.0	Semi-mature	2.2	Moderate	Fair	C	2	>40	Suppressed by nearby tree Leaning (significantly)
28	Sycamore	19	4777	4.0	4.0	560.0	Mature	6.7	Normal	Fair	B	2	>40	Lapsed pollard Co-dominant limbs Close to OHL

APPENDIX 2

RECOMMENDED TREE WORKS

Notes for Guidance:

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

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 - 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

Site: 53 Fitzroy Park, London N6 4JA

Date: 12 09 2013

Surveyor(s): Adam Hollis

Ref: WFA/53FZP/AIA

Recommended Tree Works

Show All Trees
Hide irrelevant

Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
1	Sycamore	18	380.0	2334	Mon	Leaning (slightly) W Restricted rooting in terrace bed Recommended Husbandry 3
3	Lime, Common	16	540.0	8246	Mon	Lapsed pollard / high end weight Leaning (significantly) N Small cavity on western stem Unsuitable for lawn location Recommended Husbandry 3
18	Sycamore	19	551.0	8246	Mon	Multi stem weakness Restricted rooting on embankment Unsuitable fro retention within garden interior Recommended Husbandry 3
19	Sycamore	19	489.9	3556	Mon	Multi stem weakness Restricted rooting on embankment Unsuitable fro retention within garden interior Recommended Husbandry 3
20	Cherry, Wild (Gean)	16	350.0	2444	Mon	Unprofessionally topped/lopped Suppressed by nearby tree Asymmetry (minor); Co-dominant limbs with included bark Recommended Husbandry 3
22	Sycamore	19	560.0	2756	Mon	Unprofessionally topped/lopped Co-dominant limbs Included bark in branch unions Low live crown ratio Recommended Husbandry 3

Landmark Trees

Site: 53 Fitzroy Park, London N6 4JA

Date: 12 09 2013

Surveyor(s): Adam Hollis

Ref: WFA/53FZP/AIA

Recommended Tree Works

Show All Trees
Hide irrelevant

Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
27	Lime, Common	10	180.0	5101	Mon	Suppressed by nearby tree Leaning (significantly) Recommended Husbandry 3

APPENDIX 3

RECOMMENDED TREE WORKS TO FACILITATE DEVELOPMENT (See Table 1)

Notes for Guidance:

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

Site: 53 Fitzroy Park, London N6 4JA

Surveyor(s): Adam Hollis

Date: 12 12 2014

Ref: WAL/53FP/AIA

Recommended Tree Works to Facilitate Development

Show All Trees
Hide irrelevant

Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
3	Lime, Common	16	540.0	8246	Fell	Lapsed pollard / high end weight Leaning (significantly) N Small cavity on western stem Unsuitable for lawn location To Facilitate Development
18	Sycamore	19	551.0	8246	Fell	Multi stem weakness Restricted rooting on embankment Unsuitable fro retention within garden interior To Facilitate Development
19	Sycamore	19	489.9	3556	Fell	Multi stem weakness Restricted rooting on embankment Unsuitable fro retention within garden interior To Facilitate Development
20	Cherry, Wild (Gean)	16	350.0	2444	Fell	Unprofessionally topped/lopped Suppressed by nearby tree Asymmetry (minor); Co-dominant limbs with included bark To Facilitate Development

APPENDIX 4

PROPOSED LANDSCAPING PLAN (1317-PL-213-REV-F by Wolff Architects)

PROPOSED: GROUND FLOOR

1:100 at A1
1:200 at A3

0m 5m 10m

Existing ground floor outline (120m²)

Approved ground floor outline (190m²)

Previously proposed ground floor outline (233m²)

(Areas are gross internal)

notes:

no:	rev:	date:
F	LOCATION MOVED	01.12.14
E	NEIGHBOURS REQ'S	20.11.14
D	PLANNING UPDATE	03.11.14
C	AREA REDUCED	02.10.14
B	NORTHERN EX MOV'D	02.10.14
A	BUILDING MOVED	23.09.14
0	FIRST ISSUE	08.08.14

status: PLANNING

w o l f f
ARCHITECTS

16 lambton place
notting hill
london w11 2sh
tel 02072293125
fax 02072293257
info@wolffarchitects.co.uk

project: 53 Fitzroy Park
LONDON N6 6JA

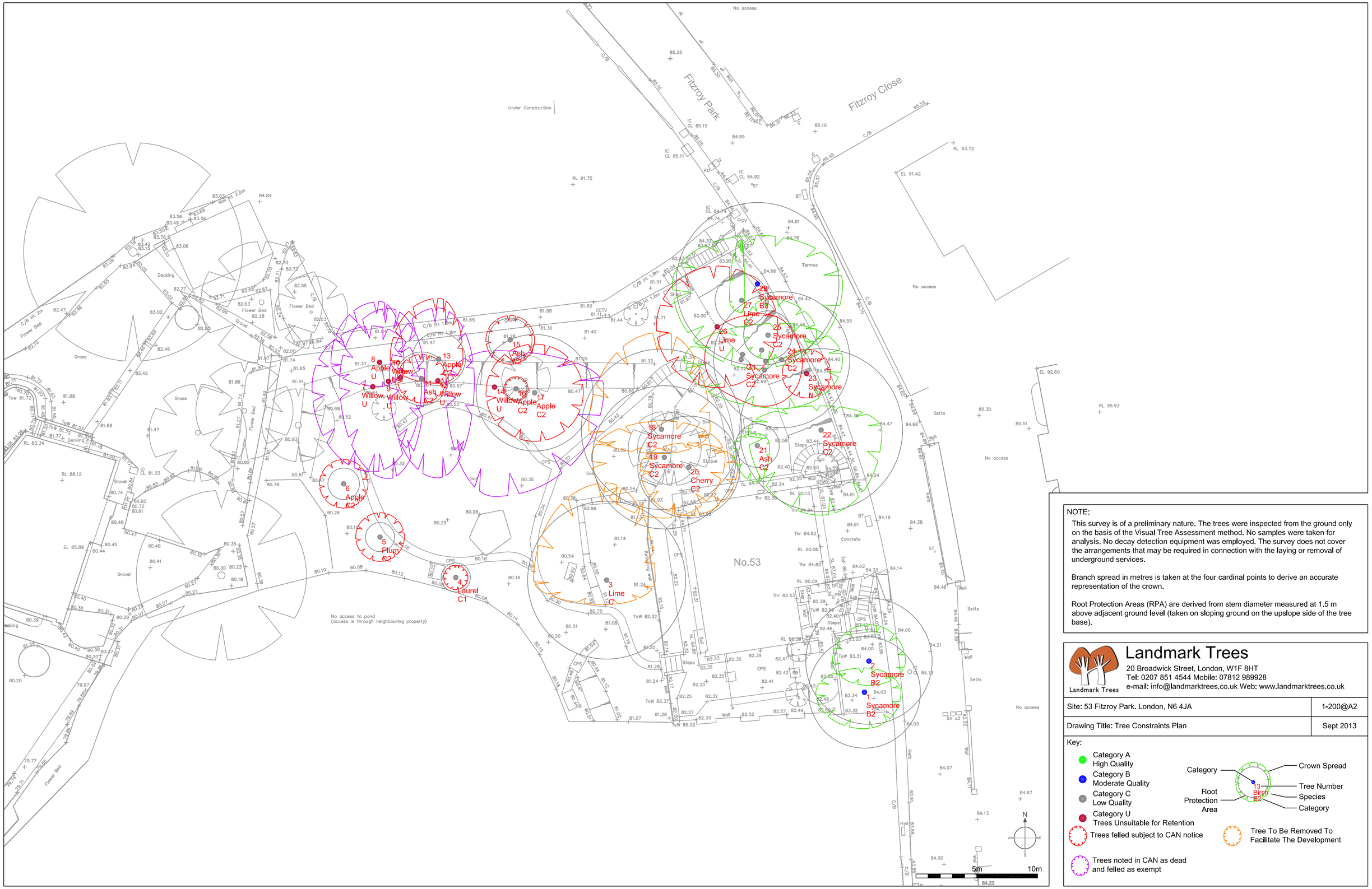
dwg no: 1317-PL-213 rev no: F

drawing title: PROPOSED:
Ground Floor Plan

date: 08.08.14 scale: 1:100

APPENDIX 5

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: 53 Fitzroy Park. London, N6 4JA	1-200@A2
Drawing Title: Tree Constraints Plan	Sept 2013

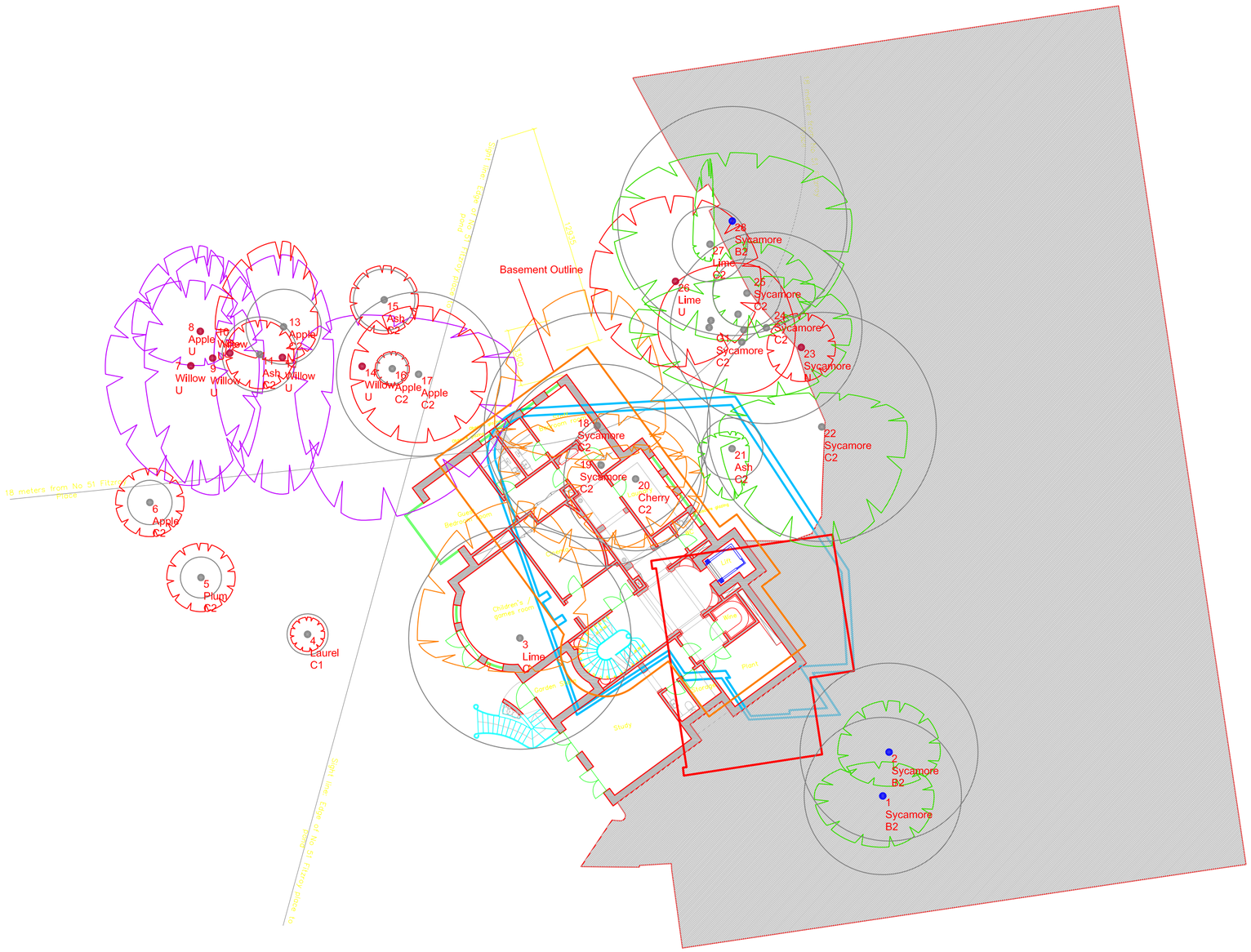
Key:

- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category U Trees Unsuitable for Retention
- Trees felled subject to CAN notice
- Trees noted in CAN as dead and felled as exempt
- Tree To Be Removed To Facilitate The Development

Category / Crown Spread / Tree Number / Species / Root Protection Area / Category
13 Birch B2

APPENDIX 6

ARBORICULTURAL IMPACT ASSESSMENT PLAN



PROPOSED LOWER GROUND FLOOR PLAN

5m 10m

N

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: 53 Fitzroy Park. London, N6 4JA	1-200@A2
Drawing Title: Arboricultural Impact Assessment	December 2014

Key:

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

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

Trees felled subject to CAN notice

Tree To Be Removed To Facilitate The Development

Trees noted in CAN as dead and felled as exempt