

# Trees and Construction

## BS5837 Tree Survey Assessment

**Site:** 1 Fitzroy Road,  
Primrose Hill, NW1 8TU

**Ref:** 15308/A1

**Client:** Mr Greg Cohen



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**- November 2015 -**

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<b>Revision</b>	<b>Description</b>	<b>Date</b>
/	First Release	19/11/2015

## 1. INTRODUCTION

1.1 **Instruction:** This advice has been prepared for Mr Greg Cohen (hereafter; client) and is in respect of the arboricultural (tree) related considerations at 1 Fitzroy Road, Primrose Hill, NW1 8TU (hereafter; site).

As the proposal relates to development works at site, the advice herein is produced in accordance with the British Standard 5837 : 2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations*' (hereafter; BS5837).

1.2 **BS5837:** The scope of BS5837 is to provide guidance on how trees and other vegetation can be integrated into construction and development design schemes. The overall aim is to ensure the protection of amenity by trees which are appropriate for retention.

1.3 **Scope of this advice:** This advice has been produced in accordance with BS5837 and is intended to demonstrate the site's realistic arboricultural constraints and assist with the design process. The objective is to systematically assess and provide recommendations regarding the proposal's potential impact on trees and vice versa.

1.4 Following instruction the consultant surveyed the site on the 4th November 2015. A site assessment and a BS5837 tree survey were carried out; all trees on and around the application boundary were surveyed from ground level and plotted as either an individual or a tree / vegetation group.

1.5 This advice is subject to caveat at Appendix I, outlines relevant terms and definitions at Appendix II and constitutes the findings of the preliminary site assessment and associated arboricultural recommendations.

1.6 The survey data and site observations use the supplied site plan to illustrate the surveyed trees in plan format as a 'Tree Constraints Plan' (hereafter; TCP); the TCP and tree survey data table are at Appendix III.

## 2. SITE INFORMATION & TREE ASSESSMENT

- 2.1 The site currently comprises a semi detached residential property. It is accessed directly off Fitzroy Road and has a sloped driveway down to a lower level garage. The front entrance is predominantly hard surfaced, as is the rear garden with planted borders.
- 2.2 **Proposal:** The site is being considered for development improvement works which relate to extensions, basement plans, parking provision and landscape enhancements. This is confirmed as the proposed 'upper ground', 'lower ground', 'basement' and 'sub-basement' floor plans (hereafter; proposed scheme) and are referenced / reviewed herein.
- 2.3 The site requires consideration from an arboricultural perspective due to the presence of trees on and around the site (G1 - offsite Indian Bean Tree, T1 - Cherry, T2 - Cordyline and T3 - offsite Crab Apple); said trees are deemed to be within impacting distance of the existing property boundary and potential construction area.
- 2.4 The Trees -
- 2.4.1 The tree survey and objective assessment resulted in BS5837 quality/retention categories 'C - low' being attributed to the surveyed trees (on and off site).
- 2.4.2 There are minor defects to the surveyed trees, although G1 and T3 are offsite and to be managed by the owners, and T1 and T2 these are currently managed within the front garden's shrub borders.

### 3. FINDINGS & RECOMMENDATIONS

3.1 The following information, as with the prior contents of this report, are to be read with the appended tree data table and tree constraints plan (15308/A1/TCP/01).

3.2 For the purpose of this assessment, the 'proposed scheme' has been used as a basis for consideration. This takes account of anticipated tree removals, tree protection options and potential alterations to account for arboricultural features.

#### 3.3 General Considerations for Tree Retention / Removal

3.3.1 G1 and T4 are categorised as low quality due to their limited function, requirement for ongoing management to avoid contact with the close proximity structures and their limited future potential. However, both trees are located offsite within the neighbour's gardens and hence their retention and potation is to be assumed hereafter.

3.3.2 T2 and T3 are small scale on site trees within the planted shrub border. They preform a limited ornamental function and have a limited future contribution. As such they are categorised as low quality trees and should not constrain or guide the scheme. Further, they could also be removed as part of standard site management; simple replacement planting of 2x small scale trees will adequately mitigate for their amenity loss.

#### 3.4 Considerations for G1

3.4.1 As per s.3.3.1, G1 is offsite with no crown overhang and with the site's boundary wall as separation. G1 was surveyed to confirm its clearance from the site and as such no constraint to proposed development works.

3.4.2 As the site's rear garden boundary wall is to be retained, this will ensure no access, material storage or other, outside of the site. Hence, there will be no impact on G1 from works on site and the proposed scheme.

#### 3.5 Considerations for T1 and T2

3.5.1 As per s.3.3.2, these tree are low quality and contribute to the site's lower level and landscape / ornamental amenity. As such, they are not to constrain or significantly guide a scheme and can be simply mitigated by replacement tree planting as part of a landscape scheme for the site.

3.5.2 T1 and T2 are within the front boundary's shrub border, which is shown as retained as part of the proposed '*upper ground floor plan*' and hence they may be retained. However, it is recommended that the trees' removal and replacement be considered in as part of a

landscape scheme. Also, in conjunction with the street side access for the development, anticipated deliveries, site movements and storage, the site's front landscape planting is likely to be impacted without direct protection.

- 3.5.3 As such, the removal of T1 and T2 is recommended prior to site works commencing. Their removal is of nominal impact to the site, one which will be mitigated for by replacement tree planting and enhanced in the long term as part of a well delivered landscape scheme; this may form part of planning conditions.

### 3.6 Considerations for T3

- 3.6.1 Due to the close proximity of T3's stem to the boundary, the standard circular RPA encroaches the site, specifically within the existing driveway slope. However, the tree is separated from site by a 1.5m+ boundary wall, the driveway is at a lower level to the neighbour's rear garden and the driveway has a concrete slab surface. Hence, it was anticipated that root growth would be restricted, or possibly completely inhibited from growing onto the site. It was therefore recommended to undertake sensitive investigations on site to confirm the presence / absence of roots onto the site from T3.

NOTE: The TCP illustrates the recommended trial pit directly in line with T3. This has been excavated as part of SI works by Matthew Penfold of Geotechnical & Environmental Associates. It was found that the concrete driveway slab bears directly onto London Clay soil, the wall foundation is 1.3m deep which bears onto London Clay soil and the pit was extended to a depth of 1.8m with no root growth below the wall's foundation or coming from offsite positions onto the site.

- 3.6.2 Further to the above, T3's root growth is considered to be entirely offsite and hence the RPA has been augmented to be excluded from the site. The scheme's proposed ground works at upper ground, lower ground, basement and subbasement levels will therefore have no impact on T3's RPA providing that the boundary wall is to remain.

- 3.6.3 The crown of T3 has been managed by previously reducing branches overhanging the driveway back towards the boundary, and also removing the lower level branches which overhang the driveway. The remaining crown is unbalanced in parts and in order to avoid impact during the site works it would be suitable to reduce the canopy back to the boundary; this will not impact significantly on the amenity of the site as this tree is low quality and the site's frontage will be enhanced by new landscape planting.

### 3.7 Tree Protection

- 3.7.1 Depending on the level of tree retention/removal, the protection methods for the retained trees is likely to vary. However, based on the retention of G1 and T4 as well as

the boundary walls, it is likely that a combination of construction restrictions will be used in conjunction with tree works and mitigation planting within the design.

The process of site operations will be an important aspect to confirm by way of a construction layout plan, i.e. showing access, demolition extents, ground work operations and order of excavation, welfare, material delivery and storage etc. As a basis for tree protection the following points will need to be considered:

- Removal of all agreed trees and any agreed pruning works prior to works commencing by a suitably qualified arboricultural contractor;
- Induction of construction personnel regarding the exclusion of works (including access and storage) from any retained trees' RPAs;
- Retention of the boundary walls and /or installation of secure temporary barrier fencing for on site retained trees to exclude the crowns and RPAs from works;
- The storage of materials clear of all retained trees and conditions to ensure no contamination/run-off into soils in proximity to trees or on higher ground;
- For the removal of existing structures and /or hard surfaces from RPAs the works to be undertaken separate to construction, manually and sensitively.

3.7.2 *Tree Works* - the tree removals to facilitate the scheme are to be justifiable in the context of the site layout and are to be mitigated by way of a landscape scheme; new tree planting will be required to replace and enhance the site's canopy cover with a general scheme of landscaping in acknowledgement for the removal of poor quality trees.

Any trees which are to be removed should be well indicated to ensure that the retained trees are suitably protected. Hence, all trees to be removed shall be referenced on a detailed landscape scheme for the council's approval and are to be marked by a suitably qualified person [spraying the stems with a cross] prior to tree works.

3.7.3 *Tree Crowns* - consideration is required for both existing and newly planted trees whereby the proposed construction should take account of trees reaching their full growth potential. It is always prudent to provide adequate clearance from a tree's current crown for future growth, i.e. to allow a tree adequate space to reach maturity without conflicts with new structures.

NOTE: Following the anticipated removal of T1 and T2 and the pruning to T4, there are no crown conflicts or encroachments between the retained trees and new structures.

3.7.4 *Root Protection Areas (RPA)* - it is *sometimes* possible to undertake construction activities within retained trees's RPAs which requires attention to tree protection, foundation designs, phasing of works etc. However, based on the anticipated removal of T1 and T3, and the offsite RPAs of G1 and T4, there will be no impacts on the RPAs of retained trees from the proposed scheme.

### 3.8 Tree Works & Planting

3.8.1 The tree removals to facilitate the scheme are to be justifiable in the context of the site layout and are to be mitigated by way of a landscape scheme; new tree planting will be required to replace and enhance the site's canopy cover with a general scheme of landscaping in acknowledgement for the removal of poor quality trees.

3.8.2 The following tree work recommendations are based both on the site's development considerations in respect of trees, and also tree works in order to facilitate the currently proposed scheme.

#### TREE WORK SUMMARY

NUMBER	TREE REMOVALS / PRUNING WORKS	
T1 and T2	Remove	Remove in conjunction with the scheme: - to be replaced with new tree planting of a minimum of 2x ornamental tree species to the front of the site.
T3	Pruning	Lateral reduction of all branches and growth back to the boundary, preferably to a suitable replacement side branch (where possible and to provide suitable site clearance).
Retained trees (G1 and T4)		Protection by retained boundary wall and suitable site management to avoid crown impact, burning or chemical spills (see; s.4.1 of the AMS).

3.8.3 Tree works in this instance are only to be undertaken with the council's prior approval in conjunction with the planning application for the proposed scheme. The tree works are to be undertaken prior to site works commencing and by a suitably qualified, experienced and insured arboricultural contractor.



#### 4. METHOD STATEMENT 'CONSIDERATIONS'

##### 4.1 Arboricultural Construction Restrictions

4.1.1 The following restrictions are considered relevant for tree protection purposes:

- a) Tree works are to be completed prior to any and all site works: no tree works not specified at s.3.8 of this report are permitted unless agreed in writing by the council.
- b) The existing boundary walls to the side of the property with G1 and T3 are to be retained and are to have tree protection signs pinned in place.
- c) Following the tree works and tree protection sign installations, all offsite areas are to act as Construction Exclusion Zones (hereafter; CEZ).
- d) No chemicals/materials are to be transported/stored/used/mixed within 5m of the side boundary with G1 and T3 and no fires are to be lit and no machinery, plant or vehicles are to be washed down within 5m of the trees' canopies.
- e) Only following construction completion can the replacement tree and landscape planting works be undertaken which will require prior ground preparation in accordance with BS8545 for new tree planting.

##### 4.2 Arboricultural Site Monitoring / Supervision

4.2.1 Once the tree works are completed and the existing die boundary wall established as being retained for site and tree protection, it is not anticipated that tree conflicts will occur and the potential for damage is managed by avoidance. Scheduled inspections are therefore advised over frequent site attendance from a retained Arboriculturalist.

4.2.2 As above, the site should be checked by a qualified Arboriculturalist throughout the construction processes to ensure the retained trees are protected during the development, i.e. (a) prior to tree work operations to approve the marking of all trees to be removed, (b) halfway through the development, (c) following construction completion during ground preparation for new landscape and tree planting, and (d) following the soft landscape completion; these inspections are recommended in order to sign off the site as having correctly adhered to the arboricultural method statement.

#### 4.3 Additional Recommendations

4.3.1 The surveyed trees have been subject to a detailed inspection and the arboricultural considerations detailed within this advice. The advice herein is intended to guide a suitable design in consideration for the site's valuable amenity assets.

Where T1 and T2 are removed and mitigation is demonstrated as part of the landscape scheme, this leaves G1 and T3 as retained which are clear of the site works. As such, the considerations herein can typically form part of tree related planning conditions.

4.3.2 The finer details of the tree planting proposals are to be illustrated on a tree planting landscape plan. This is to include the exact proposals for hard and soft landscaping together with the details for tree planting locations, species and stock selection, installation and maintenance; this is to be undertaken by the appointed landscape architect who will have the full support of the arboricultural consultant where required.

#### 4.4 Report Handling

4.4.1 This report is released to the client and architect to be distributed at their discretion. The consultant is available via telecom and/or email (via the methods on the title page) for any queries relating to this report and/or any other matter relating to arboriculture.

4.4.2 This report is produced to demonstrate that the scheme is considered and reviewed in respect of the arboricultural constraints and is achievable in line with the guidance of BS5837. The recommendations herein are to be approved by the council as a means of authorised tree protection of which site personnel are to have access to a copy.

**This concludes our advice.**

## Appendix I

### Caveat

Any and all information supplied to Indigo Surveys Ltd by/on behalf of the client is assumed to be accurate unless otherwise informed. | This advice is limited to the observations made on the date of inspection as detailed herein and any deletion, editing or alteration will result in the advice being null and void in its entirety. | This advice in its entirety may be deemed null and void if remedial works are undertaken on any area of the site, on or after the date of the survey. | No liability is assumed by the author or by Indigo Surveys Ltd for any misuse, misinterpretation or misrepresentation of this advice. | This advice is not valid in adverse or unpredictable weather conditions or for any failure due to 'force majeure' or unpredictable events. | No responsibility is assumed either by the author of this advice or by Indigo Surveys Ltd for any legal matters that may arise as a consequence. | Neither the author nor Indigo Surveys Ltd will be required to attend court or give testimony as part of this agreement. | The responsibility for any works undertaken on the basis of the recommendations of this advice does not form part of this agreement.

## Appendix II

### Terms and Definitions

*“Arboriculturist”* - person who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction.

*“Competent Person”* - person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached.

*“Topographical survey”* - an accurately measured land survey undertaken to show all relevant existing site features. *A method of carrying out topographical surveys is given in RICS specification Surveys of land buildings and utility services at scales of 1:500 and larger.*

*“BS5837 Tree survey”* - should be undertaken by an arboriculturist to record information about the trees on or adjacent to a site. The results of the tree survey, including material constraints arising from existing trees that merit retention, should be used (along with any other relevant baseline data) to inform feasibility studies and design options. For this reason, the tree survey should be completed and made available to designers prior to and/or independently of any specific proposals for development.

*“Tree categorization method”* - trees should be categorised in accordance with the BS5837 cascade chart by an arboriculturist. This is to identify the quality and value (in a non-fiscal sense) of the existing tree stock, allowing informed decisions to be made concerning which trees should be removed or retained in the event of development occurring.

*“Root protection area (RPA)”* - layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree’s viability, and where the protection of the roots and soil structure is treated as a priority, shown as an arboricultural constraint in m<sup>2</sup>. The radius is calculated using the BS5837 calculation method. An arboriculturist may change the shape of an RPA but not reduce its area.

*“Arboricultural implications assessment”* - a study, undertaken by an arboriculturist, to identify, evaluate and possibly mitigate the extent of direct and indirect impacts on existing trees that may arise as a result of the implementation of any site layout proposal.

*“Arboricultural method statement”* - methodology for the implementation of any aspect of development that is within the root protection area, or has the potential to result in loss of or damage to a tree to be retained.

*“Tree protection plan”* - a scale drawing, informed by descriptive text where necessary, based upon the finalized proposals, showing trees for retention and illustrating the tree and landscape protection measures.

## Appendix III

**Data Table:** As appended (BS5837 Tree Survey Key & Table)

**Tree Constraints Plan:** As appended (15308/A1/TCP/01)

**TREE SURVEY 'KEY' - BRITISH STANDARD 5837:2012 'TREES IN RELATION TO DESIGN, DEMOLITION & CONSTRUCTION - RECOMMENDATIONS'**

**FIELD KEY:**

<b>TPO/CA</b>	-	On client request: presence of Tree Preservation Orders (TPO) / site location within a Conservation Area (CA) & date checked;
<b>TREE REF. #</b>	-	Tree reference number: tag or plan number (T - individual tree, G - group of trees/shrubs, H - hedge);
<b>SPECIES</b>	-	Genus, species and/or common name;
<b>AGE</b>	-	Age classification (NP - new planting, Y - young, SM - semi mature, M - mature, LM - late mature, OM - over mature);
<b>HEIGHT (in m)</b>	-	Approximate height of tree in metres;
<b>CANOPY (in m) N - S - E - W</b>	-	Approximate branch spread in metres of the four principal compass points;
<b>STEM (in mm)</b>	-	Stem diameter in millimetres: measured in accordance with s.4.6 of BS5837;
<b>RPA (in m)</b>	-	Circle radius of the Root Protection Area: calculated using the stem diameter (single/multiple stem variant, as outlined within BS5837);
<b>CLEARANCE (in m)</b>	-	Crown clearance in metres above the adjacent ground level;
<b>IST BRANCH (in m)</b>	-	Clearance in metres to first significant branch and direction of growth (where relevant);
<b>VITALITY</b>	-	Physiological condition typically gauged from canopy cover and annual extension growth (good, fair, poor, dead);
<b>ESTIMATED REMAINING CONTRIBUTION</b>	-	Approximate number of years the tree will continue to make a contribution without the need for oppressive arboricultural intervention, categorised in years as <10, 10-20, 20-40 and >40;
<b>NOTES</b>	-	Structural and physiological condition observations;
<b>BS CAT.</b>	-	BS5837 tree quality assessment category: resulting from structural/physiological condition and remaining contribution (approximate Standard retention category <b>U</b> : in such a condition that any existing value would be lost within 10 years; Standard retention category <b>A</b> : high quality and value, in such a condition as to be able to make substantial contribution of 40+ years; Standard retention category <b>B</b> : moderate quality and value, in such a condition as to make a significant contribution of 20+ years; Standard retention category <b>C</b> : low quality and value, currently in adequate condition to remain until new planting could be established Standard retention sub-category, mainly due to: <b>1</b> - Arboricultural values, <b>2</b> - Landscape values, <b>3</b> - Cultural values, including conservation;
<b>MANAGEMENT</b>	-	Preliminary management recommendations (as appropriate);
<b>' * '</b>	-	Within the survey schedule denotes an estimate

**TREE SURVEY IN ACCORDANCE WITH BRITISH STANDARD 5837:2012 'TREES IN RELATION TO DESIGN, DEMOLITION & CONSTRUCTION - RECOMMENDATIONS'**

*CLIENT:* Greg Cohen

*PROJECT REF:* 15308 / A1

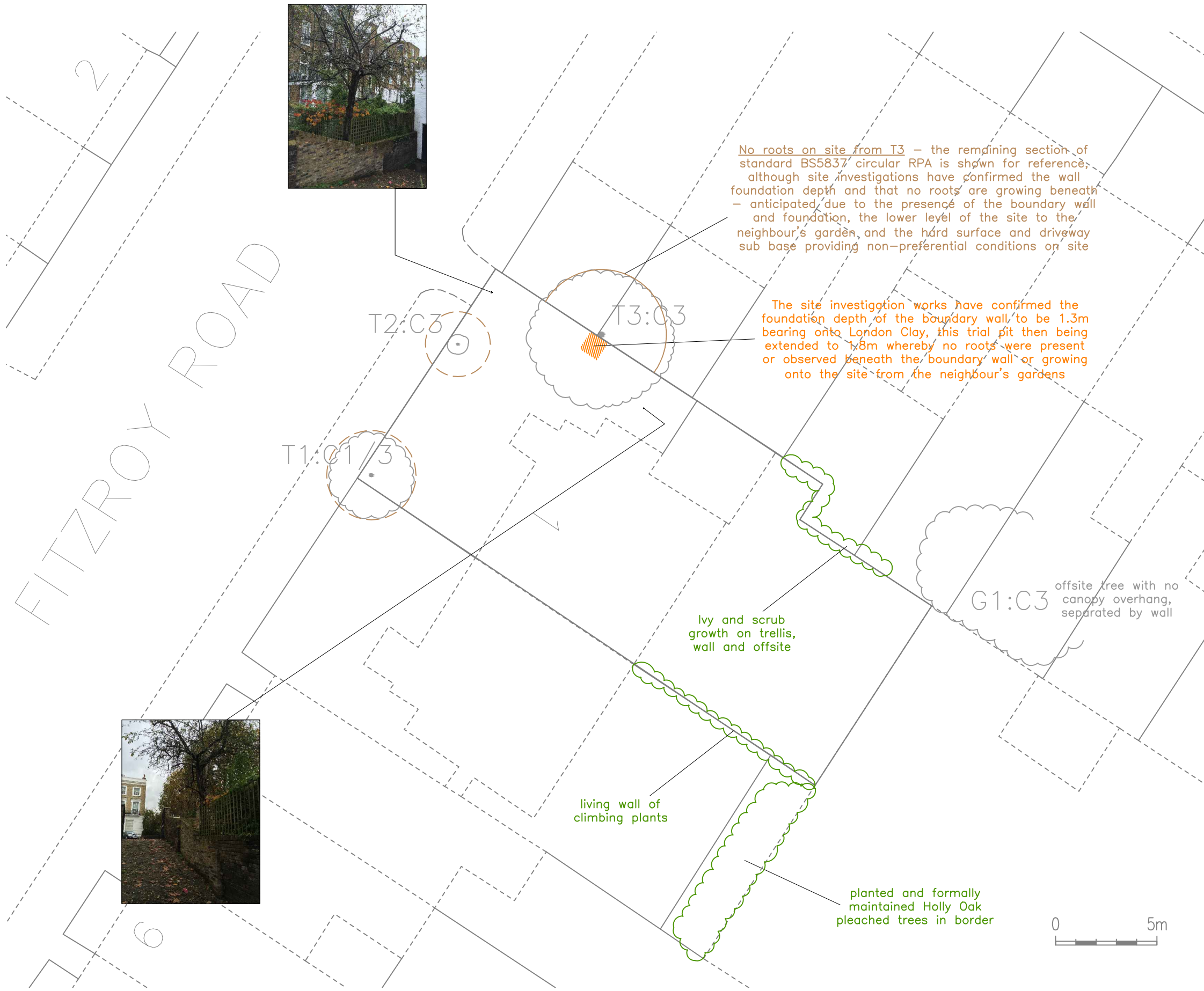
*SITE:* 1 Fitzroy Road, Primrose Hill, NW1 8TU

*CONTACT:* /

*SURVEY DATE:* 4 November 2015

*ARB CONSULTANT:* Andy Turnbull *FDS* *MArborA*

TREE REF. #	SPECIES	AGE	HEIGHT (in m)	CANOPY (in m) N - S - E - W				STEM (in mm)	RPA (in m)	CLEARANCE (in m)	1st BRANCH (in m)	VITALITY	LIFE EXPEC.	NOTES	BS CAT.	MANAGEMENT
G1	Indian Bean Tree (offsite)	Y / SM	10	/	/	/	/	300 * (no access)	3.6	2	(no site overhang)	fair	20 - 40	Offsite tree, no overhang of site, separated by boundary wall and rear adjoining property, closest tree to the rear garden.	C 3	
T1	Cherry; Prunus, Rosaceae	SM / M	8	2	2	2	2	180	2.2	2	2m - multi branch stem	fair	10 - 20	Multiple stems at 2m, maintained by reduction.	C 1 / 3	
T2	Cordyline	SM / M	6	0.5	0.5	0.5	0.5	130	1.6	2.5	/	fair	10 - 20	Small scale ornamental garden planting within shrub border.	C 3	
T3	Crab Apple; Malus, Rosaceae	M	11	3	3.5	3.5	3.5	270 *	3.2	2	2.5m - South	fair	10 - 20	Offsite at rear corner of neighbour's back garden near to the boundary wall, trellis attached at 1.5-2.0m, maintained by reduction, previously raised over the driveway.	C 3	



**KEY**

- Tree Crown Spread
- Root Protection Area (RPA)
- Tree Stem
- T1 Tree No.

**Tree Condition Category**

- A
- B
- C
- U

Indicative

The surveyed trees are illustrated on this Constraints Plan which is prepared in accordance with British Standard BS5837: 2012 'Trees in Relation to Design, Demolition and Construction - Recommendations'

A	Update following site investigations	AT	AE	19/11/15
REV.	DESCRIPTION	DWN	CHK'D	DATE

CLIENT  
Greg Cohen

PROJECT  
15308 / A1  
1 Fitzroy Road,  
Primrose Hill, NW1 8TU

TITLE  
Tree Constraints Plan

DWN	DATE	CHK'D	DATE	APP'D	DATE	SCALE
rck	5/11/2015	AT	16/11/2015			1:200

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Drawing Number  
15308 / A1/TCP/01

A3  
REV. A

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