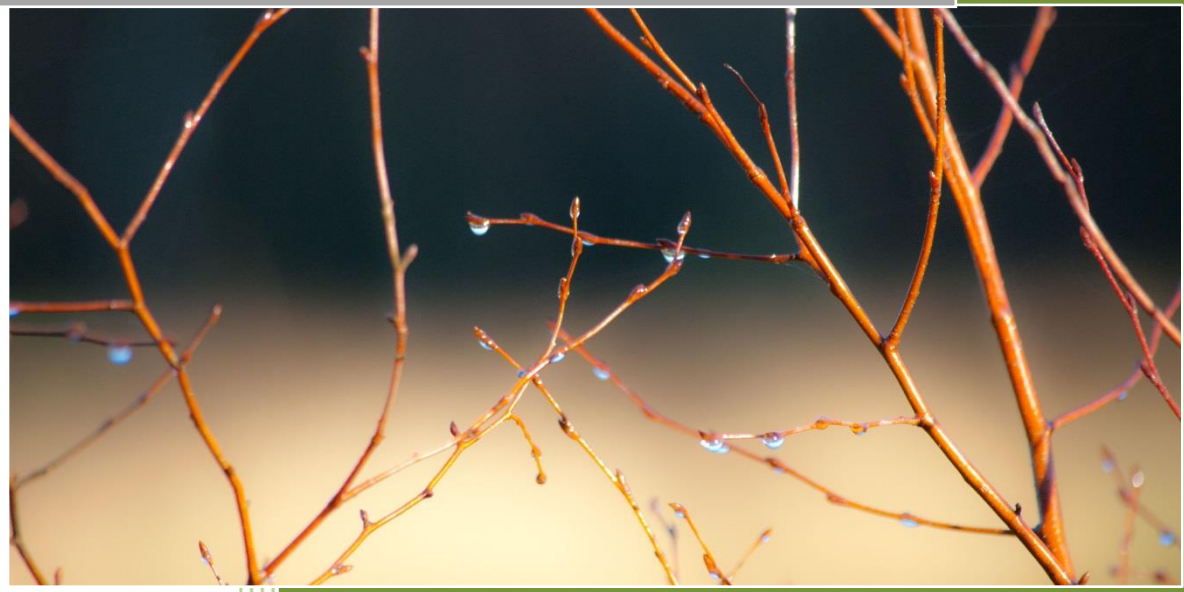
BS5837 Arboricultural Impact Assessment



Flat 1-2 24 Belsize Park, London, NW3 4DU

Client: **Ecospace Studios**

Job Reference: 02271R

Consultant: Keiron Hart (BSc Hons, C.Env, F.Arbor.A, MICFor, MEWI)

Tamla Trees
consulting arborists

March 2015

Contents

1. Executive Summary

1.1 Tamla Trees ltd has been appointed by Ecospace Studios to provide advice on the arboricultural issues relating to a proposed installation of a garden room within the rear garden of the property. During consideration of the application Westminster Council have raised concerns relating to trees. We surveyed the site on the 4th March 2015. The survey accorded with BS5837:2012 "Trees in relation to design, demolition and construction – Recommendations".

1.2 The site is currently the rear garden space for the property. We have been advised that during consideration of the planning application London Borough of Camden have requested an Arboricultural Impact Assessment.

1.3 This report seeks to identify the trees which may be affected by the proposal and detail the relevant protection measures to allow the council to support the proposal.

1.4 The main constraint tree is T1 Ash. The garden room is located outside the root protection area (RPA) for this tree but there will be a need to excavate a foul water sewer connection to the existing site manhole. This excavation will be undertaken by hand but will transect the RPA.

1.5 The site cannot be accessed by heavy machinery. The Garden Room consists of pre-fabricated panels which are brought on to site (on foot) and erected with minimal construction activity. The building is supported on 14 individual foundation 'pads' of which only 5 are located at the very periphery of T1's RPA.

1.6 We have not been advised whether the site is affected by a TPO. We are advised the site is located within a Conservation Area.

1.7 This report seeks to provide detail and demonstrate how the proposal can be implemented without adverse impact for retained trees.

1.8 This report is based on the supplied layout drawings referenced 1446.PL.02 REV 03 (layout) and SHA.SO.01A (foundations) as well as Ecospace method statement for pad foundation installation.

2. Statutory Protection

2.1 We have been advised the site is located within a Conservation Area but not whether trees are subject to a Tree Preservation Order

Conservation Area Status	
Is the site located within a Conservation Area?	Yes
Notes: (i)All trees larger than 7.5cm diameter at 1.5m above ground level are subject to regulations within a Conservation Area. Exemptions apply for trees which are dead and dangerous but clarification before any tree works is advised. A notification is required in many circumstances.	

Tree Preservation Order Status	
Are inspected trees subject to a TPO?	Unknown
Type of TPO	~~Area~~
	~~Individual~~
	~~Group~~
	~~Woodland~~
TPO Reference	-
Date TPO Made	-
Notes: (i) The type and details of any TPO determine which trees are 'protected'. Exemptions apply for trees which are dead and dangerous but clarification before any tree works is advised. An application may be required before undertaking works.	

3. Terms of Reference

3.1 BS5837:2012 'Trees in relation to design, demolition and construction – recommendations'

3.2 BS3998:2010 'Tree work – recommendations'

3.3 NJUG 4 – National Joint Utilities Group "Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees. Volume 4, issue 2. London: NJUG 2007" To include Operatives Hand-out Guidance

3.4 BGS Open Source Soil Data http://www.bgs.ac.uk/nercsoilportal/maps.html

4. The Trees

4.1 The trees can be summarised as follows:

BS 5837 Cat	A	B	C	U
Specific Trees	-	T1 TG1	T2, T3, T5 & T6	T4
Total Number	None	1 individual 1 Group	4 individuals	1 individual

4.2 These tree and shrub locations and a summary of their visual contributions can be summarized as follows:

BS 5837 Cat	A	B	C
Southern Boundary Visible between buildings in Belsize Park and to the rear garden/ properties	-	T1	-
Rear Garden Contributing to the wider private amenity to the rear of the property	-	TG1	T5

4.3 T2 (Cotoneaster), T3 (Prunus) and T6 (Cypress) are small trees of very limited local amenity.

4.4 There were no hedgerows on site.

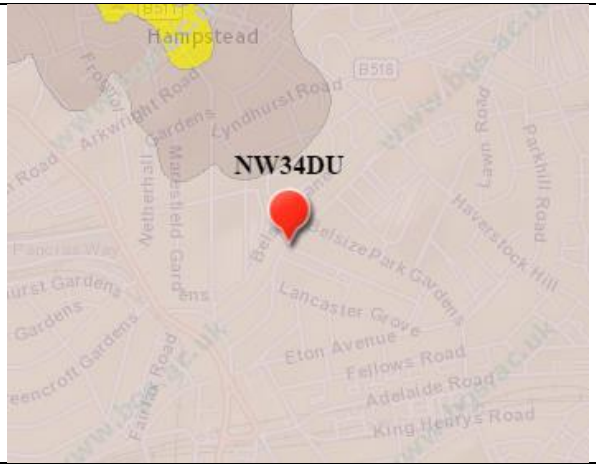
5.0 Arboricultural Impact Assessment

5.1 Site Specific Soils

5.1.1 Soil is an important factor in tree growth and the type of underlying soil can impact on successful integration of new developments.

5.1.2 A free draining sandy soil containing sand/gravel is likely to lead to water being accessible in the upper horizons during the growing season and available at greater depths and trees will generally be forced to explore a larger volume/ depth on such soils. The structure of such soil also makes compression more difficult (by heavy construction plant) and root penetration is easier for the trees. By comparison a clay soil is more easily compressed, particularly when wet and compression can have a greater impact on tree health.

5.1.3 As shown below the site is located within what is defined as clay.



Soil Description
London Clay Formation - Clay, Silt And Sand. Sedimentary Bedrock formed approximately 34 to 56 million years ago in the Palaeogene Period. Local environment previously dominated by deep seas.

Underlying Soil Material contains Clay	**Yes**
Soil Type increased rooting depth profile?	**No**
Increased risk of soil compaction due to soil type	**Yes**

5.1.4 All comments regarding soils should be verified with onsite geotechnical investigations and laboratory testing with foundation depth and design undertaken by a structural engineer in accordance with the requirements of NHBC Chapter 4.2.

5.2 Root Protection Area (RPA) Incursions

5.2.1 The following incursions into the RPA's of trees to be retained have been identified:

BS 5837 Cat	A	B	C	Summary
RPA Incursion	-	T1	-	**T1 (Ash) (Foundations) –** The pad foundations required to support the garden room will be partially located within the RPA of T1. These are located at the very periphery of the trees RPA at distances away from where we would envisage structural roots to be present. In addition the presence of existing trees in this area is likely to have limited the root growth of T1 in this area (as it is more likely to utilize areas free of further root competition). Subject to the pads being hand dug and any roots >25mm leading to localized repositioning of any relevant pad we would not envisage any discernable impact on T1 from the proposal. **Services** – The proposed rainwater soak away will be located outside the RPA of T1 and as such there should be no issue with its proposed positioning. There is a need to excavate a foul water connection to the existing manhole cover as shown in Appendix 5. These works will be done by hand with a clear brief to the operatives and appropriate on site arboricultural supervision detailed at 5.9.

5.3 Tree Loss

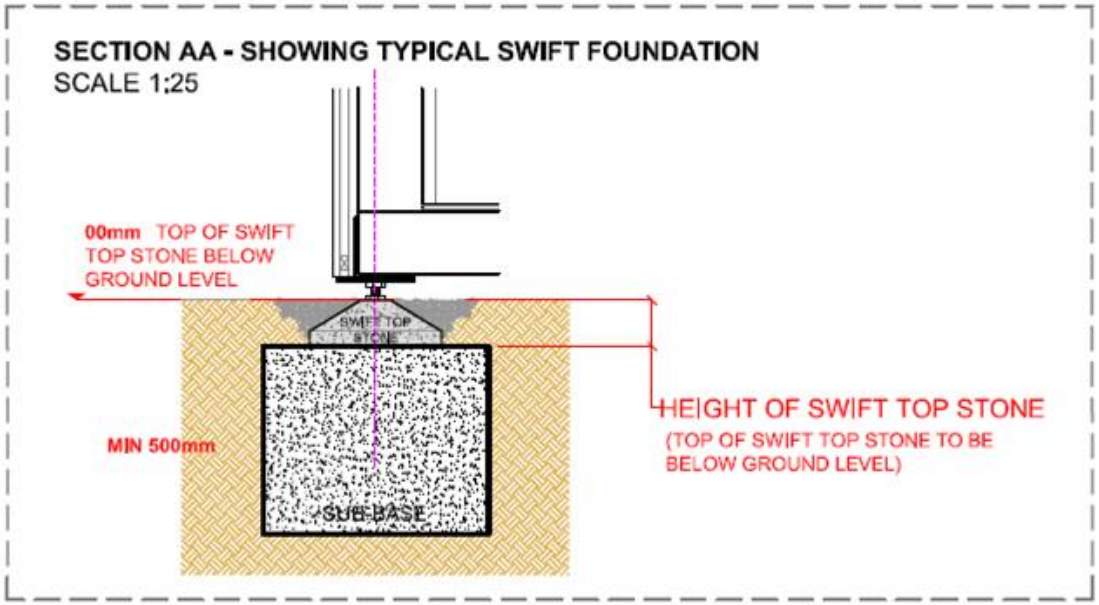
5.3.1 The proposal will result in the removal of T2 (Cotoneaster) and T3 (Prunus). Both trees are small C1 category trees of poor form and very limited wider amenity. In addition U Cat tree (T4) will be removed.

5.4 Foundations

5.4.1 Only a very minimal level of the Garden Rooms foundations encroach in to the RPA of T1 (Ash). At the distances involved (see plans) we would expect only minimal feeder roots. Such roots are seasonal and short lived and the presence of existing tree roots in this area from T3 are likely to have limited further the presence of tree roots from T1.

5.4.2 The level of incursion in to the RPA of T1 constitutes less than 5% of the trees overall RPA and is therefore considered insignificant.

5.4.3 In addition the client has indicated that the foundations will comprise of hand dug 'pads'. This limits further any risk of root disturbance.

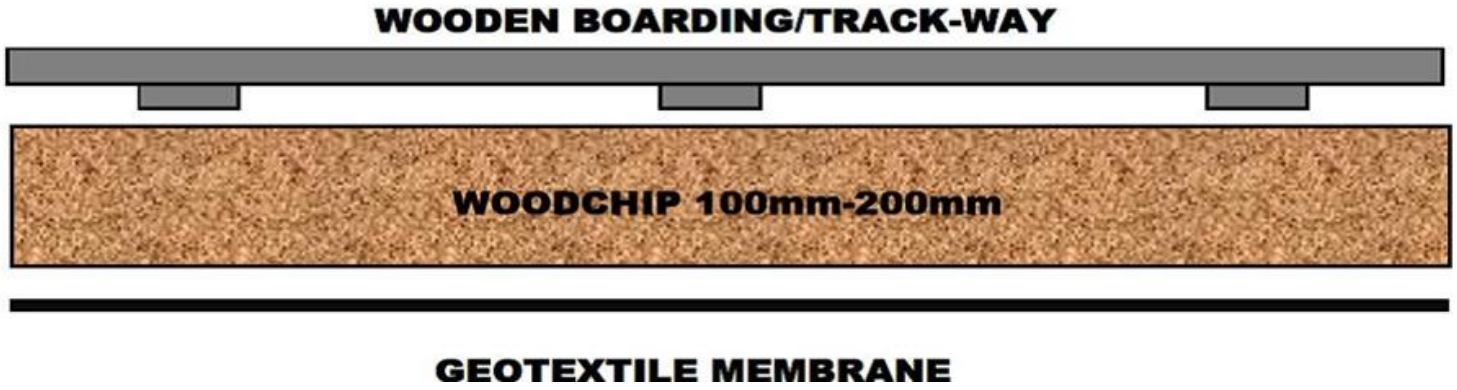


- Cross section of pad foundation
- All excavation works undertaken by hand
- Any roots >25mm originating from the direction of T1 will result in localised repositioning of the individual pad.
- Pits lined with non-permeable membrane to remove the risk of concrete to root contact

5.5 Surfaces near Trees

5.5.1 No new surfaces are proposed within tree RPA's

5.5.2 Temporary ground protection as indicated on the Tree Protection Plan at Appendix 5 is proposed for the duration of the installation to remove the risk of ground compaction during pedestrian tracking for the installation.



Cross section of temporary ground protection within the RPA of T1

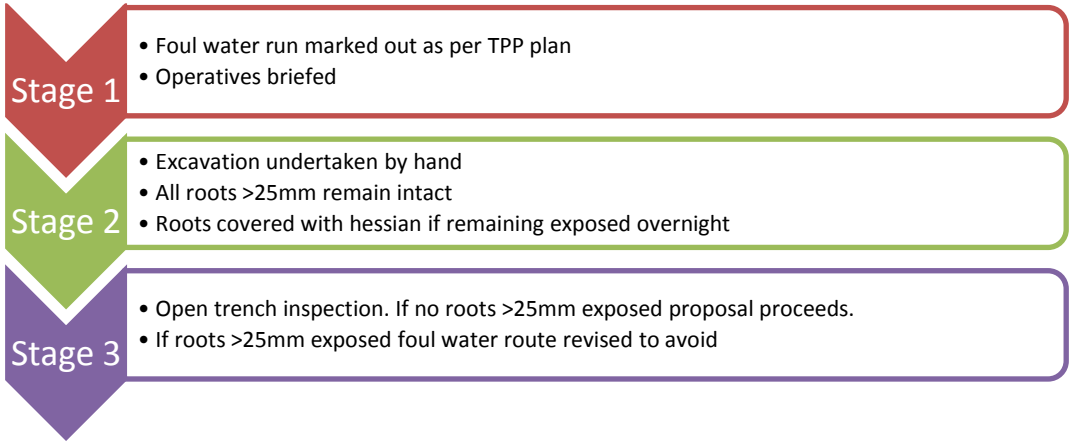
5.6 Site Service Provision

5.6.1 A new rainwater soak away is proposed but is located outside of the RPA of T1.

5.6.2 A new foul water connection is required to tie in to the existing manhole cover. This will necessitate an excavation through the RPA of T1.

5.6.3 To limit the risk of inadvertent damage it is proposed to use temporary ground protection (as indicated on the TPP plan) for movements within the RPA.

5.6.4 The excavation is still considered to be at depths and distances where only minor feeder roots will be encountered. A tree of this size has the capacity to be rooting to depths in excess of 3m and excavations are limited to the top 500mm. The closest point of excavation is 4.5m from the tree and as such we believe this is within the tolerable range, particularly when considered in the context of public highway excavations adjacent to street trees. We propose to supervise the excavation as follows:



5.7 Ground Level Changes

5.7.1 There are no ground level changes within retained tree RPA's proposed.

5.8 Tree Shading of Proposal

5.8.1 The garden room utilizes large south facing windows and this, combined with the high and minimal canopy of T1 means no tree shading issues have been identified.

5.9 Arboricultural Project Supervision

5.9.1 Most damage to trees on developments sites is caused inadvertently and to ensure continued protection during development a system of site monitoring is normal.

5.9.2 The Local Planning Authority is invited to secure a schedule by way of Planning Condition. To be effective the Local Planning Authority should provide us with a copy of the formal Decision Notice to ensure we can then contact and follow up the proposed monitoring. A copy of the Decision Notice should be emailed to info@tamlatrees.com .

5.9.3 The proposed inspection schedule is detailed on the following page:

Visit Detail	Date	Status
Pre-commencement Inspection Attend site to inspect type and location of tree protection prior to works commencing and discuss any issues associated with enabling works/ proposal/ services/ works for with site manager/ contractor	**TBC**	**Incomplete**
Site Inspection Site visit to confirm that no damage has been done to retained trees/ identify any remedial actions in the event damage has occurred. Assess any required tree surgery following construction. Inspect and record foul water excavations	**TBC**	**Incomplete**

Appendix 1 – BS5837 Survey Key

BS 5837 Cat	Description
A	Those of high quality and value: in such a condition as to be able to make a substantial contribution (> 40 years)
B	Those trees of moderate quality and value: those in such a condition as to make a significant contribution (> 20 years)
C	Those trees of low quality and value: currently in an adequate condition to remain until new planting could be established (> 10 years)
U	Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed regardless of development (< 10 years)

Note: Sub categories are denoted in the tree survey data (A1, B1, C2 etc.). You are referred to BS5837 for further detail if required.

Tree No.	T (tree), G (group), H (hedge), W (woodland) + Ref No.
Species	Common Name
Ht (m)	Measured height in metres
DBH (m)	Diameter at 1.5m above ground level
No of stems	An indication of the trees form @1.5m (1 = single stem, m/s = multi-stemmed)
Branch Spread	In m to cardinal points
Cr Ht Clearance (m)	Overall height of lowest branches from the ground level on side of proposed development
Life Stage	Young, Semi-Mature, Early-Mature, Mature, Over-Mature
General Observations	Observations on the condition of the tree(s)
Tree Work Specification	Proposed tree works in accordance with BS3998
BS Cat	See above
Life Exp	Estimated remaining contribution in years.
RPA Radius(m)	Radius of the trees Root Protection Area measured from the trunk to the edge of the RPA circle in metres

Appendix 2 – BS5837 Survey Data

Tree No.	Species	DBH (m)	No of Stems	Ht (m)	Crown Spread				BS Cat	Age Class	Life Expect	Cr Ht (m)	Observation	Recommendations	RPR (m)
					N	E	S	W							
T1	Ash	0.78	1	20	4.8	4.8	4.8	4.8	B1	Mature	20 to 40	8	High crown lifting and previously crown reduced. Decay pockets evident on main stem and vigilance for Inonotus hispidus at these pruning wound points advised.	No works	9.4
T2	Cotoneaster	0.08	M/S	4.3	1.8	3.7	3.3	2	C1	Mature	20 to 40	1.8	Multi stemmed shrub/ tree of very low wider amenity. Limited screening from upper canopy to 3rd party.	Remove to allow for proposed development	1
T3	Prunus spp	0.13	1	4.2	2	37	2.3	1.6	C1	Early-mature	20 to 40	1.3	Poor form with stem lean and asymmetrical canopy.	Remove to allow for proposed development	1.6
T4	Unknown	0.122	1		0	2	3	2	U	Early-mature	<10	0.6	Dead	Remove to allow for proposed development	1.5

Tree No.	Species	DBH (m)	No of Stems	Ht (m)	Crown Spread				BS Cat	Age Class	Life Expect	Cr Ht (m)	Observation	Recommendations	RPR (m)
					N	E	S	W							
T5	Rhus	0.14	M/S	5.8	2.6	3.5	4	3	C1	Mature	20 to 40	1	3rd party so no access to fully inspect. Low branches extend over site.	Crown lift to 3m/ cut back to provide construction clearance	1.7
TG 1	Cypress x 2 Unknown x 1	0.2	1	6	3	3	3	3	B2	Early-mature	20 to 40	1.7	Localised garden screening.	No works	2.4
T6	Cypress	0.18	1	5.4	2	2	2	2	C1	Early-mature	> 40	1	3rd party tree so unable to fully inspect. Useful localised screening. Previous topping lowers BS Cat.	No works	2.2

Appendix 3 – Tree Works Schedule

NOTE: All tree works to be undertaken in accordance with BS 3998:2010 'Tree work - Recommendations'.

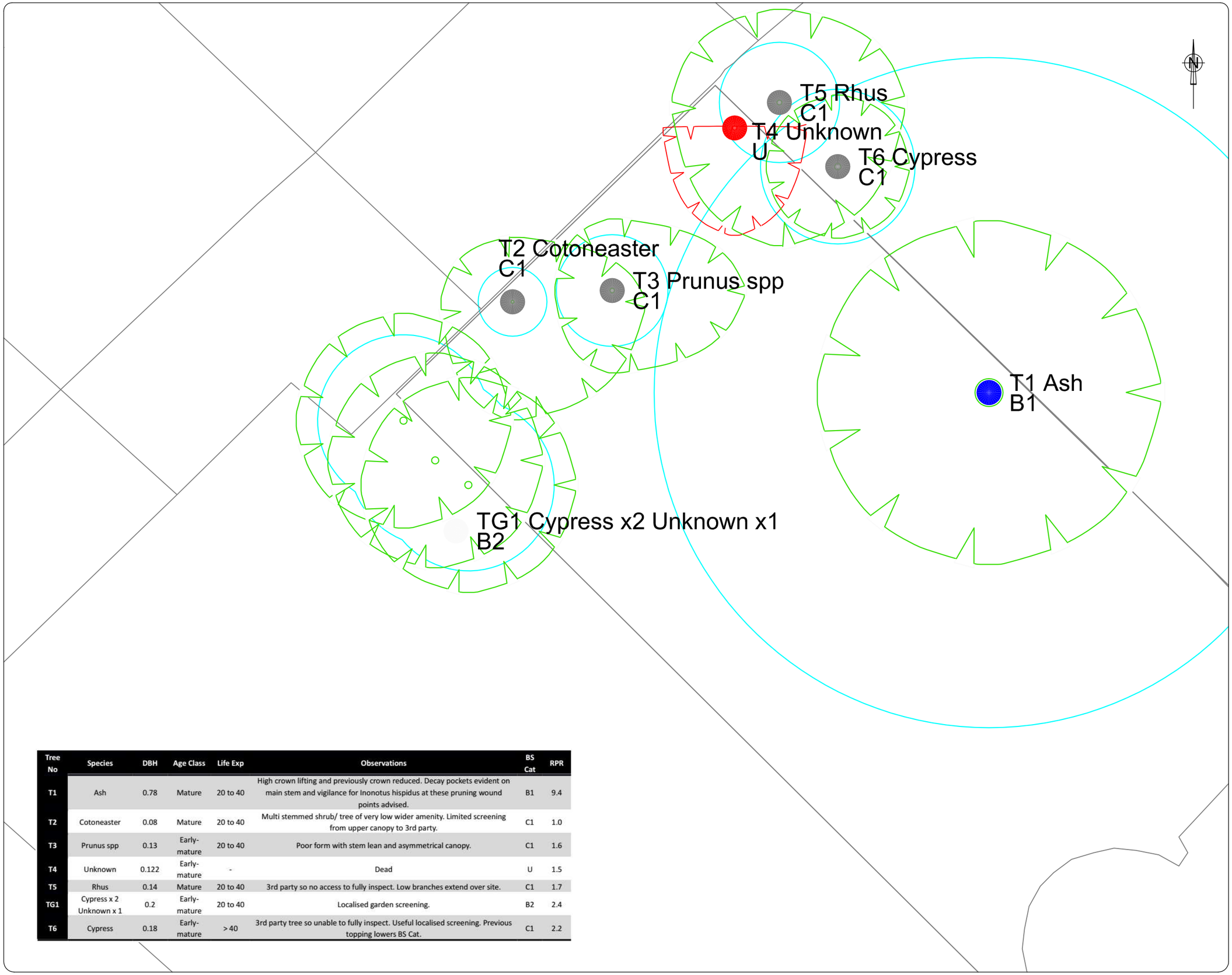
Tree Surgery

Tree No.	Species	Proposed Tree Works	BS Cat
T5	Rhus	Crown lift to 3m/ cut back to provide construction clearance **Note:** The sap of this tree can cause burns and as such any tree works must be done by a qualified tree surgeon	**C1**

Note: minimal tipping back of T4 (Cotoneaster) may also be required. See photos. **Proposed Removal**

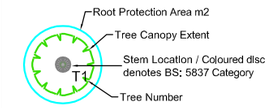
Tree No.	Species	Proposed Works	Observations	BS Cat
T2	Cotoneaster	Remove to allow for proposed development	Multi stemmed shrub/ tree of very low wider amenity. Limited screening from upper canopy to 3rd party.	**C1**
T3	Prunus spp	Remove to allow for proposed development	Poor form with stem lean and asymmetrical canopy.	**C1**
T4	Unknown	Remove to allow for proposed development	Dead	**U**

Appendix 4 - Tree Constraints Plan



Tree No	Species	DBH	Age Class	Life Exp	Observations	BS Cat	RPR
T1	Ash	0.78	Mature	20 to 40	High crown lifting and previously crown reduced. Decay pockets evident on main stem and vigilance for Inonotus hispidus at these pruning wound points advised.	B1	9.4
T2	Cotoneaster	0.08	Mature	20 to 40	Multi stemmed shrub/ tree of very low wider amenity. Limited screening from upper canopy to 3rd party.	C1	1.0
T3	Prunus spp	0.13	Early-mature	20 to 40	Poor form with stem lean and asymmetrical canopy.	C1	1.6
T4	Unknown	0.122	Early-mature	-	Dead	U	1.5
T5	Rhus	0.14	Mature	20 to 40	3rd party so no access to fully inspect. Low branches extend over site.	C1	1.7
TG1	Cypress x 2 Unknown x 1	0.2	Early-mature	20 to 40	Localised garden screening.	B2	2.4
T6	Cypress	0.18	Early-mature	> 40	3rd party tree so unable to fully inspect. Useful localised screening. Previous topping lowers BS Cat.	C1	2.2

Tree Survey Drawing Key



See Tamla Trees, Tree Survey for Individual Tree Details

KEY

Please refer to Tamla Trees report for details

- Category A - Trees of high quality
- Category B - moderate quality
- Category C - low quality
- Category U - Dead, Dying or Defect trees with <10 years retention value

RPA - root protection area as defined by Table 2 BS 5837:2012

NOTE Tree positions indicatively mapped due to lack of detailed topographical plan

REV AMENDMENTS DRAWN DATE AUTH'D

PROJECT
Flat 1-2 24 Belsize Park, London, NW3 4DU

CLIENT
Ecospace

TITLE
Tree Constraint Plan (TCP)

Job	Scale	DRG NO	Revision
02271R	1:100 @ A3	02271P_TCP_01	-
Date 05/03/2015	Type a		

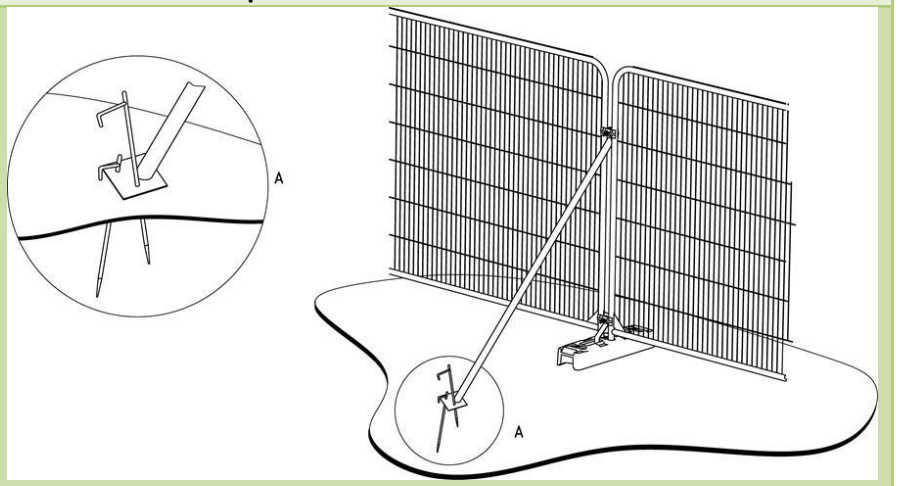
Tamla Trees consulting arborists

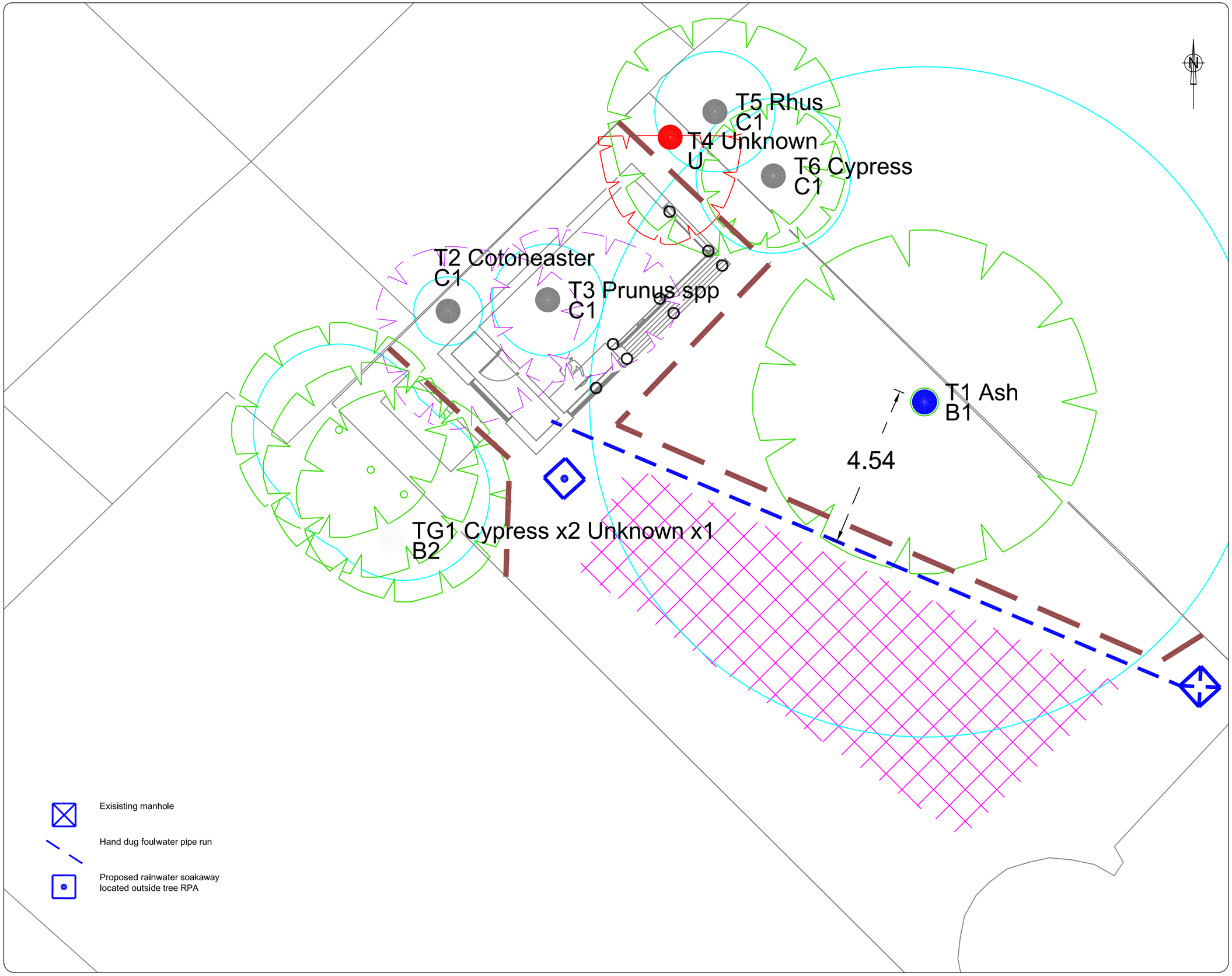
Appendix 5 - Tree Protection Plan

Tree protection is essential to successfully integrate the proposal into the surrounding trees. It is designed to manage the impact on the underlying soil and rooting environment. It must therefore be installed prior to any site activity. Even apparently minimal tracking of the soil near trees has the capacity to irretrievably modify the soil environment to the detriment of tree health and stability.

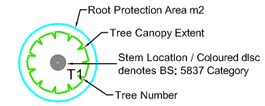
All our fencing specifications accord with advice and guidance within BS 5837. Modifications to fence types are possible but should be discussed prior to implementation. In all other instances the form detailed below should be shown. This offers the best protection to retained trees.

- **Fencing to be installed prior to any on site works.**
- **Fencing to be maintained during construction phase.**
- **To be effective it should be signed with the provided sign to advise site workers of the fencing function.**
- **To be combined with indicated ground protection**





Tree Survey Drawing Key



See Tamla Trees, Tree Survey for Individual Tree Details

KEY

Please refer to Tamla Trees report for details

- Category A - Trees of high quality
- Category B - moderate quality
- Category C - low quality
- Category U - Dead, Dying or Defect trees with <10 years retention value

RPA - root protection area as defined by Table 2 BS 5837:2012

Proposed removal

Proposed removal - to facilitate Development

Location of protective fencing

Temporary ground protection

400mm diameter x 4m deep piles to support suspended floor slab

NOTE Tree positions indicatively mapped due to lack of detailed topographical plan

REV	AMENDMENTS	DRAWN	DATE	AUTH'D

PROJECT
Flat 1-2 24 Belsize Park,
London,
NW3 4DU

CLIENT
Ecospace

TITLE
Tree Protection Plan (TPP)

Job	Scale	DRG NO	Revision
02271R	1:100 @ A3	02271P_TPP_01	A
Date 10/03/2015	Type a		

Tamla Trees
consulting arborists

Appendix 6 – Site Photographs

Image 1 – T1 (Ash) is of only limited public amenity

Image 2 – T1 (Ash) has been reduced and crown lifted previously. Vigilance for any fungal fruiting bodies on main stem (summer) around previous pruning wounds is advised

Image 3 – TG1

Image 4 – T2 & T3 to be removed

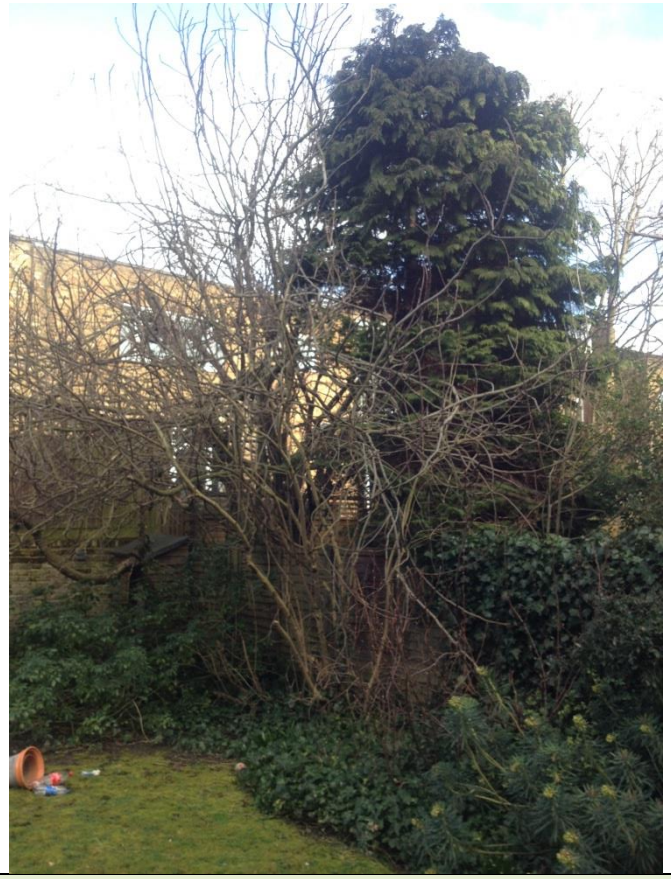


Image 5 – T4, T5 & T6

Image 6 – Image showing location of proposed garden room

Appendix 7 – Limitations

Full Legal Disclaimer

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Specific - Trees

All tree inspections, unless specified, have been undertaken from ground level and using non-invasive techniques. Comments contained within the report on the condition and risk associated with any tree relate to the condition of the tree at the date and time of survey. Please note that the condition of trees is subject to change. This change may occur, but is not limited to biological and non-biological factors as well as mechanical/ physical changes to conditions in the proximity of the tree. Trees should be inspected at intervals relative to risk/ target areas and in accordance with relevant HSE guidance. Tamla Trees ltd can provide further information on this matter if required. Where full access to trees (Ivy, materials at base, location on 3rd party land) was not possible Tamla Trees ltd accept no liability for issues that arise.

Please note no statutory control checks have been undertaken (unless specified). Where tree surgery works have been identified these works are based on the assumption that planning is approved, no tree works should be undertaken prior to determination of this application without up to date confirmation of the Tree Preservation Order / Conservation Area Status of the vegetation. All works should be undertaken in accordance with the appropriate Duty of Care. This should include, for example, site specific risk assessments and due diligence inspections for the presence of protected species.

Any comment/ measurements relating to 3rd party trees have been made without full access to the tree(s). Should these trees have any impact on the proposed development we would advise you to instruct us to contact the 3rd party and undertake further detailed inspection work.

A legal Duty of Care requires that any tree works specified in this report should be performed by qualified, arboricultural contractors who have been competency tested to determine their suitability for such works in line with Health & Safety Executive Guidelines. Additionally all works should be carried out according to British Standard 3998 (2010) Recommendations for Tree Work.