BS5837 Arboricultural Impact Assessment

110 Savernake Road, London, NW3 2JR

Client: **Nathalie Deacon**

Job Reference: 02311Rv2

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

Tamla Trees
consulting arborists

June 2015

Contents

1. Executive Summary

1.1 Tamla Trees ltd has been appointed by Nathalie Deacon to provide advice on the arboricultural issues relating to a proposed installation of a garden room within the rear garden of the property. We surveyed the site on the 15th May 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. 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 proposed installation.

1.3 The main constraint trees are T1 (Ash) and T2 (Ash). There is a minor encroachment in to the RPA for T2 (Ash) from the garden room pile locations but the overall impact is likely to be minimal given the form of excavation and remaining undisturbed rooting area for this tree.

1.4 The garden room is located outside the root protection area (RPA) for T1 (Ash). There will be a need to excavate a foul water sewer connection to the existing site manhole. The location of the tie in point is such that this work can be kept outside the RPA of retained trees (see Tree Protection Plan). The connection to the garden room is within the RPA of T2. The nature of access to the rear garden is such that all excavations will be undertaken by hand.

1.5 The site cannot be accessed by heavy machinery. The garden room consists of pre-fabricated panels which are brought on to site and erected with minimal construction activity. A video of a typical installation can be viewed here. The building is supported on individual hand dug precast foundation 'pads' minimising possible root disturbance and ensuring no use of wet concrete (removing root contamination issues).

1.6 The council have advised the site is within a Conservation Area but that it is not affected by a TPO.

1.7 This report is based on the Ecospace Studios supplied layout drawings as well as Ecospace method statement for pad foundation installation.

2. Statutory Protection

2.1 At the time of writing Camden Council have advised as follows:

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?	No
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 & T2	T3	-
Total Number	None	2 individuals	1 individual	None

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
Northern Boundary Amenity/ screening between properties and railway line	-	T2	-
Rear Garden Contributing to the private amenity to the rear of the property	-	T1	T1, T2 & S1

4.3 T3 (Lilac) is a very small tree 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) Construction Access –** The site can only be accessed by pedestrian movements which significant reduces the risk of damage to the underlying root system of the tree by heavy machinery. The main access will be through the RPA of T1 (Ash) and as a result we have indicated the use of temporary ground protection to remove the risk of compaction. This allows the protective fencing to be offset to facilitate movement of the pre-fabricated panels in to place. **T2 (Ash) Foundation Pads -** The pad foundations required to support the garden room will be partially located within the RPA of T1. The individual pads are precast concrete and are laid on top of compacted Type 1 aggregate. The individual excavations are minimal (see plan) and scope exists for localized repositioning in the event roots >25mm are encountered. The process is that the floor of the garden room is laid immediately following the ground works and as a result the construction activity is only within and around the very edges of the proposed footprint. This
		T2		

				minimizes potential root disturbance and ground compaction. The video for a typical installation shows this further: http://vimeo.com/115189961 **Services** – The proposed service route is indicated on the Tree Protection Plan. The trench will be hand dug and is located outside of the tree RPA's except for the tie in point of the garden room. The encroachment is minimal and runs directly at the tree (as opposed to across the root system) and this limits the risk of root severance. At the distances involved from T2 we would envisage only minor seasonal roots to be present.

5.3 Tree Loss

5.3.1 No trees will be removed to facilitate the proposal.

5.4 Foundations

5.4.1 As detailed the foundations are within the RPA of T2 (Ash). However they are minimal in respect that the building is supported on pad foundations which consist of a prefabricated concrete block resting on top of consolidated Type 1 aggregate.

5.4.2 Installation is by a team with over 7 years' experience and they understand fully the issues associated with tree roots and the need for careful hand excavations for the foundation pads. No wet concrete is used so there is no issue with root to concrete contamination. Any loss of fibrous roots

from the pad excavations will be minimal and in the event roots >25mm are encountered the pad is repositioned to remove the need to disturb the root and the exposed root excavation is backfilled.

5.4.3 The level of incursion in to the RPA of T1 from the collective pad excavations constitutes less than 2% of the trees overall RPA and is therefore considered insignificant.

5.4.4 The process, a cross section of an individual pad as well as an image of a typical installation prior to the garden rooms construction is shown on the following page:

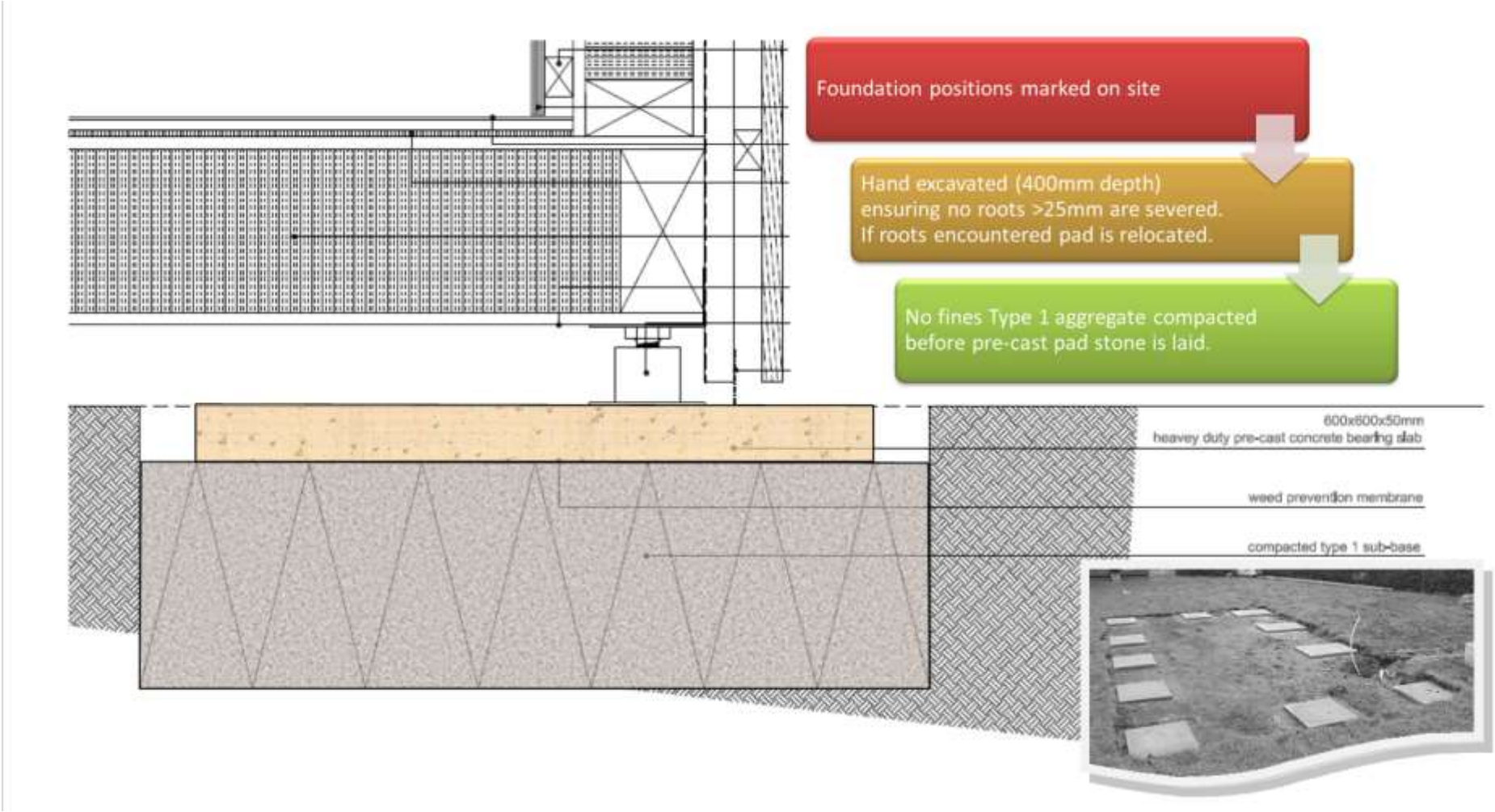


Fig 1 – Pre-cast hand dug pad foundation with installation flow and image (bottom right) of typical installation

5.5 Surfaces near Trees

5.5.1 No new permanent 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 preparation and installation.

Fig 2 - Temporary ground protection detail

5.6 Site Service Provision

5.6.1 The proposed service route is indicated on the Tree Protection Plan. The trench will be hand dug and is located outside of the tree RPA's except for the tie in point of the garden room. The encroachment is minimal and runs directly at the tree (as opposed to across the root system) and this limits the risk of root severance. At the distances involved from T2 we would envisage only minor seasonal roots to be present. The process is summarised below (with further detail in Appendix 6):

Fig 3 – Process flow and image showing depth/ width of typical service installation

5.7 Ground Level Changes

5.7.1 No ground level changes will take place.

5.8 Tree Shading of Proposal

5.8.1 The garden room utilizes large windows and this; combined with the high canopies of T1 & T2 as well as the typical use of such garden room's 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. We would advise that tree protective fencing is installed prior to any on site activities.

5.9.2 Basic checks will be required following planning being achieved to ensure that protective fencing remains intact and ensure the proposed works close to trees are completed in accordance with the finalized report. Any unforeseen issues can also be identified and discussed before damage to the trees occurs. It is likely this approach will be secured by way of Planning Condition.

5.9.3 Following each visit a formal record is sent to the Local Authority to allow formal discharge of the planning condition. Following comments from the tree officer we have revised the report to provide 2 visits. One at the start to check fencing is of the correct specification and is in place and brief the service trench ground workers, and a further final 'sign off' visit.

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 with site manager. Brief service trench ground workers.	**TBC**	**Incomplete**
Site Inspection Final 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.	**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	0.5	1	16	4.4	5.5	4.8	5	B1	Mature	20 to 40	4.5	Good high canopy. V union at 2m. Has been crown lifted in the past.	No works	6
T2	Ash	0.5	1	16	3	5	7	5	B2	Mature	20 to 40	4.5	Good high canopy. V union at 2m. Has been crown lifted in the past and the wounds have not fully occluded meaning there is decay evident. Located on network rail land. Northern canopy has recently been heavily reduced as it is on rail side. No access to fully inspect.	No works	6
T3	Lilac	0.09	1	2.4	1	0	1.3	2.6	C1	Mature	20 to 40	1	Good garden amenity but of no wider significance.	No works	1.1

Appendix 3 – Tree Works Schedule

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

Tree Surgery

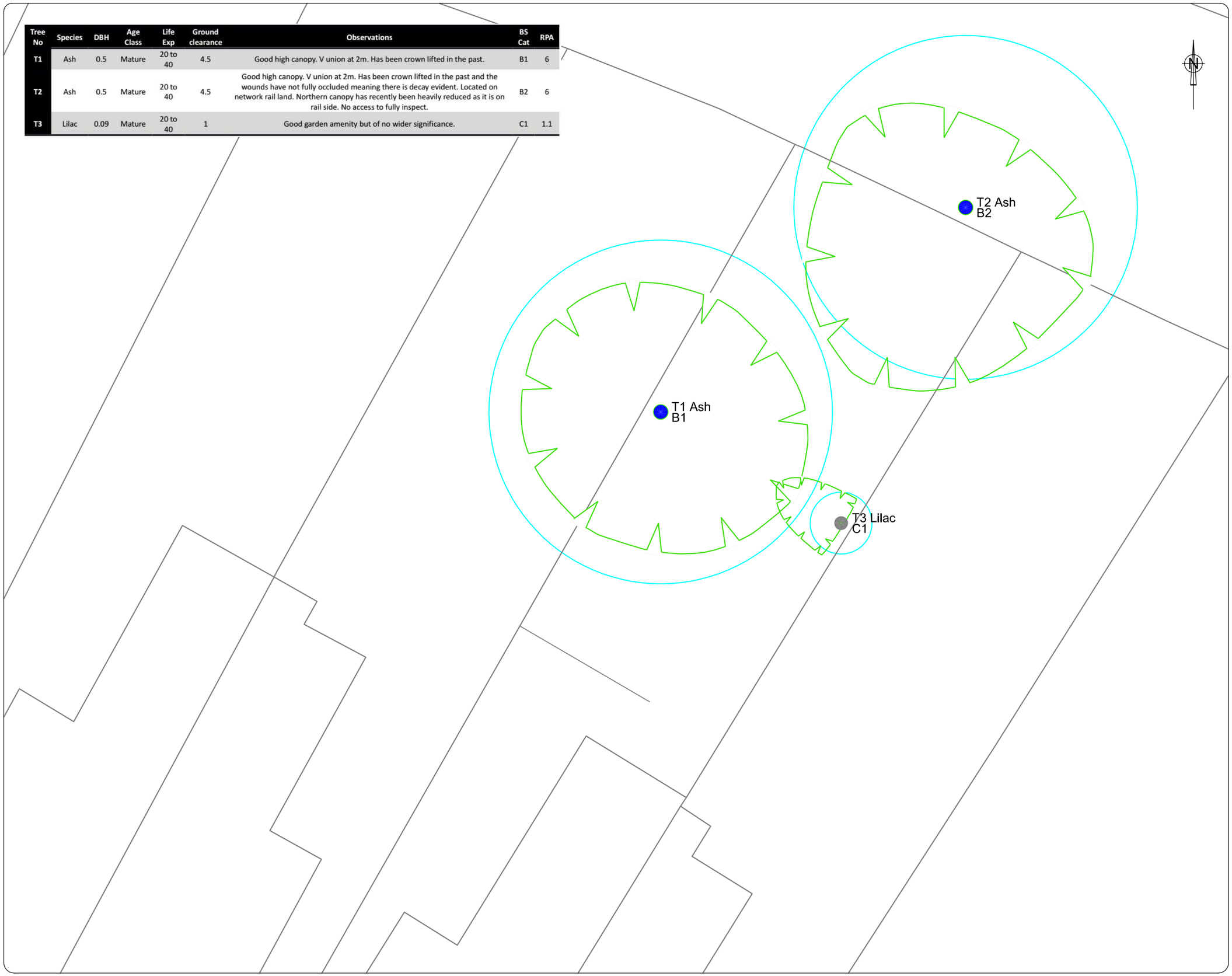
Tree No.	Species	Proposed Tree Works	BS Cat
None			

Proposed Removal

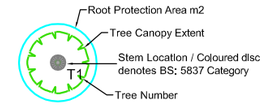
Tree No.	Species	Proposed Works	Observations	BS Cat
None				

Appendix 4 - Tree Constraints Plan

Tree No	Species	DBH	Age Class	Life Exp	Ground clearance	Observations	BS Cat	RPA
T1	Ash	0.5	Mature	20 to 40	4.5	Good high canopy. V union at 2m. Has been crown lifted in the past.	B1	6
T2	Ash	0.5	Mature	20 to 40	4.5	Good high canopy. V union at 2m. Has been crown lifted in the past and the wounds have not fully occluded meaning there is decay evident. Located on network rail land. Northern canopy has recently been heavily reduced as it is on rail side. No access to fully inspect.	B2	6
T3	Lilac	0.09	Mature	20 to 40	1	Good garden amenity but of no wider significance.	C1	1.1



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
110 Savernake Road, NW3 2JR

CLIENT
Nathalie Deacon

TITLE
Tree Constraint Plan (TCP)

Job	Scale	DRG NO	Revision
02311R	1:125 @ A3	02311P_TCP_01	-
Date: 18/05/2015	Type: a		

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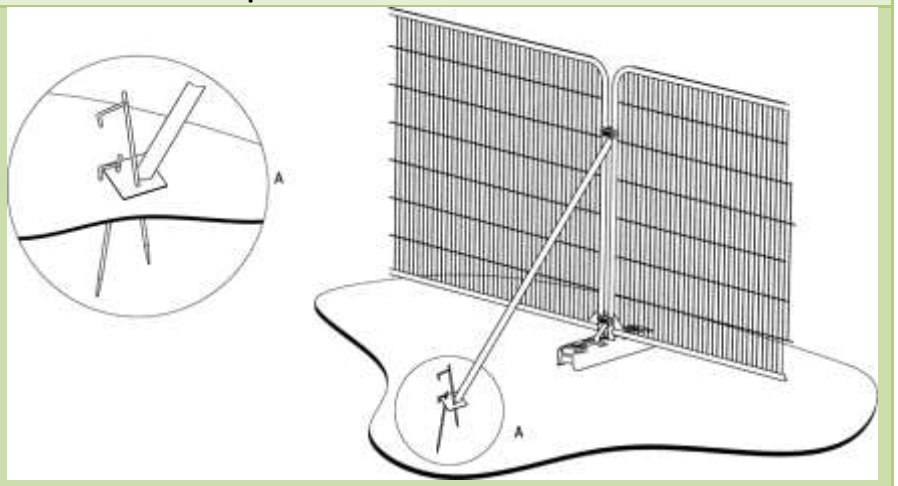
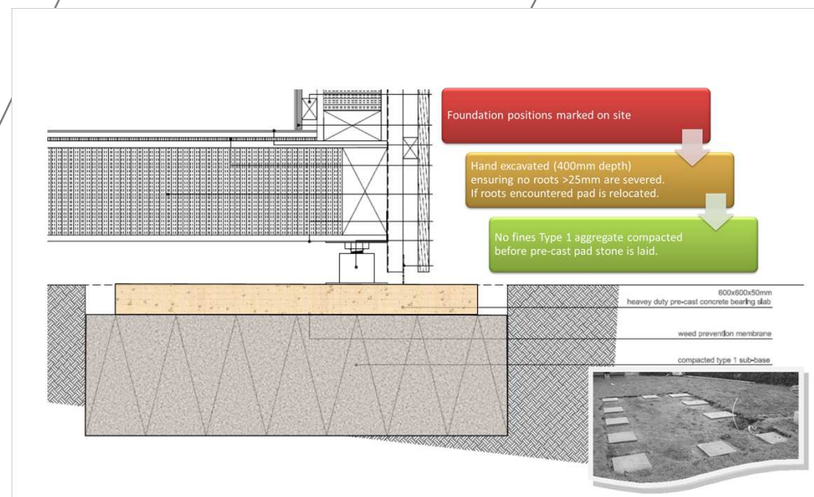
Appendix 5 - Tree Protection Plan

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.

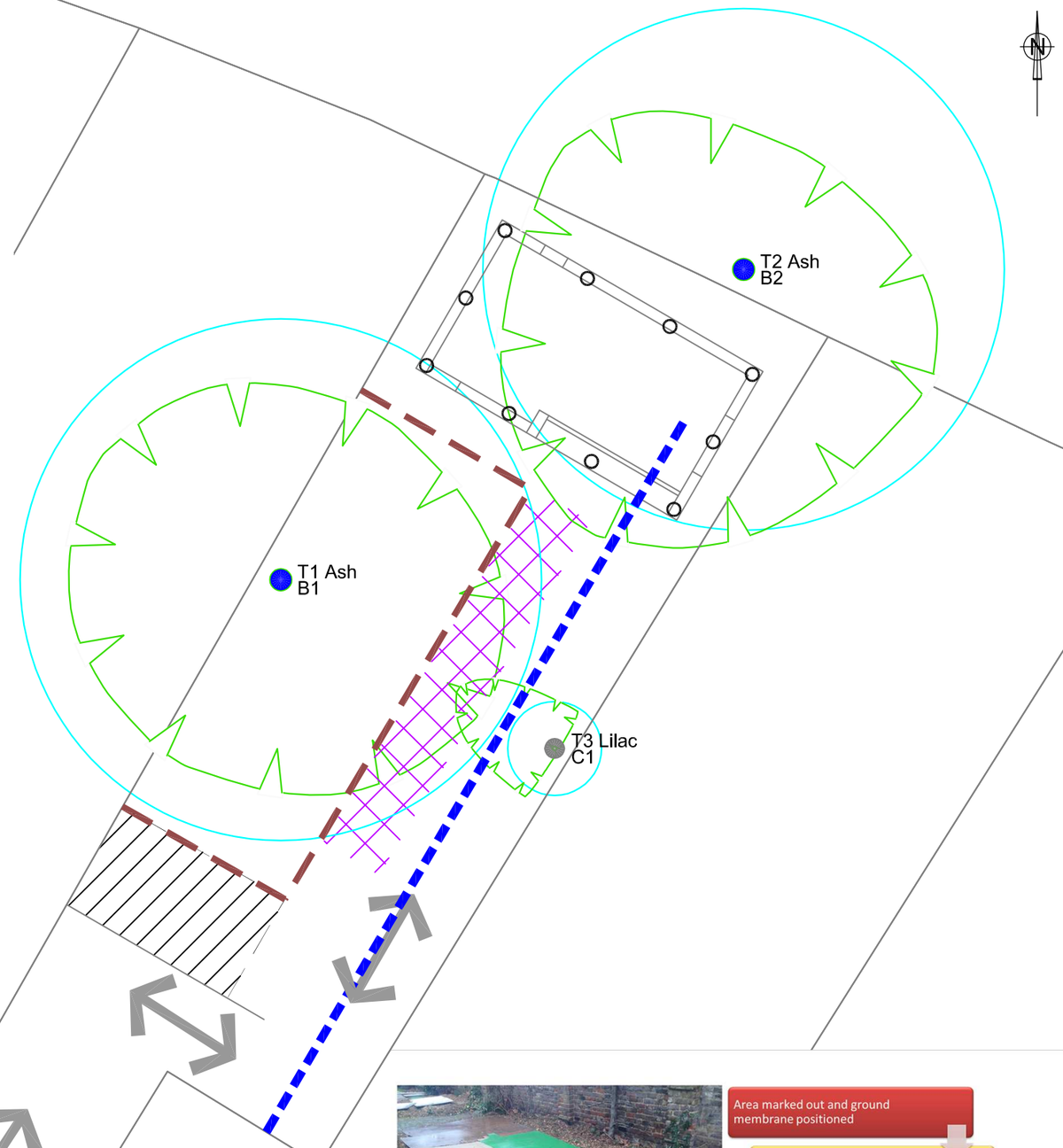
All our fencing specifications accord with advice and guidance within BS 5837. Modifications to fence types are possible but should be discussed prior to implementation. In all other instances the form detailed below should be shown. This offers the best protection to retained trees.

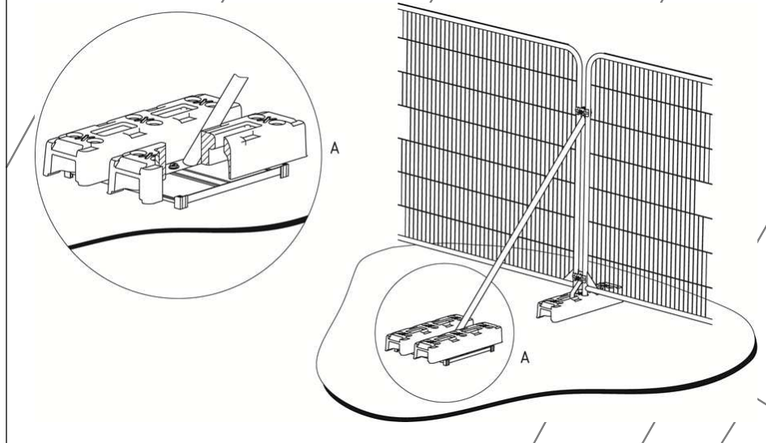
- **Fencing to be installed prior to any on site works.**
- **Fencing to be maintained during construction phase.**
- **To be effective it should be signed with the provided sign to advise site workers of the fencing function.**
- **To be combined with indicated ground protection (see plan)**
- **No fencing to northern boundary as existing boundary fence restricts movement below 3rd party tree T2 (Ash)**





Concrete Pad footing

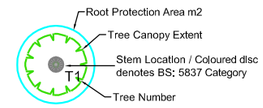




BS Feet Fence

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

Location of protective fencing

Prefabricated Panels stored on palates to maximise ground protection

Temporary ground protection

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

Site access (Pedestrian only)

Route of service trench provision to avoid tree RPA's where possible

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

REV	AMENDMENTS	DRAWN	DATE	AUTH'D

PROJECT
110 Savernake Road, NW3 2JR

CLIENT
Nathalie Deacon

TITLE
Tree Protection Plan (TPP)

Job	Scale	DRG NO	Revision
02311R	1:125 @ A3	02311P_TPP_01	B
Date: 18/05/2015	Type: a		

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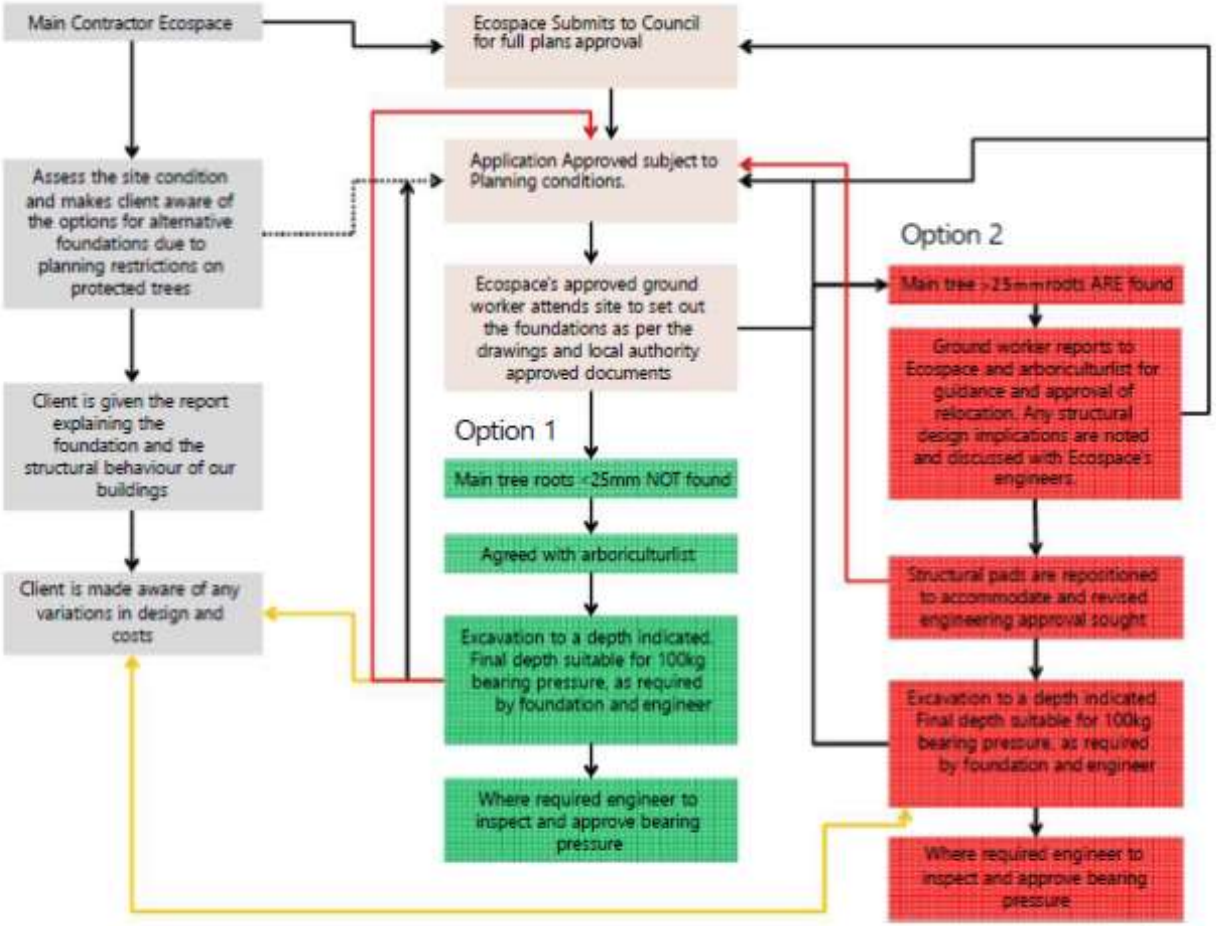
Appendix 6 – Ecospace Ground Work Method Statement



Summary of application and ground work methodology

Appendix 7 – Site Photographs

Image 1 – Pedestrian access point. No heavy machinery can or will be brought on site.

Image 2 – T1 (Ash)

Image 3 – T1 showing V union at base of canopy

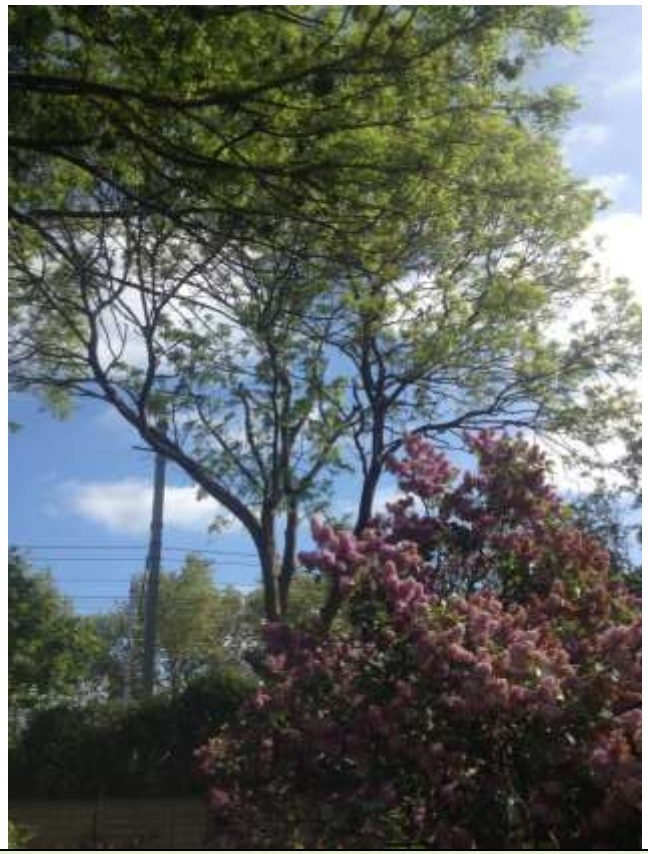


Image 4 – T2 (Ash) and T3 (Lilac)

Image 5 – Image showing pedestrian access route and sufficient low branch clearance for T1.

Image 6 – Rear boundary fence and stem of 3rd party tree T2 (Ash) visible to rear.

Appendix 8 – Limitations

Full Legal Disclaimer

This report was prepared as a report of work instructed by client (as specified). Neither Tamla Trees ltd nor any associated company, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the report and its findings. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favouring by Tamla Trees ltd or any associated company. The views and opinions of authors expressed herein do not necessarily state or reflect those of Tamla Trees ltd or any associated company.

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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.