BS5837 Arboricultural Impact Assessment

8 Downside Crescent, London, NW3 2AP

Client: **Deborah Bass**

Job Reference: 02873Rv2

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

April 2018

Tamla Trees
consulting arborists

Contents

1. Executive Summary

1.1 Tamla Trees ltd has been appointed by Deborah Bass to provide advice on the arboricultural issues relating to the installation of an Ecospace garden room. We surveyed the site on 27th March 2018. The survey accorded with BS5837:2012 "Trees in relation to design, demolition and construction – Recommendations". The Ecospace studios are prefabricated panel structures assembled by hand and with a typical installation time of 10 days/ 2 weeks. The predominant trees affected by the works are T1 (Sycamore) & T6 Magnolia. The trees have a collective root protection area (RPA) of 87sqm. The garden room utilises a pad foundation system requiring excavations that will affect 2.5sqm of the combined RPA. This level of incursion is well within the tolerable range for T2 (1.9% of RPA affected) and T6 (3.6% of RPA affected).

1.2 No demolition is required other than removal of 2 small sheds close to the trees. The new structure will be supported on precast swivel top stones which will be supported on a hand dug excavation. Scope exists to manipulate stone positions to avoid tree roots which has worked well on numerous other installations within tree Root Protection Areas (RPA's).

1.3 The works will be accessed through the side access of the property away from retained trees. Tree protection will ensure that there is no discernible impact to retained rear garden trees. A service trench will be hand dug through the rear garden to connect with the rear of the existing property but will be located to cause the minimum disruption to tree roots between the protective fencing panels.

1.4 The potential tree issues can be summarised as: **Removal of the existing sheds> Installation (including footings) of the replacement structure> service provision> landscaping.**

1.5 At the time of writing Camden Council have advised the property is located within the Parkhill Conservation Area and that T8 (Cypress) to be the subject of a Tree Preservation Order (TPO) reference C990. It is proposed to remove T3 (Cypress) a small ornamental within the rear garden.

1.6 This report is based on the client plans ref: 1806.PL.04 & 1806.PL.05. Subject to the working practices and tree protection measures outlined in this report being adopted there should be no discernible impact on retained trees.

2. Statutory Protection

2.1 At the time of writing we are advised as follows:

Conservation Area Status	
Is the site located within a Conservation Area?	Yes Parkhill Conservation Area
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?	Yes Our Ref: T8
Type of TPO	~~**Area**~~
	Individual
	~~**Group**~~
	~~**Woodland**~~
TPO Reference	C990
Date TPO Made	NA
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. (ii) At the time of writing London Borough of Camden have advised as indicated above.	

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

3.5 London Borough of Camden: Parkhill and Upper Park Conservation Area Appraisal and Management Strategy

4. The Trees

4.1 The trees can be summarised as follows:

BS 5837 Cat	A	B	C	U
Specific Trees	-	T1* & T6	T2*, T3, T4, T5, T7*, T8	-
Total Number	None	2 individuals	6 individuals	None

*3rd party trees

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

BS 5837 Cat	A	B	C
Private Residential Amenities Providing amenity between properties and contributing to the local (garden) tree scape between Downside Crescent and Lawn Road	-	T1	T2, T4 & T5
Private Residential Amenities Providing amenity between properties and contributing to the local (garden) tree scape for immediate properties in Downside Crescent	-	T6	T7
Downside Crescent Amenity to the public highway/ Downside Crescent	-	-	T8

4.3 There were no hedgerows and as such the 1997 Hedgerow Regulations do not affect this project.

4.4 T3 (Cypress) is a small tree of no discernible wider amenity. This tree is proposed for removal.

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 48 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	**No**

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		T6	T2	**Pad Foundations** – The proposal places the structure within the RPA areas of T2 (sycamore) and T6 (Magnolia). On an individual level the pad footing incursions are minimal. The collective impacts are tabulated on the following page with the greatest incursion being 3.6% of T6's RPA. T2 (Sycamore) has an RPA of 41sqm of which the pad footings occupy 0.8sqm. This incursion equates to 1.9% of the trees RPA meaning >92% of the trees RPA remains unaffected by the excavation. T6 (Magnolia) has an RPA of 46sqm of which the pad footings occupy 1.7sqm. This incursion equates to 3.6% of the trees RPA meaning >96% of the trees RPA remains unaffected by the excavation. T6	**Service**s – The new structure will require a service connection with the main property. This will be hand dug directly away from T6 (as opposed to across the root plate which has the capacity to cause greater damage). It will exit the garden room at a location to the north of the structure to again minimize potential root disturbance. Instruction for hand digging to feed services past or below any roots >25mm and ensuring any roots below

				this size are cleanly cut further reduces the risk of inadvertent damage.

5.2.2 It should be noted that some of the footprint is already occupied by a shed. The relative incursions in to the RPA for the pad excavations are as follows.

Tree Number	RPA Total (Sqm)	Incursion (Sqm)	Pads as % of trees RPA
T2	41	0.8	1.9
T6	46	1.7	3.6

5.2.3 The collective incursions detailed above are well within the tolerable thresholds for the trees. Any additional loss from the structure (above ground parts as opposed to relative pad footings) is at a level that is well within tolerable ranges.

5.3 Tree Loss

5.3.1 It is proposed to remove T3 (Cypress)

Fig 1 – The rear garden with T6 (centre) in left image. T3 (indicated right) will be removed. This is a small tree poorly located for long term retention.

5.3.2 **Birds** – If the removal of T3 will be completed between 1st March & the 31st July (inclusive) a due diligence check for nesting birds must be completed before work starts in order to comply with the Wildlife & Countryside Act 1981. This check should be recorded in the Site Specific Risk Assessment. If active nests are found work should not take place until the young have fledged.

5.3.3 **Bats** – It should be noted that in England and Wales, the relevant legislation is the Wildlife and Countryside Act (1981) (as amended); the Countryside and Rights of Way Act, 2000; the Natural Environment and Rural Communities Act (NERC, 2006); and by the Conservation of Habitats and Species Regulations (2010).

5.4 Demolition & Foundations

5.4.1 The existing 2 sheds and block paving supports will be removed and this process can be summarised as follows:

Stage 1

- T3 removed.
- Tree protection installed.

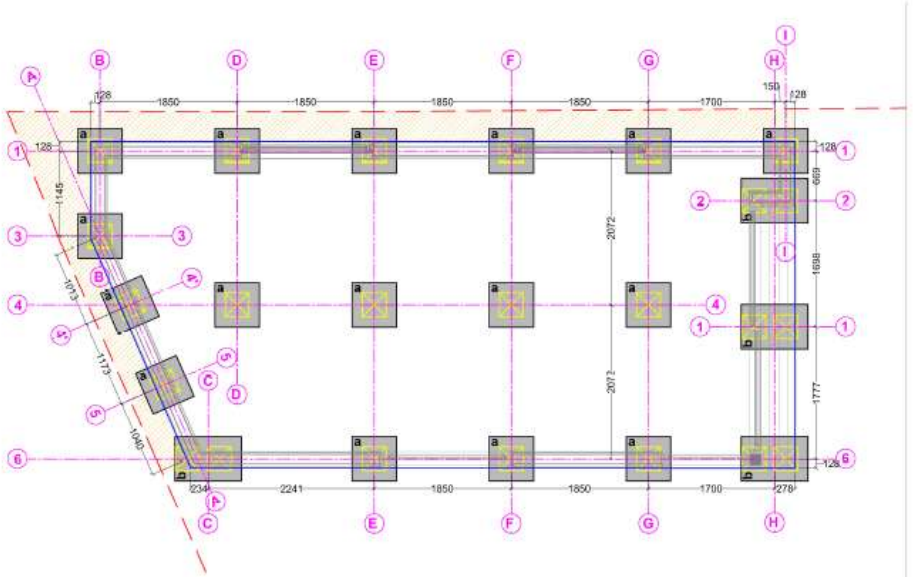
Stage 2

- Existing sheds removed by hand.
- Localised removal of block paving supports by hand.

Stage 3

- Protective fencing remains in place for duration of all construction works.

5.4.2 Pad footings will be utilised.



- **Pad footings used to minimise impact.**
- **Hand dug with localised repositioning to avoid roots >25mm.**
- **The level of works is such that no special foundation measures are proposed. In summary at this level and in this location we believe there will be no discernible impact on the trees health or stability.**
- **Service trench hand dug and pipes fed below roots >25mm (although the presence of these is considered to be unlikely).**

Fig 2 – Foundation incursion overview

5.4.3 The pad footing is used for buildings of this type. It seeks to minimise any impact on underlying tree roots.

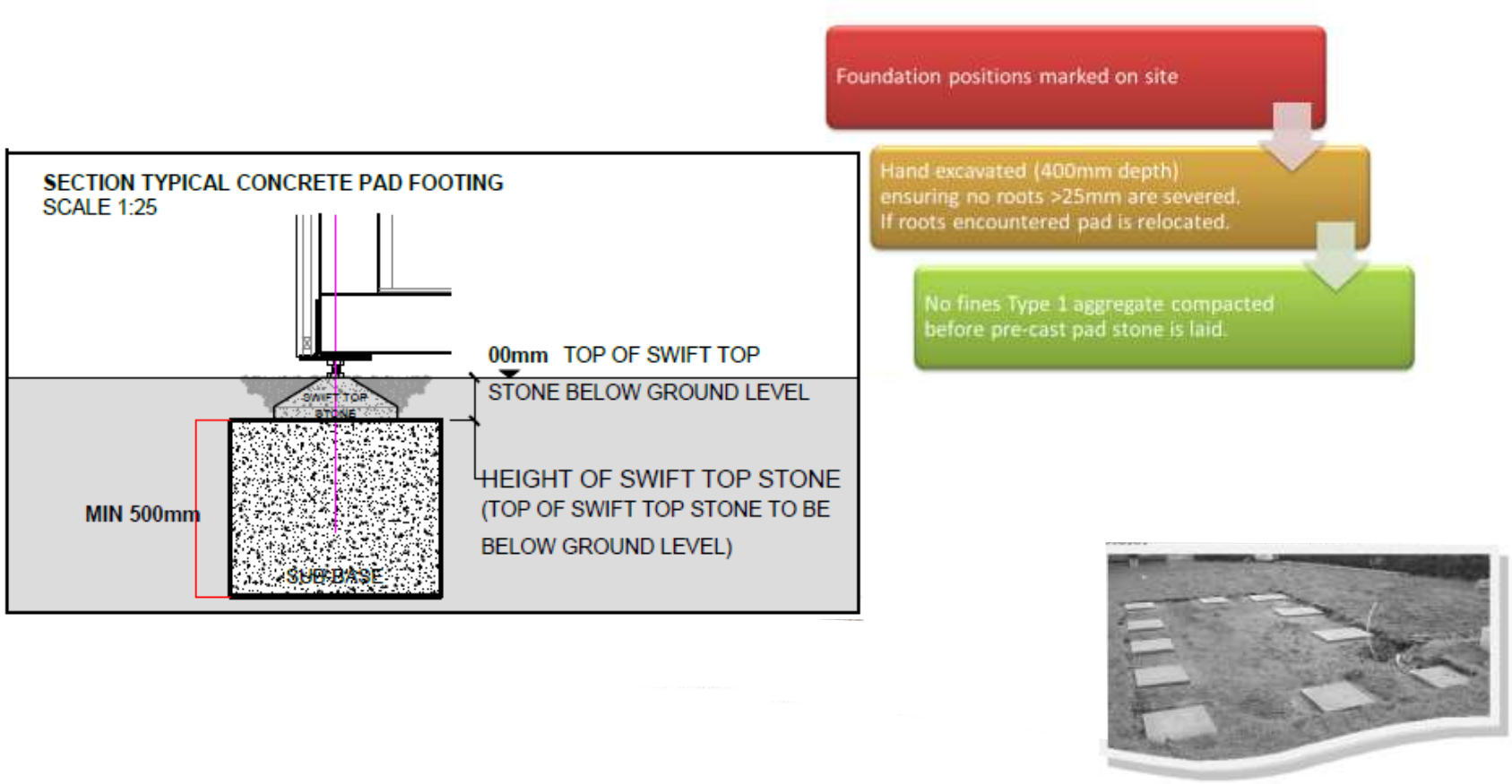


Fig 3 – Typical pad detail with installation (inset). This approach removes the need for a 'strip' foundation reducing the impact on underlying roots. Pads are hand dug and localised manipulations to retain roots >25mm diameter are possible as a result. **(Note: depth as per image not flow)**

5.4.4 All hand dug pad excavations are not lined as the pad stones are precast meaning there is no wet pour root to concrete issues.

5.4.5 **Planning the excavation:** The pad footing areas within the RPA of retained trees are marked out by hand.

5.4.6 Digging around tree roots is a skill and operatives must proceed with caution. Once (and if) a root is located it is often necessary to use a combination of hand tools and a stiff hand brush to track and 'trace' the roots location. Spot marking roots >25mm with spray paint is advised. All roots >25mm in diameter will be retained.

5.4.7 **How deep?** – The excavation need only be as deep as the proposed pad. Any exposed roots must be covered/ wrapped in hessian if being left uncovered for longer than 12 hours.

				
Narrow Face Spade & Hand Trowel	**Stiff Hand Brush**	**Hi Vis Paint (for spot marking roots)**	**Hessian (to wrap exposed roots)**	**Duct Tape (to secure hessian)**

Fig 4 – Advised tools for any hand digging activity

5.4.8 **WARNING:** Breaking the ground has the potential to uncover services/ destabilise adjacent structures etc.

5.5 Surfaces near Trees

5.5.1 No new surfaces within retained tree RPA's are proposed.

5.5.2 Access will be through the existing side gate and over hard surfacing.

- **Existing side access away from retained trees**
- **No special ground protection measures proposed due to existing hard surfacing.**

Fig 5 – The site benefits from established access for the delivery of the pre-fabricated panels and established side access

5.5.3 Tree protection measures are presented in Appendix 5. The structure itself is a pre-fabricated building carried to position in panels.

5.6 Site Service Provision

5.6.1 The new service trench will be hand dug. It will be positioned to be located outside the RPA of retained trees and will be hand dug as an extra precaution adhering to the principles of hand digging outlined in section 5.4.

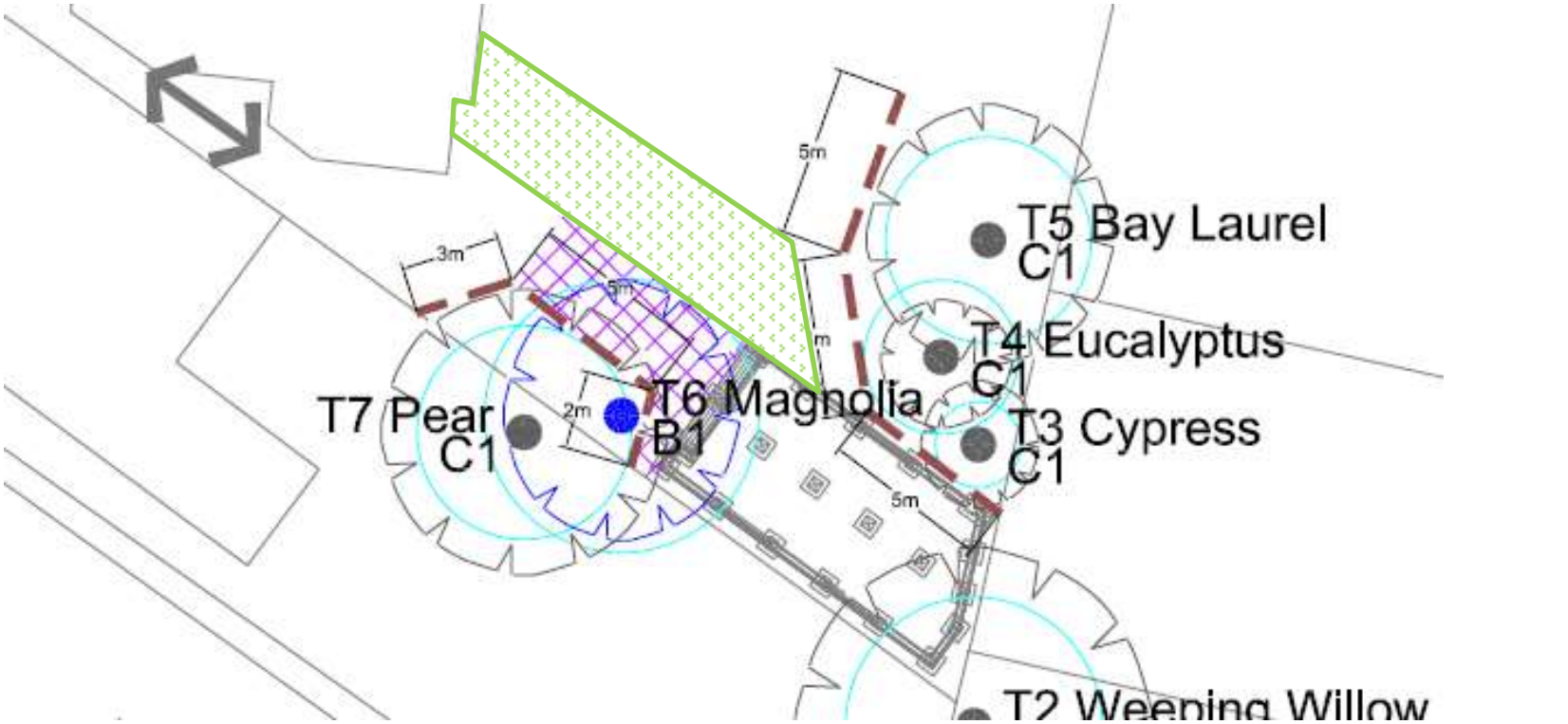


Fig 6 – A large zone (indicated above) is available for service trench installation outside retained tree RPA's

5.6.2 An indicative flow of the service installation process is shown below:

Fig 7 – Service installation overview.

5.6.3 To limit maintenance impact to the garden room from leaf drop given the proximity/ overhang of trees it is proposed that gutter guards be installed.

Fig 8 - Suitable gutter guards (2 types shown above) should be fitted to ensure that leaf drop from adjacent trees does not block new guttering leading to potential pressure for tree works.

5.7 Ground Level Changes

5.7.1 No ground level changes within the RPA areas of retained trees are proposed other than the installation of the pad stones detailed elsewhere.

5.8 Tree Shading of Proposal

5.8.1 The nature of the design is such that it benefits from large glazed areas maximizing light penetration. Issues of shading are therefore not considered to be a concern.

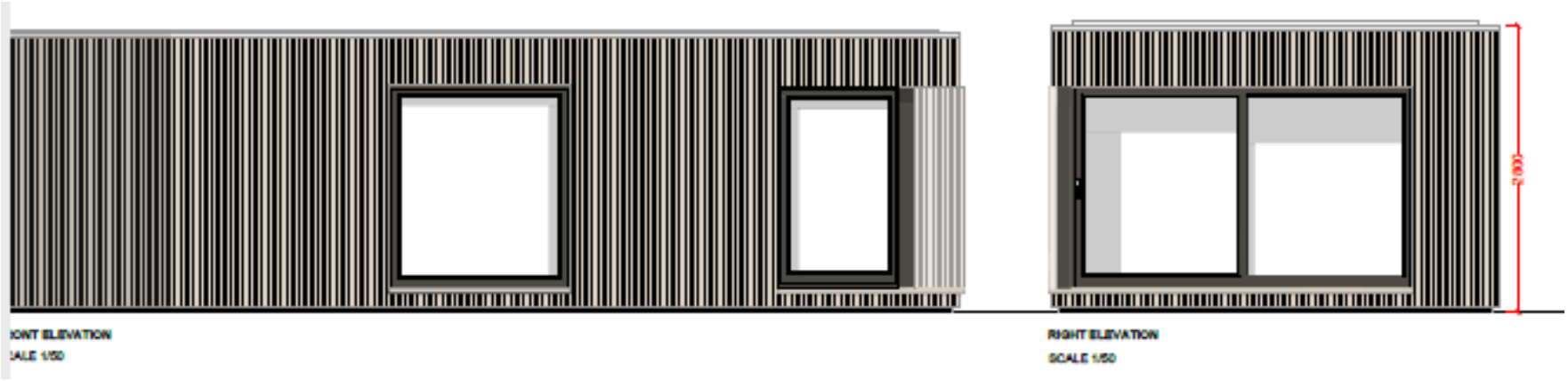


Fig 9 - The garden room benefits from large glazed areas. Issues of potential light restriction from trees are not considered an issue.

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. However, the minimal nature of the proposed construction combined with short duration (10 days to 2 weeks) means site supervision is considered disproportionate to the real pressures on retained trees.

5.9.2 The Local Planning Authority is invited to secure a schedule by way of Planning Condition in the event they do not agree with this approach.

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	Sycamore	0.5	1	19	6	6	6	6	B2	Mature	20 to 40	2	3rd party Ivy covered tree with no access to inspect. 4.5m from boundary.	No works	6
T2	Willow (Weeping)	0.3	1	12	5	5	5	5	C1	Mature	> 40	1.5	3rd party Ivy covered tree with no access to fully inspect. Subject to repeat pollard management.	No works	3.6
T3	Cypress	0.1	1	3.5	1.8	1.7	1.8	1.6	C1	Young	> 40	0	Establishing small ornamental	Remove	1.2
T4	Eucalyptus	0.18	1	12.5	1.6	2	2	1.7	C1	Early-mature	> 40	3	Establishing tree with high growth potential.	No works	2.2
T5	Laurel (Bay)	0.24	2	8	3.8	3.5	3.5	3.4	C1	Mature	> 40	1.8	Twin stemmed from ground level. Offers useful screening between properties.	No works	2.9

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							
T6	Magnolia	0.32	1	9.5	3.8	3.3	3.5	3.3	B1	Mature	> 40	1.5	Fine example offering good local amenity and screening.	No works	3.8
T7	Pear	0.25	1	10	4	4	4	4	C1	Mature	> 40	1.4	3rd party tree with no access to fully inspect.	No works	3
T8	Cypress	0.45	1	15	2.4	2.4	2.5	2.2	C1	Mature	20 to 40	2	Ornamental now outgrown location and out of character with wider street scene.	No works	5.4

Appendix 3 – Tree Works Schedule

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

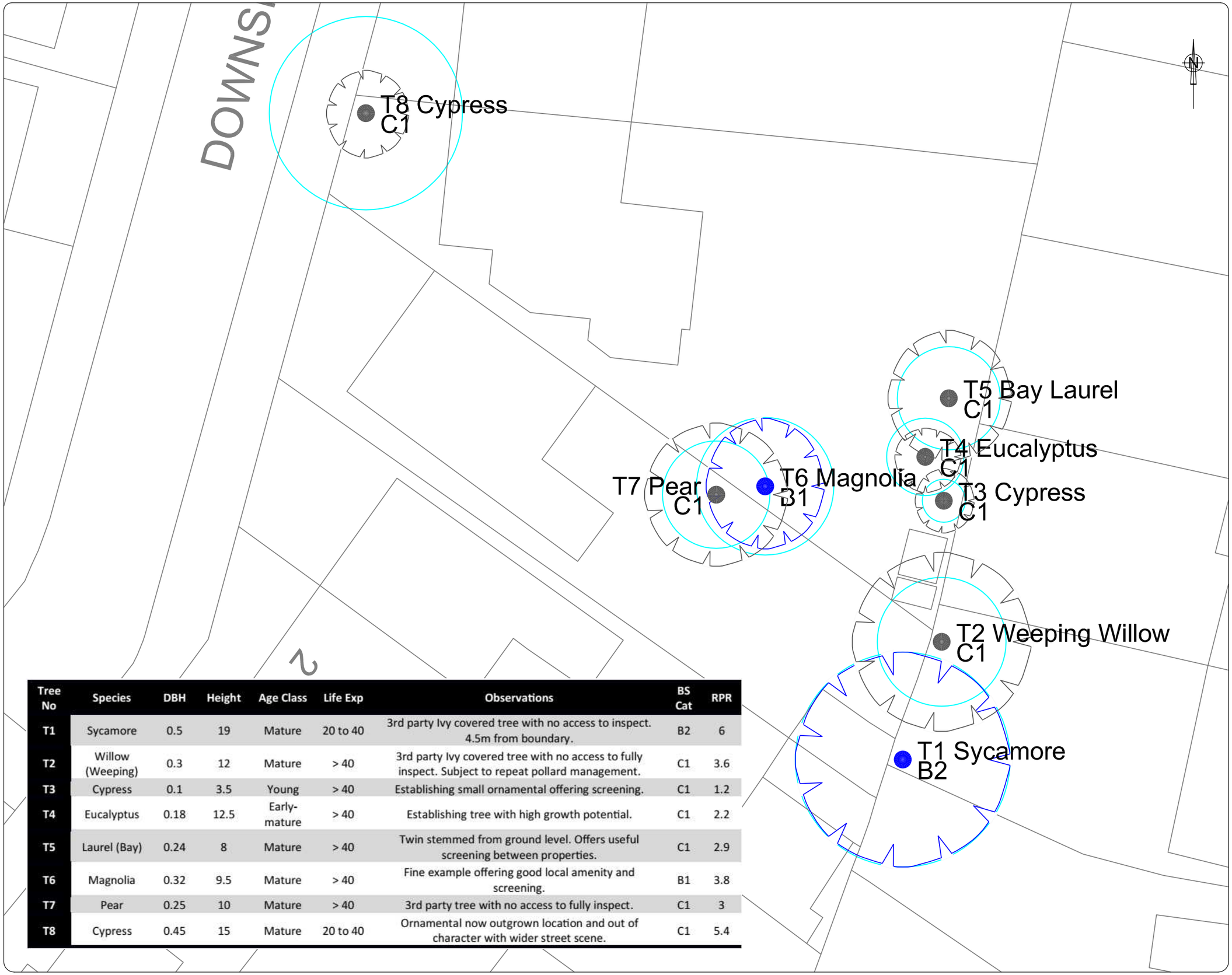
Tree Surgery

Tree No.	Species	Proposed Tree Works	BS Cat
		NONE	

Proposed Removal

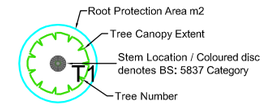
Tree No.	Species	Proposed Works	Observations	BS Cat
T3	Cypress	Remove	Establishing small ornamental	**C1**

Appendix 4 - Tree Constraints Plan



Tree No	Species	DBH	Height	Age Class	Life Exp	Observations	BS Cat	RPR
T1	Sycamore	0.5	19	Mature	20 to 40	3rd party Ivy covered tree with no access to inspect. 4.5m from boundary.	B2	6
T2	Willow (Weeping)	0.3	12	Mature	> 40	3rd party Ivy covered tree with no access to fully inspect. Subject to repeat pollard management.	C1	3.6
T3	Cypress	0.1	3.5	Young	> 40	Establishing small ornamental offering screening.	C1	1.2
T4	Eucalyptus	0.18	12.5	Early-mature	> 40	Establishing tree with high growth potential.	C1	2.2
T5	Laurel (Bay)	0.24	8	Mature	> 40	Twin stemmed from ground level. Offers useful screening between properties.	C1	2.9
T6	Magnolia	0.32	9.5	Mature	> 40	Fine example offering good local amenity and screening.	B1	3.8
T7	Pear	0.25	10	Mature	> 40	3rd party tree with no access to fully inspect.	C1	3
T8	Cypress	0.45	15	Mature	20 to 40	Ornamental now outgrown location and out of character with wider street scene.	C1	5.4

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
8 Downside Crescent, London, NW3 2AP

CLIENT
Deborah Bass

TITLE
Tree Constraint Plan (TCP)

Job	Scale	DRG NO	Revision
02873R	1:200 @ A3	02873P_TCP_01	-
Date 28/03/2018	Type a		

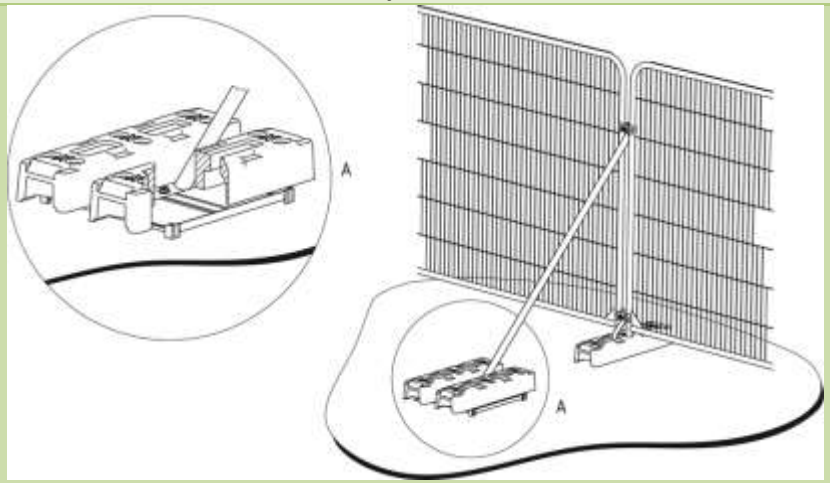
Tel: 01252 811 233
Email: Info@tamlatrees.com
Web: www.tamlatrees.com
Tamla Trees consulting arborists

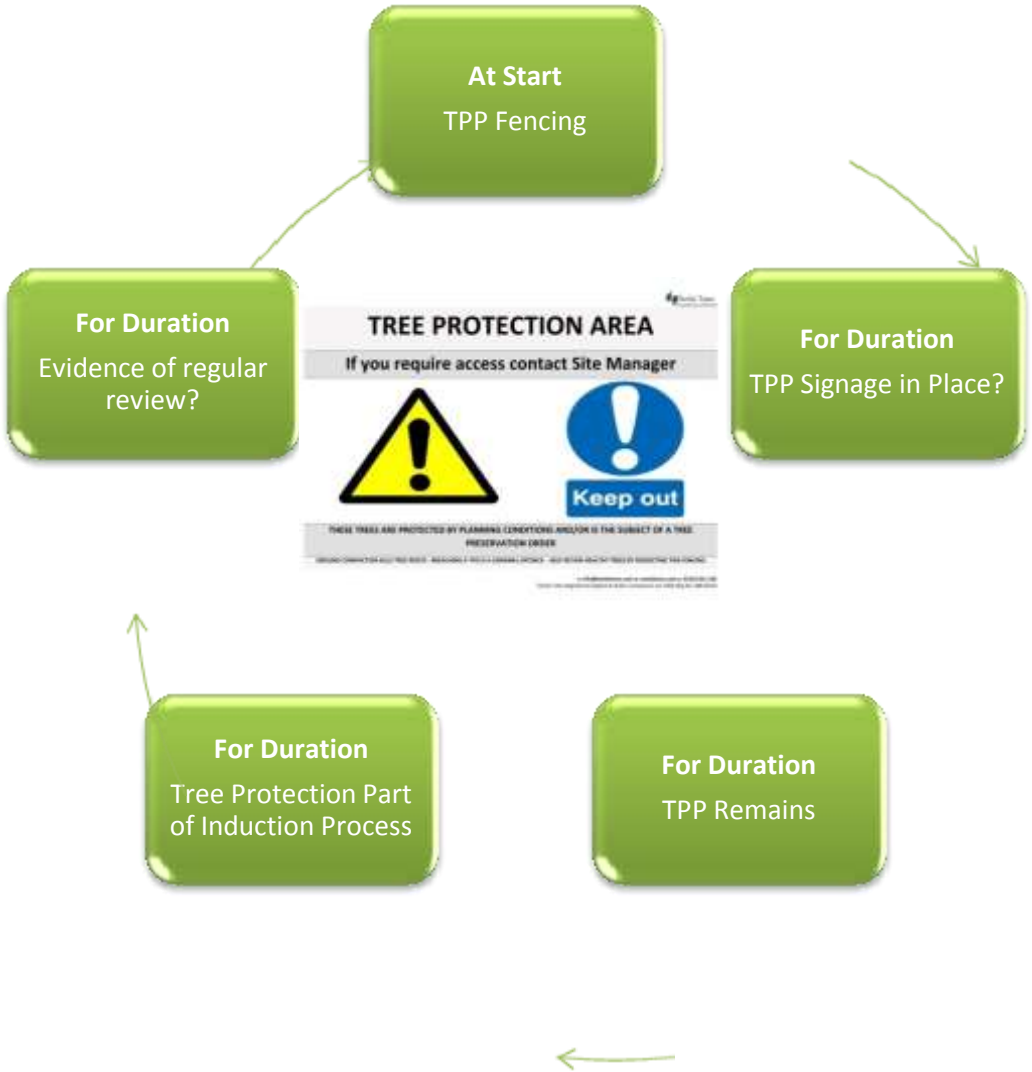
Appendix 5 - Tree Protection Plan

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 further 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.

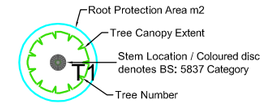
All our fencing specifications accord with advice and guidance within BS 5837. Modifications to fence types are possible but should be discussed prior to implementation. In all other instances the form detailed below should be shown. This offers the best protection to retained trees.

- **All tree protection must be in place prior to any site activities. It is recommended that this fencing is installed prior to any site works (including demolition).**
- **To be effective Tree Protection must remain in place for the duration of the development and form part of the site induction process.**
- **Site operatives to be briefed of fencing requirement & purpose.**
- **To be combined with basal shuttering of T8 and temporary ground protection for T6 & T7.**




At Start
TPP Fencing
For Duration
TPP Signage in Place?
For Duration
TPP Remains
For Duration
Tree Protection Part of Induction Process
For Duration
Evidence of regular review?
TREE PROTECTION AREA
If you require access contact Site Manager
Keep out

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 - to facilitate Development

Location of protective fencing - BS 5837 Feet Fence (or similar)

Temporary ground protection

Tree protection - Plywood Frame 1.2m tall

Site access

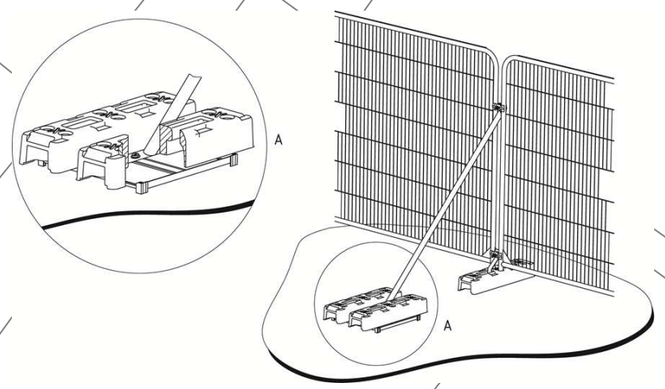
NOTE Tree positions indicatively mapped due to lack of detailed topographical plan

REV	AMENDMENTS	DRAWN	DATE	AUTH'D

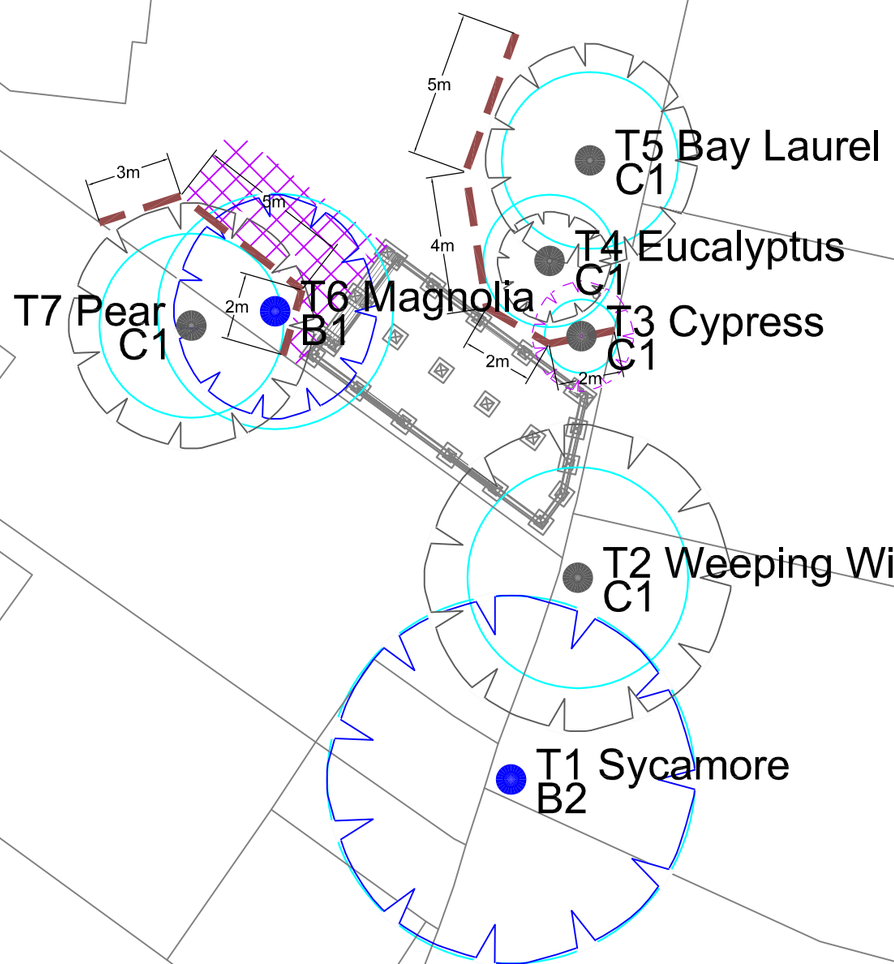
T8 Cypress
C1

Shuttered Tree

Temporary Ground Protection



BS Feet Fence



PROJECT
8 Downside Crescent,
London,
NW3 2AP

CLIENT
Deborah Bass

TITLE
Tree Protection Plan (TPP)

Job	Scale	DRG NO	Revision
02873R	1:200 @ A3	02873P_TPP_01	A
Date 13/04/2018	Type a		

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Web: www.tamlatrees.com
Tamla Trees consulting arborists

Appendix 6 – Site Photographs

Image 1 – Rear garden with T5, stem of T4, T3, T2 & T1 visible

Image 2 – T2 & T3

Image 3 –T4 (right) and T5

Image 4 – T6 & T7

Image 5 –T8

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.