BS5837 Arboricultural Impact Assessment

59 Broadhurst Gardens, London, NW6 3QT

Client: **Miriam Ryley**

Job Reference: 02915R

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

July 2018

Tamla Trees
consulting arborists

Contents

1. Executive Summary

1.1 Tamla Trees ltd has been appointed by Miriam Ryley to provide advice on the arboricultural issues relating to the installation of an Ecospace garden room. We surveyed the site on 27th June 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 TG1 (Lombardy Poplar x 3)). The trees have a collective root protection area (RPA) of 768sqm. The garden room utilises a pad foundation system requiring excavations that will affect 9.5sqm (1.2%) of the combined RPA. This level of incursion is well within the tolerable range for TG1 particularly given that a large portion of the area for footings has been previously excavated to accommodate a trampoline and will be filled in.

1.2 No demolition is required and 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 property side access limiting further construction pressures. Tree protection will ensure that there is no discernible impact to retained 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 and will track way from TG1 and outside the RPA of T2.

1.4 The potential tree issues can be summarised as: **Installation (including footings) of garden room> service provision> landscaping.**

1.5 At the time of writing Camden Council has not yet responded to our statutory search but the client advises the presence of a Conservation Area and a Tree Preservation Order (TPO) affecting TG1.

1.6 This report is based on the client plans ref: RYL.SO.01. 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
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 TG1
Type of TPO	~~**Area**~~
	~~**Individual**~~
	Group
	~~**Woodland**~~
TPO Reference	Unknown
Date TPO Made	Unknown
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 not yet responded to our statutory search. (iii) tree protection status as advised by client.	

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	-	TG1*	T1*, T2 & TG2	
Total Number	None	1 group	2 individuals & 1 group	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 for Broadhurst Gardens and Compayne Road	-	TG1	-
Private Residential Amenities Providing amenity between properties and contributing to the local (garden) tree scape for Broadhurst Gardens and Broadhurst Close	-	-	T2

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

4.4 Other trees not listed above are small or in a location where there wider amenity is very limited.

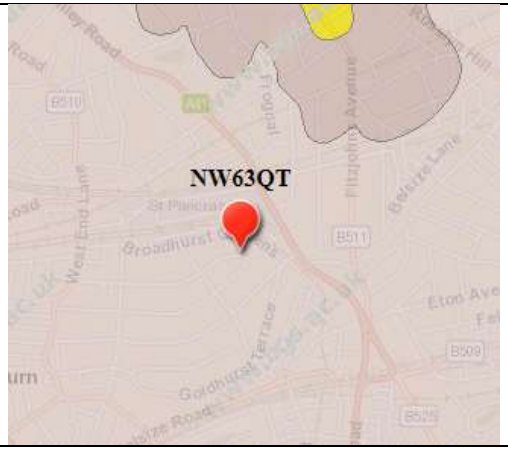
5.0 Arboricultural Impact Assessment

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		TG1	T1, T2 & TG2	**Pad Foundations** – The proposal places the structure within the RPA areas of TG1 (Poplar x 3). On an individual level the pad footing incursions are minimal. The collective impacts are tabulated on the following page with the greatest incursion being 1.2% of TG1's RPA from the pad installations. **Service**s – The new structure will require a service connection with the main property. This will be hand dug directly away from the trees and outside the RPA of T5 (Indian Bean Tree). 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 The relative incursions in to the RPA for the pad excavations are as follows (Note: This is an overestimation as part of the pad area is already excavated below and existing trampoline:

Tree Number	RPA Total (Sqm)	Pad Incursion (Sqm)	Pads as % of trees RPA
T1	18	0.1	0.5
T2	197	0.06	0.03
TG1	768	9.5	1.2
TG2	6.5*	0.02	0.3

*single tree incursion

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 No trees will be removed to facilitate the proposal but we would advise the complete severing of all Ivy stems on the lower trunks of TG1.

Fig 1 – There are very large Ivy stems on the lower trunks of TG1 and given the tree sizes and locations we would advise this is severed to allow better future inspections.

5.3.2 **Birds** – If future tree works 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 protection/ works process can be summarised as follows:

Stage 1

- Ivy stems severed while easy access remains.
- Tree and ground protection installed.

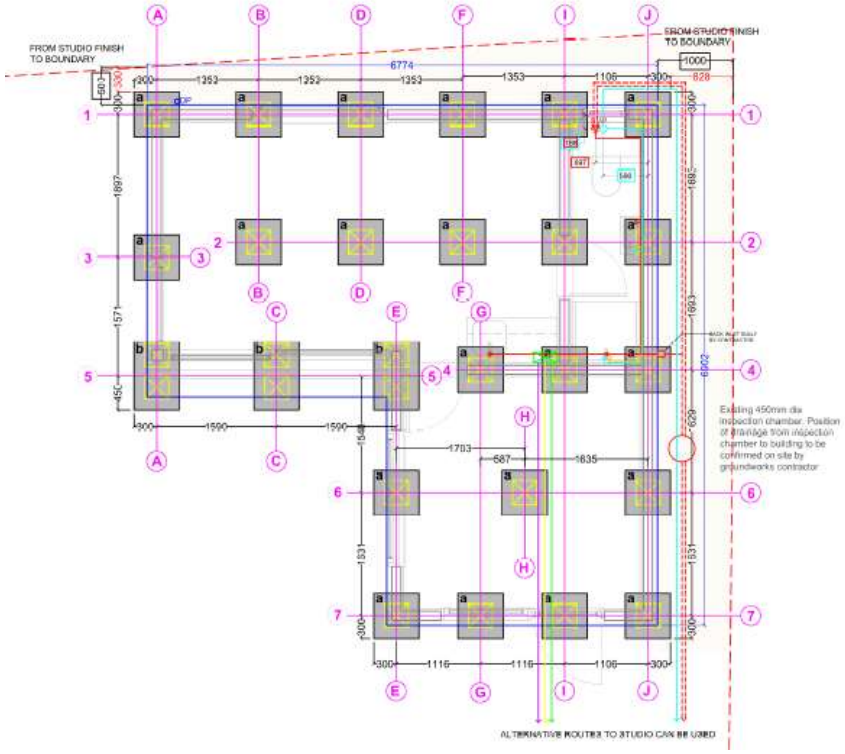
Stage 2

- Localised ground clearance & hand digging of pads.
- Localised infill of trampline excavation with excavated material from pads outside this area.
- Pad locations manipulated in the event any roots >25mm.

Stage 3

- Service trench marked out relative to TPA's and hand dug.
- 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**

Fig 2 – Foundation pad overview

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

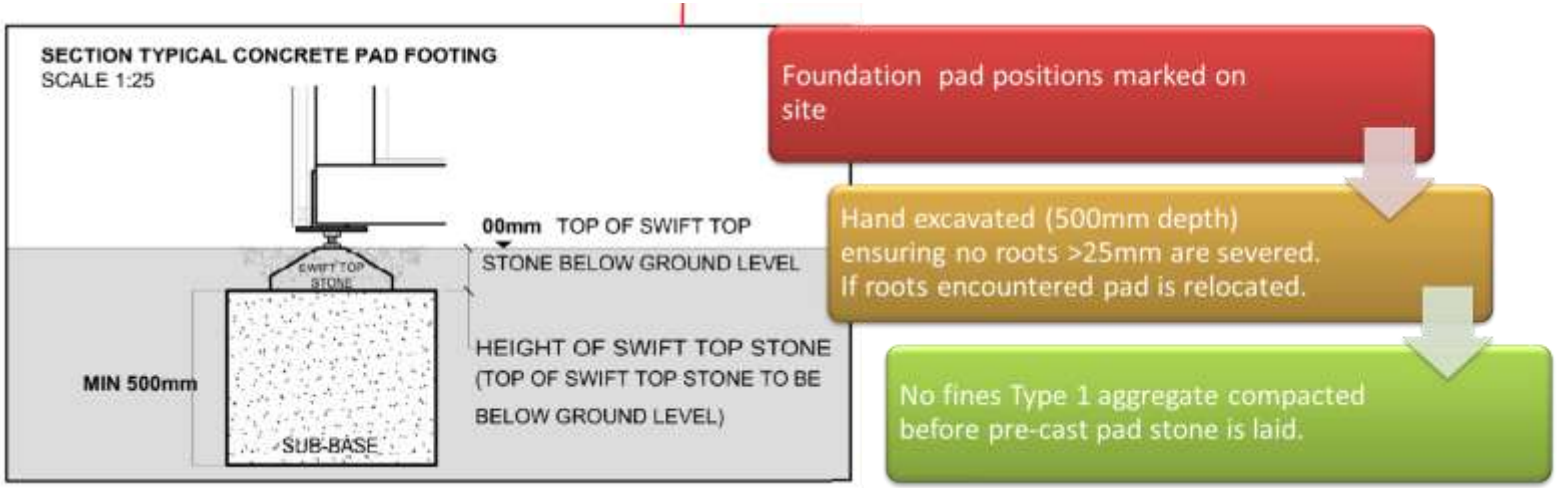


Fig 3 – Pad installation overview. This approach removes the need for a 'strip' foundation reducing the impact on underlying roots. Pads are hand dug and localised manipulations to retain roots >25mm diameter are possible as a result.

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. Access will be through the existing property.

- **Access through existing property.**
- **Protective fencing for T2 visible left and ground protection for TG1 as indicated on Tree Protection Plan (Appendix 5)**
-

Fig 5 – The site benefits only from access through the property significantly limiting potential for machinery to access the site

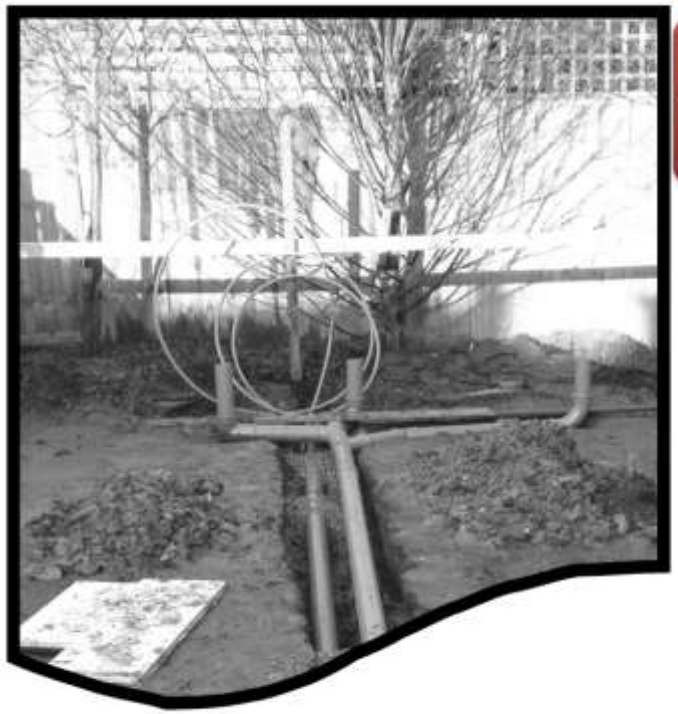
5.5.2 Tree protection measures are presented in Appendix 5. The structure itself is a pre-fabricated building carried to position in panels and by hand.

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 T2 and track away from TG1 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:



Service route marked on site

Hand excavated (400mm depth) ensuring no roots >25mm are severed. If roots encountered work stops and an assessment of whether the services can be routed below or above root is made.

Services installed and trench back filled with excavated material. All works completed in single day to ensure no roots are exposed overnight

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 and infill of the trampoline area below TG1.

Fig 9 – There is an existing excavation for the trampoline which will be filled during the construction with material excavated from the other pad locations.

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.

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	Laburnum	0.2	1	3.5	1.6	1.6	1.6	1.6	C1	Mature	10 to 20	1.8	Borderline U cat given topping and deadwood. Low quality tree.	No works	2.4
T2	Ash	0.66	1	12	3.5	3.5	5.1	5	C1	Mature	> 40	3.4	Previously topped but no regrown. Re-pollarding advised at 7-9 year intervals to limit risk of branch break outs.	Sever all basal Ivy	7.9
TG 1	Poplar (Lombardy) x 3	1.2	1	23	6	6	6	6	B2	Mature	20 to 40	2.4	Very large 3rd party trees with extensive Ivy cover. No access to inspect / measure but Ivy should be severed and trees fully inspected by 3rd party regardless of application given size, location and species. Trampoline excavation already present in RPA.	Sever all basal Ivy and advise 3rd party to re-inspect trees	14.4
TG 2	Acer X 3 & Yew X 1	0.12	1	3.5	3	3	3	3.2	C1	Early-mature	> 40	0.5	Small close grown ornamentals.	No works	1.4

Appendix 3 – Tree Works Schedule

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

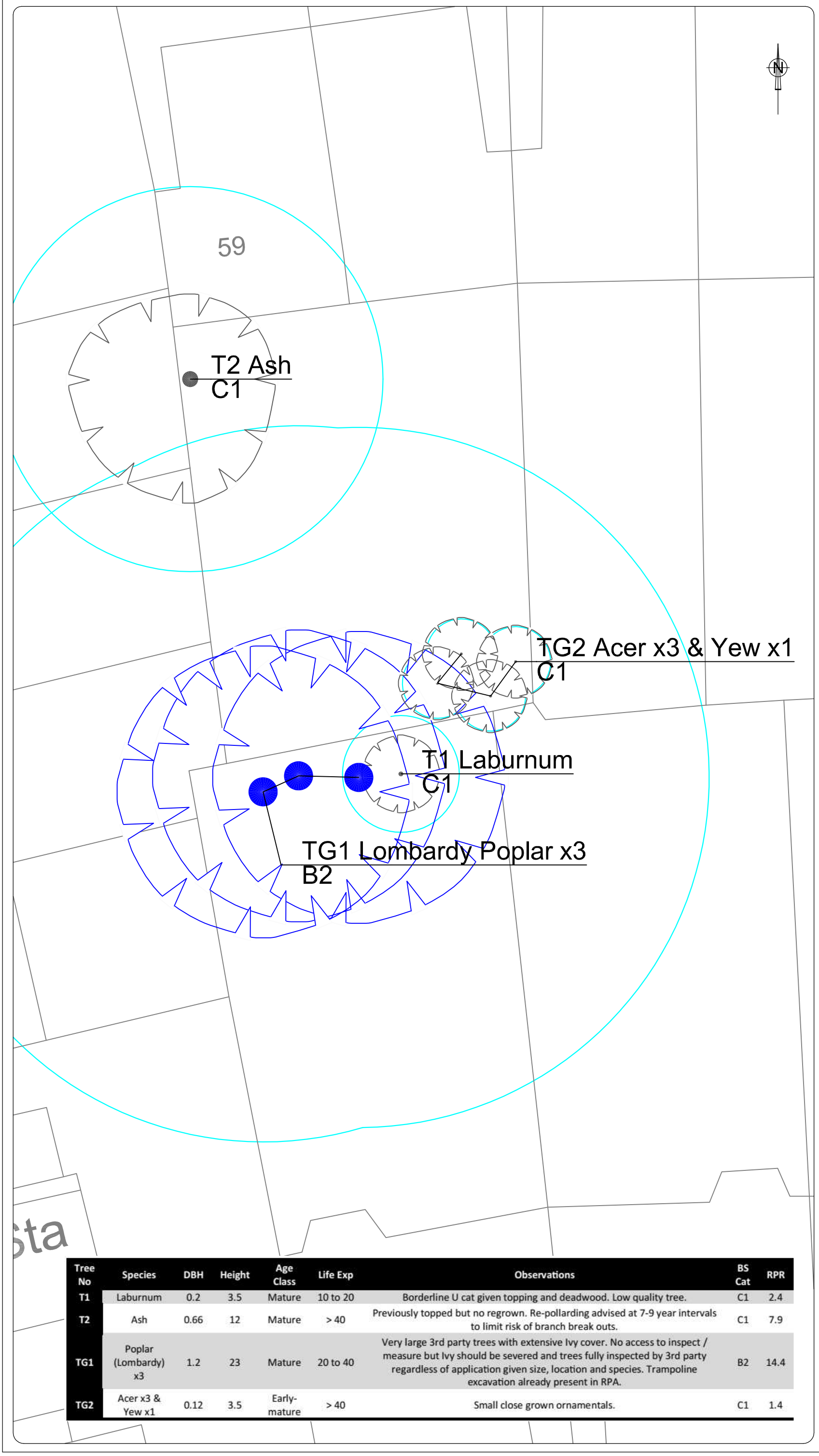
Tree Surgery

Tree No.	Species	Proposed Tree Works	BS Cat
TG1	Lombardy Poplar x 3	Sever all basal Ivy and advise 3rd party to re-inspect trees	**C1**

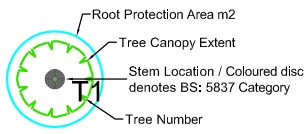
Proposed Removal

Tree No.	Species	Proposed Works	Observations	BS Cat

Appendix 4 - Tree Constraints Plan



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

Tree No	Species	DBH	Height	Age Class	Life Exp	Observations	BS Cat	RPR
T1	Laburnum	0.2	3.5	Mature	10 to 20	Borderline U cat given topping and deadwood. Low quality tree.	C1	2.4
T2	Ash	0.66	12	Mature	> 40	Previously topped but no regrown. Re-pollarding advised at 7-9 year intervals to limit risk of branch break outs.	C1	7.9
TG1	Poplar (Lombardy) x3	1.2	23	Mature	20 to 40	Very large 3rd party trees with extensive Ivy cover. No access to inspect / measure but Ivy should be severed and trees fully inspected by 3rd party regardless of application given size, location and species. Trampoline excavation already present in RPA.	B2	14.4
TG2	Acer x3 & Yew x1	0.12	3.5	Early-mature	> 40	Small close grown ornamentals.	C1	1.4

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

REV AMENDMENTS DRAWN DATE AUTH'D

PROJECT
59 Broadhurst Gardens,
London,
NW6 3QT

CLIENT
Mirium Riley

TITLE
Tree Constraint Plan (TCP)

Job	Scale	DRG NO	Revision
02915R	1:150 @ A3	02915P_TCP_01	-
Date 02/07/2018	Type a		

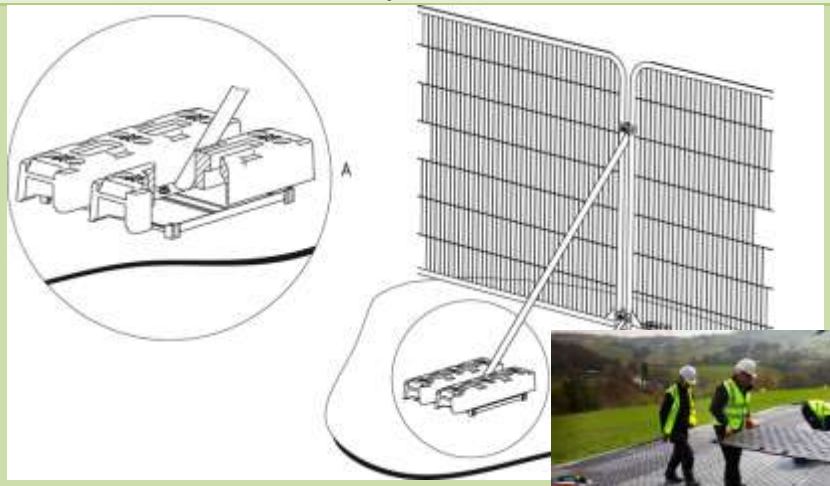
Tel: 01252 811 233
Email: info@tamlatrees.com
Web: www.tamlatrees.com
Tamla Trees consulting arborists

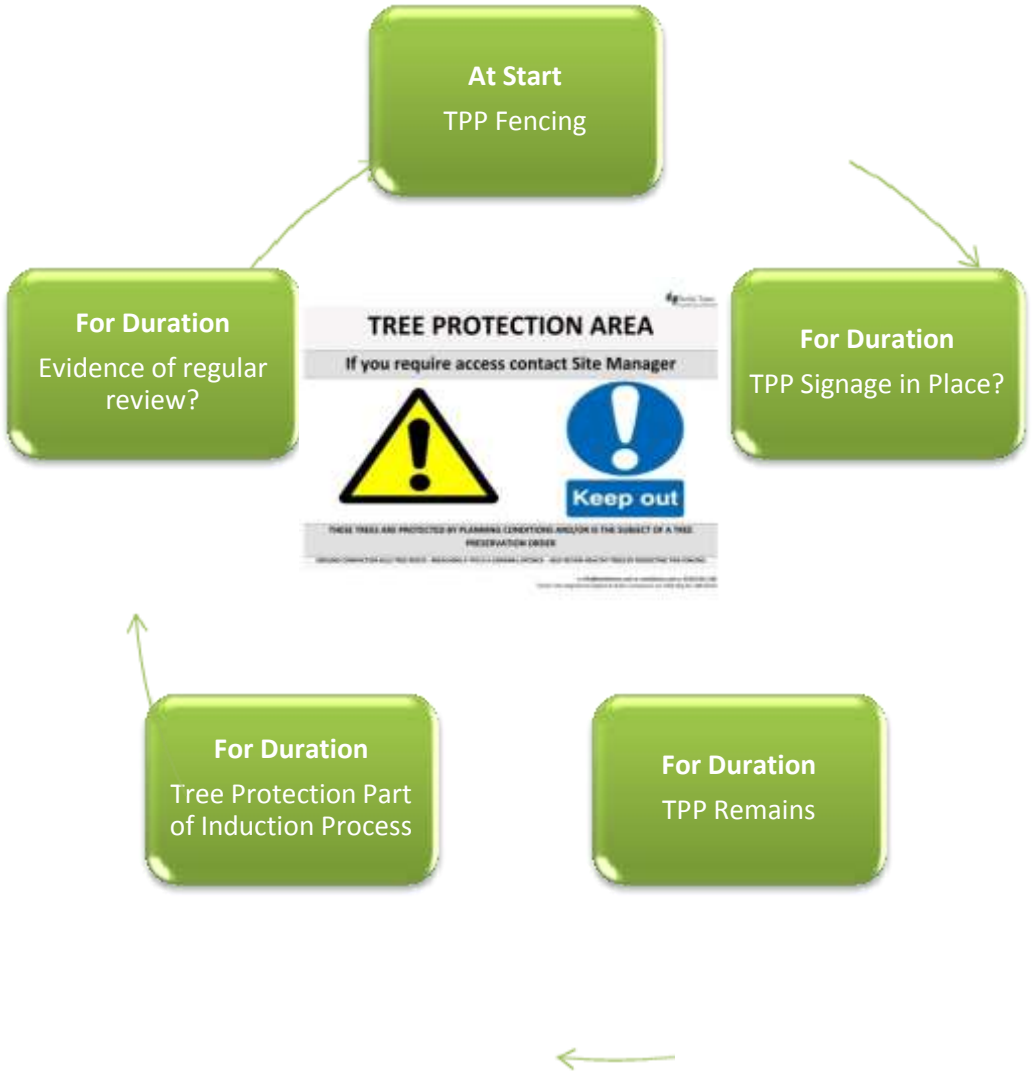
Appendix 5 - Tree Protection Plan

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 ground protection.**




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

59

5m

T2 Ash
C1

5m

4m

Storage
Area

5m

5m

TG2 Acer x3 & Yew x1
C1

T1 Laburnum
C1

TG1 Lombardy Poplar x3
B2

N

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 - BS 5837 Feet Fence (or similar)

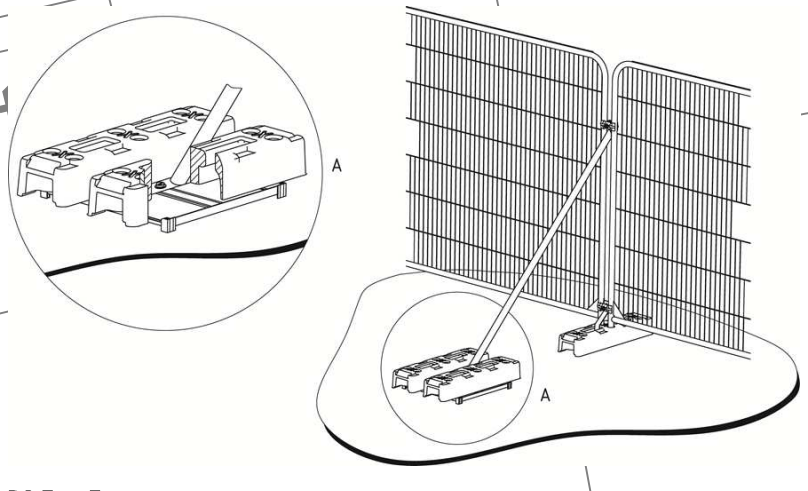
Existing boundary acting as protective fencing

Temporary ground protection

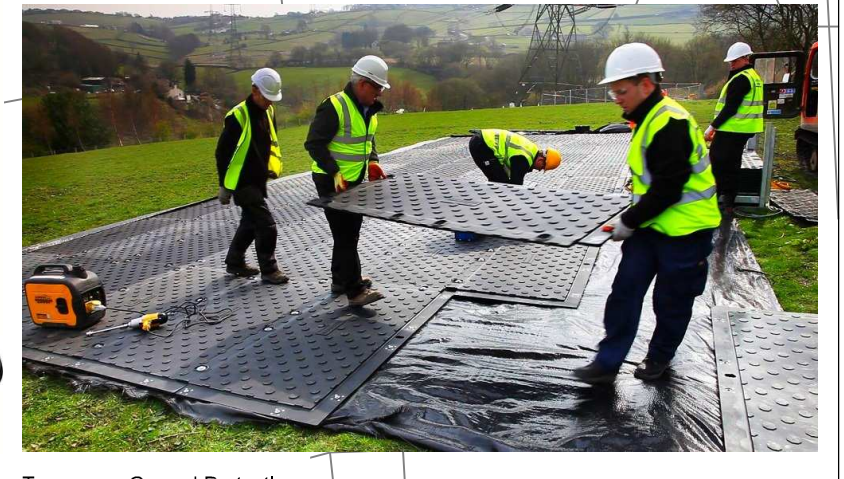
Site access

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

REV AMENDMENTS DRAWN DATE AUTH'D



BS Feet Fence



Temporary Ground Protection

PROJECT
59 Broadhurst Gardens,
London,
NW6 3QT

CLIENT
Mirium Riley

TITLE
Tree Protection Plan (TPP)

Job	Scale	DRG NO	Revision
02915R	1:150 @ A3	02915P_TPP_01	-
Date 02/07/2018	Type a		

Tel: 01252 811 233
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Tamla Trees
consulting arborists

Appendix 6 – Site Photographs

Image 1 – TG1 Lombardy Poplar x 3

Image 2 – T2 Ash

Image 3 –TG2

Image 4 – Front/ side access

Image 5 –All access is through the side access point

Appendix 7 – 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.