

Arboricultural Impact Assessment & Tree Condition Survey for Proposed Works



OAKHOUSE
ARBORICULTURAL SERVICES LTD

CLIENT - Ian Jones
SITE - 5a, Belsize Square, Belsize Park, London, NW3 4HT
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1.0 Introduction

1.1

Acting on instructions received from Mr I. Jones. The property was visited on 31st of January 2025 to view the site and undertake a Tree Condition Survey. This report has been prepared to comment on the arboricultural impact of the proposed construction of a new garden room.

1.2

The proposed works are described in detail in the Design and Access Statement. In summary the works include the construction of a flat roof Garden room.

1.3

We have been provided with a full set of the proposed drawings which have been prepared by Garden2office LTD.

1.4

Within this report we will comment on the arboricultural impact of the proposed works on the existing tree resource and any measures necessary to ensure the long-term health of the retained trees.

2.0 Site Description and Description of Development

2.1

The site at 5a Belsize Square is a ground floor residential property. Access to the rear garden is obtained via a side alley, down several steps. Access is relatively narrow at approx 650 mm wide. The garden is currently undergoing a renovation and is mainly bare earth.

2.2

The tree resource relevant to this application consist of two Sycamores in the clients garden T1 & T2 and a single third party owned Lime T3 growing beyond the rear garden western flank boundary wall.

Some minor hand tool excavation has occurred to the north of the Sycamore trees, where two railway sleepers were previously located. We have advised the client that the excavated area be back filled to raise the ground level in line with the previous height.

2.3

The proposed development is for the construction of a new garden room in the southwestern corner of the property. This proposed development coincides with a new garden project that will result in the planting of multiple new trees, shrubs and plants.

3.0 Statutory Protection

3.1

The property is located within the Belsize Park Conservation area within the London Borough of Camden.

3.2

All the trees growing within the curtilage of the Conservation Area (unless exempt) with a stem diameter in excess of 75mm are subject to protection under the Conservation Area. The Conservation Area status does not preclude the presence of Tree Preservation Orders which may also serve to protect the trees.

3.3

There are no tree or vegetation management works associated with this application.

4.0 Arboricultural Background Information

4.1

Trees provide numerous benefits including visual amenity, bio-diversity value and providing shade and shelter. In urban areas trees are often growing in sub-optimum conditions and under pressure from a number of factors which may impact on their health, longevity and or result in management works.

4.2

The two main possibilities for damage to trees in urban areas and also during and following the construction process are from direct and indirect damage.

- Direct Damage: can be defined as injury resulting from physical contact including contact with machinery or fire, and excavation of the root area.
- Indirect Damage: can be defined as injury resulting from activities that take place near the tree such as level changes, compaction of the soil, or contamination by chemical spillage in proximity to the root plate.

4.3

The risk of damage to the above ground parts of the tree can be addressed through use of physical barriers, restricting working areas and control of the activities near trees. The risk of damage and protection of the largely unseen rooting environment and root system of trees is more difficult to address. For all trees but particularly those growing in urban areas, root growth is not predictable.

4.4

Tree roots are opportunistic they grow most prolifically in areas where conditions are favourable and will be deflected by natural features and man-made structures, when hostile conditions are encountered root growth will be limited. If growing conditions are uniform this would result in relatively even circular root system.

4.5

Roots grow within the spaces in the soil and when they encounter stones or rocks, or foundations they are deflected, where conditions are hostile roots may stop growing or continue growing more slowly than in better conditions only dividing and proliferating if conditions encountered improve. It is generally agreed that the majority of tree roots, even for a mature tree are found in the top 90 cm of the soil and these roots are vulnerable to sudden changes in the rooting environment. These roots absorb the moisture and nutrients needed for growth and contrary to popular belief mature trees in the UK do not have a deep taproot that obtains moisture from great depth.

4.6

An ideal soil for tree root growth is about 50% pore space (in urban areas this is often significantly reduced), these pores, the spaces between soil particles, are filled with water and air. Construction activity can compact the soil and can dramatically reduce the amount of pore space.

4.7

This not only inhibits root growth and penetration but also decreases oxygen levels within the soil and reduces the available soil moisture that is essential to the growth and function of the existing roots.

4.8

For retained trees it is essential that the structurally important roots remain undisturbed, these important larger roots radiate outwards from the trunk, they are characterised by being relatively few in number and tapering rapidly from the base of the tree. Even for mature trees they are only 2-3m in length, at this length they are likely to be 2-5cm in diameter and they have lost their rigidity and physical strength. (See Tree Root Systems AAIS 1995).

4.9

To assist with the retention and protection of trees during the planning and construction process the British Standards Institute publish BS5837:2012 'Trees in relation to design, demolition and construction – Recommendations'. This document gives clear and current best practice recommendations and guidance on the principles to be applied to achieve a satisfactory juxtaposition of trees with structures. Where development is proposed, the standard provides guidance on how to assess the value and quality of trees and to decide which trees are appropriate for retention.

4.10

The BS Categories referred to in this report are described in detail in Appendix 1. In summary the quality of the trees resource is assessed, and the trees are divided into 4 categories based a number of factors including their condition, remaining life-expectancy, landscape, arboricultural and cultural/conservation value,

Category U: Those in such a poor condition that they cannot realistically be retained

Category A: Trees of high quality

Category B: Trees of moderate quality

Category C Trees of low quality

4.11

The BS5837 (2012) also provides information on the protection of trees during the development process. It includes a calculator for Root Protection Areas (RPA) which aims to ensure a sufficient volume of soil and proportion of the root system is protected to maintain the health and vigour and ensure the longevity of the trees.

4.12

The Root Protection Area is not related to the canopy spread of the tree; in simple terms it is an area calculated as a multiple of the trunk diameter. For trees with a trunk diameter in excess of 1250 mm the Root Protection Area is capped at a total area of 707 m². See Attached Tree Survey Plan in Appendix 1 for further details.

4.13

The RPA can be adjusted to reflect growing condition of trees. The British Standard 5837 Chapter 4.6.2 states "Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon or equivalent area should be produced, modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of the likely root distribution").

4.14

When adjusting the Root Protection Area of trees, the Arboricultural Consultant needs to consider a number of factors, Paragraph 4.6.3 of BS5837 (2012) states that: Any deviation in the RPA from the simple circle should take full account of the following factors whilst still providing adequate protection for the root system:

- a) the morphology and disposition of the roots, when influenced by past or existing site conditions (e.g. the presence of roads, structures and underground apparatus);
- b) topography and drainage;
- c) the soil type and structure;
- d) the likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management.

4.15

The RPA is in effect a theoretical area that if all the soil and roots around the periphery of the RPA were removed, there would be sufficient area around the tree to maintain the tree in a healthy condition. The RPA does not show the expected extent of root growth but indicates an area of ground considered necessary to support the tree both at the time of surveying but into the future.

4.16

The relative sensitivity of different species of trees to development works is well known and acknowledged within BS5837 (2012) but the RPA formula in BS5837 does not give any weight to different tree species. The RPA is based on the trunk diameter and would be the same for all trees of the same trunk size regardless of species.

4.17

Damage to trees (including their root systems) may impact on their health, stability and or vitality. Damage may result in the partial or complete structural failure of the tree and increases the risk of personal injury. It is therefore essential that if development is permitted this report is read by all parties and the guidelines are followed by the site agent and all contractors, particularly those undertaking groundworks on site.

4.18

Appropriate tree protection measures and appropriately specified, supervised and implemented works can significantly reduce the risk of damage to the retained trees.

5.0 Arboricultural Impact Assessment

5.1

BS5837 (2012) allow the Root Protection Area of trees to be adjusted reflect the growing condition of the trees. Paragraph 4.6.3 of BS5837 (2012) states that. Any deviation in the RPA from the simple circle should take full account of the following factors whilst still providing adequate protection for the root system:

- a) the morphology and disposition of the roots, when influenced by past or existing site conditions (e.g. the presence of roads, structures and underground apparatus);
- b) topography and drainage;
- c) the soil type and structure;

- d) the likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management.

5.2

The third-party owned Lime tree T3 is located beyond the western flank, rear garden, brick built boundary wall.

5.3

T3 is located within the rear garden of 4 Belsize Square, it is located beyond the western flank party garden wall separating 5a and 4 Belsize Square, with the rear boundary fence immediately to the southern side of the tree.

5.4

The proposed development results in an 15% encroachment into the theoretical unadjusted Root Protection Area of T3 as calculated using the formula in BS5837 (2012). Due to the use of carefully placed ground screw foundations this level of encroachment is not considered to be significant in terms of impacting on the health, stability or longevity of this previously managed tree. The real impact on the root system of T3 will be less than 15% when considering the foundations of the boundary wall will have had some impact on root growth.

5.5

The off-site tree, T3 is located a sufficient distance from the proposed works, with garden boundary wall between the proposed works and the tree, and a sufficient area of undisturbed ground around this tree that it will be unaffected by the proposed works.

5.6

T1 is located a sufficient distance from the proposed works and despite a small encroachment into the theoretical unadjusted Root Protection Area as calculated using the formula in BS5837 (2012). With a large area of undisturbed ground around this tree it will be unaffected by the proposed works.

5.7

T2 is located closest to the proposed development and construction will result in an encroachment into the theoretical unadjusted Root Protection Area of T2 as calculated using the formula in BS5837 (2012). Theoretically this should result to a slightly reduced area for water absorption within the root area of T2, but when taken into account that the garden shed, currently situated within the root area will be removed, the net loss will be minor if any. The use and careful placement of ground screw foundations will negate the need for any large-scale excavation or compaction within the root protection area.

6.0 Conclusion

6.1

No vegetation is to be removed to allow for the proposed works.

6.2

The on & off-site vegetation will be unaffected by the proposed works.

6.3

The landscaping works associated with the proposed development include an increase in opportunities for new planting within the rear garden, an increased bolster to the surrounding ecology and tree stock. Planting of new trees is proposed as part of these landscaping works.

6.4

Ground screw foundation technology will eliminate the need for large-scale excavation while also preventing the compaction and disturbance caused by traditional foundations

6.5

To protect the trees against root damage, it is recommended that the placement of the ground screw foundations be determined by the presence, or rather the absence, of substantial tree roots.

It is generally agreed that the majority of tree roots, even for a mature trees are found in the top 90 cm of the soil and these roots are vulnerable to sudden changes in the rooting environment. Therefore it is essential that the structurally important roots will remain undisturbed, these important larger roots radiate outwards from the trunk, they are characterised by being relatively few in number and tapering rapidly from the base of the tree.

Excavation for the ground screws should be done where possible by hand for the first 400 mm depth and where any structural roots discovered, the location of the ground screws adjusted to compensate.

Appendix 1

1.0 Tree Survey Methodology

Methodology of data collection

1.1 Survey Methodology

We have surveyed all the individual trees and groups of trees located within and close to the boundary of the site. The objective of the survey is to collect tree data relevant to the proposed redevelopment of the site and to categorise individual trees or tree groups in accordance with BS 5837 (2012) 'Trees in relation to design, demolition and construction – Recommendations' based on their condition, quality and future potential.

The purpose of the categories within BS5837 2012, is not to determine whether retention of trees is desirable, *'The purpose of the tree categorisation method, which should be applied by an arboriculturist, is to identify the quality and value (in a non-fiscal sense) of the existing tree stock, allowing informed decisions to be made concerning which trees should be removed or retained in the event of development occurring.'* (BS5837 2012 Section 4.5.2).

This survey should therefore be regarded as an initial appraisal and observations, assessments or recommendations relating to tree protection zones, remedial tree works, protective fencing, foundation design, material specification are beyond the scope of this report.

The location of the trees is shown on the attached drawing. A detailed inspection of individual trees with respect to decay, defects and hazard is not included. However, trees found to be in a structurally dangerous condition are identified.

1.2 Work recommendations

Any work recommendations given in the following section should be carried out within the given time frame. It is recommended that the works are carried out by fully qualified arborists and that all pruning cuts are made in accordance with the British Standards of Arboriculture (BS3998).

Tree Condition Survey

Tree No.	Species	Height (m)	Branch spread (Radius)	DBH (CM)	Age Class	Condition	Notes	RPA radius (M)	Recommendations	Bs Cat
T1	Sycamore (Acer pseudoplatanus)	12	4	45	M	Fair	Previously reduced Early mature/Mature. Tree has been subject to a hard reduction and is leaning slightly in a southerly direction.	5.4	Raise the soil level around the root area in line with where it was before minor excavations.	C1
T2	Sycamore (Acer pseudoplatanus)	13	3.5	40	M	Fair	Previously reduced Early mature/Mature. Tree has been subject to a hard reduction and is leaning slightly in a southerly direction.	4.8	Raise the soil level around the root area in line with where it was before minor excavations.	C1
T3	Lime (Tilia cordata) 3rd party tree	14	4.5	40	M	Fair	A third party owned mature tree growing to the west of the boundary wall. This tree has been subject to management in the past but has been left unmanaged for some time. It is growing in the corner of the garden approximately 2 meters from the boundary wall.	4.8	None	C1

Cascade chart for tree quality assessment

Trees unsuitable for retention (See Note)				
Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	<ul style="list-style-type: none"> Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality NOTE: Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.			Red
Trees to be considered for retention				
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Category A Trees of high quality with an estimated remaining life-expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue).	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features.	Trees, groups or woodlands See Table 2 of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	Green
Category B Trees of moderate quality with an estimated remaining life-expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation.	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality.	Trees with material conservation or other cultural value	Blue
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits.	Trees with no material conservation or other cultural value	Grey

SURVEY KEY AND GLOSSARY OF TERMS

TERM	DEFINITION
Height	The estimated or measured height of the tree in metres.
Branch spread	The estimated average length of a trees branches from the centre of its stem to the branch ends. Usually given as a radius unless otherwise stated.
M	Metres
T	Individual tree
G	Grouped trees
Age class	Y = young. SM = semi mature M = mature OM = over mature V = veteran
Condition	A summery of tree condition: <ul style="list-style-type: none"> • Good - no visible defects/very low risk • Fair - minor defects/low risk • Poor - major defects/high risk • Very poor - unacceptable defects and risk present
Reccomendations/ notes	Works to the tree that it would benefit its long term condition and/or prevent significant defects from occurring. Or for aesthetic purposes.
Priority	<ul style="list-style-type: none"> • Urgent - work required immediately (that day) to make a tree safe or safe guard a site • Very high - work required within 7-14 days • High - work required within 30 days • Moderate - work required within 90 days • Low - work(s) required are of the lowest priority and can be done in line with next scheduled works or if the budget allows
Inspection frequency	A recommended time line for the next inspection: <ul style="list-style-type: none"> • Very high - 6 months • High - 12 months • Moderate - 18 months • Low - 3 years • Very low - 5 years • None - no target exists or it has been excluded
Hazard	Something with the potential to cause harm or damage for example a tree with a recognised defect
Target	People or property
Risk	The probability that harm will actually be caused to people or property

Photograph 1 - 31/01/2025

View from the back garden showing T1, T2 & T3 in relation to the approximated area of the proposed building (shown by the red outlined area).



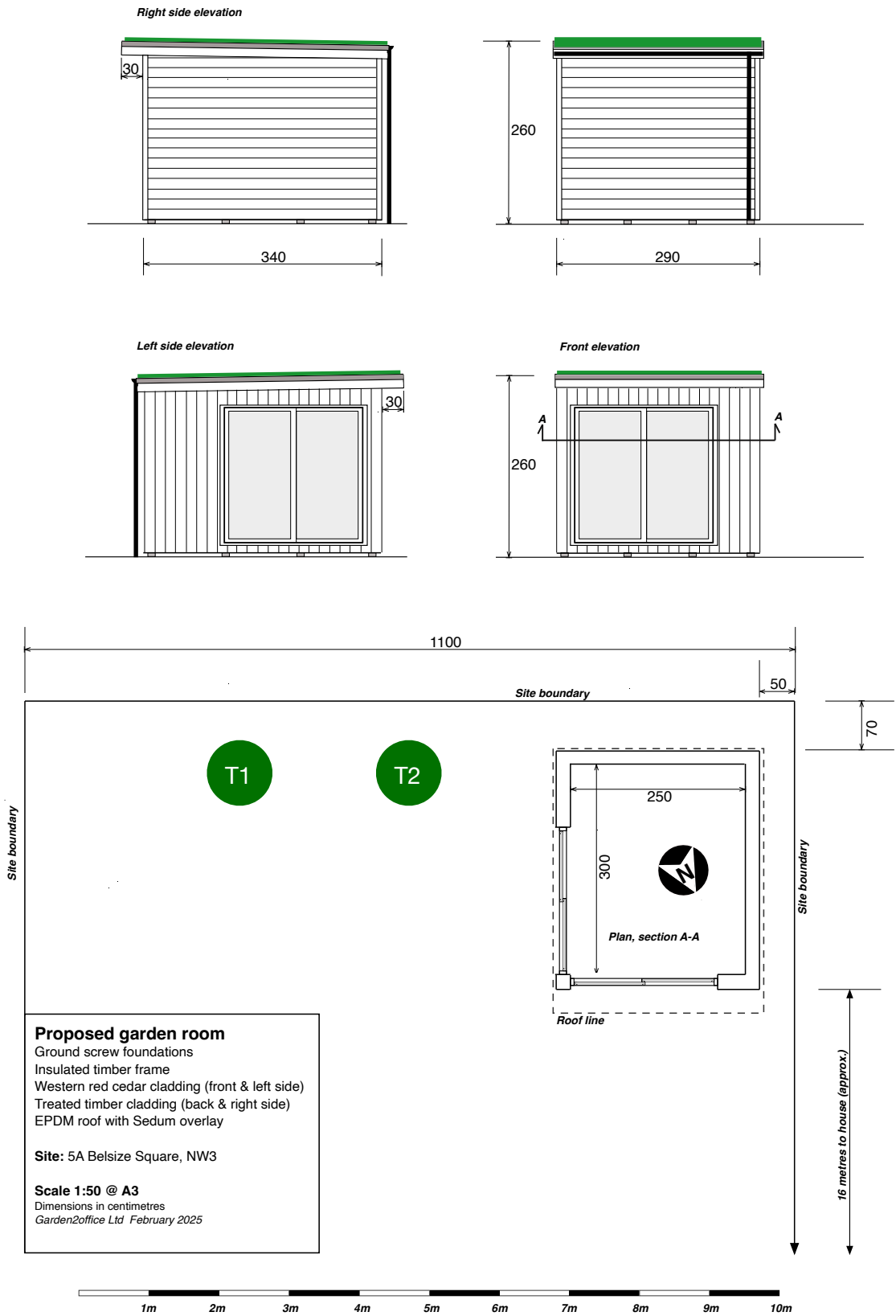


Fig. 2. Shows the approximate location of T1&T2 in relation to the proposed Garden room (trees are not to scale).

AUTHOR

This survey was carried out by Henry Parker on behalf of Oakhouse Arboricultural Services. Henry Parker is a tree surveyor. He has worked in arboriculture for over 12 years. Primarily working as a sub-contract climbing arborist across the south of England and eastern Australasia, carrying out domestic and commercial tree work for a variety of companies. He is a fully qualified arborist and a LANTRA award professional tree inspector.

LIMITATIONS

Trees are dynamic, living structures and can never be guaranteed as 100% safe. Even trees in good health can be subject to damage under average conditions. This report considers the risk posed by the trees in their current state, only.

Any effect caused by the removal or retention of trees on soil heave/subsidence should be considered by an expert in soil shrinkage and its impact on buildings.

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