



Arboricultural impact assessment

5 Rudgwick Terrace, Avenue Road

London NW

Date: 12 December 2017
Document ref: AIA 7443

Arboricultural impact assessment of proposed development at 5 Rudgwick Terrace, Avenue Road London NW8 6BR

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Report date: 12 12 17

Report reference: AIA 7443

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1 Introduction

- 1.1 This arboricultural impact assessment, commissioned by W D Architecture Ltd on behalf of Ruffle Property Holding Ltd, deals with proposed development at 5 Rudgwick Terrace, Avenue Road, London NW8 6BR.
- 1.2 The proposal is for a single-storey ground-floor rear extension.
- 1.3 This assessment considers the trees that might influence or be influenced by the application development, outlines the key likely tree-related constraints and identifies issues that would need to be addressed if planning approval were granted.
- 1.4 The framework for my report and associated drawings is the British Standard BS5837:2012 *Trees in Relation to Design, Demolition and Construction – Recommendations* because this is the Standard used by local planning authority officers when considering trees affected by development proposals.
- 1.5 Section 2 of the report deals with the site's current status. Section 3 deals with the tree condition and quality inspection and tree constraints (with the details of my findings in Appendix A). Section 4 considers the impact of the proposed development and Section 5 summarises my conclusions.
- 1.6 Please read this report in conjunction with the:
 - tree constraints plan – drawing TCP 7443
 - architectural drawings,
 which are provided as separate documents.

Background

- 1.7 I visited the site on 09 November 2017 when I assessed the site and inspected the trees.
- 1.8 A trial trench was opened along the line of the northern wall of the proposed extension on 20 November 2017, when one small root and some hair roots were uncovered.

2 The site in context

Access

- 2.1 Pedestrian and vehicle access to the application site is from Avenue Road, a public highway, via Rudgwick Terrace, which is a private road.

Ground levels

- 2.2 Ground levels are fairly level across the site, but rise by almost 1 m at the north end of the rear garden.

Soil

- 2.3 Site-specific geotechnical information was not available at the time of writing, but the 1:50,000 map of the British Geological Survey on-line Geology of Britain viewer, accessed 01 November 2017, indicates the local bedrock geology to be London Clay Formation – clay, silt and sand – without recorded superficial deposits.
- 2.4 The on-line Soilscape viewer by LandIS (The National Soil Resources Institute at Cranfield University) identifies slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils of moderate fertility.

Visual amenity

- 2.5 Trees visible from a public place are considered to provide local ‘public visual amenity’ – effectively ‘borrowed’ or ‘shared’ landscape features that contribute to the particular character and pleasantness of the neighbourhood – and there is a preliminary presumption for retaining them, if they are in safe condition. The roads around the application property are private, so that there is no view of the trees from a public place. Even so, most of the trees on the site are visible to some extent from outside the property.

Statutory protection

- 2.6 The site is within the Elsworthy Conservation Area.
- 2.7 Any proposed work to, or the removal of, most trees in a conservation area must first be notified to the local planning authority, either through a planning application, as in this case, or through separate statutory procedures for trees growing in a conservation area. Even in the lower courts steep penalties are available for damage to protected trees.

3 Tree inspection and tree constraints plan

Tree inspection and site assessment

- 3.1 My inspection was a visual tree assessment (VTA) of the above-ground parts of trees from ground level, following industry-standard procedures (see Appendix B). It was independent and impartial, and was not influenced by consideration of any development.
- 3.2 The results of the inspection are presented in two ways – a:
- schedule of my findings, shown in Appendix A of this report
 - tree constraints plan – drawing TCP 7443.
- 3.3 The inspection schedule includes preliminary recommendations for the management of the trees *regardless* of the future use of the site. The proposed development does not modify those recommendations.

Quality/retention categories and their significance for the design

- 3.4 The inspection schedule and tree constraints plans show ‘quality/retention categories’ based on criteria in the British Standard BS5837:2012 *Trees in Relation to Design, Demolition and Construction – Recommendations*.
- 3.5 The categories (and their Standard colours) are:
- **U** – unsuitable for retention in relation to the current land use (shown in dark red)
 - **A** – high quality (shown in mid green), with an estimated typical remaining life expectancy of at least 40 years
 - **B** – moderate quality (shown in mid blue), with an estimated remaining life expectancy of at least 20 years
 - **C** – low quality (shown in grey), with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.
- 3.5.1 The British Standard also suggests numerical subcategories to explain the reasons behind the quality/retention grading. They are:
- 1) mainly arboricultural qualities
 - 2) mainly landscape qualities
 - 3) mainly cultural/conservation values.
- 3.5.2 In practice the subcategories often overlap and some trees might warrant all three, but I have noted only one subcategory for each tree to indicate the *main* reason for my category grading.
- 3.6 These categories provide rule-of-thumb guidance on a local planning authority’s (LPA’s) likely priorities when considering trees in relation to development proposals.
- It is unlikely that the LPA would countenance the removal of a category A tree.
 - There is a presumption that category B trees will be retained wherever possible.
 - The retention or removal of category C trees is not usually considered to be a significant constraint on development. Trees with a small stem diameter – below 150mm – could be considered for relocation within a site, if desired.
 - Category U trees are graded as unsuitable because of safety considerations or other sound arboricultural reasons *irrespective* of any possible new development. The trees are

considered to be in a condition that means they cannot realistically be retained alive in their current environment/circumstances for longer than 10 years.

Tree grading

- 3.7 I graded the trees:
 Category U – none.
 Category A – none.
 Category B – T1, T2, T3 and G6.
 Category C – T4 and T5.

Tree constraints plan

- 3.8 The tree constraints plan shows most of the information derived from the tree inspection, together with other relevant matters:
- quality/retention category, given as a coloured circle representing the category grading in the position of the tree trunk
 - indicative crown spread, shown in dark green
 - minimum root protection area, shown in dark blue
 - basic shading, based on BS5837:2012 criteria.

Crown spread and clearance

- 3.9 The crown spread is a *general* indication of the current length of the branches based on estimates in four cardinal directions. Trees often grow unevenly, so the *actual* position of branches should always be taken into account when designing structures. The vertical constraint of the lowest significant branch is shown in the inspection schedule in Appendix A.

Root protection areas

- 3.10 A root protection area (RPA), calculated from formulae in BS5837:2012, indicates the area around a tree containing theoretically sufficient roots and soil volume to keep the tree alive, healthy and upright: it is the area where the protection of roots and soil is treated as a priority.
- 3.11 Root protection areas shown on a tree constraints plan indicate the *minimum* area that should be left undisturbed and protected during demolition and construction. Even so, an RPA is a guideline and does not predict exactly where roots are growing. The actual pattern, depth and extent of root growth are shaped by a wide range of factors, including the species and age of the tree, soil type, the presence of buildings and other structures and the surrounding environment. This means that a root protection area may be shown as a circle or polygon, depending on an arboricultural assessment of the circumstances. The root protection areas of the cherry T1, the cherry plum T2 and the lime T3 are shown as polygons because of the change in soil level to their south and the absence of roots in a trial pit (see paragraphs 4.7 to 4.10 and PHOTOS 1 and 2 on page 8).

4 Arboricultural impact of the proposed development

Tree removal

- 4.1 No tree would need to be removed to permit development, so that there would be no harmful impact on green infrastructure or local landscaping.

Pruning

- 4.2 Some pruning is desirable irrespective of the development plan. The following work should be carried out regardless of the outcome of the planning proposal:
- 4.2.1 the crown of the cherry plum T2 should be reduced by about 1.5m from branch tips in spring-early summer 2018
 - 4.2.2 large and medium-diameter dead branches should be removed from the lime T3 as soon as possible, while the crown should be reduced to the last reduction points within about three years (and subject to council permission) to maintain the reduction cycle and reduce the weight on branch knuckles (the swollen growth points from which the previously pruned branches arise)
 - 4.2.3 the crown of the magnolia T4 should be selectively reduced by up to 1.5m after flowering in 2018, cutting back from the eastern flank of the house.
- 4.3 No additional pruning would be necessary to facilitate construction.
- 4.4 For the proposed future use of the site, some light crown lifting might be desirable on the south side of the cherry plum T2. This work would probably be desirably in any event, and would be well within sound arboricultural practice.

Other above-ground impacts

- 4.5 Fencing would need to be installed to create construction exclusion zones to protect the trees on the site.

Use of a crane

- 4.6 It is not proposed to use a crane on the site.

Below-ground impact

Root distribution

- 4.7 The trees T1, T2 and T3 grow in a walled area, created at least 15 years ago, almost 1m above the paved patio. As it seemed possible that tree roots had been severed during this work, a trial trench was opened to assess root distribution outside the walled area and under the patio.

Trial trench

- 4.8 The trench was along the line of the north wall of the proposed extension, about 4.5m long and about 0.5m wide. A thick concrete slab was uncovered below the patio paving.
- 4.9 Only a few individual hair roots and a single root of less than 25mm diameter (probably from the lime T3) were discovered – please see the photographs overleaf.
- 4.10 While the loss of any tree root should ideally be avoided, the loss of some fine individual roots and a single small-diameter root would not cause any significant short-term or long-term harm to the tree.



PHOTO 1: position of trial trench and single root



PHOTO 2: the single root of less than 25mm diameter in the trial trench

Protective measures

- 4.11 During authorised development construction exclusion zones would be needed to protect the trees T1, T2, T3, T4 and T5 from direct damage. The majority of the existing paving should stay in place until after construction to protect potential tree-rooting soil from compaction.
- 4.12 If any new hard landscaping of the patio were required, an arboricultural method statement would need to be produced to protect any roots during the removal of existing hard surfaces. Any new wearing course would need to be permeable.

Services

- 4.13 All services would be connected from existing installations, and no new service trenches would be opened within root protection areas.

Structural design

- 4.14 The foundation design would need to take account of site-specific geotechnical information – especially the soil plasticity, the presence of trees and the associated impacts of so-called ‘water demand’ (as classified by the National House Building Council).

General protective measures during approved construction

- 4.15 The siting of contractor parking, materials storage, site administration and welfare facilities would need to be specified. Tree protection methods would need to be specified for the movement of materials, plant or skips; from the use, storage or mixing of materials; and to deal with any unanticipated discovery of individual roots of 25mm diameter or greater, or clumps of smaller roots.

Shading

- 4.16 There is no impact of tree shading on the proposed development.

5 Summary of conclusions

- 5.1 No tree would need to be removed to permit development, so that there would be no loss of landscaping or environmental benefits.
- 5.2 Some minor tree pruning is desirable irrespective of the development plan. Some periodic crown lifting of a cherry plum might also be desirable for the proposed future use of the site. In all, the pruning impact on the trees would be minimal.
- 5.3 A trial trench showed only one root of any size (but under 25mm diameter) to be present under the site of the proposed rear extension. Its loss would not have a harmful long-term impact.
- 5.4 Protective fencing, to create construction exclusion zones, and other standard tree protection measures would need to be specified and observed during authorised development.
- 5.5 The structural design of the property would need to take account of site-specific soil plasticity and the presence of trees.
- 5.6 Provided that adequate and sufficient tree protection measures were taken during development, it should be possible to build the proposed extension without long-term harm to the retained trees.

APPENDIX A – TREE INSPECTION

Key to inspection schedule

Tree number on plan	
T1, T2 etc	individual tree
G1, G2 etc	group of trees
Stem	
The measurement is the stem diameter at 1.5m above ground level for single-stemmed trees, unless stated otherwise, or the equivalent calculated stem diameter for multi-stemmed trees based on one of the two formulae for multi-stemmed trees in the British Standard BS5837:2012.	
First significant branch	
The height above ground level and direction of the first significant branch, which might be higher or lower than the mass of other leaves.	
Life stage	
New	Sapling or newly established tree, growing vigorously if healthy. Usually easy to transplant and re-establish.
Y	Young: still in the first third of typical life expectancy for the species and conditions. Growing vigorously, if healthy, but not necessarily yet producing seed. Possibly some scope for transplanting and re-establishing.
EM	Early mature: in the second third of typical life expectancy for the species and conditions, producing seed, but not necessarily at full height or spread.
Mat	Mature: at full size and in the final third of typical life expectancy for the species and conditions. Annual growth slow and gradually reducing.
OM	Old mature: old for the species and/or conditions and probably showing signs of senescence (very slow or no annual growth) and possible decline. Might also be described as a veteran tree, and may have special biological/ecological conservation value.
Vet	Veteran: a tree of special biological/ecological conservation, cultural or aesthetic value (or all three). Often, but not necessarily, older than the typical age range for the species. Younger trees might also qualify as a veteran because of features, such as a trunk cavity, that provide high wildlife/conservation value.
Anc	Ancient: an especially old tree with features of old mature and veteran trees, which is likely to be of high biological/ecological conservation, cultural and aesthetic value.
Remaining years, in age bands	
<10, 10 or more, 20 or more, 40 or more	
Physiological or structural condition	
Normal (physiological) or Good (structural)	no significant health problems or structural problems
Fair	some symptoms of ill health, or currently insignificant or remediable structural problems
Poor	significant symptoms of ill health, or significant structural problems
Senescent	growing very slowly or with no annual growth
Moribund	in irreversible decline
Dead	no physiological function
BS 5837:2012 Category of quality/retention	
U	Tree unsuitable for retention
A	High quality and value, to be considered for retention
B	Moderate quality and value, to be considered for retention
C	Low quality and value, or young tree, which might be considered for retention
BS 5837:2012 Criteria for category of retention	
1.	Mainly arboricultural value
2.	Mainly landscape value
3.	Mainly cultural value, including conservation
Other abbreviations	
e	estimated
oi	measurement taken over ivy or other climber, or over basal shoots
rf	root flare (base of the tree)
prov	provisional
N, E, S, W	north, east, south, west

Tree inspection schedule

Tree ident on plan	Species	Approx height in m	Stem diam- eter or equiv- alent in mm	Approx branch radius in m				Canopy height above propose d fence position in m	First signif- icant branch height in m & direct- ion	Life stage	Physio- logical condition	Structural condition	General observations and preliminary recommendations	Est. remain- ing contrib- ution in years	Category grading	Min RPA area in m ²
				N	E	S	W									
T1	<i>Prunus avium</i> wild cherry	8	220	5	5	4	4	3	2.5 S	Mat	Normal	Top-grafted. Fair-good.	None	20-40	B2	22
T2	<i>Prunus cerasifera</i> cherry plum	8.6	290	2	2.5	3.6	3.6	2.5	2 N	EM	Normal	Fair-good. Overhanging back garden of 4 Rudgwick Terrace.	Reduce crown by about 1.5m from branch tips in spring- early summer 2018.	20-40	B2	38
T3	<i>Tilia x europaea</i> common lime	17- 19	680	3	3.5	3.8	3.5	4.8	3.5 S	Mat	Normal	Co-dominant stems from about 2.8m above ground level, with naturally grafted branches above. Leans S towards house. Vigorous regrowth from previous crown reduction.	Remove all dead branches of over 300mm diameter. (Council permission not required provided that no live wood is cut.) A crown reduction to the last reduction points should be considered within 3 years (and subject to council permission).	20-40	B2	209

Tree ident on plan	Species	Approx height in m	Stem diam- eter or equiv- alent in mm	Approx branch radius in m				Canopy height above propose d fence position in m	First signif- icant branch height in m & direct- ion	Life stage	Physio- logical condition	Structural condition	General observations and preliminary recommendations	Est. remain- ing contrib- ution in years	Category grading	Min RPA area in m ²
				N	E	S	W									
T4	<i>Magnolia x soulangeana magnolia</i>	8.3	165	3	4	3	1.6	2	2 N	Mat	Normal	Fair-good, but touching house.	Reduce crown selectively by up to 1.5m from branch tips, providing at least 1m horizontal clearance from the house.	20-40	B2	12
T5	<i>Mahonia x media evergreen mahonia</i>	3.8	134	1.5	1.5	1.5	1.5	3.5	3 E	OM	Normal	Fair	None	10 -20	C1	8
T6	x3 <i>Prunus</i> sp. cherry	9.6	200	4.8	3.8	3.5	4	3	2.5 E	Mat	Normal	Fair-good	None	10 -20	C1	18

APPENDIX B –SCOPE

- 1 This report and its associated drawings are based on arboricultural criteria only. Comments and drawings relating to architectural, geological, structural, legal, planning policy or other non-arboricultural matters must be viewed as provisional and referred to appropriate specialists for confirmation and specification.
- 2 The tree condition inspection was a visual tree assessment (VTA) from ground level, following industry-standard procedures, based largely on the principles described in *The body language of trees – A handbook for failure analysis*, by Claus Mattheck and Helge Breloer, and *Principles of Tree Hazard Assessment and Management*, by David Lonsdale.
- 3 Trees are dynamic and sometimes unpredictable organisms. They change as they mature and decline, change in response to changing conditions around them, or change for reasons that research has not yet fully explained. The tree inspection deals with the tree condition observed on the day the inspection was carried out.
- 4 Where accessible, tree trunks were measured with a diameter tape at 1.5m from the ground, or according to measuring criteria in BS5837:2012. Other measurements were estimated. Trees on neighbouring properties were not inspected at close quarters.
- 5 There was no invasive investigation, such as test-boring of a tree, and no branch, leaf, fruit or root samples were collected for analysis. No survey was made of water bodies, drains or drainage systems.
- 6 The information from the British Geological Survey and LandIS provide a general indication of soils in the area, but no reliance should be placed on them for the application site, as actual soil composition can vary over short distances.

APPENDIX C – REFERENCES

BS5837:2012 *Trees in Relation to Design, Demolition and Construction – Recommendations*; British Standards Institution, 2012.

British Geological Survey, Geology of Britain viewer, <http://www.bgs.ac.uk/opengeoscience/>

LandIS (Land Information System), <http://www.landis.org.uk/index.cfm>

David Lonsdale, *Principles of Tree Hazard Assessment and Management*, Research for Amenity Trees No. 7; Arboricultural Association, reprinted 2013.

Claus Mattheck and Helge Breloer, *The body language of trees – A handbook for failure analysis*, Research for Amenity Trees No. 4; Office of the Deputy Prime Minister, 2003.



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