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BS5837:2012 TREE SURVEY AND ARBORICULTURAL IMPACT ASSESSMENT: 2-7 Montague Street, London, WC1B 5BP

Dated: 13th April 2023

Our reference: GHA/DS/162230:23

CONTENTS

Arboricultural Impact Assessment

Location: 2-7 Montague Street, London, WC1B 5BP
Our reference: GHA/DS/162230:23
Client: R Batrick
Dated: 13th April 2023
Prepared by: Glen Harding MICFor, MSc (Forestry), MArborA
Date of Inspection: 15th March 2023

Instructions

Issued by – R Batrick

TERMS OF REFERENCE – GHA Trees were instructed to survey the subject trees within and adjacent to 2-7 Montague Street, London, in order to assess their general condition and to provide a planning integration statement for the indicative proposed development that safeguards the long term wellbeing of the retained trees in a sustainable manner.

Executive Summary

The proposal for the site is to undertake renovation works to the hotel building, work that will include a new rear extension, a new room plant area and some relandscaping of the rear garden. The proposed scheme requires the removal of a small number of relatively insignificant (C and U category) trees and shrubs, which will not significantly impact the local or wider landscape. The development presents an excellent opportunity to plant some new trees, to enhance the site and local area for the future. The retained trees require protection in accordance with industry best practice and BS 5837: 2012 – Trees in relation to design, demolition and construction – recommendations, in order to ensure their longevity.

Documents Supplied

The client supplied the following documents:

- Topographical survey
- Existing layout plans
- Proposed layout plans

Scope of Survey

1.1 The survey is concerned with the arboricultural aspects of the site only.

1.2 The planning status of the subject property was not investigated in detail.

1.3 A qualified Arboriculturist undertook the report and site visit and the contents of this report are based on this. Whilst reference may be made to built structure or soils, these are only opinions and confirmation should be obtained from a qualified expert as required.

1.4 Trees in third party ownership were surveyed from within the subject property, therefore a detailed assessment was not possible and some (if not all) measurements were estimated. Where the stem location of a third party tree has been estimated, this is noted on the plan.

1.5 No discussions took place between the surveyor and any other party.

1.6 The trees were inspected on the basis of the Visual Tree Assessment method expounded by Mattheck and Breleor (The body language of tree, DoE booklet Research for Amenity Trees No. 4, 1994)

1.7 The survey was undertaken in accord with British Standard 5837: 2012 – Trees in relation to design, demolition and construction – recommendations.

1.8 Underground services near to trees will need to be installed in accord with the guidance given in BS5837.

1.9 The client's attention is drawn to the responsibilities under the Wildlife and Countryside Act (1981).

Survey Method

2.1 The survey was conducted from ground level with the aid of binoculars if needed.

2.2 No tissue samples were taken nor was any internal investigation of the subject trees undertaken.

2.3 No soil samples were taken.

2.4 The height of each subject tree was estimated using a clinometer and recorded to the nearest half metre.

2.5 The stem diameter for each tree was measured in line with the requirements set out in BS 5837: 2012 – Trees in relation to design, demolition and construction – recommendations.

2.6 The crown spreads were measured with an electronic distometer and recorded to the nearest half metre. Where the crown radius was notably different in any direction this has been noted on the Plan (appendix A) and within the tree table (Appendix B). The crowns of those trees that are proposed for removal, or trees where the crown spread is deemed insignificant in relation to the proposed development are not always shown on the appended plan; however their stem locations are marked for reference.

2.7 The Root Protection Area (RPA) for each tree is included in the tree table, both as an area, and as the radius of a circle.

2.8 The crown clearance was measured using a clinometer and recorded to the nearest half metre. Where it is significantly lower in one direction, this is noted within the tree table at appendix B.

2.9 All of the trees that were inspected during the site visit are detailed on the plan at Appendix A; this plan was produced in colour and **MUST** only be scanned or reproduced in colour. The trees on this plan are categorised and shown in the following format:

COLOUR CODING AND RATING OF TREES:

Category A – Trees of high quality with an estimated remaining life expectancy of at least 40 years. Colour = light green crown outline on plan.

Category B – Trees of moderate quality with an estimated remaining life expectancy of at least 20 years. Colour = mid blue crown outline on plan.

Category C – Trees of low quality with an estimated remaining life expectancy of at least 10 to 20 years, or young trees with a stem diameter below 150mm. Colour = uncoloured crown outline on plan.

Category U – Those in such a condition that they cannot realisitically be retained as living trees in the context of the current land use for longer than 10 years. Colour = red crown outline on plan.

All references to tree rating are made in accordance with BS 5837: 2012 – Trees in relation to design, demolition and construction – recommendations', Table 1.

The Site

3.1 The site is located on Montague Street, near to central London.

The Subject Trees

4.1 The details of the subject trees are set out in the Schedule at Appendix B.

4.2 Of the twenty-two individual trees, and groups of trees surveyed, two have been assessed as BS 5837 category A, two have been assessed as BS category B, seventeen have been assessed as BS category C with the remaining tree being assessed as BS 5837 category U.

Category A	2 trees
Category B	1 tree
Category C	18 trees / groups
Category U	1 tree

The Proposal

5.1 The proposal for the site is to undertake renovation works to the hotel building, work that will include a new rear extension, a new room plant area and some relandscaping of the rear garden.

5.2 The proposed location of the above structures can be seen on the appended plan.

Arboricultural Impact Assessment

PROPOSED TREE REMOVAL / RETENTION:

6.1 The following trees are proposed for removal as part of the new development, as these specimens could not be effectively retained as they are located within the outline of the new structures, or located too close to make their retention feasible / sustainable.

T1, T2, T3, T4, T6, T8, T10, G13, T15, T19, T20, T21 and T22

6.2 All of the trees to be removed have been given either a C or U category grading in accordance with BS 5837. It is therefore felt that these trees should not act as a limitation on the effective use of the site, or impose any significant constraints on the layout (see table 1 BS5837).

6.3 The assessed grading (as per BS5837 table 1) of each of the trees to be removed, as well as any relevant comments on their condition can be seen in the tree table at appendix B.

TREE PRUNING TO ACCOMODATE THE PROPOSAL OR ACCESS TO THE SITE

6.4 The implementation of the proposal does not lead to the requirement to prune any of the retained trees, or shrubs.

6.5 There is no part of the new rear extension which will have tree canopies (from trees to be retained) overhanging it and the building works can progress safely without the need for any facilitation pruning.

6.6 There is an overhang of the new landscaped areas and plant room from the crowns of retained trees (as shown on appended plan). The defining branch structure of these trees is however well clear of the ground below as detailed in the tree schedule at appendix B and therefore site works can progress safely without the need for any facilitation pruning.

ASSESSMENT OF RETAINED TREES ROOT PROTECTION AREAS

6.7 Section 4.6.3 of BS 5837: 2012 states that the Root Protection Area (RPA) of each tree should be assessed by an arboriculturalist considering the likely morphology and disposition of the roots, when known to be influenced by past or existing site conditions.

6.8 The assessed RPAs (excluding the RPAs of U category trees and those trees which are proposed for removal) can be seen on the appended plan.

6.9 The RPAs of several trees have been amended to take account of the existing structures (walls and buildings); these adjustments can be seen on the appended plan.

ASSESSED IMPACT ON RPAS BY PROPOSED STRUCTURES

6.10 Where the proposed extension encroaches into the RPAs of T16 and T17, a specialist foundation will be required to ensure the ground levels remain unaltered near to these trees. The use of systems employing mini piles in conjunction with ground beams is now widely accepted. Localised piles will be positioned (following trial digs) to ensure that any significant roots (over 25mm) that are present in the area where the new building will sit can be retained and protected to coexist with the new structure.

6.11 Similar principles will also apply when constructing the new plant room which must be constructed to maintain existing ground levels.

6.12 In order to arrive at a suitable foundation designs (which minimise root disturbance within the RPAs of nearby retained trees), site specific and specialist advice regarding footings should be sought from an Engineer, in close discussion with the projects Arboriculturalist.

6.13 There MUST be an air void beneath the new structure and rain water must be gathered from the roof and redistributed beneath the new structure to allow any root growth present to be allowed to continue to thrive; the existing ground levels allow for this.

6.14 All new pathways and hard / soft landscaping areas within the Root Protection Areas (RPAs) of the retained trees should be designed using no-dig, up and over construction and in close co-ordination with the retained Arboriculturalist using porous materials.

INSTALLATION OF SERVICES

6.15 The full details of existing and proposed new services have not been made available at the time of writing.

6.16 The installation of underground apparatus and drainage systems with the use of mechanical excavators will undoubtedly sever any roots that may be present and can change the hydrology and structure of the nearby soil in a way that will adversely affect the health of any nearby trees. Particular care should therefore be taken when assessing the layout of new services and consideration MUST be given to the methods of installation of ALL underground apparatus.

Post Development Pressure

FUTURE TREE AND STRUCTURE RELATIONSHIPS

7.1 The retained trees are at a satisfactory distance from the proposed new structures and highly unlikely to give rise to any inconvenience.

7.2 The retained trees on site are protected by their presence within a Conservation Area. These designations will ensure that the local planning authority retain full control over all future works to these trees, ensuring any future occupants are unable to undertake any inappropriate works to these trees.

7.3 Regular inspections of the retained trees by a suitably qualified Arboriculturalist and subsequent remedial works will ensure that the trees are maintained in a suitable manner, to exist in harmony with the new structures and its occupants for many years to come.

REMEDIATION / REPLACEMENT PLANTING AND SOFT / HARD LANDSCAPING

7.4 An assessment of suitable planting sites within the proposed development area confirms that the loss of trees discussed in section 6.1 can be addressed by the planting of new trees that would complement the existing landscape.

7.5 Proposals for new trees can be seen on the Landscape Architects plans.

7.6 Any new trees that are planted should be selected to ensure they do not become a nuisance and that the level of routine maintenance is low.

Tree Protection Measures and Preliminary Method Statement for Development Works

This is a preliminary statement outlining the principal tree protection measures that will be necessary to implement the scheme without adverse harm to trees to be retained. A full site-specific method statement and tree protection plan will be required once the scheme is finalised and approved; this will be devised by GHA Trees, in conjunction with the appointed contractor and project engineer.

8.1 TREE WORK

A list of all tree works that are required (including trees to be removed) is included in the tree table at Appendix B. Where any tree work is needed, this work **MUST** be in accordance with British Standard 3998 – 2010 (Tree Work - Recommendations).

8.2 TREE PROTECTION BARRIERS

It is essential for the future health of the trees to be retained on site, that all development activity is undertaken outside the root protection zone of these trees. The position of the fence **MUST** be marked out with biodegradable marker paint on site and agreed with appropriate representatives from the LPA and contractor. The fencing **MUST** be erected **prior** to any works in the vicinity of the trees and removed only when all development activity is complete. The protective fencing **MUST** be as that shown in BS 5837 (see Appendix C). The herras panels **MUST** be joined together using a minimum of two anti-tamper couplers which **MUST** be installed so they can only be removed from the inside of the fence. The panels **MUST** supported by stabilizer struts, which **MUST** be installed on the inside and secured to the ground using pins or appropriate weights.

The Fence must be marked with a clear sign reading:

"Construction Exclusion Zone – No Access"

8.3 GROUND PROTECTION – LIGHTWEIGHT ACCESS ONLY

Where any additional ground protection is required, these areas **MUST** be covered with a permeable membrane, with 150mm layer of compressible woodchip overlaying it; an 18mm marine ply boards will then be secured on top of the woodchip to allow a 1.5tonne mini-digger to access the area without causing major compaction or soil erosion.

8.4 IMPLEMENTATION OF THE NEW BUILDINGS ON A "RAFT STYLE" FOUNDATION WITH ASSOCIATED PILES / PADS

- **NOTE: any excavations in the RPAS with the use of mechanical excavators will undoubtedly sever any roots that may be present and can change the hydrology and structure of the nearby soil in a way that will adversely affect the health of any nearby trees.**

- The design of the new pile / pad layout must have sufficient flexibility that the locations of the supporting piles / pads is changeable. The location for these piles / pads will be confirmed following hand excavated, trial digs of the top 1000mm of each potential hole (this is where the majority of roots exist).

- The foundation design must also incorporate a void that will allow for water to reach the area beneath the structure and ensure that gaseous exchanges are not restricted.

- Hand tool excavations will only be undertaken by fully briefed site personnel. This operation will be done slowly and carefully to ensure the retention and protection of any roots that are discovered that are in excess of 25mm. These roots **MUST** then be covered and protected using damp hessian whilst further excavation commences; hessian must be left in situ until backfilling commences and re-wetted if needed to avoid root desiccation. **NOTE: OPERATIVES MUST CHECK FOR THE PRESENCE OF ANY EXISTING UNDERGROUND SERVICES PRIOR TO THE COMMENCEMENT OF SUCH WORK.**

- Any roots discovered in these trial pits in excess of 25mm diameter will immediately signal the requirement for a change of pit location.

- These trial digs will be attended by the retained arboriculturalist and site manager who will agree the final locations of the piles / pads.

- **Ground protection as that detailed above / A piling mat of appropriate thickness / loading capability MUST** be placed over the working area whilst the deeper piling / excavation of the final locations commences, with the use of a lightweight rig and / or hand tools. This will alleviate the possibility of excessive compaction or erosion within the RPA's.

- Once the trial holes are excavated to the correct depth, care must then be taken to ensure the new piles / pads are installed so as to avoid any roots present. **Any roots that require pruning (those less than 25mm diameter) should be cut using sharp tools to leave a 'clean' cut, in order to minimise the risk of infection by decay pathogens.**

- Once the piles / pads are installed, the excavated holes **MUST** then be backfilled and the soil compacted using hand tools only, to ensure not air pockets are left as these can be damaging to tree roots.

- The supporting beams can now be installed and must be raised above the ground level between the piles and no further excavation carried out.

- The beams between the piles will be precast or cast on site using a biodegradable void former. The slab will be cast between the beams using a biodegradable void former such as Clayboard or similar approved. The ground protection must remain in place until work is complete and there is no risk to the RPAs.

8.5 BOUNDARY TREATMENTS

No upgrades to the existing fencing are proposed as part of the scheme.

8.6 DELIVERY AND STORAGE OF BUILDING MATERIALS

Due to the limited on-site storage space, it may be necessary for bulk deliveries to be split into smaller deliveries. The use of a "just in time" delivery method **MUST** also be adopted to reduce the time materials are stored on site before use.

8.7 MIXING OF CONCRETE

All mixing of cement / concrete **MUST** be undertaken outside of the RPA of all of the retained trees.

8.8 USE CRANES, RIGS AND BOOMS

Precautionary measures **MUST** be observed to avoid contact of any retained trees when manoeuvring cranes rigs or booms into position.

8.9 INCOMING SERVICES, DRAINAGE AND SOAKAWAYS

Any new underground services which are to be located within (any portion of) the RPAs of any trees which are to be retained **MUST** be installed in accord with the guidance given in BS5837 together with the National Joint Utilities Group Booklet 4: 2007 Guidelines for the planning, installation and maintenance of utility services in proximity to trees (NJUG4). Service installation layouts **MUST** be planned to keep apparatus together in common ducts, in order to minimise the need for excavations. Service trench excavation within the RPAs **MUST NOT** be undertaken with the use of any mechanised machinery (minidiggers, JCBs or alike).

8.10 ON SITE SUPERVISION

Regular site supervision is essential to ensure all potentially damaging activities near to trees are properly supervised.

A pre start site meeting **MUST** occur to ensure all parties are aware of their responsibilities relating to tree protection on site; this **MUST** include a site induction for key personnel.

Key personnel:

Name	**Position**	**Contact number / email:**
Glen Harding	Retained arboriculturalist	07884 056 025 Or info@ghatrees.co.uk
TBC	Local authority Arboricultural Officer	TBC
TBC	Site manager	TBC

At this pre start meeting, a supervision programme **MUST** be devised by the site manager and retained Arboriculturalist, ensuring that Arboricultural supervision is present at the appropriate periods during construction. The critical phases as listed below will be supervised inspected on site by the retained Arboriculturalist. A photo record of each visit will also be kept and supplied to the local planning authority if requested. Day-to-day responsibility for tree protection will be devolved to the site manager.

8.11 OTHER TREE PROTECTION PRECAUTIONS

- **NO** fires lit on site within 20 metres of any tree to be retained.
- **NO** fuels, oils or substances with will be damaging to the tree shall be spilled or poured on site.
- **NO** storage of any materials within the root protections zone.

8.12 HARD / SOFT LANDSCAPING NEAR RETAINED TREES

All new pathways and hard landscaping areas within the Root Protection Areas (RPA's) of the retained trees **MUST** be designed using no-dig, up and over construction techniques, and be specified in close co-ordination with the retained Arboriculturalist. Porous materials **MUST** also be used when surfacing near the trees. No machinery will be used for this work, which **MUST** all be done by hand.

8.13 TREE PLANTING

Some proposed locations for new trees can be seen on the Landscape Architect's plans. Tree planting should be undertaken between the months of November and March by a suitably experienced contractor. The scheme should include the implementation of an aftercare package to include: weed management, tree hydration, stake and tie maintenance, replacement of any failures, mulching and formative pruning.

8.14 DISMANTLING PROTECTIVE BARRIERS

Protective barriers must only be completely removed when all machinery, and equipment has left site.

Conclusion

9.1 In conclusion, the principal arboricultural features within the site can be retained and adequately protected during development activities.

9.2 No significant or important trees will be lost to facilitate the proposed scheme.

9.3 Subject to precautionary measures as detailed above, the proposal will not be injurious to trees to be retained.

9.4 There will be no appreciable post development pressure, and certainly none that would oblige the council to give consent to inappropriate tree works.

9.5 New trees and shrubs can be planted following approval from the Local Planning Authority to ensure a sustainable tree stock for the future.

Recommendations

10.1 Site supervision – An individual e.g. the Site Agent, must be nominated to be responsible for all arboricultural matters on site. This person must:

a. Be present on the site the majority of the time.
b. Be aware of the arboricultural responsibilities.
c. Have the authority to stop any work that is, or has the potential to cause harm to any tree.
d. Be responsible for ensuring that all site personnel are aware of their responsibilities towards trees on site and the consequences of the failure to observe those responsibilities.

e. Make immediate contact with the local authority and / or retained arboriculturalist in the event of any related tree problems occurring whether actual or potential.

10.2 It is recommended, that to ensure a commitment from all parties to the healthy retention of the trees, that details are passed by the architect or agent to any contractors working on site, so that the practical aspects of the above precautions are included in their method statements, and financial provision made for these.

13th April 2023
Signed:

Glen Harding MICFor, MSc (Forestry), MArborA
For and on behalf of GHA Trees

Appendix A
TREE PLAN
(see separate PDF)

Appendix B
TREE TABLE

Tree Number	Tree Name (species)	Ht (m)	Calculated Stem Diameter (mm)	Number of Stems	Root Protection Area (Radius, m)	N (m)	E (m)	S (m)	W (m)	Age Class	Clearance (m)	Estimated life expectancy	BS Category	Comments / Recommendations
T1	Viburnum	6	130	1	1.56	3	1	1	3	M	2	10-20	C1	Small tree of limited value in the wider landscape. Too close to existing building. Recommend: to be removed.
T2	Magnolia	7	250	1	3.00	2.5	2.5	2.5	2.5	M	2	10-20	C1	Small tree of limited value in the wider landscape. Too close to existing building. Recommend: to be removed.
T3	Palm	6	269	2	3.23	0	1	2	2	M	2	10-20	C1	Small tree of limited value in the wider landscape. Too close to existing building. Recommend: to be removed.
T4	Elder	7	170	1	2.04	2.5	2.5	2.5	2.5	M	2	10-20	C1	Small tree of limited value in the wider landscape. Too close to existing building. Recommend: to be removed.
T5	Robinia	18	450	1	5.40	6	6	6	6	M	7 plus epicormic	20-40	B1	Off site - full inspection not possible. Some measurements estimated.
Tree Number	**Tree Name (species)**	**Ht (m)**	**Calculated Stem Diameter (mm)**	**Number of Stems**	**Root Protection Area**	**N (m)**	**E (m)**	**S (m)**	**W (m)**	**Age Class**	**Clearance (m)**	**Estimated life expectancy**	**BS Category**	**Comments / Recommendations**

					(Radius, m)									
T6	Bay	8	200	1	2.40	2.5	2.5	2.5	2.5	M	2	10-20	C1	Small tree of limited value in the wider landscape. Recommend: to be removed.
T7	Palm	6	219	2	2.63	0	1	0	0	M	2	10-20	C1	Small tree of limited value in the wider landscape.
T8	Bay	6	160	1	1.92	2.5	2.5	1	2.5	M	2	10-20	C1	Small tree of limited value in the wider landscape. Recommend: to be removed.
T9	Bay	7	160	1	1.92	1	2.5	2.5	2.5	M	2	10-20	C1	Small tree of limited value in the wider landscape.
T10	Palm	7	212	2	2.55	1	3	0	0	M	4	10-20	C1	Small tree of limited value in the wider landscape. Recommend: to be removed.
T11	Bay	7	210	1	2.52	2	2	2	2	M	2.5	10-20	C1	Small tree of limited value in the wider landscape.
T12	Palm	4	260	1	3.12	1.5	1.5	1.5	1.5	M	2	10-20	C1	Small tree of limited value in the wider landscape.
G13	Palm	4	200	1	2.40	1.5	1.5	1.5	1.5	M	2	10-20	C1	Small tree of limited value in the wider landscape. Recommend: to be removed.

Tree Number	Tree Name (species)	Ht (m)	Calculated Stem Diameter (mm)	Number of Stems	Root Protection Area (Radius, m)	N (m)	E (m)	S (m)	W (m)	Age Class	Clearance (m)	Estimated life expectancy	BS Category	Comments / Recommendations
T14	London plane	17	260	1	3.12	4	4.5	4.5	4.5	M	4 n	20-40	B1	Small tree of limited value in the wider landscape.
T15	Bay	6	90	1	1.08	1.5	1.5	1.5	1.5	M	1	10-20	C1	Small tree of limited value in the wider landscape. Recommend: to be removed.
T16	London plane	32	1250	1	15.00	11	11	11	6	M	4 north, first branch 11	40+	A1	No notable defects recorded during inspection.
T17	London plane	32	1220	1	14.64	10	5	4	9	M	8 north, first branch 15	40+	A1	No notable defects recorded during inspection.
T18	Bay	8	343	6	4.12	4	4	4	4	M	2	10-20	C1	No notable defects recorded during inspection.
T19	Tree of heaven	15	480	1	5.76	6	5	7	7	M	3 south, 6 east	10-20	C1	Stem / roots damaging wall to south of stem. Previously reduced on hotel side. Recommend: to be removed.
T20	Tree of heaven	12	320	1	3.84	7	1	0	9	M	3 north	Less than 10	U	Stem / roots damaging wall to south of stem. Heavy lean to north. Recommend: to be removed.
Tree Number	**Tree Name (species)**	**Ht (m)**	**Calculated Stem Diameter (mm)**	**Number of Stems**	**Root Protection Area**	**N (m)**	**E (m)**	**S (m)**	**W (m)**	**Age Class**	**Clearance (m)**	**Estimated life expectancy**	**BS Category**	**Comments / Recommendations**

					(Radius, m)									
T21	Elder	6	170	1	2.04	2	2	1	2	M	2	10-20	C1	Small tree of limited value in the wider landscape. Recommend: to be removed.
T22	Elder	6	200	1	2.40	2	2	2	2	M	2	10-20	C1	Small tree of limited value in the wider landscape. Recommend: to be removed.

KEY :
Tree No: (T= individual tree, G= group of trees, W= woodland)
Age class: Young (Y), Middle aged (MA), Mature (M), Over mature (OM), Veteran (V)
Height (Ht): Measured in metres +/- 1m

Appendix C
TREE FENCING DETAIL

Figure 3 **Examples of above-ground stabilizing systems**