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BS5837:2012 TREE SURVEY AND ARBORICULTURAL IMPACT ASSESSMENT: 11 Elsworthy Road, London, NW3 3DS

Dated: 16th January 2023

Our reference: GHA/DS/162340:23

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Arboricultural Impact Assessment

Location: 11 Elsworthy Road, London, NW3 3DS
Our reference: GHA/DS/162340:23
Client: Boyer Planning
Dated: 13th January 2023
Prepared by: Glen Harding MICFor, MSc (Forestry), MArborA
Date of Inspection: 15th December 2022

Instructions

Issued by – Boyer Planning

TERMS OF REFERENCE – GHA Trees were instructed to survey the subject trees within and adjacent to 11 Elsworthy Road, 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 renovate and extend the existing house to the side and rear. A new wheel-chair access will also be created to the front of the site. The proposed scheme does not require the removal or pruning of any of the trees on site, or of trees within nearby adjacent sites; therefore, the landscape character of the site will be unaffected by the proposal. 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:

- 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 Dense vegetation or climbers (such as ivy) also prohibited full inspections for some trees; this is noted where applicable.

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

1.7 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)

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

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

1.10 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 Elsworthy Road, a residential through road located in the Belsize Park area of north west 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 twelve eight individual trees, and groups of trees surveyed, three have been assessed as BS 5837 category A, one has been assessed as BS category B, with the remaining trees being assessed as BS 5837 category C.

Category A	3 trees / groups
Category B	1 tree
Category C	8 trees / groups

The Proposal

5.1 The proposal for the site is to renovate and extend the existing house to the side and rear.

5.2 A new wheel-chair access will also be created to the front of the site.

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

Arboricultural Impact Assessment

PROPOSED TREE REMOVAL / RETENTION:

6.1 The proposed site layout and all of its associated structures allows for the healthy retention of all of the trees on the site itself, and within nearby adjacent sites; therefore, the arboricultural landscape character of the site will be retained. There are some encroachments into the root protection areas of trees to be retained, although these will not have any impact on these trees, due to the mitigation measures as detailed further in this document.

TREE PRUNING TO ACCOMODATE THE PROPOSAL OR ACCESS TO THE SITE

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

6.3 There is a slight overhang of the access ramp from the crown of T1. The defining branch structure of this tree is however well of this structure and works can progress safely without the need for any facilitation pruning.

ASSESSMENT OF RETAINED TREES ROOT PROTECTION AREAS

6.4 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.

6.5 The RPAs of several trees have been amended to take account of the existing structures; these adjustments can be seen on the appended plan.

6.6 The other RPAs have been drawn as notional circles, as there are no structures within their RPAs that have been assessed to significantly impact the root layout.

ASSESSED IMPACT ON RPAS BY PROPOSED STRUCTURES

6.7 The proposed new building extensions are situated outside of the assessed RPAs of all of the trees; therefore, these trees pose no below ground constraints on these new structures or vice versa.

6.8 There is an encroachment into the RPA of T1 from the new access ramp as shown on the appended plan; the use of traditional strip foundations will therefore not be acceptable when installing this structure as this would cause harm to this tree.

6.9 Instead, the use of systems employing mini piles will be required. 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 ramp will sit can be retained and protected to coexist with the new structure.

6.10 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.

INSTALLATION OF SERVICES

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

6.12 From an assessment of the subject site, undertaken in conjunction with the project architect, the existing drainage system has been assessed as suitable for re-use and it is assumed that the electric and gas cabling is also satisfactory. Therefore, there is no reason to assume that any new service installations will be required within the RPAs of any trees.

Post Development Pressure

FUTURE TREE AND STRUCTURE RELATIONSHIPS

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

7.2 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.

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 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 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.

T1 will be protected using a 'tree box' comprising wooden hoarding to a height of 2.4m as per the photo below.

Above: tree box

The Fences / hoarding must be marked with a clear sign reading:

"Construction Exclusion Zone – No Access"

8.2 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.

8.3 IMPLEMENTATION OF THE ACCESS RAMP ON A PILES

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

- 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.

- **Ground protection as that detailed above MUST** be placed over the working area whilst the deeper 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 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 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.

8.4 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.

8.5 SITE HUTS, WELFARE FACILITIES AND STORAGE OF EQUIPMENT, MATERIALS AND CHEMICALS

All site huts **MUST** be positioned outside of the retained trees RPA's.

8.6 MIXING OF CONCRETE

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

8.7 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.

8.8 ON SITE SUPERVISION

Regular site supervision is essential to ensure all potentially damaging activities near to trees are correctly supervised. A pre start meeting will occur to ensure all parties are aware of their responsibilities relating to tree protection on site; this will include a site induction for key personnel.

The key personnel relating to this project are:

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

8.9 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.

8.10 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.

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

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.

16th January 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

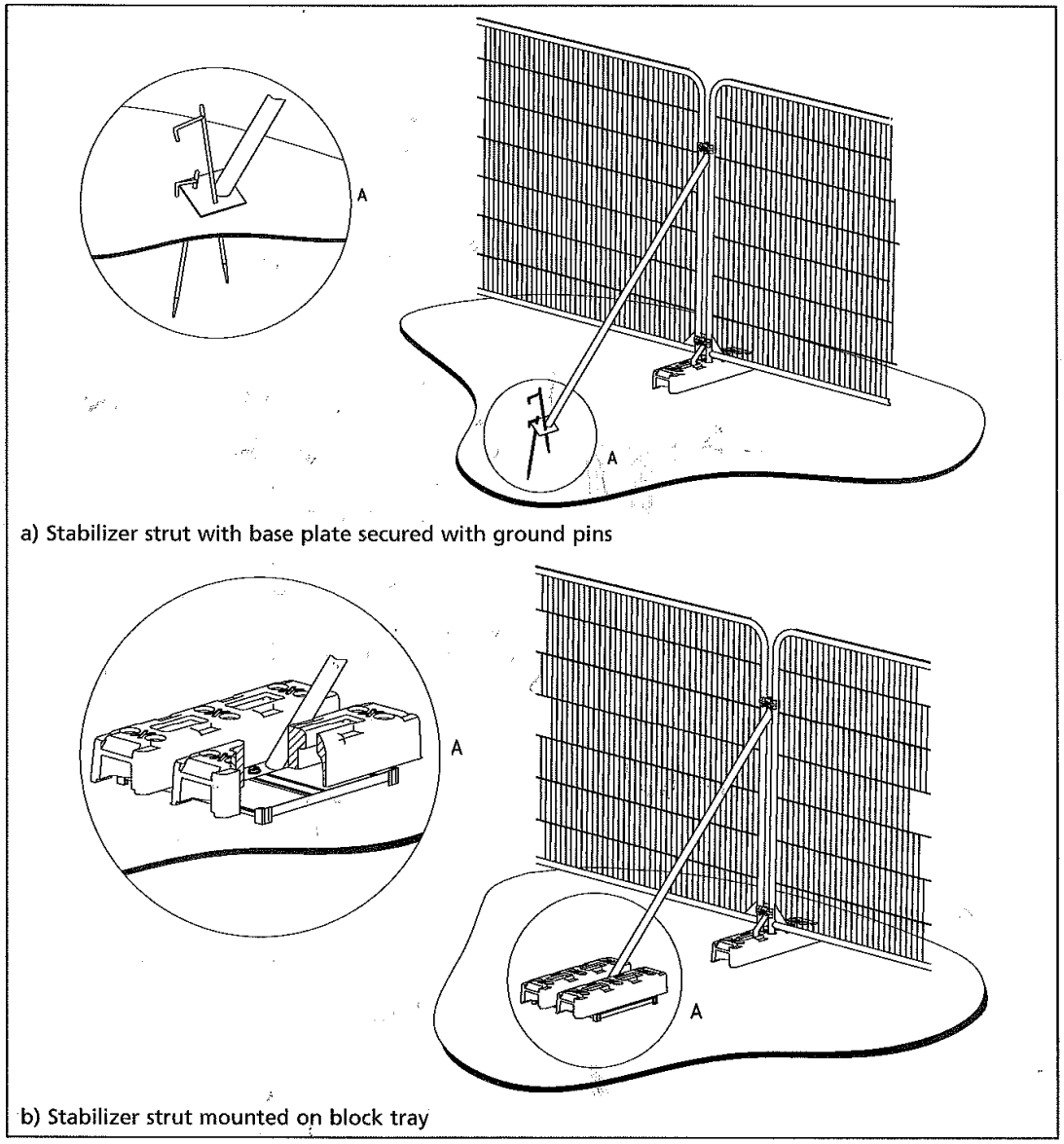
Tree Number	Tree Name (species)	Ht (m)	Calculated Stem Diameter (mm)	Number of Stems	Root Protection Area (Radius, m)	N (m)	E (m)	S (m)	W (m)	Age Class	Clearance (m)	Estimated life expectancy	BS Category	Comments / Recommendations
T1	Beech	22	800	1	9.60	8	7.5	6	5.5	M	4, first branch 7	40+	A1	No notable defects recorded during inspection.
T2	London plane	18	620	1	7.44	6	5	6	6	M	6	40+	A1	Street tree.
T3	Cherry	5	100	1	1.20	2	3.5	0	1	M	3 north	10-20	C1	Small tree of limited value in the wider landscape.
G4	Mixed shrubs - various species	1 to 3	50	1	0.60	1	1	1	1	M	0	10-20	C2	Small shrubs / trees of limited value in the wider landscape.
T5	Acer ssp	9	200	1	2.40	3.5	3.5	2	3.5	M	3	10-20	C1	Small tree of limited value in the wider landscape.
T6	Malus	6	180	1	2.16	3.5	2	3.5	3.5	M	2	10-20	C1	Small tree of limited value in the wider landscape.
T7	Malus	5	200	2	2.40	2	2	2	1	M	2	10-20	C1	Small tree of limited value in the wider landscape.
T8	Mimosa	9	140	1	1.68	2.5	2.5	2.5	2.5	M	2	10-20	C1	No notable defects recorded during inspection.
T9	Catalpa	9	250	1	3.00	5	5	3	5	M	2	10-20	C1	No notable defects recorded during inspection.
T10	Magnolia	6	170	2	2.04	2	3	4	3	M	2	10-20	C1	Major deadwood in crown. Recommend: removed deadwood.

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
G11	Lime	21	450	1	5.40	4.5	4.5	4.5	4.5	M	8 plus epicormic	40+	A2	Vegetation near base of tree prevented full and detailed inspection.
T12	Liquidamber	14	430	2	5.16	6	4.5	4	4	M	4	20-40	B1	Off site - full inspection not possible. Some measurements estimated.

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**



a) Stabilizer strut with base plate secured with ground pins

b) Stabilizer strut mounted on block tray