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BS5837:2012 TREE SURVEY AND ARBORICULTURAL IMPACT ASSESSMENT: 19 Elgood Avenue, Northwood, HA6 3QL

Dated: 4th March 2024

Our reference: GHA/DS/160112:24

CONTENTS

Arboricultural Impact Assessment

Location: 19 Elgood Avenue, Northwood, HA6 3QL
Our reference: GHA/DS/160112:23
Client: S Raizada
Dated: 4th March 2023
Prepared by: Glen Harding MICFor, MSc (Forestry), MArborA
Date of Inspection: 5th April 2023

Instructions

Issued by – S Raizada

TERMS OF REFERENCE – GHA Trees were instructed to survey the subject trees within and adjacent to 19 Elgood Avenue, Northwood, 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 the existing house, work that will include a new extension to the sides and rear; part of the new extension has already been approved under permitted development. The proposed scheme requires the removal of one small and relatively insignificant (C category) tree. A small number of relatively insignificant (C category) shrubs will be removed, which will not significantly impact the local or wider landscape. Some facilitation pruning is required to a beech tree to the south of the site and some smaller trees on the northern boundary; these trees are covered by a TPO and thus any works would require the consent of the local planning authority. The proposal requires new structures be installed within the root protection areas of nearby trees; however, mitigations are proposed to ensure these structures will not adversely affect these trees. 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 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 Tree works will be required to be in accord with British Standard 3998 – 2010 (Tree Work - Recommendations).

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

1.11 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 Elgood Avenue, a residential through road located to the east of Northwood.

3.2 Access to the property is currently gained via a driveway to the front of the site.

The Subject Trees

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

4.2 Of the sixteen individual trees, and groups of trees surveyed, one has been assessed as BS 5837 category A, three have been assessed as BS category B, ten have been assessed as BS category C with the remaining two trees being assessed as BS 5837 category U.

Category A	1 tree
Category B	3 trees
Category C	10 trees / groups
Category U	2 trees

The Proposal

5.1 The proposal for the site is to renovate the existing house, work that will include a new extension to the sides and rear; part of the new extension has already been approved under permitted development.

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 T8 is proposed for removal as part of the new development, as this tree could not be effectively retained as it is located within the outline of the new structures, or located too close to make its retention feasible / sustainable. This tree has been given a C category grading in accordance with BS 5837 and therefore 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).

6.2 A small number of relatively insignificant (C category) shrubs will be removed, which will not significantly impact the local or wider landscape.

TREE PRUNING TO ACCOMODATE THE PROPOSAL OR ACCESS TO THE SITE

6.3 There is a slight overhang of the new structures from the crowns of T6, T7, T15 and T16. These trees will therefore be pruned to improve clearances from the proposed new structure. A full specification for the proposed pruning to each tree can be seen in the tree table at appendix B.

6.4 These trees are covered by a TPO and thus any works would require the consent of the local planning authority.

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

ASSESSMENT OF RETAINED TREES ROOT PROTECTION AREAS

6.6 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.

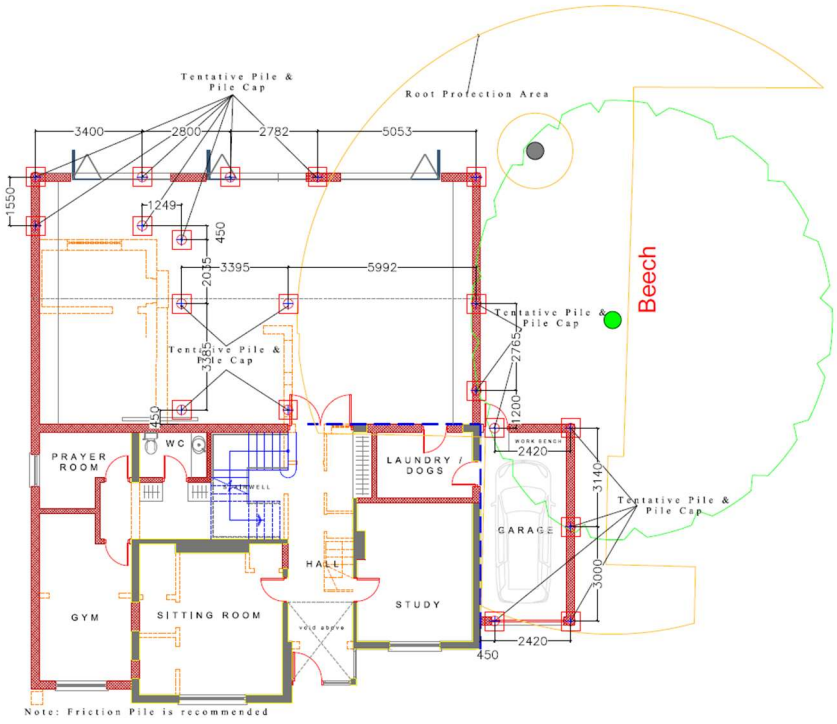
6.7 The assessed RPAs (excluding the RPAs of U category trees and those trees which are proposed for removal) can be seen on the appended plan.

ASSESSED IMPACT ON RPAS BY PROPOSED STRUCTURES

6.8 There is an encroachment into the RPA of T7 from the new structure as shown on the appended plan; this equates to an area of 39% (30.5% of which is approved under a permitted development application) and thus the use of traditional strip foundations will not be acceptable as this would cause harm to this tree.

6.9 The use of system employing mini piles in conjunction with ground beams will be adopted to protect this tree. Localised piles will be positioned (following a ground radar survey) 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. This tree is covered by a TPO and thus any works within the RPA would require the consent of the local planning authority.

Below: pile plan near T7



6.10 Encroachments also exist into the RPAs of T6, T15 and T16; however structures already exist where the extension will be constructed. These trees has been graded as a C category tree in accordance with BS 5837: 2012 – Table 1, and should therefore not act as a limitation on the effective use of the site, or impose any constraints on the layout.

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

PROPOSED ACCESS TO THE NEW DEVELOPMENT

6.12 The existing driveway and parking areas will be retained and there are no plans to upgrade or extend these areas as part of the proposed site works.

INSTALLATION OF SERVICES

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

6.14 New services must be routed to avoid all RPAs of retained trees on site and within nearby sites. From an assessment of the subject site, undertaken in conjunction with the project architect, there is no reason to assume this isn't possible. Inspection chambers must also be sited outside the RPAs of any nearby trees.

Post Development Pressure

FUTURE TREE AND STRUCTURE RELATIONSHIPS

7.1 The trees on site are protected by Tree Preservation Orders (TPOs). 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.

7.2 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.

REMEDIATION / REPLACEMENT PLANTING AND SOFT / HARD LANDSCAPING

7.3 All new pathways and 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.

Tree Protection Measures and Preliminary Method Statement for Development Works

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.

8.2 TREE PROTECTION BARRIERS
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 BUILDING ON A "RAFT STYLE" FOUNDATION WITH ASSOCIATED 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 a ground radar to allow the full root layout to be assessed and roots avoided.

- 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.

- **A piling mat of appropriate thickness / loading capability MUST** be placed over the working area whilst the deeper piling commences, with the use of a lightweight rig. 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.

8.5 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 INCOMING SERVICES, DRAINAGE AND SOAKAWAYS

New services **MUST** be routed to avoid all RPAs of retained trees on site and within nearby sites. From an assessment of the subject site, undertaken in conjunction with the project architect, there is no reason to assume this isn't possible. Inspection chambers **MUST** be sited outside the RPA.

8.9 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

After this pre start meeting, day-to-day responsibility for tree protection will be devolved to the site manager who will make contact with the retained arboriculturalist as needed.

8.10 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.

8.11 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.

8.12 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.

4th March 2024
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	Yew	7	173	3	2.08	2	3.5	3.5	3.5	M	2	20-40	B1	Off site - full inspection not possible. Some measurements estimated.
T2	Lawson cypress	13	350	1	4.20	3	3	3	3	M	3	10-20	C1	Topped at 5m in past. Off site - full inspection not possible. Some measurements estimated.
T3	Dead tree unknown	4	200	1	2.40	1.5	1.5	1.5	1.5	M	2	Less than 10	U	Dead tree
T4	Purple leaf plum	7	550	1	6.60	5	3	2	4	M	2 north	10-20	C1	Off site - full inspection not possible. Some measurements estimated.
T5	Yew	8	367	4	4.40	1	2	3.5	3	M	2 over site	10-20	C1	Off site - full inspection not possible. Some measurements estimated.
T6	Purple leaf plum	8	265	7	3.17	2	3	3	2	M	4	10-20	C1	Off site. Scrub growth left unmanaged now too large for location and touching house. Recommend: prune laterally by 2m on south side.
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**

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
T7	Beech	16	600	1	7.20	4.5	7	7	7	M	5 north, 4 west	40+	A1	No notable defects recorded during inspection. Recommend: prune laterally by 1m on north side; crown to 5m on west side.
T8	Lawson cypress	8	100	1	1.20	2.2	2.2	2.2	2.2	M	2	10-20	C1	Small tree of limited value in the wider landscape. Recommend: to be removed.
G9	Apple and sycamore	10	200	1	2.40	3	3	4	3	M	3 north	10-20	C2	Small trees of limited value in the wider landscape.
T10	Yew	12	560	1	6.72	6	5	3	5	M	2 north	20-40	B1	Slightly sparse crown noted.
T11	Robinia	16	450	1	5.40	5	4	4	5	M	3 west	20-40	B1	Vegetation near base of tree prevented full and detailed inspection.
T12	Apple	6	300	1	3.60	0	1	4	4	M	2 south	Less than 10	U	Small tree of limited value in the wider landscape.
T13	Apple	6	500	1	6.00	4	4	4	4	M	4	10-20	C1	Decay at old pruning points. Off site.
T14	Sorbus	9	160	1	1.92	2.2	2.2	2.2	2.2	M	3	10-20	C1	Small tree of limited value in the wider landscape.

T15	Purple leaf plum	9	507	4	6.09	3	3	3	3	M	3 south	10-20	C1	Scrub growth left unmanaged now too large for location and touching house. Recommend: prune laterally by 2m on south side.
T16	Box elder	10	270	1	3.24	2	2	4.5	4.5	M	6 south	10-20	C1	Scrub growth left unmanaged now too large for location and touching house. Recommend: prune laterally by 2m on south side.

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**