Treework Environmental Practice

Arboricultural Impact Assessment

Queens Crescent, Camden, London

Report Reference Number: 250124-1.1-QCCL-AIA-JBW

On behalf of

London Borough of Camden

January 2025

Document Control Sheet

Project Name: Queens Crescent, Camden, London, NW5 4EG

Report Ref: 250124-1.1-QCCL-AIA-JBW

Report Title: **Arboricultural Impact Assessment**

	Name	Position	Date
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Revision	Date	Description	Prepared by
1.0	21/01/2025	Draft for internal review	JBW
1.1	24/01/2025	Issued report following review	JBW
1.2			

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Executive Summary

- This report provides an assessment of the impact of the proposal upon on-site trees and relevant off-site trees and makes recommendations for mitigating any negative impacts. It is suitable for submission in support of a planning application.

- A check of the Camden Council interactive mapping portal on 21 January 2025 confirmed that the trees situated on, and off-site are not situated within a local Conservation Area. However, the interactive mapping does not provide information on Tree Preservation Orders (TPO)s and a further search for the presence of TPOs should be carried out to ascertain that the trees situated on, and off-site are not protected by virtue of TPO.

- A total of 3 individual trees, have been assessed that are located within the influencing distance of the Site boundary. The data for is presented within the Tree Schedule at Appendix A.

- To facilitate the proposed development, there will be no requirement for any tree removal. All trees will be retained and protected during development. Retained trees are shown with solid crown spreads and RPAs on the tree protection plan at Appendix B.

- Sufficient space and adequate protection measures have been set out to ensure that retained trees are not damaged during the pre-construction and construction phase and to enable their successful development post-construction. Retained tree protection measures are discussed throughout this report and illustrated on the Tree Protection Plan at Appendix B.

- A total of two trees will be subject to construction and/or incursions within their Root Protection Areas. Special measures are recommended to ensure that these trees are not damaged. These measures are detailed in Section 4.4 of this report and are illustrated in the Tree Protection Plan at Appendix B. methodology

1 Introduction

1.1 Brief and Context

1.1.1 Treework Environmental Practice was instructed by Camden Council on 18 October 2024 to provide an Arboricultural Impact Assessment (AIA), in accordance with British Standard BS5837: 2012 Trees in *Relation to Design, Demolition and Construction – Recommendations*, of the effect of development proposals on trees at Queens Crescent, Campden, London, NW5 4EG, known herein as the ''Site''.

1.1.2 Trees are a material consideration for a Local Planning Authority when determining planning applications, whether or not they are afforded the statutory protection of a Tree Preservation Order or Conservation Area. British Standard BS 5837:2012 *Trees in Relation to Design, Demolition and Construction* sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and new developments. The Standard recommends a sequence of activities that starts in the initial feasibility and design phase (RIBA Stage 2 'Concept Design') with a survey to qualify and quantify the trees on the Site and establish the arboricultural constraints to development (above- and below-ground) to inform the design in an iterative process, and continues with an assessment of the arboricultural impacts of the final design and measures to mitigate such impacts should they be negative.

1.1.3 Detailed technical specifications for mitigation and protection measures are devised in the design phase that follows (RIBA Stage 3 and 4 ‘Spatial Coordination’ and ‘Technical Design'), and the sequence ends with the ‘Handover’ and ‘Use’ phases (RIBA Stages 6 and 7), with the implementation of those measures once planning permission is granted, guided by Arboricultural Method Statements (RIBA Stage 4 and 5, 'Technical Design’ and ‘Manufacturing and Construction) and professional guidance where appropriate.

1.1.4 This Arboricultural Impact Assessment (AIA) reports on the direct and indirect impacts of the proposed development on trees in terms of both the buildability of the proposals and the long-term impact of the finished scheme, and where necessary presents mitigation for these impacts.

1.2 Purpose of this Report

1.2.1 This AIA, and the accompanying Tree Schedule and Tree Protection Plan, is provided to support a planning application for the proposed development. It sets out the arboricultural impacts of the proposals using the following considerations as a framework:

- Trees to be removed and trees to be retained.
- Remedial tree work to retained trees to allow development and ensure retained trees will form a harmoniously integrated component of the proposed development.
- Suitable measures to protect retained trees.
- Special construction or engineering measures are required to enable trees to be harmoniously integrated into the proposed development.

1.3 The Development

1.3.1 The proposed development is for the amendment to an existing ramp to introduce external steps, additional new lighting columns, and alterations to existing hard surfacing.

1.3.2 The following documents have been reviewed by Treework Environmental Practice:

Document Title	Document/Drawing number	Originator
Topographical Survey	25974	mk surveys
Proposed Overview Plan	L-01-PLN-004	East Architecture
Tree Constraints Plan	241112-1.0-QCCL-TCP-SH	Treework Environmental Practice

2 Existing Tree Population and Constraints

2.1.1 A tree survey covering trees on and immediately adjacent to the proposed development Site was undertaken on 04 November 2024. The full survey results are presented in the Tree Schedule at Appendix A.

2.1.2 The survey was undertaken based on trees plotted using an outline base map as a reference in Treework Environmental Practice's specialist tree management software – MyTrees. The base map contained a topographical survey of the trees. However, several of the trees/tree groups were not recorded on the topographical survey and their positions are therefore approximate and should not be taken as exact.

2.1.3 The Site is located in northwest London within the London Borough of Camden. The Site is accessed from the south off Queens Crescent and to the north from Weedington Road. The Site is centred approximately at OS National Grid Reference TQ 28239 85107.

2.1.4 The surrounding area includes a mix of residential, and commercial dwellings with areas of amenity space. The land to the north and east of the Site is characterised by residential apartments and commercial premises. To the south are further residential/commercial premises which are flanked by Queens Crescent. To the west are further residential apartments and a public recreational space.

2.1.5 A total of **3** individual trees, have been assessed that are located within the influencing distance of the Site boundary.

2.1.6 The 3 individual trees recorded during the survey broadly comprise London Plane (*Platanus x hispanica*). These trees are located on the Site and are notable features within the wider landscape. The individual trees are also considered of mature age class.

2.1.7 BS5837:2012 recommends classifying trees into four quality and value categories to determine their relative retentive worth. A summary of the relative retentive worth of the trees on site as recorded during the tree survey and expressed by their categories is given in Table 1. Appendix A explains the BS 5837:2012 tree categorisation process.

Category	Individual Trees	Tree Groups	Total
A (High quality and value and of significant material constraint)	3	0	**3**
B (Moderate quality and value and of significant material constraint)	0	0	**0**
C (Low quality and value and of minimal material constraint)	0	0	**0**
U (Trees that cannot be retained regardless of land use and of no material constraint)	0	0	**0**
Total	**3**	**0**	**3**

Table 1: *Numbers of Trees/Groups in each Retention Category*

2.1.8 Trees present constraints to development both above and below ground. The above ground constraints comprise the physical extent of tree crowns. The below ground constraints comprise the roots and are expressed in terms of the root protection area (RPA), which is the minimum rooting area that a tree needs to sustain itself in reasonable health. These constraints, as established by the tree-survey, inform this assessment of the impact of the development proposals.

2.1.9 The full results of the tree survey on which this report is based are given in the Tree Schedule at Appendix A, and the above- and below-ground constraints are illustrated on the Tree Protection Plan at Appendix B. Each tree (T) has been allocated an individual number to which it is referred in this report and all associated documents. The survey method and limitations are set out in Appendix E.

3 Statutory Designations

3.1.1 A desk study has been undertaken as a means of identifying if any statutory and non-statutory constraints or designations are present within the Site. This study includes consideration of the following environmental constraints:

- Tree Preservation Orders (TPO)
- Conservation Areas
- Ancient Woodland and Ancient, Veteran Trees.

3.1.2 A check of the Camden Council interactive mapping portal[1] on 21 January 2025 confirmed that the trees situated on, and off-site are not situated within a local Conservation Area. However, the interactive mapping does not provide information on Tree Preservation Orders (TPO)s and a further search for the presence of TPOs should be carried out to ascertain that the trees situated on, and off-site are not protected by virtue of TPO.

3.1.3 Provisional TPOs may be made whenever a local planning authority deems it appropriate, with those persons interested in the land served with a copy of the order. A further search for the presence of TPOs should be carried out and any necessary applications approved prior to the commencement of any tree works or removals specified within this report.

3.1.4 The presence of ancient woodland designation within or bordering the Site was checked on 21 January 2025 using Natural England's Multi-Agency Geographical Information for the Countryside (MAGIC) map[2], which confirmed that there are no areas of woodland within influencing distance of the Site which are designated as Ancient and Semi Natural Woodland.

3.1.5 The presence of Ancient and Veteran trees was checked on 21 January 2025 using the Woodland Trusts Ancient Tree Inventory[3], which confirmed that there are no trees recorded as ancient, veteran, or notable trees on the inventory. The survey conducted on 04 November 2024 also found no trees that were at a life stage prescribed as ancient or exhibited significant tree features of ancientness to be considered a veteran tree.

[1] Campden Council interactive mapping portal (Online). Available at Camden Maps (Last accessed 21 January 2025)
[2] MAGIC map (Online). Available at https://magic.defra.gov.uk/magicmap.aspx. (Last accessed 21 January 2025)
[3] Ancient Tree Inventory (Online). Available at https://ati.woodlandtrust.org.uk. (Last accessed 21 January 2025)

4 Arboricultural Impact of the Proposals

4.1 Tree Removal and Retention

4.1.1 To facilitate the proposed development there will be no requirement for any tree removal.

4.1.2 All trees will be retained and protected during development (see sections 4.3, 4.4, and 4.5). Retained trees are shown with solid crown spreads and RPAs on the Tree Protection Plan at Appendix B.

4.2 Facilitative Tree Works

4.2.1 To facilitate the proposed development there will be no requirement to undertake any pruning works to the retained trees on the Site.

4.3 Tree Protection

4.3.1 ***Root Protection Areas and Construction Exclusion Zones***

Retained trees will be protected during development by establishing a Construction Exclusion Zone (CEZ) around their Root Protection Areas (RPAs). RPAs are a layout design tool, that indicates the minimum area around a tree deemed to contain sufficient roots and soil to maintain the tree's viability. RPAs should be treated as a precautionary area within which activities such as ground compaction, excavation, the storing of materials, ground level changes, and other construction activities are likely to cause damage to trees and should therefore be excluded. This CEZ can be achieved by the erection of barriers at the locations shown on the Tree Protection Plan at Appendix B. Tree protection barriers must be installed before any demolition or construction works start, and, unless approved by the Local Planning Authority or by an arboriculturist approved by them, should remain in place until all construction activity has been completed.

The type of barriers should match the level of activity around the retained trees. Where a high level of construction activity is expected, fencing must be braced to be robust to vehicular impact and to prevent it from being easily repositioned; a specification similar to drawing 3 in BS 5837:2012 will be suitable (reproduced at Appendix D). In areas away from the main construction activity and vehicle movement, it may be appropriate to install a lower-specification fencing, examples of which are given at Appendix D.

All protection fencing should carry identifying signs that state its purpose and proscribe its removal until all demolition and construction work is complete. An example sign is given at Appendix D.

4.4 Special Technical Measures

Conflicts between retained trees and aspects of the proposed development that cannot be dealt with by exclusion zones, tree protection, or tree work can be mitigated by the use of special technical measures. General recommendations for these measures are presented in the sections that follow based on the information about the proposed development that is currently available. The specific details must be carefully planned once detailed construction information is available to avoid tree damage.

4.4.1 *Installation of new boundary wall, ramp, and steps in RPA of T1 and T2*

The installation of a new boundary wall, ramp, and steps will be required within the RPAs of trees **T1** and **T2**, as denoted as a yellow hatch on the Tree Protection Plan at Appendix A. The installation of the new boundary wall, ramp, and steps will create a new incursion of 2% (**T1**) and 1% (**T2**).

Given the level of new incursions and the extent of existing incursions from hard surfacing and retaining walls within the RPAs of these trees, several exploratory trial pit excavations were undertaken by hand to a depth of 800cm below existing ground levels within the area of new incursion to understand the level of rooting activity within these areas. The position of these trial pits is denoted by the cyan-coloured boxes in Image 1. After careful hand excavation, no roots from **T1** and **T2** were found, with only minor fibrous roots from the existing vegetation and shrubs within the raised planting bed. Therefore, the level of impact on **T1** and **T2** is negligible and should not be considered a constraint. The soil volume of T1 will also be increased by 2% due to the re-alignment of the existing boundary wall and thus will offset the loss of new incursion in the long term in terms of lost soil volume.

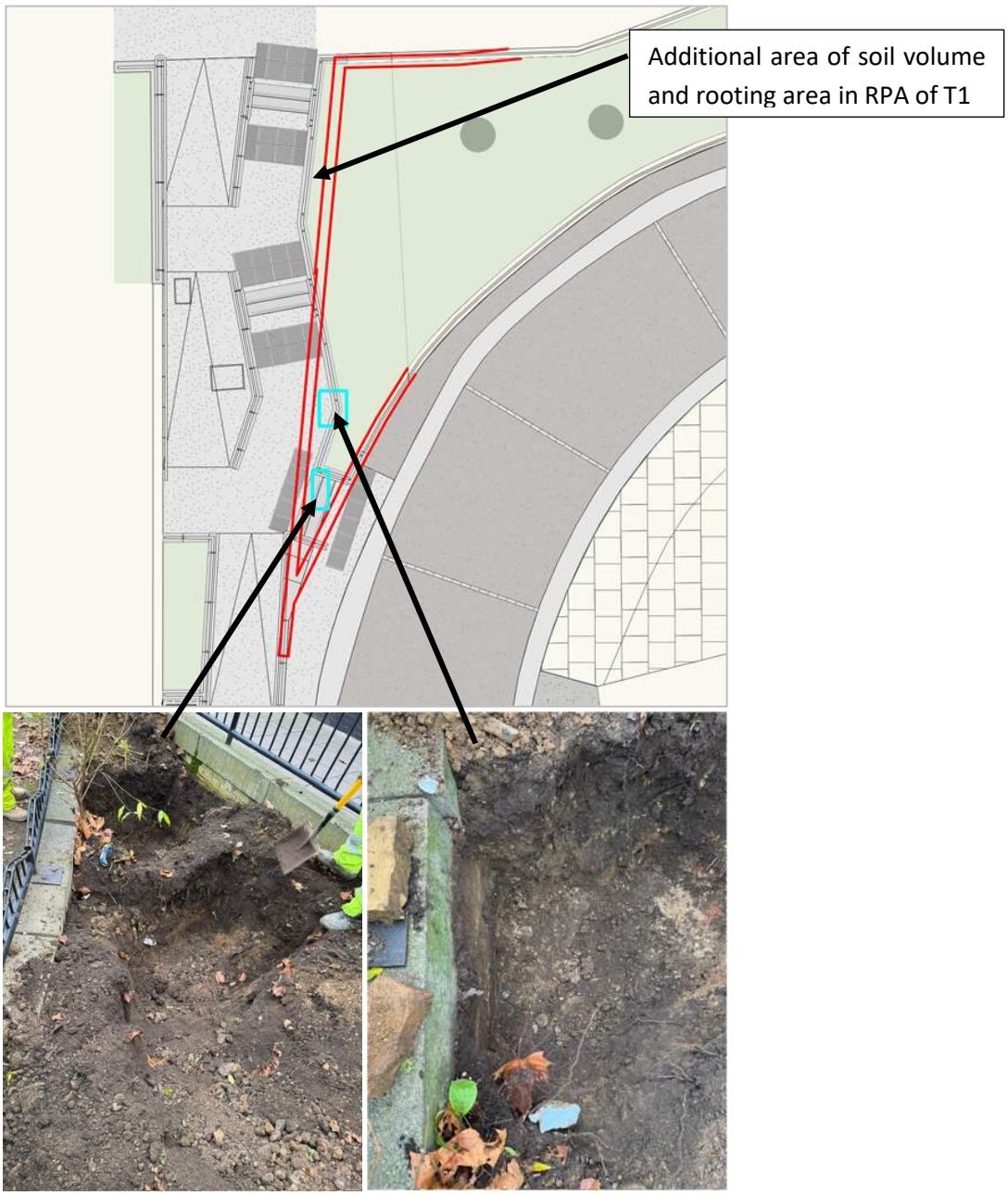


***Image 1**: Location of trail pits as denoted by cyan coloured boxes; alignment of existing boundary wall denoted in red.*

Given the lack of any significant rooting within the areas of new incursion, it is not considered that any specialist engineering methods are required. However, to ensure **T1** and **T2** are protected during the removal of the existing boundary wall and installation of the proposed new boundary wall, ramp, and steps, works will follow the points below:

1. The Arboricultural Clerk of Works (ACoW) will review any further operations that involves works within the RPAs of retained trees and input additional site-specific methodology where necessary. The additional methodology will be agreed upon with the Local Authority Tree Officer before proceeding with the work.

2. The ACoW will oversee the removal of existing footings in the RPA, where required, and the construction of replacement foundations.

3. Boundary walls with significant footings provide a natural barrier to root growth, but roots may have amassed immediately behind the wall and could be damaged by removal and replacement.

4. Tree Protection Fencing will be moved to undertake this task under the direct supervision of the ACoW.

5. Removal of the existing wall within the RPAs will be performed using hand tools. In exceptional cases where the wall can only be broken up using a machine, the machine will be positioned on the existing hard surface outside of the RPA and operate under the direct instruction of the ACoW working away from the tree.

4.4.2 ***Removal of existing hard surfacing in RPAs of T1***

Hard surfacing removal will be required within the RPAs of trees **T1** through the removal of the existing pathway to the west.

Given the level of hard surfacing, this is likely to have restricted significant rooting within the RPAs due to compaction, and the impact of the proposed works is likely to be negligible. However, to ensure the trees are not negatively impacted the works should comply with the following:

1. Removal of existing hard surfacing should be programmed to take place immediately before the laying of new surfacing to avoid premature removal of the protective surface. Tree Protection Fencing will be moved to undertake this task under the direct supervision of the ACoW.

2. Removal of the existing surface within the RPAs will be performed using hand tools. In exceptional cases where the hard surface can only be broken up using a machine, the machine will be positioned on the existing hard surface outside of the RPA, operate under the direct instruction of the ACoW, and will not operate on areas within the RPA where the surface has been removed.

3. Any exposed roots that may be present will either be pruned to a clean face using disinfected sharp secateurs or pruning saw or, if they are to be recovered, kept damp and out of direct sunlight whilst exposed, as directed by the ACoW. Woody roots >25mm diameter will not be pruned unless judged by the ACoW not to be essential to the tree's health and stability. Any roots will be pruned to a clean face using disinfected sharp secateurs or pruning saw.

4. Where possible, the existing base stone will be retained to minimise the potential damage to tree roots from excavation. New surfaces will be installed within 48hrs of removing the old material. Where this is not possible, then a temporary surface will be installed over the exposed area of the RPA.

4.5 Additional Precautions

4.5.1 *Hard and Soft Landscaping*

The ACoW will review any landscape operations that involve any work within the RPAs of retained trees and input additional site-specific methodology where necessary. Site activities within the RPAs of retained trees will be monitored by the ACoW to ensure unnecessary damage does not occur.

Hard and Soft Landscaping should be designed to avoid soil compaction and to minimise excavation into areas of existing undisturbed ground. Minor surface reconfigurations including installation of boundary fencing and seeding/turfing are unlikely to have a negative effect on retained trees. However, to ensure foreseeable damage does not occur, hand-dig-only methods will be adopted when working with the RPA of retained trees. No heavy machinery to cultivate the ground will be used in the RPAs.

The guidance of the *British Standard 8545:2014 Trees: from nursery to independence in the landscape – Recommendations* will be followed in relation to the aftercare of the proposed tree to be planted.

Appendix A

Tree Schedule

Queens Crescent, Camden NW54EG
Tree Survey BS5837-2012

Treework Environmental Practice

Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m^2)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
						N	E	S	W										
T1	1	*Platanus x hispanica* London Plane	23.0	1	84	9.5	7.0	12.0	8.0	4.5	4.0	Mature	Good	Access to inspect base - Restricted / obscured. Arboricultural work - Recent. No significant faults observed. The tree is growing an area of soil containing other trees and small vegetation. The natural ground level is similar to the paved area to the North and West. The West is sloped at a similar gradient. There is a low wall at the North and West. There is a curved retaining wall to the South. Beyond the retaining wall there is a drop down of the ground level of approximately 45cm, down to the road. Leaves are partially coverings the ground but there are no clear signs of lifting or deformation at the road or paved areas where visible. Several branches in the lower canopy have been pruned away from the footpath and building to the West.	319.2	10.1	40+	A	2

Queens Crescent, Camden NW54EG
Tree Survey BS5837-2012

Treework Environmental Practice

Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)	Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m^2)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T2	1	*Platanus x hispanica* London Plane	21.0	1	70	N 9.0 E 9.0 S 12.5 W 1.0	4.0	3.5	Mature	Good	Access to inspect base - Restricted / obscured. Arboricultural work - Recent. No significant faults observed. Suppressed crown - Minor. Unbalanced crown - Minor. The tree is growing an area of soil containing other trees and small vegetation. The natural ground level is similar to the paved area to the North and West. The West is sloped at a similar gradient. There is a low wall at the North and the West. There is a curved retaining wall to the south. Beyond the retaining wall there is a drop down of the ground level of approximately 45cm, down to the road. Leaves are partially coverings the ground but there are no clear signs of lifting or deformation at the road or paved areas where visible. The tree is slightly suppressed by the neighbouring tree and has been previously lifted.	221.7	8.4	40+	A	2
T3	1	*Platanus x hispanica* London Plane	21.0	1	58	N 9.0 E 9.0 S 7.0 W 4.5	4.0	4.0	Mature	Good	Access to inspect base - Restricted / obscured. Deadwood - Minor. No significant faults observed. The tree is growing an area of soil containing other trees and small vegetation. The natural ground level is similar to the paved area to the North. There is a curved retaining wall to the south. Beyond the retaining wall there is a drop down of the ground level of approximately 45cm, down to the road. Leaves are partially coverings the ground but there are no clear signs of lifting or deformation at the road or paved areas where visible.	152.2	7.0	40+	A	2

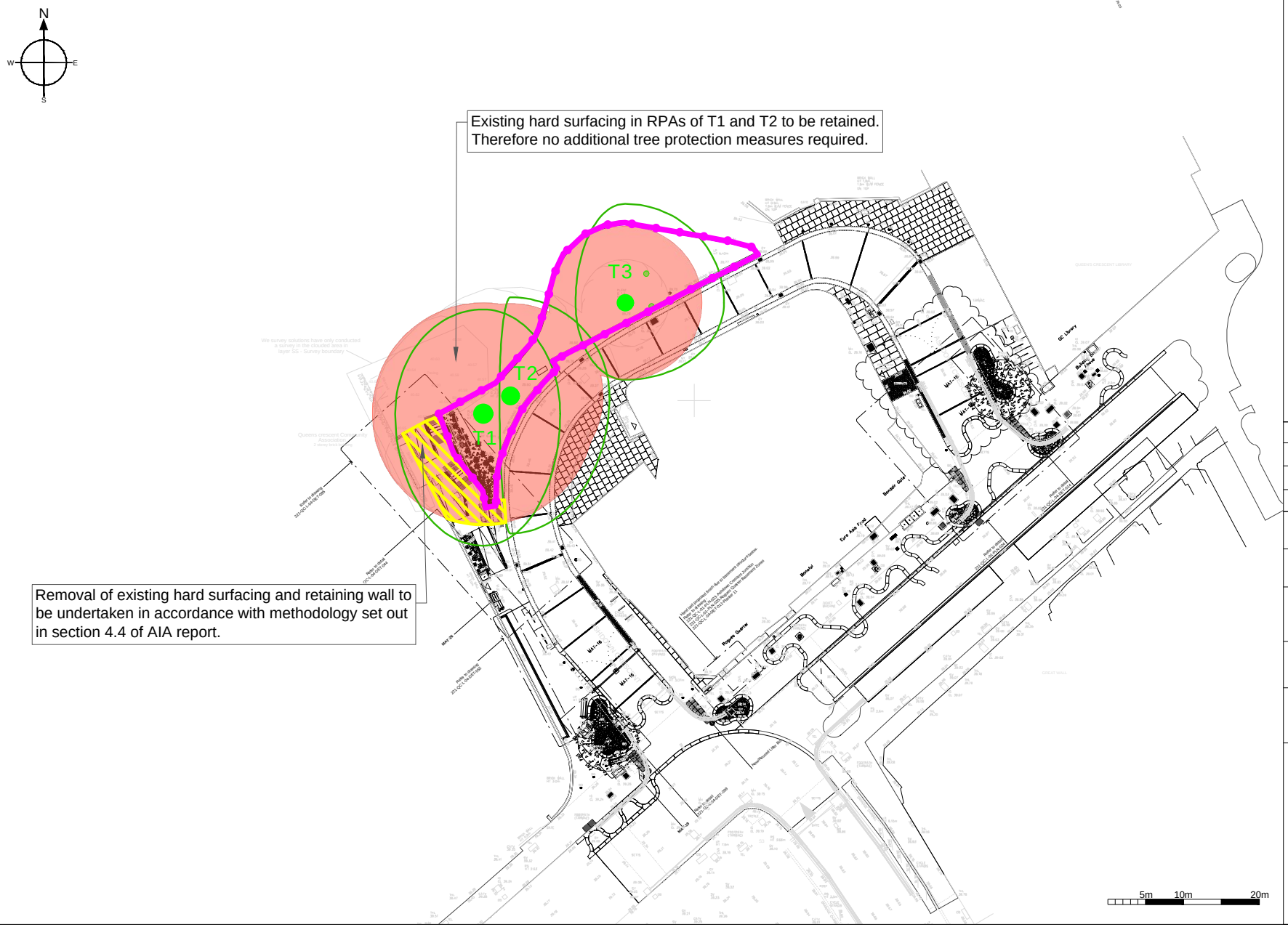
Tree Schedule Key

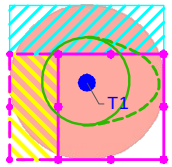
Treework Environmental Practice

Tree/Group Reference	Reference number for individual trees or groups of trees, prefixed by T (Tree), G (Group), W (Woodland), H (Hedge) or S (Shrub) to indicate the type of feature.
Tree Count	Number of trees of a particular species recorded within a group feature, with the default value of 1 for single trees.
Species	Scientific name followed by common name (where available).
Height (m)	Tree height to the nearest metre, either measured with a device or estimated. Tree height for group records refers to the estimated average height of trees within the group (unrepresentative trees may be excluded from this estimate).
Stem Count	Number of stems. Stem count indicates whether the tree is single-stemmed or multi-stemmed and informs the RPA calculation.
Stem Diameter (cm)	Stem diameter, measured at 1.5m above ground level in accordance with Annex C of BS5837:2012. Diameters of multi-stemmed trees are presented as a combined stem diameter calculated in accordance with the formulae in Section 4.6.1 of BS5837:2012. Stem diameter for group records refers to the estimated average stem diameter of trees within the group (unrepresentative trees may be excluded from this estimate).
Crown Radius (m)	Distance from stem position to crown periphery in either the four cardinal or four ordinal directions, estimated to the nearest half metre. Crown spreads for group records refer to the estimated average spreads of trees within the group (unrepresentative trees may be excluded from this estimate).
Crown Clearance Height (m)	Distance between the ground and the lowest point of the crown periphery, estimated to the nearest half metre.
Lowest Branch Height (m)	Height of the lowest branch, the removal of which is considered likely to have a significant negative effect on the tree in terms of physiology or in terms of the size of wound created.
Life Stage	Young, Semi-mature, Early Mature, Mature, Late Mature, Ancient or Veteran.
Physiological Condition	Good, Fair, Poor, Dead.
Observations	General description of the tree or tree group, including basic features and morphology, structural and physiological condition, growing conditions and surroundings.
Recommendations	Management recommendations for tree works to address immediate unacceptable risks, or to facilitate development proposals.
RPA (m^2)	Minimum area around a tree deemed to contain sufficient roots and rooting soil volume to maintain the tree's viability, in which the protection of roots and soil structure is treated as a priority. Calculated from the stem diameter according to the formulae in BS5837:2012. RPA for group records is based on the estimated average stem diameter of trees within the group (unrepresentative trees may be excluded from this estimate).
RPR (m)	Radius of the RPA, in metres, when this is plotted as a circle around the tree stem.
Remaining Contribution (years)	Estimated number of years for which the tree will continue to make a positive contribution to the site, banded as < 10, 10-20, 20-40, 40 +.
Retention Category	Quality and value category (**A**, **B**, **C** or **U**) as defined in Table 1 of BS5837: 2012 (reproduced below), where **A** = high quality and value; **B** = moderate quality and value; **C** = low quality and value and **U** = tree identified for removal due to poor condition regardless of development proposals.
Retention Sub-category	One or more sub-categories (1-3) as defined in Table 1 of BS5837: 2012 (reproduced below), assigned for Categories **A**, **B** or **C** where 1 = arboricultural qualities, 2 = landscape qualities and 3 = conservation and cultural value.

Appendix B

Tree Protection Plan





- T1 — Tree or Group Reference Number
- Tree Protection Fencing
- Tree Stem Position A Category Tree
- Initial Tree Protection Fencing
- Tree Stem Position B Category Tree
- Ground Protection
- Tree Stem Position C Category Tree
- Special Engineering /Supervised Excavations
- Tree Stem Position U Category Tree
- Construction Exclusion Zone
- Tree Crown
- Pruning/Tree Removal
- Root Protection Area
- Topographical Survey
- Design Proposals

Topographical Survey Topo-25974_R1_Additional	21.11.2024
Site Layout/Design xref221-QC-L-01-PLN-014-Proposed Area 5 Plan (1)	21.11.2024
Utilities -	-
Landscape Design -	-

Date:
January 2025

Scale:
1:500 @ A4

Project Name:
Queens Crescent Camden, London NW5 4EG

Drawing Title:
Tree Protection Plan

Drawing Number:
250123-1.0-QCCL-TPP-NC

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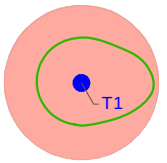
Appendix C

Tree Constraints Plan



T1 Tree or Group Reference Number

Tree Crown

Root Protection Area

Tree Survey Boundary

Tree Stem Position A Category Tree

Tree Stem Position B Category Tree

Tree Stem Position C Category Tree

Tree Stem Position U Category Tree

Date: November 2024

Scale: 1:400 @ A4

Project Name: Queens Crescent Camden, London NW5 4EG

Drawing Title: Tree Constraints Plan

Drawing Number: 241112-1.0-QCCL-TCP-SH

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Appendix D

Tree Protection Specifications

Technical Measures to Prevent Tree Damage

Tree Pruning

Tree pruning will be carried out where the design and/or planned site operations encroach into the crowns of trees and where these encroachments can be accommodated through facilitation pruning without significantly reducing the landscape value and/or viability of the tree.

Tree pruning operations will:

- be specified by the arboricultural consultant
- be in accordance with current best practice
- be carried out by a suitably experienced and qualified arborist

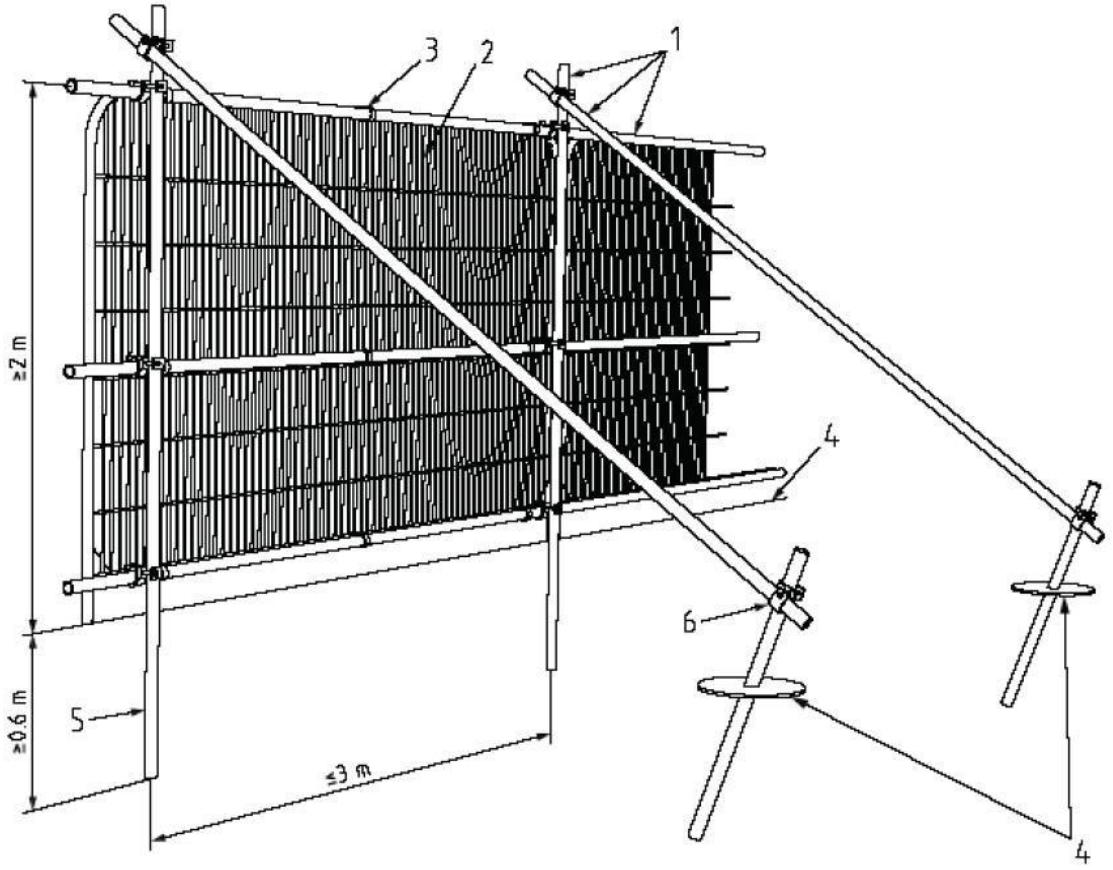
Tree Protection Fencing

Tree protection fencing will be located at the edge of the Construction Exclusion Zone (CEZ) and will be suitably robust to provide sufficient protection for trees. The performance requirement for fencing will be determined by the type of activity that will take place in the area around the CEZ.

Typically the performance requirement for the Tree Protection Fencing will be:

- Tree Protection Fencing will be installed prior to commencement of activity on the site.
- Tree Protection Fencing will only be removed once all works associated with the development have been completed.
- The Tree Protection Fencing will be installed and removed without causing damage to retained trees.
- Installation, removal and, where required, replacement of Tree Protection Fencing will be supervised and signed off by the Arboricultural Consultant.
- The Tree Protection Fencing will be stable and robust (typical construction method, in accordance with BS5837: 2012, see below).
- The area between the Tree Protection Fencing and the tree will be a Construction Exclusion Zone (CEZ)
- Fence panels will be made of mesh (e.g.: Heras fencing) or, if solid, will have 30cm windows cut into enough panels to enable conditions within the CEZ to be viewed.
- The CEZ will be clearly identified (see Construction Exclusion Zone sign example below)

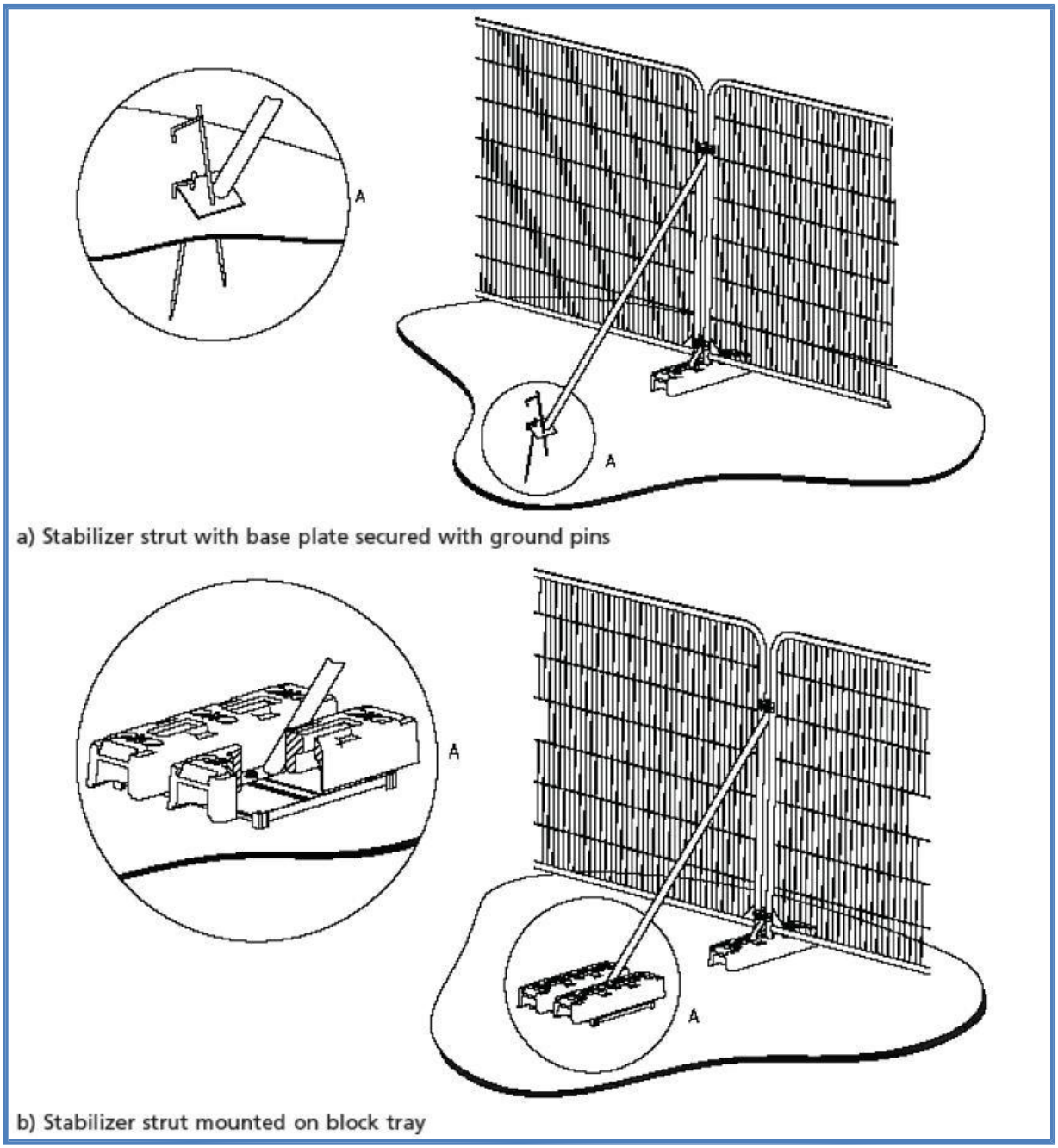
Example Tree Protection Fencing Sign



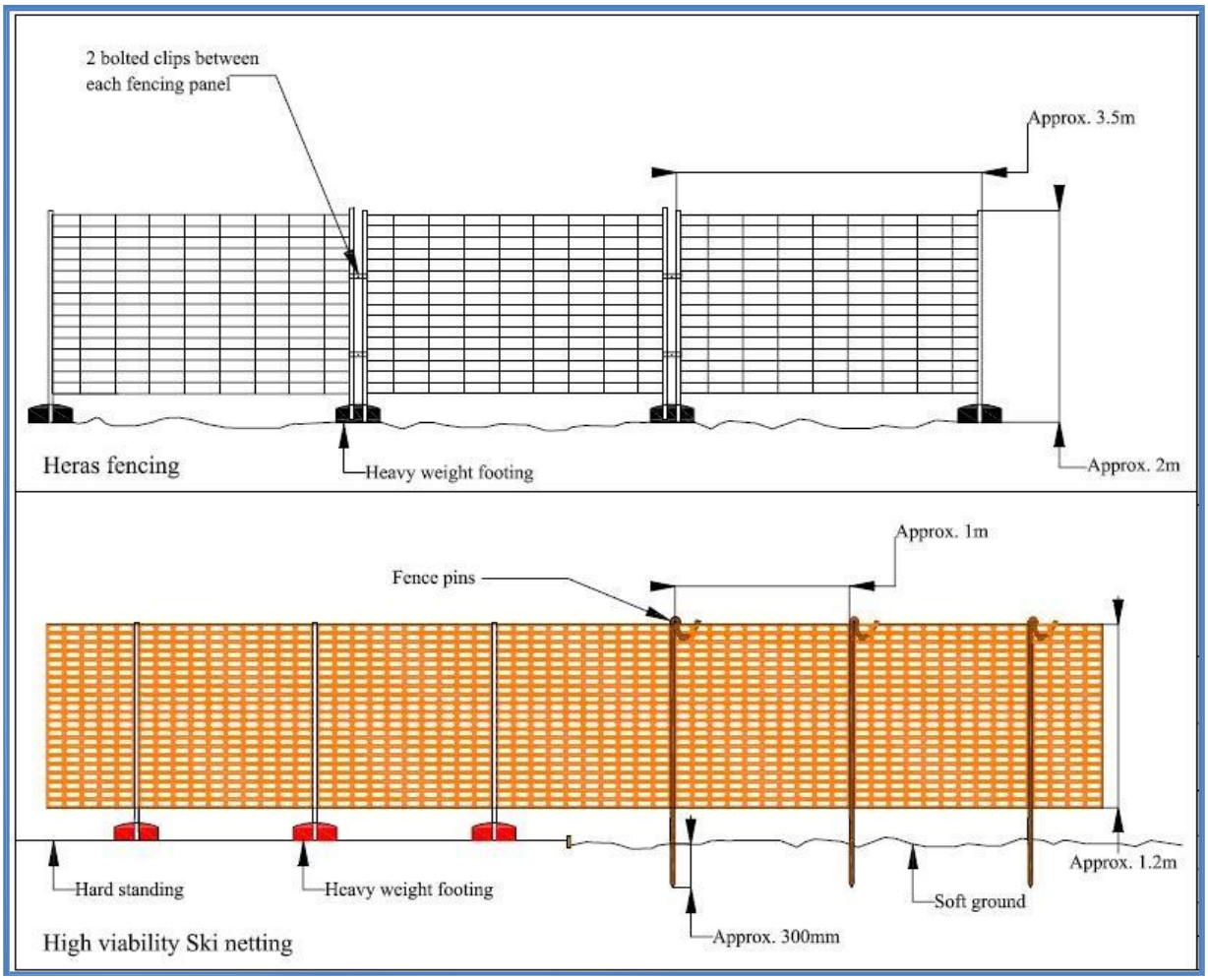
Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

BS5837: 2012 - Figure 2 – Tree Protective Barrier



BS5837: 2012 - Figure 3 – Examples of Above Ground Stabilisation Systems



Examples of specification fencing that may be appropriate for areas of low-intensity activity

No-dig Construction and Special Engineering Measures

No-dig construction methods and special engineering measures will be employed to enable the construction of roads and other built features within the RPAs of trees without damaging tree roots. Installation of built features using no-dig and special engineering measures will meet the following performance criteria:

- Ensure that tree roots are not damaged.
  - *For the roots of the trees to remain undamaged there must be no excavation, soil stripping or site grading within the rooting areas – in other words NO DIGGING.*
- Ensure that soil is not compacted.
- Ensure that no spilled toxic materials seep into the soil.
- Ensure that sufficient rain water reaches tree roots.
- Ensure that gaseous exchange can take place within the soil around tree roots.
- All operations will be supervised and signed off by the Arboricultural Consultant.

Appendix E

Tree Survey Method and Limitations

Treework Environmental Practice

Tree Survey Method and Limitations

Tree Survey Method

1. The tree survey was conducted from ground level aided by the Visual Tree Assessment method (Mattheck and Breloer, 1994) and in accordance with BS5837: 2012.

2. All trees on the site with a stem diameter of over 75 mm (measured at 1.5 m above ground) were included in the survey.

3. Offsite trees within influencing distance of the site (typically those located within a distance of up to 12 times their stem diameter away from the site) were included in the survey.

4. Data collected included:

   - a designated tree number
   - type of feature (trees, group, woodland, hedge)
   - number of trees in group
   - tree species
   - height (metres)
   - number of stems
   - stem diameter (in centimetres, as measured at 1.5 m above ground)
   - crown clearance (height of periphery of crown spread above ground level in metres)
   - height of lowest branch (metres),
   - branch spread (to N, S, E and W)
   - age class
   - physiological condition
   - useful life expectancy
   - structural condition
   - BS5837 retention category (A, B, C or U)
   - site notes (where this has a bearing on the present or future health or structural condition of the tree)
   - preliminary management recommendations.

5. All measurements were made in metric using measuring devices where applicable. Estimated stem diameters (e.g., due to lack of access or dense undergrowth) were recorded as such and are shown in the Tree Schedule in bold (see the key at the end of the Tree Schedule table at Appendix A for an explanation of the measurements and codes presented therein).

6. While the appraisals of the surveyed trees are not tree risk assessments, they nonetheless take into account observed structural defects in drawing conclusions about the trees' retentive worth.

Survey Limitations

1. The survey was a preliminary assessment from ground level and observations were made solely from visual inspection for the purposes of an assessment relevant to planning and development. Only binoculars, trowel, mallet and fine manual metal probe were used to aid tree assessment, where necessary. No invasive or other detailed internal decay detection devices were used in assessing trunk condition.

2. The conclusions relate to conditions found at the time of survey. Any significant alteration to the site that may affect the trees that are present or have a bearing on the planning implications (including level changes, hydrological changes, extreme climatic events or other site works) will require a re-assessment of the trees and the site.

3. This survey is not a tree safety inspection. It is carried out in order to inform the planning process. Where clear and obvious hazards have been observed, these have been addressed in the recommendations (see Appendix A - Tree Schedule). A full assessment of the levels of risk posed by trees would need to consider site use together with tree hazards.