Treework Environmental Practice

Arboricultural Impact Assessment

34 Nassau Road SW13 9QE

Report Reference Number: 240624-2.0-34NR-AIA-AN

On behalf of

Richard James Hastings Architecture

24 June 2024

Document Control Sheet

Project Name: **34 Nassau Road SW13 9QE**

Report Ref: **240624-2.0-34NR-AIA-AN**

Report Title: **Arboricultural Impact Assessment**

	Name	Position	Date
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Surveyed by:	Alex Needs	Principal Arboricultural Consultant	06/10/2023

Revision	Date	Description	Prepared by
1.0	21/12/2023	For submission or review	AN
2.0	24/06/2024	For submission or review	AN

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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.

- The design has been developed with careful consideration to minimise the impact on the most important trees.

- Thirteen trees and groups were surveyed. The data for each is presented within the Tree Schedule at Appendix A.

- Two category C palm trees and one shrub have been identified for removal to facilitate the development. These are not technically trees in the scientific sense and should not be included in any replanting mitigation scheme, however they have been included within the survey for completeness.

- Eleven trees will be retained and integrated into the development. 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.

- Five trees will be subject to construction within their root protection areas. Special measures are recommended to ensure that these trees are not damaged. These measures are detailed in Section 3.4 of this report and are illustrated on the Tree Protection Plan at Appendix B.

- No retained trees require remedial tree work to facilitate the development and to reduce the likelihood of their being subject to excessive pressure after the completion of the development.

- The London Borough of Richmond upon Thames has confirmed via email that no Tree Preservation Orders (TPO) affect any of the trees in the survey. I also checked their online resource on 09 October 2023 which indicates that the entire site sits outside of the Barnes Green Conservation Area meaning that they are not protected by this. There are no ancient woodland designations and no ancient or veteran trees listed on, or directly adjacent to the site on DEFRA's MAGIC map or the Ancient Tree Inventory.

1 Introduction

1.1 Brief and Context

1.1.1 Treework Environmental Practice was instructed by Richard James Hastings Architecture to provide an Arboricultural Impact Assessment, 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 34 Nassau Road SW13 9QE.

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 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. 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.

1.1.3 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 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 required to enable trees to be harmoniously integrated into the proposed development.

1.3 The Development

1.3.1 The proposed development is for a basement extension, single storey rear extension and general refurbishment of the property.

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

Document Title	Document/Drawing number	Originator
Topographical Survey	2775_Site_revA	Matrix Surveys
Proposed Layout	2313_BASE_00-00_SITE PLAN	Richard James Hastings Architecture
Tree Constraints Plan	231009-1.0-34NR-TCP-NC	Treework Environmental Practice

2 Existing Tree Population and Constraints

2.1.1 A survey covering trees on site and trees on adjacent land close enough to be affected by the development was undertaken on 06 October 2023.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 reference in Treework Environmental Practice's specialist tree management software – MyTrees. The basemap contained a topographical survey of the trees. Trees and hedges were plotted on the basemap using the topographical survey as reference.

2.1.3 The proposed development site currently houses an existing dwelling and residential garden with various deciduous and evergreen trees and shrubs. The most notable trees are the large London planes located off-site, at the end of the neighbouring garden at 36 Nassau Road. Two street trees are included in the survey as they may be affected by construction activities.

2.1.4 BS 5837:2012 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.

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

	Trees	Groups	Shrubs	Total
A	0	0	0	0
B	4	0	0	5
C	7	1	1	9
U	0	0	0	0
Total	11	1	1	13

2.1.5 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.

2.1.6 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), tree group (G), woodland, (W) and hedge (H) 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 D.

3 Arboricultural Impact of the Proposals

3.1 Tree Removal and Retention

3.1.1 Every effort has been made to retain trees wherever possible. Where high-quality trees have been found to be in conflict with the proposed design, the decision to remove such trees has been informed by an iterative process, following a review of alternative options.

3.1.2 The two ‘trees’ and one shrub group proposed for removal to facilitate the proposed development are summarised in Table 2 by BS5837: 2012 category. Trees have been identified for removal where they come into direct conflict with structures, where construction cannot be achieved without their removal, or where their future relationship with the development is considered unsustainable, having regard to their eventual potential size. Where higher value trees may be in minor conflict with the proposals, pruning or special construction and protection measures have been specified, as explained in Section 3.4.

Table 2 – Trees and groups for Removal by BS Category

Category A	Category B	Category C	Category U
None	None	T1, T2, S5	None

3.1.3 **T1** and **T2** are palms and **S5** a shrub, These are not technically trees in the scientific sense and should not be included in any replanting mitigation scheme, however they have been included within the survey for completeness. The design process has considered whether these 'trees' can be accommodated within the scheme, but due to the relatively small garden and limited space available for the development, it is not possible. I have considered the likely impact from the removal of these 'trees' on the local landscape and consider it to be negligible given their relatively low height and location in the rear garden of the terraced property. As such I do not consider there to be any negative impact on the visual amenity offered to the public as they are not visible from a public space. In my view they should not pose a constraint to the development and therefore their removal should not raise objections from the Local Planning Authority (LPA).

3.1.4 All trees other than those in Table 2 will be retained and protected during development (see section 3.3).

3.2 Facilitative Tree Works

3.2.1 No tree works will be required to enable the proposed development, other than the removal of the trees listed in Table 2.

3.3 Tree Protection

3.3.1 ***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, indicating 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 activity 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.

3.3.2 With the permission of the LPA, the trunk of **T12** will be protected from damage by a robust plywood-sided (min. 15 mm gauge) crate, reaching from ground level to a minimum height of 2m. The crate should be free standing and mounted on a frame (min. 50 mm x 50 mm thickness), boxed around the trunk A separation of at least 150 mm must be maintained between the outer face of the stem and the inner framework of the crate. No part of the crate should be attached to the tree.

3.3.3 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 C.

3.4 Special Technical Measures and Outline Methodologies

3.4.1 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.

3.4.2 ***Construction of new hard landscape within the RPA of T3***

Tree **T3** resides in a raised bed retained by a wall. It is proposed that the RPA outside of the wall, which is currently laid to paving, decking and grass, will be renewed with a hard landscape and grass area. A small area will be cut back into the wall to create a bench. It is not anticipated that levels will need to be lowered below the existing soft landscape of sub-base, however any excavation to match levels and to create the bench will be undertaken using hand tools only and under the supervision of the project arboriculturist. Where roots are exposed, they will either be pruned to a clean face using disinfected sharp secateurs or pruning saw, or, if they are to be pushed aside and re-covered, kept damp and out of direct sunlight whilst exposed, as directed by the project arboriculturist.

3.4.3 New hard surfacing will be porous and will sit above the existing sub-base, or use a 3D cellular confinement system within the RPA to prevent the need for further sub-base consolidation and soil compaction.

3.5 Additional Precautions

3.5.1 ***Arboricultural Supervision and Monitoring***

Where operations require construction within RPAs arboricultural supervision will be employed to minimize any damage to retained trees. A photographic record will be taken, and a supervision/monitoring report completed and passed to the client. Further regular arboricultural monitoring will be scheduled throughout the demolition and construction phases to document tree protection measures and tree health.

3.5.2 **Utilities and Services**

Information on the location of utility and service runs for the proposed development was not available at time of writing. In principle, traditional trench-installed utilities should be routed outside of the RPAs of retained trees to avoid root damage. Where routing utility runs within RPAs is unavoidable, all work should comply with The National Joint Utilities Volume 4 and advice should be sought from a professional Arboricultural Consultant.

3.5.3 ***Soft Landscaping***

The Arboricultural Consultant should review any landscape operations that involve any work within the RPAs of retained trees and input additional site-specific methodology where necessary.

Appendix A

Tree Schedule

34,Nassau Road,SW139QE
Tree Survey BS5837-2012

Treework Environmental Practice

Tree/Group Reference	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
T1	*Arecastrum sp.* Palm sp.	4.0	1	24	N E S W 1.5 1.5 1.5 1.5	2.5	3.0	Mature	Fair	**Fell - Ground level.** To facilitate development.	26.1	2.9	10-20	C	1
T2	*Arecastrum sp.* Palm sp.	4.0	1	24	N E S W 1.5 1.5 1.5 1.5	2.5	3.0	Mature	Fair	**Fell - Ground level.** To facilitate development.	26.1	2.9	10-20	C	1 3
T3	*Magnolia stellata* Star Mongolia	8.0	2	41	NW NE SE SW 5.0 8.0 6.0 5.0	2.0	3.0	Mature	Good	**Fell - Ground level.** To facilitate development.	76.2	4.9	20-40	B	1 2
T4	*Prunus cerasifera 'Nigra'* Purple Cherry Plum	4.0	1	15	N E S W 2.0 2.0 2.0 2.0	2.0	1.0	Early Mature	Fair	Off-site tree. Unable to access trunk. Tree not on topographical survey, position approximate. **Fell - Ground level.** To facilitate development.	10.2	1.8	10-20	C	1 2
S5	*Laurocerasus officinalis* Cherry Laurel	3.0	1	25	NW NE SE SW 1.0 2.0 1.0 2.1	0.0	1.0	Mature	Fair	Unable to access trunk. **Fell - Ground level.** To facilitate development.	28.3	3.0	10-20	C	1 2
G6	*Olea europaea* Olive *Malus sp.* Apple sp. *Laurus nobilis* Bay/Bay Laurel/Poets Laurel	6.0	1	15	N E S W 2.0 2.0 2.0 2.0	0.0	1.0	Early Mature	Fair	Not shown on topographical survey. Position is approximate. Unable to access trunks. **Fell - Ground level.** To facilitate development.	10.2	1.8	10-20	C	2
T7	*Acer negundo* Box Elder (Ash - Leaved) Maple	4.0	1	10	N E S W 2.5 2.5 2.5 2.5	2.0	2.0	Semi Mature	Fair	Tree not on topographical survey, position approximate. Unable to access land, dimensions approximate.	4.5	1.2	20-40	C	1

34,Nassau Road,SW139QE
Tree Survey BS5837-2012

Treework Environmental Practice

Tree/Group Reference	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
T8	*Prunus cerasifera 'Nigra'* Purple Cherry Plum	6.0	1	10	N 4.0 E 4.0 S 4.0 W 4.0	2.0	2.0	Mature	Fair		4.5	1.2	10-20	C	2
T9	*Platanus x hispanica* London Plane	15.0	1	80	N 6.0 E 6.0 S 6.0 W 6.0	6.0	4.0	Mature	Fair	Pollard. Tree not on topographical survey, position approximate. Unable to access trunk.	289.5	9.6	40+	B	1 2
T10	*Platanus x hispanica* London Plane	15.0	1	80	N 6.0 E 6.0 S 6.0 W 6.0	6.0	4.0	Mature	Fair	Pollard. Tree not on topographical survey, position approximate. Unable to access trunk.	289.5	9.6	40+	B	1 2
T11	*Platanus x hispanica* London Plane	15.0	1	80	N 6.0 E 6.0 S 6.0 W 6.0	6.0	4.0	Mature	Fair	Pollard. Tree not on topographical survey, position approximate. Unable to access trunk.	289.5	9.6	40+	B	1 2
T12	*Ulmus sp.* Elm sp.	5.0	1	7	N 1.5 E 1.5 S 1.5 W 1.5	1.5	2.0	Young	Fair	Damage being caused by tie and nursery pole.	2.2	0.8	40+	C	1
T13	*Crataegus monogyna* Common Hawthorn/Quick/May	6.0	1	29	NW 2.0 NE 3.0 SE 5.0 SW 3.0	3.0	2.0	Mature	Poor	Deadwood in crown. Dieback in crown.	38.0	3.5	0-10	C	1

Tree Schedule Key

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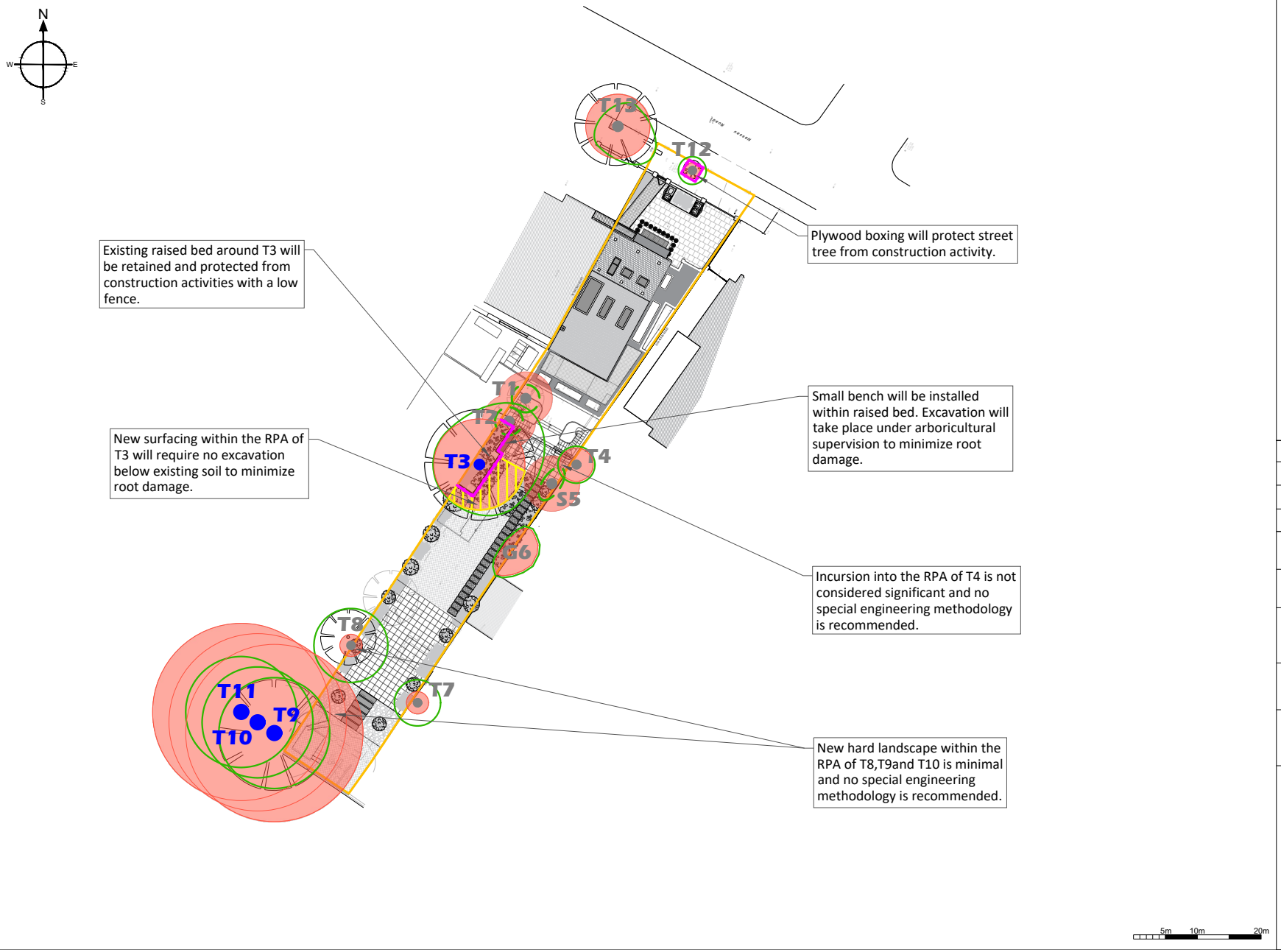
Tree/Group Reference	Reference number for individual trees or groups of trees, prefixed by T (Tree), G (Group), W (Woodland), H (Hedge) or S (Shrub) to indicate the type of feature.
Tree Count	Number of trees of a particular species recorded within a group feature, with the default value of 1 for single 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.

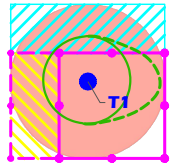
Table 1 **Cascade chart for tree quality assessment**

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.*			See Table 2
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

Appendix B

Tree Protection Plan





T1 Tree or Group Reference Number

Tree Stem Position A Category Tree

Tree Stem Position B Category Tree

Tree Stem Position C Category Tree

Tree Stem Position U Category Tree

Tree Crown

Root Protection Area

Topographical Survey

Tree Protection Fencing

Initial Tree Protection Fencing

Ground Protection

Special Engineering /Supervised Excavations

Construction Exclusion Zone

Pruning/Tree Removal

Survey Boundary

Design Proposals

Topographical Survey Topo-2775_Site_revA	02.10.2023
Site Layout/Design 2313_BASE_00-00_SITE PLAN.dwg	13.06.2024
Utilities	
Landscape Design	

Date:
June 2024

Scale:
1:600 @ A4

Project Name:
34 Nassau Road, SW13 9QE

Drawing Title:
Tree Protection Plan

Drawing Number:
240614-1.0-34NR-TPP-SH.

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Appendix C

Tree Protection Specifications

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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 trees.

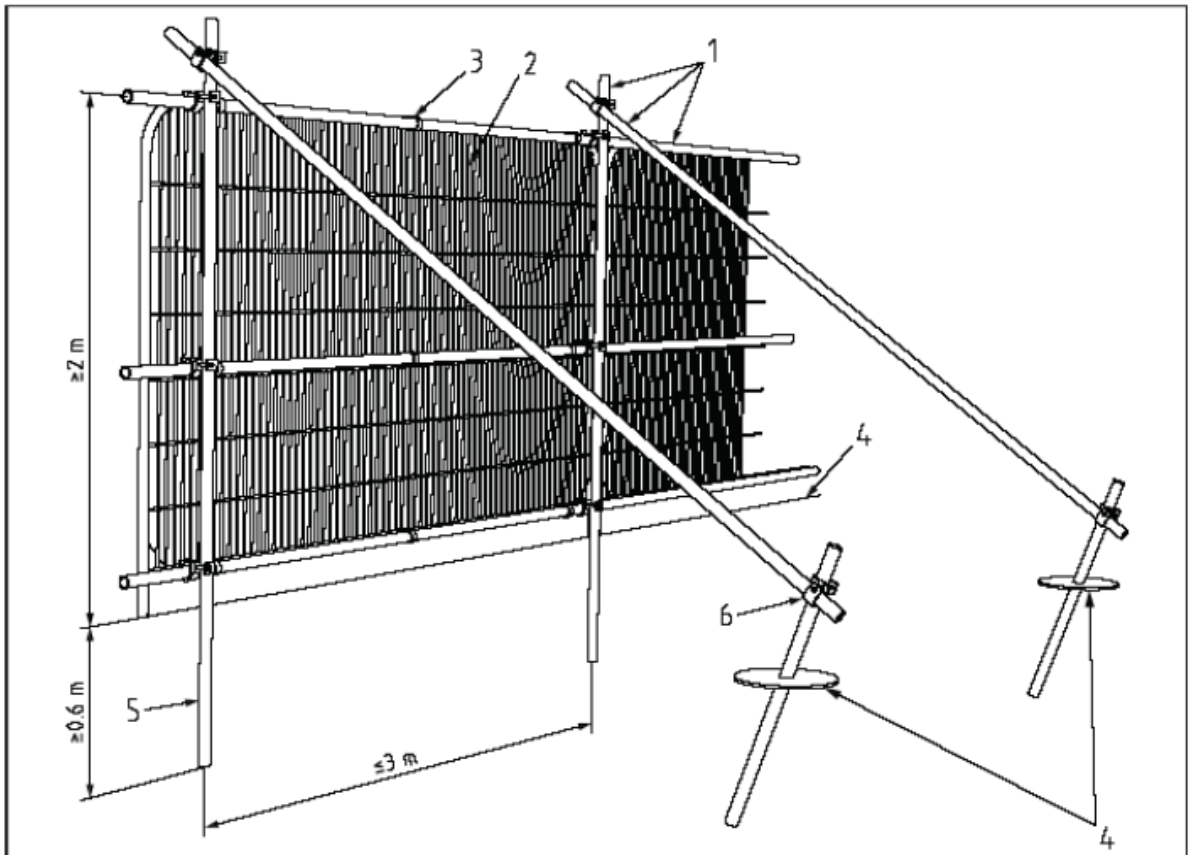
The performance requirement for fencing will be determined by the type of activity that will take place in the area around the CEZ.

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 (minimum construction method, in accordance with BS5837: 2012, see illustration 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 each panel to allow visual assessment of conditions within the CEZ

- The CEZ will be clearly identified (see construction exclusion zone sign example below)

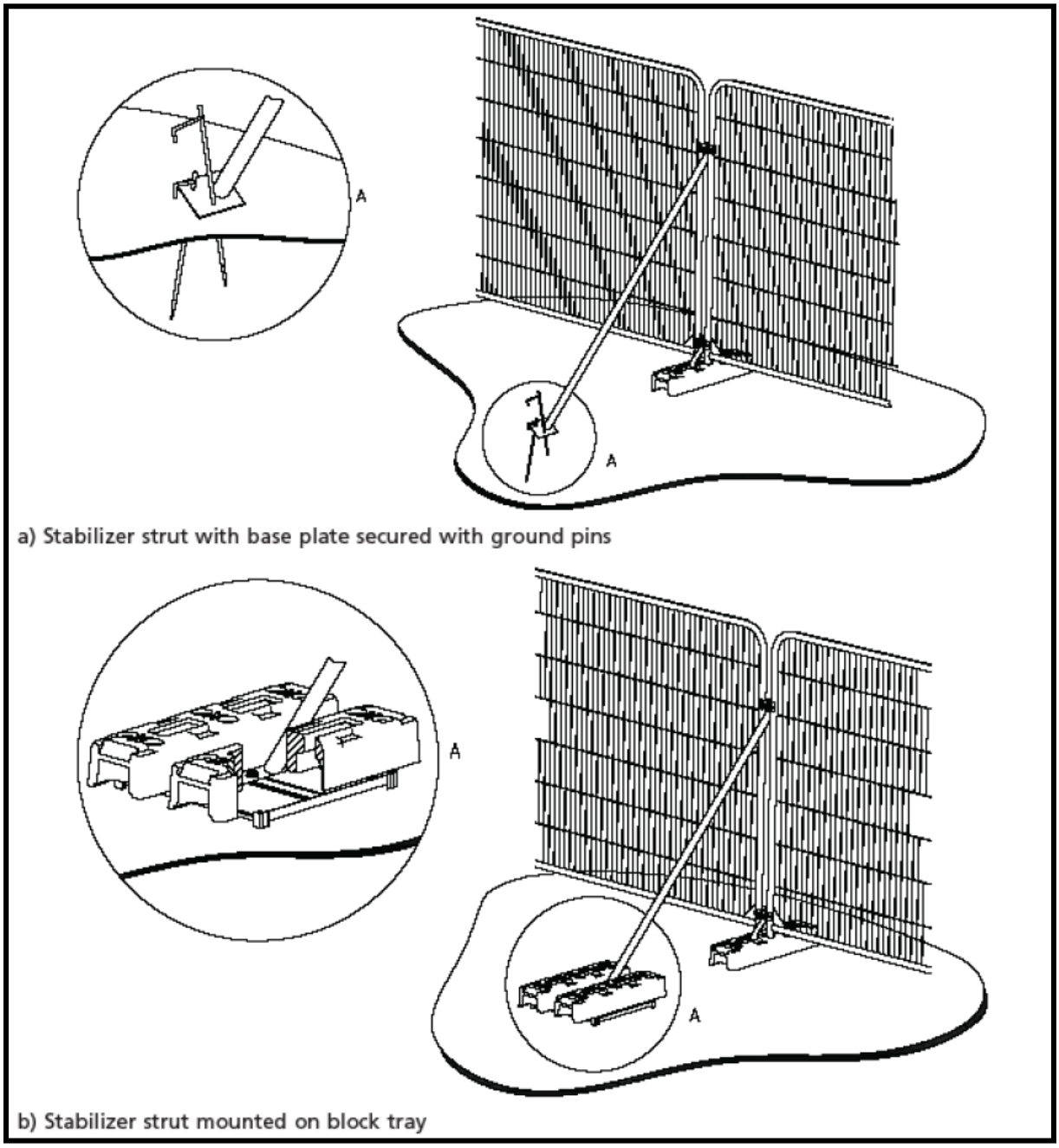
Tree Protection Fencing Sign



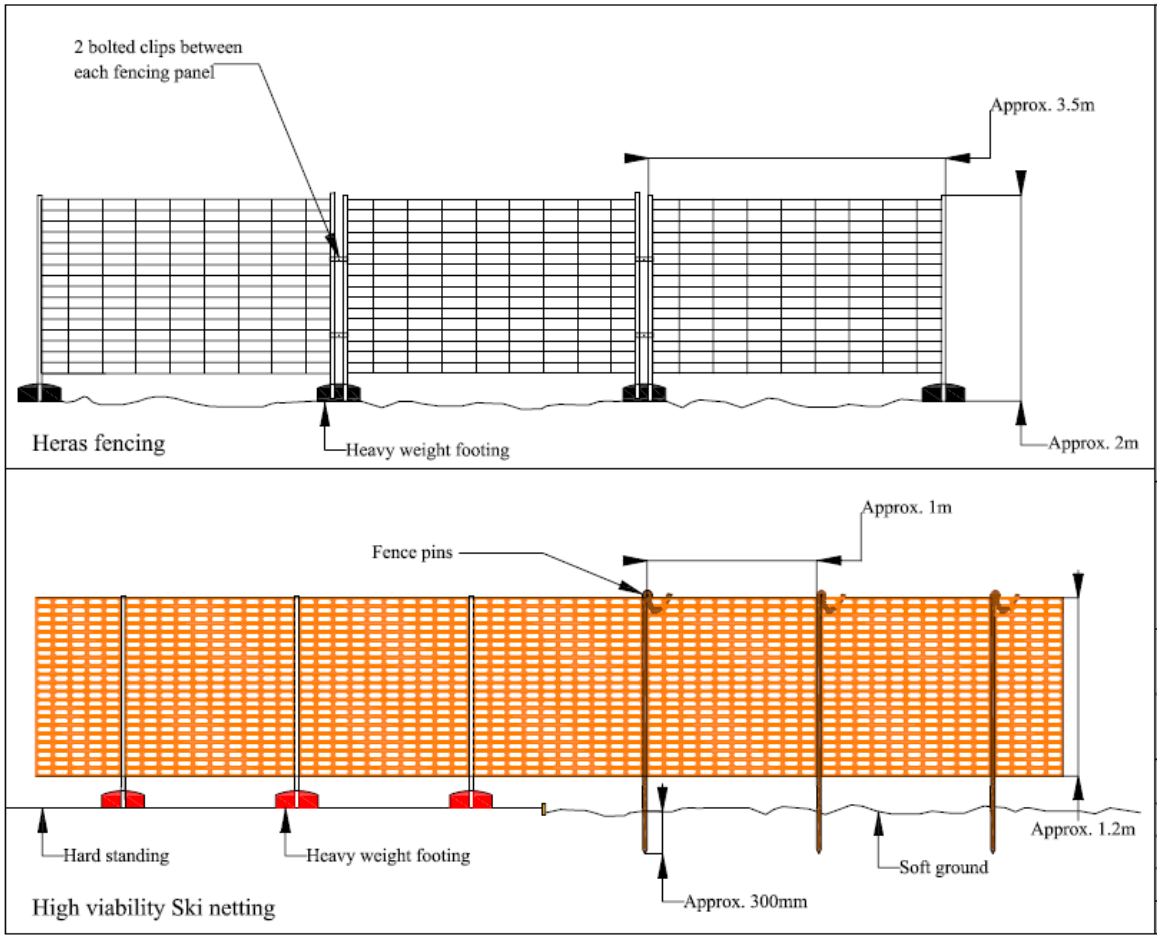
Key

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 for Temporary Tree Protection Fencing.



Examples of lower specification fencing may be considered areas of low intensity activity.

Ground Protection Measures

BS5837: 2012 provides the following examples of temporary ground protection measures:

a) *for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;*

b) *for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;*

c) *for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g.* ***proprietary systems*** *or* ***pre-cast reinforced concrete slabs****) to an engineering*

specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

Concrete Temporary Ground Protection:

The Ground Protection will be installed using reinforced concrete slabs to an engineering specification, designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

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. This means that finished levels of the Temporary Ground Protection will be above existing ground level.

The ACoW and Construction Manager will supervise and sign off the installation and removal of the Ground Protection and any change to the Ground Protection.

General Performance Specification:

- The Ground Protection will ensure that tree roots are not physically damaged
- The Ground Protection will ensure that soil within the tree root environment is not compacted
- The Ground Protection will reduce the possibility for spilled materials / substances to seep into the soil
- The Ground Protection will be designed to prevent anaerobic conditions building up under the Ground Protection allow sufficient gaseous exchange and water penetration to the covered root environment.
- The Ground Protection will only be removed once all works associated with the demolition have been completed
- The installation and removal of Ground Protection will not damage trees.

This is a typical specification for Temporary Ground Protection:

The Ground Protection will be installed using a cellular confinement system minimum 100mm thick laid upon a permeable membrane and filled with washed no fines gravel such as 20-40mm washed angular stone.

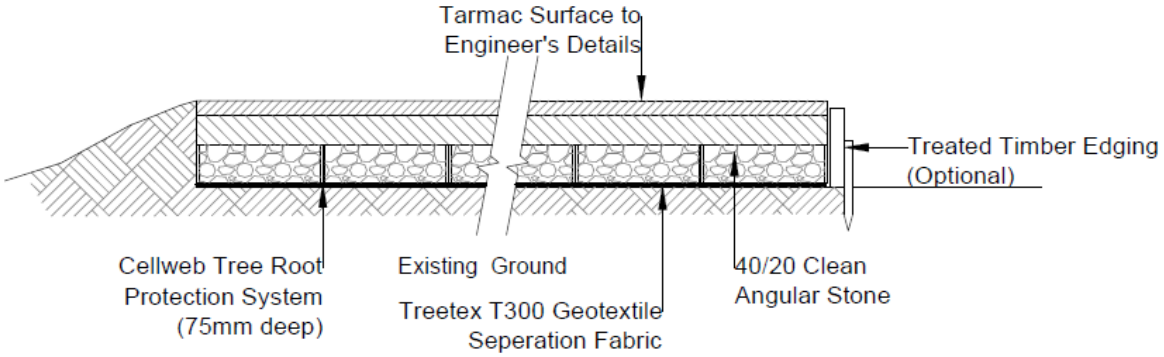
For the roots of the trees to remain undamaged there must be no excavation, soil stripping or site grading within the rooting areas – in other words NO DIGGING. This means that finished levels of the Temporary Ground Protection will be above existing ground level.

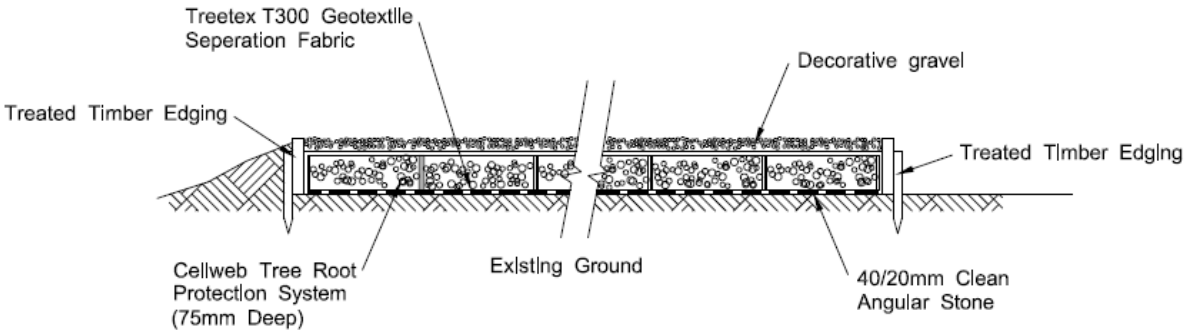
The Arboricultural Consultant will supervise and sign off the installation and removal of the Ground Protection and any change to the Ground Protection.

The installation of Ground Protection will involve the following sequence of operations:

1. *All organic material should be removed to prevent any build up of anaerobic conditions beneath the construction.*
2. *Rocks and other obstacles will be removed by hand.*
3. *Major hollows will be filled with sharp sand.*
4. *A suitable permeable membrane will be laid directly on to the ground and a cellular confinement system e.g. 'Cellweb' (see Appendix H) will be laid directly upon the membrane and pegged into position.*
5. *Washed, no-fines 20/40mm angular stone, to fill the cellular confinement system will be placed at one end and then pushed on to the grid so that machinery moves on the spread sub-base, not directly on the cellular confinement system and not the ground either side of it.*
6. *Depending on the type of access required, a sufficiently porous surface material may be laid over the top of the cellular confinement system.*
7. *The Ground Protection will only be removed once all works requiring access to the protected area have been completed and prior to commencement of soft landscaping.*

Operations to remove the Ground Protection within the RPAs of trees will be supervised and signed off by the Arboricultural Consultant.





Examples of Cellular Confinement System Details (Cellweb)

Appendix D

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.