Treework Environmental Practice

# Arboricultural Impact Assessment

# 70A Southwood Lane, Highgate N6 5DY

**Report Reference Number: 200813-1.1-70ASLH-AIA-LF**

On behalf of

**Fari Tadayon, 70A Southwood Lane, Highgate N6 5DY**

**13 August 2020**

## Document Control Sheet

**Project Name:** **70A Southwood Lane, Highgate N6 5DY**

**Report Ref:** **200813-1.1-70ASLH-AIA-LF**

**Report Title:** **Arboricultural Impact Assessment**

| | Name | Position | Date |
|---|---|---|---|
| Prepared by: | Luke Fay | Senior Arboricultural Consultant | 10/08/2020 |
| Surveyed by: | James Covenant | Arboricultural Surveyor | 08/06/2020 |

| Revision | Date | Description | Prepared by |
|---|---|---|---|
| 1.0 | 10/08/2020 | Issue for comment | LF |
| 1.1 | 13/08/2020 | Issue for planning | LF |

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## Executive Summary

- This report provides an assessment of the impact of the proposal for a single story rear extension with green roof upon relevant 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 trees.

- Nine trees were surveyed. There are no trees within the property, all surveyed trees are located in adjacent properties and the street. The data for each tree is presented within the Tree Schedule at Appendix A.

- No trees have been identified for removal to facilitate the development.

- Sufficient space and adequate protection measures have been set out to ensure that 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.

- Two trees will be subject to construction within their root protection areas. Special measures are specified 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.

- The Online Planning Map of Haringey Council does not show any of the surveyed trees to be subject to a Tree Preservation Order. The site is located within the Highgate Conservation Area.

# 1 Introduction

## 1.1 Brief and Context

1.1.1 Treework Environmental Practice was instructed by Michael Schienke, on behalf of Fari Tadayon on 01 June 2020 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 70A Southwood Lane, Highgate N6 5DY.

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 single story rear extension with green roof.

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

| Document Title | Document/Drawing number | Originator |
|---|---|---|
| Base Plan | 1028 2020-06-02_EXISTING SITE PLAN | Vorbild |
| Proposed Layout | 1028_PLANNING | Vorbild |
| Piled Foundation Plan | SL/1 | A4Design |
| Tree Constraints Plan | 200618-1.0-70ASLHL-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 08 June 2020. 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 locations. Trees were plotted on the basemap using physical features as reference and, the positions of some trees were measured from existing structures.

2.1.3 The proposed development site currently comprises a walled rear garden with decked surfaces and an area of compacted crushed stone intended for car parking. There are no trees in the garden. The most significant tree features are two Monterey pine are located in the neighbouring garden to the south. One of the pines, T1, is located adjacent to the boundary wall with 70A Southwood Lane.

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: Trees/Groups in each Retention Category**

| Category | Total | Tree |
|---|---|---|
| A | 0 | 0 |
| B | 5 | 5 |
| C | 4 | 4 |
| U | 0 | 0 |
| Total | 9 | 9 |

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) 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.

2.1.7 A check on the online Planning Map of Haringey Council (accessed on 17 June 2020) did not show any of the surveyed trees to be subject to a Tree Preservation Order. The site, is located within the Highgate Conservation Area.

# 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 design has been adjusted, through an iterative process, to ensure that they can be retained without being damaged.

3.1.2 No trees will be removed to facilitate the proposed development

## 3.2 Facilitative Tree Works

3.2.1 No tree works will be required to enable the proposed development.

## 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 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.

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 D.

### 3.4 Special Technical Measures

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 within the RPA – Non-trench Foundations***

The footprint of the extension within the proposed development encroach on the RPA of T1 and T2. The risk of root damage will be minimised by using pile foundations. Seven piles will be installed within the RPA of T1 and of which two piles are located within the RPA of T2 (see **Figure 1**, below and Appendix F).

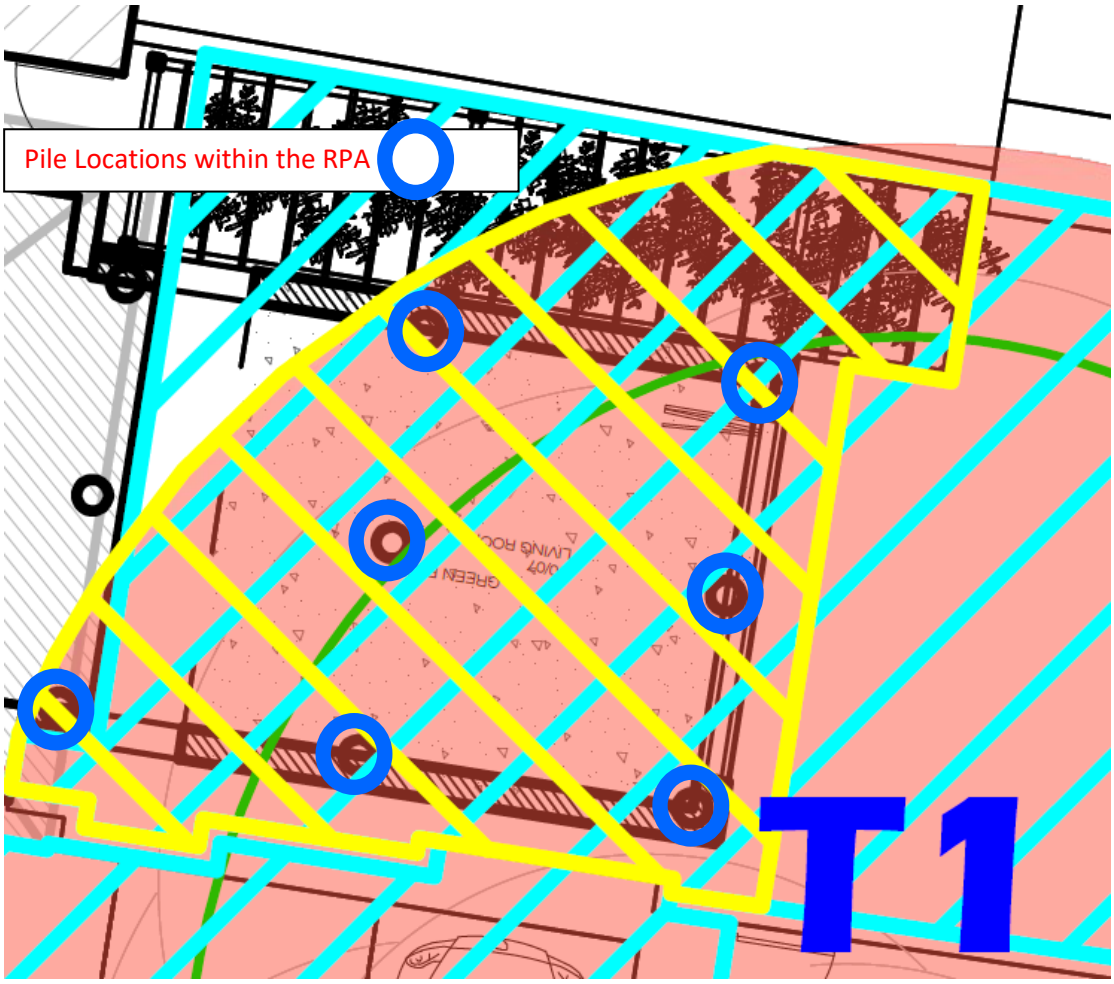



**Figure 1: Proposed Pile Locations**

3.4.3 ***Exploratory Excavations within the RPA***

The foundation method has been informed by below ground investigation. A trial pit was expatiated by hand to an approximate depth of 1.2 m in the location that corresponds to the part of the extension that will be closest to T1, see **Figure 2** and **Figure 3**, below.

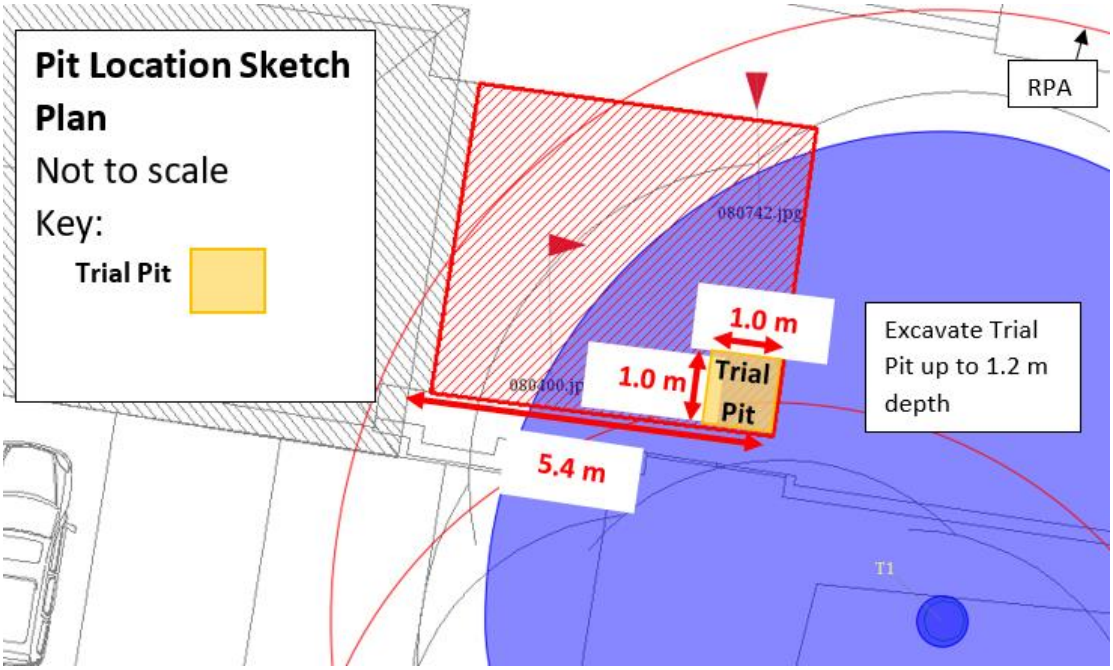



**Figure 2: Trial Pit Location**

**Figure 3: Trial Pit Location**

The ground where the trial pit was excavated comprises a compacted base layer (including concrete) dressed with slate chippings on the surface and appears to be intended for vehicle parking.


**Figure 5: Trial Pit Horizons**

**Figure 5: Trial Pit Horizons**

The excavation revealed that the top 300 mm comprises compacted subbase, below that, there are mixed materials including clay soil, sand and brick, all of which appears to be compacted.

**Figure 7: Top Layer**

**Figure 7: Horizons with Occasional Roots**

Occasional roots are present, however these are at a very low frequency that indicates that the trees do not depend on this area for nutrients. The excavation mainly uncovered fine roots (less than 5 mm diameter), apart from 1 root which was approximately 25 mm diameter.

3.4.4 ***Precautionary Measures for Excavation within the RPA***

The first 1 m of excavation within the RPAs of trees will be by hand. If tree roots of 25 mm diameter or larger are uncovered, these will be reviewed by the project arboricultural consultant who will advise, in consultation with the project architect and engineer on whether root will be severed or the excavation will moved.

Where the piling machine is located on unprotected ground within the RPAs of trees, appropriate ground protection will be installed to ensure that the rooting environment of the trees is not damaged.

## 3.5 Additional Precautions

3.5.1 ***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.

3.5.2 ***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

# 70A Southwood Lane, Highgate N6 5DY
# 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 1 | *Pinus radiata* Monterey Pine | 16.0 | 1 | 78 | N 7.5 E 6.5 S 5.0 W 7.0 | 3.5 | 6.0 | Early Mature | Fair | Buttresses / buttress roots - Buried. Pruning wounds - Historic. Pruning wounds - Recent. Structural impact - Footpath / highway / drive disturbance. Not on topographical survey. Location has been measured from the building (70A Southwood Lane). Located in neighbouring garden. | 275.2 | 9.4 | 20-40 | B | 2 |
| T2 | 1 | *Pinus radiata* Monterey Pine | 13.0 | 1 | 60 | N 2.5 E 2.5 S 7.0 W 7.0 | 2.0 | 2.0 | Early Mature | Fair | Pruning wounds - Historic. Pruning wounds - Recent. Structural impact - Footpath / highway / drive disturbance. Not on topographical survey. Location has been measured from the building (70A Southwood Lane). Located in neighbouring garden. | 162.9 | 7.2 | 20-40 | B | 2 |
| T3 | 1 | *Magnolia sp.* Magnolia sp. | 5.0 | 1 | 9 | N 2.0 E 2.0 S 2.0 W 2.0 | 2.0 | 2.0 | Semi Mature | Fair | Not on topographical survey, plotted freehand. Located in neighbouring garden. | 3.7 | 1.1 | 20-40 | C | 2 |
| T4 | 1 | *Magnolia sp.* Magnolia sp. | 6.0 | 1 | 12 | N 2.0 E 2.0 S 2.5 W 2.0 | 2.0 | 2.0 | Semi Mature | Fair | Not on topographical survey, plotted freehand. Located in neighbouring garden. | 6.5 | 1.4 | 20-40 | C | 2 |
| T5 | 1 | *Tilia x vulgaris* Common Lime | 17.0 | 1 | 65 | N 7.0 E 6.0 S 5.0 W 5.0 | 5.0 | 5.0 | Early Mature | Fair | Access to inspect base - Restricted / obscured. Base / stems obscured - Vegetation. Epicormic growth - Base / bole / principal stems. Not on topographical survey, plotted freehand. | 191.1 | 7.8 | 20-40 | B | 2 |
| T6 | 1 | *Tilia x vulgaris* Common Lime | 7.0 | 1 | 16 | N 2.5 E 2.5 S 2.0 W 2.5 | 2.0 | 2.0 | Semi Mature | Good | Not on topographical survey, plotted freehand. | 11.6 | 1.9 | 40+ | C | 2 |
| T7 | 1 | *Tilia x vulgaris* Common Lime | 7.0 | 1 | 15 | N 3.0 E 3.0 S 3.0 W 3.0 | 2.0 | 2.0 | Semi Mature | Good | Not on topographical survey, plotted freehand. | 10.2 | 1.8 | 40+ | C | 2 |

# 70A Southwood Lane, Highgate N6 5DY
# 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T8 | 1 | *Tilia x vulgaris* Common Lime | 13.0 | 1 | 60 | N 4.5 E 4.5 S 4.5 W 4.5 | 2.5 | 3.0 | Early Mature | Fair | Crown reduction - Recent. Not on topographical survey, plotted freehand. | 162.9 | 7.2 | 20-40 | B | 2 |
| T9 | 1 | *Tilia x vulgaris* Common Lime | 13.0 | 1 | 50 | N 4.5 E 4.5 S 4.5 W 4.5 | 2.5 | 3.0 | Early Mature | Fair | Crown reduction - Recent. Not on topographical survey, plotted freehand. | 113.1 | 6.0 | 20-40 | B | 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. |

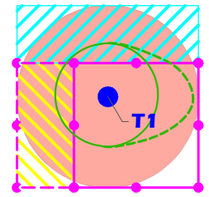
Table 1 **Cascade chart for tree quality assessment**

| Category and definition | Criteria (including subcategories where appropriate) | | | Identification on plan |
|---|---|---|---|---|
| **Trees unsuitable for retention** (see Note) | | | | |
| **Category U**<br>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)<br>• Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline<br>• 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<br>*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**<br>**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**<br>**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**<br>**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

Tree Protection Fencing

Initial Tree Protection Fencing

Ground Protection

Special Engineering /Supervised Excavations

Construction Exclusion Zone

Pruning/Tree Removal

Site Boundary

Date:
August 2020

Scale:
1:300 @ A3

Project Name:
70A Southwood Lane, Highgate, London

Drawing Title:
Tree Protection Plan

Drawing Number:
200812-1.1-70ASLHL-TPP-NC

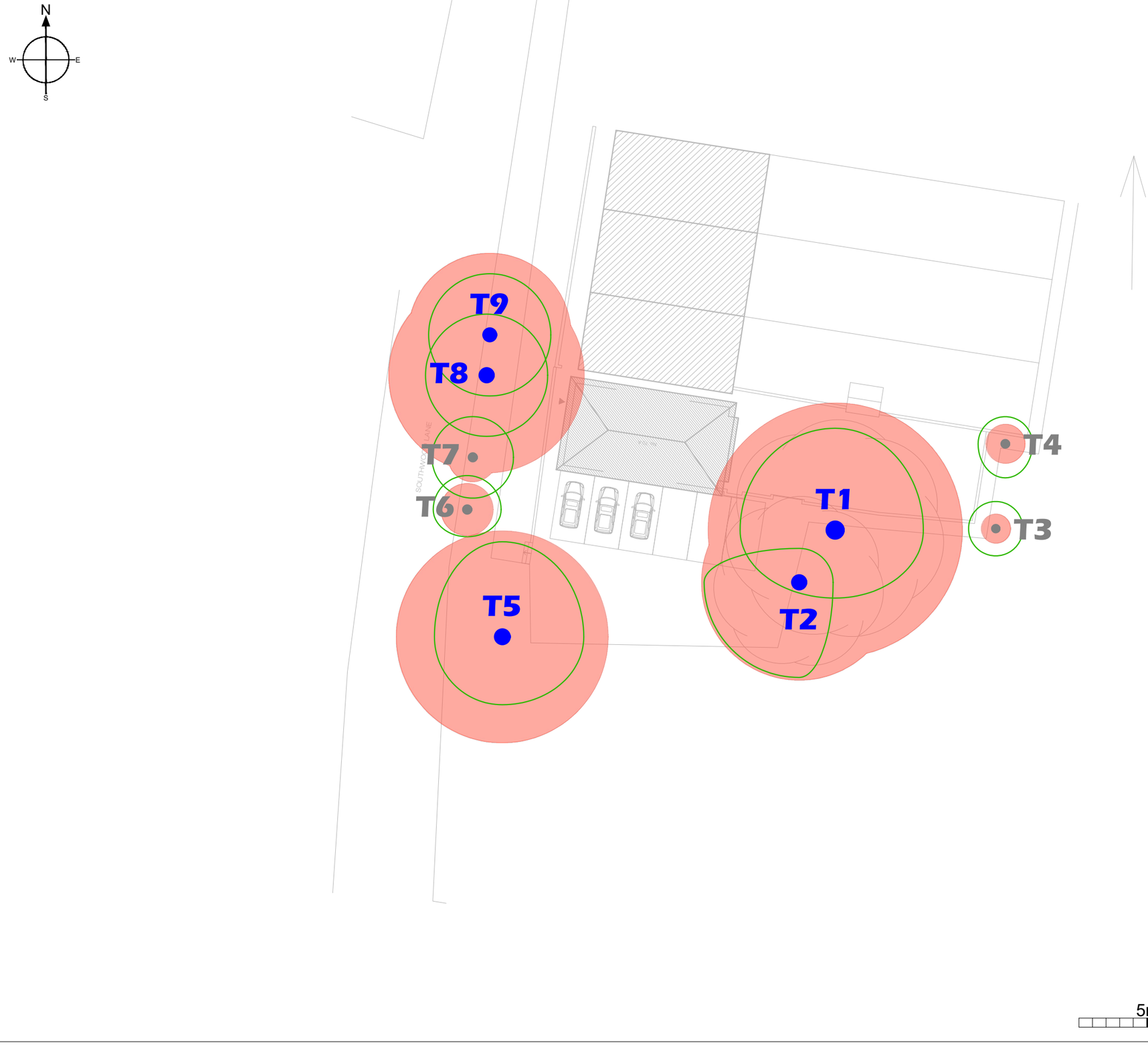
Treework Environmental Practice

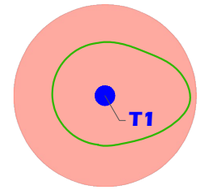
Treework Environmental Practice
Monarch House
1-7 Smyth Road
Bedminster
Bristol
BS3 2BX

Tel: 0117 244 0012
Web: www.treeworks.co.uk
Email: info@treeworks.co.uk

# 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:
June 2020

Scale:
1:300 @ A3

Project Name:
70A Southwood Lane, Highgate, London

Drawing Title:
Tree Constraints Plan

Drawing Number:
200618-1.0-70ASLHL-TCP-NC

Treework Environmental Practice

Treework Environmental Practice
Monarch House
1-7 Smyth Road
Bedminster
Bristol
BS3 2BX

Tel: 0117 244 0012
Web: www.treeworks.co.uk
Email: info@treeworks.co.uk

# Appendix D

## Tree Protection Specifications

Treework Environmental Practice

**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.

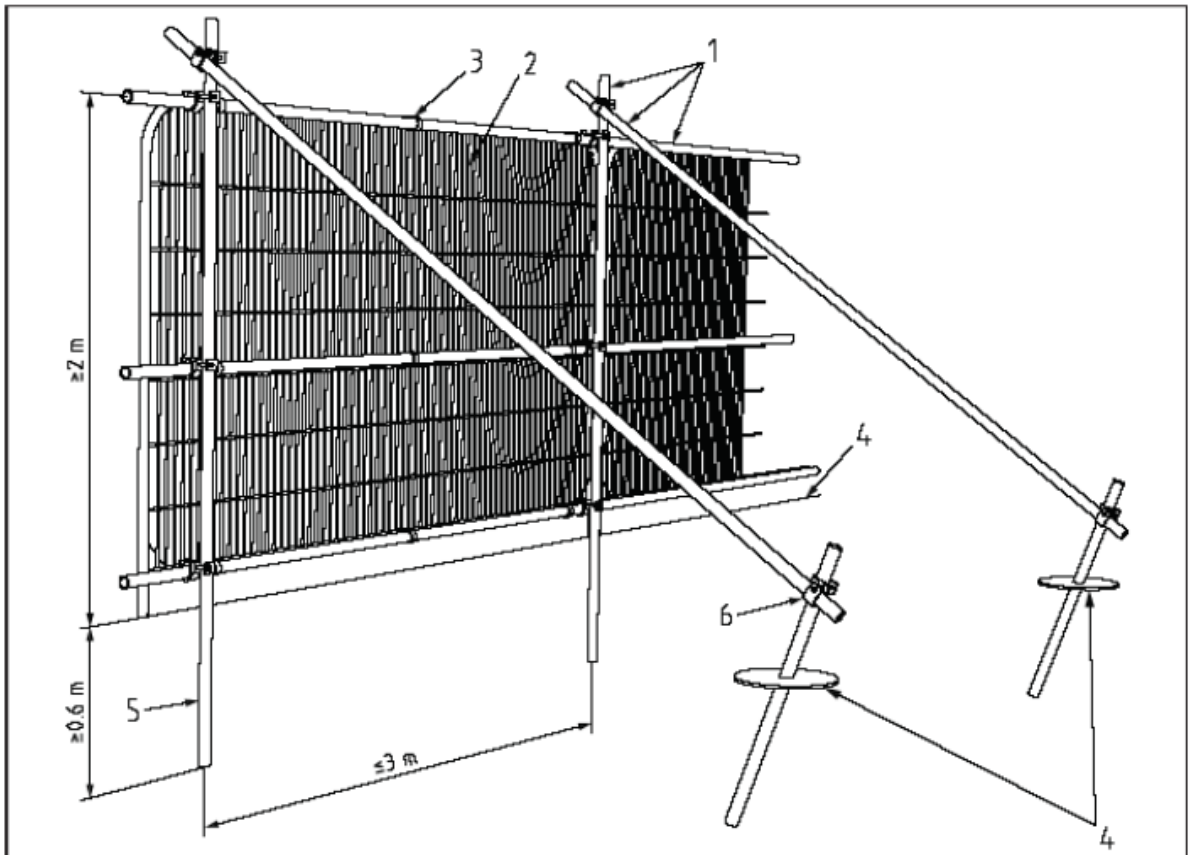
The performance requirement for fencing will be determined by the type of activity that will take place in the area around the CEZ.

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)

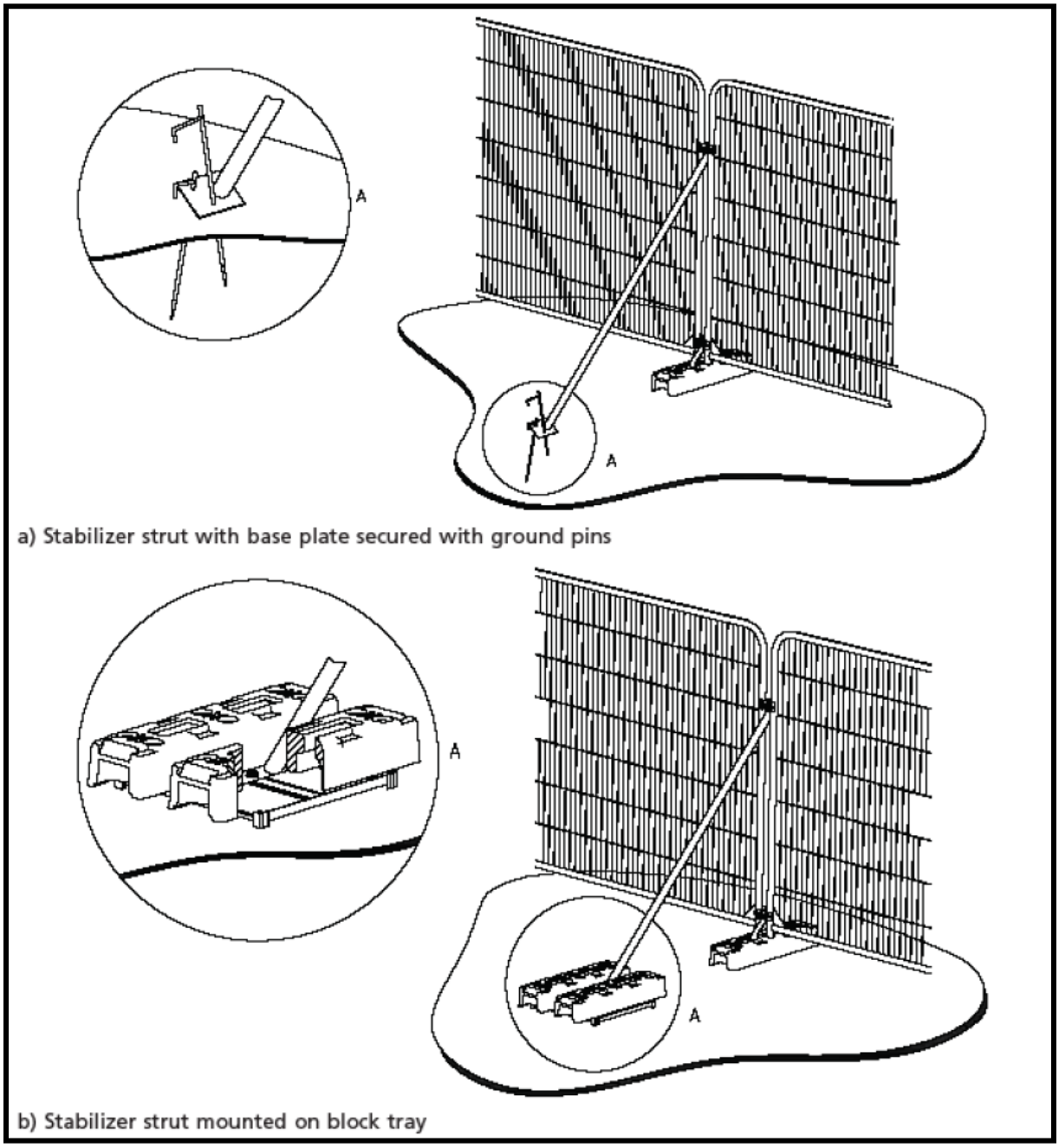

Tree Protection Fencing Sign



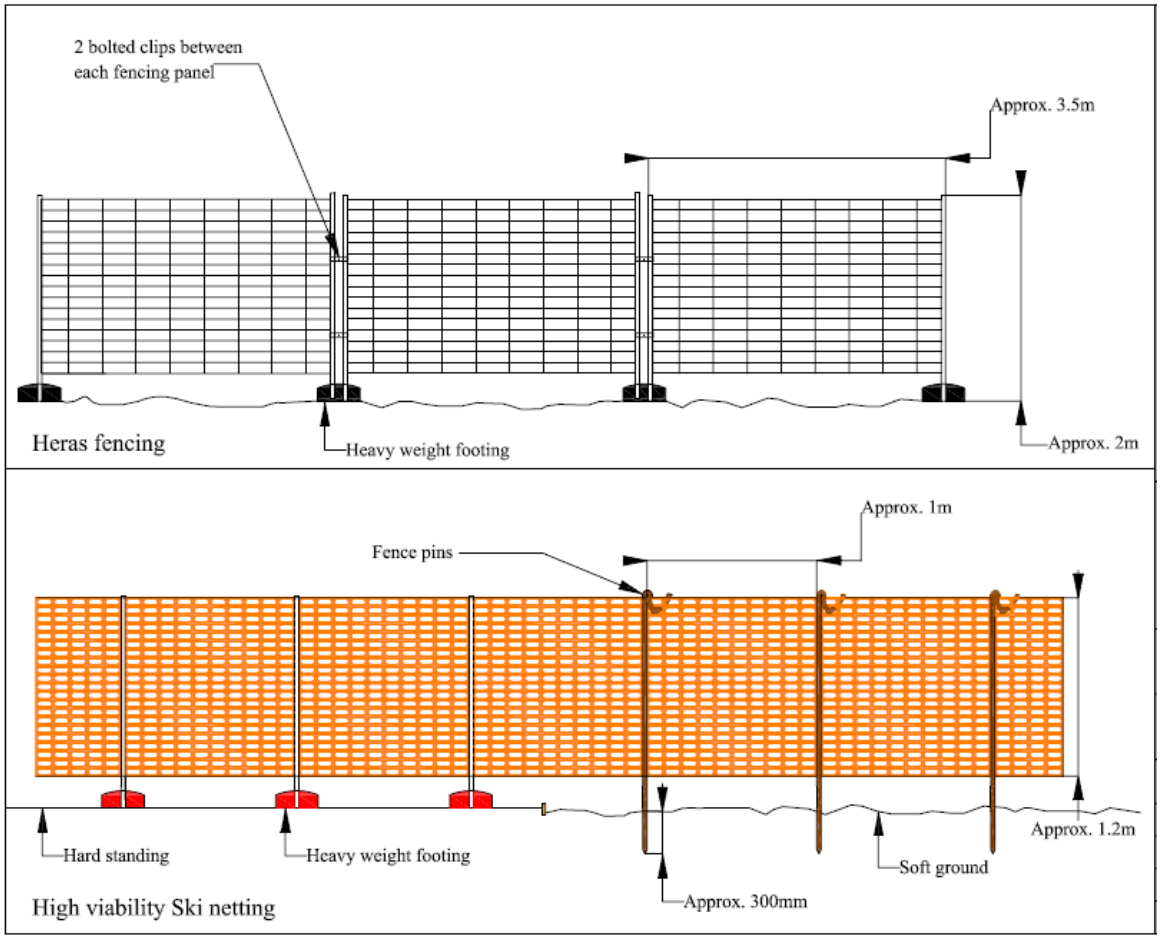

**Key**

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.*

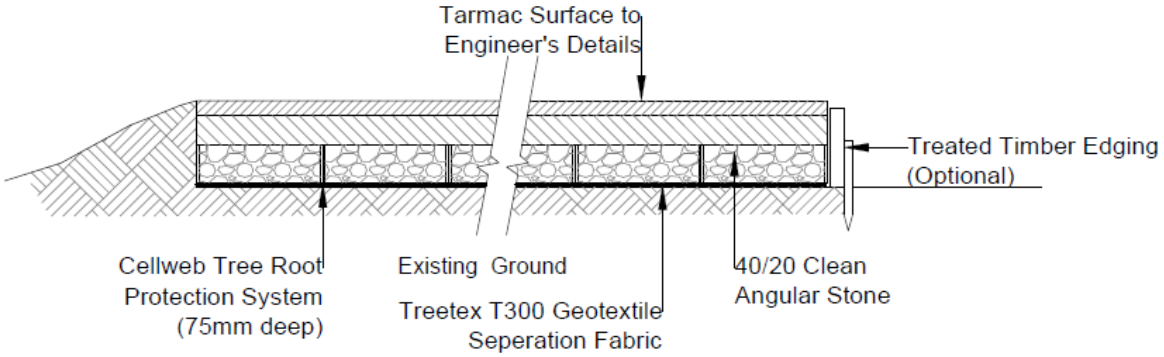
*For the roots of the trees to remain undamaged there must be no excavation, soil stripping or site grading within the rooting areas – in other words NO DIGGING. This means that finished levels of the Temporary Ground Protection will be above existing ground level.*

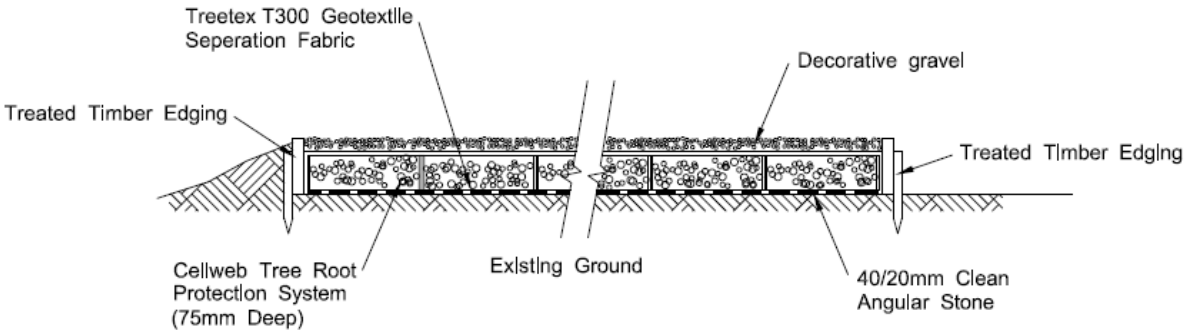
*The Arboricultural Consultant will supervise and sign off the installation and removal of the Ground Protection and any change to the Ground Protection.*

*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 E

## Tree Survey Method and Limitations

Treework Environmental Practice

# Tree Survey Method and Limitations

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## 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

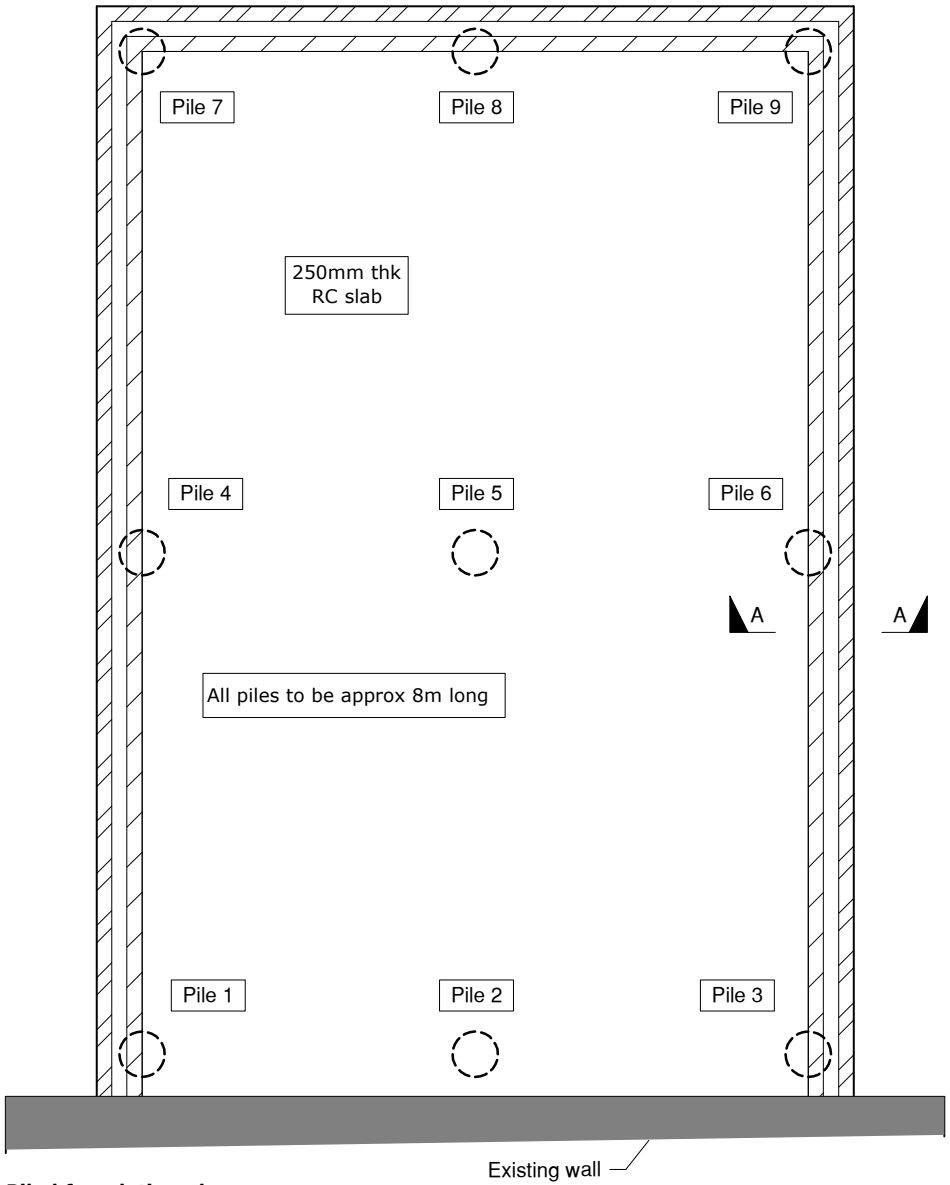
1. The survey was a preliminary assessment from ground level and observations were made solely from visual inspection for the purposes of an assessment relevant to planning and development. Only binoculars, trowel, mallet and fine manual metal probe were used to aid tree assessment, where necessary. 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.

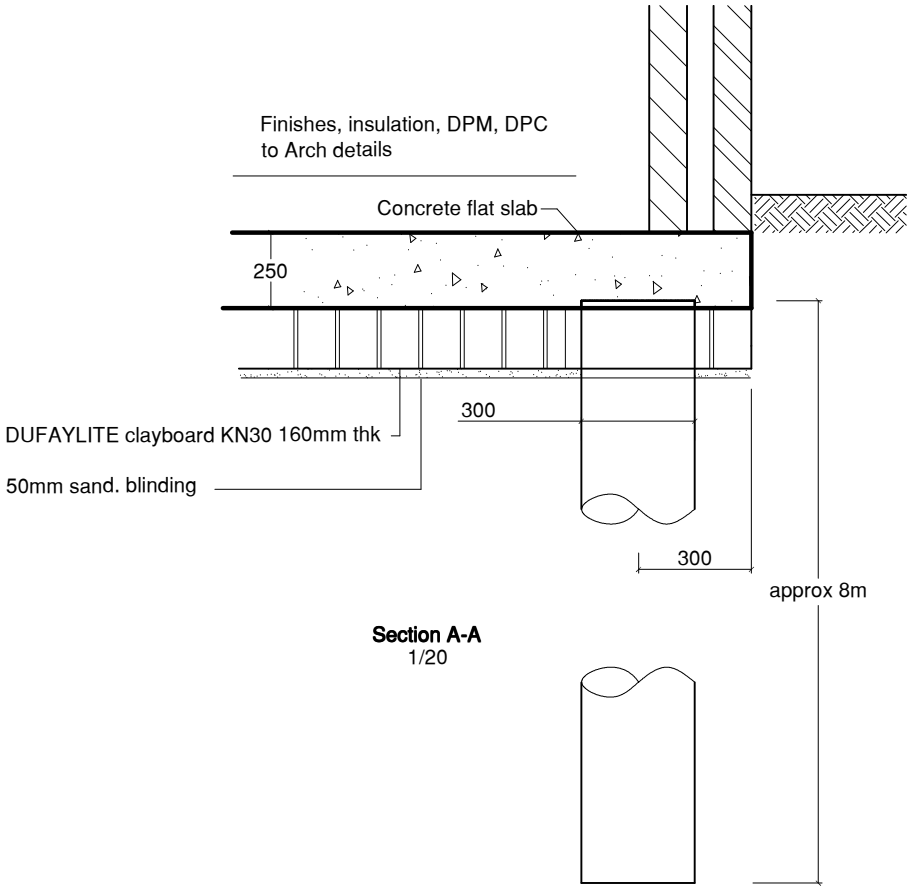
3. This survey is not a tree safety inspection. It is carried out in order to inform the planning process. Where clear and obvious hazards have been observed, these have been addressed in the recommendations (see Appendix A - Tree Schedule). A full assessment of the levels of risk posed by trees would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

# Appendix F

## Piled Foundation Plan




**Piled foundation plan**
**1/50**




**Section A-A**
1/20

PRELIMINARY
PLANNING PERMISSION ISSUE

| REV | | DESCRIPTION |
|---|---|---|

A4 DESIGN
STRUCTURAL ENGINEERS LTD
28 BURGESS ROAD
SUTTON SM1 1RW
TEL-079 0814 0667
www.A4DESIGN.eu
robert@a4design.eu


PROJECT
70A SOUTHWOOD LANE
HIGHGATE N6 5DY

TITLE
PILED FOUNDATION PLAN

DRAWING NO
SL / 1

SCALE
1/50 @ A4

DATE
JUNE 2020

BY
ROBERT