

Outline Arboricultural Method Statement

Kerswell Close, London, N15 5RP

Report Reference Number: 220811-TEP-1.0-KC-AMS-MS

On behalf of

London Borough of Haringey

August 2022

Document Control Sheet

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Report Title: Outline Arboricultural Method Statement.

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1 Key Contact Details

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2 Background

2.1 Brief and Context

2.1.1 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 potentially negative. Detailed technical specifications for mitigation and protection measures are devised in the design phase that follows (RIBA Stage 3-4 'Spatial Coordination and Technical design'), and the sequence ends with the 'Handover' and 'Use' phases (RIBA Stages 6-7) with the implementation of those measures, often once planning permission is granted, guided by an Arboricultural Method Statement (RIBA Stage 4-5, 'Technical Design and Manufacturing and Construction').

2.1.2 In addition to the Arboricultural Impact Assessment (Ref 220811-1.1-KC-AIA-MS), Treework Environmental Practice was instructed by LB Haringey to provide an Outline Arboricultural Method Statement (AMS) in support of the planning application, intended to demonstrate

that the tree impacts have been fully considered to date. It follows best practice guidelines in accordance with BS5837:2012 Trees in relation to design, demolition and construction – Recommendations, and recommends practical solutions, based on the arboricultural knowledge and experience of the author.

- 2.1.3 Its objective is to ensure that retained trees are retained in adequate conditions and co- exist with the built infrastructure over the long term, so that they can grow to maturity to fulfil the aspirations of the design.
- 2.1.4 The key to successful tree protection during the design, construction and associated works requires a collaborative approach and proactive management. Tree protection measures need to be suitably robust, and practically achievable to install and maintain, otherwise tree damage and the potential for trees to damage the built infrastructure is more likely. Tree protection not only consists of physical structures to prevent damage, such as fencing, ground protection or technical engineering solutions, but also requires good communication between Tree Managers (Arboricultural Consultants), the Lead Designers, Site Managers and Operatives. Site supervision and regular site inspections by an Arboricultural Consultant are recommended as a key component of tree protection on this site, to monitor the progressive, iterative changing site environment and its relationship and impact on retained trees.
- 2.1.6 This document provides detailed design detail, task sequencing and methodology likely to be associated with enabling works, construction, installation of underground services and final external and landscape works, within the Root Protection Areas (RPA's).
- 2.1.7 This report identifies:
- Trees to be retained (included transplanted trees) and pruned. This work is specified in the tree schedule (Appendix A). The Tree Constraints Plan, (Appendix B), identifies the extent of recently pruned canopies.
 - The location and extent of protective fencing, barriers and ground protection (Construction Exclusion Zones). These are delineated on the Tree Protection Plan (Appendix C), with specific tree protection measures detailed in Appendix D, E & F.

- The location and extent of special excavation, protection, engineering and design measures across Root Protection Areas, to minimise the impact on existing trees and the built infrastructure. These are set out in Appendix C.
- Details of monitoring and supervision of Tree Protection Measures through the duration of the works.

2.1.9 This Method Statement Comprises:

- The Statement itself, describing the sequence of tree protection and management measures;
- A Tree Schedule (Appendix A), showing trees to be retained, their Category (at Outline Planning Permission stage) and their current and proposed dimensions;
- A Tree Protection Plan (Appendix B), showing the location and extent of special excavation, protection, engineering and design measures across Root Protection Areas, to minimise the impact on existing trees;
- a Transplanting Method Statement (Appendix C)
- A Tree Protection Measures (Appendix D), comprising:
 - o Tree Protection Fencing.
 - o Stem Protection.
 - o Vehicle Barriers.
 - o Ground Protection Measures.
 - o Transplanting Methodology.
- Appendix E: Example of a Construction Exclusion Sign.
- Appendix F: Arboricultural Clerk of Works Report Form.

Abbreviations

AMS – Arboricultural Method Statement

ACoW – Arboricultural Clerk of Works (* indicates where an ACoW involvement is recommended to ensure standard is satisfactory/provide advice/additional methodology)

AC – Arboricultural Consultant

CEZ – Construction / Demolition Exclusion Zone (areas within the Tree protection fencing)

GPM – Ground Protection Measures

TPF – Tree Protection Fencing

RPA – Root Protection Area

LA - Local Authority (LB Haringey)

2.1.10 Items within the methodology tables marked with an * indicates where ACoW or AC involvement is considered necessary to ensure the standard is satisfactory/provide advice/additional methodology.

2.1.11 The following documents have been provided and reviewed:

Document Title	Document/Drawing number	Originator
Proposed Ground Floor	Drawing No. 21099-SK-004-Rev S	Newground Architects
Illustrative General Arrangement	TM-517-LA-101	Turkington martin
Landscape Statement	TM-517LA-RE03	Turkington martin
Utilities Statement Report	Utilities Statement Report	XC02
Ground Penetrating Radar Survey	SHA 848 (October 2018)	Sharon Hosegood Associates
Tree Constraints Plan	220312-1.0-KCH-TCP-NC	Treework Environmental Practice

3. Task Guide

3.1 This document provides detailed design detail, task sequencing and methodology likely to be associated with enabling works, construction, installation of underground services and final external and landscape works, within the root protection areas (RPA's) of retained trees. The tasks covered include:

1. Securing the site (installation of boundary fence/site hoarding).
2. Tree removal, transplanting and pruning.
3. Installation of Tree Protection Measures.
4. Toolbox talks to Site Managers and site operatives (enabling, groundwork's, construction & landscape).
5. Monitoring and supervision of Tree Protection Measures through the duration of the works.

3.2 Additionally, a methodology has been provided for tasks within the RPAs, as set out below:

6. Removal of existing hard surfaces.
7. Level Changes.
8. Removal of Existing Underground services.
9. Installation of underground services.
10. Temporary access of plant and equipment over soft ground.
11. Foundation design.
12. Landscape and Public Realm operations.

- 3.3 The document provides detailed information on the tasks listed in 3.1 and 3.2 above, which are presented in a table in section 5.0. This level of detail is intended to protect and manage retained trees from site enabling works through to completion including final landscaping of the project. This includes protection and management of trees, both above and below ground.

If any of the information within this document is unclear or conflicts with the practicality of the works set out within, please contact the Treework Environmental Practice - Arboricultural Consultants.

4 General Precautions

- 4.1 Prior to commencement of each task and following the Toolbox Talks, the contractors will provide the following information for review and approval by the Arboricultural Consultant (AC):
- 4.2 General method statement for each phase. This will include; enabling, groundwork, foundations and construction.
- 4.3 Where methodologies are different from those discussed within this document, the contractor should include an alternative methodology for consideration and approval by the AC. Any change in methodology, which is acceptable by the AC will be made available to LB Haringey's Tree and Nature Conservation Manager and/or Senior Arboricultural Officer (Planning) for approval prior to associated works taking place.
- 4.4 A tool-box talk has been written by the AC for the works and should be delivered by the Contractor's Site Managers to the operatives and staff prior to commencement of operations and preferably as a part of the site induction process for all those working near trees.

- 4.5 The site will be inspected by the Arboricultural Clerk of Works (ACoW) (the duration and frequency of which are to be agreed with the LPA) and reports will be made available to the client and LB Haringey's Tree and Nature Conservation Manager and/or Senior Arboricultural Officer (Planning).
- 4.6 No materials that are likely to have an adverse effect on tree health will be stored or discharged within the Construction Exclusion Zones (CEZ's).
- 4.7 Where storage of such materials are upslope of retained trees, barriers will be put in place at ground level to minimise the risk of spillages leaching down-slope and contaminating the Root Protection Areas of a tree.

Such materials include:

- Fuels and Oil
 - Bitumen
 - Cement
 - Sand
- 4.8 No fires will be permitted on site.
- 4.9 Concrete will not be mixed or transported over unprotected ground, within CEZs.
- 4.10 Dust control measures will keep dust to a minimum by utilising water bowsters and spray equipment which can directly spray water onto areas of the site where high levels of dust may spread and cover retained trees.
- 4.11 Any incidences involving potential damage to retained trees and their roots will be immediately notified to the site manager and the ACoW. The ACoW will then visit the site and record the incidence on a monitoring form (see Appendix E) and prescribe reactive works. Following confirmation from the client, a copy of this site monitoring form may be made available to LB Haringey's Tree and Nature Conservation Manager and/or Senior Arboricultural Officer (Planning).
- 4.12 Tasks associated with tree protection works will be sequenced and actioned in accordance with the tables in 5.0 below.

5 Tables of Tasks, Sequencing and Design Methodologies

5.1 Task 1: Securing the Site - Installation of Boundary Fence/Site Hoarding and Access Gates

Tree Impacts & Actions Required	Retained Tree id Ref	Appendices Reference
At the time of writing, final hoarding plans were not available. Having said this, no additional facilitation pruning is anticipated at this time. It is possible, that site hoarding may be considered sufficient to form part of the Tree Protective Fencing (TPF) if its distance from retained trees is no less than that shown on the Tree Protective Fencing (Appendix B).	All retained trees.	B, C, D

5.2 Task 2: Tree Removal, Transplanting and Pruning

Tree Impacts & Actions Required	Tree id Ref	Appendices Reference
Appendix A identifies all proposed tree removals, transplanting and pruning. All work to be carried out to avoid bird nesting season wherever possible. * On completion of the works, the ACoW will undertake an audit ensuring works accord to the works schedule and BS3998:2010, Tree work - Recommendations.	Removal: 21 trees (T3, T4, T8, T9, T15, T16, T17, T18, T19, T20, T21, T22, T23, T24, T25, T26, T27, T28, T29, T31 & T32) Transplanting: (T5, T6, T7 & T10) Pruning: 4 trees (T12, T13, T14, T33) See Appendix A for detailed specifications.	A, B, C

5.3 : Task 3: Installation of Tree Protection Measures

Tree Impacts & Actions Required	Tree id Ref	Appendices Reference
Each tree has a unique number which can be cross referenced with the Tree Schedule (Appendix A) and Tree Protection Plan (Appendix B). The Tree Protection Fencing (TPF) will be installed following completion of the tree work and before any other works on site. The TPF will be constructed in accordance with BS5837: 2012, reproduced in Appendix B and will form the Construction Exclusion Zone (CEZ). A tree protection information sign will be secured to every other fencing panel at eye level, facing into the site. This will aid identification of the CEZ and inform site operatives of its importance. An example is shown in Appendix D. TPF will only be re-aligned from full protection of RPAs where exploratory works have proven that no significant roots are present, or where there is suitable existing hard surface which acts as horizontal protection. The current alignment is detailed on the TPP, Appendix B. Horizontal protection measures may be installed over soft ground within the RPAs of retained trees where Tree Protection Fencing has been realigned to aid access to areas of the site. Where this is required, horizontal protection measures will be installed before any access is permitted. *This will consist of: • a 100-200mm bed of woodchip over the ground and either a pre-fabricated reinforced concrete slab, or formed and poured in-situ reinforced concrete slab. • *In-situ reinforced concrete slabs will have 'lifting eyes' set in the concrete so that they can be lifted out without damaging the ground below. Where TPF is re-aligned and above ground tree parts are exposed to the development area, measures will be taken to ensure that low branches which may potentially become damaged by site activity are protected. This will consist of: • a height restriction barrier to control the height of plant and vehicles in that area of the site (Appendix E provides an example).	All retained trees (T1, T2, T11, T12, T13, T14, T30, T33)	A, B, C

*Where this is not practical, water filled vehicle barriers with a 'low branches caution' sign attached, will be installed on the ground, at the periphery of the exposed tree crown/branch spread. If vehicle/plant equipment requires access through this area, then the barrels will be moved (both emptied and moved by hand, or carefully with a suitable machine) and low branches will be temporarily tied clear, with straps or rope or minimally pruned, if tying back is not sufficient, so that clearance for the vehicle/plant equipment which requires access can be achieved. The barrels and signs will then be re-installed immediately after the plant / equipment has passed below. Where this barrier needs to be moved to facilitate access, a Banksman must be present at all times and the barrier reinstalled immediately following access. Pre-fabricated reinforced concrete may also be installed in consultation with the ACoW. *Once all tree protection measures are in place, the ACoW will check the site and sign off if all measures are in place, before works commence. *Where measures are not satisfactory, instructions will be provided in writing using the monitoring form, to amend the measures, before any further works proceed. All TPF will remain in place and kept in good condition until all works are complete, unless otherwise agreed with the AC.		
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5.4 Task 4: Toolbox talks to Site Managers (Enabling, Groundwork, Construction & Landscape)

Tree Impacts & Actions Required	Tree id Ref	Appendices Reference
The content of the Toolbox Talks will cover tree protection measures and the reason they are required, common causes of damage to trees during construction, reporting procedures on damaged tree protection measures and/or damage to ground around trees or physical damage to trees above ground. *Once the tree protection measures have been checked and signed off, and before any other work starts on site, the AC will provide 'Toolbox Talks' for each construction stage. These will be provided verbally (by the AC) and in writing to the Site Manager to deliver to all operatives, engaged in site activity associated with each stage. Additional site induction sessions are recommended for all those working in close proximity to trees.	All retained trees (T1, T2, T11, T12, T13, T14, T30, T33)	B, C, D, E, F

5.5 Task 5: Monitoring of Tree protection Measures through the Duration of the Works

Tree Impacts & Actions Required	Tree id Ref	Appendices Reference
*As part of the management of retained trees and their protection measures, the ACoW will proactively monitor the site regularly (duration in agreement with the LPA, recommended no less than every three weeks) during active works. *The ACoW will assess the protection measures, any damage to trees or protection measures, suitability of measures and advise on any adjustments or changes that may need to be made. The AC will attend (and/or receive minutes of) regular Design Team/Project Planning Meetings for discussion and input with various Project Managers and implement any changes on site in agreement with LB Haringey's Tree and Nature Conservation Manager and/or Senior Arboricultural Officer (Planning), where necessary.	All retained trees (T1, T2, T11, T12, T13, T14, T30, T33)	A, B, C, D, E

5.6 Task 6: Removal of Existing Hard Surfaces within the RPA

Tree Impacts & Actions Required	Tree id Ref	Appendices Reference
What is the RPA Root Protection Areas (RPA's) are layout design tools, indicating the minimum area around a tree deemed to contain sufficient roots and soil volume to maintain the tree's viability. RPA's should be treated as a precautionary area within which activities such as ground compaction, excavation, storing of materials, ground stripping, raising of levels and building are likely to cause damage to trees and therefore excluded. The Tree Protection Plan identifies RPA's with a shaded pink circle. Construction and Level changes within the RPA Construction (including the removal of hard surfaces, such as existing paths) within tree RPAs should, where practicable, accord to the principle that the tree and its soil structure take priority, and that the most reliable way to ensure this is to preserve the RPA undisturbed. The AC will review any operation which involves the removal of existing hard surfaces within the RPA of retained trees and input additional methodology where necessary.	All retained trees	B, C, F

In general, works will follow the points below: ○ Excavators required to remove the surface will be positioned on existing hard surface outside the RPA and will not operate on areas where the surface has been removed. ○ Any other works inside the RPA, where the surface has been removed will be undertaken with hand operated tools only. ○ Any exposed roots which may be present will either be pruned or kept damp and out of direct sunlight whilst exposed. ○ In hot conditions, exposed roots will be dampened down within 1 hour and wrapped in a damp hessian material or similar. ○ Any root pruning will be undertaken with clean disinfected secateurs or clean disinfected hand saw. ○ No significant roots will be pruned. Significant roots are considered to be woody roots >25mm diameter. ○ Where possible, existing base stone will be retained to minimise the potential damage to tree roots. ○ New surfaces will be installed within 48hrs of removing the old. Where this is not possible, then a temporary surface will be installed over the exposed area of the RPA. The temporary material will be suitable for purpose.		
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5.7 Task 7: Changing Ground Levels within the RPA

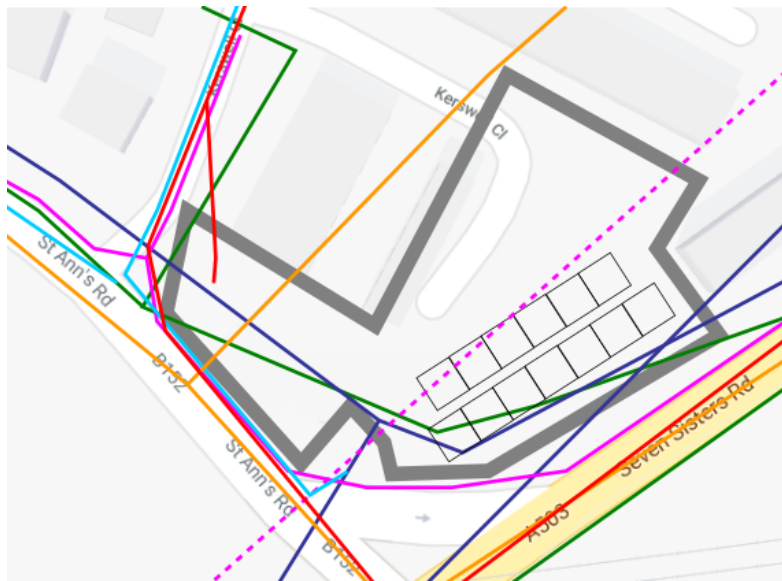
Tree Impacts & Actions Required	Tree id Ref	Appendices Reference
Ideally, there should be no change to ground levels within 1m of the stem of a tree and, beyond this prohibited zone, reduction in ground level of 100mm and increase in ground level of 200mm (<i>greater than 200mm if using a containment system and in agreement with the LPA</i>) are considered to be significant with a potential to harm the tree. Should the above change, the LPA would be notified and in principle, works would need to comply with the following performance criteria: Reducing Ground Levels Where ground levels are to be reduced the following process and methods will be employed to ensure that trees are not significantly impacted:	T11 & T12 (New stepped footway off Seven Sisters Rd (refer to Task section 5.12, Task 12 below) Potentially all retained trees at this stage.	B, C, D, E

• Detailed assessment of the presence, location and significance of tree roots in the affected area, including: ○ Visual ground assessment. ○ Trial excavation or ground penetrating radar survey. Where the impact can be kept to an acceptably low level to ensure that the tree remains viable, the work will be carried out the excavation under the following conditions: ○ All operations by hand / using hand operated tools. Where the impact cannot be kept to an acceptably low level, the design will be revised. Raising Ground Levels Where ground levels are to be raised, methods will need to meet the following performance criteria: • Ensure that tree roots are not damaged. • Ensure that soil is not compacted. • Ensure that sufficient water reaches tree roots. • Ensure that the components exist for a functioning soil ecosystem within the soil around tree roots. • Ensure that gaseous exchange can take place within the soil around tree roots. • Ensure that sufficient space is retained between tree stem and the raised ground to prevent damage to the stem and allow for incremental stem growth. The general technical specification would be likely to comprise the following components. 1. Removal of existing hard surfaces. 2. Retention of any existing sub base below hard surfaces. 3. Removal of any existing vegetation. 4. Installation of a self-supporting structure to retain the built up ground away from the stem and root buttresses of the tree. ○ For example; a circular concrete wall, without footings, built up from the existing ground level, around the stem of the tree, at approx. 1m from the stem. 5. Ventilation pipe. ○ For example; 75mm diameter pipes, laid horizontally at the existing ground level at 1m to 2m spacing throughout the affected root area, with vertical vents connecting the pipes to the proposed surface.		
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6. A containment system (e.g. Sylva Cell or Cell web) to provide stability to the raised ground and reduce the risk of compaction to the existing ground below. 7. Build up levels with loose, lightweight granular material that allows air and water to pass through it and provides sufficient support to the finished ground. ○ Upper 300mm would typically be made up of 10mm – 25mm grade lightweight expanded aggregate. ○ The space below the upper 300mm could be made up of clean, uncontaminated stone of up to 150mm grade. 8. A geotextile membrane will be laid over the aggregate. 9. The finished surface will be laid / built up from the membrane.		
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5.8 Task 8: Removal of Existing Underground Services within the RPA.

Tree Impacts & Actions Required	Tree id Ref	Appendices Reference
In principle, the removal of existing underground services within the RPA of trees should be avoided. Wherever possible, discussed services will remain in situ and be terminated outside of the RPA. In the event of this not being possible, a meeting with the AC will be held and site-specific methodology will be discussed, Any proposed methodology will be agreed with LB Haringey's Tree and Nature Conservation Manager and/or Senior Arboricultural Officer (Planning). At the time of writing, the exact alignment of proposed new utilities are unknown. The indicative (desk top study) location of existing utilities is reproduced (from the Utilities Statement Report) below. Where existing underground services are currently located within RPA's of retained trees, wherever feasible, such services will remain in situ and if necessary, be safely capped outside of the RPA. In the event of this not being possible, a meeting with the AC will be held and site-specific methodology will be discussed, Any proposed methodology will be agreed with LB Haringey's Tree and Nature Conservation Manager and/or Senior Arboricultural Officer (Planning), before proceeding with the work.	Not aware of services requiring removal at this stage.	B, C, E



Extract from XC02 Utilities desk top study, Utilities Statement Report

- EXISTING MAINS WATER (THAMES WATER)
- EXISTING FOUL SEWER (THAMES WATER)
- EXISTING GAS (NATIONAL GRID) - DIVERSION REQUIRED
- EXISTING ELECTRIC LV CABLES (UKPN)
- EXISTING COMMUNICATION INFRASTRUCTURE (BT)
- - - EXISTING COMMUNICATION INFRASTRUCTURE (VODAFONE) - NO DIVERSION REQUIRED.
- LONDON UNDERGROUND NETWORK

5.9 Task 9: Installation of Underground Services within the RPA

Tree Impacts & Actions Required	Tree id Ref	Appendices Reference
At the time of writing, the exact alignment of proposed new utilities are unknown. To ensure the retained trees are not significantly impacted, proposed new underground utilities will aim to avoid RPA's wherever possible. The actual impact to trees will be assessed by the Arboricultural Consultant on a case-by-case basis and detailed specifications will be developed in consultation with the Project Engineer any service installation does not result in significant damage to retained trees. Where underground services are to be laid within the RPAs of retained trees, the following measures will be employed to ensure that trees are not significantly impacted: • Detailed assessment of the presence, location and significance of tree roots in the affected area, including: ○ Visual ground assessment ○ Ground Penetrating Radar assessment review (for the trees already surveyed). ○ Trial excavation Where the impact cannot be kept to an acceptably low level, the following measures will be implemented: ○ Move the location of services outside of the RPA. ○ Hand dig trenches and feed services through roots that are present. ○ Excavate trenches using an Air Knife (compressed air hose) and feed services through roots that are present. ○ Trenchless Boring. Excavation of trenches will conform to the following criteria: ○ Where roots are exposed, they will be protected from desiccation and damage. ○ The trench will be backfilled within 6 hours with soil of a suitable quality to encourage rooting. ○ It may be possible to prune some roots where this is agreed by the Arboricultural Consultant. ○ All operations will be supervised and signed off by the Arboricultural Consultant.	Potentially, any retained tree.	B, C, E

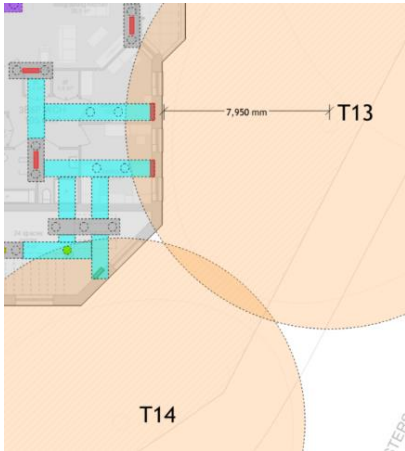
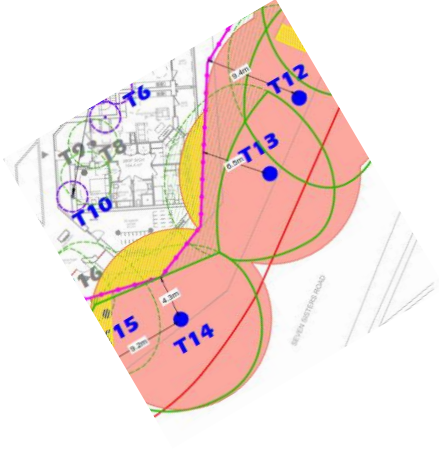
Trenchless boring will meet the following criteria: ○ No excavation will occur above 1.5m depth within the RPAs of retained trees unless agreed by the Arboricultural Consultant. ○ The plant required to carry out the excavation will be able to gain access to and operate in the work area without causing damage to the trees or requiring major pruning of tree branches. ○ Entry and exit pits will be located outside of the RPAs of retained trees unless they can be excavated without significant damage to trees. ○ All operations will be overseen and signed off by the Arboricultural Consultant.		
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5.10 Task 10: Temporary Access of Plant and Equipment over Soft Ground within the RPA

Tree Impacts & Actions Required	Tree id Ref	Appendices Reference
- Any temporary access over soft ground within the RPA will require a suitable material or bridging arrangement to prevent compaction and contamination to the ground below. - Ply-board sheeting is not to be used in any circumstances where machinery will be tracking over an area. However, this is acceptable for pedestrian use only. - An alternative for pedestrian use only is 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; - For plant and equipment <5t. 150-200mm of woodchip, with an impermeable barrier below will be installed upon existing soft ground and a suitable temporary interlinked load spread system above, such as Track way or Ground Guards. - For larger plant and equipment >5t. either: a) A suitable 3D cellular matrix filled with clean granular fill over a suitable membrane. Must be suitable for heavy plant. b) 200mm of woodchip with impermeable barrier below and pre-fabricated reinforced concrete installed above to form the upper surface of temporary haul route.	Potentially any retained tree.	A,B,C,D

c) A bridging arrangement, cantilevered from outside of the tree root area. - Any such design will be engineered and constructed in consultation with the Arboricultural Consultant. - Any other proposed system will be agreed in consultation with the AC and provided to the LA Arboricultural lead Officers before installing. - The ACoW will monitor any temporary access areas over soft ground to ensure it is well maintained and suitable for the task.		
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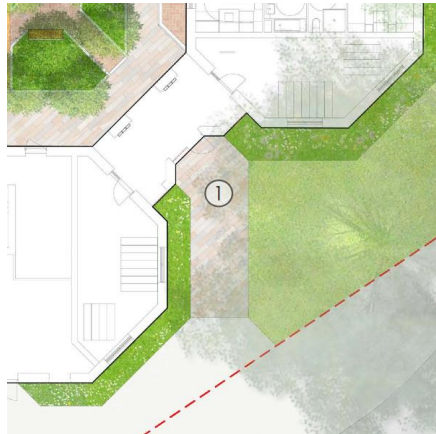
5.11 Task 11: Foundation Design within the RPA

Tree Impacts & Actions Required	Tree id Ref	Appendices Reference
Two trees (T13 and T14) would see foundations within their RPAs.  <i>Ground beams, columns and pile caps (McBain's)</i>  <i>Extract of the Tree Protection Plan Appendix B)</i> In order to minimise impacts to trees T13 & T14, the proposed foundation construction provides cantilevering 1200mm deep ground beams in the areas protruding into the RPAs. Two trees, (T30 & T33) would see a retaining wall constructed at the outer most eastern edge of their RPAs.	T13 & T14 (Building ground beams and pile caps)	A,B,C,D

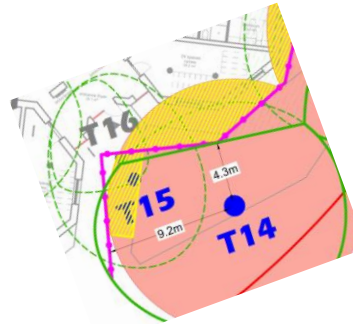
To ensure that trees T13 & T14 are not significantly impacted and are able to thrive in line with the aspirations of the design, a ground beam, on piled foundations has been recommended. The following criteria will need to be complied with: ○ Pile and raft or beam will be the most appropriate foundation design within RPAs. ○ Strip foundations will be avoided. ○ Where a slab is required for minor structures, the base will not exceed more than 20% of the existing unsurfaced ground. ○ Wherever possible the piles will be located outside of retained tree RPAs. ○ Pile rigs and any machinery will not enter the RPA, unless suitable temporary surfaces have been previously installed. ○ Where piles need to be located within RPAs, then the initial excavation will be undertaken carefully, with the ACoW present. ○ The smallest diameter piles and smallest rig possible will be used. ○ Where significant roots (>25mm) are exposed, an alternative pile hole location will be preferred. Where this is not possible, the ACoW will record the diameter and number of roots to be pruned. ○ Roots will be pruned flush with the soil profile with clean disinfected secateurs or handsaw. ○ Pile holes within RPAs have impermeable barriers installed against the soil profile acting as a 'sleeve', to prevent potential toxic contact associated with concrete, from coming into contact with roots. ○ Where rafts or slabs are installed above the piles, spanning across the RPA, then a ventilated air space will need to be designed in, to ensure tree roots between the underside of the slab and the soil surface.		
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5.12 Task 12: Landscape & Public Realm Operations

Tree Impacts & Actions Required	Tree id Ref	Appendices Reference
Three trees, two private (T1 and T2) and one public (T14) would see the installation of new hardstanding within their RPA.	T1, T2 & T14	B, C



Extract of the Landscape Statement
(Turkington Martin)

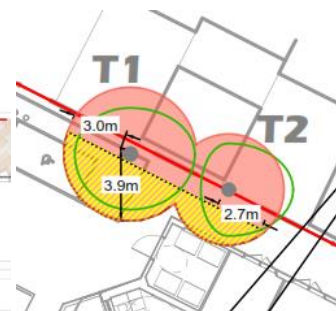


Extract of the Tree Protection Plan
(Appendix B)

Trees T1 & T2



Extract of the Landscape Statement
(Turkington Martin)

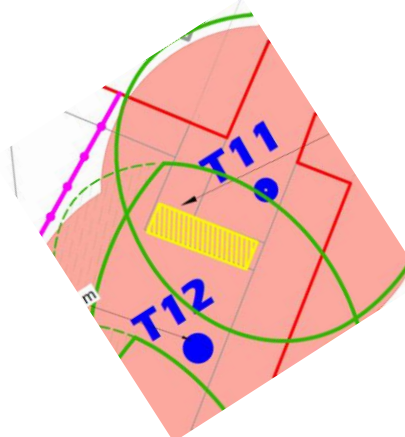


Extract of the Tree Protection Plan
(Appendix B)

Two trees (T11 and T12) would see a new stepped footway dug and surfaced linking Seven Sisters Road and an existing footway.



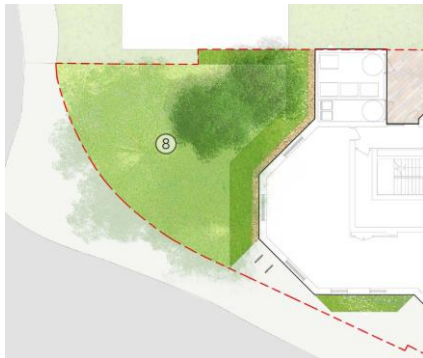
Extract of the Landscape Statement
(Turkington Martin)



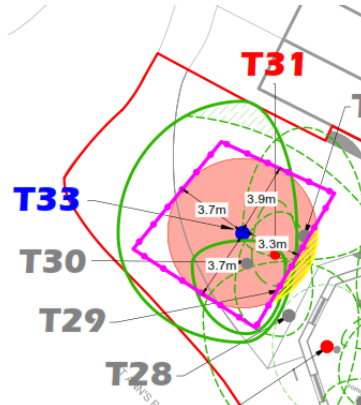
Extract of the Tree Protection Plan
(Appendix B)

**T11 & T12
(Stepped
footway)**

Two trees would see a retaining wall constructed at the very eastern edge of their RPAs.

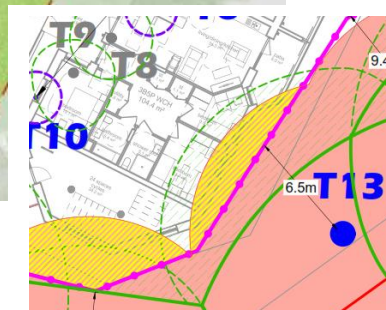
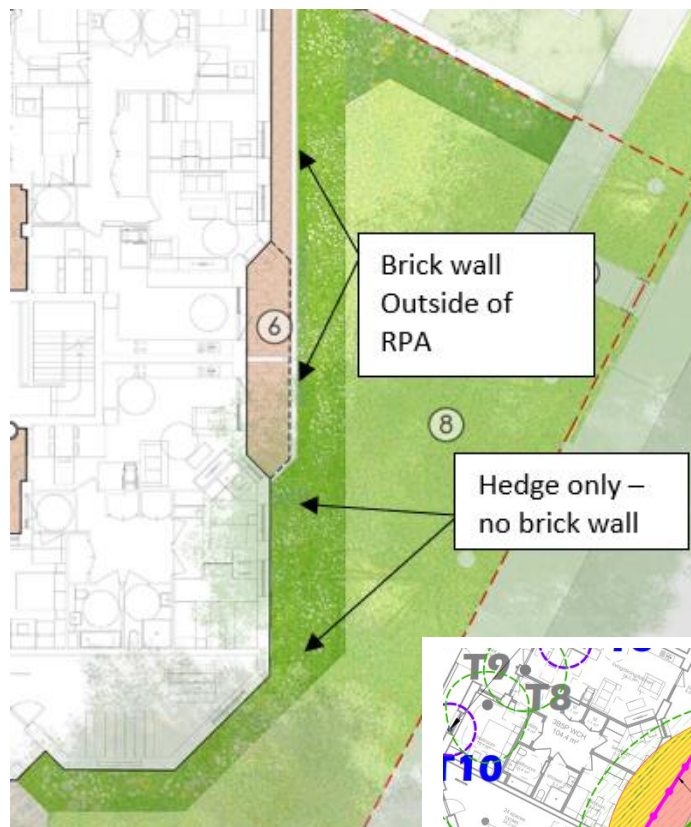


Extract of the Landscape Statement
(Turkington Martin)



Extract of the Tree Protection Plan
(Appendix B)

**T30 & T33
(Retaining
wall)**



Kerswell Close, London NR15 5RP

To ensure the retained trees are not significantly impacted and are able to thrive in line with the aspirations of the design, the following design criteria will apply: • Excavations for edging and paths etc are not carried out within 1 metre of the stem and outside of this distance are a maximum depth of 100mm (<i>except for the excavation of the proposed new footway off Seven Sisters Road, which exceeds these thresholds, having had Ground Penetrating Radar assessment, indicating that impacts on trees T11 and 12 would be acceptable</i>). • Surface materials, particularly across the RPA's previously soft will be generally permeable to allow the necessary exchange water, nutrients and oxygen. The following general criteria will also be applied: ○ Tree protection measures in place may be removed in consultation with the AC. ○ Installation of paving or other hard surfaces within RPAs will follow the principles set in task 7, above. ○ No plant or vehicles will enter soft areas of ground within the RPA. ○ No (<i>additional</i>) excavation will occur within the RPA, with the exception of small, localised post holes for fencing. ○ Post holes will be dug by hand and if significant roots are encountered (>25mm), the hole will be backfilled and another location found. ○ Small roots can be pruned flush with the soil profile with clean disinfected secateurs or a hand saw. ○ If concrete is to be used to secure posts in holes, then an impermeable barrier is to be used between the concrete and the soil profile to prevent potential toxicity to tree roots. ○ Soil, turf and other soft surfaces to be introduced will be kept to a minimum thickness (maximum 200mm) and laid upon existing soft ground, as set out in task 7 above. ○ If undulations need to be levelled, then sharp sand will be used and no excavation will be undertaken. ○ Retaining structures will be installed using pile and beam principles as set out in task 12 above. ○ No strip foundations will be installed.		
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Appendix A

Tree Schedule

Kerswell Close, Haringey, N15 5HT

Tree Survey BS5837-2012



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	<i>Acer pseudoplatanus</i> Sycamore	7.0	1	30	N 2.5	E 3.5	S 3.0	W 3.0	2.0	2.0	Early Mature	Good	Access to inspect base - Not possible. Tree out of boundary. Topped at 2m with 5m extension growth.	40.7	3.6	10-20	C	2
T2	1	<i>Fraxinus excelsior</i> Ash	8.0	1	25	N 2.5	E 3.5	S 2.5	W 1.5	2.5	3.0	Early Mature	Good	Access to inspect base - Not possible. Tree out of boundary.	28.3	3.0	10-20	C	2
T3	1	<i>Betula utilis</i> Himalayan Birch	4.0	1	10	N 2.0	E 2.5	S 2.0	W 1.5	2.0	2.0	Semi Mature	Fair	Fell - Ground level.			0-10	U	
T4	1	<i>Acer pseudoplatanus</i> Sycamore	3.5	9	9	N 2.0	E 2.0	S 2.0	W 2.0	0.5	0.5	Semi Mature	Good	Fell - Ground level.			0-10	U	
T5	1	<i>Betula utilis</i> Himalayan Birch	6.0	1	14	N 3.0	E 3.0	S 2.5	W 2.5	1.5	1.5	Semi Mature	Good	Potential transplant CAVAT Value £1,752 (175% CTI;50% location; 20-40 yr) Management objective. Transplant	8.9	1.7	20-40	B	2
T6	1	<i>Betula utilis</i> Himalayan Birch	6.0	1	13	N 2.5	E 2.5	S 3.0	W 2.5	2.0	2.0	Semi Mature	Good	Potential transplant CAVAT £1,511 Management objective. Transplant	7.6	1.6	20-40	B	2
T7	1	<i>Betula utilis</i> Himalayan Birch	6.0	1	13	N 2.5	E 2.0	S 3.0	W 2.5	2.0	2.0	Semi Mature	Good	Potential transplant CAVAT £1,511 Management objective. Transplant	7.6	1.6	20-40	B	2
T8	1	<i>Betula utilis</i> Himalayan Birch	6.0	1	12	N 2.5	E 2.5	S 2.5	W 2.5	2.0	2.0	Semi Mature	Good	CAVAT Value £885 Fell - Ground level.	6.5	1.4	10-20	C	2
T9	1	<i>Betula utilis</i> Himalayan Birch	6.0	1	11	N 2.0	E 2.5	S 3.5	W 2.5	2.0	2.0	Semi Mature	Good	CAVAT Value £744 Fell - Ground level.	5.5	1.3	10-20	C	2

Kerswell Close, Haringey, N15 5HT

Tree Survey BS5837-2012



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
T10	1	<i>Betula utilis</i> Himalayan Birch	5.5	1	13	N 3.0	E 3.0	S 2.5	W 3.0	2.0	1.5	Semi Mature	Good	CAVAT Value £1,511 Management objective. Transplant	7.6	1.6	20-40	B	2
T11	1	<i>Platanus x hispanica</i> London Plane	16.0	1	70	N 9.0	E 9.0	S 8.0	W 7.0	4.0	4.0	Early Mature	Good	Surface root close to tarmac surface	221.7	8.4	20-40	B	2
T12	1	<i>Platanus x hispanica</i> London Plane	17.0	1	78	N 10.0	E 8.0	S 10.0	W 6.0	3.0	2.5	Early Mature	Good	Surface root close to tarmac surface Prune from adjacent structure. Prune back north western canopy by 3 metres to finish 6.5m from the trunk.	275.2	9.4	20-40	B	2
T13	1	<i>Platanus x hispanica</i> London Plane	17.0	1	77	N 10.0	E 6.0	S 8.0	W 11.0	2.0	2.0	Early Mature	Good	Prune from adjacent structure. Prune back north western canopy by approximately 5 metres to finish 4.5m from the trunk.	268.2	9.2	20-40	B	2
T14	1	<i>Platanus x hispanica</i> London Plane	16.0	1	77	N 7.5	E 8.0	S 9.0	W 10.5	2.0	2.5	Early Mature	Good	Ivy on stem Prune from adjacent structure. Prune back northern canopy by approximately 2.5 metres to finish 4.3m from the trunk.	268.2	9.2	40+	B	2
T15	1	<i>Aesculus hippocastanum</i> Horse Chestnut	14.0	1	46	N 8.0	E 5.0	S 6.5	W 6.0	2.5	2.5	Early Mature	Good	CAVAT value £28,374 Fell - Ground level.	95.7	5.5	20-40	B	2
T16	1	<i>Aesculus hippocastanum</i> Horse Chestnut	14.0	1	35	N 6.0	E 2.0	S 2.0	W 5.0	2.5	4.0	Early Mature	Good	CAVAT Value £16,426 Fell - Ground level.	55.4	4.2	20-40	C	2
T17	1	<i>Fraxinus excelsior</i> Ash	10.0	1	33	N 7.0	E 7.0	S 6.0	W 2.0	3.0	2.0	Early Mature	Fair	Significant mid and upper crown die back to east CAVAT Value £4,016 Fell - Ground level.	49.3	4.0	10-20	C	2

Kerswell Close, Haringey, N15 5HT

Tree Survey BS5837-2012



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
T18	1	<i>Aesculus hippocastanum</i> Horse Chestnut	9.0	1	39	N 4.5	E 5.0	S 5.0	W 4.0	2.0	2.0	Early Mature	Good	CAVAT Value £20,395 Fell - Ground level.	68.8	4.7	20-40	B	2
T19	1	<i>Fraxinus excelsior</i> Ash	13.0	1	34	N 3.0	E 5.5	S 5.5	W 3.5	2.5	3.0	Early Mature	Fair	CAVAT Value £8,526 Fell - Ground level.	52.3	4.1	10-20	C	2
T20	1	<i>Fraxinus excelsior</i> Ash	9.0	1	21	N 2.0	E 0.5	S 0.0	W 2.5	6.0	3.0	Early Mature	Poor	Fell - Ground level.			0-10	U	
T21	1	<i>Fraxinus excelsior</i> Ash	10.0	1	28	N 4.0	E 5.0	S 4.0	W 2.5	3.0	2.0	Early Mature	Poor	CAVAT Value £1,577 Fell - Ground level.	35.5	3.4	0-10	C	1
T22	1	<i>Fraxinus excelsior</i> Ash	14.0	1	38	N 8.0	E 6.5	S 3.5	W 4.0	4.0	2.0	Early Mature	Fair	CAVAT Value £6,656 Fell - Ground level.	65.3	4.6	10-20	C	2
T23	1	<i>Fraxinus excelsior</i> Ash	14.0	1	39	N 8.0	E 2.0	S 4.5	W 6.0	3.0	2.0	Early Mature	Fair	CAVAT Value £7,011 Fell - Ground level.	68.8	4.7	10-20	C	2
T24	1	<i>Crataegus monogyna</i> Common Hawthorn/Quick/May	4.0	1	11	N 2.0	E 1.0	S 0.5	W 3.5	3.0	3.0	Semi Mature	Poor	Fell - Ground level.			0-10	U	
T25	1	<i>Crataegus monogyna</i> Common Hawthorn/Quick/May	5.0	1	17	N 4.0	E 2.5	S 3.0	W 4.0	2.0	1.5	Early Mature	Poor	Fell - Ground level.			0-10	U	
T26	1	<i>Fraxinus excelsior</i> Ash	10.0	1	22	N 1.5	E 3.0	S 5.5	W 2.5	2.5	3.0	Early Mature	Fair	CAVAT Value £2,231 Fell - Ground level.	21.9	2.6	10-20	C	2
T27	1	<i>Fraxinus excelsior</i> Ash	11.0	1	31	N 4.0	E 3.0	S 4.5	W 3.5	4.0	2.5	Early Mature	Poor	Fell - Ground level.			0-10	U	

Kerswell Close, Haringey, N15 5HT

Tree Survey BS5837-2012



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
T28	1	<i>Fraxinus excelsior</i> Ash	10.0	1	30	N 3.5	E 4.5	S 8.0	W 5.5	4.0	2.0	Early Mature	Poor	CAVAT Value £3,319 Fell - Ground level.	40.7	3.6	10-20	C	2
T29	1	<i>Fraxinus excelsior</i> Ash	10.0	1	21	N 5.0	E 2.0	S 3.0	W 3.0	2.5	3.0	Early Mature	Poor	CAVAT Value £1,626 Fell - Ground level.	20.0	2.5	10-20	C	2
T30	1	<i>Crataegus monogyna</i> Common Hawthorn/Quick/May	5.0	1	20	N 1.5	E 2.5	S 4.5	W 3.5	2.0	1.5	Early Mature	Fair		18.1	2.4	10-20	C	2
T31	1	<i>Crataegus monogyna</i> Common Hawthorn/Quick/May	6.0	1	12	N 3.5	E 1.5	S 2.0	W 1.5	2.5	2.5	Semi Mature	Poor	Fell - Ground level.			0-10	U	
T32	1	<i>Fraxinus excelsior</i> Ash	11.0	1	30	N 7.0	E 4.0	S 1.5	W 4.0	4.0	3.5	Early Mature	Fair	CAVAT Value £4,978 Fell - Ground level.	40.7	3.6	10-20	C	2
T33	1	<i>Fraxinus excelsior</i> Ash	13.0	1	40	N 8.5	E 3.5	S 7.0	W 8.0	2.0	3.5	Early Mature	Fair	Prune from adjacent structure. Prune back northern canopy by approximately 2 metres to finish 5m from the trunk.	72.4	4.8	10-20	B	2

Tree Schedule Key



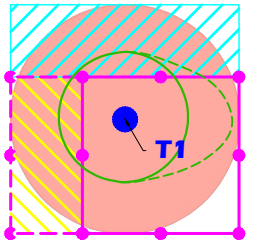
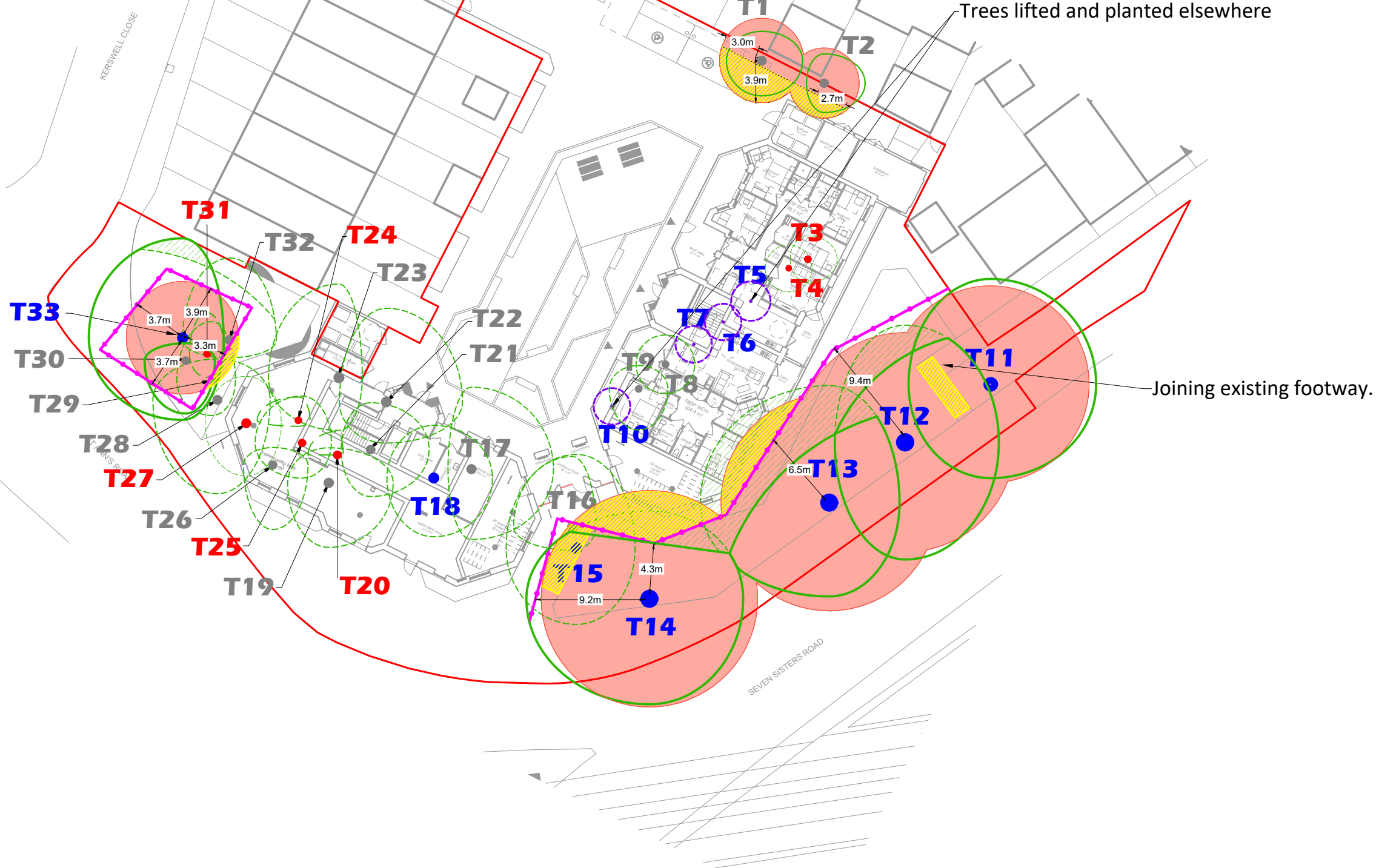
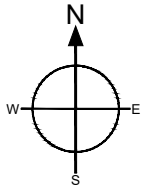
Tree/Group Reference	Reference number for individual trees or groups of trees, prefixed by T (Tree), G (Group), W (Woodland), H (Hedge) or S (Shrub) to indicate the type of feature.
Tree Count	Number of trees of a particular species recorded within a group feature, with the default value of 1 for single 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 (m²)	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 <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>			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 Protection Fencing |
| | Tree Stem Position A Category Tree | | Initial Tree Protection Fencing |
| | Tree Stem Position B Category Tree | | Ground Protection and Special Engineering / Supervised Excavations |
| | Tree Stem Position C Category Tree | | Construction Exclusion Zone |
| | Tree Stem Position U Category Tree | | Pruning/Tree Removal |
| | Tree Crown | | Site Boundary |
| | Root Protection Area | | |

Date: August 2022

Scale: 1:400 @ A3

Project Name:
Kerswell Close, Haringey, N15 5HT

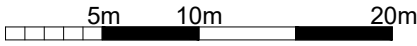
Drawing Title:
Tree Protection Plan

Drawing Number:
220826-1.8-KCH-TTP -JI



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Appendix C

Example Good Practice Method for Transplanting Trees

Good practice guidance for transplanting trees of (up to 50 -60 cm girth) and 10m height:

Note: These four trees are much smaller (at 13-14cm diameter and 6-7 m height)

1. Equipment

- a. Tree Spade (of the correct diameter and depth to be confirmed prior to lifting with the specialist operator) to remove a minimum **450mm radius** segment (subject to working around the fence railings/and/or removing the fence before transplanting) and dig the reception hole (location to be confirmed).

2. Timing

- a. Lifting and planting should be carried out between Mid -October and mid - March
- b. Watering must be carried out from start of April to end of October.

3. Prior to lifting

- a. Ensure that the tree has sufficient vitality to be successfully transplanted
- b. Prepare reception hole (location to be confirmed).

4. Transplanting

- a. Expert tree transplanting technicians using a tree spade will lift the tree
- b. Install tree in reception hole
- c. Fill voids from the location where the tree has been removed from
- d. Tree will be stabilised (e.g., underground anchoring system or above ground tree stakes and ties)

5. Post-transplant

- a. Water weekly (Minimum 56 litres of water per week) from beginning of April to end of October
 - Quantity of water may be varied in response to weather conditions and tree health
- b. Monitor tree health and condition
- c. Add or amend to growing medium depending on results of monitoring

6. Storage

- a. It possible to store a tree for up to 1 year prior to transplanting if the following measures are followed:
 - The root ball (including soil) that has been lifted with the tree is not reduced
 - Roots are protected from freezing and drying out
 - The tree is stabilised (e.g., with triangulated guy ropes)
 - The tree is watered weekly (minimum 56 litres of water per week) from beginning of April to end of October
 - Quantity of water may be varied in response to weather conditions and tree health

- The top of the root ball is dressed with tree and shrub compost mixed with a high phosphate slow-release feed
 - The compost should not be in contact with the stem
 - The compost should extend to beyond the root ball
 - Depth and mix of compost will vary depending on tree species and soil type

7. Site Supervision

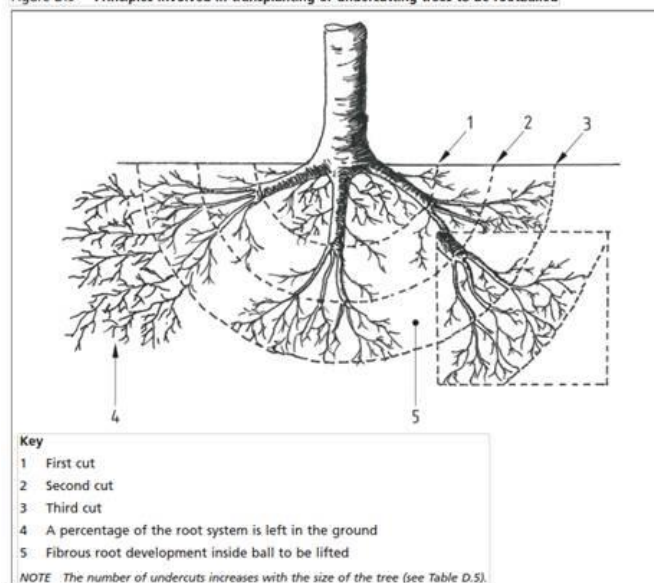
- As part of the management of retained trees and their protection measures, an Arboricultural Consultant will proactively monitor the site during active works at each of the key tasks
- The Arboricultural Consultant will visit the site assess the protection measures are compliant with the AMS, reporting to LB Haringey before site works commence.
- The Arboricultural Consultant will assess the protection measures, any damage to trees or protection measures, suitability of measures and advise on any adjustments or changes that may need to be made.
- The Arboricultural Consultant will attend (and/or receive minutes of) regular Design Team/Project Planning Meetings for discussion and input with various Project Managers and implement any changes on site in agreement with LB Haringey where necessary.

Detail

BS 8545 2014: Trees: from nursery to independence in the landscape – Recommendations, recommends tree roots are pruned prior to lifting, often referred to as undercutting.

Paragraph 3.2.4 of BS 8545 states that 'transplanting or undercutting treatment increases the amount of fibrous root which is contained in the root ball. The increase in the number and smaller size of cut roots can be significant in achieving better transplanting success. It has been estimated that when such transplanting or undercutting is not practised then as much as 95% of a young tree's root system can be left behind. The principles involved in undercutting trees to be transplanted are best shown in BS Figure D.9, an extract of which is reproduced below as figure 1. **As these trees were planted within the last 10 years, sufficient roots will be available in a 450mm radius. As such, no further root pruning is considered necessary.**

Figure D.9 Principles involved in transplanting or undercutting trees to be rootballed



Note that the guidance specifically applies to 'field grown trees. It is unknown whether these trees were 'field grown', that is, their root growth patterns are unlikely to have been artificially constrained by other structures and resource availability and are consequently more difficult to predict.

In the absence of research in this area, the principles set out in BS8545 and specifically in Table D.5 of the document, part of which is reproduced below, identifies a minimum diameter root ball required for various size trees. This indicates that a minimum root ball radius of 300mm diameter would be required for these trees. **A minimum 400mm diameter root ball for each tree. We are proposing a greater root ball of 450mm.**

Relationship between tree size and size of root ball required

Girth size of tree measured at 1 m	Minimum diameter of rootball
cm	mm
8 to 10	300
10 to 12	300
12 to 14	400
14 to 16	450
16 to 18	500
18 to 20	550
20 to 25	600
25 to 30	700
30 to 35	800
35 to 40	900
40 to 45	1 000
45 to 50	1 200
50 to 60	1 300

When moving trees, in order to better balance the root to shoot ratio and curb the levels of transpiration to reduce transplant shock, good practice (for larger trees in particular) suggests

reducing the crown before lifting by at least 30%. **In this case, the trees are small enough not to require this treatment and can be transplanted without crown pruning.**

The table below identifies the typical task sequence required for lifting and transplanting.

	Action	Risks	Risk Treatment Action
1	Transplant trees identified	-	-
2	New Location identified	Is a suitable receptor site available?	Yes, on site (exact position to be confirmed with the project landscape architect)
3	Undercutting x2	Does the project timetable allow this time?	No undercutting is required
4	Lifting and planting should be carried out between Mid-October and Mid- March	Is this seasonal window compatible with the project plan? Does in house expertise exist?	If not and operation has to be carried out before Mid - October, seek additional advice. It is possible to store the trees for up to 1 year prior to transplanting? Storage is possible but not considered necessary. Yes. Expert transplanting technicians to be used
4	Prepare reception hole with tree spade	Does site allow for Tree Spade equipment? What sign offs are required from other agencies	Early liaison with agencies (July-August)
5	Fill voids with suitable temporary material.	Public hazard	Fill voids and/or exclude public from the site.
6	Plant trees in new location (including labour, lifting equipment and associated materials, including irrigation systems and guying)	Can lifting equipment (mini crane) safely access site?	The tree is of a size that it will be moved by hand, possibly using small plant. Where plant is used suitable ground protection measures (compliant with the associated Arboricultural Method Statement, Ref 220812-1.0-KS-AMS). Early liaison with the supplier and appropriate agencies to ensure safe access and if found problematic, enable further options to be examined.
7	3- year Post Planting Maintenance		Form part of a maintenance contract with full replacement clause, including flexibility to ensure additional watering to be carried out in unusually dry periods.
8	Post planting tree health assessment (by an arboriculturist)	Stakeholder concern over medium to long term survival.	Annual tree health report and 'Hand over' report in <u>year 3</u> , delivered to LB Haringey to demonstrate whether transplanting has been successful and if not.

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

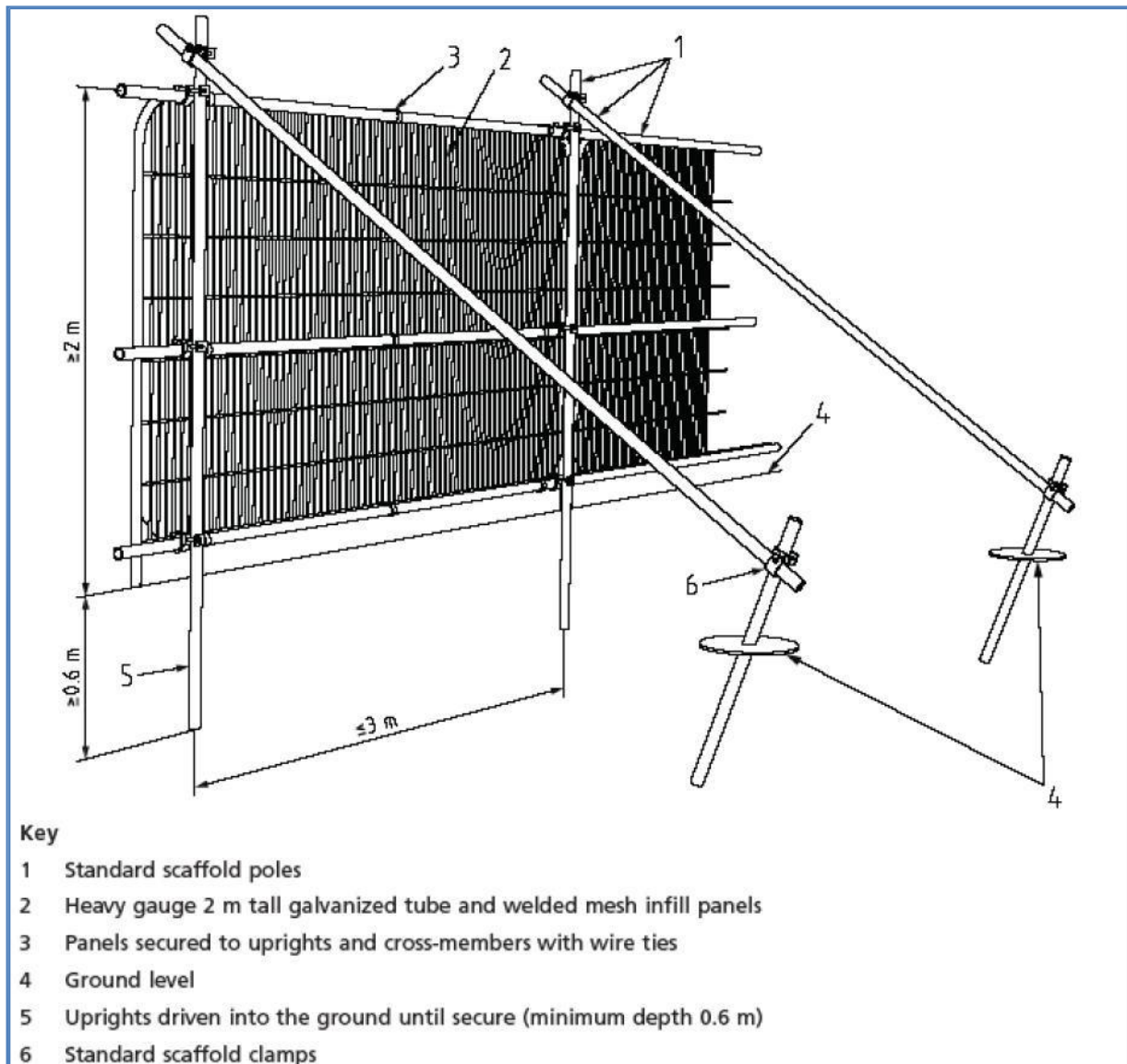
Tree protection fencing will be located at the edge of the Construction Exclusion Zone (CEZ) and will be suitably robust to provide sufficient protection for trees. The performance requirement for fencing will be determined by the type of activity that will take place in the area around the CEZ.

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

- o Tree Protection Fencing will be installed prior to commencement of activity on the site.
- o Tree Protection Fencing will only be removed once all works associated with the development have been completed.
- o The Tree Protection Fencing will be installed and removed without causing damage to retained trees.
- o Installation, removal and, where required, replacement of Tree Protection Fencing will be supervised and signed off by the Arboricultural Consultant.
- o The Tree Protection Fencing will be stable and robust (typical construction method, in accordance with BS5837: 2012, see below).
- o The area between the Tree Protection Fencing and the tree will be a Construction Exclusion Zone (CEZ)
- o 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.
- o The CEZ will be clearly identified (see Construction Exclusion Zone sign example below)



Example Tree Protection Fencing Sign



BS5837: 2012 - Figure 2 – Tree Protective Barrier

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:

What is the RPA?

Root Protection Areas (RPA's) are a layout design tool, indicating the minimum area around a tree deemed to contain sufficient roots and soil volume to maintain the tree's viability. RPA's should be treated as a precautionary area within which activities such as ground compaction, excavation, storing of materials, ground stripping, raising of levels and building are likely to cause damage to trees and therefore excluded.

The Tree Constraints and Tree Protection Plan identify the RPA with a red circle.

Construction and Level changes within the RPA

- Construction (including the removal of hard surfaces) within tree Root Protection Areas (RPA's) should, where practicable, accord to the principle that the tree and its soil structure take priority, and that the most reliable way to ensure this is to preserve the RPA undisturbed.
- The AC will review any operation which involves the removal of existing hard surfaces within the RPAs of retained trees and input additional methodology where necessary

In general, works will follow the points below:

- Excavators required to remove the surface will be positioned on existing hard surface **outside the RPA** and will not operate on areas where the surface has been removed.
- Any other works inside the RPA, where the surface has been removed will be undertaken with hand operated tools only.
- Any exposed roots which may be present will either be pruned or kept damp and out of direct sunlight whilst exposed.
- In hot conditions, exposed roots will be dampened down within 1 hour and wrapped in a damp hessian material or similar.
- Any root pruning will be undertaken with clean disinfected secateurs or clean disinfected hand saw.
- No significant roots will be pruned. Significant roots are considered to be woody roots **>25mm** diameter.
- Where possible, existing base stone will be retained to minimise the potential damage to tree roots.
- New surfaces will be installed within 48hrs of removing the old. Where this is not possible, then a temporary surface will be installed over the exposed area of the RPA. The temporary material will be suitable for purpose.

Changing Ground Levels

Ideally, there should be no change to ground levels within 1m of the stem of a tree and, beyond this prohibited zone, reduction in ground level of 100mm and increase in ground level of 200mm are considered to be significant with a high potential to harm the tree.

- Significant changes in ground levels are required across the site. The potential impact to trees have been assessed by the AC and detailed specifications have been developed in consultation with the Project Engineers and Landscape Architect to ensure any changes do not result in significant damage to retained trees.

- As the scheme develops, it is considered that 'no dig' raft systems will enable the successful retention of trees in the long term.
- In general, works will comply with the following performance criteria:

Reducing Ground Levels

Where ground levels are to be reduced the following process and methods will be employed to ensure that trees are not critically impacted:

- Detailed assessment of the presence, location and significance of tree roots in the affected area, including:
 - Visual ground assessment
 - Trial excavation (where appropriate).
- Where the impact can be kept to an acceptably low level to ensure that the tree remains viable, the work will be carried out the excavation under the following conditions:
 - All operations by hand / using hand operated tools

Where the impact cannot be kept to an acceptably low level, the design will be revised.

Raising Ground Levels

Where ground levels are to be raised, methods will need to meet the following performance criteria:

- Ensure that tree roots are not damaged
- Ensure that soil is not compacted
- Ensure that sufficient water reaches tree roots
- Ensure that the components exist for a functioning soil ecosystem within the soil around tree roots
- Ensure that gaseous exchange can take place within the soil around tree roots
- Ensure that sufficient space is retained between tree stem and the raised ground to prevent damage to the stem and allow for incremental stem growth

The general technical specification would be likely to comprise the following components.

1. Removal of existing hard surfaces
2. Retention of any existing sub base below hard surfaces
3. Removal of any existing vegetation
4. Installation of a self-supporting structure to retain the built up ground away from the stem and root buttresses of the tree
 - For example; a circular concrete wall, without footings, built up from the existing ground level, around the stem of the tree, at approx. 1m from the stem.
5. Ventilation pipe
 - For example; 75mm diameter pipes, laid horizontally at the existing ground level at 1m to 2m spacing throughout the affected root area, with vertical vents connecting the pipes to the proposed surface.
6. A containment system (e.g. Sylva Cell or Cell web) to provide stability to the raised ground and reduce the risk of compaction to the existing ground below.
7. Build up levels with loose, lightweight granular material that allows air and water to pass through it and provides sufficient support to the finished ground.
 - Upper 300mm would typically be made up of 10mm – 25mm grade lightweight expanded aggregate.

- The space below the upper 300mm could be made up of clean, uncontaminated stone of up to 150mm grade.
- 8. A geotextile membrane will be laid over the aggregate.
- 9. The finished surface will be laid / built up from the membrane.

Appendix D

Example Construction Exclusion Zone Sign

(suggest A3 size affixed to every other panel at eye level)

WARNING

**THIS AREA IS A CONSTRUCTION
EXCLUSION ZONE. IT IS A
BREACH OF PLANNING
PERMISSION TO DAMAGE TREES
OR ANY PART OF THEIR ROOTS
OR BRANCHES WITHIN THIS
AREA. IF THIS FENCING IS
DAMAGED PLEASE REPORT TO A
SITE MANAGER IMMEDIATELY.**

Appendix E

Arboricultural Clerk of Works Report Form

Site Inspection Report

Completion of Arboricultural Operations – Monitoring Form

Site Name:		
Site Address:		
Client Name:	Instructed By:	
Site Manager:		
Arboricultural Operation Checked By:	Date:	Approved / Not Approved
Operation Completed / Additional Works Required:		
Number of Photographs Supplied:		
Completed By (Contractor Name):		Contractor / Subcontractor
Copied to LPA	Yes / No	Contact Name:
Copied to Client	Yes / No	Contact Name:
Copied to Site Manager	Yes / No	Contact Name: