Twickenham Riverside

Arboricultural Impact Assessment and Method Statement

LONDON BOROUGH OF RICHMOND UPON THAMES

July 2021

Design Team

Applicant	London Borough of Richmond upon Thames
Project Manager	Arcadis
Architect	Hopkins Architects
Landscape Architect	LDA Design
Structural Engineer	Webb Yates Engineers
Mechanical & Electrical Engineer	Skelly & Couch
Transport Consultant	WSP
Quantity Surveyor	Arcadis
Planning Consultant	Savills
Townscape & Heritage Consultant	Iceni Projects
Sustainability Consultant	Method Consulting
Accessibility Consultant	Lord Consultants
Fire Consultant	FDS Consult UK
Ecology Consultant	BSG Ecology
Arboricultural Consultant	Thomson Environmental Consultants
Daylight & Sunlight Consultant	GIA Chartered Surveyors
Acoustic Consultant	TetraTech
Air Quality Consultant	Entran
Land Contamination Consultant	Geosphere Environmental
Archaeological Consultant	AOC Archaeology Group
Viability Consultant	Lambert Smith Hampton
Principal Designer	Nick Perry Associates
BIM Consultant	BIM Technologies

Thomson environmental consultants

Twickenham Riverside

Arboricultural Impact Assessment

and

Arboricultural Method Statement

For

London Borough of Richmond upon Thames

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Project No.: A-ALP-152/001

July 2021

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Project Number	Report No.
AALP152/001	002

Revision No.	Date of Issue	Author	Reviewer	Approver
001	30/07/2021	Andy Poynter	Neil Francis	Simon Mackrell

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Contents

1. Summary

1.1.1 London Borough of Richmond upon Thames is proposing the demolition of existing buildings and structures and redevelopment of the site comprising residential (Use Class C3), ground floor commercial/retail/cafe (Use Class E), and public house (Sui Generis), boathouse locker storage and floating pontoon with associated landscaping, restoration of Diamond Jubilee Gardens and other relevant works.". (see Figure 1).

1.1.2 Arcadis LLP commissioned Thomson Environmental Consultants (Thomson) to produce an Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) detailing the protection of trees at the site.

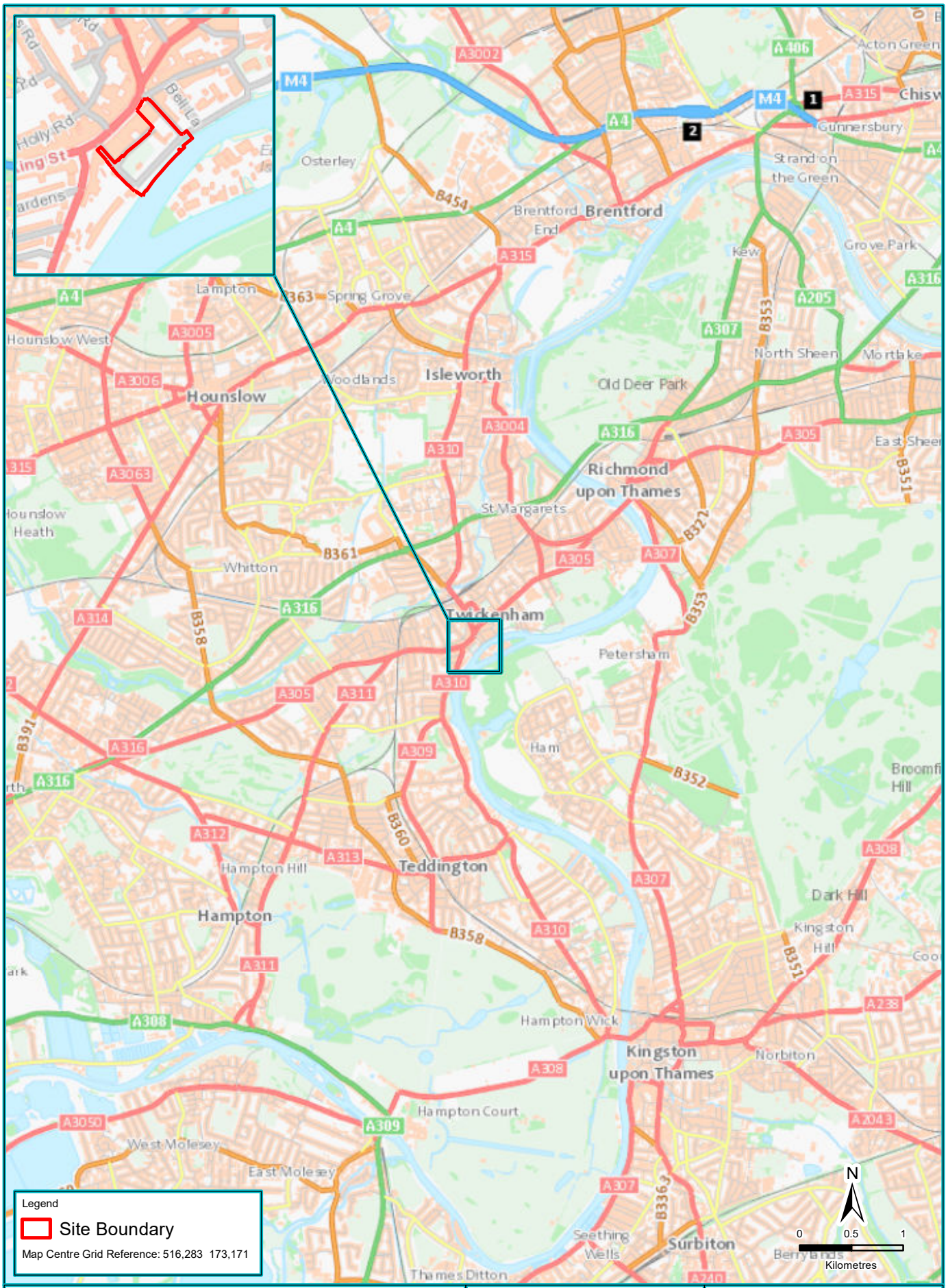
1.1.3 An arboricultural survey was previously carried out by Thomson in July 2020 in accordance with BS5837:2012 '*Trees in Relation to Design, Demolition and Construction – Recommendations'* (BS5837:2012), the results of which can be seen in Thomson report reference AALP152/001/001/003 (Thomson, 2021).

1.1.4 A total of 44 individual trees, one tree within group G3 and two groups and will be removed as part of the development. There are retained and relocated trees that will be protected through the construction phase by protective fencing, ground protection and the utilisation of arboricultural supervision during certain construction activities.

1.1.5 The site will continue to provide public amenity and the proposed tree planting will make a long term contribution. Some trees will be relocated within the site and additional trees will be planted.

1.1.6 Within the proposals there are underground soil volumes identified within the landscape strategy. This rooting medium will be delivered through either structural soil or soil cells. Moreover these will be connected beneath ground to provide a suitable reserve for the demanding conditions of the site.

1.1.7 The trees identified for retention and relocation can be managed and protected during the redevelopment of the site.



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		Date: 21/07/2020	Date: 21/07/2020

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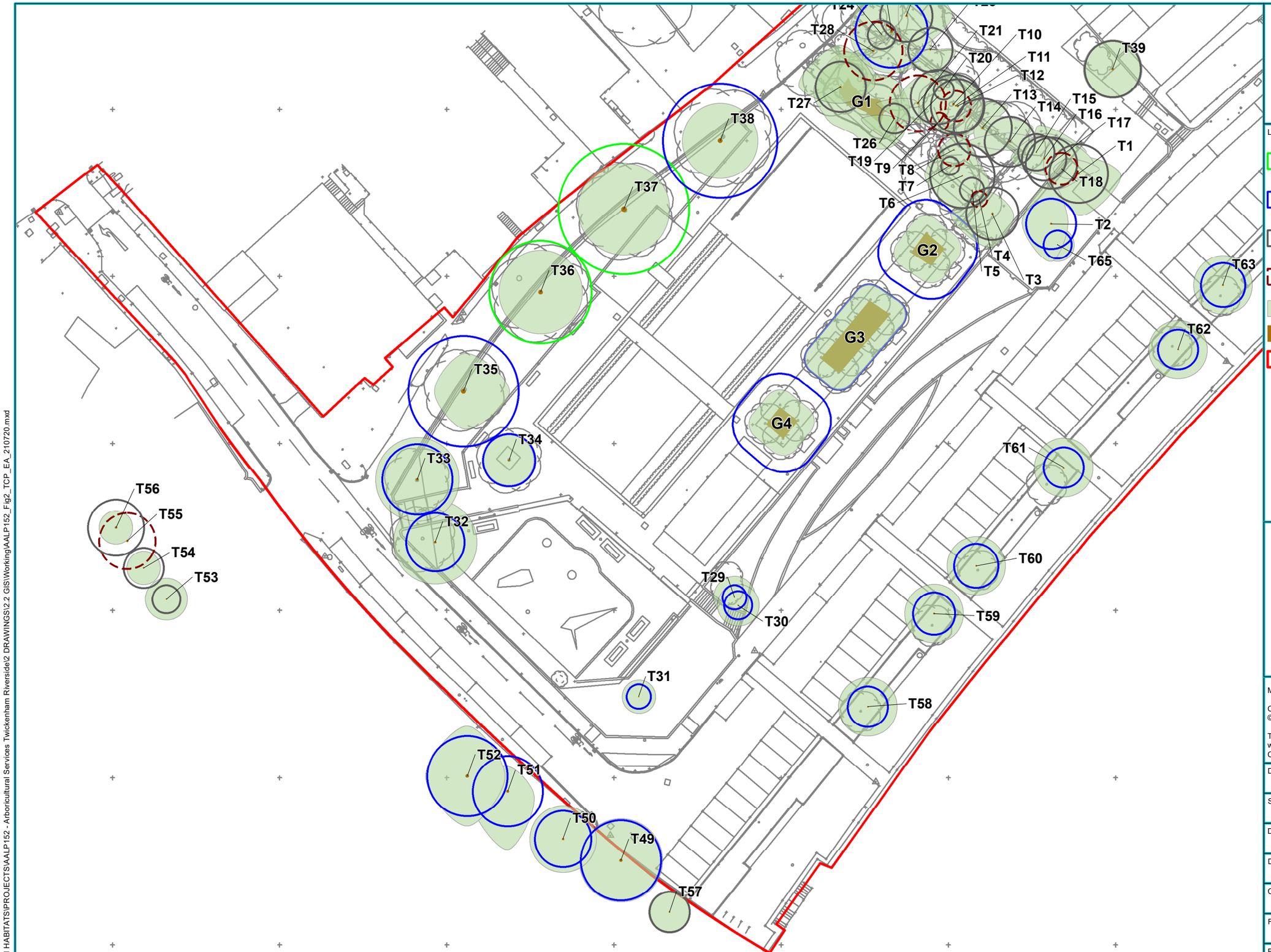

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Legend

- Root Protection Area of Category 'A' Tree
- Root Protection Area of Category 'B' Tree
- Root Protection Area of Category 'C' Tree
- Root Protection Area of Category 'U' Tree
- Tree Canopy Extents
- Tree Stem Location
- Site Boundary

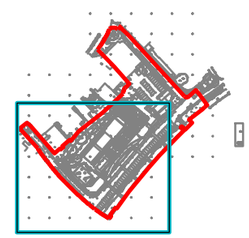

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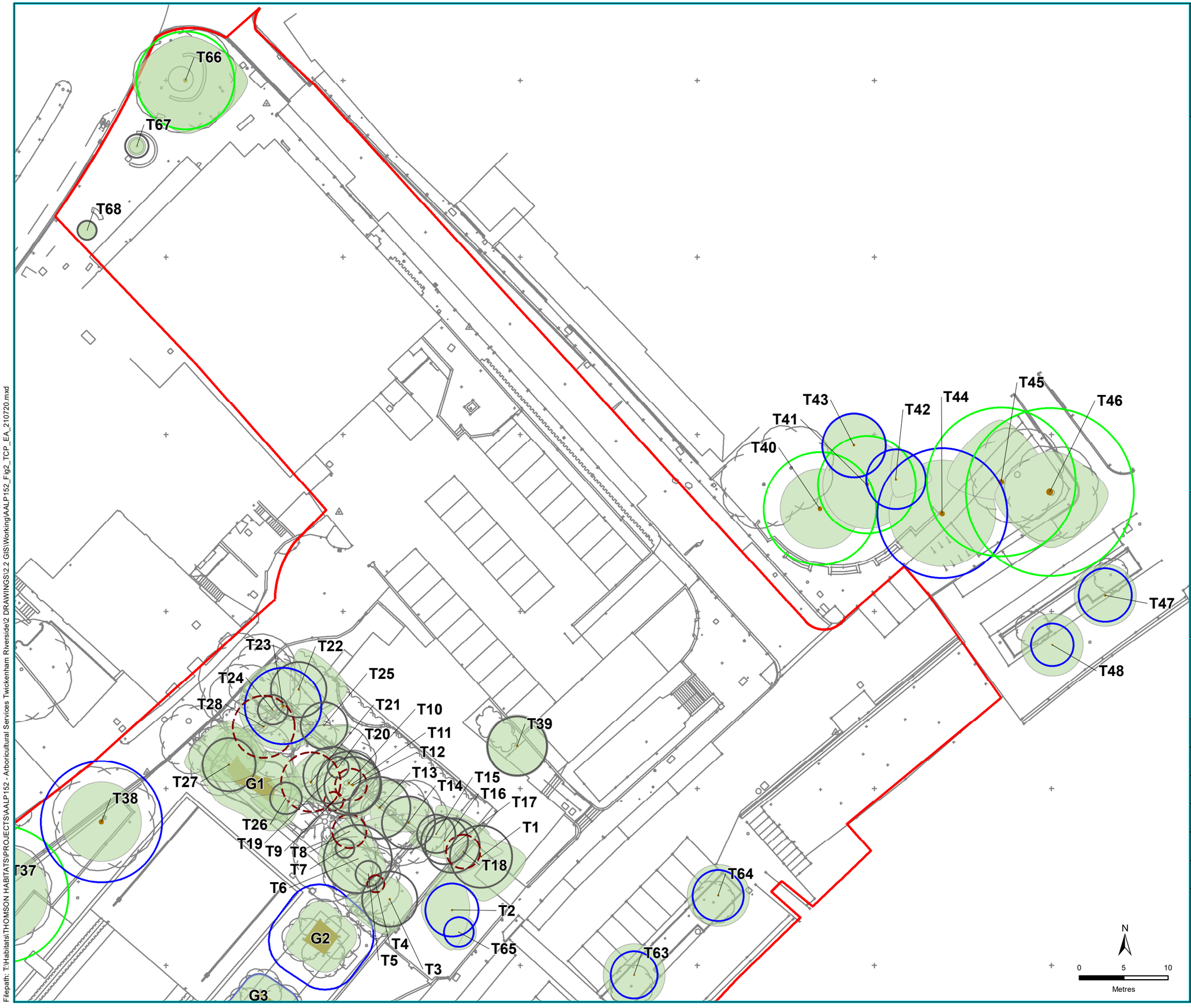
Figure Title	Tree Constraints Plan (TCP01)



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Legend

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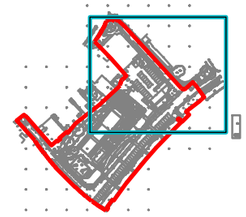

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Client	Arcadis LLP
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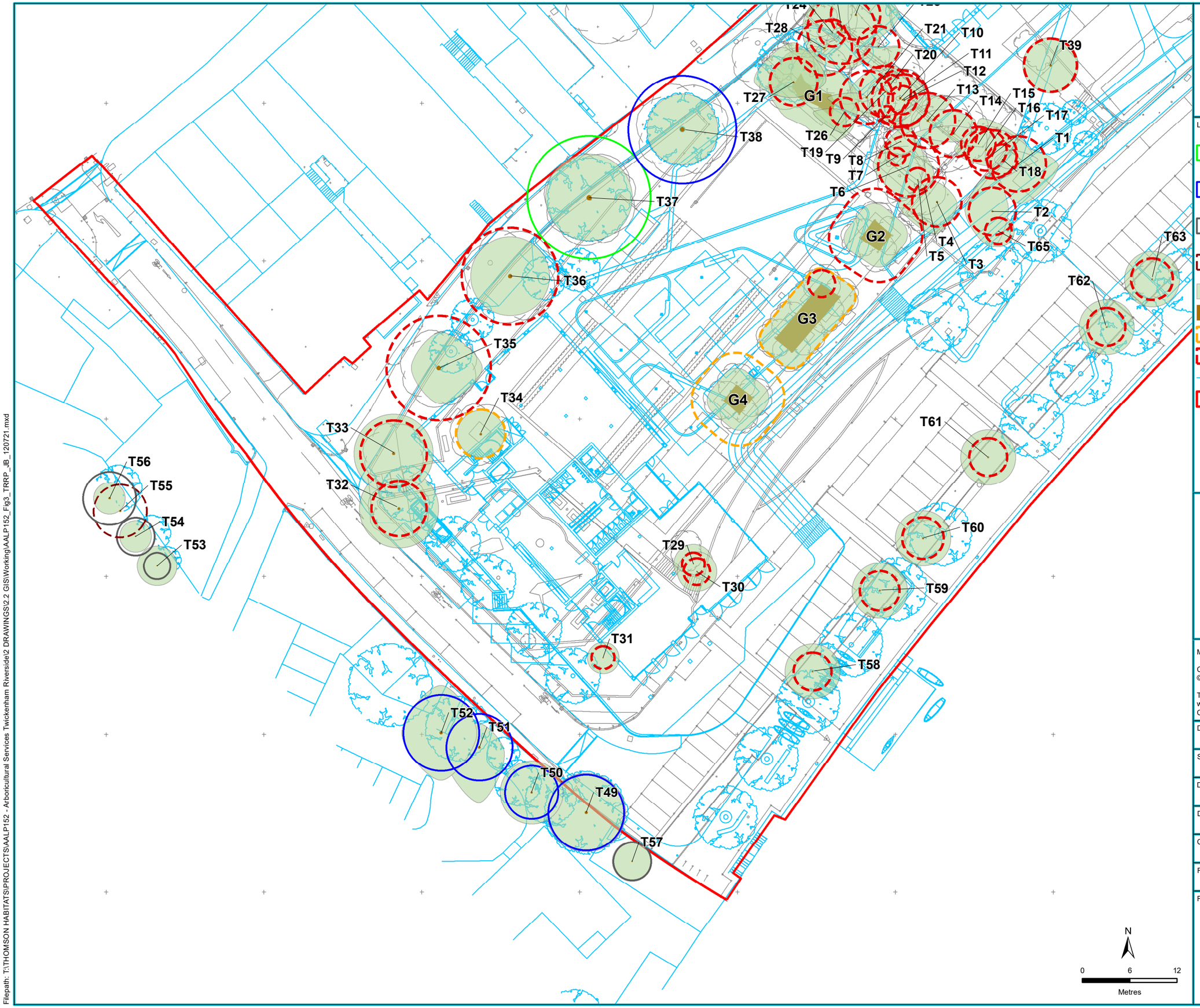
Figure Title

Tree Constraints Plan (TCP01)



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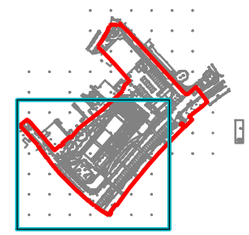
Legend

- Root Protection Area of Category 'A' Tree
- Root Protection Area of Category 'B' Tree
- Root Protection Area of Category 'C' Tree
- Root Protection Area of Category 'U' Tree
- Tree Canopy Extents
- Tree Stem Location
- Trees to be Relocated
- Trees to be Removed
- Proposed Layout
- Site Boundary



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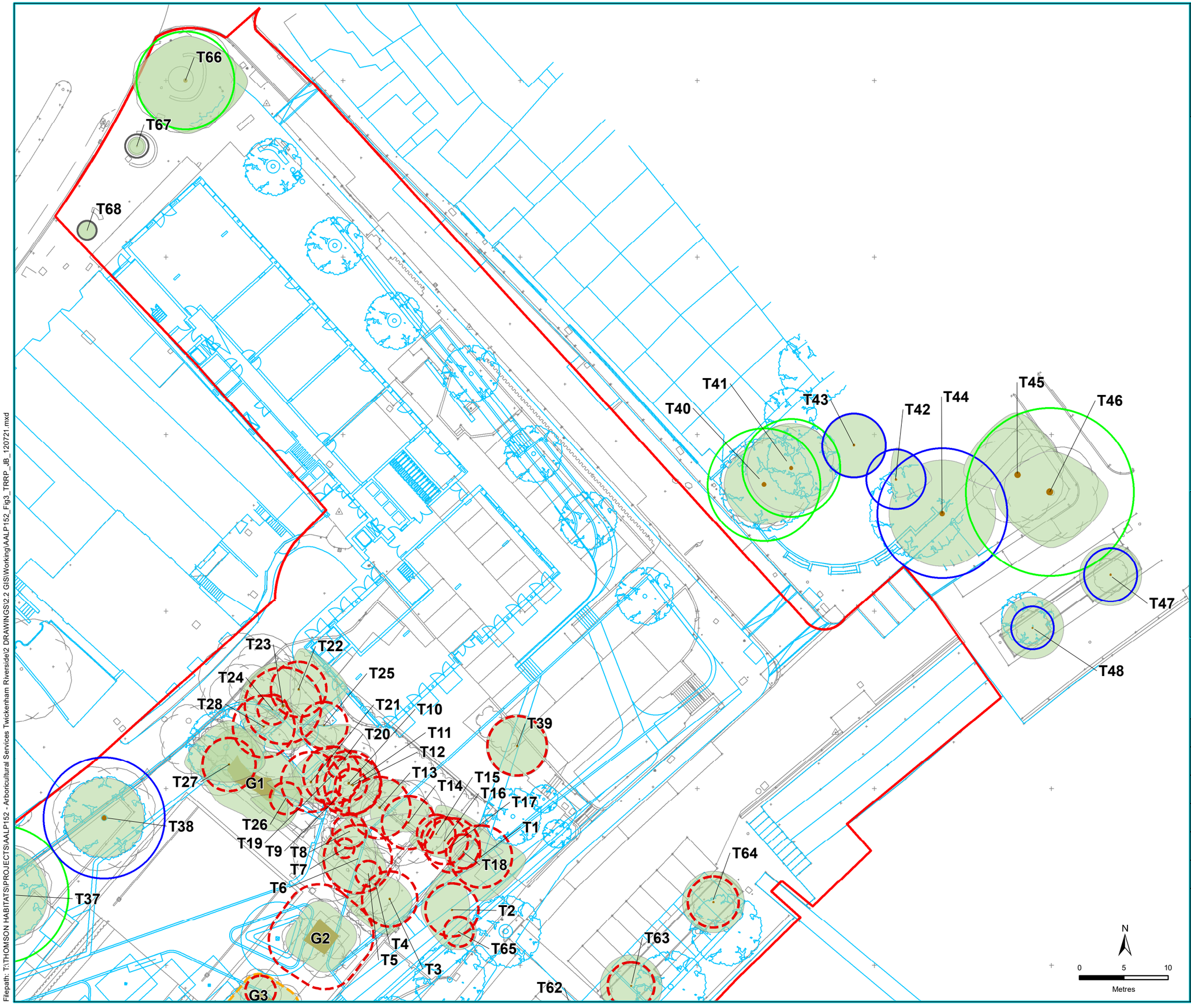
Client	Arcadis LLP
Figure Number	3a

Figure Title

Tree Removal and Retention Plan



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Legend

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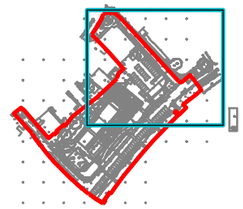

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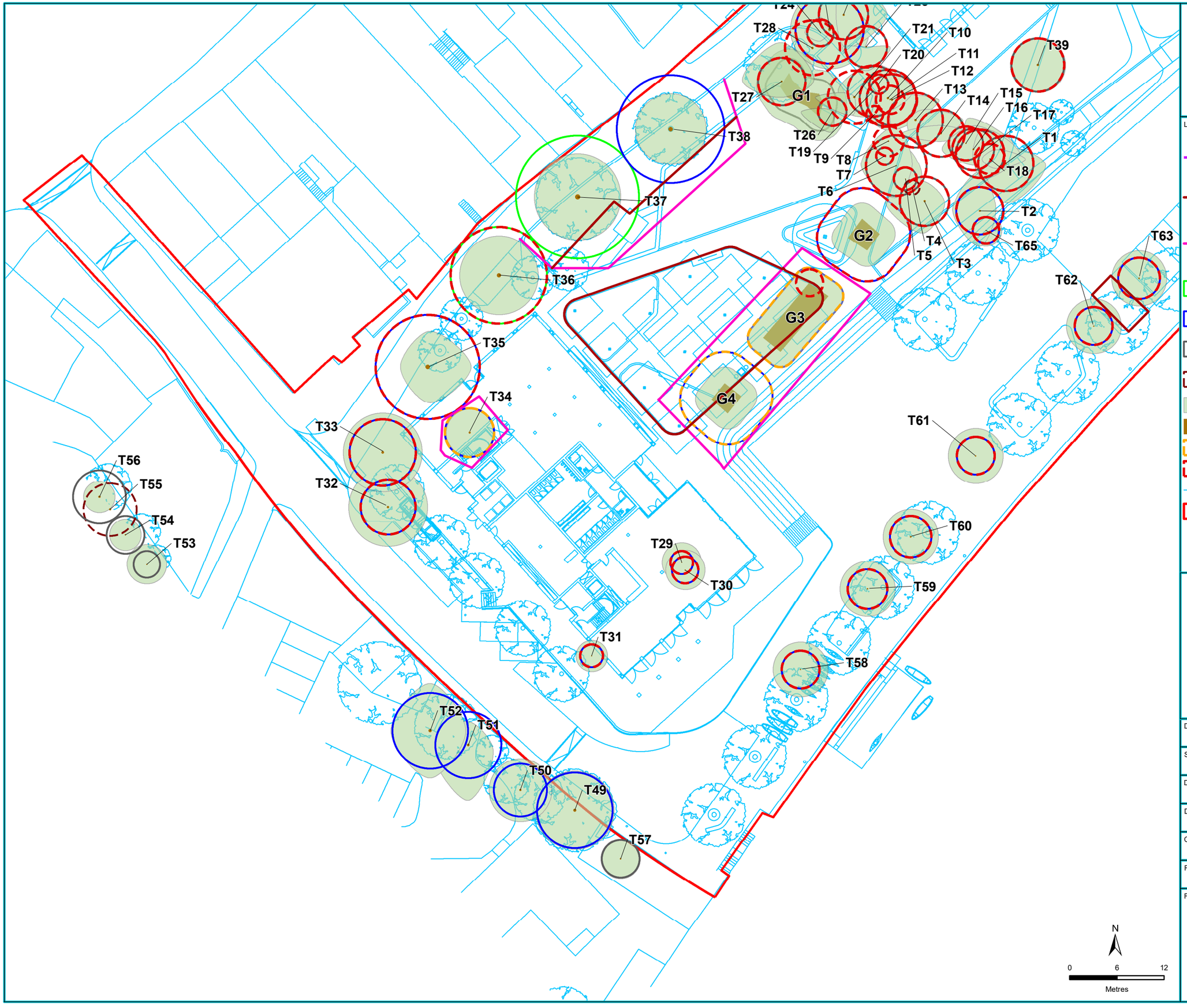
Figure Title	Tree Removal and Retention Plan



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Legend

- Adjusted Position of Protective Fencing for Works within Root Protection Areas
- Tree Protection Fencing after Re-Location
- Tree Protection Fencing during General Demolition/Site Clearance for Retained and Relocated Trees
- Root Protection Area of Category 'A' Tree
- Root Protection Area of Category 'B' Tree
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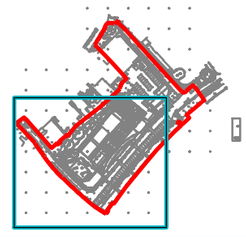

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Date: 12/07/2021	Date: 12/07/2021
Client	Arcadis LLP
Figure Number	4a
Figure Title	Tree Protection Plan

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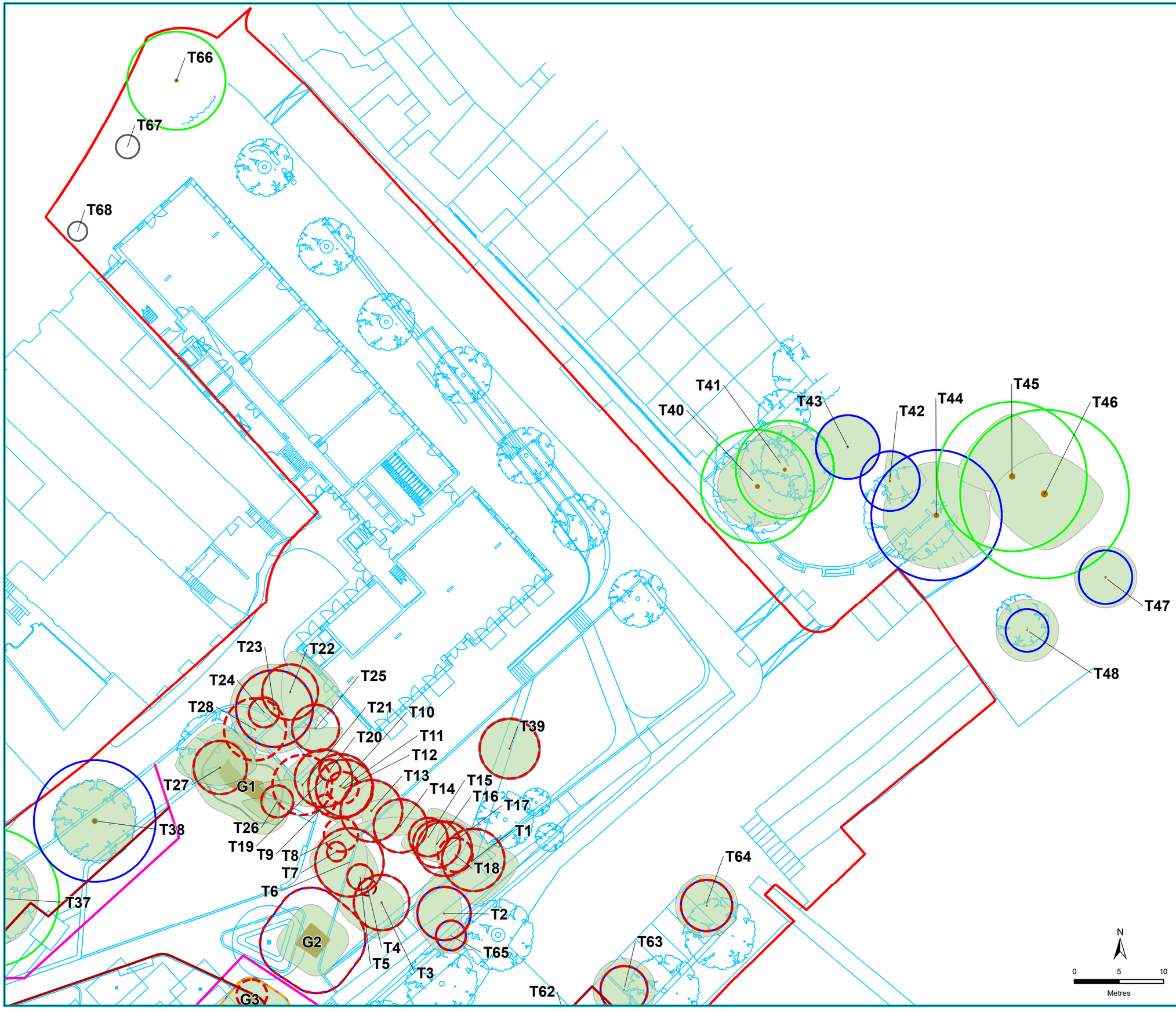

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Legend

- Adjusted Position of Protective Fencing for Works within Root Protection Areas
- Tree Protection Fencing after Re-Location
- Tree Protection Fencing during General Demolition/Site Clearance for Retained and Relocated Trees
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- Root Protection Area of Category 'U' Tree
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- Trees to be Removed
- Proposed Layout
- Site Boundary

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Date: 12/07/2021	Date: 12/07/2021
Client	Arcadis LLP
Figure Number	4b
Figure Title	Tree Protection Plan

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2. Introduction

2.1 Development Background

2.1.1 Arcadis LLP is involved in the development of a site located at 1, 1A, 1B and 1C King Street; 2-4 Water Lane; the site of the former swimming pool and associated buildings, The Embankment; the Diamond Jubilee Gardens, Twickenham, London.

2.1.2 The proposal comprises the demolition of existing buildings and structures and redevelopment of the site comprising residential (Use Class C3), ground floor commercial/retail/cafe (Use Class E), and public house (Sui Generis), boathouse locker storage and floating pontoon with associated landscaping, restoration of Diamond Jubilee Gardens and other relevant works. These proposals are hereafter referred to as 'the development'.

2.1.3 The development is located on an approximately 1.34ha area of land (grid reference TQ163731), shown on Figure 1. The area affected by the development is hereafter referred to as 'the site'.

2.1.4 There are a number of trees within the site boundary that will be affected by the development.

2.2 Arboricultural Background

2.2.1 An arboricultural survey of the site was undertaken by Thomson on July 2020. The survey was undertaken in accordance with BS5837:2012.

2.2.2 A total of 68 individual trees and four groups were recorded during the survey and listed in the Tree Schedule (see Appendix 1). Definitions of each retention category can be seen in Appendix 2.

2.3 Brief and Objectives

2.3.1 Arcadis LLP commissioned Thomson to produce an AIA and AMS.

2.3.2 The objective of the survey and report was to assess the condition of the existing trees on site and any off site trees that might be affected by the development, providing sufficient information to enable decisions to be made on potential design layout and tree retention for the proposed development. The brief was to (delete/add to as appropriate):

- An Arboricultural Impact Assessment (AIA), based on the proposed site layout, which evaluates the direct and indirect effects of the proposed design on the trees on site, identifies which trees can realistically be retained, and recommends any necessary mitigation to protect those trees.
- An Arboricultural Method Statement (AMS) detailing how retained trees will be protected on site and how any aspect of the development that is within the root protection areas of retained trees will be implemented with minimum impact on the future health of the trees.
- A Tree Protection Plan detailing how retained trees will be protected during development works.

Limitations

2.3.3 The information provided within this report and in the accompanying Tree Schedule covers only those trees that were inspected and their condition at the time of survey.

2.3.4 The Arboricultural Impact Assessment and Method Statement are based on the documents provided and referred to within this report. Drawings and documents issued by others following this assessment may require the impacts to be reviewed.

3. Arboricultural Impact Assessment (AIA)

3.1 Introduction

3.1.1 The purpose of the AIA is to assess the likely impact of the proposed development on the existing trees on site and to determine which trees are to be removed or retained during the construction phase.

3.1.2 The protection of retained trees is paramount to their survival during the development process and their consequent long term contribution to the site. The Root Protection Areas (RPAs) identified in the arboricultural survey and Tree Constraints Plan (TCP) should remain protected throughout the development to avoid potential damage, such as:

- Soil compaction;
- Root severance due to excavation;
- Soil coverage with impermeable material;
- Alterations in ground level;
- Leaks and spillages from stored materials; and
- Vehicle and heavy plant collision.

3.2 Documents

3.2.1 This assessment has been based on documents produced by [insert name]. The details of these documents can be seen in Table 5.

Table 1: Documents upon which this assessment has been based

Originator	Reference No.	Title
Hopkins Architects Limited	TRS-HAL-ZZ-00-DR-A- 2500-P04	Proposed Ground Floor GA Plan
LDA	Landscape DAS	Landscape DAS
LDA	Landscape supporting technical drawings	Landscape supporting technical drawings
LDA	6975-103	General Arrangement Tree Pit Plan
Waterwise	WWS-J2132-DWG-001-00	Irrigation system: Areas to be irrigated automatically

3.3 Tree Removals

3.3.1 A total of 44 individual trees, one tree within group G3 and two groups and will be removed as part of the development. A breakdown of the associated categories assigned to these specimens can be seen in Table 6 and the species of tree to be removed in Table 7. They are identified on the Tree Retention and Removal Plan at Figure 3.

Table 2: Number of trees to be removed within each retention category

Removal	Tree Category			
	A	B	C	U
Number of Trees	1	15	21	7
Number of Groups	0	0	2 and one tree within G3	0
Total	1	15	23	7

Table 3: Details of trees to be removed

Tree Number	Species	Category	Reason
T1	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T2	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T3	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T4	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T5	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T6	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T7	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T8	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T9	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T10	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T11	**Goat willow**; *Salix caprea*	Remove.	To facilitate development
T12	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T13	**Goat willow**; *Salix caprea*	Remove.	To facilitate development
T14	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T15	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T16	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T17	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T18	**Silver birch**; *Betula pendula*	Remove.	To facilitate development
T19	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T20	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T21	**Goat willow**; *Salix caprea*	Remove.	To facilitate development

Tree Number	Species	Category	Reason
T22	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T23	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T24	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T25	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T26	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T27	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T28	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T29	**Himalayan birch**; *Betula utilis*	Remove.	To facilitate development
T30	**Himalayan birch**; *Betula utilis*	Remove.	To facilitate development
T31	**Himalayan birch**; *Betula utilis*	Remove.	To facilitate development
T32	**Indian bean tree**; *Catalpa bignoniodes*	Remove.	To facilitate development
T33	**Indian bean tree**; *Catalpa bignoniodes*	Remove.	To facilitate development
T35	**Hornbeam**; *Carpinus betulus*	Remove.	To facilitate development
T36	**Hornbeam**; *Carpinus betulus*	Remove.	To facilitate development
T39	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T58	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T59	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T60	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T61	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T62	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T63	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T64	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T65	**Hornbeam**; *Carpinus betulus*	Remove.	To facilitate development
G1	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
G2	**London plane;** *Platanus x hispanica*	Remove all four trees.	To facilitate development
G3	**London plane;** *Platanus x hispanica*	Remove one of eight trees.	To facilitate development

3.3.2 The majority of the trees (T1-T29) to be removed are within the currently hoarded off area where most of the trees appear to be self sown.

3.4 Trees to be Retained

3.4.1 Within the red-line boundary there are three trees on the high street (T66-T68) to be retained, within the main project are there are two prominent hornbeams (T37 and T38) to be retained.

3.4.2 The RPAs of the retained trees should be protected by fencing to the specification laid out in BS5837:2012. The specification of this fencing is detailed in Section 4.7 of the AMS and an illustrated example can be seen in Appendix 4. The area protected by the fencing shall be known as the Construction Exclusion Zone (CEZ).

3.4.3 Works will be required within the RPAs of trees T37 and T38 and ground protection will be used to protect the integrity of the RPAs and prevent soil compaction and root damage. The retaining wall is being removed and the trees will benefit from an increased soil volume provided for within the proposals. There will be a need to have arboricultural supervision whilst works within the RPA are being undertaken.

3.4.4 There are 12 tree to be retained through relocation, these are poplar T34, G3 (except one tree and G4.

Shading

3.4.5 In urban areas, shading can be desirable to reduce excessive solar heating or glare and to provide shelter and comfort during hot weather. The combination of shading, wind speed and evapo-transpiration effects of trees can be combined with building design and landscaped spaces to provide local microclimatic benefits.

3.5 Tree Works

3.5.1 Prior to the erection of protective fencing, there are two trees (T37 and T38) which, in order to maintain their health and future structural integrity, require some maintenance works. All tree work is to be undertaken in accordance with the British Standard BS3998:2010 Recommendations for Tree Work (BS3998:2010). There are trees to be relocated, this is a specialist operation that will be undertaken by a specialist sub-contractor.

Table 4: Schedule of tree works for on-site trees

Tree No.	Species	Works	Category
T34	**Black poplar**; Populus nigra	Relocate.	B1 2 3
T37	**Hornbeam**; *Carpinus betulus*	Crown lift to 4m.	B2
T38	**Hornbeam**; *Carpinus betulus*	Crown lift to 4m.	A1 2
G3	**London plane;** *Platanus x hispanica*	Remove one of eight trees. Relocate remaining seven trees.	B2
G4	**London plane;** *Platanus x hispanica*	Relocate all four trees	B2

3.6 Construction Work within RPAs

3.6.1 The new play area of the proposed development incurs into the RPAs of T37 and T38. The incursion should be seen as a positive impact for the trees in the long term as the works involve the removal of the existing retaining walls and reducing the extent of hard surfacing. The hard surfacing will be replaced with a soft and porous play-surface.

3.6.2 The high street trees (T66-T68) are remote from the main development, the only work in the vicinity is the installation of a speed table but this is several metres from the RPA of oak T66.

3.7 Services and Utilities

3.7.1 The final route of underground services is not available at this time. However, it is anticipated that underground services serving the new development will be routed to avoid the existing trees' RPAs and accommodate the proposed planting.

3.7.2 The extent of services within the highways has not been determined but new trees are set back from the highway so there is a reduced likelihood of conflict.

3.7.3 If service installation is required within RPAs of any of the five retained trees then the guidelines within National Joint Utilities Group publication '*Guidelines for the planning, installation and maintenance of utility services in proximity to trees*' (NJUG 4, 2007) should be adhered to.

3.8 Post Development Management

3.8.1 As the retained trees are located adjacent to a play area that will be used by the public they should become subject to regular inspection by a qualified arboriculturist if there is no regime currently in place.

3.8.2 Although the site only has a low retained tree population, there will be a significant change in its use. Therefore the retained trees and the new trees planted as part of the final landscaping scheme should be subject to some form of tree management system. Guidance on the level of tree management required can be found in the National Tree Safety Group publication, '*Common sense risk management of trees*' (NTSG, 2011).

3.9 New Planting

3.9.1 The proposed layout indicates a total of 35 new trees to be planted as part of the new landscaping scheme. This level of new planting should be sufficient to compensate for the trees and groups of trees being removed listed in Table 7. Additionally there are 12 trees being relocated.

3.9.2 It is an opportunity to replace the struggling pin oak trees with species more suitable for the site and its usage. The reasons for the poor condition of the Pin oaks is unclear and it is hoped that this development will provide an opportunity to review the previous installation and through detailed inspection along with soil and water testing, understand the factors that have contributed to their condition. These investigations are separate from the planning application but may inform the final species selection.

3.9.3 When deciding what tree to plant, the available space above and below ground is often overlooked. Knowing what a tree will look like in 10 and 30 years' time is important as too often trees suffer poor form and stunted growth due to restricted space and conflict with their surroundings. The tree's height, crown spread and root space as it nears maturity should be considered during the tree selection process.

3.9.4 Choosing a range of native and non-native tree species suitable to different urban settings will avoid the potential risk of complete and rapid tree loss caused by tree pests, diseases and climate change. Since tree pests and diseases tend to be selective, a varied treescape will usually suffer fewer losses when an outbreak does occur. Frank Santamour (1990) proposed a '10-20-30' formula to develop a diverse tree population - no more than 10% of any species, 20% of any genus or 30% of any family. This would be almost impossible to apply if limited to just native species.

3.9.5 Trees filter pollution and particulates from the air. As the leaf area of a tree increases, so the filtering capacity increases. Deciduous trees are also good at absorbing gases.

3.9.6 Areas designated for new tree planting should be protected during the construction phase and the ground suitably prepared, including soil preparation prior to the new trees being planted.

3.9.7 For this project there are a number of tree planting areas across the site, and whilst at ground level they appear to be separated in places the design strategy for soil volume connects the various below ground rooting environments to provide a good quantum of rooting medium.

3.9.8 There is a mixture of structural soil and cells identified and the use of each will be determined by the specific site use and this is set out on the LDA General Arrangement Tree Pit Plan drawing no. 6975-103. This drawing sets out the minimum requirements based upon the GreenBlue online soil volume calculator (https://greenblue.com/gb/resources/soil-calculator/). The overall strategy seeks to connect as many tree pits together as practically possible.

3.9.9 Structural soil is a soil 'recipe' that comprises a high proportion of incompressible aggregate such a stone, gravel and sand. Recipes vary and include Amsterdam soil, Stockholm tree pit soil and Cornell Universitiy's Structural soil (http://www.hort.cornell.edu/uhi/outreach/pdfs/CU-Structural%20Soil%20-%20A%20Comprehensive%20Guide.pdf) . As the names suggest, these have been pioneered abroad and are now becoming more widely used in the UK.

3.9.10 Soil cells are a crate system that are stacked and connected to essentially create a void, there are a variety of products on the market and GreenBlue provide an overiew of systems (https://greenblue.com/gb/solutions/soil-cells/) .

3.9.11 Details of new tree planting have been proposed but the site investigation for the failed pin oaks may influence the final species selection.

3.9.12 Detailed landscaping plans have been provide by LDA and these are supported by a suit of technical drawings. The landscaping details include irrigation information.

3.9.13 Guidance on how newly planted trees can be successfully grown and planted and flourish in their environment without excessive maintenance can be found in British Standard BS8545:2014 " *Trees: from nursery to independence in the landscape – Recommendations*" (BS8545:2014).

3.9.14 In advance of the planning application there has been dialogue with the LPA tree officers and this has influenced the proposed tree planting.

3.10 Conclusion

3.10.1 The development will result in the removal of 46 treee and two groups from the site. One of the eight London plane tree within group three will also be removed.

3.10.2 There should be no harm caused to any trees planned for retention by these proposals subject to the erection of protective fencing furnished with tree protection notices, ground protection, 'no-dig' construction techniques, hand excavation and the creation of a Construction Exclusion Zone.

3.10.3 Once detailed finalised drawings for the underground services have been produced, they should be reviewed by an arboricultural consultant prior to approval by the Local Planning Authority Tree Officer.

4. Arboricultural Method Statement (AMS)

4.1 Introduction

4.1.1 This AMS sets out the tree protection required to facilitate the proposed development, and should not be read as a definitive engineering or construction statement for this site. Matters relating to construction or engineering detail should be referred to a qualified structural engineer for further information and specification.

4.1.2 This AMS is to be used in conjunction with the Tree Protection Plan (TPP01) in Figure 3.

4.2 Documents

4.2.1 This AMS has been based on documents listed in Table 9.

Table 5: Documents upon which this assessment has been based

Originator	Reference No.	Title
Hopkins Architects Limited	TRS-HAL-ZZ-00-DR-A-2500-P04	Proposed Ground Floor GA Plan
LDA	Landscape DAS	Landscape DAS
LDA	Landscape supporting technical drawings	Landscape supporting technical drawings
LDA	6975-103	General Arrangement Tree Pit Plan
Waterwise	WWS-J2132-DWG-001-00	Irrigation system: Areas to be irrigated automatically

4.2.2 The relationship between the trees and the proposed development are shown on the Tree Protection Plan (TPP01), (see Figure 3) which is based on the Tree Constraints Plan (TCP01) and the drawings detailed in Table 9.

4.3 Arboricultural Issues

4.3.1 There is a requirement to remove most trees to facilitate this development, as detailed in Appendix 3 of this report. These trees should be removed before construction commences. There are trees to be relocated and these are to stay in situ until they are to be moved to the new location.

4.3.2 Access facilitation pruning of the canopies of retained trees, as laid out in Appendix 3, should be completed before construction begins.

4.3.3 All drainage, service installations and ground modelling works are to be undertaken outside the Construction Exclusion Zone (CEZ). This will be created by the temporary protective fencing (see Figure 3).

4.4 Supervision

4.4.1 Before construction commences, a suitably qualified and experienced arboriculturist shall be appointed to oversee key stages of the construction work that will affect the tree, as laid out in Table 11.

4.4.2 The arboriculturist shall hold a pre-commencement meeting with the site manager, relevant construction staff and Local Authority Tree Officer (if appropriate) to explain and agree the contents of this AMS to ensure its correct implementation.

4.4.3 A site induction will be held for all personnel in relation to site procedures and rules that relate to all retained and protected trees on site, as well as explaining the content of the agreed AMS. Construction staff shall be required to sign and confirm that they fully understand their responsibilities with respect to trees and will abide by these requirements. The Site Manager shall retain copies of the site induction statements for future reference where necessary.

4.4.4 Once the tree protection fencing has been installed, it should be checked for integrity by a suitably qualified arboriculturist.

4.4.5 During the removal of existing hard surfaces, and the laying of new surfacing and retaining wall within the RPAs of trees T37 and T38, arboricultural supervision will be required to ensure that roots uncovered during excavatory works are not damaged and the soil structure remains uncompromised.

4.4.6 Monthly visits should be undertaken by a qualified arboriculturist to ensure the retained trees have not been damaged by construction works and that installed tree protection measures remain intact and positioned in the intended locations.

4.4.7 After each site visit by the arboriculturist, a report of the visit shall be submitted to Ealing Council Planning Department detailing the result of the visit. Where necessary, this will be supported with photographic evidence highlighting unacceptable practices as well as good site management and tree protection measures.

4.4.8 In the event that there is a non-approved incursion into a construction exclusion zone, works on site should be temporarily suspended and the lead arboriculturist consulted. A site visit may be necessary to inspect the affected tree and a report of the incident, including any remedial actions taken, sent to London Borough of Richmond Council Planning Department.

4.4.9 Any changes to the nature and sequence of works specified in this AMS regarding the retained trees should be agreed with an arboricultural consultant at least 48 hours before their realisation.

4.5 List of Contacts

4.5.1 The list of contacts within Table 10 should be used as reference if any deviations from, or issues with, any part of this AMS arise.

Table 6: List of contact details for relevant parties

Name	Job Title	Organisation	Contact Details	
Andy Poynter	Principal Arb Consultant	Thomson Environmental Consultants	Andrew.Poynter@thomsonec.com	
			-	07824 692620
David Blythe	Project Manager	Arcadis LLP	david.blythe@arcadis.com	
			0207 812 2000	(0)7770 735545
Mike Burnell	Project Architect	Hopkins Architects	mike.b@hopkins.co.uk	
			020 7724 1751	-
Tim Wilson	Associate	LDA Design	Tim.Wilson@lda-design.co.uk	
			020 7467 1470	-

4.6 Tree Removals and Pruning

4.6.1 The tree removals, relocations and pruning are set out at Appendix . The stumps of the felled trees shall be removed. Trees requiring pruning shall have the works carried out in accordance with BS3998:2010 *'Recommendations for Tree Work'*.

4.6.2 T37 and T38 need to have their crowns lifted to give a minimum clearance of 4m from ground level. This will allow access for machinery used on site without the risk of the trees' crowns being damaged. None of these minor works will have an impact on the local amenity value and long term health of these trees. Trees requiring pruning shall have the works carried out in accordance with BS3998:2010 *'Recommendations for Tree Work'*.

4.6.3 Care is to be taken of the ground around retained trees to make sure that it does not become compacted as a result of tree surgery operations. No equipment or vehicles such as timber excavators, dumpwrs or cranes should be parked or driven beneath the crowns of any retained trees, to prevent subsequent soil compaction and root death. All arisings are to be removed and the site is to be left in as tidy and orderly manner as possible.

4.7 Protective Fencing

4.7.1 Temporary fencing will be erected as indicated on the Tree Protection Plan (TPP01) in Figure 4. The specification for this fencing will be in accordance with the recommendations given in BS5837:2012 '*Trees in Relation to Design, Demolition and Construction – Recommendations*' (BSI). It will comprise 2.0m high mesh fencing (Heras type panels are a simple, readily available solution) attached to a scaffold framework. Support scaffolds will be attached to the scaffold framework as necessary at an angle of 45 degrees on the side of the trees and anchored by further scaffold poles carefully firmed into the ground. The vertical scaffold tubes will be spaced at a maximum interval of 3m.

4.7.2 A diagram illustrating an example of the protective fencing can be seen in Appendix 4.

4.7.3 Clear signs will be attached at 4m intervals along the fencing stating 'Tree Protection Area – Keep Out'. These should be outward facing and weather protected and maintained for the duration of the works. A suitable sign can be seen in Appendix 7.

4.7.4 The area protected by the fence shall be known as the Construction Exclusion Zone (CEZ).

4.7.5 The following principles must be maintained within the CEZ:

- Existing ground levels shall not be altered;
- No excavation shall occur to avoid root severance;
- No plant or vehicles shall enter the CEZ;
- Impermeable surfacing shall not be laid down over soil ('capping');
- No materials, fuels or chemicals shall be stored within any of these areas;
- No fires to be lit where flames may reach within 5m of the CEZ;
- No structures or fixtures of any kind shall be fastened in any way to the trunks of the retained trees;
- No drainage or irrigation pipes shall be installed within the RPAs of the retained trees; and
- Any unwanted vegetation shall be removed by hand.

4.7.6 The fencing shall remain in place until soft or hard landscape operations require its full or partial removal. No other construction activity will take place within those areas formerly protected by the fence.

4.8 Ground Protection

4.8.1 There is no requirement for ground protection to be installed for this development other than for the installation of soft and hard landscape works as detailed above.

4.9 Removal of Hard Surfaces within the RPA

4.9.1 An area of hard-standing within the RPAs of T37 and T38 requires removal as part of the development. To prevent damage to any underlying roots this will be removed by hand where possible. Machinery can be used if necessary to break up and remove larger or more substantial sections of the surface, however the machinery should be footed outside of the RPA or on sections of the surface not yet removed.

4.9.2 The existing hard standing that is located within the RPAs of T37 and T38, will be removed by hand where possible, taking care not to damage any underlying roots. Removal will begin working from the edge of the hard standing closest to the tree and working backwards from there to prevent the need to work from any areas newly exposed. If machinery is required to remove the hard standing, the same method will be used, with the machinery footed outside of RPAs and on areas of hard standing yet to be removed at all times.

4.10 Construction within RPAs

4.10.1 There is no requirement to undertake any construction work within the RPAs of any of the retained trees for this development. Only soft and play landscape will be installed.

4.11 Services and Utilities

4.11.1 All underground services and drainage routes shall be located so that no excavations are required within the RPAs of the retained trees. In this instance, the best route onto the site is along the southern boundary or the north-west corner of the site.

4.11.2 In the event that an incursion into an RPA is unavoidable, the installation shall comply with the methods and guidelines detailed in *Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees* NJUG 4 (2007). If this does occur, then an arboricultural consultant shall be consulted before any works commence within the RPA to agree the methodology for the excavation.

4.12 Landscaping

4.12.1 The plans provided show new planting beds within the RPAs of the retained trees. In order to prevent damage to the trees' roots, mechanical preparation of the ground in these areas shall not be allowed. Instead, cultivation using suitable hand tools such as trowels will be used to break up the surface of the existing ground and to help with decompaction of the soil structure. The addition of organic matter will also assist with the soil amelioration.

4.12.2 In addition, it will also be important to adhere to the principles of the CEZ (as detailed in Section 3.6.5) with particular reference to level changes, root severance and 'capping' with impermeable materials. If impermeable surfaces are to be laid within the RPA of any of the retained trees then they should not cover greater than 20% of the area.

4.13 Sequence of Works

4.13.1 A logical sequence of events is to be observed as shown in Table 11.

Table 7: Sequence of works.

Stage	Event	Arboricultural Supervision required
Stage 1	Prestart meeting with LPA Officer, site manager and relevant construction staff. This will include site induction for all personnel.	Yes
Stage 2	Carry out tree removals specified in Section 3.5 and any other necessary tree pruning operations to enable access and siting of site compound building and materials storage.	No
Stage 3	Install Protective Fencing in the position shown on Figure 3, to the specifications given in Section 3.6	No
Stage 4	Install site compound, building and materials storage facility.	No

Stage	Event	Arboricultural Supervision required
Stage 5	Site visit by arboriculturist to sign off the installed fencing and ground protection. Further regular visits will be undertaken by the arboriculturist.	Yes
Stage 6	Complete main construction phase of development. Relocating of trees within site.	Yes
Stage 7	Complete all the landscaping.	No
Stage 8	Removal of all machinery from site.	No
Stage 9	Dismantle protective fencing by hand and remove from site.	No
Stage 10	Arboricultural assessment of retained trees on site to confirm their health post development.	Yes

5. Bibliography

5.1.1 British Standards Institution (2014) BS8545:2014 *Trees: from nursery to independence in the landscape - Recommendations*. BSI, London.

5.1.2 British Standards Institution (2012) BS5837:2012 *Trees in Relation to Design, Demolition and Construction – Recommendations*. BSI, London.

5.1.3 British Standards Institution (2010) BS3998:2010 *Recommendations for tree work.* BSI, London.

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5.1.9 Johnson, O. & More, D. (2004) *Collins Tree Guide*. London: HarperCollins

5.1.10 National Joint Utilities Group (NJUG) (2007) *Guidelines for the planning, installation and maintenance of utility services in proximity to trees*. NJUG, London.

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5.1.13 Santamour, F.S. (2002) *Trees for urban planting: diversity uniformity, and common sense*. U.S. Department of Agriculture. Washington D.C.

5.1.14 Urban Horiculture Institute (2015) *CU-Structural Soil A Comprehensive Guide*. Cornell University

Appendix 1 - Tree Schedule

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T1	**Sycamore**; *Acer pseudoplatanus*	10	240, 140, 90	2	5	5	3	2.5SW	3	Middle-aged	10+	Fair	Fair	Variegated variety. Multistemmed from base with included unions. Ivy to 2/3 height. One sided canopy due to competition. Has been raised before.	Remove ivy and reduce/ remove smaller stems.	C2	38.6	3.6
T2	**Sycamore**; *Acer pseudoplatanus*	10	250	5	2	4.5	3.5	2W	1.5	Middle-aged	20+	Good	Good	Uneven canopy due to competition, thin growth to the north. Has been raised before, leaving dead pegs. Deadwood in lower canopy. In close proximity to top of retaining wall.	Remove deadwood and pegs.	B2	28.3	3
T3	**Sycamore**; *Acer pseudoplatanus*	11	260	2.5	2.5	4	5	2.5W	3.5	Middle-aged	10+	Fair	Good	Uneven canopy due to competition. Deadwood in canopy. Ivy to 1/3 height. Close to concrete swimming pool edge.	Remove ivy and deadwood	C2	30.6	3.2
T4	**Sycamore**; *Acer pseudoplatanus*	7	80	0	0	0	0	-	0	Young	<10	Dead	Poor	Dead tree	Fell to ground level	U	-	-
T5	**Sycamore**; *Acer pseudoplatanus*	8	80	4	2	2	4	0.5W	1	Young	10+	Fair	Fair	Very poor form. Suppressed tree. Close to concrete pool at base. Sparse canopy.	-	C2	6.6	1.5
T6	**Sycamore**; *Acer pseudoplatanus*	10	150, 200, 200	5	2	4	4.5	1S	1	Middle-aged	10+	Fair	Fair	Very poor form. Suppressed tree. Close to concrete pool at base. Sparse canopy. Ivy to 1/4 height.	Remove ivy	C2	46.4	3.9
T7	**Hornbeam**; *Carpinus betulus*	5	90	2	0	0	0	1E	1	Young	20+	Good	Fair	Suppressed tree. Close to concrete pool at base. Sparse canopy. Ivy to 1/2 height.	Remove ivy	C2	3.7	1.1
T8	**Goat willow**; *Salix caprea*	7	160	0	0	0	0	1W	1	Over-mature	<10	Poor	Hazardous	Nearly dead, collapsed coppice. Close to concrete pool at base. One stem is alive still.	Fell to ground level	U	-	-

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T9	**Sycamore**; *Acer pseudoplatanus*	9	90	3.5	0	0	3	4S	3	Young	<10	Poor	Poor	Suppressed tree. Close to concrete pool at base. Sparse canopy. Damaged at 1m by scrap metal leaning on stem. Wilted foliage.	-	U	-	-
T10	**Sycamore**; *Acer pseudoplatanus*	15	300	3	2	4	4	5NW	6	Mature	20+	Good	Fair	No lower canopy. Close to concrete pool at base. Sparse canopy. Ivy to 2/3 height.	Remove ivy.	C2	40.7	3.6
T11	**Goat willow**; *Salix caprea*	8.5	150	0	0	0	0	-	0	Middle-aged	<10	Dead	Hazardous	Held with ivy to live tree.	Fell to ground level	U	-	-
T12	**Sycamore**; *Acer pseudoplatanus*	14	268	0	6	3.5	0	2NW	4.5	Middle-aged	10+	Good	Fair	Canopy competition. Close to concrete pool at base.	-	C2	32.5	3.3
T13	**Goat willow**; *Salix caprea*	10	290	1	6	3	1	4SE	4.5	Mature	10+	Poor	Fair	Deadwood in canopy. Close to concrete pool at base. Sparse canopy. Swept leaning stem se from ground level.	Remove deadwood	C2	38.0	3.5
T14	**Sycamore**; *Acer pseudoplatanus*	15	250	1	4	1	5	4NW	3.5	Middle-aged	10+	Fair	Fair	No lower canopy. Close to concrete pool at base. Sparse canopy. Twin stem from 1.7m included union. Deadwood in canopy.	Remove deadwood.	C2	28.3	3
T15	**Sycamore**; *Acer pseudoplatanus*	12	180	3	6	0	0	3NE	2	Middle-aged	10+	Fair	Fair	No lower canopy. Close to concrete pool at base. Sparse canopy. Suppressed leaning tree.	-	C2	14.7	2.2
T16	**Sycamore**; *Acer pseudoplatanus*	14	220	3	5	2	4	5N	2	Middle-aged	10+	Good	Fair	Close to concrete pool at base. Sparse canopy. Canopy competition.	-	C2	21.9	2.7
T17	**Sycamore**; *Acer pseudoplatanus*	13	220, 130	3	5	3	1	4NE	2.5	Middle-aged	10+	Good	Fair	Close to concrete pool at base. Canopy competition. Smaller stem is growing through railings. Almost no foliage on it.	Remove smaller stem	C2	29.5	3.1
T18	**Silver birch**; *Betula pendula*	11	160	1	4.5	1	1	6E	6	Middle-aged	<10	Poor	Fair	Close to concrete pool at base. Canopy competition. Very low vigour. Many dead branches. Leaning suppressed tree.	Fell to ground level	U	-	-

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T19	**Sycamore**; *Acer pseudoplatanus*	15	270	3.5	5	3	4.5	2.5E	3	Middle-aged	10+	Good	Fair	Grown through paving. Canopy competition. Ivy filled.	Remove ivy.	C2	33.0	3.3
T20	**Sycamore**; *Acer pseudoplatanus*	9	100	1	0	0	0	2.5E	2.5	Young	10	Good	Fair	No lower canopy. Suppressed tree.	-	C2	4.5	1.2
T21	**Goat willow**; *Salix caprea*	8	280	0	0	2	5	1.7NE	3.5	Mature	<10	Poor	Poor	Mainly dead 1.7m pollard. Ivy filled.	Fell to ground level	U	35.5	3.4
T22	**Sycamore**; *Acer pseudoplatanus*	14	260	4.5	5.5	4	1	2NE	2.5	Mature	20+	Good	Good	Root girdling. Ivy to 1/3 height. Suppressed one sided tree.	Remove ivy.	C2	30.6	3.2
T23	**Sycamore**; *Acer pseudoplatanus*	15	360	5	5	5	5	3.5N	3	Mature	20+	Good	Good	Ivy to 1/3 height. Close proximity to retaining wall. Fence is fixed to stem.	Remove ivy. Repair fence and remove nails from tree.	B2	58.6	4.4
T24	**Sycamore**; *Acer pseudoplatanus*	10	140	2	1	1	2	3W	3	Young	10	Good	Fair	Suppressed tree	Fell to remove competition from b2 tree	C2	8.9	1.7
T25	**Sycamore**; *Acer pseudoplatanus*	12	220	0	3	3	3	3W	3	Middle-aged	10+	Good	Fair	Suppressed tree. Ivy filled	Remove ivy	C2	21.9	2.7
T26	**Sycamore**; *Acer pseudoplatanus*	9.5	150	0	0	2.5	4	6W	4	Young	10	Good	Fair	Suppressed tree. Leaning west. Minimal canopy.	-	C2	10.2	1.9
T27	**Sycamore**; *Acer pseudoplatanus*	16	250	5	4	2	5	5N	4	Mature	10+	Good	Fair	One sided canopy.	-	C2	28.3	3
T28	**Sycamore**; *Acer pseudoplatanus*	9	290	0	0	0	0	-	4	Mature	< 10	Poor	Hazardous	Has failed at base and fallen into other trees.	Remove tree	U	38.0	3.5
T29	**Himalayan birch**; *Betula utilis*	7	120	2.5	2.5	2.5	2.5	1.5N	1	Young	20+	Good	Good	-	-	B1 2	6.5	1.5
T30	**Himalayan birch**; *Betula utilis*	7	140	2.5	2.5	2.5	2.5	1.5SE	1	Young	20+	Good	Good	-	-	B1 2	8.9	1.7
T31	**Himalayan birch**; *Betula utilis*	7	120	2	2	2	2	2NW	1	Young	20+	Good	Good	-	-	B2	6.5	1.5
T32	**Indian bean tree**; *Catalpa bignoniodes*	9	290	5	5	5	5	2SE	1	Mature	20+	Good	Good	Scattered small deadwood. Has been reduced before.	-	B1 2	38.0	3.5
T33	**Indian bean tree**; *Catalpa bignoniodes*	9	350	5	5	5	5	1.5W	1	Mature	20+	Good	Good	Scattered small deadwood. Has been reduced before. Low limbs on west side have been broken.	Remove torn pegs of low limbs.	B1 2	55.4	4.3

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T34	**Black poplar**; *Populus nigra*	13	260	3	3	3	3	2.5SE	1.5	Young	10+	Fair	Fair	Evidence of wet-rot decay at old pruning wound. Exudate down stem. ***Planted by HRH Princess Alexandra for Diamond Jubilee.***	-	B1 2 3	30.6	3.2
T35	**Hornbeam**; *Carpinus betulus*	15	550	4.5	5.5	4.5	3.5	3.5SE	2.5	Mature	10+	Fair	Fair	Bark necrosis on main stem. Dead stubs from old pruning operations in canopy. Deadwood in canopy. Thin low vigour growth over road.	-	B2	136.8	6.7
T36	**Hornbeam**; *Carpinus betulus*	15	510	5	5	5	5	0S	0	Mature	40+	Good	Good	Bark necrosis on main stem. Dead has been raised before. Small deadwood in canopy. Basal growth	Remove basal growth.	A1 2	117.7	6.2
T37	**Hornbeam**; *Carpinus betulus*	15	650	5.5	5.5	5.5	5.5	2.5S	2	Mature	40+	Good	Good	Ivy covered stem. Scattered deadwood in canopy. Has been raised before. Roots restricted by retaining wall to the north. Some damage to surface roots.	Remove ivy. Mulch to protect roots.	A1 2	191.1	7.8
T38	**Hornbeam**; *Carpinus betulus*	15	570	4.5	4.5	4.5	4.5	2.5W	2	Mature	10+	Poor	Poor	Large area of bark necrosis ground to 2m up stem. Low vigour patchy canopy. Scattered patchy deadwood in canopy. Has been raised before. Minimal rooting area.	Remove deadwood. Mulch.	B2	147.0	6.9
T39	**Sycamore**; *Acer pseudoplatanus*	11	280	3.5	3.5	3.5	3.5	-	4	Middle-aged	10+	Fair	Fair	No access measurements are estimated. Growing between gap in brick structures. Stem not visible below 4.5m.	-	C2	35.5	3.4
T40	**Italian alder**; *Alnus cordata*	16	530	4.5	4.5	4.5	4.5	3S	1.5	Mature	20+	Good	Good	-	-	A2	127.1	6.4
T41	**Italian alder**; *Alnus cordata*	165	460	5	5	5	5	3.5S	1.5	Mature	40+	Good	Good	-	-	A1 2	95.7	5.6
T42	**Whitebeam**; *Sorbus aria*	9	280	3.5	4	2	0	2.5NE	1.5	Mature	10+	Fair	Good	Suppressed one side tree. Deadwood.	Remove deadwood.	B2	35.5	3.4

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T43	**Sycamore**; *Acer pseudoplatanus*	9.5	300	3.5	3.5	3.5	3.5	-	1.5	Mature	10+	Fair	Fair	No access estimated measurements. Managed pollard.	-	B2	40.7	3.6
T44	**False acacia**; *Robinia pseudoacacia*	16	610	6	6	6	6	2SW	1.5	Mature	20+	Fair	Fair	Historical large tear out wound from 2m to ground. Scattered deadwood. Has been reduced before.	Raise over footpath. Remove deadwood.	B2	168.3	7.4
T45	**Weeping willow**; *Salix x sepulcralis 'Chrysocoma'*	15	700	7	5	2	6	5E	2	Mature	20+	Good	Fair	History of large snap outs. Has been heavily reduced.	-	A2	221.7	8.4
T46	**Weeping willow**; *Salix x sepulcralis 'Chrysocoma'*	15	790	4.5	6	6	6.5	2.5E	2.5	Mature	20+	Good	Fair	History of large snap outs. Has been heavily reduced.	Raise over road.	A2	282.3	9.5
T47	**Pin oak**; *Quercus palustris*	10	250	3.5	3.5	3.5	3.5	2.5E	1.5	Middle-aged	20+	Fair	Fair	Strong excurrent shape. Low vigour.	Raise over road and footpath	B1 2	28.3	3
T48	**Pin oak**; *Quercus palustris*	8.5	200	3.5	3.5	3.5	3.5	2.52	1.5	Middle-aged	10+	Fair	Fair	Strong excurrent shape. Low vigour. Die back at top.	Raise over road and footpath. Remove deadwood.	B1 2	18.1	2.4
T49	**Sycamore**; *Acer pseudoplatanus*	14	400	5	5	5	5	-	1.5	Mature	10+	Good	Fair	No access estimated measurements. Pollard form	-	B2	72.4	4.9
T50	**Sycamore**; *Acer pseudoplatanus*	10	280	4	4	4	4	-	2	Middle-aged	10+	Good	Fair	No access estimated measurements.	-	B2	35.5	3.4
T51	**Sycamore**; *Acer pseudoplatanus*	15	350	3	3	7	4.5	-	0	Mature	20+	Fair	Fair	No access estimated measurements. One side canopy. Has been reduced before. Sparse canopy.	-	B2	55.4	4.3
T52	**Ash**; *Fraxinus excelsior*	15.5	400	6	4.5	6	5	-	1.5	Mature	20+	Fair	Fair	No access estimated measurements.	Raise over footpath.	B2	72.4	4.9
T53	**Sycamore**; *Acer pseudoplatanus*	6.5	140	2.5	2.5	2.5	2.5	2.5SW	1.5	Young	10+	Good	Good	No access estimated measurements.	Raise over carpark	C2	8.9	1.7
T54	**False cypress species**; *Chamaecyparis sp.*	11	200	2	2	2	2	-	0	Middle-aged	10+	Poor	Fair	No access estimated measurements. Very sparse foliage. Very low vigour.	-	C2	18.1	2.4
T55	**Domestic apple**; *Malus domestica*	4	280	0	0	0	0	-	0	Mature	<10	Dead	Poor	No access estimated measurements.	Fell	U	35.5	3.4

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T56	**Domestic apple**; *Malus domestica*	6.5	280	2	2	2	2	-	0	Mature	10+	Good	Fair	No access estimated measurements.	-	C2	35.5	3.4
T57	**Elder**; *Sambucus nigra*	6.5	200	2.5	2.5	2.5	2.5	-	0	Mature	10+	Fair	Fair	No access estimated measurements.	-	C2	18.1	2.4
T58	**Pin oak**; *Quercus palustris*	9	200	3.5	3.5	3.5	3.5	2SW	1.5	Middle-aged	10+	Fair	Fair	Strong excurrent shape. Low vigour.	Raise over road and footpath.	B1 2	18.1	2.4
T59	**Pin oak**; *Quercus palustris*	9	210	3.5	3.5	3.5	3.5	2.5S	1.5	Middle-aged	10+	Fair	Fair	Strong excurrent shape. Low vigour. Dieback at top. Root girded.	Clear stem of regrowth.	B1 2	20.0	2.6
T60	**Pin oak**; *Quercus palustris*	8.5	220	3.5	3.5	3.5	3.5	2.5S	1.5	Middle-aged	10+	Fair	Fair	Strong excurrent shape. Low vigour. Dieback at top.	Clear stem of regrowth.	B1 2	21.9	2.7
T61	**Pin oak**; *Quercus palustris*	8	200	3.5	3.5	3.5	3.5	2.5S	1.5	Middle-aged	10+	Fair	Fair	Excurrent shape. Low vigour. Dieback at top.	-	B1 2	18.1	2.4
T62	**Pin oak**; *Quercus palustris*	9	200	3.5	3.5	3.5	3.5	2.5S	1.5	Middle-aged	10+	Fair	Fair	Excurrent shape. Low vigour dieback at top.	-	B1 2	18.1	2.4
T63	**Pin oak**; *Quercus palustris*	8	220	3.5	3.5	3.5	3.5	2.5S	1.5	Middle-aged	10+	Fair	Fair	Excurrent shape. Dieback at top.	-	B1 2	21.9	2.7
T64	**Pin oak**; *Quercus palustris*	8	240	3.5	3.5	3.5	3.5	2.5S	1.5	Middle-aged	10+	Fair	Fair	Excurrent shape. Dieback at top.	Remove deadwood	B1 2	26.1	2.9
T65	**Hornbeam**; *Carpinus betulus*	7	140	2	2	2	2	1.5S	1.5	Middle-aged	20+	Good	Good	-	-	B2	8.9	1.7
T66	**Pedunculate Oak**; *Quercus robur*	11	460	5	7	6	6	2NW	1.5	Middle-aged	40+	Good	Good	Locally prominent tree on high street.	-	A1	95.7	5.6
T67	**Callery pear**; *Pyrus calleryana*	5	110	1	1	1	1	1.5W	1.5	Young	10+	Fair	Fair	Established tree although sparse crown compared to adjacent tree.	-	C1	5.5	1.32
T68	**Callery pear**; *Pyrus calleryana*	5	90	1	1	1	1	1.5N	1.5	Young	10+	Good	Fair	Satisfactory condition	-	C1	3.7	1.1
G1	**Sycamore**; *Acer pseudoplatanus*	11	150	3	3	3	3	3	-	Middle-aged	10+	Fair	Fair	Group of low value ivy filled sycamore. Suppressed poor formed trees.	-	C2	-	-

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
G2	London plane; Platanus x hispanica	5.5	160	2	2	2	2	2	-	Middle-aged	20+	Good	Good	Group of pleached plane trees	Continue formal pruning programme. Remove basal growth.	B2	-	-
G3	London plane; Platanus x hispanica	5.5	160	2	2	2	2	2	-	Middle-aged	20+	Good	Good	Group of pleached plane trees	Continue formal pruning programme. Remove basal growth.	B2	-	-
G4	London plane; Platanus x hispanica	5.5	160	2	2	2	2	2	1.5	Middle-aged	20+	Good	Good	Group of pleached plane trees	Continue formal pruning programme. Remove basal growth.	B2	-	-

Appendix 2 - Table of 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 be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have serious, irremediable, structural defects, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality NOTE Category U trees can have existing or potential conservation value which might be desirable to preserve			DARK RED
	1 Mainly arboricultural values	**2 Mainly landscape values**	**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 of formal or semi-formal arboricultural features (e.g. the dominant and/or principle 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)	LIGHT GREEN
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	MID BLUE
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 150mm	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 landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	GREY

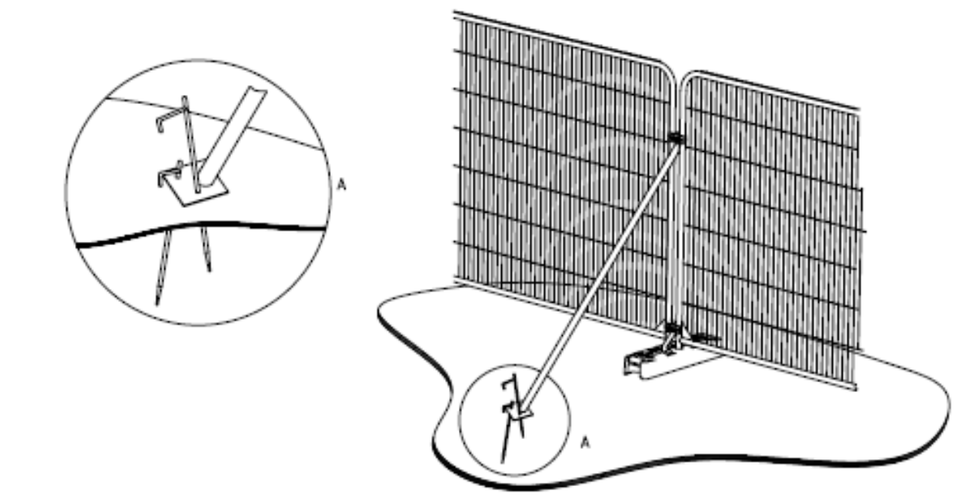
Appendix 3 - Schedule of Tree Works

Tree No.	Species	Works	Reason
T1	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T2	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T3	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T4	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T5	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T6	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T7	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T8	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T9	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T10	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T11	**Goat willow**; *Salix caprea*	Remove.	To facilitate development
T12	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T13	**Goat willow**; *Salix caprea*	Remove.	To facilitate development
T14	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T15	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T16	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T17	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T18	**Silver birch**; *Betula pendula*	Remove.	To facilitate development
T19	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T20	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development

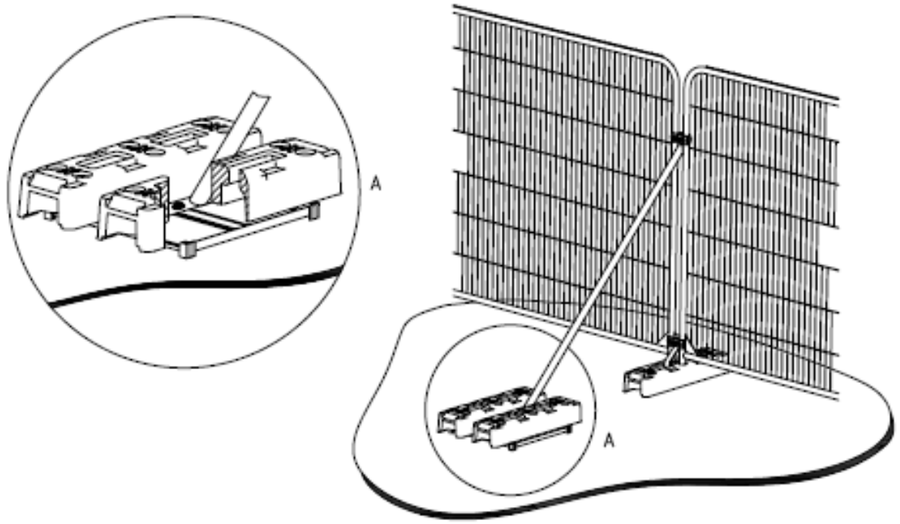
Tree No.	Species	Works	Reason
T21	**Goat willow**; *Salix caprea*	Remove.	To facilitate development
T22	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T23	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T24	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T25	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T26	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T27	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T28	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T29	**Himalayan birch**; *Betula utilis*	Remove.	To facilitate development
T30	**Himalayan birch**; *Betula utilis*	Remove.	To facilitate development
T31	**Himalayan birch**; *Betula utilis*	Remove.	To facilitate development
T32	**Indian bean tree**; *Catalpa bignoniodes*	Remove.	To facilitate development
T33	**Indian bean tree**; *Catalpa bignoniodes*	Remove.	To facilitate development
T35	**Hornbeam**; *Carpinus betulus*	Remove.	To facilitate development
T36	**Hornbeam**; *Carpinus betulus*	Remove.	To facilitate development
T39	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
T58	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T59	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T60	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T61	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T62	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T63	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development
T64	**Pin oak**; *Quercus palustris*	Remove.	To facilitate development

Tree No.	Species	Works	Reason
T65	**Hornbeam**; *Carpinus betulus*	Remove.	To facilitate development
G1	**Sycamore**; *Acer pseudoplatanus*	Remove.	To facilitate development
G2	**London plane;** *Platanus x hispanica*	Remove all four trees.	To facilitate development
G3	**London plane;** *Platanus x hispanica*	Remove one of eight trees.	To facilitate development
Pruning/Relocation			
T34	**Black poplar**; Populus nigra	Relocate.	Integral to development proposal
T37	**Hornbeam**; *Carpinus betulus*	Crown lift to 4m.	To allow for works beneath crown
T38	**Hornbeam**; *Carpinus betulus*	Crown lift to 4m.	To allow for works beneath crown
G3	**London plane;** *Platanus x hispanica*	Remove one of eight trees. Relocate remaining seven trees.	Integral to development proposal
G4	**London plane;** *Platanus x hispanica*	Relocate all four trees	Integral to development proposal

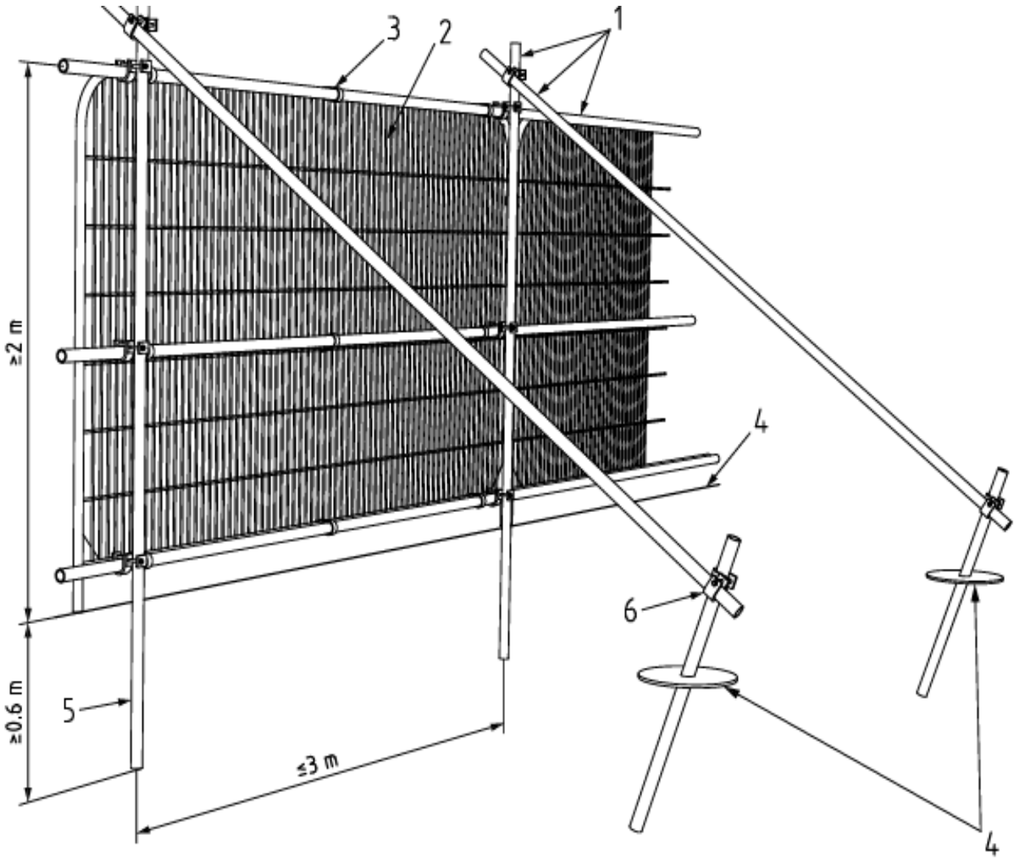
Appendix 4 - Example of Protective Fencing



a) Stabilizer strut with base plate secured with ground pins



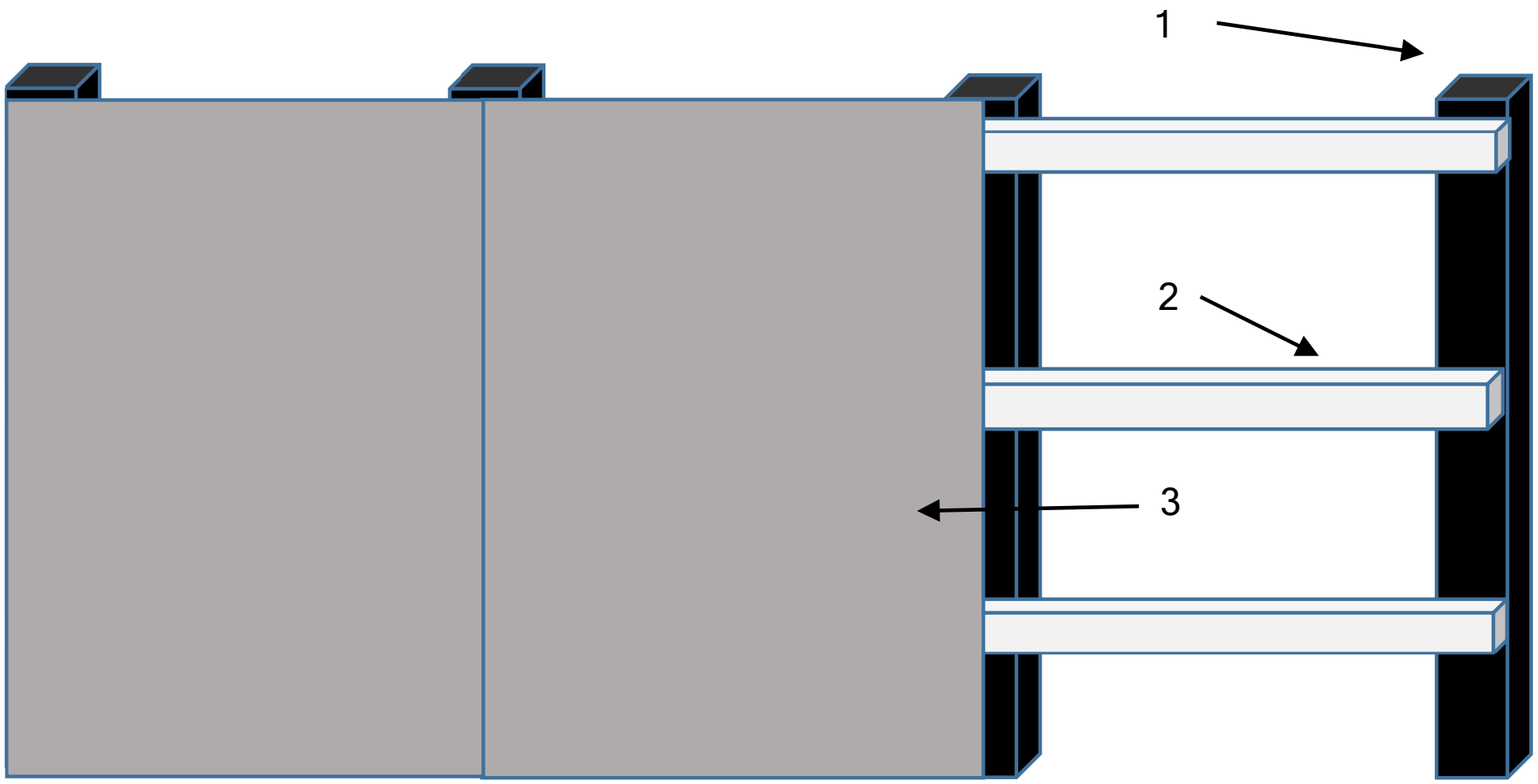
b) Stabilizer strut mounted on block tray



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

Appendix 5 – Example of Protective Fencing



1. 100mm x 100mm timber posts at 1.2m centres

2. Three 100mm x 50mm timber rails

3. 12mm WBP Virola hardwood through plywood framed panels

Appendix 6 – Tree Protection Fencing Notice