

**Uber Boat**  
by **thames clippers**

# **HAMMERSMITH TEMPORARY FERRY**

## **LANDSCAPE AND EXTERNAL DESIGN & ARBORICULTURAL ASSESSMENT**

**AUGUST 2021**  
2048-BRL-02-XX-RP-C-1700



**BECKETT RANKINE**  
Marine Consulting Engineers

## CONTROLLED DOCUMENT STATUS

<b>CLIENT</b>	Uber Boat by Thames Clippers					
<b>PROJECT TITLE</b>	Hammersmith Temporary Ferry					
<b>SUBJECT</b>	Planning & Consents					
<b>DOCUMENT TITLE</b>	Landscape & External Design with Arboricultural Assessment					
<b>DOCUMENT REF</b>	2048-BRL-02-XX-RP-C-1700					
<b>REVISION RECORD</b>						
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P02	S2 - Suitable for Information	14/05/21	TfL Comments	NS	TKHB	TKHB
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P05	S2 – Suitable for Information	18/08/21	Further planning comments	NS	GG	HP

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## **1 INTRODUCTION**

### **1.1 Purpose of Document**

1.1.1 Beckett Rankine (BR) has been commissioned by Uber Boat by Thames Clippers (UBTC) to prepare studies to support statutory consent applications for two passenger piers for the Hammersmith Temporary Ferry. This report has been prepared to accompany applications for:

- Planning, where the relevant authorities are:
  - The London Borough of Hammersmith and Fulham (LBHF)
  - The London Borough of Richmond upon Thames (LBRuT)
- Marine consents, where the relevant authorities are:
  - The Marine Management Organisation (MMO)
  - The Environment Agency (EA)

1.1.2 Recognising the environmental and social sensitivity of the area, BR has been working with, and is in ongoing discussion with, the following statutory authorities:

- London Borough of Hammersmith and Fulham (LBHF)
- London Borough of Richmond Upon Thames (LBRuT)
- Marine Management Organisation (MMO)
- Environment Agency (EA)
- Port of London Authority (PLA)
- Greater London Authority (GLA)

1.1.3 Additionally, consultations are being held with local residents, local schools, and river users.

## **1.2 Project Background**

1.2.1 Hammersmith Bridge provides a major link between Hammersmith and Barnes. There are no cross-river London Underground services in this location. The bridge's closure to all traffic in August 2020 has resulted in major disruption to the local and wider area due to the absence of an alternative nearby river crossing.

1.2.2 Transport for London (TfL) has concluded that the quickest way to provide a safe alternative river crossing at Hammersmith is to provide a Temporary Ferry operation for pedestrians, wheelchair users and cyclists. To enable this service two temporary piers are required, one on the Hammersmith shore and the other on the Barnes shore.

1.2.3 While the bridge has recently reopened for pedestrian and cyclist traffic, this is a temporary condition only. The bridge may be required to close once more on short notice. As such the need for the ferry remains unchanged.

1.2.4 Both Hammersmith Pier and Barnes Pier, which enable the Hammersmith Temporary Ferry service, are to be temporary in nature and will be removed on re-opening of Hammersmith Bridge. The design of each structure has therefore been completed with ease of removal as a key criterion. The Hammersmith Temporary Ferry will be in place up to 3 years.

## **1.3 Site Assessment**

1.3.1 The two temporary piers will be located on either side of the river, immediately downstream of Hammersmith Bridge as seen in Figure 1-1. Hammersmith Pier on the north bank will land at the end of Queen Caroline Street, while Barnes Pier will land of the Thames towpath on the south bank.

1.3.2 Site visits have been carried out to identify the location, girth, condition of trees and other vegetation at the site. This has been undertaken in accordance with the recommendations in BS 5837.

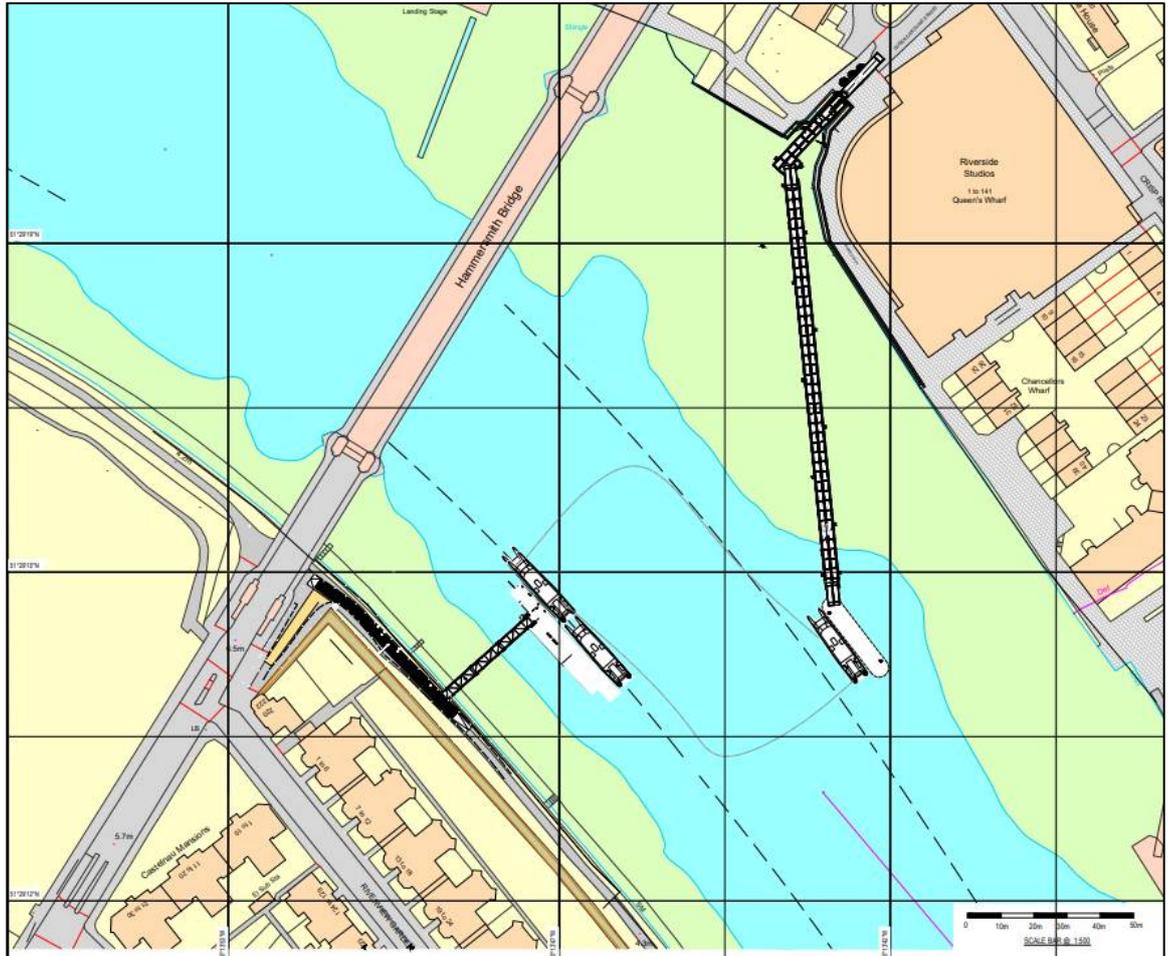


Figure 1-1: Proposed Scheme Location

## 2 LANDSCAPING DESIGN

### 2.1 Existing Layout

#### Temporary Hammersmith Pier (North Side)

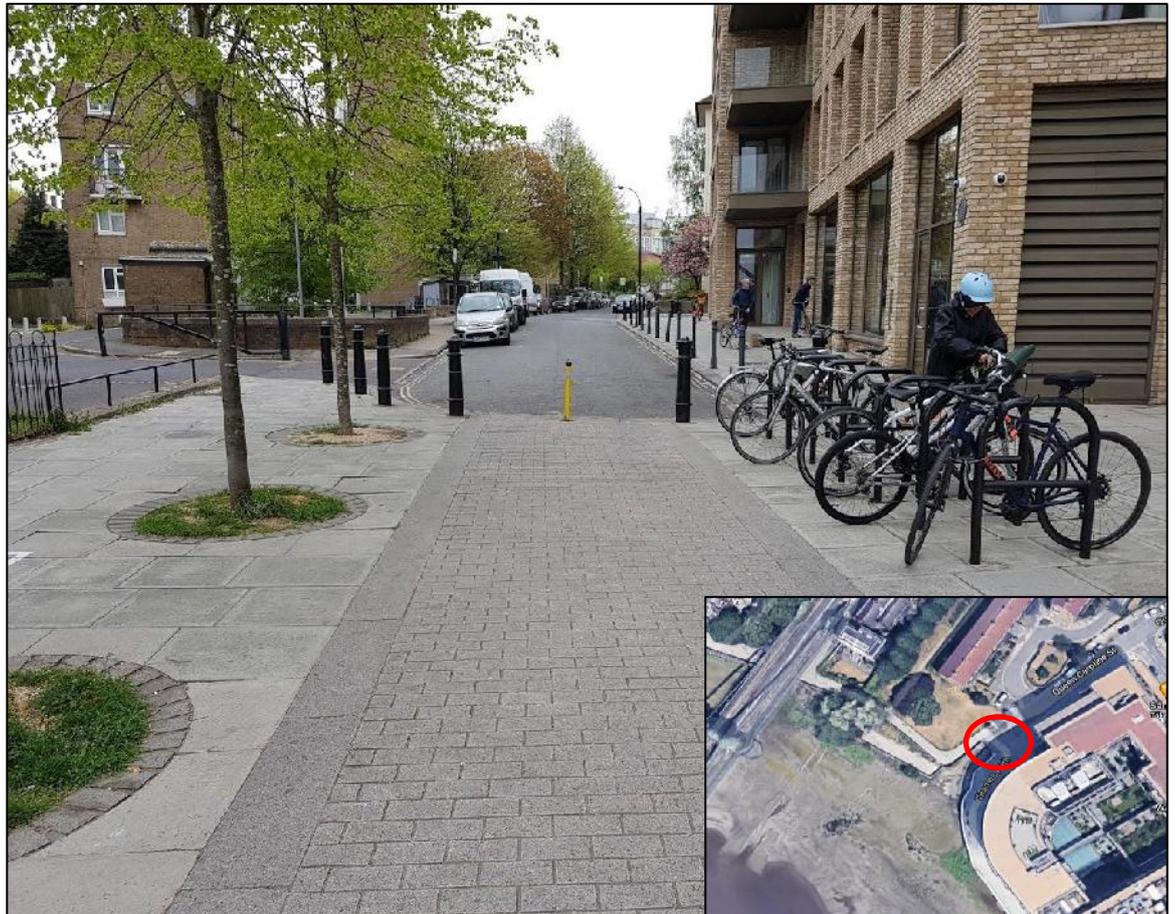


Figure 2-1: Proposed Landing Area for Hammersmith Pier Access Ramp

2.1.1 Figure 2-1 shows the existing landside of the area to be used for landing the Hammersmith Pier.

### Temporary Barnes Pier (South Side)



Figure 2-2: Proposed Landing Area for Barnes Pier

2.1.2 Figure 2-2 shows the existing landside of the area to be used for landing the Barnes Pier.

## **2.2 Design**

2.2.1 Before construction, a Construction Environment Management Plan (CEMP) is required to set out the overarching construction. The CEMP is included alongside the planning application. The document sets out the best practice environmental management controls during the works, and measures to reduce noise, dust emissions, light emissions, and how to avoid the risk of potential river water contamination due to accidental spills and leakages.

2.2.2 The materials and finishes of the design are shown in the drawing package which forms part of the submission, and will be developed further for fabrication.

### Temporary Hammersmith Pier (North Side)

2.2.3 The landside works for Hammersmith Pier will consist of installing a ramp that will land on a transition platform and gangway which will provide access to the slipway

at the end of Queen Caroline Street. Note that the upper flood board will be removed as part of this process – this will not compromise the flood defence level at the site. The overall length of the ramp together with the transition platform is 17.5m. The proposed landing area is shown in Figure 2-1. The slope of the ramp will be (Disability Discrimination Act) DDA compliant with a limited slope as per the recommended guidelines. A further walkway of 125m length spans between the transition platform and the pontoon.

#### Temporary Barnes Pier (South Side)

- 2.2.4 The landside works for Barnes Pier will involve installing a concrete base for the brow bearings, a raised walkway on the current embankment towpath and re-grading the slope to the side of Hammersmith Bridge.
- 2.2.5 The embankment towpath is located below Highest Astronomical Tide level and floods on large tides. As part of the works, a 45m long lightweight steel frame raised walkway will be installed to allow dry access to the pier. The clear width of this structure will be a minimum of 2.5m to suit segregated pedestrian and cycle traffic. The slope to the side of Hammersmith Bridge will be regraded to improve accessibility to the walkway. The slope consists of a gravelled path, an image of which is shown in Figure 2-3.



Figure 2-3: Concrete Path to the Side of Hammersmith Bridge

2.2.6 The path will be reprofiled as shown in Figure 2-4 with compacted MOT Type 1 (i.e. granular fill material typically used for footpaths).

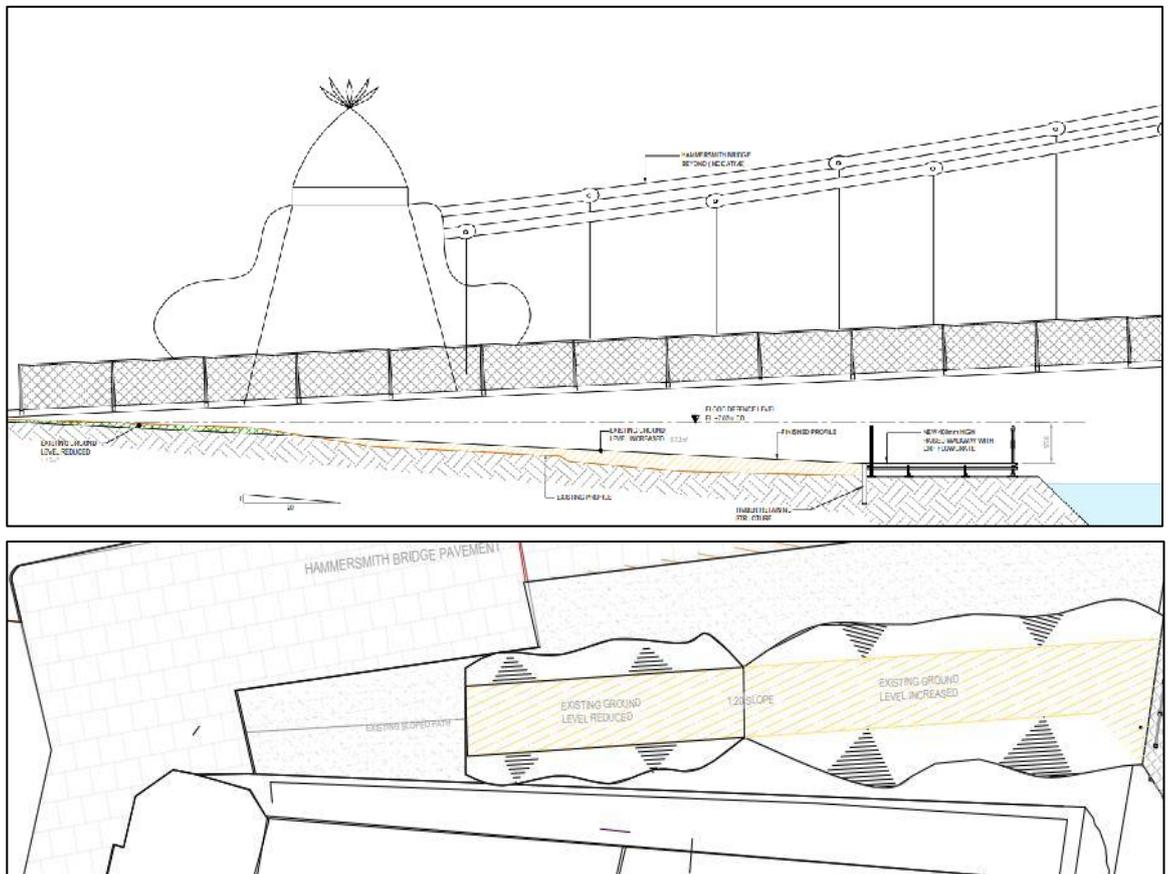


Figure 2-4: Proposed Footpath Regrading

## 2.3 Site Plan

2.3.1 The locations of the landscaping for the Temporary Hammersmith Pier and Barnes Pier access are shown in Figure 2-5 and .

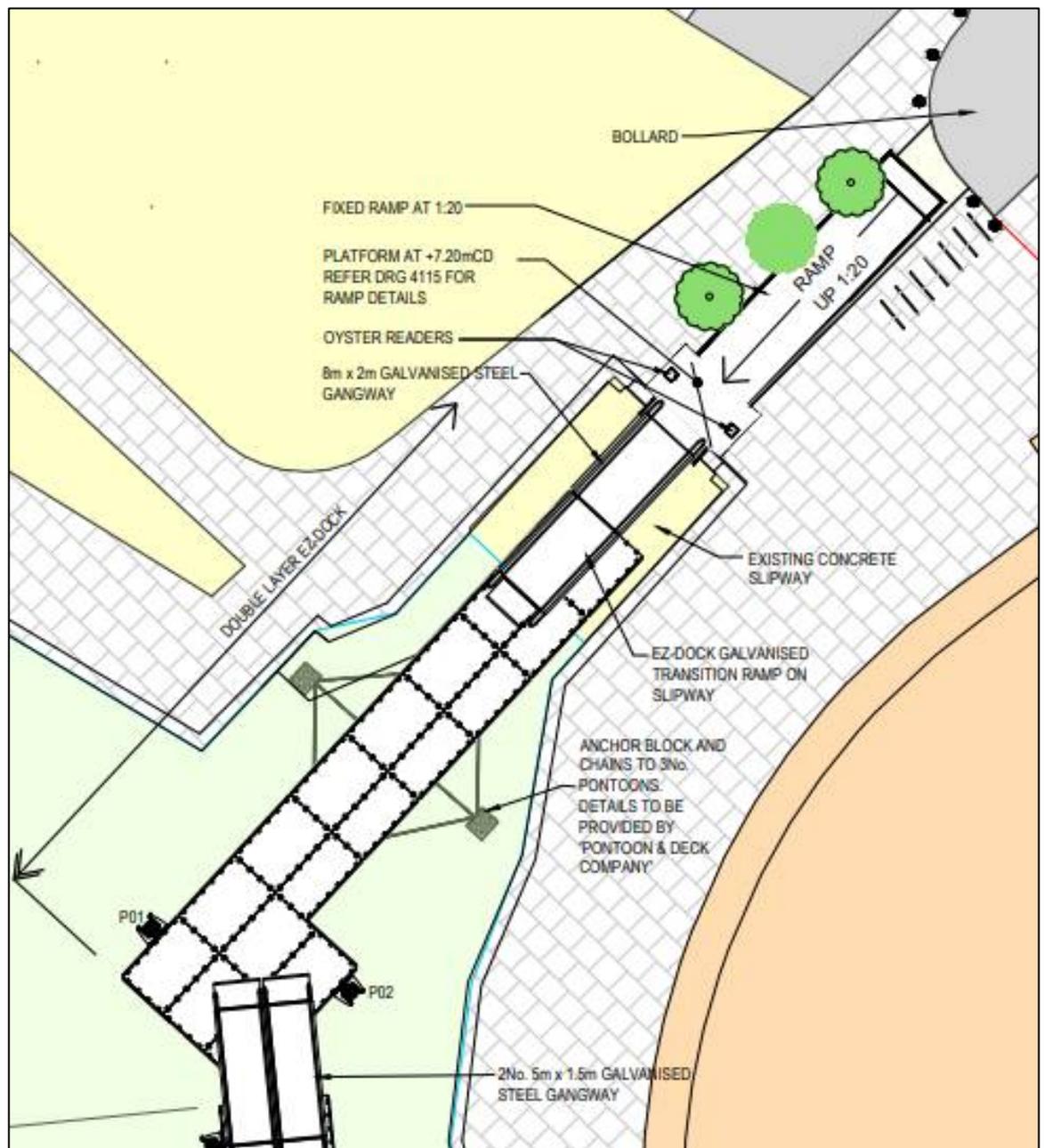


Figure 2-5: Proposed Plan for Temporary Hammersmith Pier





Figure 2-7: Proposed Hammersmith Temporary Pier CGI



Figure 2-8: Proposed Hammersmith Temporary Ferry Aerial CGI



Figure 2-9: Proposed Hammersmith Pier Landside CGI



Figure 2-10: Proposed Barnes Pier Brow CGI



Figure 2-11: Proposed Barnes Pier Landside CGI

2.4.5 As shown in Figure 2-7, during operation, the physical presence of the Hammersmith Temporary Ferry will affect the protected views to the historic Hammersmith Bridge from the East. However, this image also shows that, based on the pile heights, the bridge will still be predominantly visible at both high and low water from the northern bank. On the southern bank, the extent of the Barnes Pier is lesser meaning that only a small proportion of the bridge is covered (at all tides states) and the subsequent impact is therefore limited.

2.4.6 Further, this impact will be temporary and will only occur while Hammersmith Bridge is being refurbished. The bridge is currently closed off by hoarding and dismantling of the decorative cladding has commenced with scaffolding and temporary enclosures in place. Additional dismantling and erection of scaffolding enclosures will further obscure the bridge from view as the refurbishment works progress. Compared to these visual obstructions the ferry will have only a minor impact on views of the bridge. The visual impact of the ferry on views from the west will be minimal.

2.4.7 Considering all the above it is not expected that the presence of the pier structures will cause any significant harm to protected views and it is not likely to give rise to significant adverse visual effects.

2.4.8 For further details, refer to the Heritage Statement (ref. 1817-125/08/21)

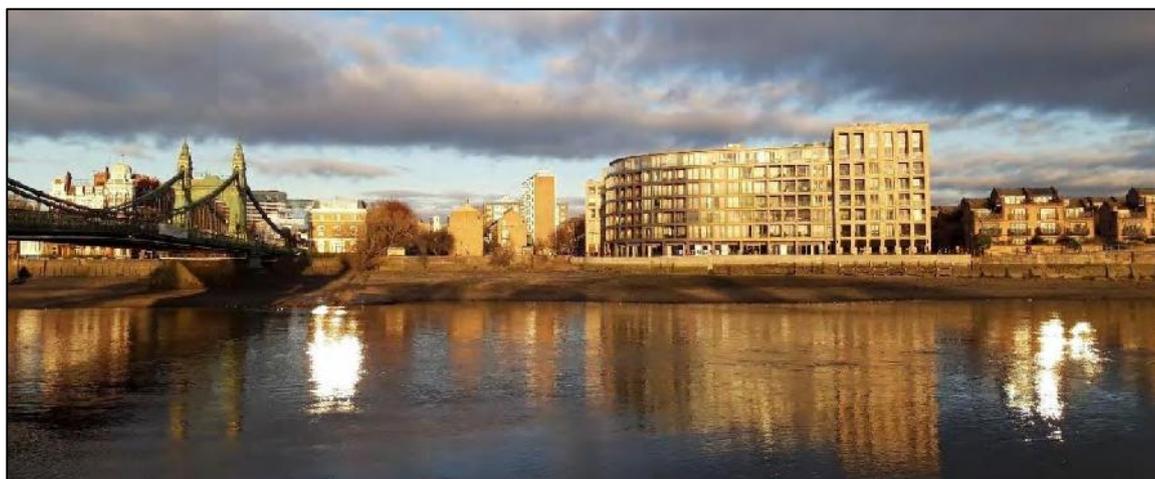


Figure 2-12: View to North Bank where the Temporary Hammersmith Pier will Land

### Other Foliage

2.4.9 The other foliage on the Barnes footpath consists of low level scrub which can be seen in Figure 2-13. These plants do not have any arboricultural merit to constrain the development proposals.



Figure 2-13: Image of the Temporary Barnes Pier Towpath

## 2.5 Ecology

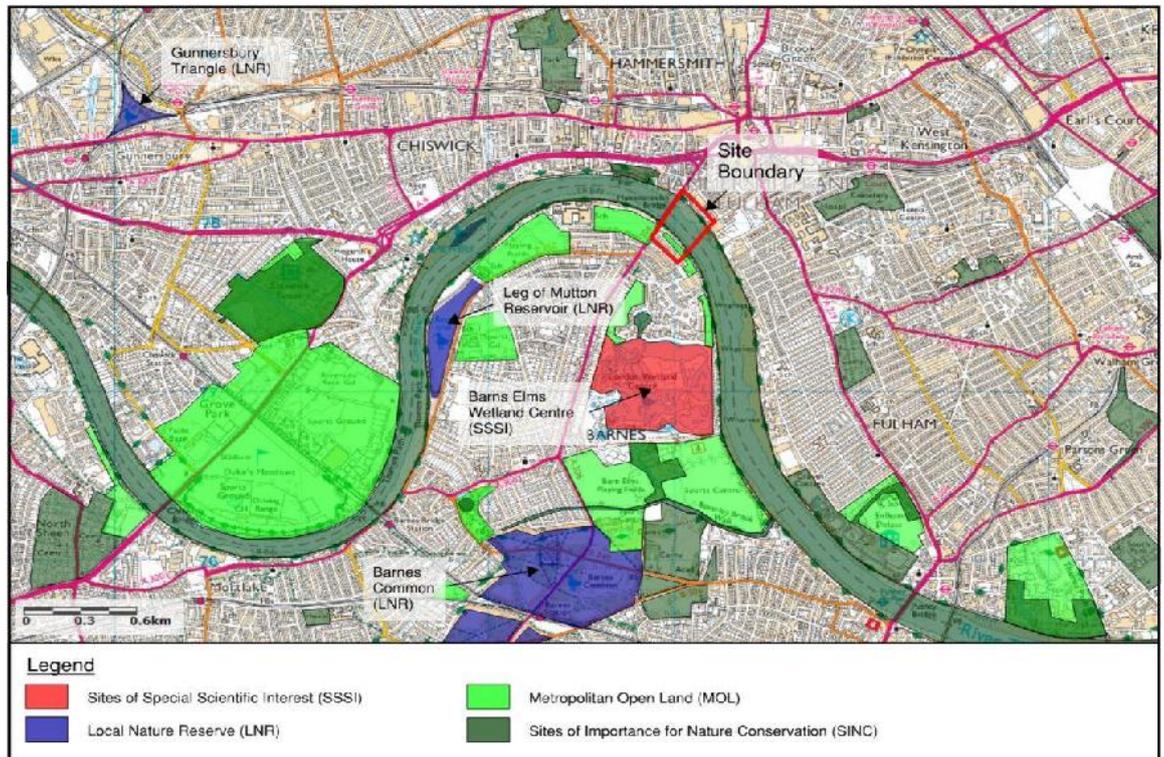


Figure 2-14: Ecological Designations

### Statutory Designated Sites

- 2.5.1 No international designated sites (marine or terrestrial) have been identified within 5 km of the Site.

2.5.2 No marine statutory designated sites have been identified within 5 km of the Site. The following land-based statutory designated sites of importance for nature conservation have been identified within 1km of the Site:

- Barn Elms Wetland Centre Site of Specific Scientific Interest (SSSI), located approximately 650m south of the proposed Site;
- Chiswick Eyot Local Nature Reserve (LNR), located approximately 940m west of the Site; and
- Leg of Mutton Reservoir Local Nature Reserve (LNR), located approximately 1km south-west of the Site.

2.5.3 The Site is also situated within a SSSI Impact Risk Zone for Barn Elms Wetland Centre SSSI (see Figure 2-14).

#### Non-statutory Designated Sites

2.5.4 The following non-statutory designated sites of importance for nature conservation (SINCs) have been identified within 1 km of the proposed Temporary Ferry site:

- River Thames and Tidal Tributaries (M031), located within the Site and classified as a Site of Metropolitan Grade Importance;
- Furnivall Gardens, located approximately 285m north-west of the Site and classified as a Site of Local Importance;
- Disused track bed west of Hammersmith station, located approximately 600m to the north-west of the Site and classified as a Site of Borough Grade Importance (Grade I);
- Ravenscourt Park, located approximately 895m north-west of the Site and classified as a Site of Borough Grade Importance (Grade II); and
- Margravine Cemetery, located approximately 780m east of the Site and classified as a Site of Local Importance.

2.5.5 As per the Planning DataMap, the following areas of metropolitan open land (MOL) are within 1km of the Site (these are limited to the Southern bank only):

- Thames Barn Elms Foreshore;
- Riverview and Harrods Thames Footpath; and
- St Paul's Playground.

Tree preservation orders and conservation areas

2.5.6 No Tree Preservation Orders (TPO) are found near the Site. However, there are three Conservation Areas within the Site and immediately adjacent;

- The Mall Conservation Area;
- Fulham Reach Conservation Area; and
- Castelnau Conservation Area

2.5.7 These conservation areas are shown in Figure 2-15, for further information refer to the Heritage Statement (ref. 1817-125/08/21). Trees within the conservation areas are under protection.

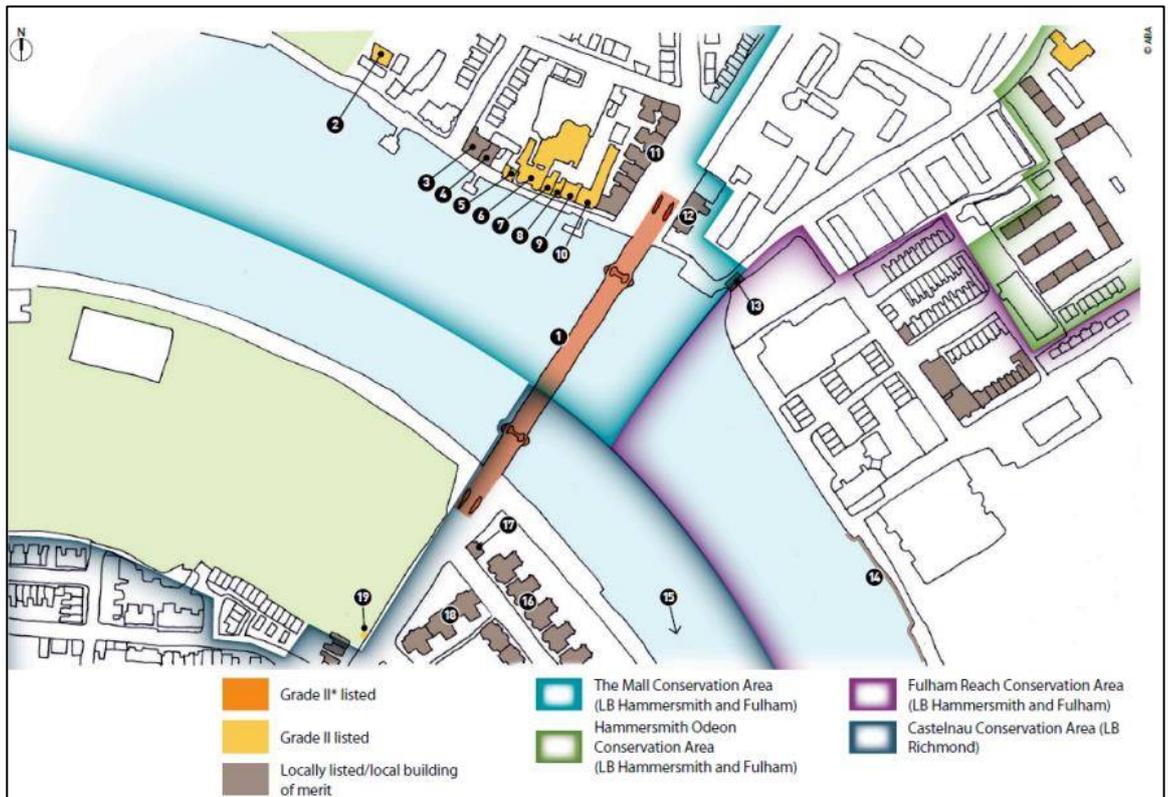


Figure 2-15: Local Conservation Areas

Source: Alan Baxter

## **2.6 Decommissioning**

- 2.6.1 The environmental effects during the decommissioning of the Hammersmith Temporary Ferry (e.g., noise, nuisance, dust emissions) are likely to be similar to those of the construction phase; thus a similar CEMP (or a development of the initial CEMP) will be produced.

### **3 ARBORICULTURAL IMPACT ASSESSMENT / METHOD STATEMENT**

3.1.1 An Arboricultural Impact Assessment (AIA) is a type of tree survey that considers how a proposed development, and its associated trees will co-exist and interact in the present and future. From this, an Arboricultural Method Statement (AMS) has been produced.

3.1.2 Both of the these documents have been developed by Thomson Ecology on behalf of Beckett Rankine. For details of the findings and requirements, refer to Appendix A.

## **4 CONCLUSION**

4.1.1 The following assessments have been undertaken for the works of the Hammersmith temporary ferry:

- Landscape and External Design assessment;
- Arboricultural Impact Assessment (AIA)
- Arboricultural Method Statement (AMS)

4.1.2 From the findings of this study it has been determined that the risks posed to the existing landscaping of the surrounding area and to the trees situated in close proximity to the works is very low and temporary in nature.

4.1.3 As such, it is concluded that the proposed works will not cause or contribute to deterioration of status, or jeopardise achieving good status for the ecology or environment of the surrounding area of the works in the long term.

4.1.4 Prior to operation ceasing, a reinstatement landscape design strategy should also be implemented to ensure that all areas affected will be reinstated once the temporary piers are removed.

**APPENDIX A                    ARBORICULTURAL IMPACT ASSESSEMENT (AIA) AND  
ARBORICULTURAL METHOD STATEMENT (AMS)**



**Hammersmith Temporary  
Ferry**

Arboricultural Survey,

Arboricultural Impact  
Assessment

and

Arboricultural Method  
Statement

For

Beckett Rankine

Project No.: AECO881/001

August 2021

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Project Number	Report No.
AECO881/001	001

Revision No.	Date of Issue	Author	Reviewer	Approver
001	15.07.21	Andy Poynter	Neil Francis	Simon Mackrell
002	17.08.21	Andy Poynter	Neil Francis	Simon Mackrell

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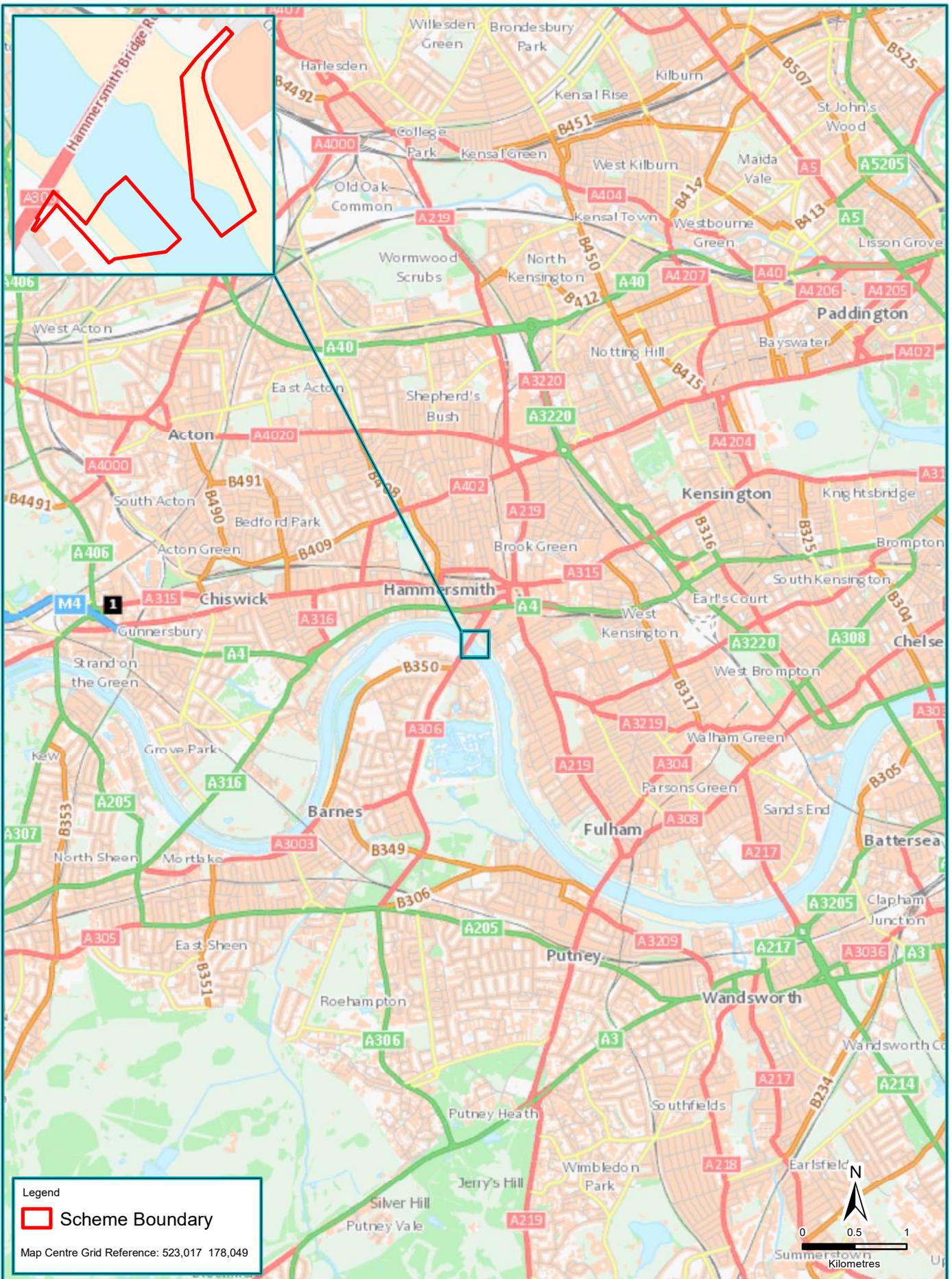
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- FIGURE 1: SITE LOCATION
- FIGURE 2: TREE CONSTRAINTS PLAN (TCP01)
- FIGURE 3: TREE PROTECTION PLAN (TPP01)

## 1. Summary

- 1.1.1** Beckett Rankine is proposing the construction of a temporary ferry infrastructure for a crossing over the River Thames while Hammersmith Bridge is repaired. There is a (planning) red line boundary on either side of the river.
- 1.1.2** Beckett Rankine commissioned Thomson to review a previous arboricultural survey of trees within and adjacent to the site, and to produce an Arboricultural Impact Assessment (AIA) which discusses the likely impact of the development proposals on the trees at the site, and to compile an Arboricultural Method Statement (AMS) detailing the protection of all the trees at the site.
- 1.1.3** The initial arboricultural survey (by Pell Frischmann reference 102963-PEF-BAS-ZZZ-REP-EN-00002) and the additional trees recorded was carried out in accordance with BS5837:2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations*' (BS5837:2012).
- 1.1.4** All trees were categorised in accordance with the cascade chart for tree quality assessment in BS5837:2012 (see Appendix 2). Trees were given a ranking of A, B or C in descending order of value and assigned one or more subcategories qualifying the basis of that value as either arboricultural, landscape or cultural. Trees with only short-term remaining value or that require immediate removal for safety or management reasons are given a U rating.
- 1.1.5** Of the trees recorded within the two areas, a total of one Category A tree, seven Category B trees, three Category C trees, one category C group and one Category U group within or adjacent to the site (see Figure 2) were recorded during the survey and listed in the Tree Schedule.
- 1.1.6** Category A, B and C trees represent a material consideration to development. Concerted effort should be made to retain A and B category trees within the development. Whilst Category C trees should be retained where possible, but should not be retained where they would present a serious constraint to development.
- 1.1.7** One Category U group, G46, is recommended for removal due to its poor condition and is not a material consideration for the planning application. As such, whilst recommended for removal for arboricultural reasons, it is not necessary for the proposed development.
- 1.1.8** The retained trees will be protected through the construction phase by protective fencing, ground protection and the creation of a Construction Exclusion Zone. The new walkway will sit on top of the existing footprints and require no works within the RPAs of the retained trees.

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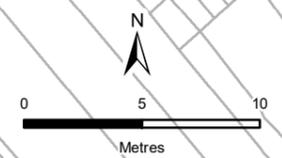
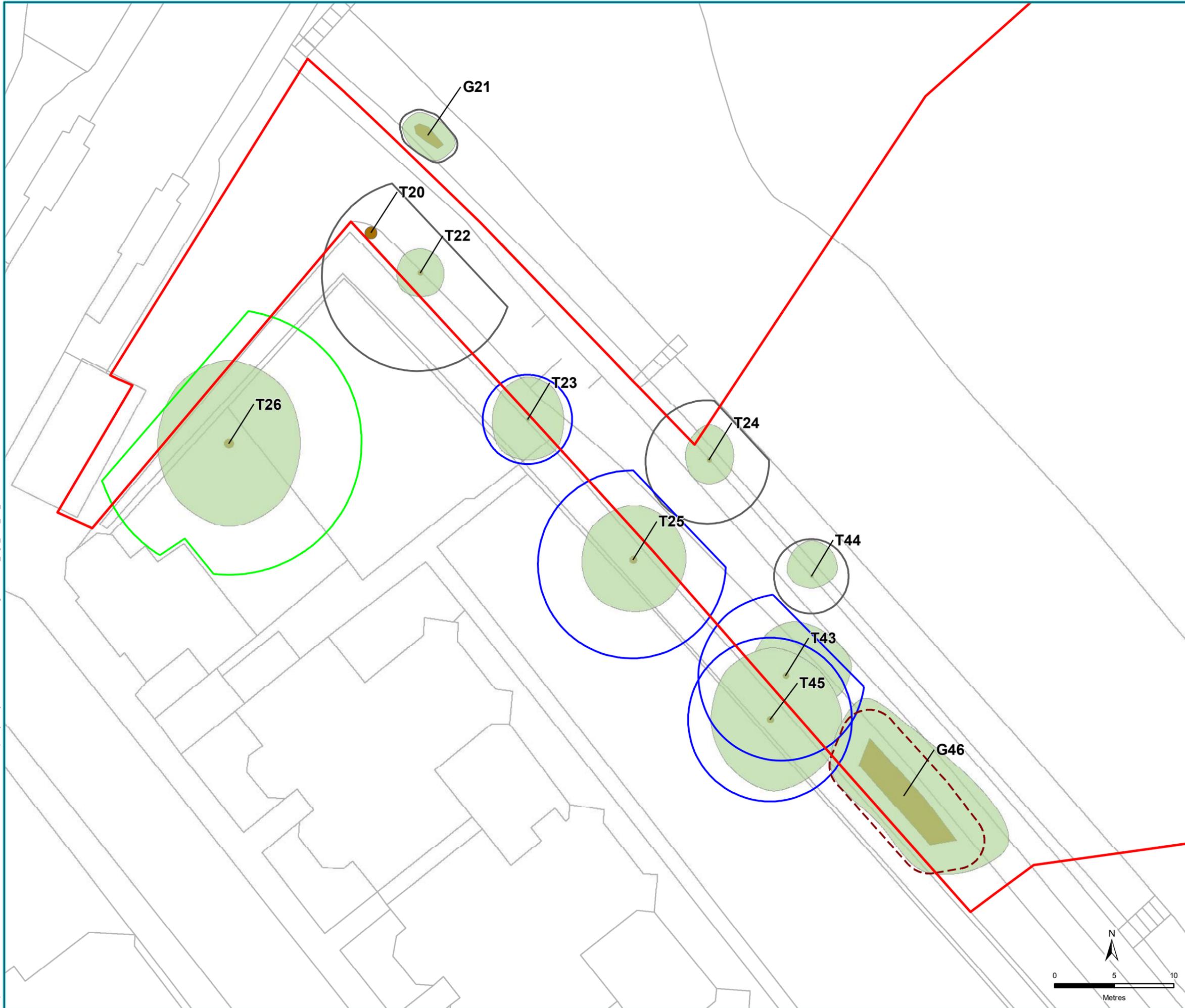
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  -  Root Protection Area of Category 'U' Tree
  -  Scheme Boundary



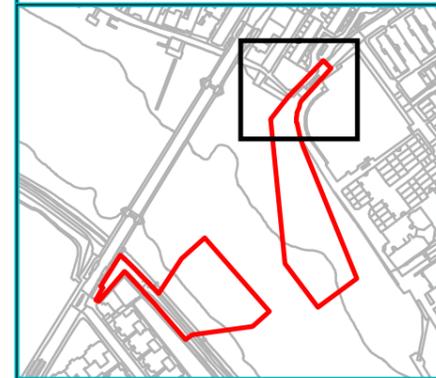
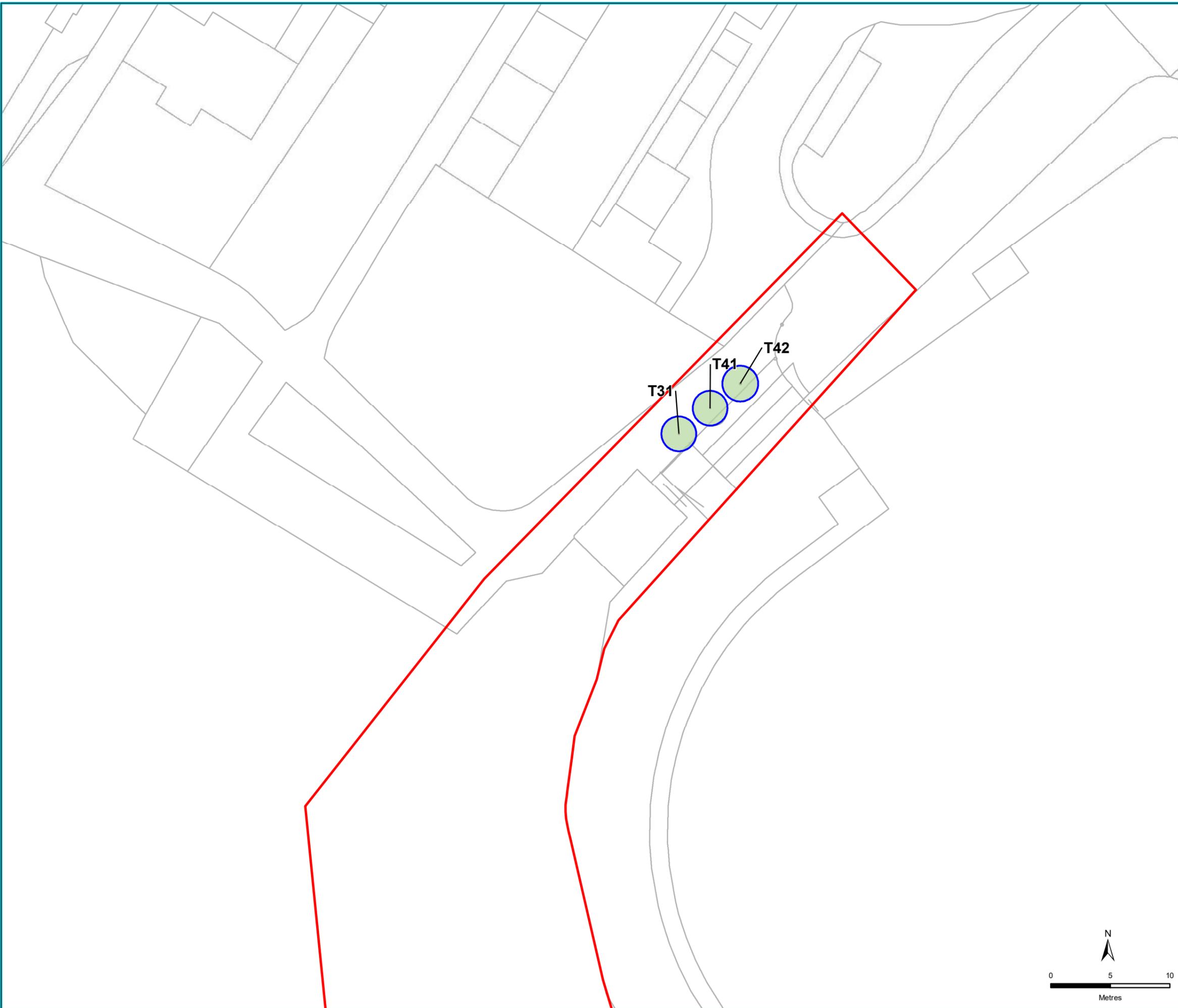
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Tree Constraints Plan  
 (TCP01) -  
 Page 1 of 2

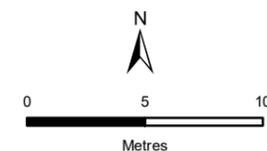


- Legend
- Tree Stem Location
  - Tree Canopy Extent
  - Root Protection Area of Category 'A' Tree
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  - Root Protection Area of Category 'U' Tree
  - Scheme Boundary

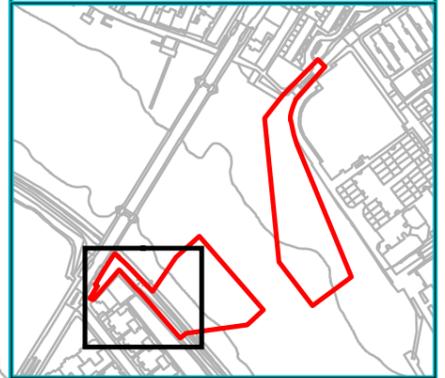


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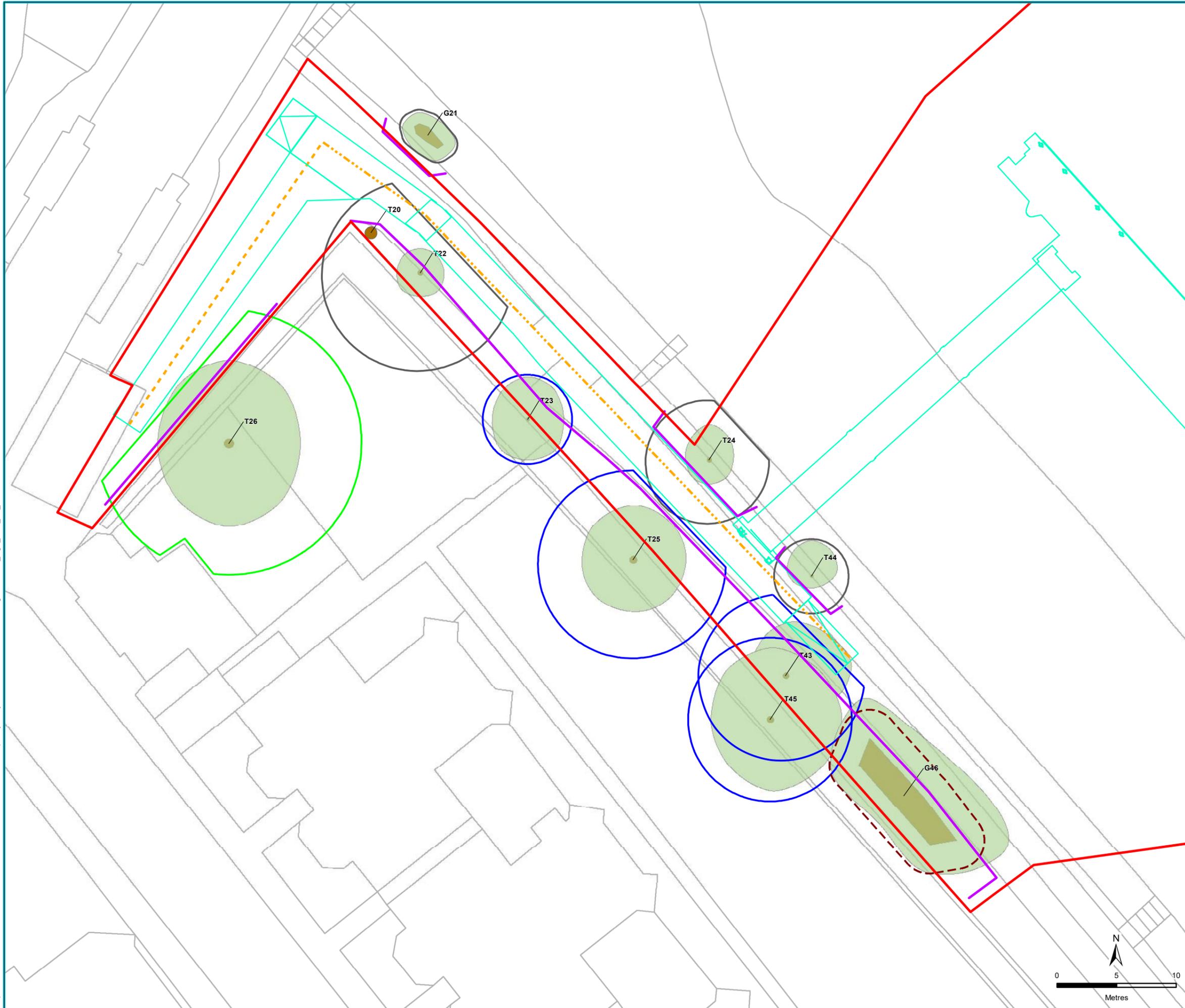
- Legend
- Tree Protection Fencing
  - - - Services (Water, electricity and data) suspended below walkway
  - - - Services (Water, electricity and data) within trench
  - Tree Stem Location
  - Tree Canopy Extent
  - Root Protection Area of Category 'A' Tree
  - Root Protection Area of Category 'B' Tree
  - Root Protection Area of Category 'C' Tree
  - Tree to be Removed
  - Scheme Boundary



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**Tree Protection Plan (TPP01) - Page 1 of 2**

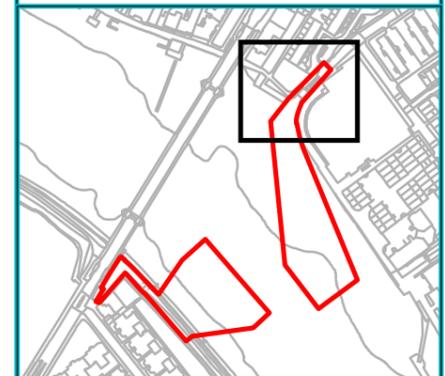
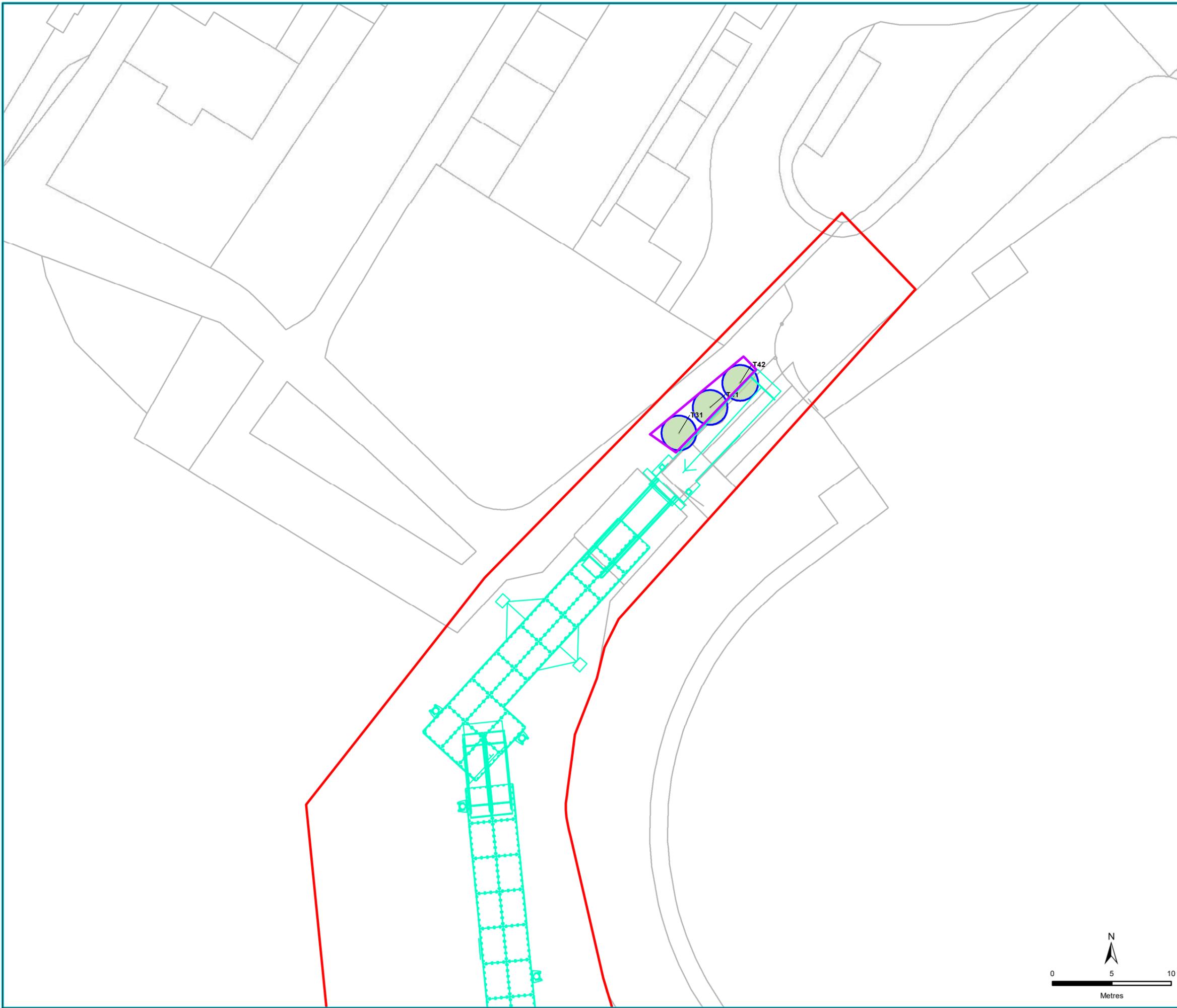


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Legend

- Tree Protection Fencing
- - - Services (Water, electricity and data) suspended below walkway
- - - Services (Water, electricity and data) within trench
- Tree Stem Location
- Tree Canopy Extent
- Root Protection Area of Category 'A' Tree
- Root Protection Area of Category 'B' Tree
- Root Protection Area of Category 'C' Tree
- Tree to be Removed
- Scheme Boundary



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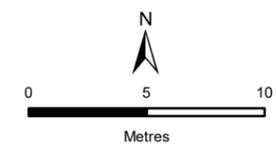
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Client  
**Beckett Rankine**

Figure Number  
**3**

Figure Title  
**Tree Protection Plan (TPP01) - Page 2 of 2**



## 2. Introduction

### 2.1 Development Background

2.1.1 Beckett Rankine is involved in the proposal to construct a temporary ferry facility for the duration of the repair works to Hammersmith Bridge that is closed to vehicles due to age related fracturing. These proposals are hereafter referred to as ‘the development’.

2.1.2 The development is located on two parcels of land and water (grid references TQ23087814 and TQ22987794), shown on Figure 1. The areas affected by the development is hereafter referred to as ‘the site’.

2.1.3 There are a number of trees within the site and adjacent to the site boundary that may be affected by development. Detailed development plans have been submitted.

### 2.2 Site Description

2.2.1 The site is divided between the north and south side of the River Thames, to the east of Hammersmith Bridge.

2.2.2 The northern site is predominantly hard surfaced and used by pedestrians and cyclists. The proposed jetty location is a slipway.

2.2.3 On the southern side the existing metalled towpath is bound by a narrow verge of vegetation along its southern side, and within adjacent gardens.

### 2.3 Brief and Objectives

2.3.1 Beckett Rankine commissioned Thomson to undertake attend site and review the arboricultural survey of the site, including a Tree Schedule (see Appendix 1) and a Tree Constraints Plan (TCP) (see Figure 2), and to produce an Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) including a Tree Protection Plan (TPP).

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 complete:

- Review the Arboricultural Survey of trees within or immediately adjacent to the site, in line with BS5837:2012.
- Online review of the Local Planning Authorities’ websites to determine whether trees on site are subject to a Tree Preservation Order or are covered by Conservation Area restrictions.
- An Arboricultural Report detailing our survey methods, results and recommendations, including the Tree Schedule and Tree Constraints Plan, which should be used to inform feasibility studies and design options at an early stage.

- 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.

## 2.4 Limitations

- 2.4.1 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.
- 2.4.2 A full hazard assessment has not been made and therefore no guarantee is given as to the structural integrity of any of the trees on or off site.
- 2.4.3 Where trees were clad in ivy (*Hedera helix*), dense epicormic growth or dense underplanting obscured the main stem this was recorded in the Tree Schedule. The inspection of such trees is impeded and as such a further inspection may be required following the removal of the obstruction. The Retention Categories of such trees should be considered as provisional only.
- 2.4.4 Measurements for off-site trees have been estimated and therefore may not fully represent the related constraints.
- 2.4.5 Whilst this report makes general observations on the long term potential of the trees surveyed, trees are dynamic organisms and subject to continual change, thus this report should not be relied upon for the purposes of development for more than 12 months from the date of survey.

## 3. Methodology

### 3.1 Desk Study

- 3.1.1 Records of Tree Preservation Orders (TPOs) existing at the site and Conservation Areas within or adjacent to the site were sought from the London Borough of Richmond and London Borough of Hammersmith and Fulham websites.

### 3.2 Tree Survey

- 3.2.1 The previous survey by Pell Frischmann was reviewed where the trees were located within the planning red-line boundary for this proposed development.

- 3.2.2 All significant trees at the site were assessed for their potential to be affected by the development proposals. Significant trees are defined as those with a trunk diameter of greater than 75mm at 1.5m above ground level according to the survey methodology outlined in BS5837:2012. Off-site or third party trees have been included where it is likely they would influence the development.

- 3.2.3 The trees surveyed were inspected from ground level only and no internal investigations were undertaken.

#### *Date of Survey*

- 3.2.4 The site was visited and the survey undertaken on 8<sup>th</sup> July 2021 by Andy Poynter BSc (Hons.) FARborA, MICFor, MIHort, CEnv.

#### *Weather Conditions*

- 3.2.5 The weather conditions at the time of survey were dry and overcast. Deciduous trees were in full leaf.

## 4. Results

### 4.1 Desk Study

- 4.1.1 It was confirmed following a review of London Borough of Richmond website on 13<sup>th</sup> April 2021 (that does not have interactive mapping), that trees within the red line boundary area located within the Castlenau Conservation Area. The online map can be found on this link [https://www.richmond.gov.uk/media/11444/conservation\\_area\\_map-2.pdf](https://www.richmond.gov.uk/media/11444/conservation_area_map-2.pdf). There is no information relating to the presence of Tree Preservation Orders apparent online.
- 4.1.2 The review of London Borough of Hammersmith and Fulham website (also 13<sup>th</sup> April 2021) revealed the majority of the site on the northern side is within either The Mall, Fulham Reach or Hammersmith Odeon Conservation Area. The map referred to is here [https://www.lbhf.gov.uk/sites/default/files/section\\_attachments/borough\\_wide\\_conservation\\_area\\_map.pdf](https://www.lbhf.gov.uk/sites/default/files/section_attachments/borough_wide_conservation_area_map.pdf). However it appears the three trees (T31, T41 and T42) within the red line boundary are actually outside of all three Conservation Areas.
- 4.1.3 There is a list of London Borough of Hammersmith and Fulham Tree Preservation Orders dated 5<sup>th</sup> November 2018 available online at [https://www.lbhf.gov.uk/sites/default/files/section\\_attachments/tree\\_preservation\\_order\\_list\\_05.11.18.pdf](https://www.lbhf.gov.uk/sites/default/files/section_attachments/tree_preservation_order_list_05.11.18.pdf). There are no Tree Preservation Orders under the street names of Hammersmith Bridge or Lower Mall.
- 4.1.4 Under the Town and Country Planning (Tree Preservation) (England) Regulations 2012 it is prohibited to cut down, top, lop, uproot, wilfully damage or wilfully destroy; or cause or permit the cutting down, topping, lopping, uprooting, wilful damage or wilful destruction of any tree, or group of trees, subject to a TPO or that is located within a Conservation Area except with the consent of the local authority.

### 4.2 Tree Survey

- 4.2.1 Eleven significant individual trees and two groups of trees located within or immediately adjacent to the site boundary were recorded in the Schedule. Of these records nine were recorded within the previous survey by Pell Frischmann and a four further records were made for the ferry proposal. One tree previously recorded, T20, has since been felled.
- 4.2.2 A breakdown of categories can be found in Table 4 below. The locations of all trees, RPAs, retention categories and reference numbers are shown on Figure 2.
- 4.2.3 A detailed description of each tree is given in the Tree Schedule in Appendix 1.

**Table 1: Number of significant trees allocated to each retention category.**

Tree Category	Number of Trees	Tree Numbers	Number of Groups	Group numbers	Total
<b>A</b>	1	T26	0	-	1
<b>B</b>	7	T23, T25, T31, T41. T42, T43, T45	0	-	7
<b>C</b>	3	T22, T24, T44	1	G21	4
<b>U</b>	0	-	1	G46	1
<b>Total</b>	<b>11</b>		<b>2</b>		<b>13</b>

**4.2.4** A list of the criteria used to determine the category and subcategories of the trees can be found in Appendix 2 - Table of Quality Assessment.

*Root Protection Areas (RPAs)*

**4.2.5** The RPAs for the trees and groups surveyed can be seen in Figure 2. The actual RPAs, in m<sup>2</sup>, for the individual trees surveyed are shown in Appendix 1.

**4.2.6** The RPAs for trees T22, T25, T26 and T43 have been adjusted to take into account the influence of the towpath. The RPA of T24 has been adjusted to reflect its river bank location.

## 5. Arboricultural Impact Assessment (AIA)

### 5.1 Introduction

5.1.1 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.

5.1.2 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;
- Alterations in ground level; and
- Leaks and spillages from stored materials.

### 5.2 Documents

5.2.1 This assessment has been based on documents produced by Beckett Rankine. The details of these documents can be seen in Table 2.

**Table 2: Documents upon which this assessment has been based**

Originator	Reference No.	Title
Beckett Rankine	2048-BRL-02-XX-DR-C-3013 P03	Hammersmith Pier Proposed Block Plan
Beckett Rankine	2048-BRL-02-XX-DR-C-3023 P03	Barnes Pier Proposed Block Plan
Beckett Rankine	2048-BRL-02-XX-DR-C-3201 P06	Barnes Pier Proposed GA
Beckett Rankine	2048-BRL-02-XX-DR-C-3203 P04	Barnes Pier Proposed Elevation
Beckett Rankine	2048-BRL-02-XX-DR-C-3205 P05	Barnes Pier River Sections
Beckett Rankine	2048-BRL-02-XX-DR-C-3207 P03	Barnes Pier Landward Walkway Layout
Beckett Rankine	2048-BRL-02-XX-DR-C-3208 P03	Barnes Pier Ex Landward Walkway Layout
Beckett Rankine	2048-BRL-02-XX-DR-C-3209 P04	Barnes Pier Proposed Highway Access Section
Beckett Rankine	2048-BRL-02-XX-DR-C-3215 P02	Barnes Pier Proposed Sections

### 5.3 Tree Removals

5.3.1 No trees require removal to facilitate this development.

### 5.4 Trees Works

5.4.1 Prior to the erection of protective fencing, there are six trees which, in order to avoid damage, require some pruning works. All tree work is to be undertaken in accordance with the British Standard BS3998:2010 Recommendations for Tree Work (BS3998:2010). Full details of all trees requiring work are given in Table 3.

5.4.2 The majority of these works are crown lifting operations required along the walkways to facilitate the passage of pedestrians.

**Table 3: Schedule of tree works for on-site trees**

Tree No.	Species	Works	Category
T24	London plane	Prune lateral branches to provide 0.5m clearance from walkway and crown lift to 2.5m over walkway (max. 3.0m above ground level).	C
T31	Lime	Prune lateral branches to provide 0.25 m clearance from walkway and crown lift to 2.5m over walkway (max. 3.0m above ground level).	B1
T41	Lime	Prune lateral branches to provide 0.25 m clearance from walkway and crown lift to 2.5m over walkway (max. 3.0m above ground level).	B1
T42	Lime	Prune lateral branches to provide 0.25 m clearance from walkway and crown lift to 2.5m over walkway (max. 3.0m above ground level).	B1
T43	Sycamore	Prune lateral branches to provide 0.5m clearance from walkway and crown lift to 2.5m over walkway (max. 3.0m above ground level).	B1
T44	Hawthorn	Prune lateral branches to provide 0.5m clearance from walkway and crown lift to 2.5m over walkway (max. 3.0m above ground level).	C
<b>General recommendation – not required to facilitate development</b>			
G46	Elms	Fell	U

### 5.5 Construction Work within RPAs

5.5.1 No construction work is required within the RPAs of the retained trees for this development.

5.5.2 Through careful design, the bank seat on the southern side is located between the RPAs of T24 and T44.

## 5.6 Services and Utilities

- 5.6.1 On the Barnes side, the best route is between the walkway and the bridge. All services can be located within one trench up to the river's edge. Thereafter it will be attached to the underside of the suspended walkway to avoid excavation and so that the electricity, water and data cables can be connected to the lighting and oyster touch-pads along the walkway and then down onto the pontoon.
- 5.6.2 The Hammersmith side will connect into existing services and with young trees there is unlikely to be any conflict with their RPAs.
- 5.6.3 If service installation is required within RPAs 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.

## 5.7 Conclusion

- 5.7.1 The development does not require the removal of any trees. One group of dead elms is recommended for removal for arboricultural reasons.
- 5.7.2 As an outcome of accommodating the arboricultural constraints, there will be no harm caused to any trees by these proposals subject to the erection of protective fencing furnished with tree protection notices (see Appendix 5) and the creation of Construction Exclusion Zones.
- 5.7.3 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.

## 6. Arboricultural Method Statement (AMS)

### 6.1 Introduction

- 6.1.1** The purpose of this AMS is to demonstrate how work will be undertaken on the site to avoid an unacceptable impact on, and provide an adequate level of protection for, the retained trees.
- 6.1.2** 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.
- 6.1.3** This AMS is to be used in conjunction with the Tree Protection Plan (TPP01) in Figure 3.

### 6.2 Documents

- 6.2.1** This AMS has been based on documents provided by Beckett Rankine. The details of these documents can be seen in Table 4.

**Table 4: Documents upon which this assessment has been based**

Originator	Reference No.	Title
Beckett Rankine	2048-BRL-02-XX-DR-C-3013 P03	Hammersmith Pier Proposed Block Plan
Beckett Rankine	2048-BRL-02-XX-DR-C-3023 P03	Barnes Pier Proposed Block Plan
Beckett Rankine	2048-BRL-02-XX-DR-C-3201 P06	Barnes Pier Proposed GA
Beckett Rankine	2048-BRL-02-XX-DR-C-3203 P04	Barnes Pier Proposed Elevation
Beckett Rankine	2048-BRL-02-XX-DR-C-3205 P05	Barnes Pier River Sections
Beckett Rankine	2048-BRL-02-XX-DR-C-3207 P03	Barnes Pier Landward Walkway Layout
Beckett Rankine	2048-BRL-02-XX-DR-C-3208 P03	Barnes Pier Ex Landward Walkway Layout
Beckett Rankine	2048-BRL-02-XX-DR-C-3209 P04	Barnes Pier Proposed Highway Access Section
Beckett Rankine	2048-BRL-02-XX-DR-C-3215 P02	Barnes Pier Proposed Sections

- 6.2.2** 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 4.

### 6.3 Arboricultural Issues

- 6.3.1 There is no requirement to remove trees to facilitate this development.
- 6.3.2 Access facilitation pruning of the canopies of retained trees, as laid out in Appendix 3, should be completed before construction begins.
- 6.3.3 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).

### 6.4 Supervision

- 6.4.1 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 6.
- 6.4.2 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.
- 6.4.3 Once the tree protection fencing has been installed, it should be checked for integrity by a suitably qualified arboriculturist.
- 6.4.4 During the level reduction of the existing hard surfaces alongside London Plane T26 an arboriculturist should be available should a root be discovered. The modest excavation is localised and adjacent to the bridge with the greatest 150mm excavation outside RPA. From that deepest point the level is gently graded to achieve the 1:2 gradient and there is consequently no requirement for an arboriculturist to be present, just contactable.
- 6.4.5 After each site visit by the arboriculturist, a report of the visit shall be submitted to the relevant LPA 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.
- 6.4.6 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 the respective Local Planning Authority Planning Department.
- 6.4.7 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.

### 6.5 List of Contacts

- 6.5.1 The list of contacts within Table 5 should be used as reference if any deviations from, or issues with, any part of this AMS arise.

**Table 5: List of contact details for relevant parties**

Name	Job Title	Organisation	Contact Details	
Andy Poynter	Principal Arb Consultant	Thomson Environmental Consultants	<a href="mailto:andrew.poynter@thomsonec.com">andrew.poynter@thomsonec.com</a>	
			-	07496 895839
Tim Beckett	Project Manager	Beckett Rankine	<a href="mailto:tim@beckettrankine.com">tim@beckettrankine.com</a>	
			020 7834 7267	
Craig Ruddick (tbc)	Arboricultural Manager	London Borough of Richmond upon Thames	tbc	
			-	-
Leon Parry (tbc)	Senior Arboriculturalist	London Borough of Hammersmith and Fulham	tbc	
			-	-

## 6.6 Tree Removals and Pruning

6.6.1 There is no requirement for tree removal.

6.6.2 Prior to the erection of protective fencing, there are five trees which, in order to avoid damage, require some pruning works. All tree work is to be undertaken in accordance with the British Standard BS3998:2010 Recommendations for Tree Work (BS3998:2010). Full details of all trees requiring work are given in Appendix 4.

6.6.3 Trees requiring pruning shall have the works carried out in accordance with BS3998:2010 *'Recommendations for Tree Work'*.

## 6.7 Protective Fencing

6.7.1 Temporary fencing will be erected as indicated on the Tree Protection Plan (TPP01) in Figure 3. 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, 2012). 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.

6.7.2 A diagram illustrating an example of the protective fencing can be seen in Appendix 5.

6.7.3 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 6.

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

6.7.5 The following principles must be maintained within the CEZ:

- Existing ground levels shall not be altered except where agreed alongside London Plane T26;
- 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.

**6.7.6** The fencing shall remain in place until completion of works. No other construction activity will take place within those areas formerly protected by the fence.

## **6.8 Ground Protection**

**6.8.1** There is no requirement for ground protection to be installed for this development. The existing metalled towpath and hard surfacing will provide sufficient protection

## **6.9 Installation of support pads within the RPA**

**6.9.1** The supporting pads of the temporary walkway sit at ground level upon the existing surface and require no excavation.

## **6.10 Construction within RPAs**

**6.10.1** There is no requirement to undertake any construction work within the RPAs of any of the retained trees for this development. The bank seat on the southern side is located between the RPAs of T24 and T44.

## **6.11 Services and Utilities**

**6.11.1** All services shall be routed so that no excavations are required within the RPAs of the retained trees.

**6.11.2** On the Barnes side, the best route is between the walkway and the bridge. All services can be located within one trench up to the river's edge. Thereafter it will be attached to the underside of the suspended walkway to avoid excavation and so that the electricity, water and data cables can be connected to the lighting and oyster touch-pads along the walkway and then down onto the pontoon.

**6.11.3** The Hammersmith side will connect into existing services and with young trees there is unlikely to be any conflict with their RPAs.

**6.11.4** 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.

## 6.12 Landscaping

6.12.1 The plans provided do not show any landscaping. However, if any is to be undertaken post-construction the principles of the CEZ (as detailed in Section 6.7.5) should still be adhered to 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.

## 6.13 Sequence of Works

6.13.1 A logical sequence of events is to be observed as shown in Table 6.

**Table 6: Sequence of works.**

Stage	Event	Arboricultural Supervision required
Stage 1	Prestart meeting with LPA Tree Officer(s), site manager and relevant construction staff. This will include site induction for all personnel.	Yes
Stage 2	Carry out tree pruning operations to enable access.	No
Stage 3	Install, site compound building and materials storage facility. (It is assumed this will be the bridge/highway).	No
Stage 4	Install Protective Fencing in the position shown on Figure 3, to the specifications given in Section 6.7.	No
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.	Yes
Stage 7	Complete landscape reinstatement.	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

## 7. Bibliography

- 7.1.1 British Standards Institution (2014) BS8545:2014 *Trees: from nursery to independence in the landscape - Recommendations*. BSI, London.
- 7.1.2 British Standards Institution (2012) BS5837:2012 *Trees in Relation to Design, Demolition and Construction - Recommendations*. BSI, London.
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- 7.1.13 Robertson, J, Jackson, N & Smith, M (2006) *Tree Roots in the Built Environment*. The Stationery Office, London.
- 7.1.14 Santamour, F.S. (2002) *Trees for urban planting: diversity uniformity, and common sense*. U.S. Department of Agriculture. Washington D.C.

## Appendix 1 - Tree Schedule

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m)				Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition		Comments	Preliminary Management Recommendations	BS Category	RPA (m <sup>2</sup> )	RPA Radius (m)
				N	E	S	W					Physiology	Structure					
T20	Stump	1	1000	-	-	-	-	-	-	-	-	-	-	Tree has recently been felled	None.	-	-	-
G21	Mixed species	6	100	1	1	1	1	1	1	Young	10 +	Fair	Fair	Elder, lime and ash within group.	None.	C	4.5	1.2
T22	Poplar, hybrid black; <i>Populus canadensis</i>	15	410, 410	2	2	2	2	4 N	4	Semi Mature	10 +	Fair	Fair	Northward leaning stem over path	None.	C	152.2	6.96
T23	Ash, common; <i>Fraxinus excelsior</i>	12	300	4	3	3	3	3 N	5	Semi Mature	20 +	Good	Fair	Ivy been removed.	None.	B2	40.1	3.6
T24	Plane, London; <i>Platanus x hispanica</i>	5	400	3	2	2	2	0 N	0	Semi Mature	10 +	Good	Good	Small elder and hawthorn also immediately adjacent RPA estimated due to unsafe position to take a measurement.	None.	C	72.4	4.8
T25	Maple, Norway; <i>Acer platanoides</i>	12	600	5	5	5	5	4 N	4	Semi Mature	20 +	Good	Good	Satisfactory condition.	None.	B2	162.9	7.2
T26	Plane, London; <i>Platanus x hispanica</i>		800	7	6	7	6	6 W	6	Mature	40 +	Good	Good	DBH estimated as location is in private garden.	None.	A1	289.6	9.6
T31	Lime, European; <i>Tilia x europaea</i>	6	120	1.5	1.5	1.5	1.5	2 E	2	Young	20 +	Good	Good	Established young tree.	None.	B2	6.5	1.4
T41	Lime, European; <i>Tilia x europaea</i>	7	120	1.5	1.5	1.5	1.5	2 S	2	Young	20 +	Good	Good	Established young tree.	None.	B2	6.5	1.4
T42	Lime, European; <i>Tilia x europaea</i>	5	210	1.5	1.5	1.5	1.5	2 N	2	Young	20 +	Good	Good	Established young tree.	None.	B2	6.5	1.4
T43	Sycamore; <i>Acer pseudoplatanus</i>	17	490	5	6	3	3	2 E	3	Early Mature	20 +	Good	Good	Asymmetric form, otherwise satisfactory	None.	B1	108.6	5.9
T44	Hawthorn; <i>Crataegus monogyna</i>	5	250	3	2	1	2	0 N	0	Mature	10 +	Fair	Fair	Growing out of riverbank wall.	None.	C	28.3	3.0
T45	Sycamore; <i>Acer pseudoplatanus</i>	18	550	6	6	6	5	3 S	3	Early Mature	20 +	Good	Good	Offsite tree within adjacent garden.	None.	B1	137.9	6.6

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m)				Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition		Comments	Preliminary Management Recommendations	BS Category	RPA (m <sup>2</sup> )	RPA Radius (m)
				N	E	S	W					Physiology	Structure					
G46	English Elm; <i>Ulmus procera</i>	8	200	2	2	2	2	2	2	Young	Dead	Dead	Fair	Group of dead elms.	Fell.	U	-	-

## Appendix 2 - Table of Quality Assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
<b>Trees unsuitable for retention (see Note)</b>				
<b>Category U</b> 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	<ul style="list-style-type: none"> <li>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)</li> <li>Trees that are dead or are showing signs of significant, immediate and irreversible overall decline</li> <li>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</li> </ul> NOTE Category U trees can have existing or potential conservation value which might be desirable to preserve			DARK RED
	<b>1 Mainly arboricultural values</b>	<b>2 Mainly landscape values</b>	<b>3 Mainly cultural values, including conservation</b>	
<b>Trees to be considered for retention</b>				
<b>Category A</b> 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
<b>Category B</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
<b>Category C</b> 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 - Arboricultural Survey Data Collection

Trees were categorised as single trees or those that formed part of a distinct group such as a woodland or hedgerow. Groups can be defined as cohesive arboricultural features, either aerodynamically (for example, companion shelter), visually or culturally including for biodiversity (BS5837:2012). The information recorded for each tree can be seen in Table 1.

**Table 7: Information recorded for each tree during survey.**

Attribute	Description
<b>Tree No.</b>	Numerical reference given in sequential order starting at number '1', corresponding with the numbers as set out in Figure 2; trees are given the prefix 'T', groups 'G', woodlands 'W' and hedgerows 'H'.
<b>Species</b>	The common names are based upon on site identification and expressed according to <i>Tree Guide</i> (Johnson & More, 2004).
<b>Height</b>	Measured approximately from ground level with the aid of a clinometer and shown in metres (m).
<b>Stem Diameter</b>	Diameter measured at approximately 1.5m above ground level. In the case of multi-stemmed trees, measurement is taken of each stem at 1.5m, where there are two to five stems; or a mean stem diameter at 1.5m, where there are more than five stems. Given in millimetres (mm).
<b>Canopy Spread</b>	Maximum branch spread measured in metres from the centre of the trunk in the direction of the four cardinal points of the compass (or an average can be given if branches demonstrate an even spread).
<b>Crown Clearance</b>	Height above ground level of the first significant branch and direction of growth, and the height above ground level of the overall canopy.
<b>Age Class</b>	<ul style="list-style-type: none"> <li>• Young - less than one-third natural life span spent;</li> <li>• Middle-aged - between one-third and two-thirds natural life span spent;</li> <li>• Mature - greater than two-thirds life span completed;</li> <li>• Over-mature - mature, and in an overall state of decline;</li> <li>• Veteran - surviving beyond the typical age range for the species with a high value in terms of conservation and amenity.</li> </ul>
<b>Physiological Condition</b>	Overall health, condition and function of the tree in comparison to a 'normal' example of the species of a similar age; e.g. 'good', 'fair', 'poor' or 'dead'. If deemed necessary, these gradings may be elaborated upon in the 'Comments' section.
<b>Structural Condition</b>	The overall structural condition of the tree including the roots, butt, trunk, limbs and their unions, and the presence of any structural defects, decay or pathological defects.

Attribute	Description
	<ul style="list-style-type: none"> <li>• Good - no significant visible structural defects with a form typical for the species;</li> <li>• Fair - a specimen with only minor defects that are easily remedied or of no long term significance;</li> <li>• Poor - significant and irremediable physiological or structural defects that may lead to early or premature decline;</li> <li>• Hazardous - significant structural defects of such a degree that there is a risk of imminent collapse or failure. If deemed necessary, these gradings may be elaborated upon in the 'Comments' section.</li> </ul>
<b>Comments</b>	Comments have been made, where appropriate, relating to location, health and condition, structure and form, estimated life expectancy, conservation value and amenity value within the local landscape.
<b>Preliminary Management Recommendations</b>	Tree work that should be undertaken for good arboricultural management, regardless of the requirements of the development.
<b>Estimated Remaining Contribution</b>	The estimated time, in years, that the tree will provide a safe contribution to the site (i.e. <10, 10+, 20+ and 40+).

### Quality Assessment

During the survey, the trees were assessed qualitatively, categorising the quality and value of the trees based on arboricultural, landscape and cultural (including conservation) features. Each tree was then placed into one of four categories. The four categories can be seen in Table 2. Definitions for these categories can be found in Appendix 2.

**Table 8: Quality assessment categories**

Category	Description
<b>Category U</b>	Trees 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.
<b>Category A</b>	Trees of high quality with an estimated life expectancy of at least 40 years.
<b>Category B</b>	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
<b>Category C</b>	Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.

### 7.1.15

**7.1.16** Trees categorised as either A, B or C, were also allocated up to three subcategories. The subcategories chosen for each tree are dependent on the main reasons for selection of the particular category grading. The three subcategories are as follows:

- 1 - Category grading based on mainly arboricultural qualities;
- 2 - Category grading based on mainly landscape qualities; and
- 3 - Category grading based on mainly cultural values, including conservation.

*Root Protection Areas (RPAs)*

Trees that are selected for retention on the site could be at risk of damage during construction, such as root damage during the excavations for foundations or services or any ground-working for landscaping. Further impacts on the trees may potentially result from vehicle movements and materials storage, including root severance, compaction of the soil and exclusion of air and water to the soil. The risk of tree damage is minimised if construction activities are planned to avoid the roots of trees.

The area of ground adjacent to each tree or group of trees that contains the majority of the roots can be calculated using the equation provided in the BS5837:2012. This Root Protection Area (RPA) is a radius around the tree of 12 times the stem diameter for a single stem. For multi-stemmed trees of two to five stems and greater than five stems, the cumulative stem diameters to be multiplied by 12, are calculated as per the equations in Table 3.

**Table 9: Equations for the calculation of the RPA of multi-stemmed trees**

Number of stems	Equation
Two to five	$\sqrt{(\text{stem diameter } 1)^2 + (\text{stem diameter } 2)^2 \dots + (\text{stem diameter } 5)^2}$
More than five	$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$

The RPA for each tree in the Tree Schedule has been calculated and, where relevant, has been adjusted to take into account site conditions. For example, when a tree is growing in a confined root space adjacent to an existing building or other solid structure that would restrict root growth in that direction, the RPA has been adjusted accordingly (see Figure 2).

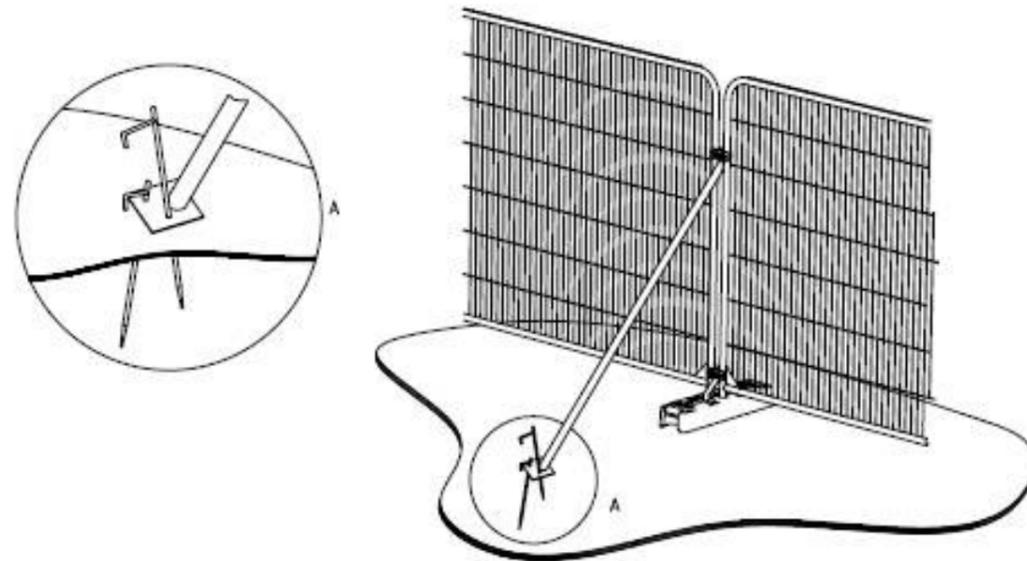
The RPA for tree groups is calculated using the stem of the largest tree within the group. The RPA radius is calculated as per Section 3.2.7 and then used to define the RPA by following the outline of the group's extent.

Where the calculated RPA exceeds 707m<sup>2</sup>, it has been capped at this figure, as per BS5837:2012. This is equivalent to a circle with a radius of 15m or a square with approximately 26m sides.

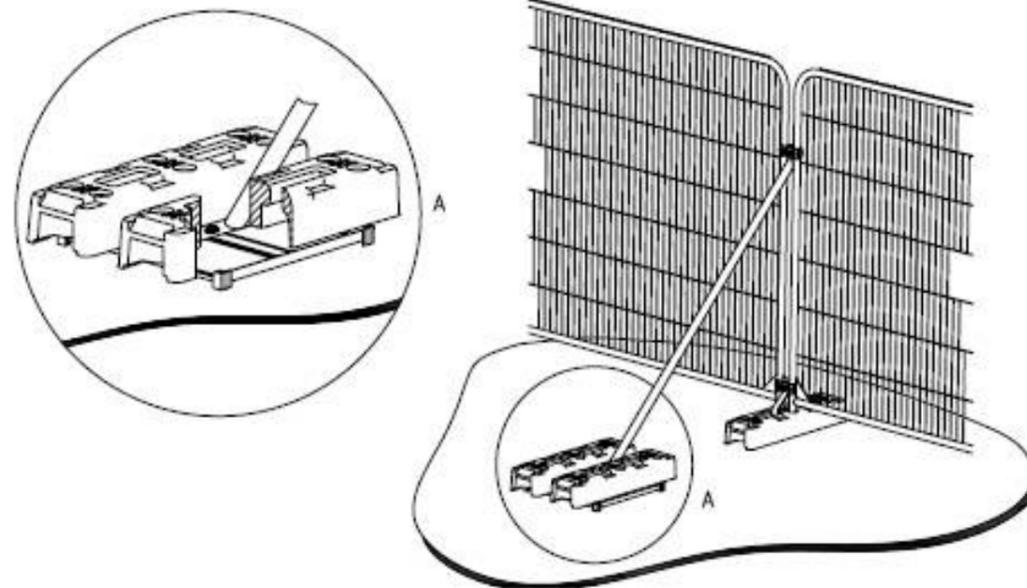
## Appendix 4 - Schedule of Tree Works

Tree No.	Species	Works	Category
T24	London plane	Prune lateral branches to provide 0.5m clearance from walkway and crown lift to 2.5m over walkway (max. 3.0m above ground level).	C1
T31	Lime	Prune lateral branches to provide 0.25 m clearance from walkway and crown lift to 2.5m over walkway (max. 3.0m above ground level).	B1
T41	Lime	Prune lateral branches to provide 0.25 m clearance from walkway and crown lift to 2.5m over walkway (max. 3.0m above ground level).	B1
T42	Lime	Prune lateral branches to provide 0.25 m clearance from walkway and crown lift to 2.5m over walkway (max. 3.0m above ground level).	B1
T43	Sycamore	Prune lateral branches to provide 0.5m clearance from walkway and crown lift to 2.5m over walkway (max. 3.0m above ground level).	B1
T44	Hawthorn	Prune lateral branches to provide 0.5m clearance from walkway and crown lift to 2.5m over walkway (max. 3.0m above ground level).	C
<b>General recommendation - not required to facilitate development</b>			
G46	Elms	Fell	U

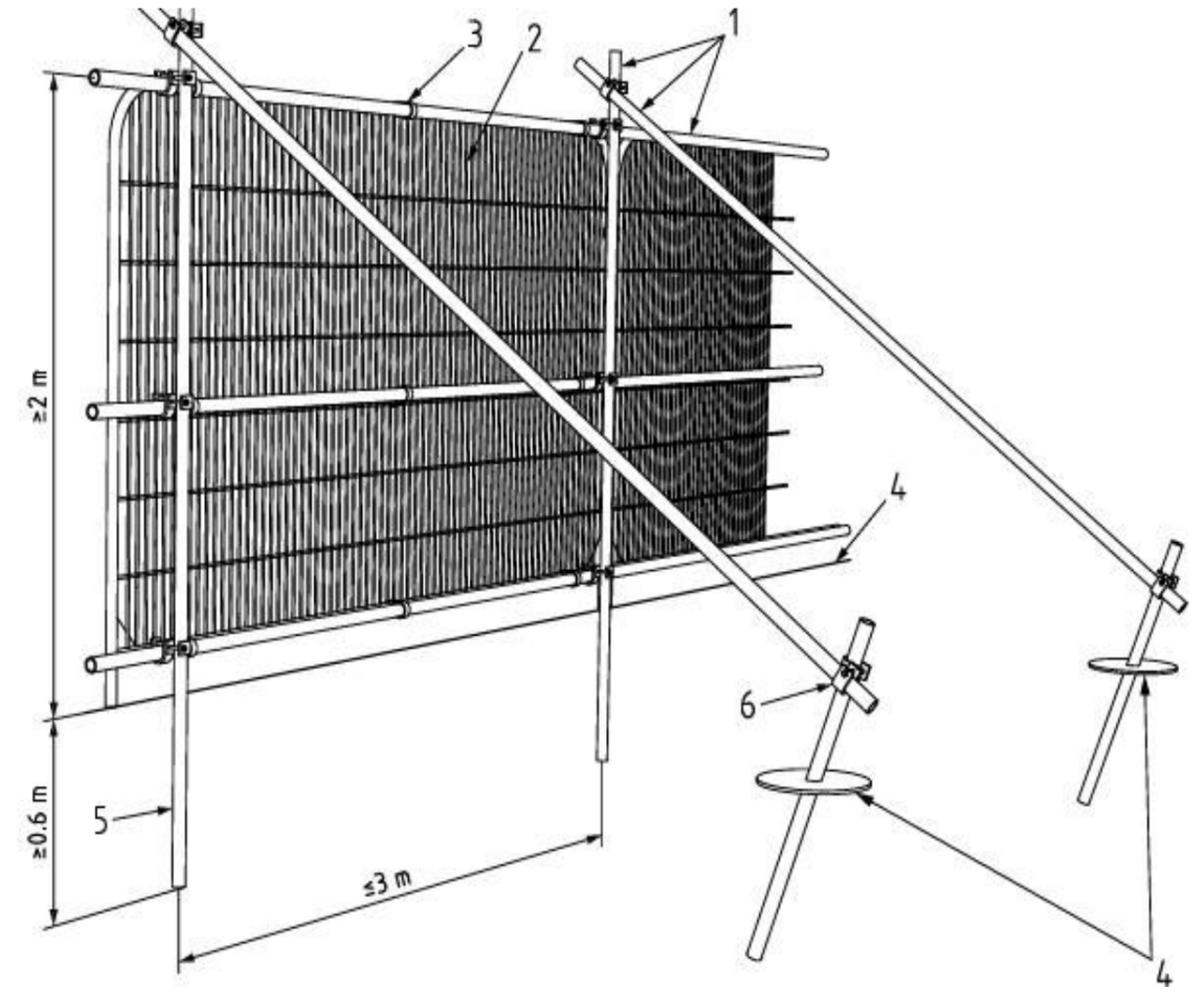
Appendix 5 - Example of Protective Fencing



a) Stabilizer strut with base plate secured with ground pins



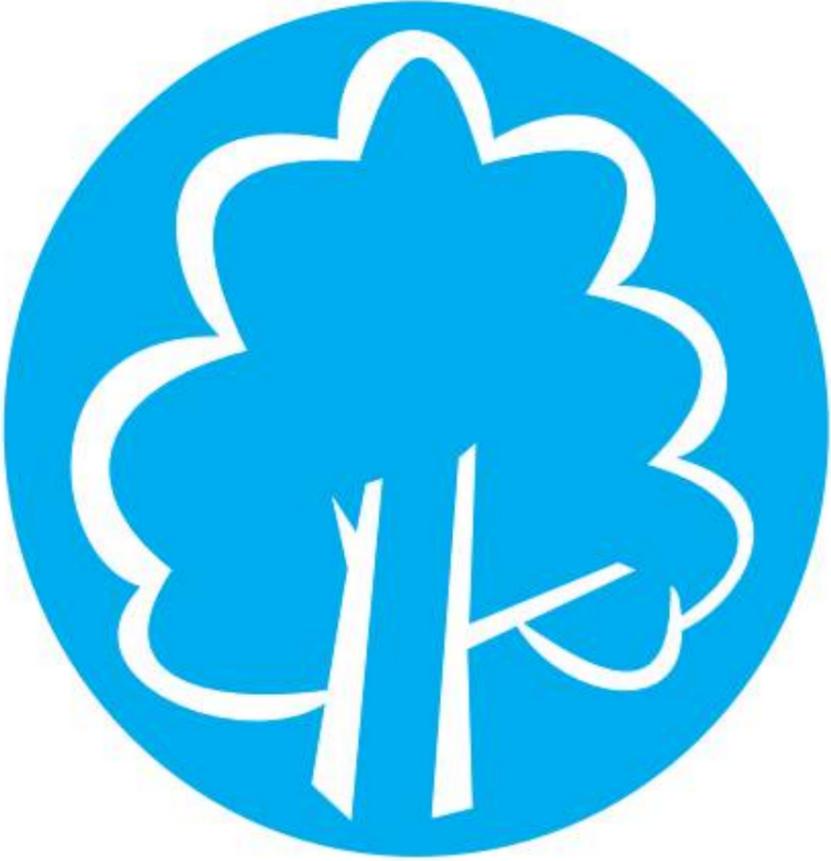
b) Stabilizer strut mounted on block tray



**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 6 - Tree Protection Fencing Notice



**PROTECTIVE FENCING. THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.**



**TREE PROTECTION AREA  
KEEP OUT !**  
(TOWN & COUNTRY PLANNING ACT 1990)  
TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A TREE PRESERVATION ORDER.  
CONTRAVENTION OF A TREE PRESERVATION ORDER MAY LEAD TO CRIMINAL PROSECUTION  
ANY INCURSION INTO THE PROTECTED AREA MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY