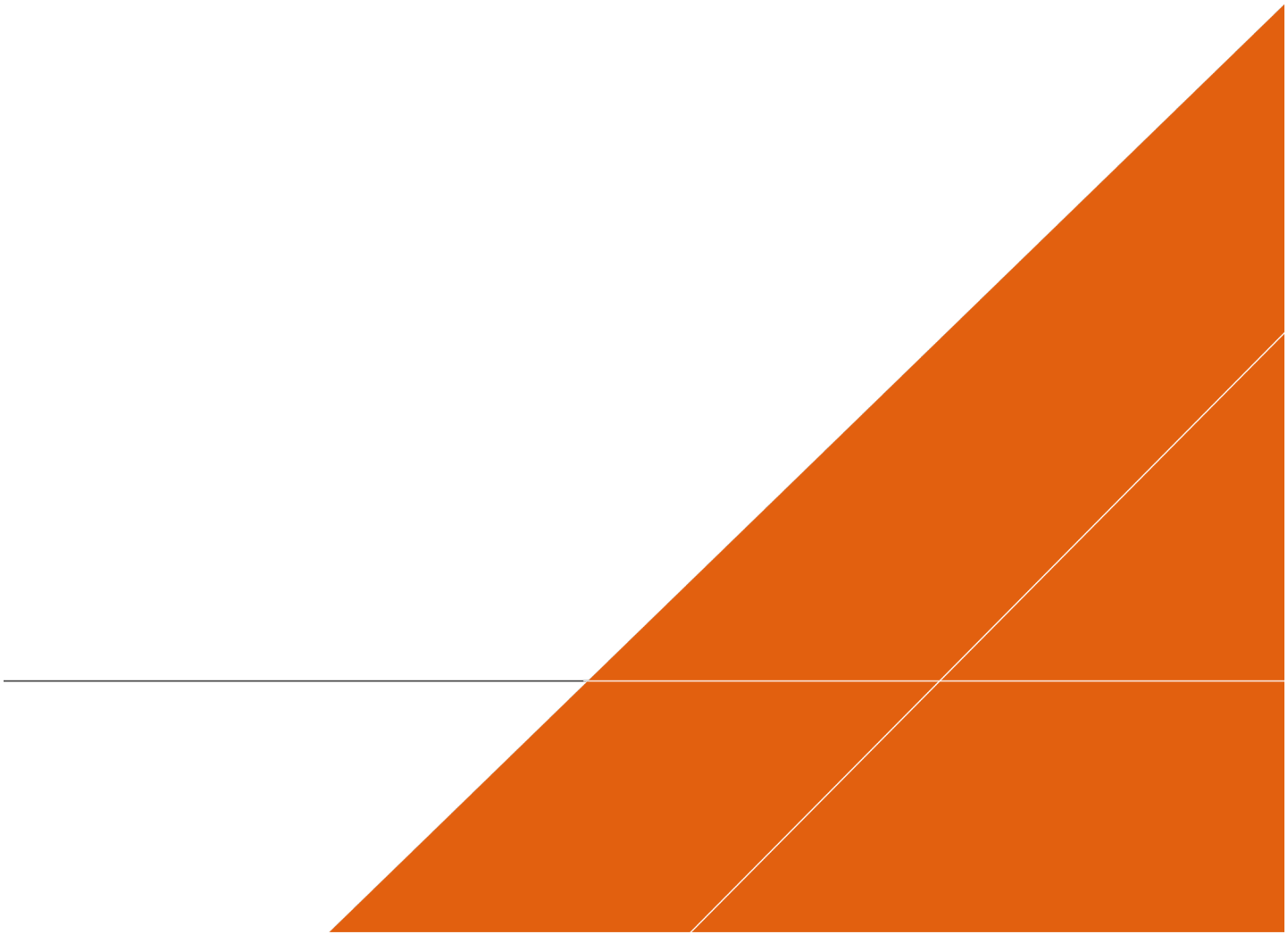
# TREVOR BASIN STEPS

## BS 5837: 2012 Arboricultural Method Statement

MARCH 25



# TREVOR BASIN STEPS

## BS 5837: 2012 Arboricultural Method Statement

| | |
|---|---|
| Author | Will Green |
| Checker | James Potts |
| Approver | Brandon Murray |
| Report No | 10058635-ARC-XX-XX-RP-YY-0001-01-Arboricultural Method Statement |
| Date | MARCH 2025 |

## Version control

| Version | Date | Author | Changes |
|---|---|---|---|
| 01 | 07/03/2025 | W Green | N/A |
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This report dated March 25 has been prepared for Canal and River Trust (the “Client”) in accordance with the terms and conditions of appointment (the “Appointment”) between the Client and **Arcadis Consulting (UK) Limited** (“Arcadis”) for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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# 1 Introduction

## 1.1 Overview

Arcadis Consulting (UK) Limited (Arcadis) has been commissioned by Canal and River Trust (CRT) ("the Applicant") to prepare an Arboricultural Method Statement (AMS) in line with British Standard BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations (British Standards Institution, 2012), henceforth referred to as BS 5837: 2012. This is to support the discharge of Arboricultural Planning Conditions related to Planning Application P/2024/1180 which are detailed below:

*"No development shall take place until an Arboricultural Method Statement has been submitted to and approved in writing by the Local Planning Authority. No development or other operations shall take place except in strict accordance with Method Statement as is approved. The Method Statement shall include the following:*

*1) A specification for tree protection fencing and ground protection measures that comply with British Standard 5837:2012;* **- Details specified within Appendix C of this report.**

*2) A Tree Protection Plan showing the location of the trees to be removed and retained with their crown spreads, Root Protection Areas, Construction Exclusion Zones, and location of protective fencing and ground protection measures accurately plotted*; **- Provided within Figure 1. Tree Impact and Protection Plan**

*3) A full specification for any access, driveway, path, underground services or wall foundations within retained tree Root Protection Areas or Construction Exclusion Zone , including any related sections and method for avoiding damage to retained trees;* **- Sectional drawings and specifications for construction of new steps have been submitted separately.**

*4) Details of general arboriculture matters including proposed practices with regards to cement mixing, material storage and fires; -* **Provided in Section 3 and Figure 1. Tree Impact and Protection Plan**

*5) Details of the frequency of supervisory visits and procedures for notifying the findings of such visits to the Local Planning Authority;* **- Provided in Section 3.4**

*6) Method for protecting retained trees during demolition works;* **- Provided in Section 3.3**

*7) Details of all proposed tree works, including felling and pruning."* **- Provided in Section 3.3**

## 1.2 Site Location and Setting

The site is located in adjacent to the Pontcysyllte Aqueduct at Trevor, Wrexham, centred on Ordnance Survey (OS) Grid Reference SJ 27060 42082 and centred around the post code LL20 7TY. The site is approximately 0.12 ha in area and is comprised of primarily stepped footpath on a steep slope, surrounded by broadleaved woodland with marginal scrub and grassland habitat. To the north of the site, the area is bordered by the village of Trevor.

An aerial screen shot illustrating the site location (red outline) and survey area (blue outline) is presented in Image 1.



*Image 1 Site Boundary (red line), Imagery © 2024 Infoterra Ltd & Bluesky*

## 1.3 Proposed Development

The proposed scheme aims to improve the existing access from Trevor Basin to the River Dee riverside walk. In addition, there will be the improvement of approx. 30.0m length of path and the creation of a new viewpoint near the river.

# 2 Methodology

## 2.1 Arboricultural Method Statement

This Arboricultural Method Statement has been produced to ensure the retention and protection of all trees to be retained under proposals included in planning reference DC/23/0052/FUL. This report provides methodologies for working safely retained trees along with specialist methods of tree protection where required. Trees to be retained and protected are as highlighted in Arboricultural Impact Assessment (AIA) Report Ref: *10058635-AUK-XX-XX-RP-ZZ-0001-01 Arboricultural Impact Assessment.*

The Arboricultural Method Statement was produced by Will Green BSc (Hons) TechArborA (Consultant Arboriculturist and Ecologist) in March 2024 in accordance with BS 5837:2012 Trees in relation to design, demolition and construction: Recommendations.

The Arboricultural Impact Assessment was completed in June 2024 and was submitted in support of planning application for the redevelopment of existing access from Trevor Basin to the River Dee riverside walk.

All arboricultural features / data referenced in this report as detailed in the Schedule of Trees and Tree Constraints Plan provided in Appendix B is extracted from the Arcadis Arboricultural Survey and Impact Assessment report.

**This AMS must be read in conjunction with the associated: *10058635-AUK-XX-XX-DR-ZZ-0002_TIPP V2* provided as** Error! Reference source not found..

An explanation of terms referenced in the site-specific AIA and this AMS are provided in Appendix A.

## 2.2 Supporting Documentation

Collected field data and design details provided on behalf of the Client. Table 1 provides details of the documents and drawings used to enable this report.

*Table 1: Data Sources*

| Document / Plan Title and Author | Date | Information Type |
|---|---|---|
| *10058635-AUK-XX-XX-DR-LA-0032-P1-General Arrangement 2* (Arcadis) | June 2024 | Trevor Basin Steps General Arrangement Detail |
| *10058635-AUK-XX-XX-DR-ZZ-0002_TIPP V2* (Arcadis) | June 2024 | Tree Impacts and Protection Plan |
| *10058635-AUK-XX-XX-RP-ZZ-0001-01 Arboricultural Impact Assessment* (Arcadis) | June 2024 | Arboricultural Impact Assessment |

# 3 Arboricultural Method Statement

This Arboricultural Method Statement provides detail on tree removal techniques and how existing trees are to be retained and protected during the demolition and construction phase of works. The advice is specific to this site and should be read in conjunction with Figure 1. Tree Impact and Protection Plan.

## 3.1 Project Supervision - Roles and Responsibilities

A Project Arboriculturist must be appointed prior to the commencement of works to act as point of contact for site and project managers when considering on-site arboricultural issues.

Due to the nature of the works, amendments to design details are regularly required for construction operations. Should any tree-related issues related to design amendments arise on site the Site manager must inform the Project Arboriculturist, who will assess the situation and make recommendations accordingly.

The Project Arboriculturist should be an appropriately qualified and experienced arboriculturist with a minimum qualification recognised by the Arboricultural Association at level 4 or a membership of the of the Arboricultural Association at a minimum of Technical Member.

Due to the nature of the works a pre-commencement site meeting will be required between the project arboriculturist and the site manager as specified within the AMS to ensure that all tree protection measures are in place. Photographic evidence will need to be provided to the project arboriculturist for key stages of the project which will include:

- Tree pruning and felling operations
- Installation of tree protection fencing
- Installation of ground protection within RPA's
- Hand excavation around roots
- Reinstatement and removal of tree protection fencing

A breakdown of the roles and responsibilities of figures outlined in this Arboricultural Method Statement is detailed in Table 2 below.

*Table 2: Roles and responsibilities of figures outlined in this Arboricultural Method Statement*

| Title | Roles and Responsibilities | Involvement |
|---|---|---|
| Project Arboriculturist | Resource for site contractor and interface between site works and local authority. Responsible assessing any design changes resulting from on-site works and providing Arboricultural Compliance notes to the Local Planning authority. | Pre, during and post construction overseeing of all on-site arboricultural matters, compliance with Arboricultural Method Statement |
| Arboricultural Clerk of Works (ACoW) | On-site arboricultural presence responsible for supervising demolition or construction activity with the potential to impact retained trees. | On-site presence as defined by the Arboricultural Method Statement and Project Arboriculturist |
| Tree / Arboricultural Officer | Local Planning Authority officer responsible for, review/approval of all non-routine tree works to Conservation Area or TPO trees.<br>The application to the LPA to remove or undertake works on such trees requires a decision which can often take at least two months. | Pre-during and post construction involvement with site contractor and project arboriculturist |
| Arboricultural Contractor | Subcontractor responsible for the removal, pruning and remediation works associate with on-site trees as appointed by the primary contractor. | Pre-construction facilitation works and mid / post construction mitigation works as required by the Project Arboriculturist |

## 3.2 Order and phasing of operations

In order to ensure successful delivery of tree works and protection of retained trees, the phasing of Arboricultural Input into site works is presented in Table 3 below. This should form the basis of the auditable schedule of supervision by the Project Arboriculturist over the course of the proposed works.

*Table 3: Works Phasing and Arboricultural Input*

| Timing / Phasing | Arboricultural Input / Site Operations |
|---|---|
| Pre- Commencement | Pre-commencement meeting including review of AMS |
| | Layouts and specifications of tree protection measures to be agreed upon during the pre-commencement meeting and confirmed by the Project Arboriculturist prior to the commencement of works. |
| | Undertake any necessary tree removals and facilitation pruning works, to be agreed upon with the arboricultural contractor. |
| Site Setup | Installation of Site hoarding and Tree Protection Fencing as agreed during pre-commencement site meeting. |
| | Installation of ground protection measures as specified in the Arboricultural Method Statement and agreed during the pre-commencement meeting. |
| Site Works / Construction Phase | Project Arboriculturist to be consulted on any tree related issues over the course of the proposed works to ensure continued compliance with Arboricultural Method Statement |
| | Any site-specific operations requiring the attendance of the Project Arboriculturist should be scheduled in accordingly and will form part of an auditable inspection schedule. |
| Works End / Site Reinstatement | Works end briefing and inspection between Project Arboriculturist and Site Manager to assess the health of retained trees and identify any required remedial works required |
| | Completion of any remedial tree/soil works where trees/RPAs have been impacted, to be confirmed following post development inspection |

## 3.3 Site setup / Pre-construction

### Site briefing

Prior to any site works being undertaken, a pre-commencement meeting between the Site Manager and Project Arboriculturist shall be carried out. The meeting will review development proposals in relation to existing trees, confirm any tree works and construction requirements within this document, as well as inform any further necessary tree protection measures to be implemented over the course of the works.

During the pre-commencement briefing any additional requirements for arboricultural site monitoring will be agreed and scheduled between the Site Manager and Project Arboriculturist.

The pre-commencement briefing will also confirm the required layouts of proposed site hoarding and temporary tree protection measures (Fencing and/or Ground Protection) to be implemented over the course of the proposed works.

### Tree Works

Following the pre-commencement meeting but prior to the commencement of site establishment all required tree works should be confirmed by the project Arboriculturist and completed by a suitable qualified and experienced Arboricultural Contractor.

## Tree Removals

Prior to the commencement of demolition or construction works all approved tree removal and pruning works will be completed.

Tree removals on site will be limited to those displayed in Table 4 of this report provided below.

*Table 4: Tree Removals*

| Feature no. | Species | Partial or Full Removal | Reason For Removal | Grade |
|---|---|---|---|---|
| G6 | Mixed Species: Ash *(Fraxinus excelsior)*, Hazel *(Corylus avellana)*, *W*ild Cherry *(Prunus avium)*, Sycamore (*Acer pseudoplatanus*) | Partial | Selective thinning of self-set trees <75 mm DBH to facilitate access for works. | C2 |

A photograph of area of trees requiring thinning is displayed in Image 2 below



*Image 2: Photograph of G6*

## Tree Pruning

Tree pruning works are necessary to facilitate proposed construction operations in a number of areas on site. Tree pruning works will be limited to those approved under planning consent as listed in Table 5 and as marked by green hatching in Figure 1. Tree Impact and Protection Plan.

If any additional tree pruning works are identified during site works, they must be confirmed in writing by the project arboriculturist and be completed in accordance with BS 3998:2010 Tree Works Recommendations.

*Table 5: Tree Pruning Works*

| Feature no. | Species | Notes | Grade |
|---|---|---|---|
| G2 | Mixed Species: Hazel *(Corylus avellana),* Hawthorn *(Crataegus monogyna)* | Re-Coppice stems back to existing bole at or near ground level to facilitate access for installation of new steps. | B3 |
| G3 | Mixed Species: Hazel *(Corylus avellana),* Hawthorn *(Crataegus monogyna)* | Re-Coppice stems back to existing bole at or near ground level to facilitate access for installation of new steps. | C2 |

Photographs of area to be coppiced are displayed in Image 3 and Image 4 below



Image 3: Photograph of G2



Image 4: Photograph of G3

## Installation of Site Hoarding and Tree protection fencing

Following completion of all required tree works, all proposed Tree Protection Fencing as displayed in Figure 1. Tree Impact and Protection Plan will be installed across the site to form worksite boundaries and Construction Exclusion Zones.

Alignment of protective fencing is shown in Figure 1. Tree Impact and Protection Plan. Exact layouts for tree protection fencing must be confirmed by the Project Arboriculturist and Site Manager during the pre-commencement site meeting.

During the pre-commencement meeting, designated routes for pedestrian and plant accessing the site will be confirmed and any further protective fencing or ground protection required will be agreed upon. Once agreed, these routes should be adhered to at all times when travelling to and from construction areas.

Where fencing is required, it shall be erected immediately after the completion of any tree works but prior to bringing any vehicles, plant or materials onto site and will form a Construction Exclusion Zone (CEZ).

Once installed, fencing shall be considered as sacrosanct and must not be removed or adjusted through the entire course of the development unless under written consent of the Local Planning Authority Tree Officer and Project Arboriculturist.

**By default, Tree Protection Fencing shall comprise** 2-metre-high Heras® type galvanized weldmesh panels, which must be secured to the ground and supported by a system of vertical and horizontal scaffold tubes and supporting back stays **as specified in Figure 2 of BS 5837:2012 as shown in Appendix C of this report**.

It may be appropriate to install lower grades/specifications of fencing where construction operations are lighter or where construction traffic is reduced. Fencing installed should be appropriate to the level of adjacent construction activity and must be agreed with the Project Arboriculturist.

Weather-proof notices shall be attached to any protective fencing located adjacent to retained trees displaying the words “Construction Exclusion Zone”. All site operatives must be made aware of these restrictions as part of their site induction.

Upon completion of site hoarding and tree protection fencing installation, plant, machinery and other materials may be allowed onto operation areas of the site. All site operations must then be undertaken from

within the extents of site hoarding but outside of any Construction Exclusion Zones to avoid impacts to trees to be retained.

All site operations must then be undertaken from within the extents of site hoarding but outside of any designated Construction Exclusion Zones encompassed by Tree Protection Fending to avoid impacts to trees to be retained.

### Site storage and facilities

Storage or stockpiling areas, temporary road access, accommodation and other facilities must be located outside of all CEZs, inside designated sites away from retained trees and all care must be taken to prevent the leakage or spilling of harmful materials into the soil.

Building materials and fuels such as oil, bitumen or cement shall not be stacked or discharged within 20 metres of the trees stem and no fires shall be lit within 10m of the canopies of trees to be retained.

### Ground protection

Currently there is no requirement for temporary access inside the RPAs of trees to be retained to facilitate works.

Works requirements around trees should be reviewed by the site manager and project arboriculturist will be reviewed at regular intervals and where access is required within the RPAs of trees to be retained, site-specific ground protection measures must be implemented to ensure the protection of trees to be retained.

Ground protection measures implemented shall be agreed upon by the Project Arboriculturist. Ground protection must be installed above the existing surface level and prior to bringing any construction vehicles or material onto and must be fully compliant with Section 6.2 of BS 5837:2012.

## 3.4 Site Works / Construction Phase

### Toolbox Talk / Site Inductions

A hard copy of this Arboricultural Method Statement and associated Tree Impacts and Protection Plans shall be kept on site as a reference over the full course of the project construction phase.

The site/project induction shall reference to the locations of any tree protection fencing and associated Construction Exclusion Zones, as well as highlight general recommendations for tree protection included in this document.

If works are found to be required inside Construction Exclusion Zones near trees to be retained, a pre-works toolbox talk will be delivered by the Project Arboriculturist to ensure all operatives are aware of works constraints.

### Ongoing Site Monitoring

Over the course of the proposed works, the Project Arboriculturist shall undertake any scheduled monitoring / site visits as agreed during the pre-commencement meeting. Considering the nature of the works it is anticipated that the majority of works with regard to pruning and installation of protection fencing will be undertaken within during or directly following the pre-commencement meeting. Therefore, subsequent site visits are not considered necessary. Regular checks ins between the site manager and project arboriculturist will be required where evidence of works and compliance with the site-specific AMS will be provided in the form of photographs and detailed reports of works. Should at any time during the site works the project arboriculturist will be contactable in regard to any arboricultural matters on site to provide overview and insight.

The Project Arboriculturist will keep a register of any observations / recommendations made during the pre-commencement site visit and any evidence of works that are provided by the site manager which will be included in the works end letter of compliance which will be submitted to the Local Planning Authority upon completion of the works. .

## Excavations or Installation of new structures and surfaces

Table 6 below provides details of works required inside or adjacent to the RPAs of trees to be retained in order to facilitate construction works.

*Table 6: Proposed structures or surfaces in or adjacent to tree RPAs*

| Feature no. | Proposal | Works and ordering | Grade |
|---|---|---|---|
| T10 | Excavation and soil regrading up to 500 mm to facilitate installation of new steps. . | All excavations within the RPAs of retained trees and groups of trees shall be carried out using hand-held tools. Ideally tools that utilise high-pressure gas to loosen soil aggregates (e.g., airspade) are recommended.<br>Any tree roots encountered to be cleanly severed using secateurs or a pruning saw back to the edges of the excavation. | B1 |
| G2 | Excavation and soil regarding up to 300 mm and 400 mm in order to facilitate the installation of new steps. | | B3 |
| G3 | Excavation and soil regarding up to 250mm in order to facilitate the installation of new steps. | | C2 |

Any excavations within the RPAs of retained trees as detailed in Table 6 must be reviewed by the Project Arboriculturist prior to commencement.

Where deemed necessary by the project Arboriculturist, the first 1000mm of excavation within RPAs of retained trees shall be carried out using hand-held tools. Ideally tools that utilise high-pressure gas to loosen soil aggregates (e.g., airspade) are recommended. The Project Arboriculturist will confirm if direct arboricultural supervision during excavation works is necessary. Sectional drawings and specification for construction of new steps have been submitted separately from this document and will need read in combination with the AMS.

Exposed roots (woody and fibrous) should be initially covered using hessian sheeting pegged in and kept damp and prevented from drying out. A geotextile permeable terram may be used on the tree side of any trenching to protect soil/root environment from desiccation or contamination.

Where root pruning is found to be necessary, it must be completed under direct arboricultural supervision. Roots must be cleanly severed using secateurs or a pruning saw.

Any excavations required for the installation of foundations or retaining walls adjacent to the RPAs of trees to be retained must be carefully lined with a non-permeable membrane in order to prevent chemical leeching into adjacent soils.

## 3.5 Works Close Out / Site Reinstatement

### Works End Briefing and Tree Condition Assessment

An on-site works end briefing between the Site Manager Landscape Contractor and Project Arboriculturist should be carried following completion of main site works.

The works end briefing should as a minimum cover the following details:

- Assess the condition of all retained/protected trees;
- Understand appropriate techniques/operations for removal of any temporary fencing/ground protection where required; and,
- Specify any remedial tree works or soil amelioration as, as well as necessary replacement tree planting as a result of construction operations, where required.

### Removal of Temporary Tree Protection Measures

Temporary Tree Protection measures should remain in situ until all main works operations are completed on site and removal has been confirmed by the Project Arboriculturist.

Once confirmed, temporary protection fencing and ground protection may be carefully removed, ensuring no accidental damage to retained trees.

Once temporary tree protection measures have been removed, any required soft landscaping and/or remedial tree works, and mitigation tree planting may commence.

### Remedial Tree Works

Any remedial tree works specified by the project arboriculturist should be captured in a schedule of works to be implemented by a suitably qualified and experience arboricultural contractor following relevant industry standards and best-practice.

Details of completed remedial tree works must be submitted to and approved in writing by the Project Arboriculturist.

Remedial tree works specified by the Project Arboriculturist may include pruning works to make good damaged or dangerous trees ahead of site reinstatement, along with soil amelioration works where soil disturbance or compaction has occurred within the RPAs of retained trees.

### Mitigation Planting and Soft Landscaping

Any additional required mitigation planting specified by the project arboriculturist following the works-end briefing should be incorporated into the proposed soft landscaping scheme / planting plan and be implemented by the landscape contractor.

All landscaping should avoid soil re-grading and disturbance within the RPAs of all retained trees. Raising levels should be achieved through the use of gas and water permeable granular material.

All tree planting undertaken should be in accordance with BS 8545:2014 Trees: from nursery to independence in the landscape – Recommendations.

# 4 References

Arcadis (2024*) 10058635-AUK-XX-XX-RP-ZZ-0001-01* Arboricultural Impact Assessment

British Standards Institution (2010) BS 3998:2010, Tree Work Recommendations.

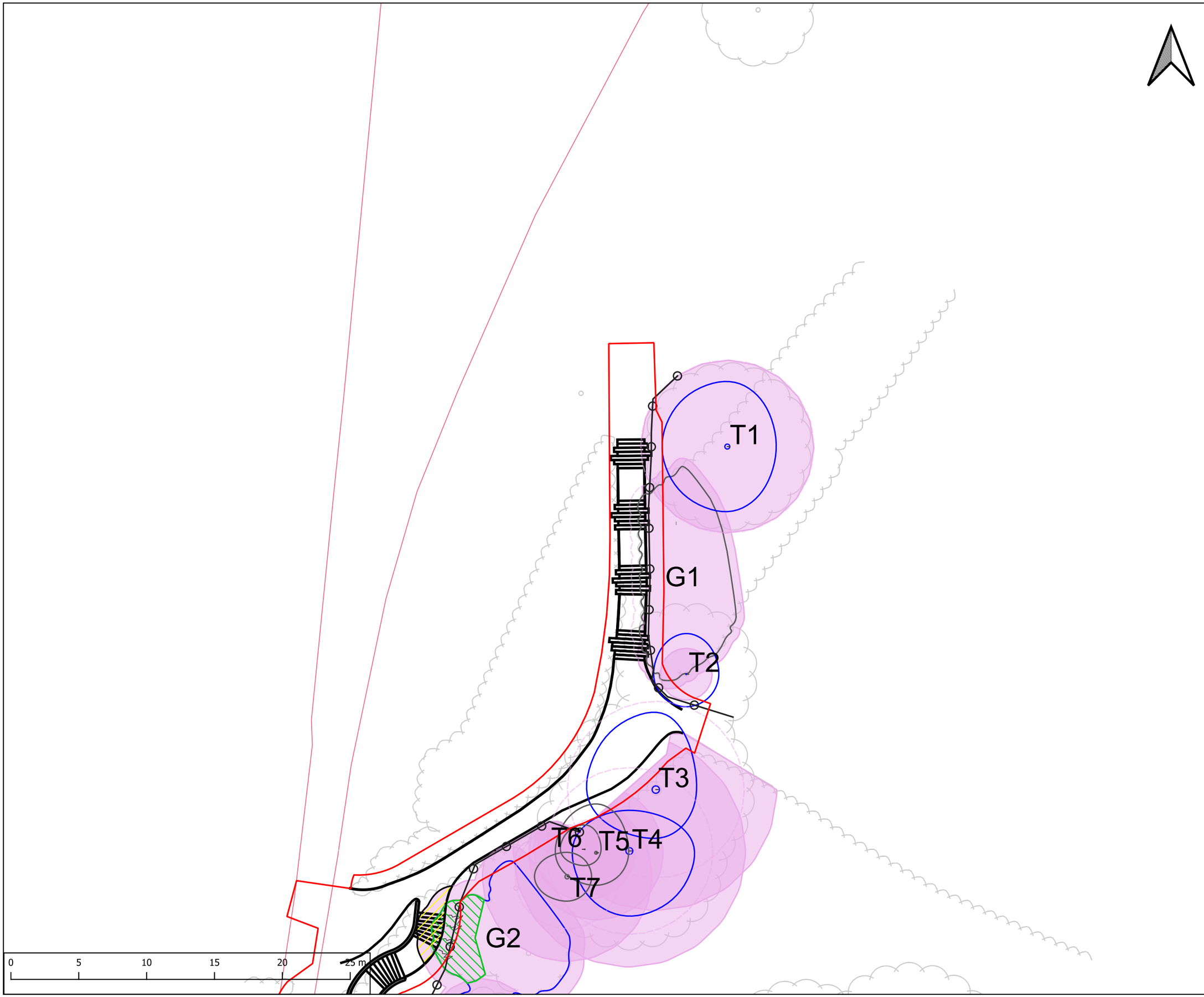
British Standards Institution (2012) BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations.

British Standards Institution (2014) BS 8545:2014 Trees: From nursery to Independence in the Landscape – Recommendations.

DEFRA (2025) Magic Map: https://magic.defra.gov.uk/MagicMap.aspx [Accessed:March 2025]

Mattheck, C. and Breloer, H (1994) The Body Language of Trees: A Handbook for Failure Analysis Research for Amenity Trees No.4. HMSO.

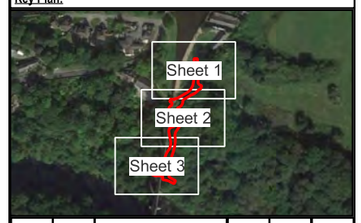
# Figure 1. Tree Impact and Protection Plan




Legend:

- Site Boundary
- Survey Boundary
- Canopy extent of A Category Tree/Group
- Canopy extent of B Category Tree/Group
- Canopy extent of C Category Tree/Group
- BS 5837:2012 Root Protection Area (RPA)
- Indicative Calculated BS 5837:2012 Root Protection Area (RPA)
- Root Protection Area Incursions
- Tree Pruning to Facilitate Works
- Tree Protection Fencing

Key Plan:




| Rev | Date | Description | Drawn | Check | Approv |
|---|---|---|---|---|---|
| P2 | 10/06/24 | Updated site boundary | JP | JP | AA |
| P1 | 14/05/24 | For information | IL | JP | BM |

Client: Canal and River Trust

PROJECT: Pontcysyllte Aqueduct Access Improvements

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TITLE:

# FIGURE 2
# TREE IMPACTS AND PROTECTION PLAN
SHEET 1 OF 3

| | | | |
|---|---|---|---|
| Designed: | JP | Date: 10/06/24 | Signed: |
| Drawn: | IL | Date: 10/06/24 | Signed: |
| Checked: | JP | Date: 10/06/24 | Signed: |
| Approved: | BM | Date: 10/06/24 | Signed: |
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| Original Size: | A3 | Grid: | OS |
| Suitability Code: | 00 | Project Number: | 10058635 |

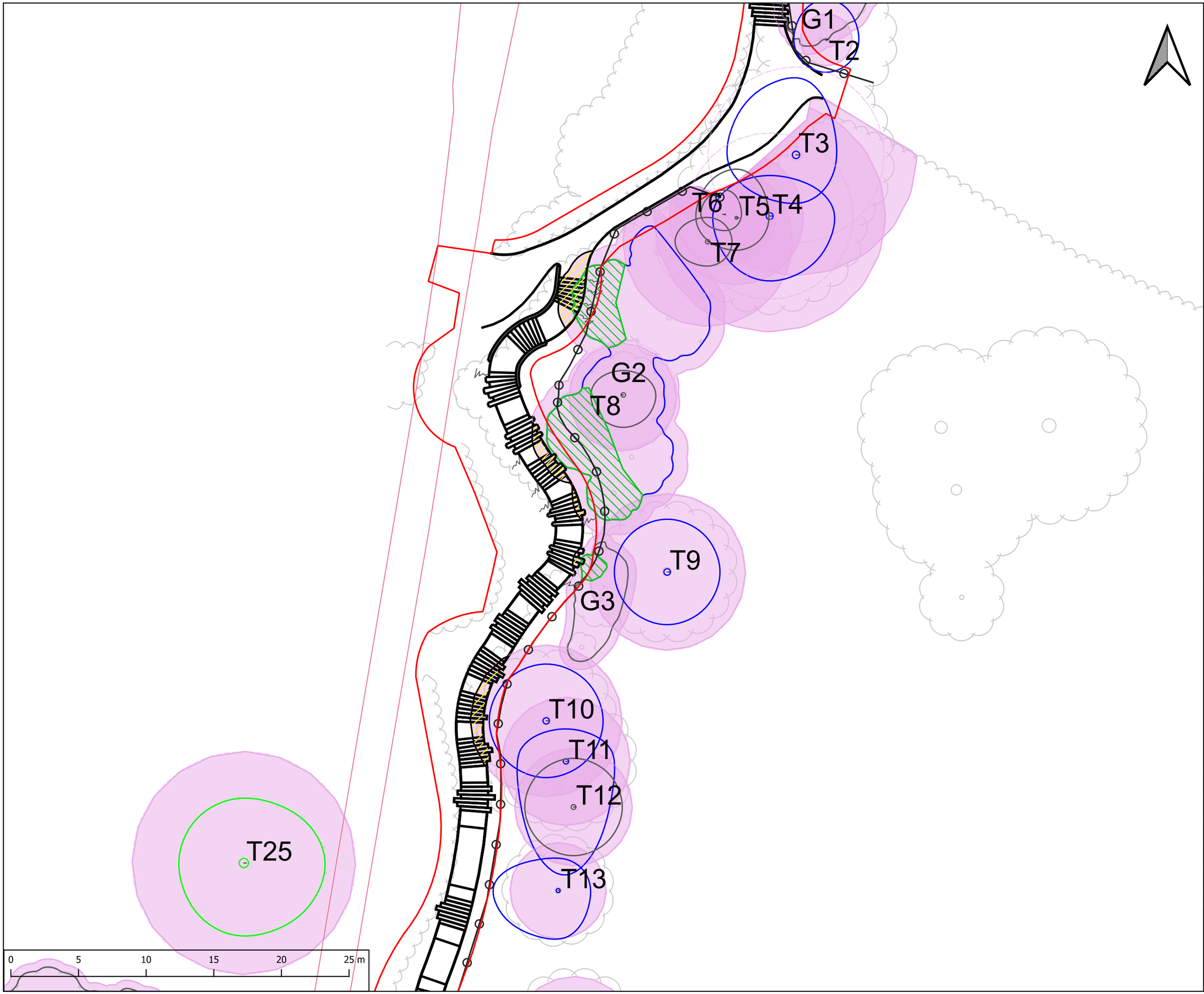
Suitability Description:

**FOR INFORMATION**

NOT TO BE USED FOR DESIGN OR CONSTRUCTION

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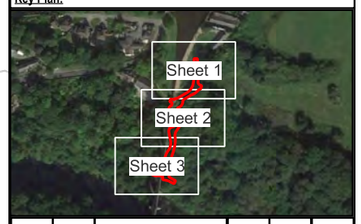
Revision: P02




Legend:

- Site Boundary
- Survey Boundary
- Canopy extent of A Category Tree/Group
- Canopy extent of B Category Tree/Group
- Canopy extent of C Category Tree/Group
- BS 5837:2012 Root Protection Area (RPA)
- Indicative Calculated BS 5837:2012 Root Protection Area (RPA)
- Root Protection Area Incursions
- Tree Pruning to Facilitate Works
- Tree Protection Fencing

Key Plan:




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Coordinating office: Arcadis, 80 Fenchurch Street, London, EC3M 4BY, Tel: 44 (0)20 7812 2000

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TITLE:

# FIGURE 2 TREE IMPACTS AND PROTECTION PLAN

SHEET 2 OF 3

| | | | |
|---|---|---|---|
| Designed: | JP | Date: 10/06/24 | Signed: |
| Drawn: | IL | Date: 10/06/24 | Signed: |
| Checked: | JP | Date: 10/06/24 | Signed: |
| Approved: | BM | Date: 10/06/24 | Signed: |
| Scale: | 1:250 | Datum: | AOD |
| Original Size: | A3 | Grid: | OS |
| Suitability Code: | 00 | Project Number: | 10058635 |

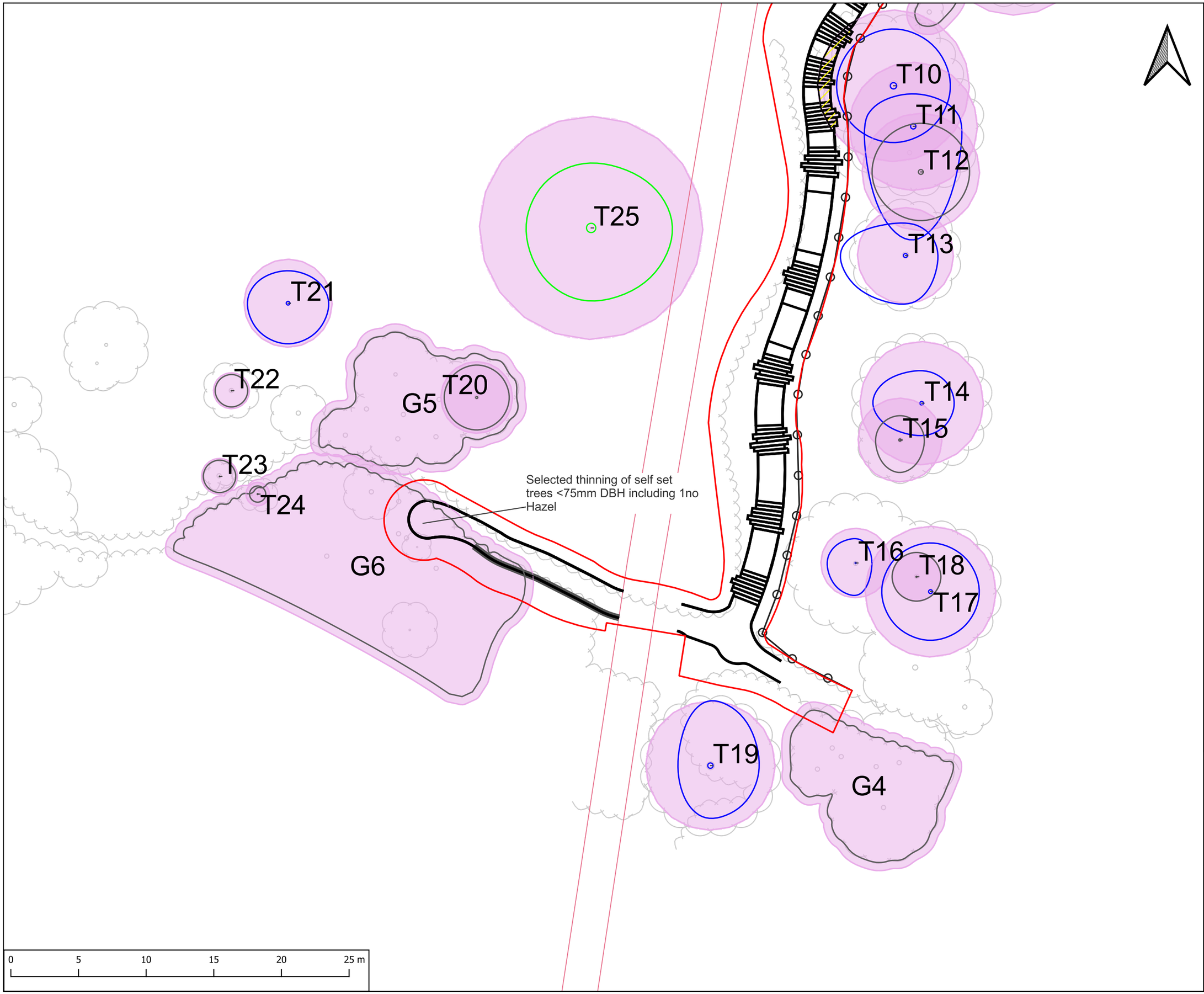
Suitability Description:

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NOT TO BE USED FOR DESIGN OR CONSTRUCTION

Drawing Number: 10058635-AUK-XX-XX-DR-ZZ-0002-P1-TIPP01

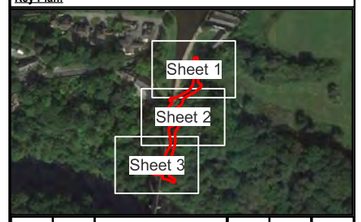
Revision: P02




Legend:

- Site Boundary
- Survey Boundary
- Canopy extent of A Category Tree/Group
- Canopy extent of B Category Tree/Group
- Canopy extent of C Category Tree/Group
- BS 5837:2012 Root Protection Area (RPA)
- Indicative Calculated BS 5837:2012 Root Protection Area (RPA)
- Root Protection Area Incursions
- Tree Pruning to Facilitate Works
- Tree Protection Fencing

Key Plan:




| Rev | Date | Description | Drawn | Check | Approv |
|---|---|---|---|---|---|
| P2 | 10/06/24 | Updated site boundary | JP | JP | AA |
| P1 | 14/05/24 | For information | IL | JP | BM |

Client: Canal and River Trust

PROJECT: Pontcysyllte Aqueduct Access Improvements

ARCADIS Design & Consultancy for natural and built assets

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Coordinating office: Arcadis, 80 Fenchurch Street, London, EC3M 4BY, Tel: 44 (0)20 7812 2000

www.arcadis.com

TITLE:

# FIGURE 2
# TREE IMPACTS AND PROTECTION PLAN
## SHEET 3 OF 3

| | | | |
|---|---|---|---|
| Designed: | JP | Date: 10/06/24 | Signed: |
| Drawn: | IL | Date: 10/06/24 | Signed: |
| Checked: | JP | Date: 10/06/24 | Signed: |
| Approved: | BM | Date: 10/06/24 | Signed: |
| Scale: | 1:250 | Datum: | AOD |
| Original Size: | A3 | Grid: | OS |
| Suitability Code: | 00 | Project Number: | 10058635 |

Suitability Description:

**FOR INFORMATION**

NOT TO BE USED FOR DESIGN OR CONSTRUCTION

Drawing Number: 10058635-AUK-XX-XX-DR-ZZ-0002-P1-TIPP01

Revision: P02

# Appendix A. Explanation of Terms

## Age Class

Young (Y) – Establishing tree that could be transplanted without specialist equipment.

Semi-mature (SM) – Fully established but has not reached its ultimate height and has significant growth potential.

Early-mature (EM) – A tree reaching its ultimate potential height, growth rate is slowing, will still increase in DBH.

Mature (M) – A mature specimen with limited potential for any significant increase in size.

Over Mature (OM) – A senescent or moribund specimen with a limited safe useful life expectancy.

Veteran (V) – A specimen of high value due to either its age, size, or ecological significance. Can be identified by the presence of specific characteristics.

## Stem Diameter

The diameter of the stem measured in millimetres (mm) at a height of 1.5m above ground level

## Crown Spread

Average measured in metres using a ground tape where possible

## Physiological Condition

Good – Healthy tree with no signs of ill health and signs of good extension growth for species

Fair – Trees with signs of disease, minor defects and decreased life expectancy due to physical damage

Poor – Trees with significant disease, significantly reduced life expectancy and/or under major physiological stress

Dead – Dead tree or trees with over 70% crown dieback

## Structural Condition

Good – Trees with no significant defects

Fair – Trees with remedial defects which require minor tree surgery works

Poor – Trees with remedial defects which require significant tree surgery works or felling

Dead – Trees which require felling

## BS 5837 Retention Category

Each tree, group of trees or hedge is assigned to a retention category. Category A trees of high quality and amenity value. Category B trees of moderate quality and amenity value. Category C trees of low quality or amenity value. Category U trees of very low quality or requiring immediate removal due to health and safety concerns

British Standards BS 5837:2012 recommends that these categories may be further broken down into sub-categories A1 A2 A3 pertaining to Arboricultural, Landscape or Cultural values respectively.

## Deadwood

Minor – <70mm diameter

Moderate – >70mm and <150mm diameter

Major – >150mm diameter

# Appendix B. Schedule of Trees

Client: Canal and River Trust
Survey date**: 07 February 2024**

Project: **Trevor Basin Steps**
Surveyor**: James Potts BSc (Hons), MArborA**

*Table B1 Tree Schedule*

| Tree reference number | Species | Height (m) | Stem diameter (mm) | Branch spread (m) | | | | Height of crown clearance (m) | RPA Radius (m) | RPA ($m^2$) (T) / RPA Offset (m) (G, H, W) | Age class | Physiological condition | Structural condition | Comments | Estimated remaining contribution (years) | Category grading |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | N | E | S | W | | | | | | | | | |
| T1 | Wild Cherry *(Prunus avium)* | 14 | 725, 500 | 8 | 6 | 8 | 8 | 2 | 10.6 | 350.9 | M | Good | Fair | Twin stem at 1.2m, compression fork, sloped at west side towards steps. | 20+ | B2 |
| T2 | Hazel *(Corylus avellana)* | 9 | 100 | 5 | 4 | 4 | 4 | 2 | 3.2 | 31.7 | M | Good | Good | Coppice stool with mature growth, off site behind bank and fenceline. | 40+ | B2 |
| T3 | Sycamore *(Acer pseudoplatanus)* | 14 | 900 | 9.5 | 5 | 6 | 8.5 | 2.5 | 10.8 | 366.4 | M | Fair | Fair | Minor lean to north, heavily ivy clad on main stem, stood behind cracked retaining wall. | 40+ | B2 |
| T4 | Sycamore *(Acer pseudoplatanus)* | 17 | 850 | 5 | 8 | 8 | 7 | 5 | 10.2 | 326.9 | M | Good | Good | Set back from retaining wall 3m down bank, twin stem, no major defects. | 40+ | B2 |
| T5 | Pedunculate Oak *(Quercus robur)* | 15 | 350 | 6 | 4 | 4 | 5 | 6 | 4.2 | 55.4 | SM | Good | Good | High, drawn crown, no major defects, next to retaining wall. | 20+ | C1 |
| T6 | Hazel *(Corylus avellana)* | 6 | 75 | 3 | 2 | 2 | 3 | 2.5 | 2.2 | 15.3 | SM | Fair | Fair | Grown next to retaining wall. Major coppice regrowth. | 20+ | C2 |
| T7 | Ash *(Fraxinus excelsior)* | 15 | 530 | 3 | 3 | 3 | 4 | 5 | 6.4 | 127.1 | SM | Fair | Good | Forks at 1.6, no major defects. | 20+ | C1 |
| T8 | Ash (*Fraxinus excelsior)* | 16 | 550 | 3 | 4 | 4 | 4 | 4 | 6.6 | 136.8 | SM | Fair | Fair | High, drawn form, ivy clad, thin crown, minor dieback, sign from candelabra form. | 10+ | C1 |
| T9 | Sycamore *(Acer pseudoplatanus)* | 18 | 800 | 6.5 | 6.5 | 6.5 | 6.5 | 5 | 9.6 | 289.5 | EM | Good | Good | Good form, even crown, no major defects. | 40+ | B1 |
| T10 | Sycamore *(Acer pseudoplatanus)* | 18 | 775 | 7 | 7 | 7 | 7 | 7 | 9.3 | 271.7 | EM | Good | Good | Stem ivy clad, good form and condition. | 40+ | B1 |
| T11 | Sycamore *(Acer pseudoplatanus)* | 16 | 655 | 4 | 6 | 14 | 6 | 4 | 7.9 | 194.1 | EM | Good | Good | Major lean to south. Twin stem with tight Union. Bark damage on east side. | 20+ | B1 |
| T12 | Ash *(Fraxinus excelsior)* | 16 | 600 | 6 | 6 | 6 | 6 | 7 | 7.2 | 162.9 | EM | Fair | Fair | Heavily ivy clad. | 20+ | C1 |
| T13 | Sessile Oak *(Quercus petraea)* | 12 | 490 | 4 | 4 | 6 | 8 | 3 | 5.9 | 108.6 | SM | Fair | Fair | Stem ivy clad, minor south lean. | 40+ | B2 |
| T14 | Goat Willow *(Salix caprea)* | 0 | 510, 370 | 4 | 4 | 4 | 6 | 4 | 7.6 | 179.6 | M | Fair | Fair | Minor tip dieback, ivy cladding. | 20+ | B2 |

| Tree reference number | Species | Height (m) | Stem diameter (mm) | Branch spread (m) | | | | Height of crown clearance (m) | RPA Radius (m) | RPA ($m^2$) (T) / RPA Offset (m) (G, H, W) | Age class | Physiological condition | Structural condition | Comments | Estimated remaining contribution (years) | Category grading |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | N | E | S | W | | | | | | | | | |
| T15 | Goat Willow *(Salix caprea)* | 12 | 340, 260 | 3 | 3 | 4 | 3 | 3 | 5.1 | 82.9 | EM | Fair | Poor | Major split branch in upper crown, major bark wounding in southern crown at 5m. | 10+ | C1 |
| T16 | Hazel *(Corylus avellana)* | 8 | 145 | 3 | 2 | 4 | 3.5 | 2 | 4.3 | 57.1 | M | Good | Good | Coppice stool with mature regrowth. | 40+ | B2 |
| T17 | Goat Willow *(Salix caprea)* | 10 | 465, 4801 | 6 | 6 | 6 | 6 | 4 | 8.0 | 202.0 | M | Good | Good | Major deadwood, light ivy cladding. | 40+ | B1 |
| T18 | Hazel *(Corylus avellana)* | 8 | 150, 145, 135 | 3 | 3 | 3 | 3 | 2 | 3.0 | 27.9 | M | Good | Good | Mature coppice stool. | 40+ | C1 |
| T19 | Sessile Oak *(Quercus petraea)* | 18 | 660 | 8 | 6 | 6.5 | 4 | 10 | 7.9 | 197.1 | EM | Good | Fair | High drawn form, minor deadwood, asymmetric to east. | 40+ | B1 |
| T20 | Wild Cherry *(Prunus avium)* | 12 | 210, 300 | 4 | 4 | 4 | 4 | 5 | 4.4 | 60.7 | EM | Good | Good | - | 20+ | C1 |
| T21 | Goat Willow *(Salix caprea)* | 10 | 450 | 4 | 5 | 5 | 5 | 3 | 5.4 | 91.6 | M | Fair | Fair | Ivy clad, minor south lean. | 20+ | B1 |
| T22 | Hazel *(Corylus avellana)* | 4 | 75 | 2 | 2 | 2 | 2 | 1 | 2.2 | 15.3 | SM | Fair | Fair | - | 20+ | C1 |
| T23 | Hazel *(Corylus avellana)* | 4 | 75 | 2 | 2 | 2 | 2 | 1 | 2.2 | 15.3 | SM | Fair | Fair | - | 20+ | C1 |
| T24 | Ash *(Fraxinus excelsior)* | 4 | 120 | 1 | 1 | 1 | 1 | 1 | 1.4 | 6.5 | EM | Fair | Fair | Young tree next to path. | 20+ | C1 |
| T25 | Pedunculate Oak *(Quercus robur)* | 18 | 1140 | 8 | 10 | 9 | 8 | 3 | 13.7 | 587.9 | M | Good | Good | Major broken branches, moderate deadwood, minor west lean. | 40+ | A2 |
| G1 | Mixed Species: Ash *(Fraxinus excelsior),* Hazel *(Corylus avellana),* Wild Cherry *(Prunus avium)* | 6 | 75 | 1 | 1 | 1 | 1 | 2 | 0.9 | 1 | Y | Fair | Fair | Young self set group lining east side of steps on bank. | 40+ | C1 |
| G2 | Mixed Species: Hazel *(Corylus avellana),* Hawthorn *(Crataegus monogyna)* | 4 | 400 | 3 | 3 | 3 | 3 | 1 | 4.8 | 1.8 | EM | Good | Good | Small stand of mature hazel coppice forming edge of woodland. | 40+ | B3 |

| Tree reference number | Species | Height (m) | Stem diameter (mm) | Branch spread (m) | | | | Height of crown clearance (m) | RPA Radius (m) | RPA ($m^2$) (T) / RPA Offset (m) (G, H, W) | Age class | Physiological condition | Structural condition | Comments | Estimated remaining contribution (years) | Category grading |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | N | E | S | W | | | | | | | | | |
| G3 | Mixed Species: Hazel *(Corylus avellana)*, Hawthorn *(Crataegus monogyna)* | 10 | 200 | 3 | 3 | 3 | 3 | 2 | 2.4 | 1 | SM | Poor | Fair | High ivy clad central tree with mature hazel coppice stools and Holly set further back in group. | 40+ | C2 |
| G4 | Hazel *(Corylus avellana)* | 7 | 300 | 3 | 3 | 3 | 3 | 1 | 3.6 | 1 | EM | Fair | Fair | Mature hazel coppice group and semi mature ash. | 40+ | C2 |
| G5 | Mixed Species: Hazel *(Corylus avellana)*, Hawthorn *(Crataegus monogyna,* Wild Cherry *(Prunus avium)* | 6 | 200 | 2 | 2 | 2 | 2 | 2 | 2.4 | 1 | SM | Fair | Fair | Hazel coppice stools north of path. | 20+ | C2 |
| G6 | Mixed Species: Ash *(Fraxinus excelsior)*, Hazel *(Corylus avellana)*, Wild Cherry *(Prunus avium)*, Sycamore (*Acer pseudoplatanus*) | 4 | 150 | 2 | 2 | 2 | 2 | 1 | 1.8 | 1 | SM | Fair | Fair | Mixed regeneration and self set. Scattered group. | 20+ | C2 |

# Denotes estimated value

*Table B2 Key to Categories*

| Trees unsuitable for retention | | | | |
|---|---|---|---|---|
| **Category and Definition** | **Criteria (including subcategories where appropriate)** | | | **Identification on Plan** |
| **Category U**<br>Those in such a condition that they cannot realistically be retained as a living tree in the context of the current land use for longer than 10 years. | • Trees that have a serious, irremediable structural defect such that their early loss is expected due to collapse, including those that will become unviable after removal of other U category trees (i.e. Where for whatever reason the loss of companion shelter cannot be mitigated by pruning)<br>• Trees that are dead or are showing signs of significant immediate or irreversible overall decline.<br>• Trees infected with pathogens of significance to the health and or safety of other trees nearby by or very low-quality trees suppressing adjacent trees of better quality. | | | Red |
| **Trees to be considered for retention** | | | | |
| **Category and Definition** | **1. Mainly arboricultural values** | **2. Mainly landscape values** | **3. Mainly cultural values** | **Identification on Plan** |
| **Category A**<br>Trees of high quality with an estimated remaining life expectancy of at least 40 years | Trees that are a particularly good example of their species, especially if rare or unusual, or essential components of groups or of formal or semi-formal arboricultural features. | Tree groups or woodlands of particular visual importance as arboricultural and/or landscape features. | Tree groups or woodlands of significant conservation historical, commemorative or other value | Green |
| **Category B**<br>Trees of moderate quality with an estimated remaining life expectancy of at least 20 years. | Trees that might be included in the high category but are downgraded because of impaired condition. | Trees present in numbers, usually 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 benefits. | Blue |
| **Category C**<br>Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 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 benefits. | Grey |

# Appendix C. Preliminary Tree Protection Measures

## Overview

These Preliminary Tree Protection Measures provide generic best practice measures to be adopted in order to protect retained trees during the development process. It has been prepared in order to inform the planning and the construction/ development process. Should a bespoke AMS be recommended by the suitably qualified arboriculturist, one should be drawn up in liaison with the contractor undertaking the works.

## Protective Fencing

The purpose of this fencing is to provide protection to the RPAs of retained trees/groups and to protect trees and hedgerows prior to their translocation. The type of fencing used shall be appropriate to the level of adjacent construction activity and shall be agreed with the Local Authority tree officer. Weather-proof notices shall be attached to any protective fencing located adjacent to retained trees displaying the words "Construction Exclusion Zone" and listing restrictions which apply. All personnel must be made aware of these restrictions.

Fencing Specifications may comprise BS 5837:2012 Specification Heras and Saffold back propped panelling for high activity areas, Heras Pannel Fencing for areas of moderate activity areas, or chestnut pail fencing or orange weldmesh barrier fencing for areas of low activity

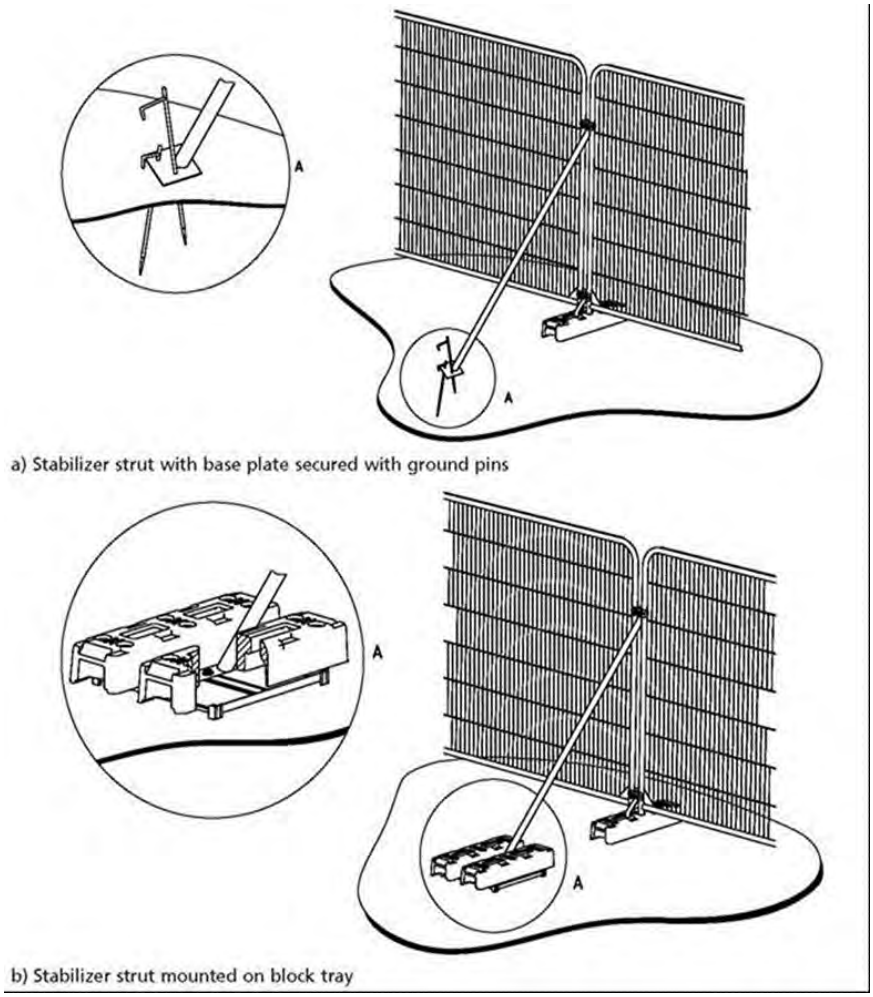



*Figure C1 Tree protection fencing specification (extract from BS 5837: 2012)*

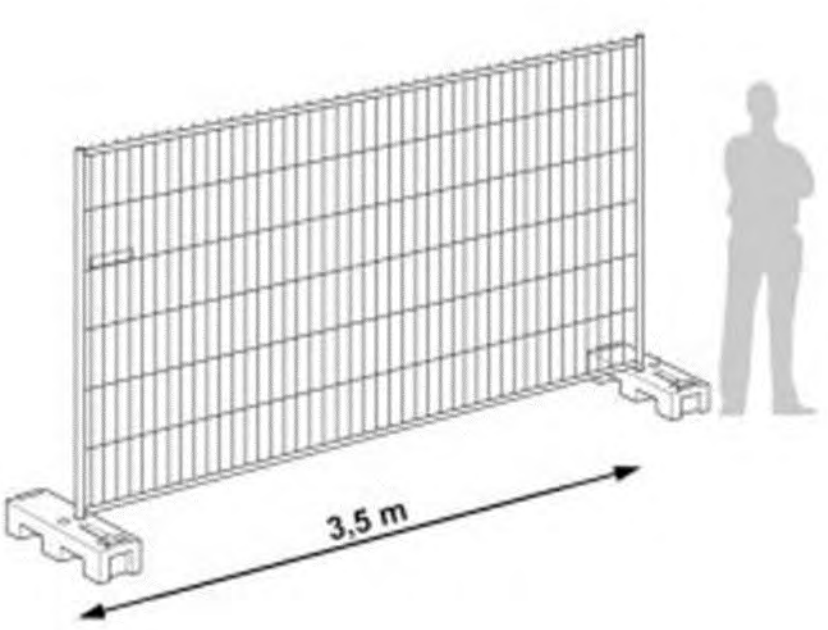



*Figure C2 Tree protection fencing specification (Heras Panelling)*





*Figure C3 Tree protection fencing specification (Orange Weldmesh or Chestnut Pail)*

## Construction Exclusion Zone (CEZ)

The Construction Exclusion Zone (CEZ) is the area identified by a suitably qualified arboriculturist as the area to be protected during development, from site clearance and construction work through the use of barriers and/or ground protection to ensure the successful long-term retention of a tree. Fencing or ground protection shall not be taken down or relocated at any time without prior agreement and/or site supervision as recommended by the arboriculturist.

All areas excluded by protective tree fencing shall be treated as CEZs, and the following restrictions shall apply:

- No construction activity must occur within these areas.
- No works on trees unless agreed by a suitably qualified arboriculturist.
- No alterations of ground levels or conditions.
- No chemicals or cement washings.
- No excavation.
- No temporary structures*
- No storage of soil, rubble or other materials.
- No vehicles or machinery to be used or parked without appropriate ground protection measures as per BS5837 recommendations. This will require the use of a proprietary system of reinforced concrete slabs/steel road plates on a compressible layer, or side butting scaffold boards/ 18mm plywood sheets on a compressible layer. The type of ground protection used shall be appropriate for the likely loading applied.
- No fixtures (lighting, signs etc.) to be attached to trees.
- No fires within 10 metres of the canopies of any tree or hedgerow.

*Site huts, provided they are of the “Jack Leg” type, can be sited to act as ground protection for the duration of the construction.

## Temporary Ground Protection

New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil. The ground protection might comprise one of the following:

- For pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g.100 mm depth of woodchip), laid onto a geotextile membrane;
- For pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g.150 mm depth of woodchip), laid onto a geotextile membrane;
- For wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

## New Permanent Surfacing Within RPAs

Any new surfacing is within the RPAs shall occur above ground level without soil stripping. New surfaces shall be constructed on a cellular confinement to prevent localised compaction of the rooting medium post development. Porous geotextile membranes shall be used both above and below the cellular confinement system to prevent mixing of materials with the binding layer or the soil. The new surface needs to be permeable to air and water (resin bound gravel or similar is recommended). This is to allow roots to respire without there being a build-up of carbon dioxide, and to ensure the roots continue to receive the moisture and oxygen they require to function. Traditional kerbing requires excavation to install and will therefore not be suitable within the root protection areas of retained trees. As an alternative, haunched kerbing, treated

timber edging, aluminium L-shaped edging, galvanised metal edging or no fixed edging shall be used. Construction of the new surface will require access into the construction exclusion zone defined by the temporary ground protection. The ground protection shall not be removed until new surface is installed. The root protection areas should not be left exposed during construction.

## General Canopy Protection

Since the canopies of retained trees may be in close proximity to areas of plant operation, the following restrictions will apply:

- All plant will be sited outside the defined RPAs of retained trees / groups, and the appointed contractor will ensure all relevant personnel shall be made aware of the location of branches and the need to avoid causing damage to them.
- Prior to the implementation of lifting operations, a representative from the equipment supply company shall visit the site and ensure all operations can be completed without causing damage to retained trees. A lifting plan will be prepared and submitted for approval prior to all lifting operations. The lifting plan will make provision for the potential for damage of retained trees.
- All lifting operations will be completed under the close direction of a qualified banksman, who will be briefed by the appointed contractor as to the need to avoid damage the stems and branches of retained trees.
- Should additional tree removal or pruning be required the Local Authority Tree Officer shall be contacted and the scope of works agreed in writing.

## Hazardous Materials

Any mixing of cement-based materials is to take place outside the RPAs of all trees. Provision shall be made to ensure that the mixing area is contained so that no water runoff enters the RPAs of any trees. All mixers and barrows shall be cleaned within this dedicated mixing area.

All other chemicals hazardous to tree health, including petrol and diesel, are to be stored in suitable containers as specified by the Control of Substances Hazardous to Health (COSHH) Regulations (2002) (Ref 4), and kept away from the RPAs.

# Example of Protective Fencing Signs






Trevor Basin Steps
BS 5837: 2012 Arboricultural Method Statement

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