4.2 Ecology

4.2.1 Ecology Appraisal

A desk study and a field survey were undertaken in January 2024 to assess and map habitats within the site and a Preliminary Ecological Appraisal (PEA) was produced.

The conclusions are as follows:

- The report assesses the potential impacts upon ecological features resulting from the proposed footpath upgrades and viewpoint creation development.
- The site is located less than 10m from the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC and Afon Dyfrdwy (River Dee) SSSI, and so there is the potential for them to be affected physically or by pollution from the works. A range of other protected species may be present or at least use the site.

Mitigation and enhancement measures have been identified based upon the current understanding of the proposals in the form of:

- Demarcation of a works exclusion buffer from the boundaries of the SAC and SSSI.
- Where possible, avoid the removal of woodland, trees and scrub habitat and compensate for any habitat lost
- Pre-construction checks for protected species identified as a potential constraint, including reptile, amphibian, otter, dormouse and protected plants by an Ecologist.
- Pre-construction nesting bird checks, should vegetation be removed during the core nesting bird season (March to August inclusive) by an Ecologist; and
- Supervision by an Ecological Clerk of Works is recommended, including a toolbox talk, for all works anticipated to have potential to impact wildlife.

For full details please refer to ***10058635-AUK-XX-XX-RP-ZZ-0050 Preliminary Ecological Appraisal***.

The conclusions of the PEA have been factored into the development of the proposals within this application.

Lighting of the scheme does not form part of the proposals.

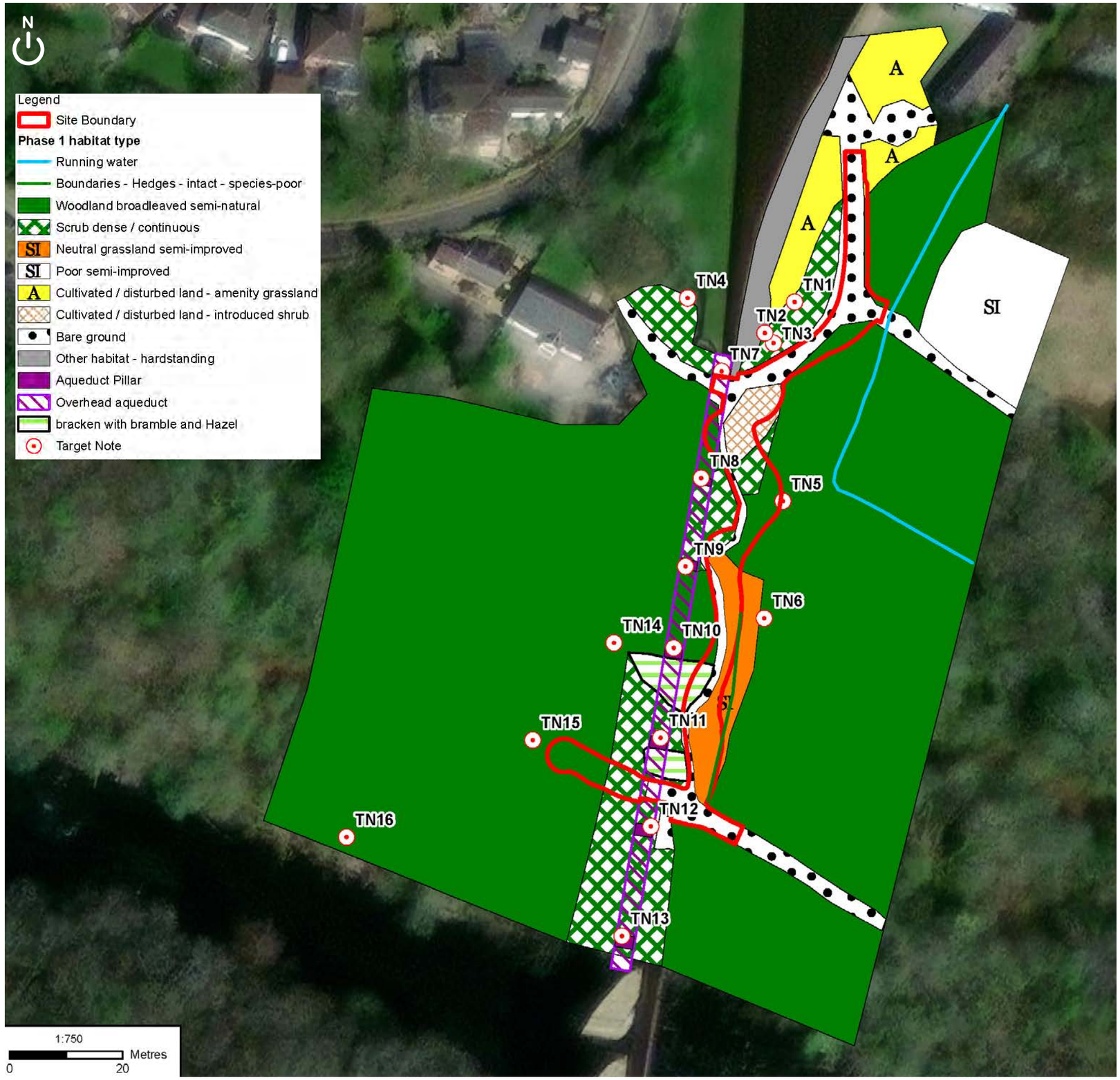


Figure 04-3: Phase 1 Habitat Map

Scale as shown

4.3 Archaeology

4.3.1 Archaeology Assessment

An archaeology assessment report was produced by Heneb, the Trust for Welsh Archaeology and is submitted as part of this application.

This desk-based assessment was commissioned by the Canal & River Trust to determine the historical and archaeological potential of the proposed development.

The assessment identified and located known and undocumented archaeological assets which provide a baseline for the historical and archaeological potential of the site.

These were then combined with research to determine the potential for encountering sub surface archaeological assets.

The assessment has highlighted a relatively low probability of encountering subsurface assets associated with the prehistoric, Roman and medieval periods, however, there is a high potential for features associated with post-medieval activity, which due to the proximity and potential association with the Pontcysyllte World Heritage Site, would hold high to very high archaeological significance.

The diagram in Figure 04-4 identifies broadly the locations of the potential archaeological assets within and close to the location of the proposed development site. This shows the red line boundary before any changes were made, based on the ourtcome of the report.

As a result of the findings of the report, Section 5 shows how the design has been modified to move the proposed works away from the potential archaeological location. The red line boundary showing in the report in Figure 04-4 has also been modified to at least 1.5m away from the potential features, using geo-referenced co-ordinates which pinpoint their exact locations.

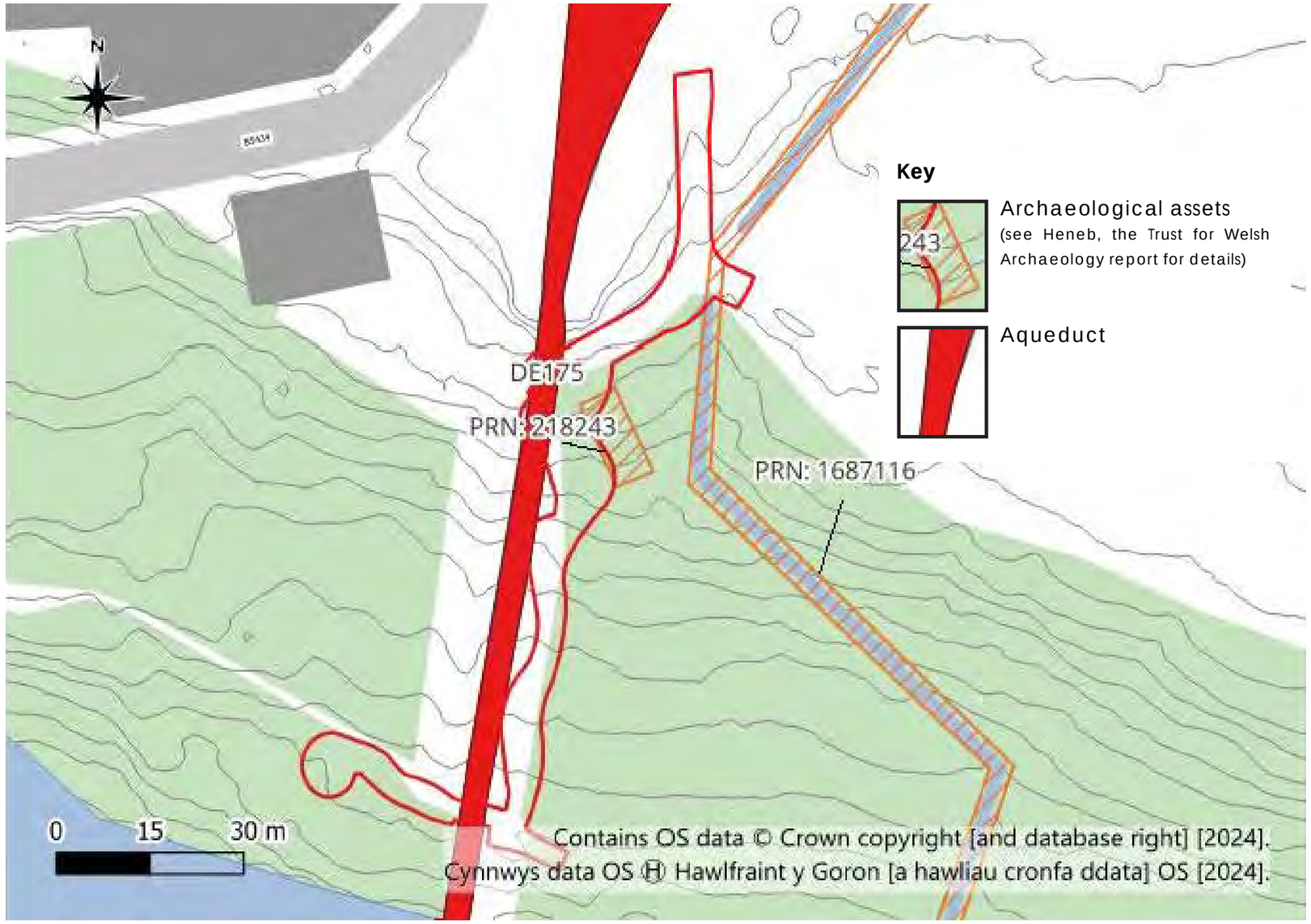


Figure 04-4: Designated and non-designated assets situated within the proposed development

Scale as shown

4.4 Heritage

4.4.1 Heritage Impact Statement - methodology

A Heritage Impact Statement was prepared in March 2024 by the Canal & River Trust in support of the planning application for improving the stepped access alongside the eastern elevation of the Pontcysyllte Aqueduct, located within a former conservation area and a World Heritage Site.

The statement considered current statutory and non statutory guidance and historical information, with particular reference to Cadw's designation description.

4.4.2 Heritage Significance

The significance of the existing steps is considered to be very limited. They are a late 20th/early 21st century installation comprising timber risers and edging, with a backfill of loose stone and soil, probably formalising a previous informal 'desire line' track. Although of relatively low visual impact, they now provide a more formalised means of traversing the side of the valley from the aqueduct to the valley below, but have very little historic interest and their materiality suggests that they were only ever seen as a temporary solution.

4.4.3 Proposed works

The proposed works have been designed to replace the existing access with infrastructure that is more suitable in relation to both the landscape and its overall relationship with the aqueduct.

From initial discussions with the regional Cadw Inspector, it was identified that the location of the existing route was causing low-level incidental erosion to the aqueduct's sandstone piers, as shown in Figures 04-5 and 04-6. In order to mitigate this issue, it was decided that the pathway should be re-routed to take the steps away from the structure at several 'pinch-points' in order to prevent further erosion.

Along with the change in the route, it also proposed that the base material is upgraded (from compacted soil and gravel to stone) and that a centrally positioned handrail is installed at certain points to provide a safer environment for traversing the stepped sections.

Following the production of an archaeological report by Heneb to determine the historical and archaeological potential of the site, and to better inform the level of mitigation that may be required as a result of the proposed works, a new on-site feature was discovered to the eastern side of the aqueduct, (see Heneb: Clwyd-Powys Archaeological report 2018; Trevor Public Realm Desk Based Assessment, 2024) and the alignment of the steps was revised to avoid these features, resulting in the need to create two lengths of retaining structure to stabilise the embankment. These will take the form of narrow-gauge gabion baskets carefully filled with hand selected stone to give the allusion of dry-stone walling.

The scheme has been designed in-line with the objectives of 'enhancing visitor attractions and dwell time' and 'improving accessibility' identified in the Trevor Basin and Surrounding Area Master Plan (2020).

4.4.4 Materials

The design team investigated the use of locally sourced Cefn sandstone (as used for the aqueduct piers) for the steps. However the local quarries could not supply the volume of stone required and therefore a suitable alternative stone has been identified. The proposed stone is Crosland Hill, quarried at the Wellfield Quarry in Huddersfield, North Yorkshire, which is a 'buff' sandstone with naturally occurring variations (see Figure 04-7).

It is envisaged that the central handrail to each individual flight will comprise uprights of cast iron with a simple timber handrail. The upright balusters have been designed with subtle references to the form of the aqueduct balusters. The handrail itself will be of timber with socketed joints and a rounded finish to provide something pleasing to touch, and more in keeping with the natural environment in which it is situated.

4.4.5 Heritage Impact Statement

Whilst the proposed works are not a direct invention on the aqueduct itself, they do have the potential to affect the setting of the structure. As Planning Policy Wales states in its definition of setting in relation to historic assets, 'The setting of a historic asset includes the surroundings in which it is understood, experienced and appreciated, embracing present and past relationships to the surrounding landscape. Its extent is not fixed and may change as the asset and its surroundings evolve.' This particular historic setting is currently in the process of evolving, and interventions of this type present no long-term impact to the significance of the heritage asset and its setting, if well designed, maintained and used as instructed. In relation to the Conservation Area, this type of intervention should be viewed as an enhancement, especially if it serves a wider public benefit of providing safer access to the base of the aqueduct and the existing public right of way.

Any change of this type to the setting of a heritage asset will inevitably have some short-term impact on the setting and



Figure 04-5: Route of current steps



Figure 04-6: Instances of erosion caused by the proximity of the steps



Figure 04-7: Proposed stone contrasted with the sandstone piers of the aqueduct

landscape, however, it is predicted that the change in the route of the stepped access will decrease any further erosion to the asset's sandstone piers, as well as providing a safer means by which to navigate the steep ascent and decent of the surrounding landscape. If the wider public benefit of the improvements are taken into account (as identified as objectives within the Masterplan), then the relatively small change in design and materials should be considered to be positive. In both instances, the overall impact on the significance of the heritage asset should be considered to be neutral, as due to both the independence of the design and the longer-term reversibility, no harm is perceived to be registered to the heritage significance of the structure or its setting.

4.4.6 Justification Statement

It is evident that the existing steps have become life expired, as well as their proximity to several of the sandstone piers being responsible for a low level of incidental damage to the stonework through their continuous heavy use.

The existing steps are too narrow to allow people to easily pass one another in transit which is resulting in an informal widening of the margins and the creation of gulleys which increase the rate of erosion of the slope.

The steps are irregular in height, and their depth makes them difficult to navigate for those of limited mobility, especially without an attendant handrail.

The proposed stone steps and handrail will help to regularise the access provision to the valley floor, and make it more accessible to those who would otherwise have struggled to make the ascent/descent by making the steps of equal rise and going, with landings provided between flights.

The central handrail, to the flights only, will increase safety whilst also improving the ability to pass along the route, reducing the likelihood of having to 'step off' causing erosion to the areas immediately adjacent.

Relocating the path of the steps, away from the stone piers, will reduce the levels of incidental erosion whilst still allowing visitors to experience the sheer scale of the structure from close range.

Whilst it is recognised that the proposed steps will initially have a greater visual impact on the setting of the aqueduct, the materials have been carefully selected to blend in with the local environment and the aqueduct structure, and the proposed steps will become less intrusive as the materials weather and patinate.

Care has also been taken with the design to ensure that the proposal is appropriate to the setting and local context, and does not appear to confuse the visitor by looking as if it were installed contemporaneously with the aqueduct itself, which would imply a greater level of significance.

The steps provide an important link between the aqueduct and the river valley below, providing a unique opportunity to view the historic structure from a different viewpoint within a wider landscaped setting. They form part of an existing Public Right of Way, Footpath LLA/35, linking Allt-y-bont and the village centre with footpath LLA/34 which follows the northern bank of the River Dee from Cysylltau Bridge to the Tref-y-nant Brook.

Therefore, retaining safe and appropriate passage down the valley side, which reduces the physical impacts upon the historic asset, is seen as a necessary requirement, which the current provision is no longer able to serve.

For more information on Heritage please refer to the full document ***'Pontcysyllte Aqueduct Access Improvements – Heritage Impact Statement - March 2024, Canal & River Trust'.***

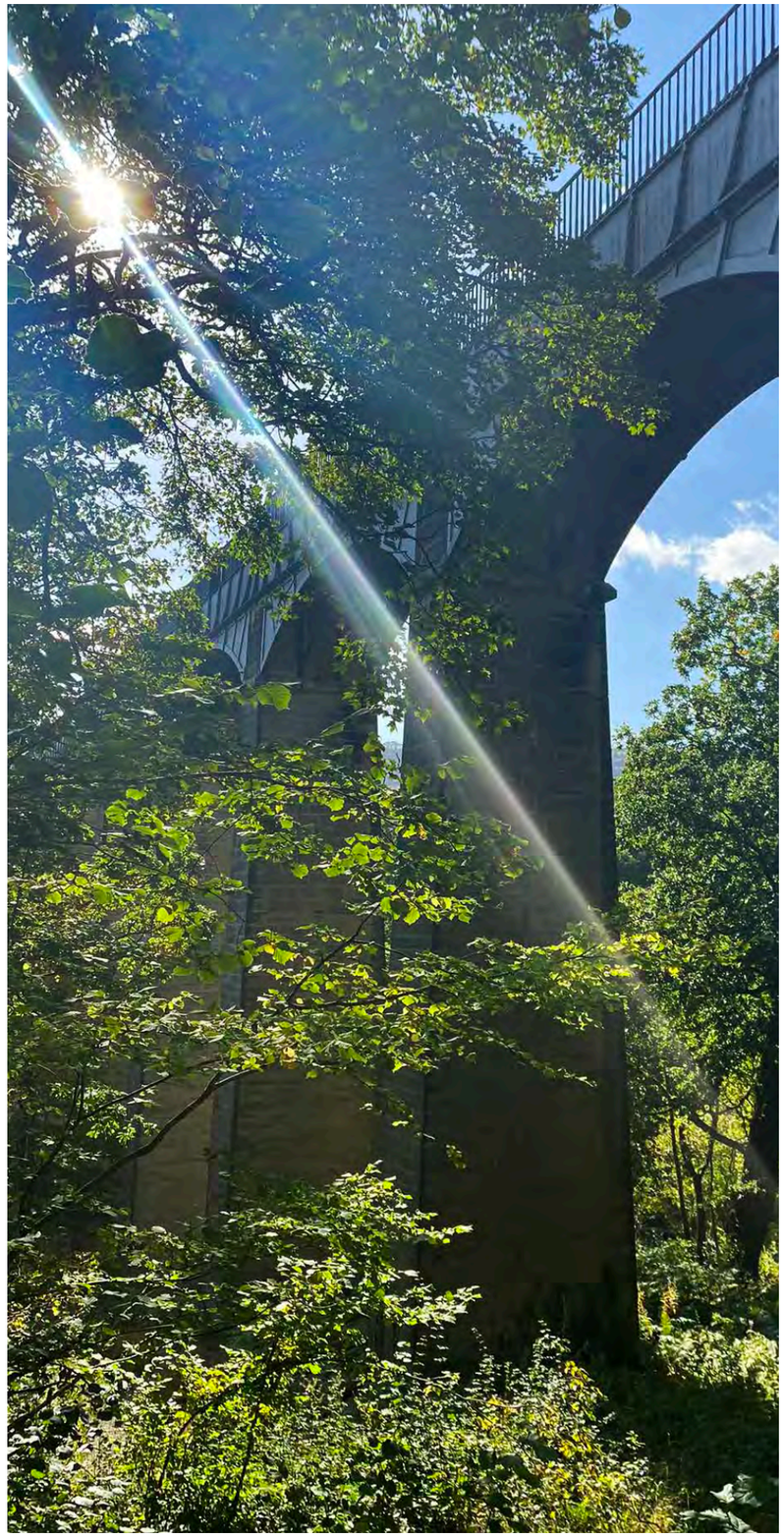


Figure 04-8: Pontcysyllte Aqueduct eastern elevation

4.5 Arboriculture

4.5.1 Arboricultural Impact Assessment

An Arboricultural Impact Assessment was prepared by Arcadis in Spring 2024, with an Arboricultural Survey undertaken in February 2024 and observations conducted from ground level, using the Visual Tree Assessment (VTA) system. Individual trees and groups of trees were categorised according to their quality and value and root protection areas (RPA's) calculated, in accordance with BS 5837:2012, as shown in Figure 04-9.

4.5.2 Tree Survey Results

31 arboricultural features were recorded within the study area, including 25 individual trees (T) and six tree groups (G). Each arboricultural feature was assigned a category, as listed below:

- Category A features: one individual tree (T) has been identified as Category A (trees of high quality) as part of this survey;
- Category B features: 13 individual trees (T) and one group of trees (G) have been identified as Category B (trees of moderate quality) as part of this survey;
- Category C features: 11 individual trees (T) and five groups of trees (G) have been identified as Category C (trees of low quality) as part of this survey;

It was confirmed by the Wrexham District Council's interactive mapping system that:

- no trees surveyed are subject to Tree Preservation Orders
- the site is situated in and subject to the Pontcysyllte Aqueduct Conservation Area

It was confirmed using the Data Maps Wales ancient woodland inventory that there are two designated ancient woodlands in the study area. These comprise Ancient Semi Natural Woodland (ID reference 34232) and Restored Ancient Woodland (ID Reference 37509). No veteran trees were identified during the site survey. Any tree works must be carried out by a qualified contractor in accordance with BS 3998: 2010: Tree Work – Recommendations. Proposed works will encroach inside the RPAs of two groups (G2 and G3) as well as within the RPA of one individual tree (T10). Although these incursions are not expected to have a significant impact on the trees, mitigation measures outlined in the AIA should be followed. Facilitation pruning will be required for two groups of trees (G2 and G3) to enable to the proposed works. The trees were assessed to have good vitality, and as such, required pruning is not believed to significantly impact the arboricultural features. See ***10058635-AUK-XX-XX-RP-ZZ-0001 Trevor Basin Arboricultural Impact Assessment*** for more details.

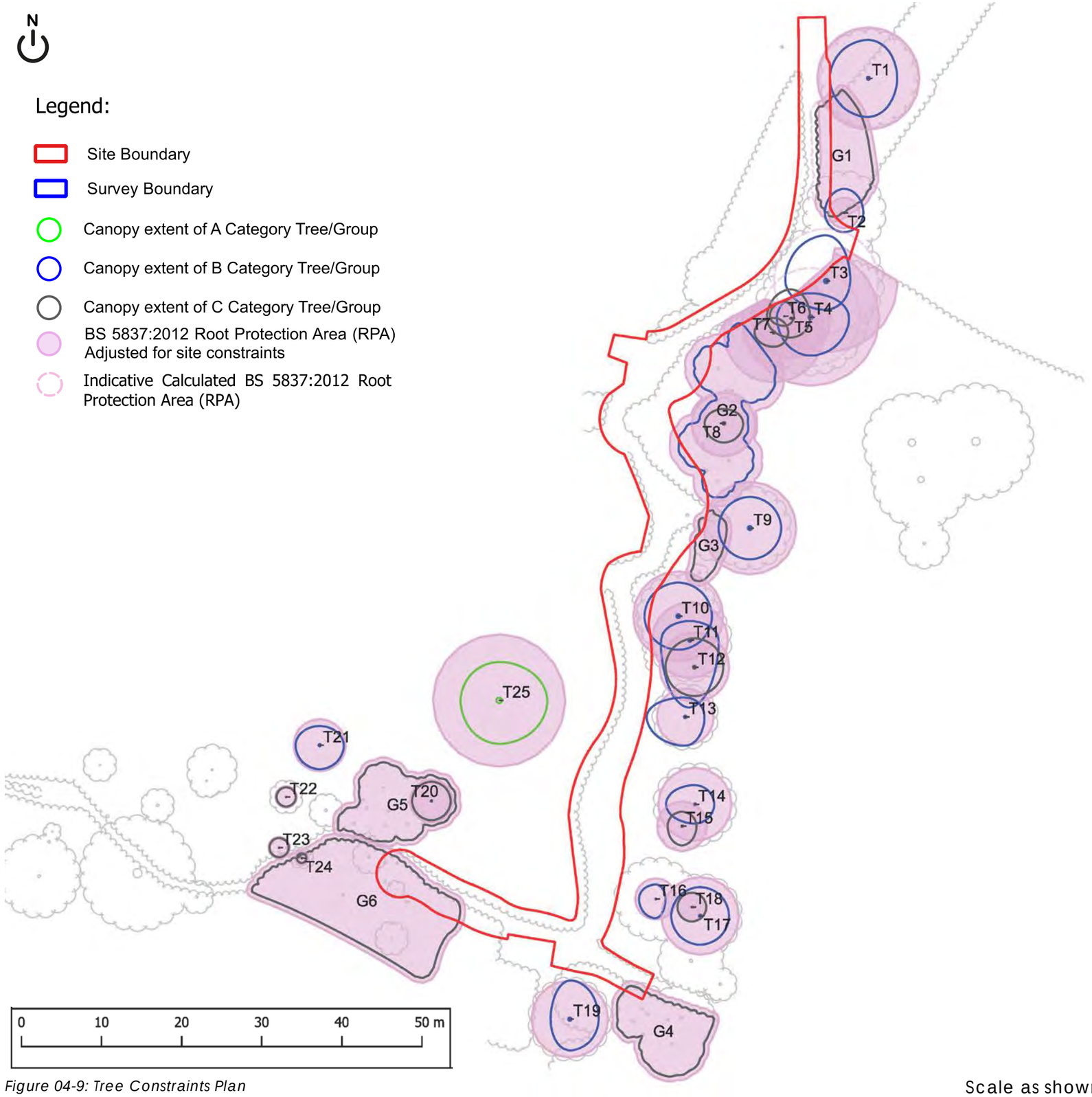


Figure 04-9: Tree Constraints Plan

Scale as shown

4.6 Landscape Statement

4.6.1 Landscape Statement

A Landscape Statement was prepared by Arcadis in Spring 2024 to consider the impact the proposals may have on landscape character and visual amenity.

4.6.2 Landscape and Heritage Related Designations

The Site and its surrounds are located within/close to several internationally and nationally important landscape and heritage designations:

- Pontcysyllte Aqueduct and Canal UNESCO World Heritage Site;
- Pontcysyllte Aqueduct Conservation Area;
- Pontcysyllte Aqueduct and Canal Scheduled Monument;
- Clwydian Range and Dee Valley AONB;
- Vale of Llangollen and Eglwyseg Historic Landscape Area; and
- Pontcysyllte Aqueduct Grade I Listed Building.

4.6.3 Landscape Character

The following published national and local character assessments have informed the identification of the landscape character baseline of the Site and surrounds:

- National - National Landscape Character Areas (NLCA) published by Natural Resources Wales; and
- Local - Wrexham LANDMAP Supplementary Planning Guidance, Wrexham County Borough Council, 2007 (Ref 1.19).

The Proposed Development is not considered to result in marked changes to the overall landscape character of the Site and its surrounds. Whilst there would be some adverse effects on the localised landscape character during construction phase, these would be temporary and over a small geographical area.

The Proposed Development is designed to be well integrated into the existing landscape, enhancing access to and appreciation of the Site's natural and industrial heritage. The proposals are considered to have a very small visual impact on the surrounding landscape and will integrate well with its character.

By incorporating appropriate design measures and mitigation strategies, it is considered the Proposed Development would be well-integrated into the landscape setting, improving the visitor experience and positively contributing to long-term management of the World Heritage Site.

For more information please refer to ***10058635-AUK-XX-XX-RP-LA-0001-Landscape Statement***.

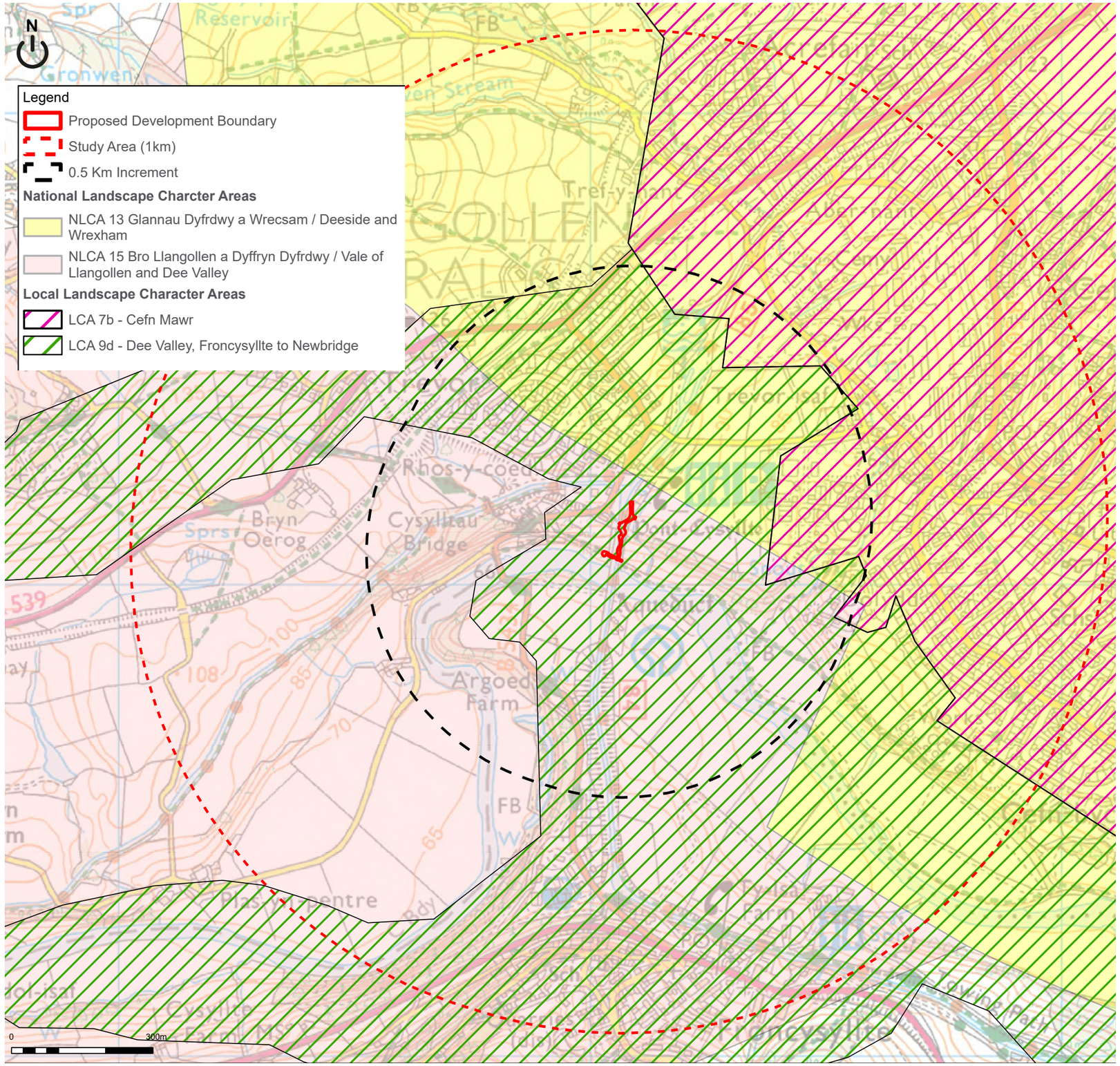


Figure 04-10: Landscape Character

Scale as shown

4.7 Drainage Strategy

4.7.1 Drainage Strategy Report

A Drainage Strategy Report was prepared by Arcadis in January 2023, to provide a Drainage Strategy assessment for the Sustainable Drainage Systems (SuDS) Approval Body (SAB), to support the planning application for the Trevor Basin Stepped Access Improvements.

A 1km offset for the study area from the site boundary was selected due to the limited visual envelope of the low-lying proposed development within a steep wooded valley slope landscape.

The report considers location, topography, ground conditions, existing water courses, site drainage and flood risk, comparing existing to proposed, to produce a Surface Water Drainage Proposal, as shown in Figure 04-11.

The report details the design methodology for the Surface Water Drainage Proposal as part of the new development proposals, as follows:

It is proposed to adopt the drainage strategy of the existing stepped access at Trevor Basin, as such any surface water running off from the proposed development surface will shed from the stepped surface into the adjacent vegetated region, where it will be slowed down and likely naturally infiltrated.

Based on the existing topography and contours, any surface water not infiltrated will act as overland flow running into the stream eastwards of the proposed development, which feeds into the River Dee.

The greenfield runoff rates for the impermeable development surface area were calculated to no greater than the greenfield peak flow rate (QBAR).

Following consultation with Wrexham County Borough Council, it has been confirmed that on the basis of the strategy proposals a SAB application would not be required.

For more information and scale drawings please see ***10058635_ARC-XX-ZZ-RP-CE-00001 Drainage Strategy Report***.

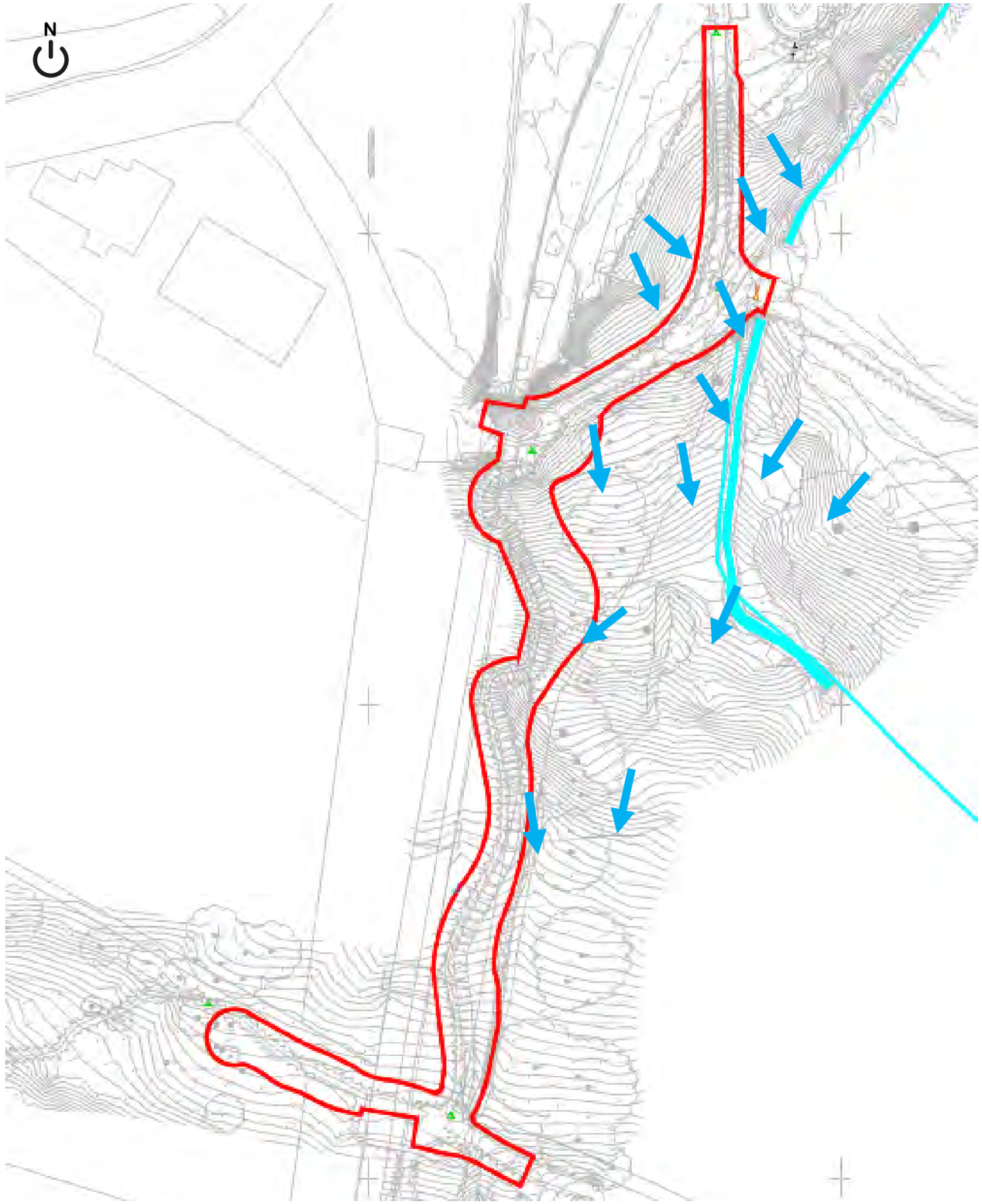


Figure 04-11: Indicative overland flow path outlined on the existing site topography and contour lines

Not to scale

4.8 Analysis

4.8.1 Site Analysis Plan

The diagram in Figure 04-12 indicates some of the early key findings and potential opportunities from our understanding of the brief.

1. **Future opportunity for wider, shallower descent**
   Create wider, shallower steps over a longer length - gentler approach to main steps
2. **Future opportunity to strengthen confluence/nodal point**
   Create improved link to woodland footpath, improve signage and wayfinding, opportunity for public art
3. **Pause point and Key view**
   Opportunity to open up first views of whole aqueduct at this point by removal of trees
4. **Enclosure and Shelter experience**
   Celebrate only location on descent where user can experience the structure up close from beneath
5. **Pinch point realignment**
   Opportunity to realign descent moving users away from vulnerable corner of bridge pier
6. **'Pause Point' opportunity**
   Future opportunity to create 'viewing area' off the stepped descent for users to pause mid-descent. Also would link into 8 & 9 below
7. **Opportunity to improve access to view water rill**
   Future opportunity to Improve/formalise link to woodland path leading to 9 below - opportunity for public art
8. **Opportunity for pause point/ woodland shade**
   Formalise area adjacent to water to provide views up and down rill and into woodland area and area of shade in which to pause
9. **Improve stepped descent**
   Installquality steps with consistent risers and treads and handrails as required - opportunity to work with public artist on design of bespoke handrails
10. **Retain reinstated historical hedgeline**
    Ensure recently reinstated hedgeline is protected and retained
11. **Strengthen confluence/nodal point**
    Create improved link to ongoing footpaths, improve signage and wayfinding, and address embankment erosion
12. **Instal railing at pause point/keyy viewing point of River Dee**
    Opportunity to pause and view the river and aqueduct
13. **Restricted access**
    Restrict access to rivers edge at this point
14. **Potential to formalise path to viewing area**
    Improvements to existing footpath to provide access to views of aqueduct

NOTE: Not all opportunities will be taken forward to the masterplan

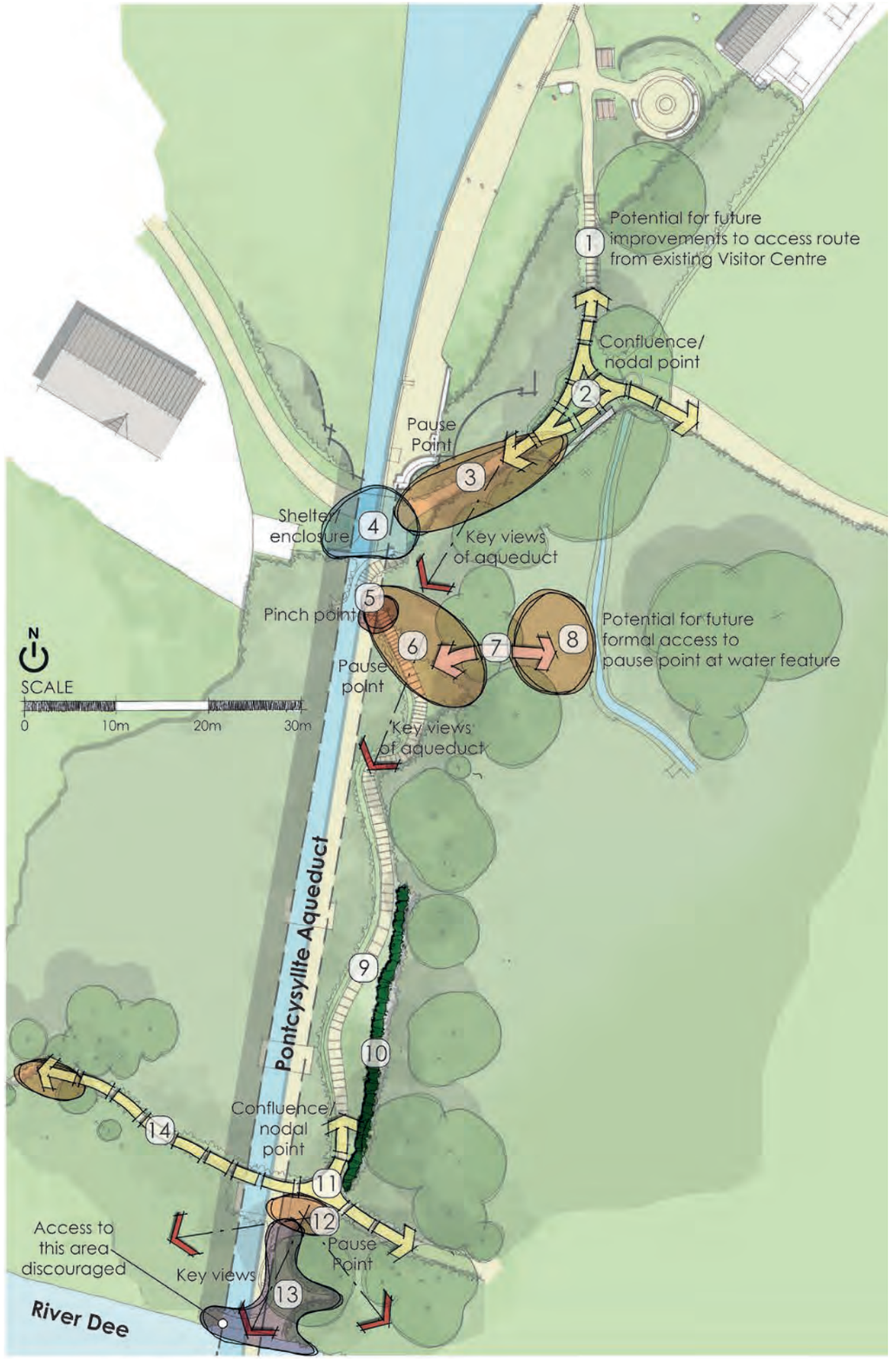


Figure 04-12: Initial Analysis

Scale as shown



05 Design Proposals