05 Design Proposals

5.1 Developing the Design

5.1.1 Developing the Masterplan Layout

In developing the final layout we started to look in more detail at the configuration of the descent and worked on creating a 'rhythm' which would be consistent from top to bottom for a more comfortable user experience.

Following consulation with key stakeholders CADW, the step alignment was moved away from the existing aqueduct where currently it is very close, to protect the structure from further erosion/damage caused by the close proximity of users to it. After an archaeological assessment identified potential archaeological features close to/within the proposed works area, we realigned the route and reduced the red line site boundary to exclude this and to avoid any disturbance of the potential archaeological assets.

For guidance on the design of the steps, ramps and handrails we consulted the following:

- **Part K Regulations**: Protection from falling, collision and impact
- **Part M Regulations**: Access to and use of buildings
- **Metric Handbook**: Planing and Design Data (2nd Edition)
- **Access for All Design Guide** (Environment Agency) - as recommended by the ***Landscape Institute Technical Guidance Note 04/2020***
- **Easy Access to Historical Landscapes** (Historic England)

The flights were designed so they had the same number of steps with the same size tread and riser. Landings between the flights have been designed to be of varying lengths but similar gradients to provide the same continuity as the steps.

Handrails have been added at the centre of each set of steps to minimise the number of handrails and reduce the amount of visual clutter, allowing however for support for users on both sides.

In order to design out any requirement for barriers to protect against potential drops, we carefully oriented the descent to enable the localised ground levels to marry with the edges of the landings and steps. Hazard warning tactile paving is to be provided on the level landing at the top and bottom of the full descent but is not required between each flight, as per the guidance used.

Due to the archaeological findings, retaining structures are proposed to allow the steps to take an alignment around this archaeological asset. A new railing is also proposed to extend around the footpath above the proposed retaining wall, above the new flight of steps. This will take the same form as the step handrails.

Figure 05-1 shows the final Design Proposals, see Drawing 10058635-AUK-XX-XX-DR-LA-0035 Site Rendered Plan for full scale drawing.

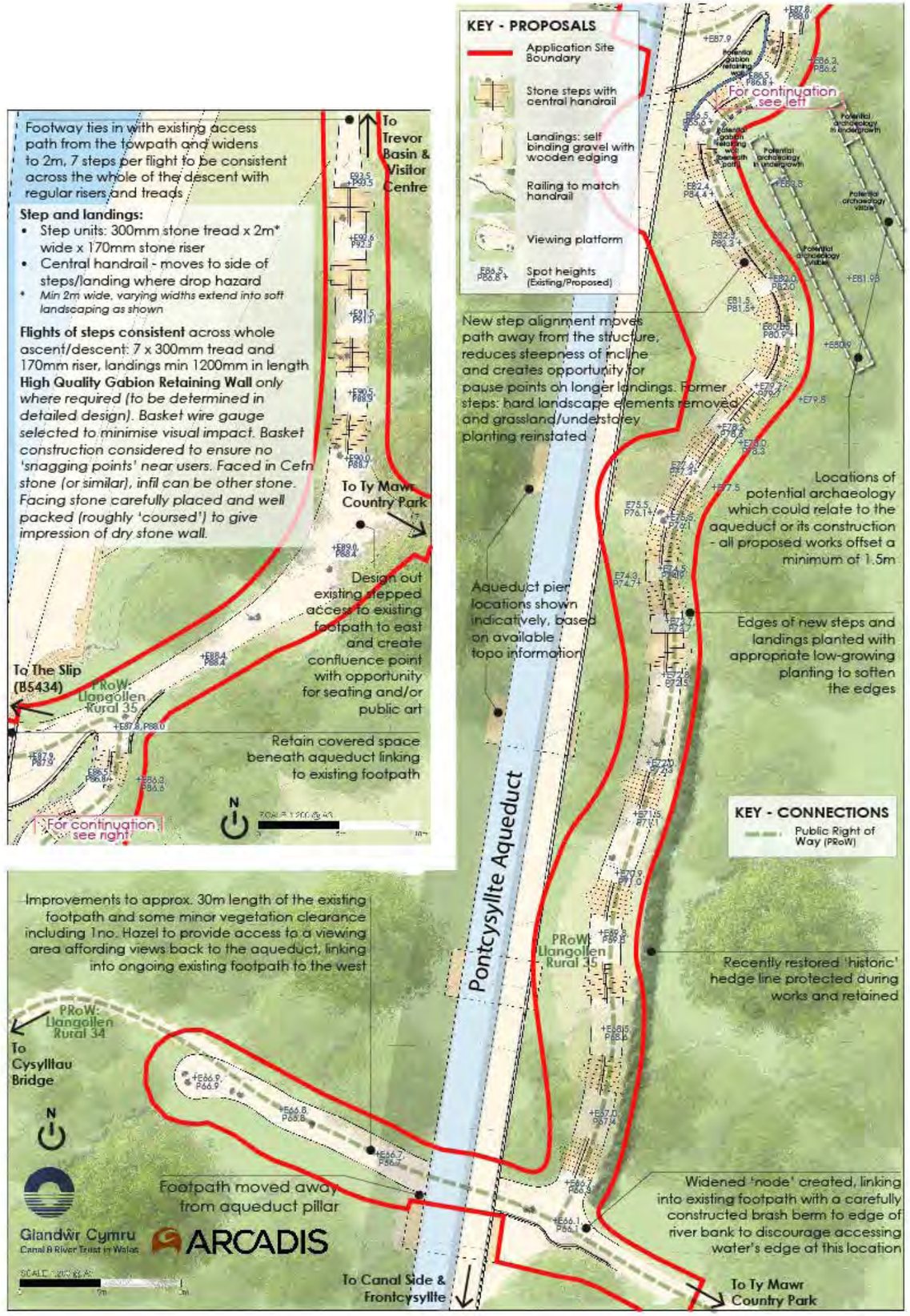
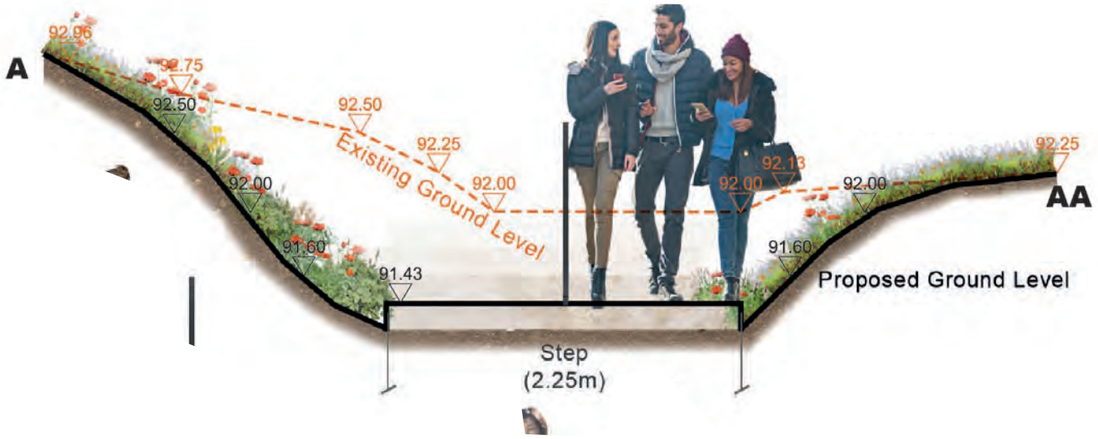


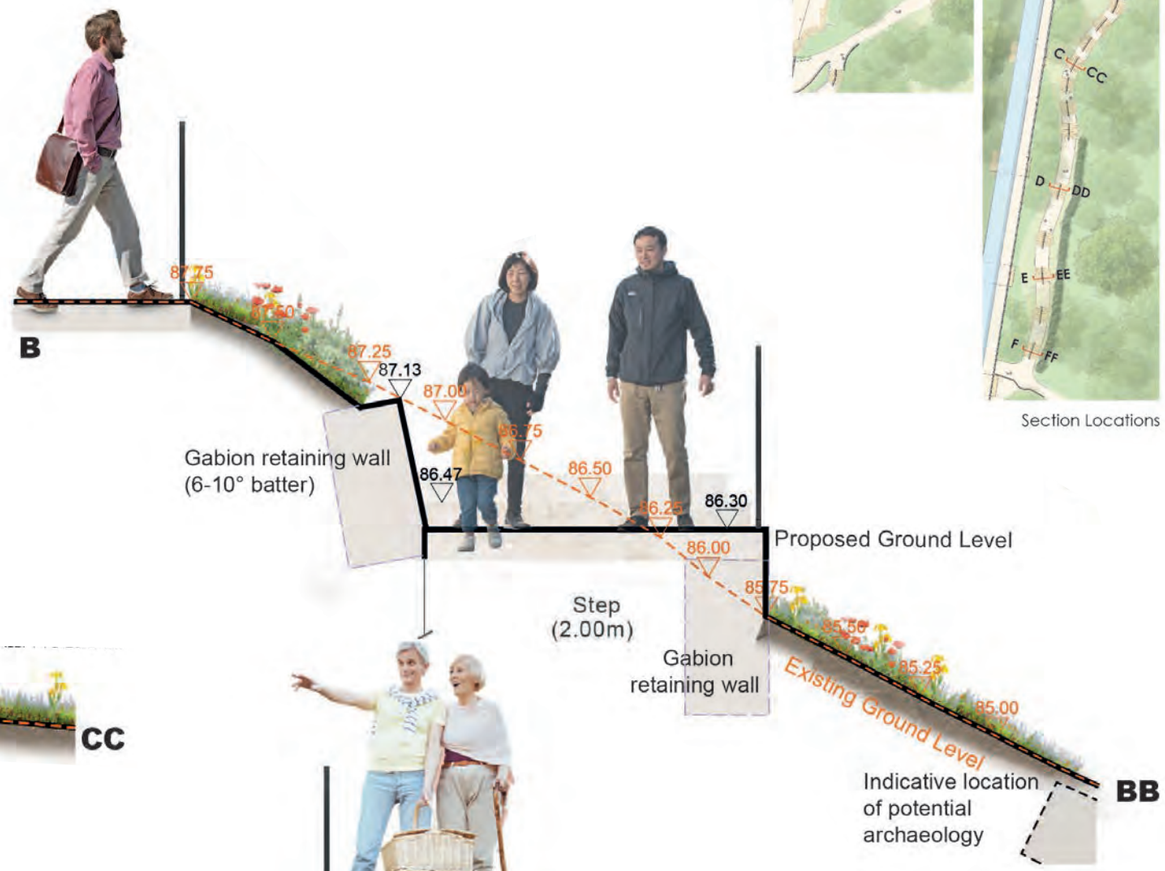
Figure 05-1: Design Proposals

5.2 Detailing the Design

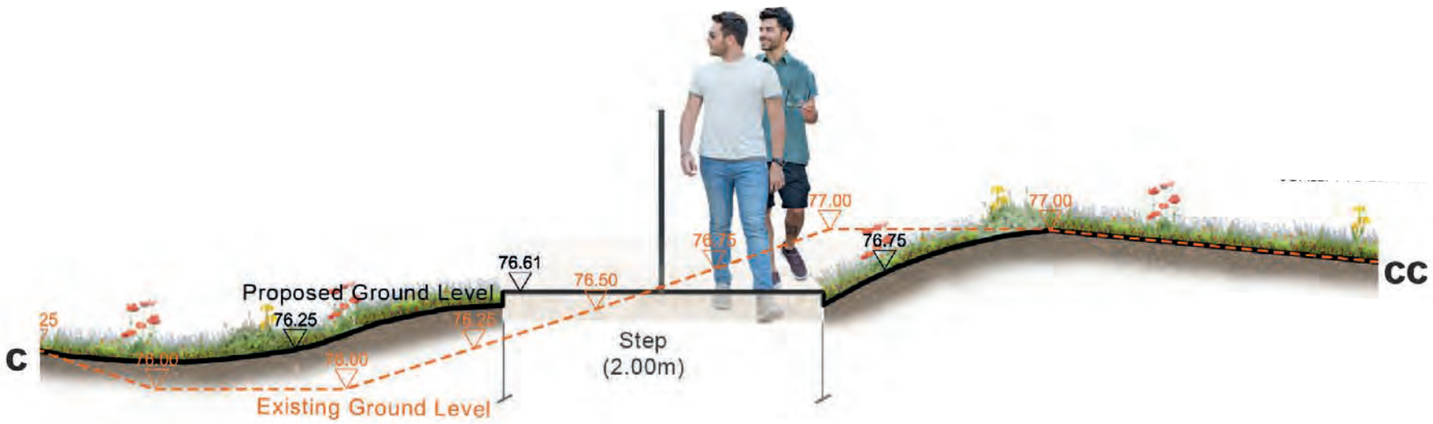
5.2.1 Indicative Section Elevations

Figure 05-2 shows a range of sections taken through the stepped access to demonstrate how the proposals sit against the existing levels. We have where possible minimised the amount of cut and fill and regraded localised levels to design out falls and drops. The locations are shown in the inset location plan.

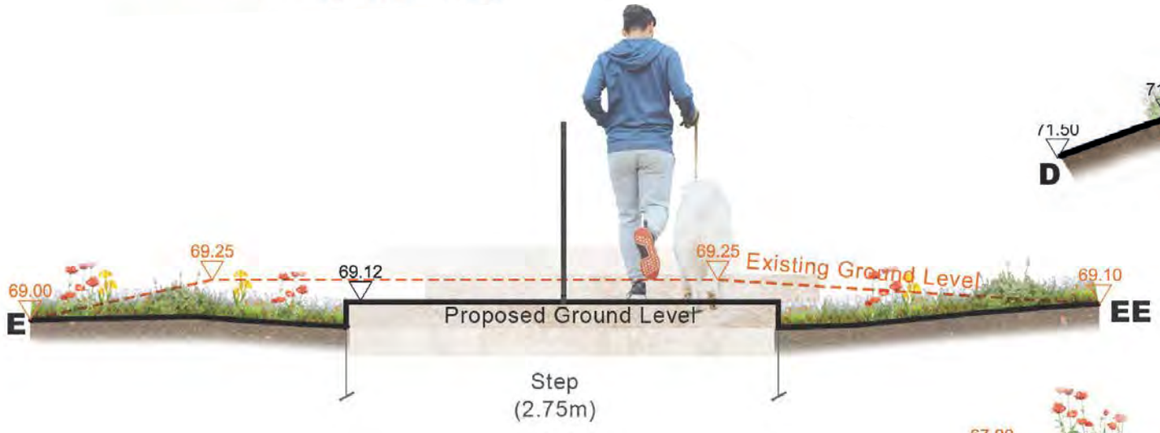


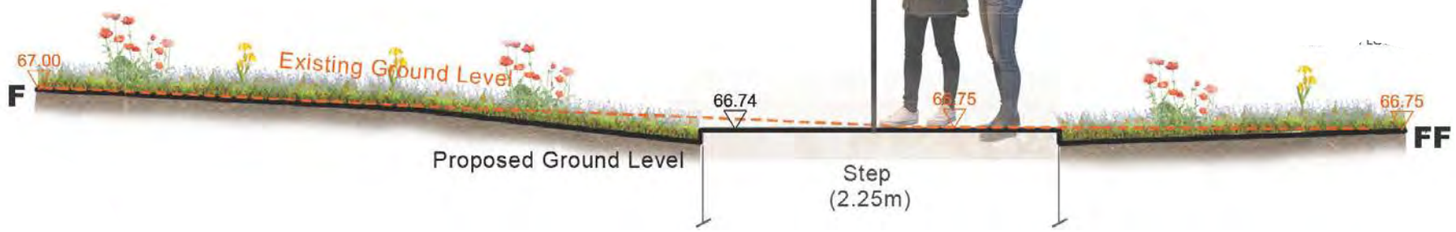


Section Locations









SECTIONS ARE NOT TO SCALE
For scale drawings refer to 10058635-AUK-XX-XX-DR-LA-0018 Sheets 1-3

Figure 05-2: Section Elevation Details

5.2.2 Indicative Long Section Elevation

Figures 05-3 to 05.5 show a section elevation running through the whole length of the descent, taken through the centre of the footway. It is shown here as the upper series of flight and the lower series of flights split between A and B, as shown in the inset key plan.

The aqueduct has been shown indicatively in the elevation to suggest the relationship between the structure and the stepped access from the top to the bottom. The existing levels are also shown to indicate the level of cut and fill required.

The upper flight of steps are included in this applicaiton, however they are potential future works as the existing steps (as shown on the photo on page 16) are in good condition.

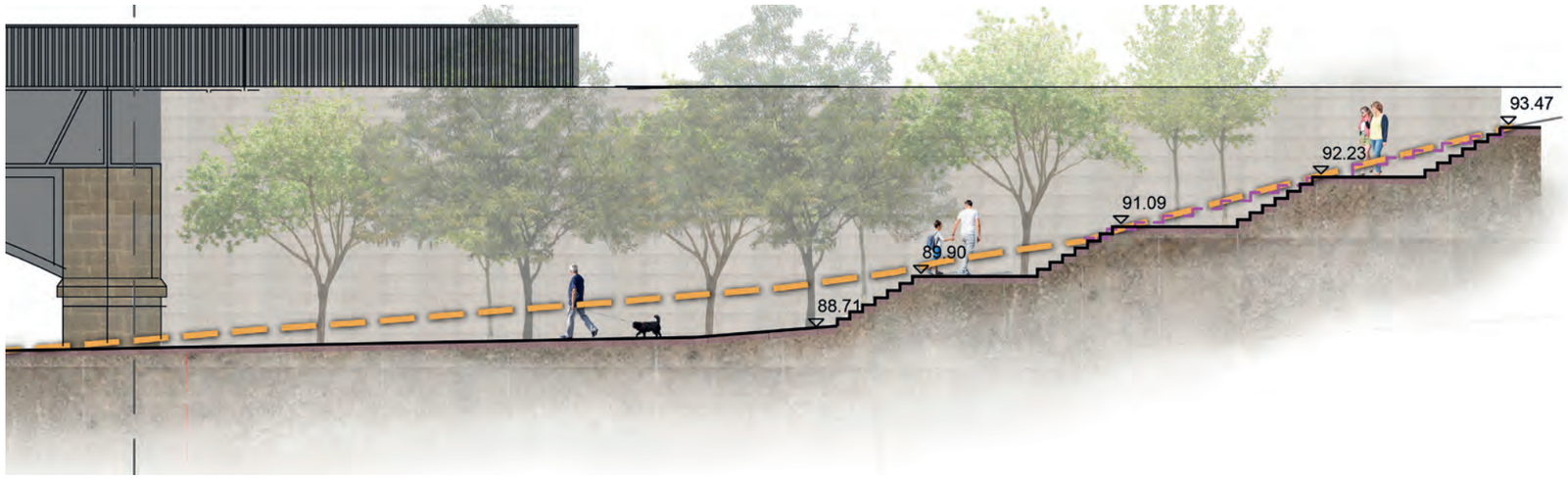


Figure 05-3: Upper Flight Series Section

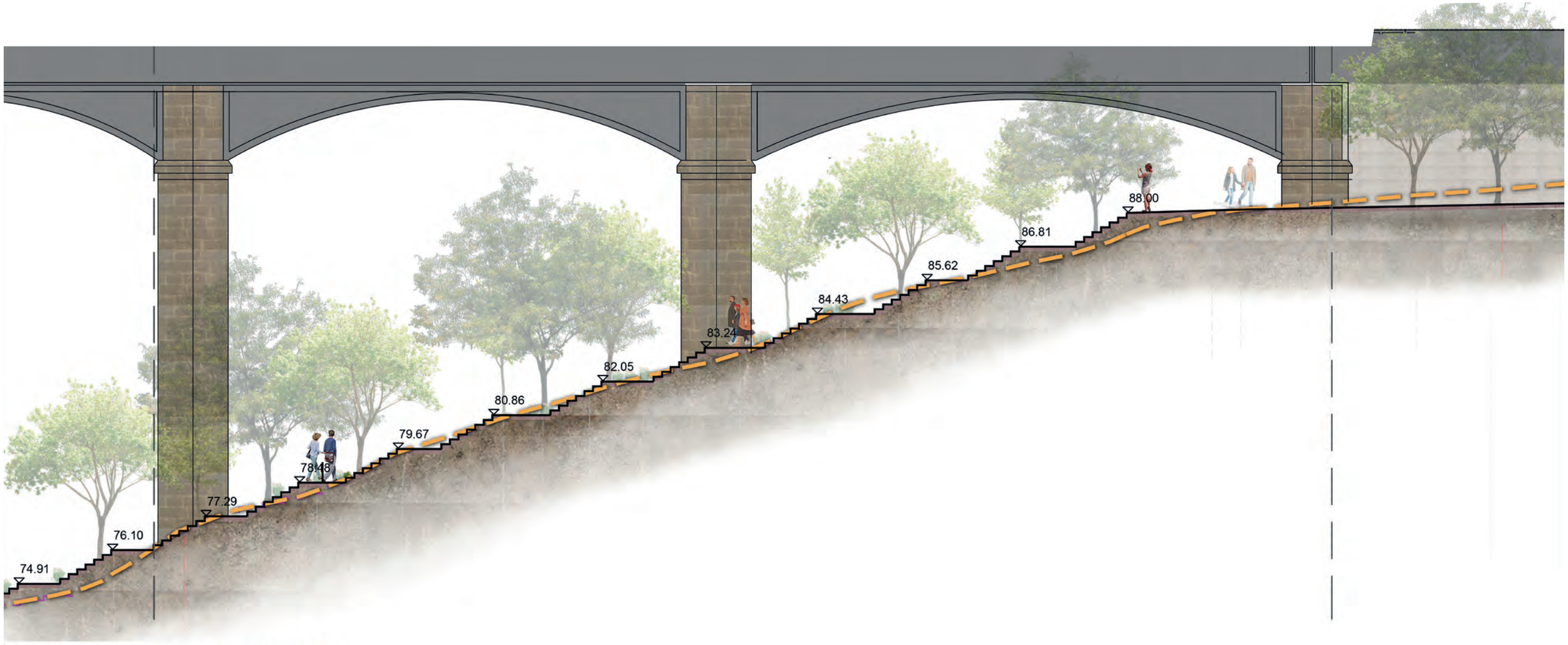


Figure 05-4: Lower Flight Series Section A

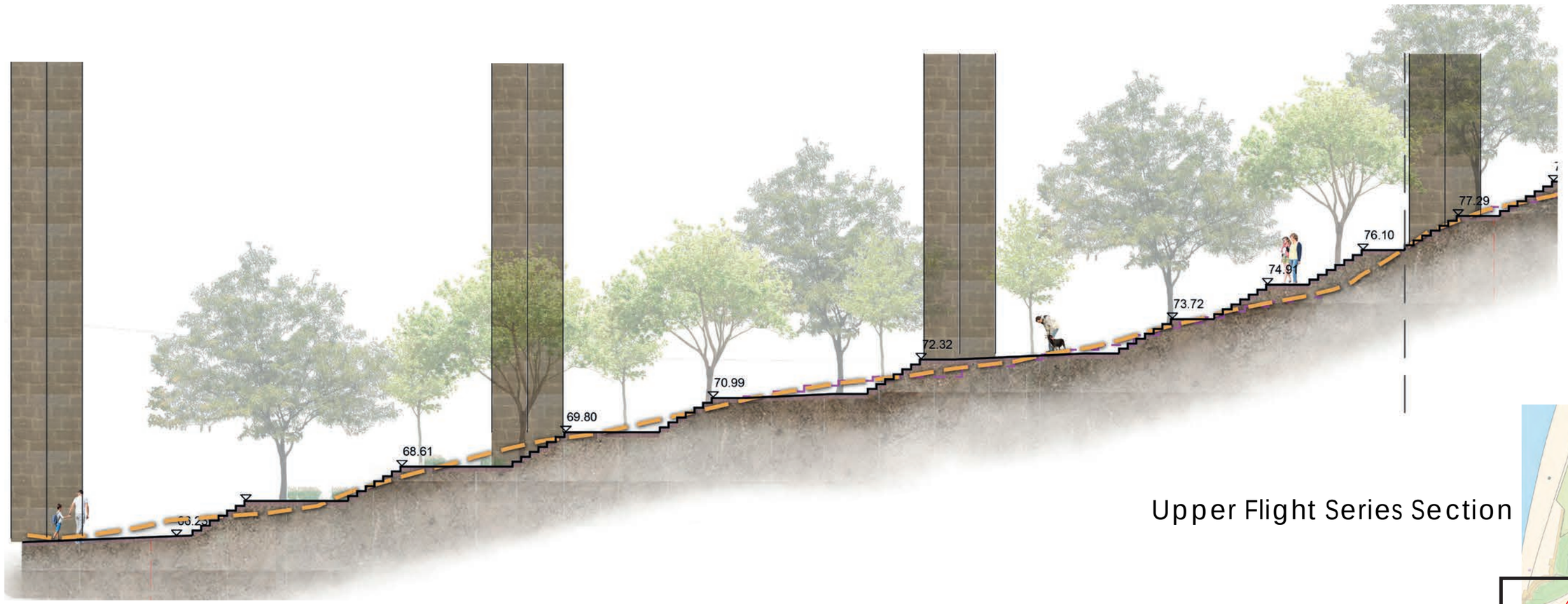
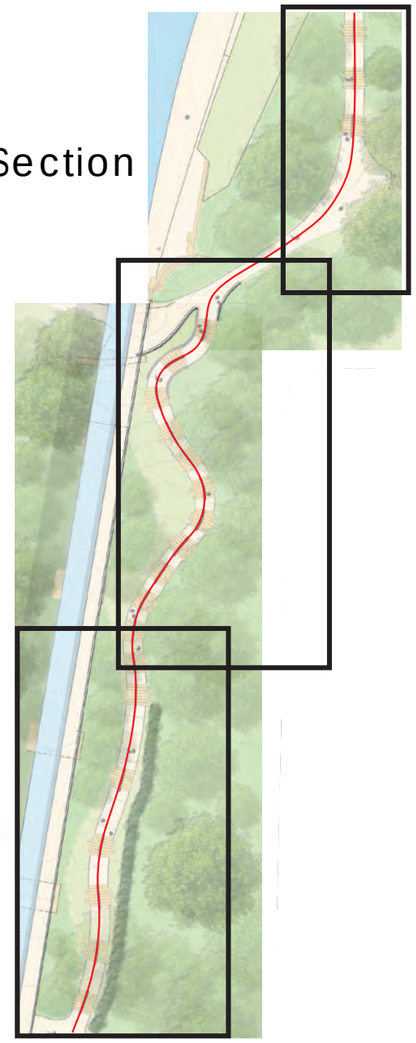


Figure 05-5: Lower Flight Series Section B

Scale
0 5m 10m

Upper Flight Series Section



Lower Flight Series Section A

Lower Flight Series Section B

INDICATIVE SECTIONS - SCALE AS SHOWN
For scaled drawing refer to 10058635-AUK-XX-XX-DR-LA-0017

5.2.3 Visualisation - Artist's Impression

Figure 05-6 is an 'artists's impression' of how the proposed stepped access could look.

It gives an indication of the colour and type of materials to be used including the steps, landings and handrails.

It also gives a suggestion of the type of planting to be used to soften the edges of the structure and help it to sit more gently within the existing soft landscape.



Figure 05-6: Artist's Impression

5.3 Materials Palette

5.3.1 Indicative Materials - Hard Landscaping

After consideration of suitable materials in terms of their look and feel, durability, sustainability and appropriateness we have carefully proposed a range of materials which we feel will sit comfortably within the setting of the world heritage site and compliment the local vernacular materials of the listed structure whilst fulfilling the requirements for robustness, quality and deliverability.

In attempting to match the existing 'Cefn' sandstone used to build the aqueduct, there was insufficient volume available locally so an alternative complementary stone has been proposed, a 'buff' sandstone with naturally occurring variations. In choosing the preferred material several alternatives were considered from outside the UK and locally and in a variety of finishes. The selected stone is a Yorkshire Sandstone which when viewed side by side next to the Aqueduct provides a near perfect complementing material.

The handrail will be designed to complement the existing handrail from the aqueduct and will be designed and fabricated a local craftsman with experience in the WHS. The handrail will have metal uprights referencing the design of the aqueduct, in timber with a rounded finish (see artist impression on previous page).

The current base material for the paths and landings between the steps of compacted soil and gravel is being upgraded in the proposed design to a self-binding gravel carefully colour matched to complement the pathways in and around the project location.

Where there is a need to retain the edges of the stepped access, a high quality gabion retaining wall is proposed, exact locations to be determined in detailed design stage. Basket wire gauge will be selected to minimise the visual impact but provide resilience, and the construction of the baskets considered to ensure there are no 'snagging points' of the wire basket near users. The baskets will be faced in Cefn stone (or similar), and the facing stone will be carefully hand stacked and well packed (roughly 'coursed') to give the impression of a dry stone wall.

A railing is also proposed at the top of the flight of steps above the northern most retaining wall to match the handrail along the steps.

Figure 05-7 shows the existing on-site materials plus those proposed, for comparison.

Existing stone - aqueduct



Existing Cefn Sandstone, photos of Pontcysyllte Aqueduct showing colour, tonal variation, texture, and hand-tooled finishes

Proposed Steps

Sandstone: for paving, tactiles and edging



Sandstone to match existing Aqueduct stone, with matching tactile

Existing footpath materials



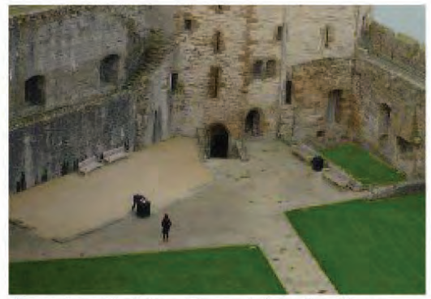
Existing self-binding gravel onsite, Trevor Basin

Proposed Landings/Footpaths

Gravel options



Breedon Hoggin buff colour



Breedon Golden Gravel Application: Caernarfon Castle

Proposed Gabion Retaining Walls





Indicative images - high quality gabion baskets faced in Cefn sandstone (or similar)

Figure 05-7: Hard Landscape Materials Palette

5.4 Green Infrastructure Statement

The intentions of the proposals are for the new stepped access to sit in harmony with the existing landscape.

The steps have been designed with a feathered edge, always staying at a minimum width of 2m but extending out to either side, as appropriate to levels, into the soft landscape. This will help to blend it into the local topography by allowing understory planting to merge into the edges of the steps, as shown in the inset plan below in Figure 05-8.

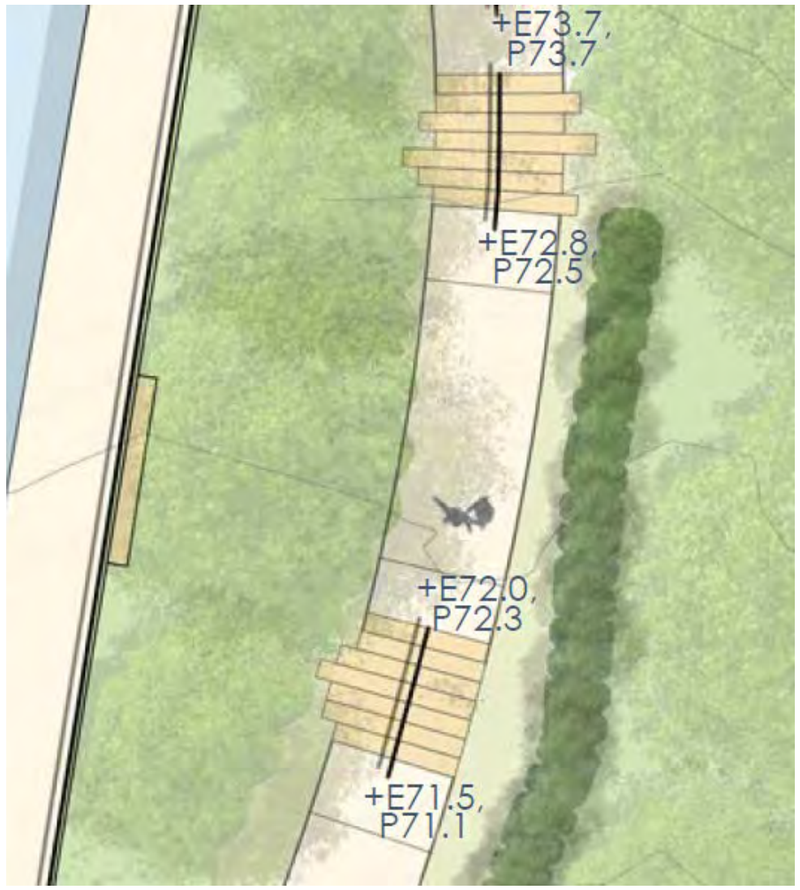


Figure 05-8: Inset detail of staggered step design

The design of the consistent minimum 2m central width of steps will remove the need for users to step off the steps and cause erosion to the hillside which is currently evident, as shown in Figure 05-9.



Figure 05-9: Current erosion of the hillside

Proposed planting will take its cue from the existing understorey planting to further soften the edges of the steps (so a 'hard alignment' isn't visible). The proposed planting will be native species and will respect / consider the SAC designation. This will be achieved by bringing the vegetation to the edges of the steps and landings, overall enhancing the scheme and the green infrastructure on the hillside. The original alignment of the steps will also be restored to natural understorey woodland in keeping with the surrounding landscape.

To facilitate the scheme, there will be the removal of 1no small hazel to the west of the aqueduct as well as selective coppicing and/or removal of small self seeded trees and this will in addition improve views to the aqueduct.

5.5 Summary of Proposals

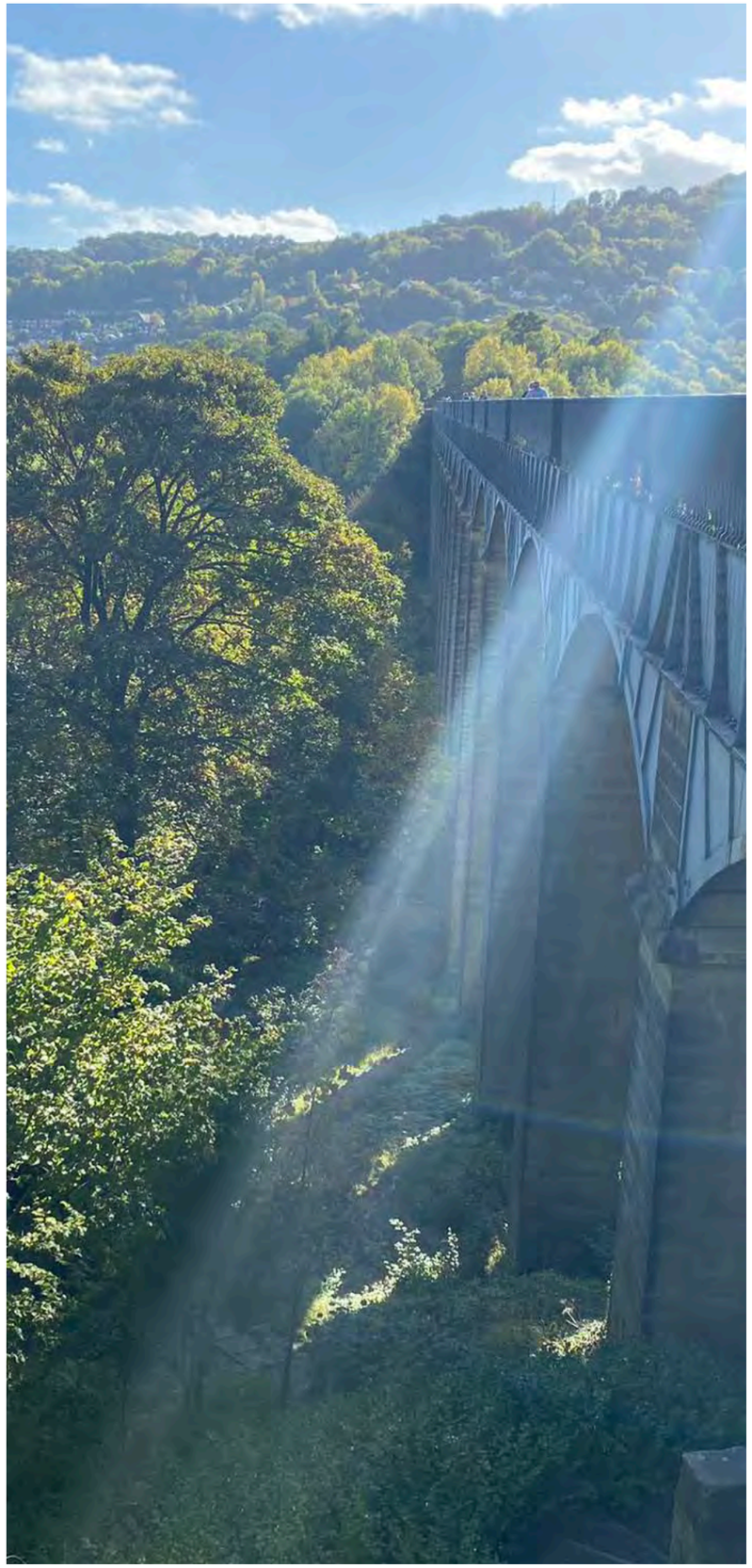
During the data gathering, baseline analysis and technical review stages we developed a list of key considerations which have been taken into account during the design development of the proposals:

Alignment
- Move the alignment away from the listed structures to reduce potential erosion/damage (following consultation with Cadw)
- Alignment proposed to minimise the impact upon found archaeology on site - overgrown masonry structures that may have been associated with the aqueduct early water management or construction period.
- Protect and retain existing improved hedgeline to east of steps

Access
- Widen steps to create space for passing
- Create landings for passing/pausing
- Regularise numbers of steps in a flight, length of tread and height of risers to create a consistent approach across the whole descent/ascent
- Provide handrails as necessary
- Restrict access to the rivers edge from the bottom of the steps

Enhanced User Experience
- Removal of 1no Hazel to the west of the aqueduct, and selective thinning of self-set trees <75mm dbh (if required) to open up a key view of the aqueduct
- Providing space to pass and pause
- Replace existing steps with quality, robust materials in keeping with the WHS status of the site
- Creation of additional improved footpath to give access to views of the aqueduct from the rivers edge

In summary, the proposals represent a carefully considered approach for delivering a high quality, sustainable solution to improving the access and connectivity around the Pontcysyllte Aqueduct which also introduces protective measures to help preserve the heritage asset.





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