

B6351 Westnewton Bridge Permanent Scour Protection works

Planning Statement in support of Planning Application

Explanation of the need for the development, the impact of permitting/refusing it and benefit to local communities/economy.

Westnewton Bridge carries the B6351 public Highway over the College Burn. The road is an arterial link through the Glen Valley from Akeld to the communities of Mindrum, Yeholm and Kelso.

The local community industries are based on hill farming, forestry and tourism with travel along the B6351 road fundamental to the functioning of all who live in the Glen Valley. This route is a strategic asset in allowing tourists access to the College Valley to enjoy the special qualities of the National Park.

The flood event of 25th September 2012 caused damage to one the piers of Westnewton Bridge and the bridge was closed to all users until emergency repairs were implemented to temporarily reinstate the foundations. The road closure required all vehicles to travel 21 km via a diversion from one side of the bridge to the other. This put an immediate strain on businesses and all who needed to access services on a day to day basis. A long term closure would have caused severe hardship to individual families and could have compromised the viability of some business activities.

There remains a substantial risk to the bridge foundations from scour during flood events and, to permanently safeguard the integrity of the river crossing, the County Council is proposing to provide permanent scour protection and construct soft engineering works to minimise the potential for deposition of sand and gravel around the bridge. This would ensure that this essential Highway link is safe guarded for the benefit of the Glen Valley residents and those using the road for longer journeys. Furthermore, the proposals will protect the valuable heritage asset of Westnewton Bridge, a structure that if damaged beyond repair could not be rebuilt to a similar standard.

The flood event of September 2012 showed that the bridge foundations are particularly vulnerable to scour and investigations have confirmed that the footings are built at a level higher than would usually be expected for a structure of this order. Failure to implement these works could leave the listed bridge structure vulnerable to catastrophic failure, a situation only narrowly avoided in 2012.

It is known that the river has a propensity to meander with large volumes of material scoured from the outside of bends and extensive deposition of gravels and cobbles on the inside. This situation prior to 2012 resulted in the available waterway through the bridge arches being dramatically reduced with a risk of blockage from woody debris washed down during flood events.

It is therefore proposed to provide permanent scour protection around the bridge sub-structures and install soft engineering to limit meandering upstream of the bridge. Hydrological and geomorphological studies have been undertaken to understand the locations of high bed shear and water velocity that may cause river bed instability and bank

erosion. The reports on these matters were undertaken by Cbec Eco-Engineering and considered a 1 in 200 year flood return event modified to allow for climate change and is enclosed in the Application as Ref 2, 3, and 4. These studies have also highlighted additional concerns of retaining the current straighter alignment where an existing rail bridge abutment downstream of the bridge forms a pinch point to high flows and increased risk of river bed instability. The proposal therefore also includes for removing the pinch point and locally re-grading the embankment.

Another concern determined from the studies was a locally low crest height of the flood embankment. It is proposed to use excavation arisings to raise this crest level to a height in excess of the 1 in 200 year event plus climate change allowance. This is efficient reuse of materials that otherwise would have gone to a licensed tip as waste or for recycling.

Further consultation on the proposals were held with Claire Pattison of the Environment Agency and a record of the communications and decisions is enclosed with the Application as Ref 5.

A review of the findings of Cbec Eco-Engineering was undertaken by Malcolm Newson of River Catchment Services Ltd, a renowned national authority on geomorphological issues. This review is enclosed in the Application as Ref 12.

The scope for developing elsewhere/outside the park, or meeting the need for such a facility in another way

The manner of development cannot be implemented elsewhere because it is specifically to protect an existing public asset. However, a feasibility option appraisal has been carried out in which all means of achieving the required level of protection have been considered. The report is enclosed in the Application as Ref 10. The conclusion is that there are very few alternative construction forms that can be delivered due to safety concerns and practical construction considerations. The developed scheme represents the only solution that it is considered can be delivered after due study and consultation with all stake holders.

Where it is considered appropriate to use soft engineering, details have been specified using softwood and hardwoods in maintaining the current river alignment. Several options were considered at these locations and are described in the addendum to the feasibility report in Ref 10.

Any detrimental impacts on the park's special qualities public enjoyment of these/setting of historical assets/natural resources/transport network and mitigation of any detrimental impacts.

The design team is highly aware of the special qualities of the National Park and issues have been driven by this together with the need to address the cause for the development.

The principle visual impact could have been the concrete apron cast across the full width of the river. However, the proposals include for the embedment of 60 tonnes of cobbles in the top concrete surface that, whilst aiding the scour characteristics of the invert in this location, should also give the appearance of a natural bed after the river sediments have had a chance to naturalise things after further flood events.

The listed structure of the bridge is recognised as an important heritage structure. To this end the proposals have been modified to ensure that the concrete apron is structurally separate to the masonry of the abutments and piers and cannot have a detrimental effect on the performance of the stonework.

During the pre-application process the NNPA Historic Environment Officer raised the possibility of a historic crossing point of the river at the bridge location. The emergency works allowed an inspection of a substantial depth of river bed material in excess of that needing to be excavated for the permanent works. It is therefore proposed that in view of the limited depth of excavation for the proposed works and the knowledge that no evidence of historic remains were found during the emergency works, the development does not require the watching brief by an archaeologist. However, should the NNPA Historic Environment Officer not agree with this statement, a suitably qualified professional will be appointed in a watching brief to oversee the works.

The soft engineering works to the RH bank upstream have been chosen to maintain the current river alignment and characteristics. Installation of log soldiers to the edge of the river have been specified to mimic those installed by the Cheviot Futures organisation in 2012 but washed out later that year. Additionally, soft engineered groynes along this bank are being proposed to prevent 'cut back' scours that could cause severe meandering and threaten the flood bund by scouring. Several options were considered in the use of soft engineering at these locations and are described in the addendum to the feasibility report in Ref 10.

The proposed log arrays immediately upstream of the bridge are key to maintaining the approach of the river through the centre arch of the bridge. These features can be constructed in a number of 'hard' materials but the proposals allow for the use of hardwood materials to lessen the initial visual impact. It is considered that should vegetation regeneration continue in a similar manner since the 2012 emergency works, the logs will be virtually hidden by this emerging growth.

A key consideration of the proposals is the consideration of the effects on the protected species and habitat of the SSSI. Econorth have been appointed to survey and consider the temporary and permanent methodology and, an Appropriate Assessment under the Habitats Regulations has been produced for consideration by the Environment Agency and Natural England. The report is enclosed as Ref 8.

A Water Framework Directive Compliance Assessment of the effects of the scheme on the ecological status of the river environment was also required. This report is in two parts, one produce by Cbec Eco-Engineering, and the other by Econorth. They are enclosed with the Application as Ref 3 and 9.

The reports set out an assessment of the potential effects of the works on the interest features of the SAC, including an assessment of the in-combination effects with other relevant proposals. Without the inclusion of mitigation measures the assessment concludes that the proposal will have an adverse effect on the integrity of the SAC and is therefore contrary to the requirements of the Habitats Regulations (2010). A range of mitigating measures have been devised and are incorporated into the design philosophy, the features of the design and the working methods proposed. Following inclusion of mitigating measures the report concludes that the proposal will not adversely affect the integrity of the Tweed

Catchment Rivers SAC and is not contrary to the provisions of the Habitats Regulations. Northumberland County Council proposes to employ an Ecological Clerk of Works ECoW to oversee mitigation measures and works on site to ensure compliance with the details of the method statement proposed.

Econorth have wide experience of study and knowledge of the College Burn environment and been extensively involved in determining appropriate measures and mitigation for the construction of the proposals. Mitigation includes for the timing of the works to avoid the principle migratory fish runs, filtration of pumped water to remove suspended solids before returning it to the waterway, and chemical treatment of concrete contaminated water again before returning it to the river, and the use of ecological Clerk of Works. The Method Statement and associated sketches for construction of the scheme are enclosed in the Application as Ref 6 and 7.

During the pre-application process it was highlighted that a flood risk assessment is required to ascertain that the risk of fluvial or localised flood risk issues are not increased. The flood risk assessment is enclosed in the Application as Ref 1.

The development's positive impacts on the park's special qualities/public enjoyment of these/setting of historical assets/natural resources/transport network.

It is considered that there are several strongly positive outcomes for the delivery of the proposals.

1. The integrity of the river crossing will be protected and this will ensure that the important Highway connectivity of the Glen Valley is maintained to all communities. This is considered to be in the over whelming public interest and a corner stone of sustaining these communities.
2. The key businesses of farming, tourism and forestry rely on the connectivity that the river crossing provides. Any interruption, albeit temporary or permanent, could have a damaging effect on the viability and therefore sustainability of the communities it serves.
3. It is not anticipated that there will be any temporary restrictions on use of the public Highway during the works or after their completion.
4. During the pre-application process it was understood that the NNPA Access and Recreation Officer stated that in terms of public access, the proposals are a ggood thing amd will protect the public right of way (Kirknewton footpath 7).
5. The stability of the listed structure will be assured and this important heritage asset will be safe guarded. The heritage statement in support of this application is enclosed as Ref 11.
6. The stability of the river corridor environment will be improved allowing fauna and flora to re-generate fully after several large flood events from 2008 to 2012.
7. The flood defence bund upstream of the bridge will be improved so that 1 in 200 year floods events (including an allowance for climate change) will not breech the defences. This will offer a significant assurance to the Kirknewton community who are aware that the flooding of 1947/48 occurred from the same location. The conservation area of Kirknewton village will also benefit for the same reasons.
8. The stability of the river alignment will lessen the potential for meandering and deposition of gravel/cobble shoals that can block the available waterway through the bridge arches. This improves resilience against flooding of Kirknewton and the surrounding housing. Also, the valuable adjacent farming land, managed under a Higher

Level Stewardship scheme, will benefit from the assurance of long term protection from the enhanced flood defences.

9. The flood defences to the RH bank downstream of the bridge in private ownership will benefit from the reduction in scour effects due to lesser water velocities and bed shear forces during flood events.
10. Hard engineering techniques are proposed where no other lesser options would be resilient in locations of high bed shear and scour risk, However, soft engineering is proposed in other locations and is considered appropriate for the landscape setting.

The design team has extensive knowledge and experience of preparing and constructing measures to protect public infrastructure in spate rivers of north Northumberland that have high ecological value. These qualities are invaluable in understanding the constraints of the site and proposing method statements that have effective mitigation but also allow for development of designs that are resilient and appropriate to an aggressive environment.

Any cumulative impact with other built development

There are no other known developments in the river environment therefore cumulative impacts have not been considered.

The extent to which design and siting respects the landscape character

To a great extent the design and siting of the development has been governed by practical construction considerations and what can be delivered in a safe manner by the workforce. However, some aspects have been designed to be sympathetic to the landscape:

1. The concrete apron detail will have embedded cobbles that will mirror the size and character of the adjacent river bed material.
2. All the works to maintain the alignment of the river will use timber soft engineering rather than other harder material such as steel sheet piles and concrete.
3. Following the emergency works of 2012 the river corridor is recovering well with extensive growth from natural regeneration. It is proposed to allow this to continue after the proposed works are complete.
4. Similarly, for the flood bund embankment that is to have the crest heightened, it is proposed to allow natural regeneration or for the farmer to carry out replanting under the terms of the Higher Level Stewardship currently in force.