# EIA Quality Mark Case Study

## A487 New Dyfi Bridge

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<th>Key Issues:</th>
<th>Purpose of the project:</th>
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<td>The Afon Dyfi is subject to frequent flooding which inundates the A487 trunk road between Dyfi Bridge and the railway line just north of Machynlleth. As a result, the A487 trunk road in this section, is closed frequently, severing the local communities either side of the river. Further closures result from accidents on Dyfi Bridge and associated bridge repairs. During bridge closures, trunk road traffic is required to take a diversion of up to 30 miles. Dyfi Bridge is a 19th century five span masonry arch structure, constructed in 1805. There are restrictions on altering the bridge as the bridge is Grade II* listed and a Scheduled Monument. The Scheme passes through the predominantly rural landscape of the Dyfi Valley and lies partly within the Snowdonia National Park, the boundary of which extends south of the river encompassing part of the valley floor. The Scheme also lies within the UNESCO Dyfi Biosphere Reserve, an area of terrestrial and coastal/marine ecosystems which is internationally recognized within the framework of UNESCO’s Man and the Biosphere Programme. The scheme crosses the flood plain and it was critical to ensure the design and future construction did not significantly affect the existing flooding.</td>
<td>The A487 Fishguard to Bangor Trunk Road is the principal strategic south to north route along the west coast of Wales. The trunk road north of Machynlleth crosses the River Dyfi on the Dyfi Bridge and has been subject to increased traffic flows and repeated flooding. The nature of Dyfi Bridge causes a hazardous situation for all users. It has a poor alignment and visibility, no footways and a poor junction at the northern end all of which results in traffic collisions and bridge strikes.</td>
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<th>Description of the project:</th>
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<td>The A487 New Dyfi Bridge is for the provision of a new 1.2km section of Trunk Road to the north of Machynlleth. The scheme consists of a new viaduct structure across the floodplain and a river bridge to cross the River Dyfi approximately 480m upstream of the existing Dyfi Bridge. The scheme includes a new 725m long viaduct and river bridge across the River Dyfi and its associated floodplain. The scheme comprises a new section of single carriageway road, with a typical overall width of 14.3m. The existing A487 will be de-trunked between the two ends of the scheme, with the existing Dyfi Bridge being restricted to walkers, cyclists and horse-riders only.</td>
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EIA Learning Outcomes

Lessons learnt:

Early Contractor Involvement: By having the contractor onboard early, a detailed construction method could be put together to minimise works in the floodplain. To do this, the intention is to construct the majority of the viaduct in sections, on a 20m wide temporary platform/embankment and ‘push launch’ it across the floodplain. Push launching will involve construction using the ‘incremental launching method’ (ILM). This ILM is considered the most economical and safe procedure for constructing bridges and has been proposed for the viaduct as it offers significant advantages in this location.

Construction Hydraulic Modelling: Although unlikely, it is possible that an extreme flood event will occur at Machynlleth during the construction phase of the bridge development. Therefore, the temporary works had to be incorporated into the hydraulic model to ensure that the scheme can remain compliant even during the construction phase.

Lessons learnt continued:

Engagement with Natural Resources Wales (NRW) on the Flood Consequences Assessment: Detailed hydraulic modelling of the River Dyfi was carried out to inform the Flood Consequences Assessment (FCA). The FCA addressed the key flood risk issues associated with the scheme.

Prior to the commencement of modelling, liaison with NRW established the required scope and extent of additional river channel and topographic survey data required. Hydrological inputs were also discussed and estimated peak flow inputs agreed.

To establish a baseline model and provide a level of confidence in the model outputs, the extended model was submitted to NRW for a pre-application technical review. Following some initial comments from the Flood Risk Analysis team, further amendments were made to the model, and this was subsequently resubmitted to and accepted by NRW as appropriate for use to inform the design phase of the bridge.

The design phase has used an iterative approach to derive a scheme that ensures that the new crossing can remain compliant with all relevant guidance and legislation. This has involved consultation with NRW throughout to seek agreement on the appropriate type and scope of the assessment of the hydraulic regime, and the parameters to apply in judging the acceptability of the results for the investigations undertaken.

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