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CYMRU

# Design Review Report

Dyfi Bridge, Machynlleth

**DCFW Ref: 92**

Meeting of 14<sup>th</sup> January 2016



## Declarations of Interest

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Panel members, observers and other relevant parties are required to declare **in advance** any interests they may have in relation to the Design Review Agenda items. Any such declarations are recorded here and in DCFW's central records.

### Review Status

Meeting date	<b>PUBLIC</b> 14 <sup>th</sup> January 2016
Issue date	26 <sup>th</sup> January 2016
Scheme location	Near Machynlleth
Scheme description	Highways/new viaduct
Scheme reference number	92
Planning status	Pre-application

## Declarations of Interest

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DCFW panellist, Andrew Linfoot works for CH2M, who are consultants on this scheme, but he is not directly involved in the project. All present confirmed they were content to proceed with Andrew in the room.

## Consultations to Date

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A public exhibition was held in Machynlleth in October 2015.

## The Proposals

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The proposed scheme is a new viaduct structure crossing the River Dyfi approximately 480m upstream of the existing bridge. The proposed structure starts at a T-junction on the A487 to the north of the river before crossing the flood plain on piers and connecting via a short embankment to the A487. The main purpose of the scheme is to improve the reliability of the A487 corridor and reduce delays associated with flooding and maintenance of the existing bridge. The stretch of the existing A487 would be de-trunked and retained for non-motorised users and farm access.

The location of the proposed scheme is in particularly sensitive landscape, sitting partly within the Snowdonia National Park. A Landscape and Visual Impact Assessment (LVIA) is being undertaken and a landscape design strategy being developed.

## Main Points in Detail

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This review was well timed to take place at an early stage in the project where there is scope for design review to contribute to the scheme as the design process progresses. The following points summarise key issues from the review and should be considered to inform work on this important scheme ahead of further review and publishing of draft orders:

### **Special landscape – special response**

The presenting team gave a clear and convincing explanation of the need for the scheme and the sensitive nature of the landscape context. This special landscape demands excellent design quality to deliver an equally special solution. The Design Commission for Wales believes that well-designed infrastructure projects can and should be valuable additions to the landscape. This approach minimises the need for 'mitigation' which alone does not lead to good design.

### **'Motto': Light-touch, simple and elegant**

During the review meeting, the design team stated that their aim was for the scheme to be light-touch, simple and elegant. The Commission suggests that this becomes a motto for the whole project and that all aspects of the design process; engineering, landscape design, detailing, value engineering, construction and maintenance strategy, are tested against the motto.

Whilst simplicity can be economical in terms of construction and maintenance efficiency, it requires sufficient time and resources to be invested in the design process, both at strategy and detail design stages. Many iterations may be required to refine the design to achieve the most simple and elegant solution possible. However, given the expected life-span of the proposed viaduct, investment in good quality design will pay off in the long term. In order to achieve elegance and simplicity much of the work may be 'hidden'.

### **Landscape Design**

It is encouraging that the landscape design is already being considered at this early stage and that the landscape architect appears to be working collaboratively with the rest of the team. This should enable an integrated landscape strategy to be developed which upholds the project motto.

The outcomes of the Landscape and Visual Impact Assessment (LVIA) will be important given the sensitive location of the scheme. The LVIA findings should be used to inform the landscape strategy and other design decisions without losing the creative input of the landscape designer.

A simple, elegant structure would reduce or avoid the need for 'mitigation' planting. It may even be beneficial to remove or leave out some planting to allow better appreciation of the new structure by maximising views to or from it.

Consideration should be given to maximising the possibility for vegetation to grow successfully underneath the structure where light and rainfall will be reduced. The detail of the maintenance track should also be thought about carefully so that it does not detract from the beauty of the landscape or the proposed structure.

The panel welcomed the project team's reassurance that road lighting would not be required on the bridge or at the new junctions. The project team are currently exploring whether any lighting to assist bat routes will be required.

### **Geometry and detail design**

The team explained that different form and location options for the viaduct had been considered and that the straight option was preferred for reasons relating to health and

safety, construction method and programme, impact on flood plain, economy and driving experience. It could be argued that the straight option fits with the aim for simplicity.

The number of piers has been minimised, which helps the scheme achieve a light touch approach. However, the two solid leaf piers at the north end of the structure contradict this ambition and require further consideration.

A series of cross-section drawings would be useful to show the relationship of the structure with ground levels. The project team stated that piers would be cast directly onto piles, without pile caps. This should minimise the risk of any substructure appearing above ground level but the final design should ensure that foundations cannot be seen, with landscape surfaces running continuously up to the face of piers and abutments.

The detail design and refinement of this scheme will be most important, and it is good that the team are talking about the detail at this early stage. The detail design should reinforce the project motto. As work on the scheme progresses, better drawings will be required to properly understand and resolve the details to achieve elegance. All junctions between different materials and elements of the structure should be given careful consideration.

Details of the safety barriers, how these terminate, the transition between different types and their relationship to other parts of the structure will make a difference to the quality of the scheme.

The geometry and details of the abutments and piers will be especially crucial to the overall success of the scheme.

The north abutment, where a cattle route needs to be incorporated, is one of the more complex parts of the scheme and will require effort to resolve and refine to achieve a simple, elegant solution. At both abutments, the panel strongly encouraged maximising the use of landscape surfaces and minimising the visible extent of concrete surfaces.

### **Pier design**

The proposal presented at his review showed paired concrete piers with curved outer faces and square inside faces. Although noted as being informed by potential flood water flow, this proposed shape has the potential to seem a bit arbitrary. The water flow calculations currently being undertaken could inform the pier shape to provide a logical and elegant solution.

However, given the project motto, it would also make sense to minimise the apparent bulk of the piers so that they seem as light-weight and elegant as possible. This may lead to a simple cylindrical form. Assessment of pier design options should take into account views beneath the structure, daylight and the flood modelling.

The proposed leaf piers at the north end of the structure are particularly intrusive and contradict the aim for elegance and light-touch. This is a response to the additional beams needed for the longer spans. Given that pedestrian and cyclists will experience this part of the scheme close up, it is especially important that the most elegant solution is found.

It would be ideal to have a consistent run of paired piers throughout the structure. There are options to be tested and a steel crosshead beam within the depth of the steel beams could maintain a visual simple and elegant appearance.

### **User experience**

It is important that the experiences of walkers and cyclists in the surrounding area, as well as the experience of drivers, are considered. In particular, the national cycle route, which will pass under the new structure alongside the river, requires careful design.

Views to and from the proposed structure should be carefully considered in the planting and landscape design.

### **Existing routes**

The treatment of the existing road once it is closed off will be important; what works will be needed for 'de-trunking'? For example, are there concrete kerbs that should be removed to create soft verges? This work should include careful consideration of how the old bridge will be used. The manner in which the route is closed off, the surface treatment and opportunities to enhance people's experience of the landscape and new structure should all be considered. It should not look like a leftover road but should become an integrated part of the rural landscape.

### **Sophisticated creative input**

A level of creative and sophisticated integrated landscape/creative-input is currently missing, but could add significant value to the scheme.

The team stated that a 'gateway feature' would be installed to signify the boundary of the National Park. If the design and placement of this is an afterthought, it could unnecessarily clutter the landscape and detract from the elegant simplicity of the new structure. However, if a serious and talented landscape artist was appointed to the team, they could work with the landscape architect to consider the whole project, including the old bridge, existing structures and historic routes in a sophisticated way. Few creative practitioners have the kind of experience and track record appropriate to this kind of project however there are a very few, of international reputation, who might be researched by the team, with a view to achieving specialist, unique input which would add lasting value and interest.

### **Further Review**

The Design Commission would welcome the opportunity for further review of this important scheme, it is suggested that the next review focuses on the detail design of the structure and landscape. It would be useful if the Design Commission's comments, as set out in this report, were shared with relevant people at statutory bodies including NRW, who would be welcome to attend further reviews.

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***A Welsh language copy of this report is available upon request.***

## Attendees

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Agent/Client/Developer:	Peris Jones, Welsh Government Julian Davies, Alun Griffiths (Contractors) Ltd Richard Bruton, Alun Griffiths (Contractors) Ltd David Rowlands, Alun Griffiths (Contractors) Ltd
Architect/Planning Consultant:	Chris Furneaux, Arup Ben Oakham, Arup Darren Jones, Arup
Design Review Panel:	
Chair	Alan Francis
Lead Panellist	Ewan Jones Andrew Linfoot Mike Gwyther-Jones Amanda Spence, Design Advisor, DCFW Carole-Anne Davies, CE, DCFW
Observing:	James Healey, Welsh Government