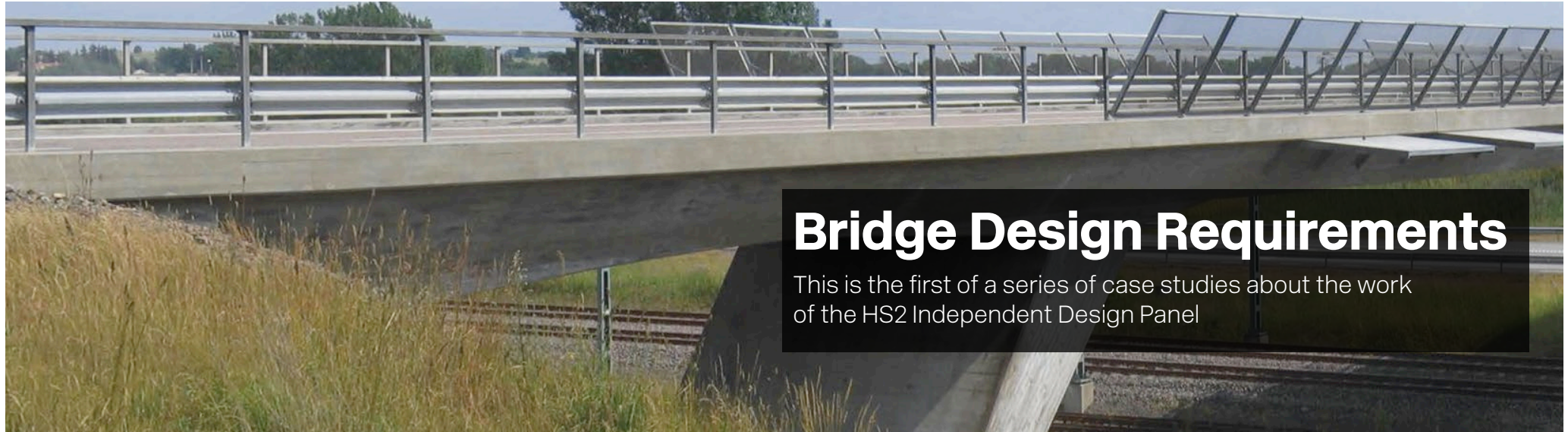


Case Study #1

Bridge Design
Requirements

HS2 INDEPENDENT
DESIGN PANEL



Bridge Design Requirements

This is the first of a series of case studies about the work of the HS2 Independent Design Panel

Bridge Design Requirements is one of a suite of design guidance documents being prepared by HS2 Ltd, which are vital as a mechanism to uphold the Design Vision as well as inspire design excellence. It provides the framework for the design of all bridges, setting out both guidance and requirements, and will be used by bridge design teams. It will also be used as the basis for assessing designs by HS2 Ltd.

Three review meetings were held by the HS2 Independent Design Panel in May 2015, October 2015 and February 2016. Over the nine months of panel involvement the document went from initial draft to being at the final draft stage in February 2016. Since then

Bridge Design Requirements has become a Technical Standard and is mandatory. It is part of the suite of documents issued for tender and the awarded contractor has to comply with it (or a subsequent revision).

Process: there are a number of ways that the Independent Design Panel provides support, from a full review to individual mentoring. In this case each meeting was made up of a small group of two or three panel members and the chair who reviewed the document. The consultants and HS2 Ltd were also at the meeting. Following a presentation by consultants there was a discussion with the panel.

Project headlines

- One of a suite of design guidance documents
- Provides the framework for the design of all bridges
- Panel comments led to changes in text and approach
- Now a mandatory technical standard

Panel Comments

In general, the panel was positive about the approach of the guidance, and at the last review congratulated HS2 Ltd on a thorough, well presented document. The panel emphasised the strategic importance of the guidance which has a dual purpose: to be used to defend design quality; and to inspire design excellence. It strongly encouraged HS2 Ltd to raise the bar of its aspirations and make them clear. The panel made some points that were focused on fine tuning parts of the document. Most importantly, the panel challenged some of the assumptions being made.

There are three areas where the panel's comments have been particularly helpful to HS2 Ltd and have influenced the final document.

1. Bridge parapets and specimen design

The parapets are one of the most visible parts of the railway line and the panel pointed out that they have the potential to establish or reinforce an HS2 'brand' and identity. Their design is therefore hugely important to the overall impression that the public has of HS2. The panel highlighted an exciting opportunity for innovative solutions to parapet design that will demonstrate HS2 Ltd's aspiration to look to the future and set new standards.

One idea suggested by the panel was that the parapets could be transparent. People naturally want to see through parapets to what is across and below. Although no solution is currently on the market, the challenge from the panel was to explore that option rather than preclude it.

The panel encouraged HS2 Ltd to create a specimen design for parapets that would be an illustrative solution to provide a design quality benchmark. To achieve this the panel encouraged HS2 Ltd to procure parapet design separately. This is now being taken forward.

2. Design teams

The comments of the panel were not confined to the design of the structures but also focused on the design process. They felt that the success of HS2 bridge designs would be dependent on an interdisciplinary approach, and that teams should include an architect, engineer and landscape architect to help achieve a well integrated design. HS2 Ltd was already taking that approach but the panel's recommendations helped them improve the wording of the guidance to make it more explicit.

3. Off-site production

A challenge for HS2 Ltd is to be cost effective as well as innovative. Choosing off-site production is a way to manage costs but the panel was eager to point to the important distinction between off-site production and standardisation, saying that the two terms are not inter-changeable.

The panel felt that within off-site production there was considerable scope to develop customised and bespoke designs, responding to specific site locations. It suggested that HS2 specifications and procurement processes for off-site production should be designed to achieve this. This led HS2 Ltd to change the wording of the guidance to give a stronger message about design quality and the scope for bespoke design solutions.