

Editorial

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On a personal note, I see myself as extremely fortunate to have worked on the Queensferry Crossing (Scotland, UK) from the time when it existed in embryonic form in the minds of engineers and planners to a landmark presence in steel and concrete, or as an American colleague on the project put it ‘from soup to nuts’. I am undoubtedly biased, but the structure is a fitting addition to an already stunning bridge-scape. State-of-the-art bridge design and construction from three centuries set adjacent to each other. It is thus gratifying to see these sentiments reflected in the Foreword by the First Minister of Scotland, writing ‘this magnificent achievement’ and ‘cemented its place in people’s hearts’ (Sturgeon, 2019). I am very proud of having played a part in this project and echo the sentiment of the First Minister that more than 15 000 people who contributed to the building of the project should be equally proud. Collaboration across skills, roles and responsibilities is fundamental to our business and we are hugely reliant on every cog of the machine to deliver projects of this scale and complexity.

It is for these reasons and along with the importance of the project in Scottish infrastructure – ‘Scotland’s largest project in a generation’ – that the Queensferry Crossing merits its own themed issue in *Bridge Engineering*. This journal takes the reader through from initial feasibility to opening to traffic, allowing insight into the decisions taken to promote the project, the development of scheme and concept all the way through to design, construction and operation. Something for everyone – or at least for everyone with an interest in bridges.

Additionally, innovation and engineering need to go hand-in-glove together and it is hoped that this could be seen as integral to many parts of the creation of the crossing. For example, the sustainable use of the existing bridge that resulted in critical savings to the cost of the new bridge; the overlapping stay arrangement bringing both elegance and structural efficiency; design that ensured the stability of the world’s longest free cantilever; and a single-plane deck erection gantry perched between the central cable planes. All of these and more described within are bespoke solutions developed for the Queensferry Crossing, but I confidently predict that they will

see re-use in future schemes. Again, it is hoped that bringing these solutions to publication in this journal will promote re-use and further development of the science of bridge engineering.

To complete the circle, we should acknowledge that design of the main caisson foundations of the flanking towers and pier S1 have some small part drawn from the 1882 caisson construction of the Forth Bridge, even if large parts of the technology and methodology have changed beyond recognition. Delivering complete 32 m dia. steel caissons across the North Sea and floating them off a semi-submersible barge, with inspection and final cleaning being carried out by divers would have been considered science fiction back then.

A little-known fact is that the project played host to Scotland’s two biggest bridges under construction; the Queensferry Crossing and the Ferrytoll viaduct – a major structure and challenge in its own right, with a 120 m long abutment and some elements governed by seismic loading.

It should also not be forgotten that the new crossing was required as a replacement for the Forth Road Bridge because of the condition of the existing main cables. The picture is therefore completed with the description of the measures to ensure the durability, inspectability and maintainability of the Queensferry Crossing. These three drivers are integrated into both design and operation and are supported by a full structural health monitoring system.

Finally, the project brought together people, skills and materials from around the world and it is fitting that the authorship of these papers draws from the spectrum of those involved and is indicative of how the collaboration mentioned above helps builds these projects.

REFERENCE

Sturgeon N (2019) Foreword: The Rt. Hon. Nicola Sturgeon MSP – First Minister of Scotland. *Proceedings of the Institution of Civil Engineers – Bridge Engineering* **172(2)**: 80, <https://doi.org/10.1680/jbren.18.00011>.