

Profile



Martin Knight is one of the UK's leading bridge architects and has spent 20 years working with engineers on what are the most expressive of structures. What has he learned? He tells Jackie Whitelaw.



IMAGE BY MARTIN KNIGHT

Figure 1
Gateshead Millennium Bridge

Bridge architect and Institution Companion Martin Knight can trace his bridge design career back to the Poole Harbour bridge competition of 1997, run by the Highways Agency in England. Coincidentally, this was an event which pretty much introduced the general pool of architects to the notion that their professional skills had a long-term role to play in what had usually been the exclusive domain of engineers.

The winning cable-stayed design was never built; plans for constructing a major road bridge at that time encountered a sudden shift in government policy in favour of rail and it was not until 15 years later that Poole Harbour got a completely different double-basculade "twin sails" crossing.

But it did allow Knight – then working with Michael Hopkins & Partners – entry to a new area, and it is one he has built on most successfully over the past two decades. He has been project architect on the Stirling Prize-winning Gateshead Millennium "Blinking Eye" Bridge (Figure 1), Swansea Sail Bridge and the Royal Ballet School's "Bridge of Aspiration" in London, all with Wilkinson Eyre. And as director of his own practice, Knight Architects, he has

produced the fun and clever Merchant Square lifting footbridge in Paddington, London; the fish hook-shaped bascule of the Lower Hatea River Crossing in New Zealand (Figure 2); and is the client's architectural adviser on the new 2.4km, £600M Mersey Gateway crossing (Figure 3) between Runcorn and Widnes for Halton Borough Council in northwest England.

Knight Architects celebrates its 10th anniversary in April and is widely recognised as the UK's leading specialist bridge architecture practice, with its 16 staff working on crossings around the world.

Knight's own skills are also now being called on by the Independent Design Panel for HS2 – the £50bn high-speed railway to be built between London, Birmingham, Leeds and Manchester. The panel is intended to act as a critical friend to HS2 to make sure it focuses on coherent, quality design for all elements of the project.

Better together

"The competition for Poole raised the profile of bridge design at an architectural level," Knight says. "And then the millennium, with the associated funding for new projects, brought with it so many



Figure 2
Lower Hatea River Crossing in Whangarei, New Zealand

Figure 3
Mersey Gateway



bridge competitions all intended to use infrastructure to express civic and political optimism. The winners were those who had the best ideas but also the best-presented ideas. So architects brought presentation and creative skills to the party, to join with the can-do skills and efficient structures of engineers."

That time, he says, produced a lot of flamboyant structures as a reaction to the years previously when dour, dull bridges heavily driven by economy had been the norm. "One extreme did architects a disservice, the other engineers."

Gateshead Millennium Bridge was, however, a shining example of what both professions working together can achieve. "I had seen the evidence of what could be aspired to on Poole," Knight says.

He had always been interested in engineering thinking and, after acquiring his architectural diploma in 1994, had joined engineer Battle McCarthy for a year. "They never did see the divide between the professions; it was multidisciplinary, inventive, creative and fun."

Poole and Michael Hopkins gave Knight the chance to work with the man he describes as the "king of bridge engineering" – Jörg Schlaich of Schlaich Bergermann & Partners. He saw first hand how a seemingly simple but really fiendishly clever, elegant structure could emerge from collaboration between an engineer and architect both at the top of their game. "Our aim at Hopkins was an understated design and that suited Schlaich, so there was a strong alignment between architectural and engineering principles. It was a lovely expression of engineering and architecture," he says. And even though the design lost out in the competition to a flamboyant cable stay, Knight was hooked on bridges.

He took that experience to Wilkinson Eyre to work on the bridge at Gateshead, armed with a reference from Schlaich. "I rather like that," he says.

Gateshead Millennium Bridge, designed by Gifford with Knight's then new employer, is the world's first and only tilting lift bridge and is a landmark on the River Tyne. Knight worked closely with Gifford engineer Peter Curran and, as he says, the resulting structure "still makes my heart sing".

The obvious solution – though no one had ever thought of it before – was the best solution and a perfect example of great design with a real sense of place earning the accolade iconic rather than setting out to be iconic. The latter, Knight says, is never a great place to start.

Right approach

Knight left Wilkinson Eyre in 2006 to strike out on his own. Mersey Gateway was one of his first commissions. Since then he and his team, as the company has grown, have worked on a series of bridges at Stratford City for the London 2012 Olympics, footbridges for Network Rail, the Hong Kong–Zhuhai–Macau Crossing, and the Kruunusillat bridge in Helsinki. Current projects include bridges on the M4 corridor around Newport, the A14, and the A9 and A82 schemes through a national park in Scotland. The firm is also shortlisted for two bridges in Guangzhou, China, competing with Zaha Hadid.

"A lot of what we do is self-consciously seen to blend in – the 'beautiful ordinary' in our phrase. Structures don't always need to stand out, but they should be designed to look like someone cared about them," he says.

High Speed Two

Martin Knight grew up in – and still lives and works in – the Chilterns, so he has a personal interest in the progress of HS2, which cuts through the local countryside. It makes his role on the Independent Design Panel somewhat personal. "Before the Chiltern Tunnel was lengthened, one of the portals was going to be in a field I walked through to go to school," he says.

"One of the laudable things HS2 has done is to set out a vision to design for a sense of place – recognising the unique features of the

different localities. Where I see the Design Panel really adding value is being a critical friend to HS2, holding them to account and helping them deliver on their ambitions.

"Because I know infrastructure and the Chilterns – and if this railway is going to happen – I want it to be as good as it can be and I want to play a part in that rather than standing around waving a placard.

"I am in favour of infrastructure. It is what we base our future on and it requires long-term vision and short-term stoicism."

PATRICK REYNOLDS

KNIGHT ARCHITECTS

The best piece of writing about sensitive bridge design, Knight claims, is in the then Highways Agency's 1998 *Design Manual for Roads and Bridges*, Volume 1, Section 3, Part 11. To paraphrase, that includes advice on two ways not to design a bridge: route one not to follow is to decide what the bridge should look like and then see how to make it stand up; wrong route two is to decide on the most economic/constructional solution and then try to make it look nice. Light and shade, longevity, how the bridge can be built are all fundamental to the design and in Knight's view that demands the services of both engineer and architect.

Working with engineers on bridges is a very democratic process, he explains. "They are bigger businesses but we all sit round the table together. Each bridge is completely different even though there are very few different types of structure. You boil it down to the basic questions of what the user needs, the loading, the span, what it's spanning, the ground conditions and softer things like ambition for the project – is it an overt statement or should the structure be in the background; fundamentally, who is it for?"

"Part of what we do is to understand engineering so we can participate in the conversation at a reasonable level."

Celebrating bridge design

Planning is the usual entry point for the bridge architect. "Planning always requires that you reveal what something looks like and that is usually when we are asked to intervene."

He has no objection to the current trend towards standardisation

to speed construction and control costs as long as it is done sensitively.

"Standardisation can fit into what we do as long as it is done intelligently. It clearly brings benefits of speed, quality, safety and economy, but I don't think you can apply a standard rule to a unique criterion without intellectually embracing how the structure works in context, as well as how the context informs the structure."

He has seen a few of the worst results of standardisation and has been asked recently to improve some particular horrors. "A contractor's good design because it is lowest risk and least cost can produce some appalling visual results; clients should be careful as what we build must stand the test of time."

Throughout his time working with bridge engineers, Knight has always been pleased at how the two disciplines of architecture and engineering "mind meld". "That's what I like about engineers. They love the creative dialogue, the push and pull of design and it is often the case that they talk about architecture and we talk about engineering and we subconsciously coordinate our thoughts.

"What I'd like to change is to get us invited to the table earlier. And I'd rule out all use of the word 'mitigate'. People sometimes think good design is mitigation, employing phrases like 'not environmentally worse than'.

"You shouldn't use design as a way of working out how to apologise for bridges. We should always celebrate them."

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