

## On the record: with Holger Svensson

Dipl.-Ing., Holger Svensson, PE, CEng, is a professional engineer and former Speaker of the Executive Board of renowned consulting engineers Leonhardt, Andrä und Partner (LAP). Recently, he has published a book, *Schräggabelbrücken – 40 Jahre Erfahrung weltweit*, about stay cable bridge design and construction, based on over four decades of extensive experience of design engineering for major international projects. He now shares a few thoughts and experiences on the Sava Bridge project and cable-stayed structures generally.

Sava is an interesting bridge – its form is that of half a normal cable-stayed bridge, so if you doubled the size you would arrive at a very large bridge indeed. It also has a couple of unique aspects. Firstly, it's the largest cable-stayed bridge with a single tower in Europe and, secondly, the sidespan – which doesn't rest on piers over the water – acts as an exact counterbalance to the main span.

Originally, the bridge was designed completely in steel to reduce the weight, because the sidespans could only be supported from the shore. LAP submitted an alternative proposal for a hybrid bridge with a steel main span and concrete sidespans – the concrete acting as a counterweight for the main span. This was a really competitive alternative, as it delivered a significant cost reduction for the client over the steel option.

The whole project went extremely smoothly and came in on time and on budget. There were sliding forms for tower construction and sidespans constructed using the incremental launching method – which, incidentally, was invented by

LAP in the 1960s. The 45 m sidespans were quite something – involving extremely heavy weights. The 376 m long free cantilevering

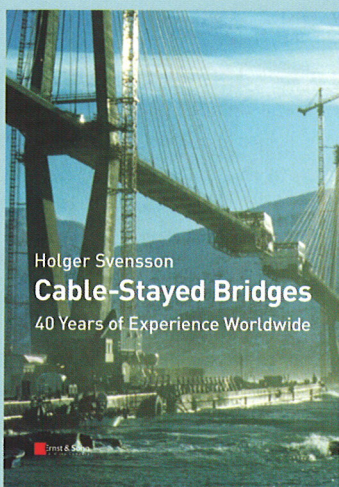


main span was fabricated in Asia, shipped to site, preassembled and installed – not a unique situation, but it went very well indeed. LAP's relationship with BBR began with the cable-stayed Schillersteg footbridge back in 1960. Fritz Leonhardt thought of using BBR tendons for their strength and stiffness and, along with colleagues, developed a system which later became BBR HiAm. This small bridge, with its parallel wire technology, was the forerunner of whole generations of major cable-stayed bridges which followed around the world.

Today, design challenges are largely around realizing longer spans. The trickiest thing with longer spans is cable dynamics. So, we use three types of countermeasures – profiled sleeves to avoid rivulet formation, dampers

and thirdly, we have the option of using cross-ties, although this is preferably to be avoided.

Personally, I believe the casual observer should be able to see the flow of forces, to understand how the structure functions – many cable-stayed bridges do this well. Above all, simplicity – this is a golden rule for creating a successful cable-stayed bridge.



*Schräggabelbrücken-40 Jahre Erfahrung weltweit* by Holger Svensson was published by John Wiley & Sons Limited in 2011, ISBN 3433029776, 9783433029770, 450 pages. The English version will be available in May 2012.