

Featured Project: SPS “Sandwich Plate System” Used on Germany’s Mettlach Bridge



The 1951-vintage suspension bridge crossing the river Saar in Germany at Mettlach needed refurbishing to meet current highway safety standards. The bridge is located in unique “Saarschleife” tourist region and connects the districts of Mettlach and Keuchingen with a double span of 108 m. This is an important traffic connection in the area for which a total closure was not allowed. In the 1950s the

bridge was a pioneer project for light design. It originally received a light steel-concrete composite deck supported by a steel girder and cable structure. Due to wear, corrosion and high traffic, the structural load carrying capacity was reduced. SPS (Sandwich Plate System) was chosen as the best solution to reinstate and upgrade the bridge to current standards.

SPS is a structural steel material that is stronger, more versatile and accurate than concrete. The Sandwich Plate System is a composite material comprised of two metal plates bonded with a polyurethane elastomer core and is 75% lighter than an equivalent-strength concrete deck. SPS transfers shear between each plate and eliminates the need for stiffeners while precluding local faceplate buckling. SPS was originally designed to protect drilling islands in the Arctic Beaufort Sea



from ice floes and has been in use for over 18 years. SPS has since evolved as a product of choice for architects and engineers around the world for a variety of engineering projects.

With nearly 3 million square feet in use, SPS can be found in the mezzanine floors of New York’s historic Carnegie Hall, the terraces of the 2012 London Olympics Aquatics Center, roof structures &

building floors and as a strengthening method for ship hulls and decks. There are many conventional and orthotropic bridge decks in countries around the world that have been improved by SPS

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technology. Some SPS Bridge Deck installations have more than 350 million fatigue cycles without incident.

Eiffel Deutschland Stahlbau (EDS) together with Intelligent Engineering (IE), inventor of SPS along with the support of RWTH Aachen in Germany developed details and designs in accordance with the appropriate Euro Codes and have now applied these designs to build the 3rd SPS bridge in Germany.



SPS is able to replace orthotropic bridge decks with a new design that has enhanced structural performance. SPS is an isotropic plate with damping and vibration insulation characteristics that also reduces traffic noise emission.

By using the SPS deck, the Mettlach bridge weight was reduced from 500 tons down to 200 tons making it possible to increase traffic loads to current standards while relieving stress in the cables. The slim design of SPS is also only a quarter of the depth of the original orthotropic deck. The replacement strategy was developed within a short 4-month construction schedule. Importantly,

there was no full closure as one full traffic lane was maintained. Construction phases for both lanes separately began in November, 2012 and were successfully completed in February, 2013.

For more information on SPS, please see www.ie-sps.com or contact Kay Jimison at jimison@ie-sps.com.