



Bridges

Reference Details:

Owner Federal Republic of Germany, represented by DEGES (Deutsche Einheit Fernstraßenplanungs- und -bau GmbH), Berlin, Germany +++ **Main Contractor** Max Bögl GmbH & Co. KG, Neumarkt, Germany +++ **Design Büro** Keipke, Rostock, Germany +++ **Structural Design** Schüssler Plan Ing. GmbH, Berlin, Germany +++ **Structural Analysis** Schmitt Stumpf Frühauf und Partner, Munich, Germany

DSI Unit SUSPA-DSI GmbH, Germany
DSI Services Supply and installation of 150 t or 3,360 m stay cables including 64 DYNA Grip® Anchorages DG-P 37.

**DYNA Grip® Stay Cables for new Ziegelgraben Bridge****Ziegelgraben Bridge, 2nd Strelasund Crossing, Stralsund - Rügen Island, Germany**

At present, the only road connection from the mainland to the island of Rügen is a two-lane road built on top of the Rügen dam, crossing the "Ziegelgraben". The road includes a bascule bridge that opens several times a day. As a consequence, particularly in the summer months and on weekends, opening of the bridge causes traffic jams sometimes lasting several hours. This situation hinders the development of tourism on Rügen island as well as in the entire economic area.

The second Strelasund Crossing as part of the A20 "Baltic Sea" expressway to the city of Bergen will finally eliminate this bottleneck. This project is characterized by a particular complexity, since in addition to planning and legal conditions, special environmental and peripheral requirements must be taken into account. The entirety of these marginal conditions defined the engineering scope of work, in particular for the key structure, the clear span crossing of the "Ziegelgraben" with a navigation clearance of 42 m and a span length of about 200 m.

The multi-stage preliminary planning for the 4,100 m long section including the feasibility study, the road order and the design was managed by DEGES and the federal state of Mecklenburg-Vorpommern on behalf of the national government. Remarkable from an engineering point of view, this 2, 830 m long structure is one of the longest road bridges in Germany. Most of its length is across the Baltic Sea but some crosses densely populated terrain.

Preliminary designs were prepared for alternative construction methods including arched, continuous girder and pylon bridges with span lengths from 150 m and evaluated according to technical, functional and economical criteria. The various bridges designs were examined with regard to their effect on the urban environment at the given location using visualizations - an indispensable planning aid in such cases. Subsequently the chosen bridge configuration was ultimately optimized to include a pylon and the entire structure designed.

The stay cable bridge across the "Ziegelgraben" has a main span of 198 m and a total length of 583 m. The 16 m wide steel superstructure is supported from the 128 m high tower by two planes of stay cables arranged in the shape of a harp. Originally, locked coil cables were planned and tendered. For its tender SUSPA-DSI took advantage of the explicit approval of supplementary tenders featuring strand bundles. The stay cables consist of bundles of 34 high-grade, multiple corrosion protected individual prestressing strands bundled into an Ø 180 mm HDPE sheathing.

For their anchorage DYNA Grip® Anchorages type DG-P 37 were used. This anchorage procedure allows inspection of each individual strand in the future. In addition, it is possible - if required - to replace individual strands without compromising the entire stay cable. The DYNA Grip® Anchorages successfully meet the suitability and quality tests accurately described in the catalog of requirements in accordance with the new fib guidelines and comply with the most demanding quality assurance requirements.

After a construction period of only 3 years the new Rügen bridge will be opened to traffic in summer 2007.

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