

Highway Bridge BW 91, Germany

Project Description:

The highway-bridge BW91 is part of the highway A2 between Hannover and Berlin, Germany. The bridge crosses the Mittellandkanal near Braunschweig. It was opened in 2003 as a three-lane-bridge.



BW91 near Braunschweig, Germany

Quick Facts:

- **Name and Location:** BW91 (highway-bridge) near Braunschweig, Germany
- **Owner:** Bundesrepublik Deutschland
- **Structure category:** composite bridge
- **Spans:** 1 span: 56,26m
- **Structural system:** Steel box girder with deck as an composite construction
- **Start of SHM:** January 2003
- **Number of sensors installed:** 15
- **Instrumentation design by:** University of Technology CAROLO WILHELMINA at Braunschweig, Institute of Steel Structures, Braunschweig, Germany

Description of Structure:

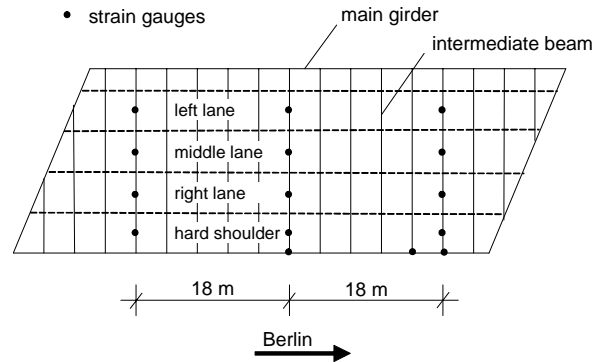
The superstructure comprises of two steel box girders and a deck as an composite construction. The intermediate beams of the composite construction have a spacing of 3.60 m, the width of the bridge is 20 m. There are two units of this bridge, one for each direction.

Purpose of Inspection:

Due to the central position of the bridge BW91 the validity area of the measured weights of the vehicles and their distribution in the flow of traffic covers a large number of other bridges of the Highway A2. Beside this, the measurements are carried out to obtain the strains at critical details. The measurements are carried out within the collaborative research center SFB 477 'Life Cycle Assessment of Structures via Innovative Monitoring' (www.sfb477.tu-braunschweig.de).

Sensor Details:

Type of sensors	Number	Location
Strain gauges	15	at 3 intermediate beams (spacing: 18 m) underneath each lane including the hard shoulder



Measurement Equipment and Data Management:

Type of system	Data Management	CMS
PC based measurement system	<ul style="list-style-type: none"> data pre-analysis (statistics) on site main analysis, graphical presentation and documentation in office long term data base due to permanent monitoring 	

Data Analysis Procedures:

Type of analysis	Software	Additional features
WIM, statistics, rain flow analysis, changes in traffic density	Self made software	▪

Example of Outcome:

The calibration of the sensors was carried out by use of a 30 t truck. According to the specification of the COST 323 - Project the measuring system has an accuracy class of D+(20).

Benefits of using SHM Technologies in the Project:

Due to permanent monitoring long-term changes in the flow of traffic can be observed.

References:

Peil, U., Frenz, M.: Lebensdauervorhersage von ermüdungsbeanspruchten Bauwerken durch Monitoring und begleitende Versuche
Arbeitsbericht 2000-2003 des SFB 477, Beitrag TP B3, Schriftenreihe des SFB 477, 2003, S. 37-60 (in German)

Submitted by:

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