



## Rehabilitation of Illerkanal Viaduct at Kirchdorf – A Steel Composite and Precast Concrete Structure

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### Summary

Illerkanal Viaduct is located in Baden-Württemberg, Germany. The bridge on the A7 motorway connecting Ulm and Füssen crosses the Iller canal and two rural roads north of Memmingen at Kirchdorf. The Iller canal feeds a hydroelectric power plant and could thus be closed only temporarily to demolish the existing superstructure while the substructures were reused to conserve resources. Due to the local and geographical situation, a steel composite deck was used to cross the Iller canal forming the main span while precast concrete deck was used for the end spans.

The relatively long center span was designed as a twin composite box girder, making it a relatively light structure. To balance out the center span and avoid bearing lift-off at the abutments the end spans were designed as double T-beams in precast concrete.

The basic idea for this arrangement was to move the point of zero moments towards the coupling joint of composite and precast concrete structure, i.e. the composite section is connected directly with a concrete cantilever thus is not supported directly by piers. In order to optimize steel plate thickness, post-tension was varied, thus the points of zero moments could be moved further towards the middle of the bridge.

This rarely used construction is a very innovative solution crossing a large span while having a solution for the resulting technical challenges.

**Keywords:** pre-stressed concrete, composite-steel, deconstruction, strengthening, optimizing composite-steel cross-section

### 1. Introduction

The Illerkanal Viaduct is located on the A7 motorway that connects the cities of Ulm and Füssen (Fig. 1). It crosses the Iller canal and two rural roads north of Memmingen at Kirchdorf. The deck is skewed at an angle of 32.8 gon though the bearing axes are arranged perpendicularly to the deck. The maximum height above the canal is 4.70 m. This Iller crossing is administered by the Tübingen Regional Council.

The local situation is somewhat complicated by a local road linking Kirchdorf and Fellheim also crossing the Iller canal at the nearly same location and passing over the motorway bridge.



Fig. 1: Illerkanal Viaduct (bridge below) after rehabilitation