The longest swing bridge in Europe is now in operation. In September 2009, ISC Consulting Engineers A/S won the international design competition for a 900 m long bridge connection, a part of the new circular road around Odense City—comprising a bridge crossing the 80 m wide Odense navigation canal and on the western side of the canal an approximately 540 m approach bridge and dam joining the main circular road.

The key part of this connection is the 194 m long swing bridge. The main structure is designed in steel as a twin box girder bridge with orthotropic steel deck with a 3 m clearance between the box girders. The center span of the bridge is 120 m and the side spans are 37 m each. The bridge carries two lanes in each direction as well as pedestrian and bicycle paths of 4 meters width. The bridge has been designed for 100 year lifetime. The two main supports for the swing parts are pulled back from the embankment, ensuring that no parts of the bridge would be located outside the shores of the navigation canal in the open condition. The main concrete supports carrying the permanent bearings and the bearings for rotation have a diameter of 12.0 m.

The superstructure is a monoplane triangular shaped support structure with top level 20 meters above the road surface. The bearing system for the bridge is a new invention, based on sliding bearings for rotation of the bridge. 2 permanent bearings supports the swing section in service and 2 other bearings are jacked up under the bridge to secure stability during rotation. To reduce vertical load on the sliding bearing during rotation a vertical central column provides a 1000 ton jackup vertical load. The swing bridge consists of two equal rotating parts which in the closed position are linked to the end abutments with hydraulic operated shear bearings. In the center of the bridge shear bars are provided as well. The design started in September 2009. Construction started in beginning of 2011 and the bridge was inaugurated June 15th 2014. The total cost is US$ 60 mio. The Bridge has been awarded the Danish IABSE Award for outstanding structure 2013. The total cost of the 900 m long bridge was approximately 50 million.

Odins Bridge

The bearing system for the bridge is a new invention, based on sliding bearings for rotation.

FACTS

Project owner: Odense Kommune
Engineer: ISC Consulting Engineers A/S
Architect: Bystrup Architecture
Steelwork Contractor: MTHøjgaard
Location: Odense, Denmark
Completion date: 15.06.2014
Dimensions: 200 m x 26 m
Tonnage: 5000 ton
Structural concept: Swing bridge