

ORESUND IMMERSED TUBE TUNNEL - DENMARK TO SWEDEN



Arial view Oresund cast & launch facility in Copenhagen - Launching of 2 completed tunnel elements

SERVICES PERFORMED BY R. BITTNER

Supervision of Tender Process as Tunnel Bid Manager:

- ◆ Developed construction concepts for immersed tunnel cast and launch factory

Project Engineer Design Manager for JV:

- ◆ Developed detail design of tunnel cast and launch factory including launch basin concept and gates

PROJECT INFORMATION

Year of Completion: 2000

Design & Construction Cost: \$745M

Contractor: Oresund Tunnel Contractors JV

Client & Owner: Orsundskonsortiet

The 16 km long Oresund Fixed Link connects Copenhagen, Denmark and Malmo, Sweden. Its component parts include a 4.05 km long immersed tube tunnel, a 4.055 km long artificial island, and a 7.854 km long bridge. The total crossing was designed to accommodate 4 standard highway lanes, two high speed rail tracks and an emergency escape. The immersed portion of the tunnel has 20 tunnel elements that are each 176 m long. Each tunnel element is comprised of 8 tunnel segments of 22 m in length.

The tunnel segments were cast above sea-level using the full section casting technique to minimize the risk of thermal cracking. The method of casting the tunnel segments was similar to launch-casting of bridges where each full section of the bridge is cast on a fixed bed and then pushed off the bed after 24 hours of curing. For Oresund Tunnel, this cast and push cycle was repeated eight times to produce one tunnel element 176 m long weighing 55,000 Tonnes. Following the completion of casting the eight segments, the completed tunnel elements were skid-

ded into an outfitting station for the installation of temporary post-tensioning, ballast tanks and end bulkheads to allow floatation. After the outfitting was completed, a sliding entrance gate was closed and floating exit gate was towed into position to create a closed basin that could be flooded to allow lift-off of the completed tunnel elements. Once the elements were towed over a deeper area of the launch basin, the basin was drained back down to sea level and the floating exit gate was opened to allow tow out of the completed tunnel elements.



Casting of full-section by 22 m long tunnel segment in Oresund production factory



Tow out of completed 176 m long completed tunnel element from casting yard



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