

Zeitschrift: IABSE reports = Rapports AIPC = IVBH Berichte
Band: 82 (1999)

Artikel: Detailed design of the cable stayed bridge for the Øresund link
Autor: Hauge, Lars / Petersen, Anton
DOI: <https://doi.org/10.5169/seals-62108>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 03.04.2026

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>



Detailed Design of the Cable Stayed Bridge for the Öresund Link

Lars HAUGE

Dept. Head, Major Bridges
COWI
Lyngby, Denmark



Mr. Hauge graduated from the Technical University of Denmark in 1986. Since 1990, he has been employed by COWI, where he at present is head of the department for design of major bridges. Mr Hauge was in charge of the detailed design of the cable-stayed bridge for the Øresund Link

Anton PETERSEN

Dir., Bridges
COWI
Lyngby, Denmark



Mr. Petersen has since his graduation from the Technical University of Denmark in 1974, been employed by COWI. He is currently director for bridges. Mr. Petersen has been the project manager for the detailed design of the Øresund Bridges.

Abstract

The 7.7 km long Øresund bridge is a major part of the Öresund Link between Denmark and Sweden. The most significant element of the entire Link is the cable stayed high bridge spanning the navigation channel. The bridges were tendered on a design-built basis leaving the responsibility for the design with contractor. Sundlink was awarded the contract to built the bridges in 1995 and subcontracted the design to CV Joint Venture, comprising COWI from Denmark and VBB from Sweden. This article describes the detailed design of the High Bridge.

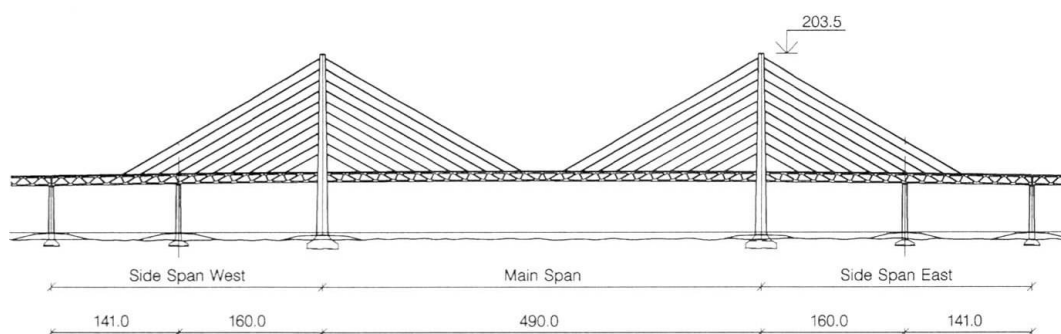


Fig. 1 High level bridge, Elevation

The bridge will carry a four lane motorway with emergency lanes and dual tracks for a high speed railway, and will when completed be the longest cable-stayed bridge for high speed railway. The traffic is arranged in two levels with the roadway on the upper deck and the railway on the lower deck. The rails are laid in ballast over the entire length of the bridge.



1 Pylons

Rising 203.5 m above the sea level, the pylons of the cable-stayed bridge will be the landmark of the entire link. The pylons are designed as clean Hs without an upper cross beam. This resulted in almost 150 m free standing legs in the transverse direction of the bridge alignment, which lead to heavy vertical reinforcement above the cross beams of the legs where the pylon legs are designed to resist an accidental impact load of 8 MN in any direction.

The pylons are founded directly on Copenhagen limestone in level -17 m and level -18.5 for the east and west pylon, respectively. The foundation structures are cellular caissons with a footprint of 35 m x 37 m. The dimensions have been governed by ship collision

One of the key issues in the design has been to keep the dimensions and the weight of the caissons as low as possible because of the size of the available dry-dock facilities and the available draft during tow-out.

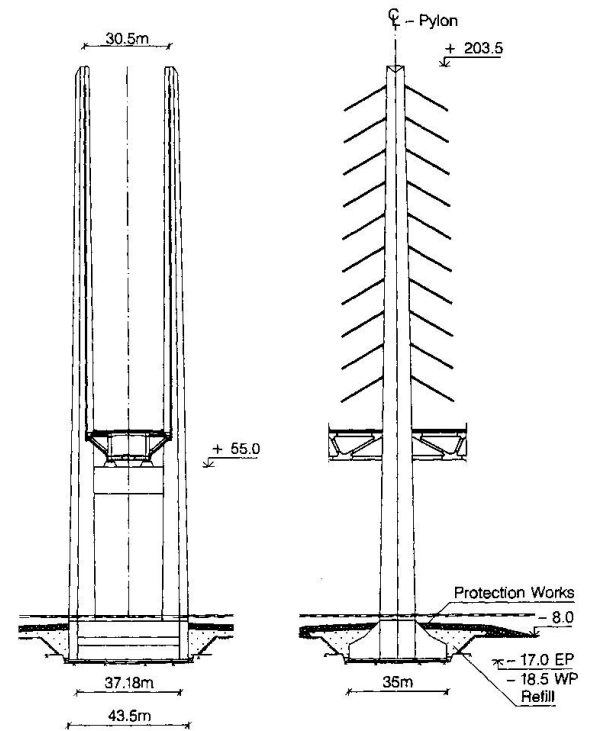


Fig. 2 Pylon, elevation

2 Bridge Girder

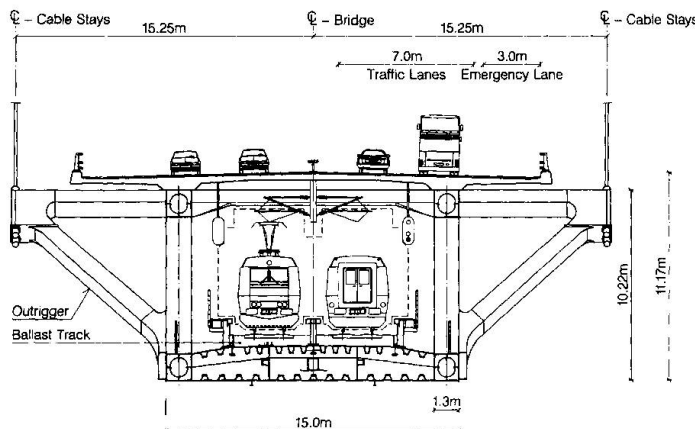


Fig. 3 High Bridge girder, cross section

designed in S355 (EN10113).

3 Cables

The cables (PWS) are arranged in a harp system with all cable stays in parallel. The effects from buffeting, vortex shedding, forced vibrations of the supports and rain/wind induced vibrations have been investigated analytically. The cables are designed with an outer PE-sheeting with helical ribs as a countermeasure for rain/wind induced vibrations.

The bridge girder for the high bridge is arranged as a steel truss girder with an upper transversely post-tensioned concrete roadway deck and a lower deck for the railway, designed as a closed steel box. The inclination of the truss members is arranged with approximately 30° and 60°, respectively. The cables are anchored to the girder on outriggers with the same inclination as for the flat diagonals and the stay cables. Diagonals, chords and the railway deck are in steel grade S420 (EN10113) except for the secondary elements inside the railway deck which are