



Inspection and complete rehabilitation of the Langebro Bridge in Copenhagen with focus on sustainable solutions

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Abstract

Langebro is an iconic bridge across the harbour in central Copenhagen, Denmark. The bridge connects central Copenhagen with the island of Amager.

The bridge consists of different spans, including a steel bascule span and two arch spans over the harbour. Viaduct spans on each side allow road traffic underneath the bridge. The bridge was completed in 1954. The bridge has a total length of 385 meters, a width of 33 meters and carries six road traffic lanes, along with cycle lanes and pedestrian footways. The bridge is a landmark and is protected (cultural heritage).

A complete rehabilitation including strengthening of the entire bridge is currently in progress.

Keywords: Rehabilitation; load capacity assessment; strengthening; concrete repair, brickwork rehabilitation; provision of additional concrete cover; condition assessment; sustainable solutions.

1 Introduction

Over the past decades, most countries have experienced an increase in traffic in terms of volume and weight. In addition, the general condition of many bridges has deteriorated and environmental conditions, including, e.g., the usage of de-icing salts, has caused corrosion of reinforcement and spalling of cover concrete.

For Langebro Bridge a complete rehabilitation is currently in progress. The works were initiated in 2021 and are expected to be completed in 2025.

2 Layout of the bridge

2.1 Details for the Langebro Bridge

Langebro Bridge is a complex structure where some of the areas below the approach spans are utilized for parking and office space, etc. The approach spans are constructed from a beam-slab RC-structure supported on RC columns and walls. The area below the approach spans on the Copenhagen (West) side covers an area of around 4,500 m² and was originally utilized as a parking area. The area below the approach spans on the