



Temburong Bridge, Brunei – Independent Design Check

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Abstract

The new 30 km Cadangan Projek Jambatan Temburong (Temburong Bridge Project) in Brunei will connect the relatively isolated district of Temburong with the more developed Brunei-Muara district. For a project of this significance, an independent category 3 design check has been carried out of the tender design. The check includes structural and geotechnical verification of the 13km long marine viaduct, two cable-stayed bridges across the navigation channels, and three tunnels. The paper describes the objective and process of the independent design check. The checker provides comments to the design drawings and the design basis, and the designer provide replies. The checker has to set up completely independent analysis models. As an example, the finite element models of the pile foundation and the deck of the cable-stayed bridges is presented. For the cable-stayed bridges the construction process and the cable rupture analysis is discussed.

Keywords: Independent design check, category 3, fixed link, marine viaduct, cable stayed bridge, pile foundation, ladder beam deck

1 Introduction

This paper is part of a session, which describes the complex process of planning, designing, checking and executing an international large-scale infrastructure project like the unique Temburong Fixed Link project.

The Temburong Fixed Link is a new dual two-lane highway with a total length of approximately 30km. The link includes 13km long marine viaducts in the Brunei Bay, two cable stayed bridges, three tunnels and short span bridges through the mangroves.

The marine viaducts have typically 50m long spans with precast and pre-stressed concrete box girders. The substructure consists of concrete piers and pile caps. For the foundation spun piles and steel pipe piles are used depending on soil conditions.

The two cable-stayed bridges across the Brunei Channel and Eastern Channel have a main span of 145m and 260m respectively. They have a pre-stressed in-situ concrete ladder beam deck and they are characterized by complex shaped concrete towers (Figure 1).