THE RE-DESIGN OF CABLE STAYED BRIDGE UPPERSTRUCTURE WITH ORTHOTROPIC STEEL BOX GIRDER DECK (CASE STUDY: BUKITTINGGI, NGARAI SIANOK BRIDGE)

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Abstract

The Ngarai Sianok Bridge design in 2013 aimed to solve traffic congestion problems on the Sicincin - Malalak - Balingka road section. The design was conducted according to SK.SNI T-02-2005, SK.SNI T-12-2004, and AASHTO LFRD Bridge Design Specification, Fifth Edition 2010. The initial design resulted a multi span cable stayed type with the length of main span and side span are 170 and 87.5 m respectively, the type of girder used was a concrete box girder with longitudinal steel stringer, single plane cable arrangement on transversal direction, fan type, single tower type, bridge length 680 m, bridge width 24 m, and tower height at ± 170 m. The National Standardization Agency and AASTHO have made updates to several design codes including SK.SNI T-02-2005 to SNI 1725:2016 and AASHTO LFRD Bridge Design Specification, 5th Edition 2010 to AASHTO LFRD Bridge Design Specification, 8th Edition 2017. The selected type of composite deck used is considered heavier compared to steel. There is an option of girders that use steel material, namely Orthotropic Steel Deck. Due to these condition, the authors redesign the superstructure of the Ngarai Sianok bridge. The redesign starts from OSD's girder design, required cable volume analysis and pylon analysis. The result of redesign is that the weight of the superstructure is significantly reduced causing the number of strands in the cable to decrease and the internal forces that occurs in the upperstructure is reduced.

Kata kunci: bridge, cable-stayed, sianok-canyon

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