DESIGN OF MALANGSARI – BANYUWANGI CABLE-STAYED BRIDGE WITH TWO VERTICAL PLANES SYSTEM

Student Name : Hendri
NRP : 3107 100 518
Department : Civil Engineering FTSP-ITS
Academic Supervisor : Dr. Ir. Hidayat Soegihardjo, MS

Abstract

Cable stayed bridge is one of the several long span bridge type. It has some beneficial characteristics compared to other long span bridge type either from technical, economic, and also esthetics factor.

This final project consists Design of Malngsari-Banyuwangi Cable-Stayed Bridge with Two Vertical Planes System which connects south road of Kendeng Lembu and Jember through river of Malangsari, Glenmore, Residence of Banyuwangi, Province of East Java. It has 231 m length divided in two side spans each 48 m and one 135 m middle span, and 11.2 m deck width (2/2UD), crossing cable configuration with two vertical planes system and longitudinal with radial system. Deck are made from composite deck and WF steel profile and also pylons are made from reinforced concrete. While cables and its anchors use VSL 7-wire strand.

This project is assisted by computer program of MIDAS/Civil v7.0.1 to analyse the behavior of the whole structure, SAP 2000 v9.0.2 and HILTI Profis to analyse secondary structure. MIDAS can analyse construction method steps at the same time in one program execution.
Where the result of analysis at service load then compared to the result of analysis at construction load.

The result of this project is the structure dimension of deck, cables, anchors, block anchors, pylons, and also abutment and elastomer support, by using reference code of RSNI T-02-2005, RSNI T-03-2005, Pd T-04-2004-B, Pd T-12-2005-B, BMS '92, and SNI 03-2847-2002. Furthermore, the bridge stability related to wind is also controlled using dynamic analysis such as aerodynamics stability analysis that is vortex-shedding (which has direct relationship with psychological effect), flutter and dynamic earthquake.

Keyword: Cable stayed bridge, two vertical planes system, radial system, static analysis, staging analysis, dynamic analysis