

Geometry Control of Mokpo Cable Stayed Bridge: Dimension Based Control

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Summary

Mokpo Bridge is a 3-span cable stayed bridge with a steel box girder and a main span of 500m, located in Mokpo city, Korea. Geometry control method based on dimension of structural elements was applied to construct the bridge. The error was wholly controlled from the prefabrication phase of bridge element to the construction phase. During construction, error estimation and correction was done by forecasting analysis through computer model updated in accordance with the situation of the site. The tension forces of stay cables and geometry of the bridge could be controlled by this process within target range during construction and after completion. This paper presents the main features of geometry control method adopted for Mokpo Bridge.

Keywords: Mokpo Bridge, Cable Stayed Bridge, Steel Box Girder, Geometry Control, Dimension Based Control, Cable Length Method, Forecasting Analysis

1. Introduction

The Mokpo Bridge construction project had been designed as a detour connecting the North Harbor to Goha Island (Fig.1) and to improve the accessibility between the New Harbor and the logistics facilities near Mokpo city. The total project length of this sea-crossing infrastructure project is 4.13km and a total length of the bridge structures is 3.06km. The main span of this bridge is 900m 3-span cable stayed bridge with a center span of 500m which is described in this paper and the approaching spans are precast concrete box girder bridges.



Fig.1: The bridge location

It is very important that the cable stayed bridge's geometry during construction must be carefully controlled so that the bridge's final profile should coincide with the design profile at the end of construction, especially for the cable stayed bridge which is erected by balanced cantilever method and has long span like Mokpo Bridge.

Geometry control method can be divided into various types depending on details. However, it is largely divided into the cable force method focusing on the tension force of cable, and the cable length method based on the cable length (or dimension of bridge element).

Since the cable force method, due to its nature, is much affected by uncertainty including temporary working load and environmental factors, such