

Cable Erection of Triple Pylons (multi-span) Suspension bridge, New Millennium Bridge

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Abstract

The triple pylons suspension bridge in Korea, New Millennium Bridge, has triple pylons and multi-span. For the erection of main cables with 21 strands and 2,667 wires, the Prefabricated Parallel Wire Strand (PPWS) method has been adapted, and the cable erection work will be conducted from June to August in 2017. The paper describes the installation and design of catwalk and pylon saddle and erection of main cable of New Millennium Bridge.

Keywords: multi-span suspension bridge; cable erection; PPWS method; triple pylons; catwalk system; pylon saddle;

1 Introduction

The characteristics of the 21st century bridge technology can be summarized in two keywords, elongation and enlargement. These things made it possible to construct the suspension bridges which have the level of crossing straits. These long-span bridges need construction techniques to ensure a wide seaway space in line with the logistics requirements of the shipping.

However, it is difficult to efficiently and economically overcome constraints such as the achievement of long-span bridges for ensuring the seaway space, the deep water depth and the poor ground condition with the multifunctional system of the girder bridge. As a practical solution to this problem, multi-span suspension bridge construction technique is attracting as a new paradigm of next-generation of suspension bridge construction technology.

New Millennium Bridge, located to Sinan-gun, Jeollanam-do, is the most recently designed suspension bridge in South Korea. New

Millennium Bridge is a multi-span suspension bridge divided into four spans by triple pylons, and this type of suspension bridge is being attempted for the first time in South Korea.

New Millennium Bridge has been constructed in the second section of connecting Aphae Island and Amtae Island in South Korea since this project was started in 2010.

The bridge is designed as the first triple pylons suspension bridge across the straits. It consists of the only one steel box girder for two traffic lane and two pedestrian lanes with a 1,750m span and triple pylons with the each height of 150.4m, 163.2m and 150.4m. This bridge was designed as an earth-anchored suspension bridge.

Also main cables with a diameter 0.30m will be anchored in the concrete anchorages founded by reverse circulation drill pile and steel open caisson. At the main span, hanger ropes with a diameter of 75mm and a cross section of CFRC (Center Fit Rope Core) support the steel girder.