



Design and Construction of Shinminato Bridge

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Summary

This paper describes design and construction of Shinminato Bridge, a continuous steel-concrete hybrid bridge having a center span length of 360 meters. An outline of the bridge project, earthquake-resistant system against Level-2 earthquake with vertical shock having 7-grade magnitude, durability improvement design for attaining 100-year life span, and construction process are explained.

Keywords: cable-stayed bridge, level 2 earthquake, vibration control system, durability improvement, fatigue design, wind-resistant design, bicycle pedestrian way

1. Introduction

Toyama New Port is an important international port in Hokuriku area facing Japan Sea, which is located near Toyama city, Toyama prefecture. Toyama city has a population of around 400 thousands, and a central city from viewpoints of economic, culture and politics in Hokuriku area. The port is an international multi-purpose terminal and provides the berth for passenger boat and for cargo boat transporting raw materials, such as timbers and coals etc.

In order to attain smooth distribution of products from international multi-purpose terminal, Ministry of Land, Infrastructure and Transport is now in charge of constructing a harbor road connecting east and west sides of the port.

This harbor road is a link of the left bank (Kaiou-machi, Izumi city) and right bank (Kairyu-machi, Izumi city) of the Toyama New Port (see Fig.1). The Shinminato Bridge (tentative name), a cable-stayed bridge, is located at the central part of this road. In order to ensure safe navigation of large-size ships, the clearance larger than 270m-width and 47m-height was necessary. Hence, a continuous cable-stayed bridge having steel-concrete hybrid main girder and steel towers was chosen. A center span length of the cable-stayed bridge is 360m and tower height is 127m from the sea level. The central part between towers is two-box type steel girder with a steel deck and the side span girder is made of three-cellular PC box girder. Since the side span length is relatively short, steel-concrete hybrid system was selected.