

Design and Construction of the Komono Second Viaduct in Mie, Japan

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1 Abstract

The present paper describes key aspects of the design and construction of the Komono Second Viaduct. The viaduct is a three-span prestressed concrete extradosed bridge with a three-cell box girder across the Mitaki River, carrying the Shin-Meishin Expressway at Komono, Mie Prefecture in Japan. The extradosed bridge has an overall length of 341m and a main span of 161m with a 23.35m wide deck carrying dual carriageway with two lanes for each direction. Dual central cable planes are adopted allowing for future deck widening. The stay cable consists of either 37 or 48 seven-wire prestressing strands of 15.2mm diameter and has four-layer corrosion protection system for 100-year service life. The top half of the pylon is built with steel-concrete composite structure and the stay cables are anchored inside the pylon box sections to facilitate inspection and maintenance works of the stay cable anchorages.

Keywords: extradosed bridge; stay cable; tower; cable corrosion protection; cable vibration mitigation; expressway.

2 Introduction

The Shin-Meishin Expressway ("shin" means new in Japanese) is a major highway running about 150km from Yokkaichi, Mie to Kobe, Hyogo in the central part of Japan. Its construction and opening have been carried out in a step-by-step manner since 1993 and about 115km of the Shin-Meishin Expressway is put in service as of September 2019. The Shin-Meishin Expressway is expected to compensate for insufficient functions of the Meishin Expressway (the oldest expressway in Japan) as the main artery between the Chukyo metropolitan area and the Keihanshin metropolitan area.

The construction of part of the Shin-Meishin Expressway between Yokkaichi and Kameyama, Mie was started in 1999 and completed in March 2019. There are 17 bridges in the part of the Shin-Meishin Expressway of which length is about 23km and among them, the Komono Second Viaduct is a landmark structure, identifying the image of the part of the expressway and becoming a symbol of the community around the viaduct (Figure 1).

The Komono Second Viaduct is a three-span prestressed concrete (PC) extradosed bridge with a three-cell box girder across the Mitaki River with approach viaducts to the north and the south, carrying the Shin-Meishin Expressway at Komono, Mie Prefecture in Japan. The extradosed bridge has an overall length of 341m and a main span of