

Design and Construction Challenges-Extradosed Bridge over River Hatania Doania in West Bengal

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Abstract

Bridge across river Hatania-Doania is a priority project which now connects the island of Bhakkali with the main land Namkhana in South 24 Parganas, in the state of West Bengal at about 100km south of Kolkata. Though Bakkhali and its neighbourhood being a popular tourist attraction, tourists used to avoid the area because of the delay that is caused in crossing the river. To reach Bakkhali, the tourists had to cross Hatania-Doania river by motorboats while vehicles were ferried by the barges. Under emergency, during late night hours, crossing the river was a nightmare. The navigable river serves as a shorter route channel for inland waterway traffic, hence requires a vertical clearance of 10m in 100m central width. Large size barges ply on the route. The project is meant for three lane of traffic and have a main module of 85m+170m+85m extra-dosed bridge deck across main river followed by viaduct portion on either side of the bridge. Bridge Deck is monolithically connected at intermediate pylon location and resting on POT-cum-PTFE bearings at end spans. Deck is laterally supported by 2 plane of stay cables arranged in a semi-fan fashion. The spans are resting on twin-D well foundation at pylon locations.

Keywords: Extradosed Bridge; Long Span Bridge; Cantilever Construction; Well Foundation; Concrete Bridge

1 Introduction

This paper is about long span extradosed bridge in India. Construction of this bridge was entrusted to S.P.Singla Constructions Pvt. Ltd. on EPC mode in December 2014 and the construction was successfully completed in May 2019 after facing several challenges. This bridge is Gold Award winner of National Highways Excellence Award 2019 for outstanding work in challenging conditions. This paper describes the design aspects of the Extradosed bridge along with challenges faced in construction of deep well foundations for the main river bridge.

1.1 About the Project

Owner: Public Work (Roads) Directorate National Highway Wing, Government of West Bengal

Contractor: M/s SP Singla Constructions Pvt. Ltd.

Consultant: M/s B&S Engineering Consultants Pvt. Ltd.

The total length of project is 3.266 km. The project involves construction of a new bridge across river Hatania - Doania including its immediate approach road/embankment and viaduct spans etc. Length of Main Extradosed Bridge is 340m. Figure 1 shows the location map of the bridge.