

A new IRC Guideline for Design, Construction and Maintenance of Extradosed Bridges in India

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Abstract

Initiated by the Indian Roads Congress (IRC), the official body that is responsible for developing standards and codes for Roads and Bridges in India and an institution which represents the think-tank on the subject, IRC constituted a body of experts under the aegis of the B-9 Committee 'Specialised Bridge Structure including Sea-Link', to formulate a guideline for the design, construction, and maintenance of extradosed bridges. Currently, there are more than 30 extradosed bridges existing or under construction in India. Many more are in the pipeline, in bidding stage. This paper highlights the salient features of the provisions in the guideline that is recently published by IRC.

Keywords: Extradosed Bridges, Stay Cables, Pylon, deck, Anchorage, fatigue, corrosion protection.

1 Introduction

The extradosed bridge form is eminently suited to spans in the range of 100m to 250m. This is a span range, which is too long for girder bridges and too short for cable-stayed bridges, to be cost-effective. Currently, the longest span extradosed bridge in the world is the Wuhu Yangtze River Bridge located in China, which was completed in the year 2000. The main span length of this bridge is 312 m. In India, the maximum individual span length achieved to date is 234m for an extradosed bridge over Durgam Chevuru lake, Hyderabad. India holds the record for the world's longest multi-span extradosed bridge, which is a bridge over river Ganga at Bihar. The length of the navigable portion of this mighty river, which is covered by extradosed spans is 1920m.

The concept of an extradosed bridge (EDB) dates back to 1988, when Jaques Mathivat, a French engineer presented the concept by taking the external tendons outside the structural depth of

the deck to take benefit of the increased lever arm. Since then, this structural type has been evolved and used worldwide. The first extradosed bridge was the Odawara Blueway Bridge, completed in Japan in 1994. Today there are more than 200 bridges of this type around the world. In India, the first extradosed bridge came into existence in 2006, which was a river bridge at Coorg, Karnataka (Span arrangement 28m+56m+28m). This was closely followed by another ROB at Pragati Maidan for Delhi Metro, (Span Arrangement: 24.7m+31.25m+93m+24.8m+22.6m). Since then, nearly 30 bridges are constructed/are under construction, with this concept.

Extradosed bridges are often described as mix of a conventional prestressed concrete girder bridge and a traditional cable-stayed bridge because most extradosed bridges are built to combine a prestressed concrete superstructure with stay-cable technologies. However, this simple definition