



The Iconic Bandra Worli Sealink in the city of Mumbai, India – Construction of the Bandra Cable-Stayed Bridges

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Summary

The Bandra Worli Sea Link is an iconic structure in the city of Mumbai. The 4.7 km long Sea Link has two parallel independent 4-lane carriageways for north bound and south bound traffic. In India, the bridge has demonstrated many firsts: the first Sea Link using solely precast segmental construction, the first cable stayed bridge across a sea, the first cable stayed bridge with a single central pylon. The Sea Link has two cable stayed bridges on each carriageway, along its alignment, which are very outstanding. The Sea Link as such is a masterpiece in bridge aesthetics.

This paper presents in brief the structural components and the construction details of the towers and deck of the Bandra Cable Stayed Bridge.

Keywords

Bandra Worli Sea Link, cable stayed bridges, aesthetic finish, climbing formwork, balanced cantilever erection, precamber,

1. Introduction

The project involved construction of an elevated link from the Northern suburb Bandra of Mumbai, across the Mahim bay, to Worli.



Fig. 1 – Bandra cable stayed bridge on right and Worli Cable Stayed bridges on the left)

Apart from two cable stayed bridges, the sea link has 800m long approach bridge from the north (Bandra), 1600m long Approach Bridge from the South (Worli) and 811m long Link bridge to KAGK Road.



2. Bandra Cable-Stayed Bridges

The cable-stayed portion of the Bandra channel is 600m in overall length between expansion joints and consists of two 250m cable supported main spans, flanked by 50m side spans. (Fig. 2). A central tower, with an overall height of 126m above pile cap level, supports the superstructure by means of four planes of stay cables in a semi-harp arrangement. This is the longest spans for precast segmental concrete cable stayed bridge in India

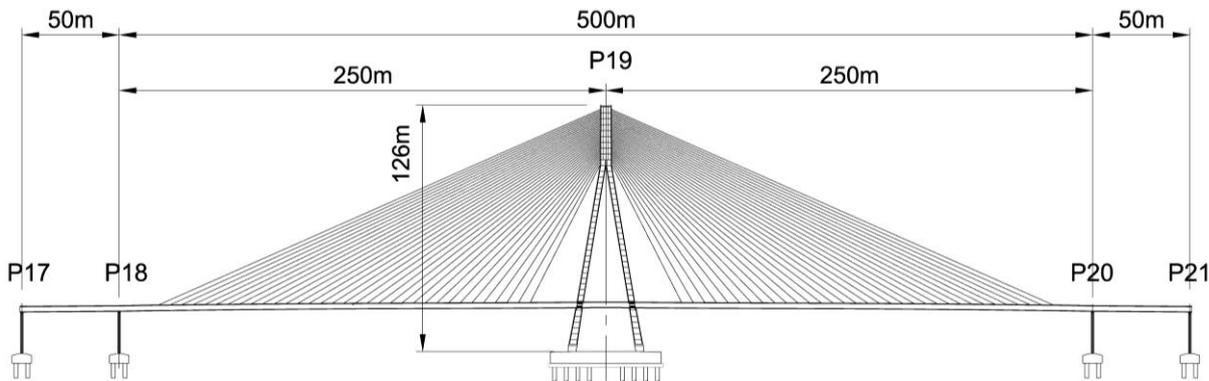


Fig. 2 - Elevation of Bandra Cable Stayed Bridge at P19

The main components of the Bandra Cable stayed bridge are listed below as per the general construction sequence

- 1) Pile and pile cap for tower and side span piers
- 2) 50m side spans with 5 nos. cantilever segments on either side
- 3) Tower legs below the deck
- 4) Tower cross-diaphragms at deck level
- 5) Pier table deck segments
- 6) Tower legs above deck including cable anchorage zone
- 7) Balanced cantilever deck.

3. Conclusion :

This paper highlights construction aspects of the Bandra Cable Stayed Bridge of the Bandra Worli Sea Link. It should give an idea about detailed planning and efforts required for construction of cable stayed bridges; in Detailed Construction Stage Analysis, Design and fabrication of specialised equipments, meticulous survey and monitoring with precision equipment to achieve Geometry Control to demanding accuracy, fabrication of special embedded parts like guide pipes, anchorage boxes for Stay cable anchorages to the complicated 3 dimensional geometry, Use of specialized self climbing formwork for construction of pylons, which paved the way for construction of Bandra Stay Cable Bridge to flawless accuracy, which is a unique example of one of the longest span cable Stayed bridges supported on a Single central pylon.

4. Acknowledgements:

The authors thank the organizers for extending invitation to write this paper on a unique project in India viz. Bandra Worli Sea Link.