

Large Span V-shaped Pier Continuous Rigid Structure Design of China-Maldives Friendship Bridge

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Abstract:

The China-Maldives Friendship Bridge is a Foreign Aid Project by the Chinese government. The bridge crosses the Gaadhoo Koa Strait, with a total length of 2km. The maximum water depth at bridge site is 46m and long-period waves have a significant impact on the project. The engineering geology is mainly coral reef layer. The main bridge is V-type pier six-span continuous rigid frame bridge, the span arrangement is (100 + 2 × 180 + 140 + 100 + 60) m, with the total length of 760m. The superstructure of main bridge adopts the hybrid girder composed of concrete beam + steel box girder. The main pier foundation of the main bridge is made of steel pipe composite pile.

Key words: V-type rigid frame bridge; coral reef geology; hybrid girder; steel pipe composite pile,

1 Introduction

The China-Maldives Friendship Bridge is located in the Maldives North Male Atoll (as shown in Figure 1), crossing Gaadhoo Koa Strait. The project connects the Airport Island and the Male Island. It is the most important island connection project of Maldives. The project is a Foreign Aid Project by the Chinese government and also the key project of "The Belt and Road". The project adopts the Chinese Codes. Typical width of the bridge is 21 m, dual two lanes. The navigable channel is reserved in double spans with a clearance of 70 m wide and 12 m high.

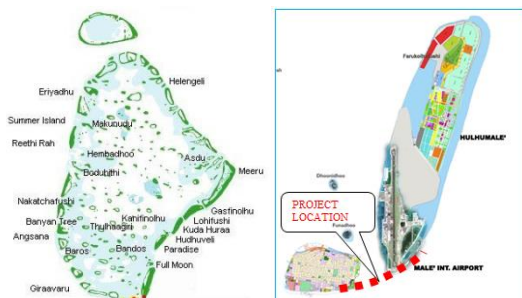


Figure 1. Project location map

2 Construction Conditions

2.1 Landform

The Male Island is located at southern edge of the North Male Atoll of Maldives. As shown in Figure 2, the physiognomy at the north of Male Island is mainly coral reef connected to the outer sea through several waterways. At the south of Male Island is mainly coastal landform. The water depth of Gaadhoo Koa channel at the bridge is 0-60 m. The slope is deep at the northeast-east of the Male Island, the max water depth is nearly 60m. At the southeast side, the slope is more slightly, the max water depth is about 46m.

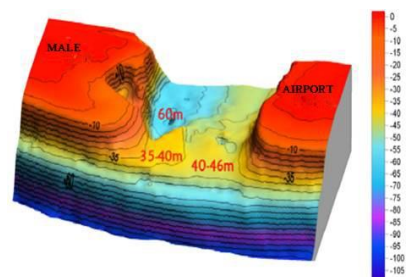


Figure 2. Gaadhoo Koa Channel depth