



## Key Construction Techniques of East Tower and Anchorage of Lingdingyang Bridge in Shenzhong Link

Hong Zhang, Hang Yuan, Hehui Zheng

CCCC Second Harbour Engineering Co., Ltd., Wuhan 430040, China;

Key Laboratory of Large-span Bridge Construction Technology, Wuhan 430040, China;

CCCC Highway Bridge National Engineering Research Centre Co. Ltd, Beijing 100088, China.

Contact: [459883413@qq.com](mailto:459883413@qq.com)

### Abstract

Lingdingyang Bridge of Shenzhong Link is a three-span suspension bridge with a full floating system of 580 + 1666 + 580. In view of the complex construction conditions of the bridge site, the construction scheme of island cofferdam was proposed for the east anchorage, and the flexible combined island cofferdam structure of 'lock steel pipe pile + I-shaped sheet pile + parallel steel wire rope' was innovatively adopted to transform the offshore construction into land construction. For the east cable tower, the flexible manufacturing production line of steel mesh was developed, and the integrated intelligent tower building equipment suitable for ultra-high concrete cable tower was developed, forming the industrial construction technology of ultra-high cable tower based on reinforced bar product and intelligent tower building. The key construction technology of anchorage and tower solves the construction problem of super long-span suspension bridge in offshore sea, and improves the intelligent and industrial construction level of ultra-high tower engineering.

**Keywords:** suspension bridge, sea anchorage, island cofferdam, ultra-high tower, industrial construction.

### 1 Introduction

The Shenzhong Link Project is a world-class sea-crossing cluster project connecting Shenzhen City and Zhongshan City in Guangdong Province, which is a super large-scale integration of 'bridge, island, tunnel and underground interworking'. The total length of the Shenzhong Link project is 24 km, of which the sea-crossing section is 22.4 km. The two-way eight-lane highway standard is adopted, and the design speed is 100 km/h. The island tunnel project and the bridge project from Shenzhen to Zhongshan are in turn. The Lingdingyang Bridge, as the key control project in the bridge project, crosses the Shenzhong Link and adopts the structural form of a three-span full floating system

suspension bridge with 580 + 1666 + 580, as shown in Figure 1.

The east anchorage of Lingdingyang Bridge is a gravity anchorage in the sea. The foundation adopts the '8'-shaped diaphragm wall structure (107.1m in length, 65m in width and 1.5m in thickness). The concrete pouring amount of the anchorage is 34.3t, and the structure is huge. It is in the broad sea area and adjacent to the 100,000-ton Lingdingyang waterway. The bottom of the anchorage foundation is mostly flow plastic and soft plastic silt, and the silt layer is thick and the lateral stability is extremely poor. In addition, the typhoons are frequent in the region, and the water operation time is long and the safety risk is high.