



Key technology for the construction of distributed pressure slurry extra-long pile foundation in Yellow River Wetland Reserve

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Abstract

In view of a series of pile foundation construction problems such as the high environmental protection requirements of the Yellow River Wetland Nature Reserve, the first application of distributed post-grouting technology in China, and the difficulty in implementing the traditional method of removing steel casings, this project creatively developed a self-circulating mud system; using distributed Post-grouting technology, the grouting tube and the acoustic measuring tube are combined into one, the pile side and pile end are grouted simultaneously, and the intelligent construction technology is used to monitor and control the grouting process in real time; by using the air compressor air cap technology Remove the steel guard. Finally, the construction of 72 pile foundations of the main bridge was realized, which provided a reference for the construction of pile foundations of the same type, especially the Yellow River Wetland Nature Reserve.

Keywords: pile foundation; pump suction reverse circulation; distributed grouting; gas cap

1 Introduction

The main bridge of the Yellow River Bridge with a semi-floating structural system is a double-tower double-cable plane composite beam cable-stayed bridge. The bridge span is arranged as (110+135+520+135+100) m follows: Figure 1. The main girder is the entire double-sided steel box girder section. The cable tower adopts steel shell concrete bottle tower, 23 pairs of steel strand stay cables are arranged on both sides, and separate bearing platform, group pile foundation. Auxiliary piers and transition piers all use single pile foundations. 36 D2.7m~D2.2m bored cast-in-place

piles are arranged under a single bearing platform of the cable tower, arranged in a plum blossom shape, with a pile length of 95m, using temporary steel pipe construction, and the pile foundation is made of C35 underwater concrete follows: Figure 2.

The Sota foundation is located in the Yellow River Wetland Nature Reserve, with high environmental protection requirements, and the geology is dominated by silt and fine sand. The design maximum navigable water level is +88.14m, the minimum navigable water level is +79.78m (1985 National Elevation Datum), and the basic wind speed is 26.9m/s.