

Comparison of High Speed Railway Bridge Foundation Design

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Abstract : This paper discussed the design and analysis of bridge foundation subjected to load of train with three codes, namely AASHTO code, British Standard BS Code 8004 (1986), and Chinese code (TB10002.5-2005). The study focused on the design and analysis of bridge's foundation manually with the three codes and found which code is better for design and controls the problem of high settlement due to the applied loads. The results showed the Chinese codes are costly that the number of reinforcement bars in the pile cap and piles is more than those with AASHTO code and BS code with the same dimensions. Settlement of the bridge was calculated depending on the data collected from the project site. The vertical ultimate bearing capacity of single pile for three codes is also discussed. Other analyses by using the two-dimensional Plaxis program and other programs like SAP2000 14, PROKON many parameters are calculated. The maximum values of the vertical displacement are close to the calculated ones. The results indicate that the AASHTO code is economics and safer in the bearing capacity of single pile. The purpose of this project is to study out the pier on the basis of the design of the pile foundation. There is a 32m simply supported beam of box section on top of the structure. The pier of bridge is round-type. The main component of the design is to calculate pile foundation and the settlement. According to the related data, we choose 1.0m in diameter bored pile of 48m. The pile is laid out in the rectangular pile cap. The dimension of the cap is 12m 9 m. Because of the interaction factors of pile groups, the load-bearing capacity of simple pile must be checked, the punching resistance of pile cap, the shearing strength of pile cap, and the part in bending of pile cap, all of them are very important to the structure stability. Also, checking soft sub-bearing capacity is necessary under the pile foundation. This project provides a deeper analysis and comparison about pile foundation design schemes. Firstly, here are brief instructions of the construction situation about the Bridge. With the actual construction geological features and the upper load on the Bridge, this paper analyzes the bearing capacity and settlement of single pile. In the paper the Equivalent Pier Method is used to calculate and analyze settlements of the piles.

Keywords : pile foundation, settlement, bearing capacity, civil engineering

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