

## COMPARISON OF HIGH SPEED RAILWAY BRIDGE FOUNDATION DESIGN

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This paper discuss 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 was also discussed. In another analysis by using the two-dimensional Plaxis program and other programs like SAP2000 14 and PROKON many parameters were calculated (Figure 1). The maximum values of the vertical displacement were close to the calculated ones. The results indicate that the AASHTO code was more economic and safer in the bearing capacity of single pile.

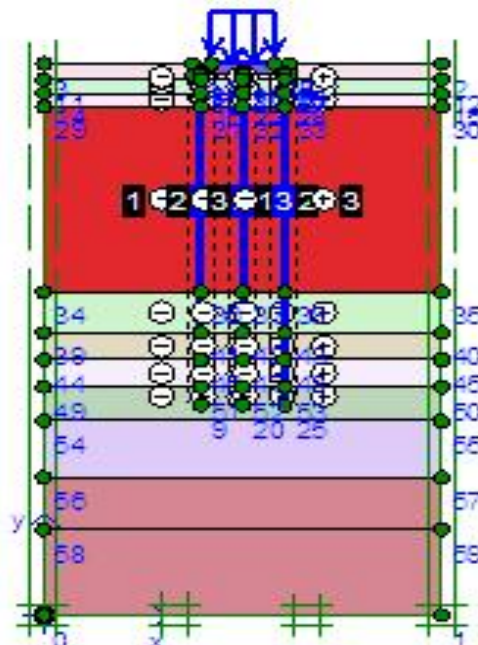


Figure 1. The model of pile cap analyzed by using PLAXIS program

Another purpose of this project was to design of the pile foundation. There is a 32 m 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 1.0 m in diameter bored pile of 48 m. The pile is lain

out in the rectangular pile cap (Figure 1). The dimension of the cap is  $12\text{m} \times 9\text{m}$ . Because of the interaction factors of pile groups, we must check the load-bearing capacity of simple pile, 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. In this paper the Equivalent Pier Method is used to calculate and analyze settlements of the piles. Also, checking soft sub-bearing capacity is necessary under the pile foundation. The results of the design shear resistance of the pile cap for the AASHTO code and BS code are shown in Table 1.

Table 1. The Design shear strength in pile cap

The codes	AASHTO		BS
The value	Vux	Vuy	Vu
(KN)	525.705	547.83	9778.8

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