**Evaluation of the pile cap capacity when considering the deviation of the pile axis during construction: a Case Study in Vietnam**

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**Abstract.** During the construction of piles (bored piles, driven or pressed piles), the deviation of the pile coordinates compared with the design documents is a common problem. In Vietnamese standards, there are regulations on the allowable deviation of piles, but in reality, the constructed piles with incorrect positions usually account for a large proportion. This deviation of the pile coordinates leads to changes in the internal force in the pile cap, which can endanger the working of the pile cap. This problem affects the progress, cost, and quality of construction work. In this study, a method is proposed to evaluate the influence of pile axis deviation and other factors on the safe working of the pile cap. Reliability theory is applied to simulate the state function with random parameters, thereby determining the reliability of the working of the pile cap. The analysis results show that even if the pile axis deviation is within the allowable range of the standard, the pile cap may still be unsafe; it depends on the safety interval selected by the designer.

**Keywords:** deviation position of the pile axis, pile cap capacity, reliability, Vietnam.