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Piled Raft Foundation with Consideration to Soil-Structure Interaction: A Review

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Abstract: *This paper presents a comprehensive review of studies and research conducted on piled raft foundations with a specific focus on incorporating SSI effects. The review begins by providing an overview of the fundamental concepts related to piled raft foundations, highlighting their advantages and practical applications. It then delves into the significance of understanding SSI phenomena, discussing the various factors that influence the soil-structure interaction behavior. These factors include soil properties, foundation geometry, loading conditions, and the presence of adjacent structures. A critical analysis of numerical and experimental studies on piled raft foundations is presented, emphasizing the methodologies employed to account for SSI effects. Various numerical modeling techniques, such as finite element analysis (FEA) and boundary element methods (BEM), are discussed in detail, along with their advantages and limitations. The review also addresses the challenges associated with experimental testing of piled raft foundations and the methods adopted to replicate realistic SSI conditions in laboratory setups. Overall, this review consolidates the existing knowledge on piled raft foundations, specifically focusing on the incorporation of SSI effects. It provides an in-depth understanding of the key factors influencing SSI behavior, the available numerical and experimental techniques for analysis, and the impact of SSI on the performance of piled raft foundations. The findings from this review contribute to the advancement of geotechnical engineering practices, enabling more accurate and reliable design solutions for piled raft foundation systems.*

Keywords: Piled Raft Foundation, Soil-Structure Interaction, Review, Geotechnical Engineering, Load Distribution, Settlement, Bearing Capacity, Numerical Modelling, Finite Element Analysis, Boundary Element Method etc.

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