

Useche-Infante, D.J., Aiassa-Martinez, G.M., Arrua, P.A. et al. Performance evaluation of post-grouted drilled shafts: a review. *Innov. Infrastruct. Solut.* 7, 230 (2022). <https://doi.org/10.1007/s41062-022-00830-y>

Performance evaluation of post-grouted drilled shafts: a review

Abstract

Base grouting in drilled shafts has been used to improve the foundation performance. The main objectives of this technique are to generate a preload in the base soil, induce negative friction on the pile side, and improve the soil surrounding the shaft. In recent years, new experimental and numerical studies were published, which have helped to better understand the soil–post-grouted drilled shaft interaction mechanism. Likewise, new grouting devices were developed, and design methodologies were introduced. This review paper focuses on the analysis of available approaches to investigate the performance of post-grouted drilled shafts (PGDS). The mechanisms of post-grouting of drilled shafts to improve the bearing capacity of pile foundation are discussed, and some properties of the grout typically used in this procedure (such as water–cement ratio, type of grout, etc.) are described. Based on the literature survey, this study presents the devices used to distribute the grout at the tip and side pile, the grouting techniques, and the effect of grout pressure and grout volume on pile behavior. The investigation indicated that the enhancement in pile bearing capacity is affected by the grout quantity, grouting pressure, pile dimensions, soil type, etc. Subsequently, full-scale field tests, small-scale tests, and numerical investigations published to analyze the performance of PGDS are summarized. Finally, the design methodologies available in the technical literature and future developments for this type of foundation are discussed.