

Abstract

Alternatives to Deep Foundations to Enhance Sustainability of Infrastructure Projects

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Deep foundations (e.g., driven piles) are required when shallow foundations (e.g., strip footings) do not have the required capacity or would settle significantly as deep foundations transmit loads to deeper, competent soils. Deep foundations are often 100 feet long or more and 5-10 feet in diameter, thus requiring large volumes of concrete and steel to be constructed. While it is possible to salvage the material of the super-structure at the end of a project's life, the materials used for deep foundations are buried underground and lost to the economy. This paper presents a life cycle study of traditional deep foundation systems at a project site and possible alternative materials, e.g., bio-inspired or recycled materials, for ground modification to enhance the sustainability of the infrastructure project.

Keywords: foundation, sustainability, ground improvement, infrastructure

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