

A COMPARATIVE REVIEW OF A TRADITIONAL AND AN INNOVATIVE SOIL IMPROVEMENT METHODS: CEMENTATION AND BIOLOGICAL METHOD

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Soil stabilization and improvement methods are crucial in various fields including construction, agriculture, and environmental conservation. In civil engineering, stabilizing soil can improve its load-bearing capacity, reduce settlement, and prevent erosion. This is vital for constructing buildings, roads, and other infrastructure on a stable foundation. Traditional methods, such as cementation, have been widely used for decades to enhance the engineering properties of soil and was one of the oldest stabilization techniques humans used for constructions. Recently, the increasing demand for usable land for developments necessitates exploring alternate techniques for ground and soil treatment, especially, methods that might have minimal impact on the environment and be cost-effective.

This paper provides a comparative analysis of both traditional and innovative soil improvement techniques. The review focuses on cementation techniques, such as lime and cement stabilization, that have long been used mainly to increase soil strength and reduce compressibility and the biological methods that involve the use of bio-based substances such as bio-microorganisms, bio-enzymes, and biopolymers. It also explores the mechanisms, applications and limitations of each method highlighting their suitability for different soil conditions and project requirements.