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THE CURING TIME EFFECT ON SOIL STABILIZATION WITH TWO CEMENTS

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Abstract

Transportation infrastructures are in an accelerated development process worldwide, occasionally in a process of rehabilitation, in both cases investments are strongly depending on the subgrade mechanical behavior that is often requiring a soil improvement by stabilization where eco-materials would be the first choice. The objective of this paper is to investigate the influence of the curing time on soil stabilization with eco-cement (EC) compared to Portland cement (PC) as stabilizers. Standard procedure has been used to obtain the soil-cement mixed samples with 2.5%, 5%, 7.5% and 10% EC and PC, reported to the dry unit weight of soil, and cured for 1, 7, 14 and 28 days. After each specified curing time, compressibility and unconfined compression tests have been performed and the results of the soil modulus and strength are reported to the standard time intervals with the displayed trends beyond 28 days of curing. The unconfined compressive strength is 15% higher for EC compared to PC for 2.5% participation, increasing to 23% for 10% participation. In addition to this finding, as cement participation is referring to a large range of values, the reported values in this paper can be used as reference for soil stabilization reported on one marginal soils category, namely hard clayey soils, that exhibit a water-induced collapsibility in its natural state, improved with a new eco-cement available since 2021 for the construction industry.

Key words: eco-cement, oedometric modulus, Portland cement, soil stabilization, unconfined compression strength

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