Beneficiation of Clayey Soils Using Aggregate Blending and Cement Stabilization

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Roads are expensive to build and maintain. To make roads last longer, transportation agencies can specify cement treatment of the underlying soil layer to improve its strength and durability, ensuring higher structural capacity and greater resistance to damage from freeze-thaw and wet-dry cycling over time. However, different soils require different amounts of cement to achieve the desired material properties. When a soil contains clay, such as the soil studied in this project, an excessive amount of cement may be required to achieve the target strength. In this case, other alternatives are desirable because of the relatively high price of cement. One potential method of reducing the cement requirement involves the addition of crushed stone, or aggregate, to the soil. This project explores the effect of aggregate additions on the strength of clayey soils treated with cement. Samples were mixed with varying amounts of aggregate and cement. Compressive strength testing was performed on the samples after a standard curing period of 7 days. For the tested material, a gravimetric blend of 5% cement and 40% aggregate is recommended to meet the industry standard of 500 psi.

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