

Project report on

Stabilization of soil using Bio-enzymes



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ABSTRACT

Cost effective roads are very vital for economic growth in any country. There is an urgent need to identify new materials to improve the road structure and to expand the road network. Hence, the search for new materials and improved techniques to process the local materials has received an increased impetus. When poor quality soil is available at the construction site, the best option is to modify the properties of the soil so that it meets the pavement design requirements. This has led to the development of soil stabilization techniques.

Recently Bio-Enzymes have emerged as a new chemical for soil stabilization. Bio-Enzyme is a natural, non-toxic, non-flammable, non-corrosive liquid enzyme formulation fermented from vegetable extracts that improves the engineering properties of soil, facilitates higher soil compaction and increases strength. Enzymes catalyze the reactions between the clay and the organic cat-ions and accelerate the cat-ionic exchange process to reduce absorbed layer thickness. For other types of soil stabilization, chemicals are mixed with soil, which is difficult to mix thoroughly, but Bio-Enzyme is easy to use as it can be mixed with water at optimum moisture content and then it is sprayed over the soil and compacted.

TerraZyme is a surfactant (an ionic surface active agent) which changes the hydrophilic nature of clay and lime materials to hydrophobic. Its application not only assists in the expulsion of water from soils, but also aids the lubrication of soil particles and increases the compatibility of many soils. The reaction of TerraZyme on these materials is particularly effective because of the ion-exchange capacity of clay minerals the property that clay minerals have of absorbing certain ions such as the TerraZyme molecule, thereby changing its physical properties.