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CIVIL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

MECHANICAL STABILIZATION
AND DENSIFICATION

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MECHANICAL
STABILIZATION AND
DENSIFICATION

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SUMMARY

Most of the earth's land surface is covered with a layer of granular sediments known as soil which because of its universal availability and its low cost is widely used an engineering material.

Usually the engineering properties of soil in its natural state are quite unfavourable, therefore some method must be employed for improving them. This method is known as soil stabilization. Therefore soil stabilization is the term used to describe the alteration of the engineering properties of soil so as to meet specific engineering requirements.

Although stabilization is still most often considered in relation to road construction, the range of application has increased with the increased knowledge of techniques and nowadays it is used in nearly all civil engineering projects where soil is employed.

The simplest stabilization method is mechanical stabilization usually achieved by compaction and drainage; if a loose soil is tamped down or if water is drained out of a wet soil the soil will become stronger. Greater strength still may be obtained by improvement of the gradation of the soil maintained by a proper selection of the fine material.

Other methods employed are stabilization by the use of additives such as cement, lime, bitumen by heat treatment and by forced drainage achieved by the use of electric potentials.

It must be stated though that specification and control is required in every method used, that is why before and after the application of any stabilization method several tests must be carried out.

Generally stabilization is of great application since it is not always possible to use other alternatives such as the relocation or redesign of the project.

INTRODUCTION

An essential preliminary to the execution of a civil engineering project is an adequate ground investigation. This aims to the most accurate evaluation possible concerning the general suitability of the site and the capacity of the ground to support the proposed structure without excessive stress or deformation.

Where ground conditions over part or all of a site are found to be inadequate, say with respect to strength, compressibility or permeability, it may be possible to achieve some improvement in one or more of these properties in the field through certain geotechnical processes. The alteration of soil properties so as to create a new material capable of better meeting special engineering requirements, is known as soil stabilization. This may be a temporary measure to permit the construction of a facility, or it may be a permanent one to improve the performance of a completed facility.

In other words stabilization is not only a corrective treatment but also a preventive measure or insurance against unfavourable conditions developing other in the course of construction or throughout the life of the structure.

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