
Arabian Institute For Training

Soil Investigation

INTRODUCTION

- Soil mechanics can play a vital role in all construction disciplines, such as buildings, pavements, roadways and weirs, etc. Besides, errors in the design of the foundation can lead to serious structural problems and, consequently, to a collapse. Solutions to the problems of construction due to soil are difficult and very expensive. Most diagonal cracks are due to differential settlement. The withdrawal of the water table without a good study or excavation close to existing buildings may lead to serious cracking in those buildings. In fact, many problems with roadway pavements are due to the lack of existing subgrade tests, such as cracking and rutting, which result in accidents.
- The challenge of soil investigation is that the soil may be in different forms, such as granular material or slurry material. The soil also has a wide range of properties. Laboratory tests or field tests may give incorrect results if the samples have not been extracted in the correct way. The permissible load capacity may vary depending on the soil, the water table and the geometry of the foundation. This training course on Soil Investigation will provide you an in-depth knowledge of soil mechanics, Soil problems and the best solutions.

This Soil Investigation training course will feature:

- Understanding the three phases of the soil
- The importance of the classification of the soil
- Sieve analysis and consist tests of the soil
- The validity of the compaction and proctor test
- Understanding the parameters of shear strength
- Understanding the skills of soil investigation
- Most Laboratory tests and field tests

OBJECTIVES

This training course is intended to provide the participants with:

- Overview of the properties of the soil and types and classifications
- Knowledge of calculating the failure criteria of the soil and shear strength parameters
- Illustration of calculating the bearing capacity and design the isolated foundation
- Developing the inspection skills to investigate the soil and distinguish between different types of the soil
- Understanding the serious importance of the long-time settlement due to consolidation process and liquefaction as well

TRAINING METHODOLOGY

- This Soil Investigation training course will utilise a variety of proven adult learning techniques to ensure maximum understanding, comprehension, and retention of the information presented. The daily workshops will be highly interactive and participative. Videos and photos will be used for illustration.

WHO SHOULD ATTEND?

This training course is intended to provide professionals and engineers with knowledge of geotechnical engineering. The Soil Investigation training course will also benefit:

- Junior Engineers
- Civil Engineers
- Structural engineers
- Engineers and technician who are interested in understanding how to prepare a soil investigation report

Course Outline

Understanding the Main Properties of the Soil and needed Tests and the Classification

- Practical Importance of Index Properties
- Size and Shape of Soil Particles
- Properties of very Fine Soil Fractions
- Mechanical Analysis of Soils
- Soil Aggregate
- Consistency of Fine-Grained Soils
- Soil Classification
- Minimum Requirements for Adequate Soil Description

Understanding the Shear Strength Parameters and the Consolidation

- Shear Strength Parameters
- Shear Box Test
- Triaxial Compression Test
- Van Shear Test
- SPT – Standard Penetration Test
- CPT – Cone Penetration Test
- Parameters of the Consolidation
- Workshop on Shear Strength and Consolidation

How to Validate the Compaction and Introduction to Problematic Soil

- Introduction to the Compaction
- Machines which are used in Compaction
- Proctor Test
- Sand Cone Test
- Plate Loading Test
- Types of Problematic Soil
- Effect of Expansive Soils and Solutions
- Collapsible Soil and Solutions

How to Investigate the Soil and Prepare a Report

- Methods of Soil Exploration
- Disturbed Samples
- Undisturbed Samples
- Skills of Visual Inspection
- Challenge of Soil Investigation in the Practice
- Workshop to prepare Soil Investigation Report

Calculating the Bearing Capacity and Design Isolated Footing

- Bearing capacity general form based on shear strength
- The effect of settlement of bearing capacity
- The effect of water table on bearing capacity
- Bearing capacity based on SPT
- Eccentric foundations due to permanent loads
- Eccentric foundations due to temporary loads


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