Brieser CONSTRUCTION

Toolbox Talk



Excavation - Soil Classification - DATE 10/25/26-10/31/26

Introduction

The Occupational Safety and Health Administration's (OSHA) Excavation standards, 29 Code of Federal Regulations (CFR) Part 1926, Subpart P, contain requirements for excavation and trenching operations. The standards apply to all open excavations made in the Earth's surface, including trenches.

Soil Classification Categories

Stable Rock

Natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

Type A

Cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) (144 kPa) or greater. Examples include: clay, silty clay, sandy clay, and clay loam. Certain conditions preclude soil from being classified as Type A. For example, no soil is Type A if it is fissured or has been previously disturbed.

Type B

Includes cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa) and granular cohesionless soils (such as angular gravel, similar to crushed rock, silt, silt loam, sandy loam, and, in some cases, silty clay loam and sandy clay loam).

Type C

Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less, granular soils (including gravel, sand, and loamy sand), submerged soil or soil from which water is freely seeping, unstable submerged rock.

Methods to Classify Soil Types

There are many methods we can use to classify soil types: *Visual analysis*-observe soils that have been excavated and the sides of the excavation. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily is granular. Observe the sides of the excavation to identify if the soil is layered. Any water seeping from the sides or at the bottom of the excavation indicates a Type C soil condition. *Plasticity analysis*-Mold a moist or wet sample of soil into a ball and attempt to roll it into threads 1/8" diameter; cohesive soils can be rolled easily without breaking. Other methods include a shearvane, penetrometer, or the Thumb Penetration method as described below:



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Thumb Penetration

The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation D2488—‘‘Standard Recommended Practice for Description of Soils (Visual—Manual Procedure).’’)

Type A soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort.

Type B soils with an unconfined compressive strength between 0.5 and 1.5 tsf will allow your thumb will sink into the soil up to the end of your thumbnail.

Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure.

This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences.

****All excavations at Brieser Construction are to be treated as Type C soil until the Competent Person on site classifies the soil type as something other than Type C.****



Type A: Only with great effort, tip of the thumb



Type B: Penetrates to the end of thumbnail.



Type C: Easily penetrated by several inches.

Next week we will discuss sloping and benching based on soil types.



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