

SOIL

Classifications

Determining soil classifications prior to performing any trench and excavation activities is vital to keeping workers safe.

More information can be found in OSHA 1926 Subpart P App A.

TYPE A



Unconfined compressive strength of **1.5 tons per square foot or greater**.

Examples include **clay, clay loam, sandy clay, or silty clay**. Cemented soils, including caliche and hardpan, are considered Type A.

The soil is part of a sloped, layered system where the layers dip into the excavation on a **slope of four horizontal to one vertical (4H:1V)** or greater.

Soils cannot be classified as Type A if the soil is **subject to vibration** from nearby traffic or equipment, **contains fissures** or has been **previously disturbed**. These conditions would classify the soil as Type B.

TYPE B



Unconfined compressive **strength greater than 0.5 tons per square foot but less than 1.5 tons per square foot**.

Examples include **angular gravel, silt, silt loam and sandy loam**.

Materials are part of a sloped, layered system **where the layers dip into the excavation on a slope less steep than 4H:1V**, but only if the material would be otherwise classified as Type B.

TYPE C



Unconfined compressive **strength of 0.5 tons per square foot or less**.

Examples include **gravel, sand and loamy sand**.

Submerged soil with freely seeping water or submerged, unstable rock.

Type C soil can be sloped or shored but is **not permitted to be benched**.

Material in a sloped, layered system **where the layers dip into the excavation on a slope of 4H:1V or steeper**.

STABLE ROCK



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

It is usually identified by a rock name such as **granite or sandstone**.

Where different soils are **configured in layers**, the soil shall be classified under the **weakest soil layer**. However, **each layer may be classified individually** where a **more stable layer lies under a less stable layer** (i.e., where a Type C soil rests on top of stable rock).

SOIL Testing Methods

It is important to remember that a soil test shall be conducted by a competent person. The soil classification shall be documented on the daily inspection report and kept in the vicinity of the work area. At least one visual test and one manual test must be performed.

VISUAL TESTS

EXAMINE THE EXCAVATED SOIL FOR:

Estimated range of **particle sizes**
Cohesive and/or **granular quality**

EXAMINE THE SIDES OF THE EXCAVATION AND ADJACENT AREAS FOR:

Signs of **cracks or fissures**
Layered systems (i.e. **multiple different soil types**)
Utilities and other **underground structures**
Evidence of **surface water**
Sources of **vibration**

MANUAL TESTS

PLASTICITY TEST

Roll a moist soil sample into a thread until it is **1/8 in. thick and 2 in. long**. If the sample can be held from one end without it breaking, then it is cohesive. If the sample breaks easily, then it is non-cohesive.

THUMB PENETRATION

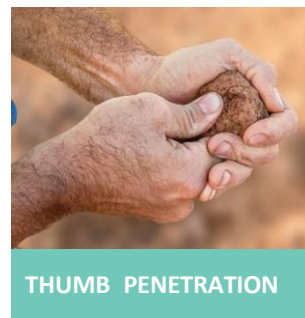
Grab an undisturbed sample and indent your thumb into the soil. If your thumb only makes a small indentation, then it is Type A. If your indent goes up to the end of your thumbnail, then it is Type B. If your thumb sinks all the way into the soil clump, then it is Type C.

DRY STRENGTH

Check the strength of the soil by compressing it with your hand. It will either be granular or cohesive depending on the difficulty of it breaking into powder or smaller clumps.

POCKET PENETROMETER

Insert the scale indicator into the sample and press until the engraved line reaches the soil level. The scale is calibrated in tons per square foot or kilograms per square centimeter. Type A will measure **at least 1.5 tons per square foot**. Type B will measure **between 0.5 and 1.5 tons per square foot**. Type C will measure **less than 0.5 tons per square foot**.



Learn more about
trenching and excavation
safety