

SOIL TYPES

One of the primary duties of the Competent Person at an excavation site is to examine the soil and other conditions present in and around the excavation to make a determination as to what type, or types, of soil are present. That, in turn, will determine type, size, strength and/or configuration of the protective system that is utilized to protect workers inside of the excavation from cave-ins. The Competent Person will initially make this determination of soil types through visual observations, and then usually confirm it by performing at least one manual test. Here is an overview of the different rock and soil types spelled out in the OSHA excavation standard, starting with the most stable and least likely to cave-in, and ending with the most unstable type:

- Stable Rock is natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed. However, the rock must be free of cracks or fissures after it has been excavated to be considered Stable Rock. Examples of Stable Rock could include some deposits of granite or sandstone. While rock is certainly present at many of our excavation sites, “stable” rock is relatively rare to find on an excavation site. That is because there are usually cracks or fissures detected in rock that has been excavated with a jack-hammer, rock breaker, dynamite, or similar mechanical means. Rock that has cracks or fissures in it is usually classified as Unstable Rock, which falls into another classification covered below.
- Type A Soils are cohesive soils with a high clay content, and which are very hard to penetrate. Examples of Type A cohesive soils are clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. However, no soil can be classified as Type A if it is fissured or cracked, if it is subject to vibration that affects the stability of the soil, if it has been previously excavated, if it is part of a sloped, layered system where the layers dip into the excavation on a slope of 4 horizontal to 1 vertical or greater, or if there is water seeping into, or standing in, the excavation; in these cases it will have to be downgraded.
- Type B Soils are cohesive soils that are a little softer than Type A soils, or they were a Type A soil that had to be downgraded due to the various reasons we just covered. In addition, there are other kinds of Type B soil, including angular gravel, silt, silt loam, dry unstable rock, and layered systems sloping into the trench at a slope less than 4 horizontal to 1 vertical, so long as the soil meets all other criteria for Type B soil. In addition, Type B soil cannot have any water seeping into, or standing in, the excavation.
- Type C Soils are cohesive soils that are extremely soft, and therefore are easy to penetrate or mold with light finger pressure. Type C soils also include granular soils such as sand, loamy sand, and non-angular gravels. Type C soils also include all submerged soils, soil from which water is freely seeping, and unstable rock that is submerged in water. Also included in this classification is any material in a sloped, layered system where the layers dip into the excavation at a slope of four horizontal to one vertical or greater.

On excavation sites where there is more than one soil type present, the Competent Person will test and classify each area or layer separately, and then adjust the selection of protective systems accordingly.

The purpose of today’s discussion is not to try and teach you how to classify soils; that is solely the responsibility of a Competent Person. Instead, we just want you to be aware that the classification of various soil and rock deposits can vary on the job. And that, in turn, can impact the type, or types, of protective systems we decide to use on the job.

