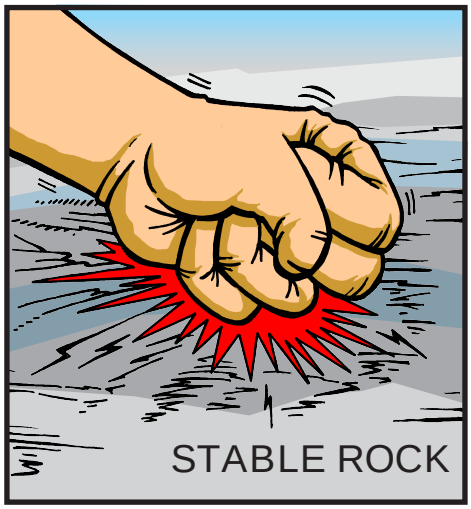
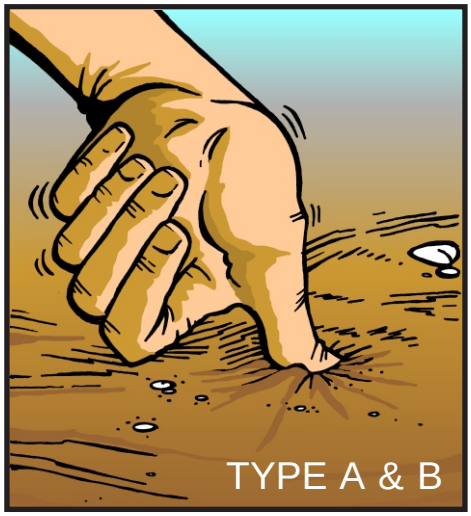
# ESC TOOLBOX SAFETY TRAINING

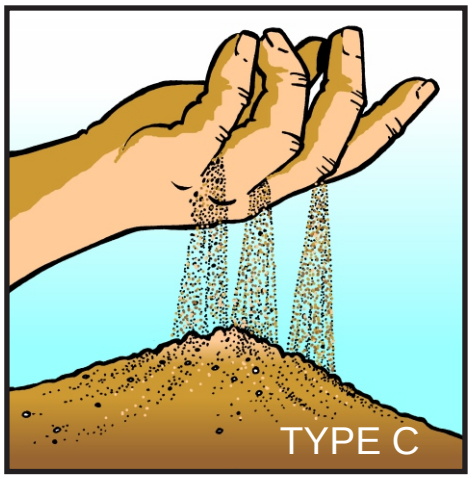
Company _____ Location _____ Date _____

*Vol 30 - No 16*

## TRENCHING - SOIL GRADES




**OSHA categorizes soils and rock deposits under four different classifications. The categories are determined based on an analysis of the soils taking into consideration the stability, cohesiveness, moisture content and the environmental conditions that the excavation may be exposed to such as rain, sleet, ice, freezing/thawing and excessive heat. Various other factors such as vibration from heavy traffic, pile driving in the vicinity, or if the soils have been found to have been previously disturbed or are part of a multi-soil layered system can change the soil class to a less stable one.**

**The following is a brief definition of the four soil classifications:**

1. **STABLE ROCK means a natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed. Even though you may be digging an excavation in soil that you think is stable rock, be careful. The rock excavated walls may contain fractures that are not clearly visible. The fractures could be caused by stress or tension in the rock formation and tree roots.**

2. **TYPE A means cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf). Examples of this type of soil are clay, silty clay, sandy clay, clay loam, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A soil.**

3. **TYPE B means cohesive soils with an unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf. Examples of this type of soil are granular cohesion less soils including angular gravel (similar to crushed rock), silt, silt loam, sandy loam, silty clay loam and sandy clay loam.**

4. **TYPE C means cohesive soils with an unconfined compressive strength of 0.5 tsf or less. Examples of this type of soil are granular soils including gravel, sand, loamy sand, soil from which water is freely seeping, rock that is not stable and soil that is part of a multi-soil layered system.**

**Acceptable methods of analyzing the soil for classification on the job site are performing a visual, manual, and thumb penetration on freshly excavated material. A pocket penetrometer may also be used to test the soil for tsf. Analyzing and classifying soils requires extensive knowledge of testing procedures that can only be gained through study, practice and experience. A competent person must be on site to determine soil classification.**

**No matter what type of soil the excavation is located in, consider the soil to be the worst (Type C) and protect your workers by either shoring, sloping, benching or providing a trench shield. You never know when those excavation walls may decide to cave in.**

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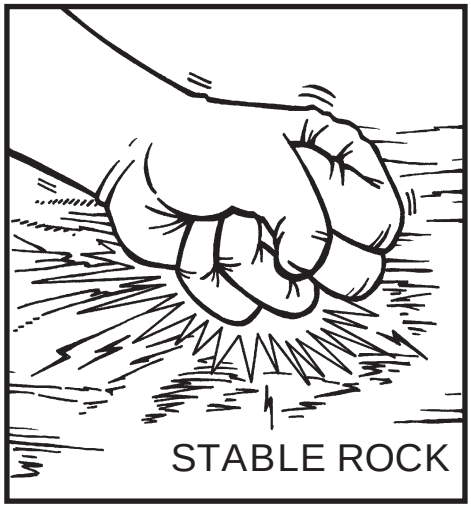


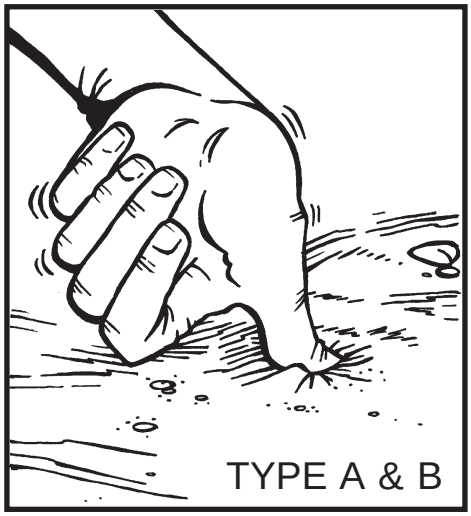


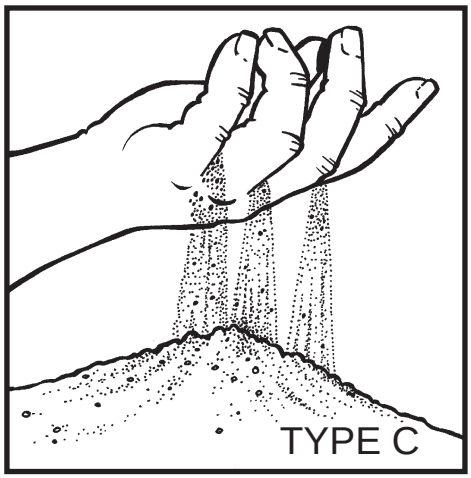


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