**Allowable Slope by Soil Type**

In order to determine the correct protection system, visual and manual tests are necessary to identify the type of soil. A trench protection system will be used depending on the type of soil. If site conditions change, the soil will need to be reevaluated. Identifying the soil type must be done by a competent individual on site.

* Employees working on excavations must be trained in four soil types: stable rock, Type A, Type B, and Type C.
* Among the soil classifications, Type A is the most stable. Clays, silty clays, sandy clays, and clay loams are examples of Type A soils.
* Type B soil is less stable than type A solid but is very cohesive and relatively stable. There are many types of granular, non-cohesive soils, including angular gravel, similar to crushed rock; silt; silt loam; sandy loam; and previously disturbed soils, except those classified as Type C soils.
* Type C is the least stable and most hazardous among all the soil types. Granular soils, such as gravel, sand, or loamy sand; submerged soil or soil from which water seeps freely; and unstable submerged rock are examples.

| **SOIL TYPE** | **HEIGHT: DEPTH RATIO** | **SLOPE ANGLE** |
| --- | --- | --- |
| Stable Rock | Vertical | 90° |
| Type A | ¾:1 | 53° |
| Type B | 1:1 | 45° |
| Type C | 1½:1 | 34° |
| Type A(short-term) | ½:1 | 63° |

Below are the maximum allowable slopes for excavations less than 20 feet deep:

* In excavations 5 feet or deeper, sloping, benching, or other cave-in protection systems must be used. If the excavation is deeper than 20 feet, a registered professional engineer shall design the slope or bench.