



Brunswick Sewer District

## Excavation and Trenching Safety Policy

2019 Update Reviewed and Adopted by the Safety Committee 2019

2020 Update Reviewed and Adopted by the Safety Committee 2020

**Purpose:** Since we work in the construction industry around excavations, we have one of the most hazardous jobs. This safety policy outlines planning considerations applying to all open excavations made in the earth's surface.

**Objective:** The primary objective is to prevent employee exposure to excavation hazards such as cave-ins, equipment or material that could fall/roll from an excavation face and the collapse of adjacent structures.

Protective Systems primarily consist of support systems such as sloping, benching, and shielding.

This policy is outlined as follows:

- A. Site Evaluation and Planning
- B. Exemptions from Excavation Requirements
- C. Soil Classifications
- D. Sloping/Benching and Shielding/Shoring Options
- E. Excavation Planning Checklist
- F. Definitions

#### **A. Site Evaluation and Planning**

Before any digging begins the site must be checked for potential hazards.

1. Check for electrical power lines (overhead and buried), natural gas and water lines. Contact the utility company(ies) and call Dig safe at 811.
2. Check for hazardous atmosphere and possible contaminated soils containing hazardous materials.

#### **B. Exemptions from Excavation Requirements:**

There are two situations where adherence to excavation requirements DO NOT apply.

1. If the excavation is made entirely in "stable rock".
2. If the excavation is less than five (5) feet in depth and examination by a competent person provides no indication of a potential cave in.

#### **C. Soil Classifications:**

Soils are classified into four (4) types:

1. NATURAL solid mineral material (rock).
2. Type A soil.

3. Type B soil.
4. Type C soil. \* (Mostly here in Maine)

For the purpose of the District Type C soil will be assumed in all cases.

1. **Visual and Manual Test** should be conducted as specified by OSHA Regulations to determine soil type.
2. Most soil conditions we encounter are worst-case type C. If we follow the maximum allowable limits specified for sloping, benching, shielding or shoring **Visual and Manual** test is not necessary.

**NOTE:** Refer to OSHA 1926.650 subpart P for soil class descriptions and visual and manual test guidelines.

#### **D. Sloping, Benching, Shielding and Shoring Options:**

1. Maximum allowable OSHA limits for sloping require an angle not steeper than one and a half- (1½) horizontal to one (1) vertical [34 (thirty-four degrees)]. This 34-degree sloping is normally used for protection in type C soils.
2. Less slopes and benching require visual and manual soil type identification. **Competent** persons can conduct soil testing.
3. Other protection systems (shielding/shoring) require approval and/or designs by a registered professional engineer.

#### **E. Excavation Considerations Checklist:**

- Identify/assign competent person (must be on site.)
- Is excavation exempt from OSHA standards?
- Identify soil conditions/types.
- Are site plans available?
- Identify and locate underground/overhead utilities. (Call Dig Safe at 811)
- Consider weather conditions for excavation duration.
- Surface water or high ground water table.
- Identify protective systems needed. (Competent person.)
- Will professional engineer be needed?
- Is excavation considered a confined space? (Hazardous atmosphere.)
- Will water accumulation require dewatering?
- Identify stability of adjacent structures.
- Check for surface encumbrances (signs, poles).
- Consider exposure to equipment and traffic.
- Competent person to conduct and document daily inspections. (Requirement.)
- Plan access and egress points, (maximum 25' from employees).

- Materials, equipment, loose rocks/soil are 2' from excavation edge.
- Detailed written emergency procedure.

Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

**NO** employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

#### **F. Definitions:**

**Benching (Benching Systems):** Method of protecting employees from cave-ins by excavating the sides of the excavation to form one or a series of horizontal levels or steps, usually with vertical or near vertical surfaces between levels.

**Cave-in:** The separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation either by sliding or falling, in sufficient quantity so that it could entrap, bury, or otherwise injure or immobilize a person.

**Cohesive Soil:** Clay (fine grained soil), soil with high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical side slopes, and is plastic when moist. Cohesive soil is hard to break up when dry and sticks together when submerged. Cohesive soils include clay silt, sandy clay, silty clay, clay and organic clay.

**Competent Person:** Capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. Must be experienced and knowledgeable in OSHA excavation standards.

**Confined Space:** A confined space is any space having limited means of egress, not normally employee occupied, which could be subject to accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere. Confined spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaustion ducts, sewers, underground utility vaults, tunnels, pipelines and open top spaces more than four (4) feet in depth such as excavations, pits tubs, vaults and vessels.

**Excavation:** Any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.

**Fissured:** A soil material that tends to break along definite planes or fracture with little

resistance, or a material that exhibits open cracks, such as tension cracks in an exposed surface.

**Granular:** Gravel, sand or silt (coarse-grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

**Layered System:** Two or more distinctively different soil or rock types arranged in layers. Seams or weakened planes in rock or shale are considered layer.

**Shield (Shield system):** A structure that can withstand the forces imposed by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with OSHA 1926.652. Shields used in trenches are usually referred to as "trench boxes" or "trench shields".

**Shoring (Shoring System):** A structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

**Stable Rock:** Natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

**Trench (Trench excavation):** A narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation to reduce to dimensions measured from the forms or structure side of the excavation to 15 feet or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.