

## Definitions for Trenching and Excavation

**Aluminum Hydraulic Shoring:** a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

**Bedding:** A material that is usually placed around a pipe prior to backfilling. In most cases, bedding is gravel, sand, or fine crushed rock, and it extends from 5 inches below the pipe to 6 inches above the pipe.

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

**Bottom:** (Base or Floor) the bottom of the trench.

**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 falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

**Competent Person:** one who is 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.

**Cross braces:** the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

**Excavation:** any man-made cut, cavity, trench, or depression in the Earth's surface formed by earth removal.

**Exposure:** a threat of harm that exists from having no protection from a hazard when there are no protective measures provided.

**Faces or sides:** the vertical or inclined earth surfaces formed as a result of excavation work.

**Failure:** breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

**Hazard:** any object, situation, or behavior that has the potential to cause injury, ill health, or damage to property or the environment.

**Hazardous atmosphere:** an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

**Ingress and Egress:** “entry” and “exit,” respectively. In trenching and excavation operations, they refer to the provision of safe means for employees to enter or exit an excavation or trench.

**Kickout:** the accidental release or failure of a cross brace.

**Protective system:** a method of protecting employees from:

- material that could fall or roll from an excavation face or into an excavation
- cave-ins
- collapse of adjacent structures.

Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

**Ramp:** an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

**Registered Professional Engineer:** a person who is registered as a professional engineer in the state where the work is to be performed. (However, a professional engineer who is registered in any state is deemed to be a “registered professional engineer” within the meaning of Subpart P when approving designs for “manufactured protective systems” or “tabulated data” to be used in interstate commerce.)

**Risk:** a determination of what the consequence will be, should an accident occur. In other words, what do we stand to lose.

**Sheeting:** the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

**Shield:** (Shield system) a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect 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

1926.652(c)(3) or (c)(4). 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.

**Sides:** See Faces.

**Sloping:** (Sloping system) a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

**Spoil:** the pile of excavated earth that was removed to form the trench.

**Stable rock:** natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be 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.

**Structural Ramp:** a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

**Subsurface Encumbrances:** underground utilities, foundations, streams, water tables, transformer vaults, and geological anomalies.

**Support System:** a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

**Surcharge:** means an excessive vertical load or weight caused by spoil, overburden, vehicles, equipment, or activities that may affect stability.

**Surcharge Load:** any weight on top of the surface of the soil that would add extra stress to the walls of the trench. Spoil piles, backhoes, rocks, vehicles, buildings, or other loads placed near the trench opening would be surcharge loads.

**Surface Encumbrance:** utilities, foundations, streams, water tables, transformer vaults, walkways, bridges, roads, and geologic anomalies.

**Tabulated data:** tables and charts approved by a registered professional engineer and used to design and construct a protective system

**Toe:** The leading edge of the spoil pile

**Trench:** a narrow excavation (in relation to its length) made below the surface of the ground. The depth is greater than its width and the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).

**Trench Box:** (also known as a shield) a structure that is able to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. It can be a permanent structure or can be designed to be portable and moved along as work progresses. Additionally, it can be either premanufactured or job-built in accordance with 1926.652(c)(3) or (c)(4).

**Trench shield:** See Shield.

**Unconfined Compressive Strength:** the strength of a rock or soil sample when crushed in one direction (uniaxial) without lateral restraint. It is also described as the load per unit area at which soil will fail in compression. This measure can be determined by laboratory testing, or it can be estimated in the field using a pocket penetrometer, by thumb penetration tests, or by other methods.

**Uprights:** the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called sheeting.

**Wales:** horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

**Wall:** (Face, Sides) the sides of the trench.