

Great Western Painting

Trenching/Shoring/Excavations

EXCAVATING, TRENCHING & SHORING

Scope, application, and definitions applicable to this subpart. - 1926.650

Specific Excavation Requirements. - 1926.651

Requirements for protective systems. - 1926.652

Soil Classification - 1926 Subpart P App A

Sloping and Benching - 1926 Subpart P App B

Timber Shoring for Trenches - 1926 Subpart P App C

Aluminum Hydraulic Shoring for Trenches - 1926 Subpart P App D

Alternatives to Timber Shoring - 1926 Subpart P App E

Selection of Protective Systems - 1926 Subpart P App F

Excavating involves any earth removal which creates a cut, cavity, trench, or depression in the earth's surface. A trench is 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 so as to reduce the dimension measured from the forms or structure to the 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.

Prior to excavating, obstructions that may create a hazard to employees will be removed or supported and utility companies will be contacted, advised of the proposed work, and asked to establish the location of underground installations.

If the utility company cannot respond to this request within 24 hours and/or the exact location of the underground installations cannot be determined, actual work may begin provided that:

- a. extreme caution is observed.
- b. detection equipment or other acceptable means are used to locate the approximate location of the utility installation.
- c. as the approximate location is approached, the exact location will be determined by safe and acceptable means before proceeding.

In addition to calling the specific utility company, the competent person will call: **"811"** which is a One Call before you dig information service.

The below universal color indicates what utility is buried below ground:

- Red – Electric
- Orange – Communications, Telephone/CATV
- Blue – Potable Water
- Green – Sewer/Drainage

- Yellow – Gas/Petroleum Pipe Line
- Purple – Reclaimed Water
- White – Premark site of intended excavation

Caution must be exercised because:

1. Many underground utilities are not recorded.
2. Many that are recorded are not accurate.
3. Many are at different depths below ground than indicated.

Utilities must be physically identified to ensure they are not hit.

Once utilities are found, use signage incorporating the universal color codes, above.

Note: After we put in an underground item, we must report it so the next contractor does not hit it.

In open excavations, underground installations will be protected, supported or removed as necessary to protect employees.

To ensure employee safety, the competent person will ensure that during excavating work in trenches there is:

- a. appropriate access and egress for personnel and/or equipment such as stairs, ramps and ladders so as to require no more than 25 feet of lateral travel for employees in trenches four (4) feet or more deep.
- b. employee protection from head injury. All employees must wear hard hats.
- c. no spoil pile or equipment within two (2) feet of the edge of the excavation.
- d. employee protection from vehicular traffic such as barricades, ground guides for operators of equipment with a limited view, away sloping grades, etc..
- e. protection against potential falling loads..

Note: Employees may never work under loads of material being excavated.

- f. no danger to employees from water accumulation. This must be checked prior to work. See our inspection checklist for excavating.
- g. no danger from cave-in. Shoring, a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation, will prevent cave-ins.
 1. Shoring is not required for trenches less than five (5) feet deep if an examination by a competent person determines the soil has no potential for a cave-in. In this situation, vertical sides are allowed.

Soil Classification: Each soil and rock deposit will be classified by a competent person as Stable Rock, Type A, Type B, or Type C. The visual and manual analyses detailed in paragraph (c)(d), 1926 Subpart P App. A are acceptable. If soil properties, factors, or other conditions change in any way, the changes will be evaluated by the competent person and the soil, if necessary, reclassified.

2. Once a trench is over 20 feet deep, protective systems, which may include shoring, must be designed by a registered professional engineer.
 3. There are other methods of protection from cave-ins such as sloping or benching the adjacent ground according to specific criteria dependent on the soil conditions, weather, and adjacent structures.
 4. The total number of cave-in accidents is relatively small, however, the accidents which do occur are generally very serious and are much more likely to be fatal than other types of accidents in the construction industry.
- h. a method to prevent mobile equipment from falling into the excavation such as barricades. Ground guides will be used if the equipment operator does not have a clear view of the edge. If possible, the grade should slope away from the excavation.

If the atmosphere is dangerous or likely to be dangerous, testing will be done as often as needed and emergency rescue equipment -- such as breathing apparatus, safety harness and line, or a basket stretcher -- must be available.

When a hazardous atmosphere does exist, appropriate respiratory protection will be used and a rescue plan developed which includes having an attendant outside the hazardous area with appropriate equipment and training.

PROTECTIVE SYSTEMS

Except when an excavation is made entirely in stable rock or it is less than 5 feet in depth and a competent person finds no indication of potential cave-in, employees in an excavation will be protected from cave-in by protective systems designed in accordance with paragraphs (b) or (c) of 26 CFR 1926.652.

Sloping and benching systems: Specific criteria for sloping and benching systems are found in 1926 Subpart P App. B.

Support systems, shield systems, and other protective systems: Specific criteria for timber shoring for trenches is found in 1926 Subpart P App C. Specific criteria for aluminum hydraulic shoring for trenches

is found in 1926 Subpart P App D. Alternative to timber shoring, such as a trench shield, is found in 1926 Subpart P App. E.

The above devices must be in good repair and inspected before use. Defective items will be removed from service. Shields must be designed to resist calculated trench forces and at no time may they be subjected to excessive forces beyond that for which they were designed. Employees may not be in a shield when it is being installed or being removed.

All employees involved with excavating are to review these standards and understand, in general terms:

- a. The extensive degree of basic data, design, and knowledge that goes into employee protection during excavating projects.
- b. The types of soils and how to identify them on the job site.
- c. The soil condition -- specifically moisture content -- and how that impacts on stability during excavations.
- d. The absolute need for a competent person to be on site at all times during excavating work to visually and manually test soil conditions as work progresses and to maintain a safe site.

DAILY INSPECTIONS

Prior to work and as needed throughout the shift, a competent person will conduct daily inspections of excavations, adjacent areas and protective systems to find evidence of a developing cave-in situation; failure of protective systems; hazardous atmosphere; or other hazardous conditions.

After every rainstorm or event which would affect the safety of employees within an excavation, an inspection will be made by a competent person.

FALL PROTECTION

Walkways or crossings must be provided where employees or equipment are required or permitted to cross over excavations. Employees using these walkways and crossing will be protected from falling to a lower level by railings or guardrails. Specific criteria for guardrails is found in 29 CFR 1926.502(b), a copy of which is found in our Fall Protection Program located in Section III of this safety program.

Responsibilities of Competent Person

The competent person on Trenching, Shoring & Excavation projects is:
Robert Evans

The competent person's responsibilities include:

- a. Conducting inspections of the excavations, adjacent areas, and protective systems before the start of work; and, as needed

throughout the shift; and at least daily for potential cave ins, failures, hazardous atmospheres, or other hazards.

- b. Taking prompt corrective action or remove employees from recognized hazards.

Additionally, the competent person must be able to demonstrate the following:

- a. The ability to recognize all possible hazards associated with excavation work and to test for hazardous atmospheres. If appropriate, test will be conducted for air contaminants (oxygen, flammable gases, etc.) and provide ventilation when necessary..
- b. Knowledge of the current safety orders pertaining to excavation and trenching.
- c. The ability to analyze and classify soils.
- d. Knowledge of the design and use of protective systems.
- e. The authority and ability to take prompt corrective action when conditions change.

Before work begins, the competent person will ensure that employees are protected from hazards associated with water accumulation.

Employees are not work allowed in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation.

The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations will be monitored by the competent person to ensure proper operation.

Lastly, If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means will be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation.

Excavations subject to runoff from heavy rains will require an inspection by a competent person.

Great Western Painting

JOB SITE CHECKLIST [Excavating]

Job Site Identification: _____

Date: _____

(Signature of Competent Person)

Check appropriate box:

Yes No NA

Postings

- | | | | |
|---|--------------------------|--------------------------|--------------------------|
| a. OSHA Form 3165 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. OSHA Form 300A (February 1 to April 30) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Emergency Phone Numbers
(Hospital - Emergency Response - Main Office) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Excavating

- | | | | |
|--|--------------------------|--------------------------|--------------------------|
| a. Designated competent person on site
(Must have authority to stop work) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Underground utilities located, marked, utilities notified | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Daily inspection by competent person for hazards | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d. <u>Excavation: Depth less than 5 feet</u> | | | |
| 1. Inspection by competent person to ensure no indication
of potential cave-in | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e. <u>Excavation: Depth greater than 5 feet</u> | | | |
| 1. Sloping | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Benching | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Working within a protective device | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Excavation of earth material may be dug 2 feet
below the bottom of the shield if there are no
indications while the trench is open of possible
loss of soil from behind or below the shield. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f. <u>Excavation: Depth greater than 20 feet</u> | | | |
| 1. Protective systems designed by professional engineer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Engineering documentation on-site; readily available | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g. Egress (Depth 4 feet or greater) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1. Ladder accessible within 25' of lateral movement | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Ladder extends 3' above edge of excavation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Ladder inspected for defects | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

	<u>Yes</u>	<u>No</u>	<u>NA</u>
h. Spoil pile maintained a minimum of 2' from excavation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Water accumulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Loads are not suspended above employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Defective cables; chains; slings removed from service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Traffic control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. Warning signs and barricades in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Flagmen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Vests (reflective is required when exposed to public traffic)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Equipment</u>			
a. Inspected before use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Defective items tagged and removed from service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Powered Equipment</u>			
a. Inspected before use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Protected from overhead electrical hazards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>General Job Site</u>			
a. First aid kits available and stocked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Adequate restrooms facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Potable water available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Temporary Electrical Wiring</u>			
a. Extension cords inspected & free of defects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Ground fault circuit interrupters (GFCI) in use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. All equipment properly grounded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Temporary wiring clear of employee & vehicular traffic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Personal Protective Equipment (PPE) Required</u>			
(Note: Serviceable equipment available & training received)			
a. Hard Hats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Eye protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Appropriate, approved, work shoes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Gloves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Items specific to this job site</u>			
a. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>