OSHA

Trenching/Excavation

June 29, 2023

ENFORCEMENT PROGRAMS

REGIONAL EMPHASIS PROGRAMS

- Falls in Construction & General Industry
- Cranes in Construction
- Upstream Oil & Gas Industry
- Fabricated Metal Products
- **Construction (Trenching/Excavation & Confined Spaces)**
- Grain Handling Facilities
- High Noise in Manufacturing Industries
- Health Hazards in Healthcare Facilities
- Heat Illnesses
- Poultry Processing Facilities
- Transportation Tank Cleaning

ENFORCEMENT PROGRAMS

NATIONAL EMPHASIS PROGRAMS

- **Trenching and Excavation**
- Hexavalent Chromium
- Lead
- PSM Covered Chemical Facilities
  - Category 1 – Petroleum Refineries
  - Category 2 – Ammonia facilities
  - Category 3 – Chemical Manufacturers
  - Category 4 – Facilities likely to be PSM covered not in Cat 1, 2, or 3.
- Primary Metal Industries
- Ship Breaking
- Combustible Dust
- Hazardous Machinery/Amputations
- Heat NEP Effective April 8th 2022

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Most Cited OSHA Standards in Trenching and Excavation

FY2022 Region VI

Standard	# Total Vio	# Serious Vio	# Willful Vio	# Repeat Vio
Grand Total	**348**	**283**	**1**	**9**
1926.652(a)(1) **Protection from cave-ins** by an adequate protective system.	88	74	1	6
1926.651(c)(2) Safe means of **egress** from trench excavations.	64	56	0	1
1926.651(j)(2) Protection from excavated or other materials or equipment at least **2 feet from the edge of excavations**.	38	31	0	1
1926.651(k)(1) **Daily inspections** of excavations, the adjacent areas, and protective systems made by a competent person.	14	11	0	0
1926.100(a) **Head Protection**/ Protective helmet.	13	9	0	0
1926.21(b)(2) **Training.** Recognition and avoidance of unsafe conditions. Control or elimination of hazards.	11	7	0	0
1926.652(b) Design of sloping and benching systems.	10	9	0	0
1926.102(a)(1) The employer shall ensure that **each affected employee uses appropriate eye or face protection.**	5	4	0	0
1926.651(e) Exposure to falling loads.	5	4	0	0
1926.651(h)(1) Employees working in excavations in which there is **accumulated water**.	5	4	0	0

Most Cited OSHA Standards in Trenching and Excavation

FY2022 Oklahoma Area Office

Standard	# Total Vio	# Serious Vio	# Willful Vio	# Repeat Vio
Grand Total	**64**	**53**	**0**	**1**
1926.652(a)(1) **Protection from cave-ins** by an adequate protective system.	20	18	0	1
1926.651(c)(2) Safe means of **egress** from trench excavations.	15	13	0	0
1926.100(a) **Head Protection**/ Protective helmet.	11	8	0	0
1926.651(j)(2) Protection from excavated or other materials or equipment at least **2 feet from the edge of excavations**.	8	6	0	0
1926.651(k)(1) **Daily inspections** of excavations, the adjacent areas, and protective systems made by a competent person.	2	2	0	0
1926.1053(b)(1) Ladder **side rails did not extend at least 3 feet** (.9 m) above the upper landing surface.	2	2	0	0
1904.40(a) Copies of the records kept under part 1904 were not provide within four (4) business hours.	1	0	0	0
1926.602(c)(1)(vii) Unauthorized personnel shall not be permitted to ride on powered industrial trucks.	1	1	0	0
1926.651(e) Exposure to falling loads.	1	1	0	0
1926.651(h)(1) Employees working in excavations in which there is **accumulated water**.	1	0	0	0

Trenching And Excavation Safety

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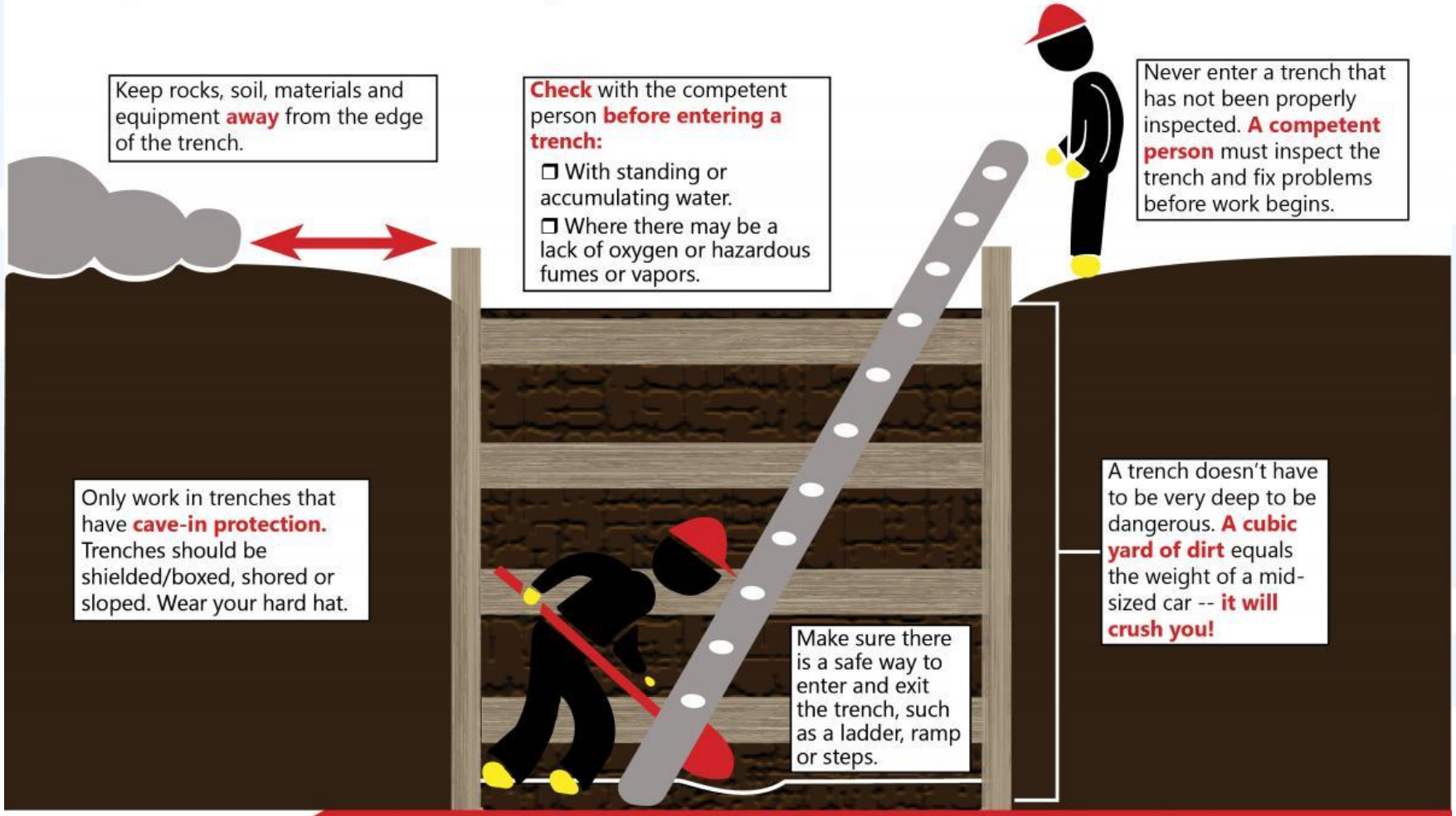
Practice Trench Safety. It Saves Lives.

Trench collapses cause fatalities and injuries.

It only takes a second for a trench to collapse. Take the following precautions to protect workers in trenches.



alliance CPWR THE CENTER FOR CONSTRUCTION RESEARCH AND TRAINING

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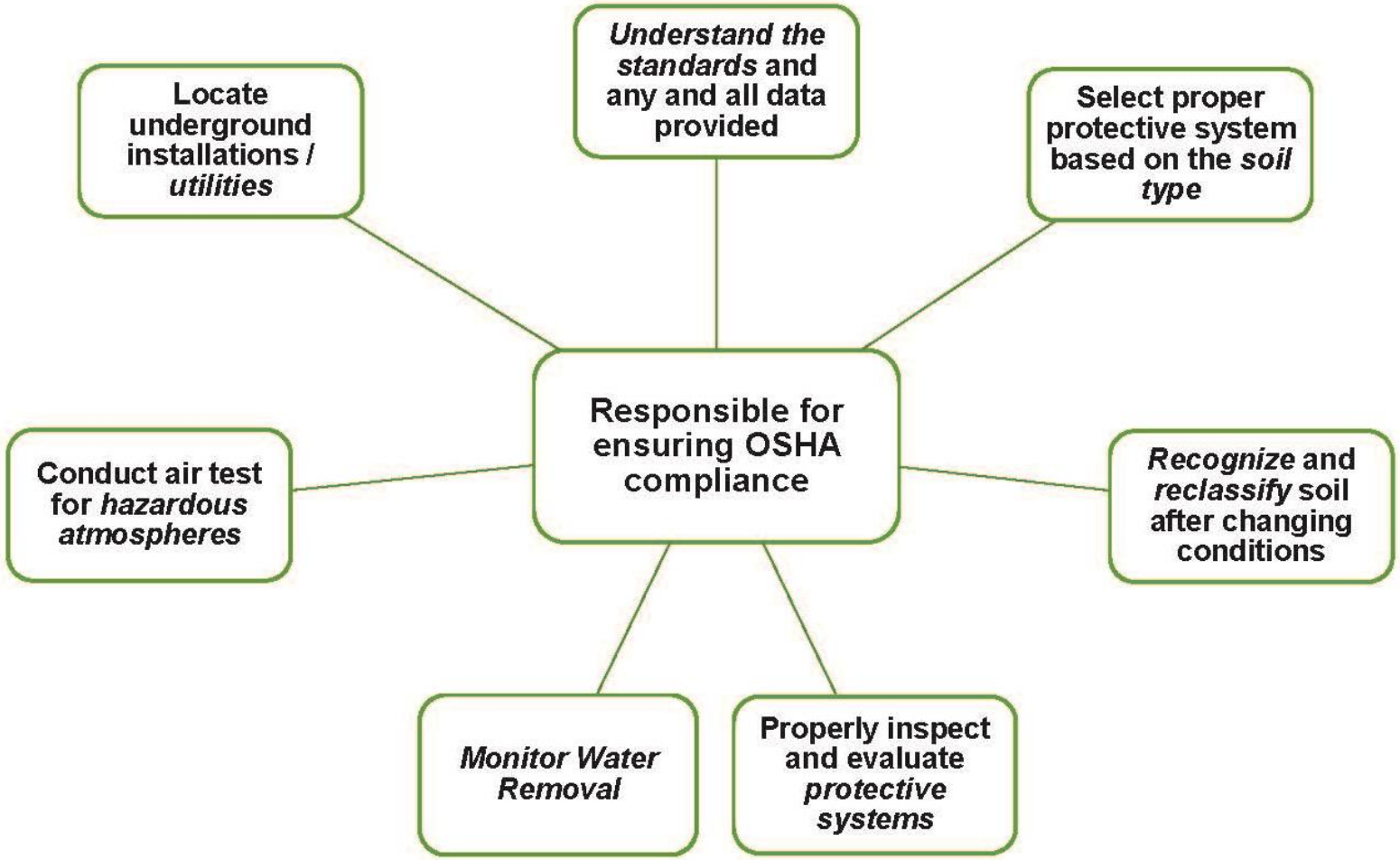
Competent Person - Responsibilities



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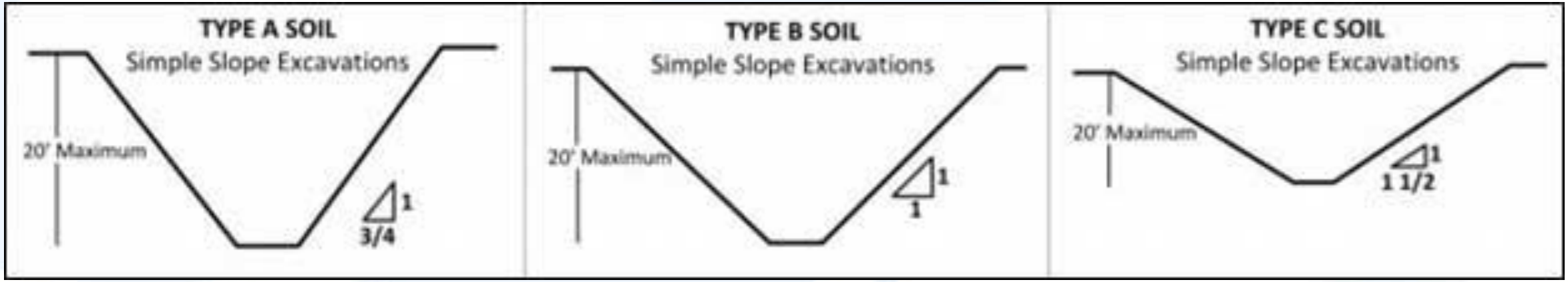

Soil Type	Height/Depth ratio	Slope Angle
Stable Rock	Vertical	90 degrees
Type A	Maximum allowable slope of 3/4:1	53 degrees
Type B	Maximum allowable slope of 1:1	45 degrees
Type C	Maximum allowable slope of 1 1/2:1	34 degrees

OSHA® QUICK CARD™

Working Safely in Trenches

When done safely, trenching operations can reduce worker exposure to cave-ins, falling loads, hazardous atmospheres, and hazards from mobile equipment.

OSHA standards require that trenches and protective systems be inspected daily and as conditions change by a competent person before work begins.

Never enter a trench unless:

- It has been properly inspected by a competent person.
- Cave-in protection measures are in place.
- There is a safe way to enter and exit.
- Equipment and materials are away from the edge.
- It is free of standing water and atmospheric hazards.

Prevent trench collapses:

- Trenches 5 feet deep or greater require a protective system.
- Trenches 20 feet deep or greater require a protective system designed by a registered professional engineer.

Protective systems for trenches:

- SLOPE or bench trench walls by cutting back the trench wall at an angle inclined away from the excavation.
- SHORE trench walls by installing aluminum hydraulic or other types of supports to prevent soil movement.
- SHIELD trench walls by using trench boxes or other types of supports to prevent soil cave-ins.

For more information:

U.S. Department of Labor

OSHA® Occupational Safety and Health Administration

www.osha.gov (800) 321-OSHA (6742)

OSHA 3243-09R 2018

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Fatal Trenching Incident Case Study

- On November 13, 2015, compliance officer observed a local television media report of a trenching accident.
- An employee was working inside of a trench installing an 8 inch sewer line.

Fatal Trenching Incident Case Study

- The trench was approximately 21 feet in depth with vertical walls.
- The employee was working in the northwest section of the trench when the trench wall collapsed burring the employee under approximately 3 feet of soil.

Fatal Trenching Incident Case Study

- The soil was previously disturbed and the soil was classified cohesive Type B soil.
- At the time of the incident there was no safe means of egress.
- There were 4 trench boxes available for us onsite.
- There was a competent person onsite, but he did not inspect the trench for hazards.

Fatal Trenching Incident Case Study

OSHA issued a Serious Violation of:

1926.651(k)(1) – The employer **did not conduct daily inspections**.

OSHA issued Repeat Violations of:

1926.651(c)(2) – A **safe means of egress** was not located in the trench.

1926.652(a)(1) – Each employee in an excavation was not **protected from cave-ins** by an adequate protective system.

Trenching and Excavation Significant Case Study

- In September of 2020, the OKAO received a referral (with photos) of workers working in an excavation with unprotected sides that was more than 5 feet deep.

- The next day at the site the compliance officer observed workers working inside of a second excavation with unprotected sides. This excavation measured approximately 7 feet deep.

Trenching and Excavation Significant Case Study

- The employer was contracted to install approximately 1,700 LF of waterlines.
- The foreman was directing work from inside of the excavator being used to dig the trench and excavation.
- This is a photograph of the trench with unprotected sides and no safe egress.
- This trench had several feet of accumulated water at the bottom. The employee is standing on a pipe.

Trenching and Excavation Significant Case Study

- The trench and excavation were both located along a busy road and parking lot.
- The soil was previously disturbed and the soil samples for each was classified cohesive Type B soil.
- This is a photograph of the trench with unprotected sides and no safe egress.

Trenching and Excavation Significant Case Study

- The only ladder available onsite was not in the excavation.
- The ladder was damaged.
- Also, the ladder did not extend at least 3 feet above the landing.

Trenching and Excavation Significant Case Study

- The employer was cited in 2017 for trenching and excavation violations at three (3) separate worksites.

Partial Citation Issued:

- Due to the hazards observed on the second day and the employer not ensuring employees were not exposed to cave-in hazards, a partial citation was issued on the third day of the inspection and hand delivered to the employer onsite.

- The citation was a Willful violation of 1926.652 (a)(1) each employee in an excavation was not protected from cave-ins by an adequate protective system.

Trenching and Excavation Significant Case Study

Final Citation Issued contained:

Willful 1926.100(a) Lack of protective helmets.

Repeat 1926.651(c)(2) A **safe means of egress** was not located in trench or excavation.
Repeat 1926.651(h)(1) Employees working in excavation with **accumulated water**.
Repeat 1926.651(j)(2) Employees were not protected from **equipment falling into excavation**.
Repeat 1926.1053(b)(1) Ladder **siderails did not extend at least 3 feet** above the landing.

Serious 1926.21(b)(2) **Training** of unsafe conditions.
Serious 1926.1053(b)(6) Ladder **used on unstable surfaces**.
Serious 1926.1053(b)(16) **Portable ladder with structural defects** was used and not taken out of service.

OTS 1904.40(a) Injury and illness logs were not provided within 4 hrs.

Trenching and Excavation Resources

https://www.osha.gov/trenching-excavation

Construction: Trenching and Excavation eTool:

https://www.osha.gov/etools/construction/trenching

Compliance Directive for the Excavation Standard:

https://www.osha.gov/sites/default/files/enforcement/directives/CPL_02-00-165.pdf