Job hazard analysis (JHA): Trenching

Task: Trenching	**Site or job:**
Crew:	**Date:**
Supervisor:	

No.	Job step	Hazard	Controls (most effective first)
1	Plan the dig and locate utilities	Digging into a gas, electric, water or sewer line	**Eliminate:** Reroute the trench or use trenchless methods where a line cannot be moved or de-energized. **Administrative control:** Find the estimated location of utilities before opening the excavation. (29 CFR 1926.651(b)(1)) **Administrative control:** Contact the utility owners and ask them to mark their lines before digging starts. (29 CFR 1926.651(b)(2)) **Administrative control:** Find the exact location by safe means, such as careful hand digging, when you get close. (29 CFR 1926.651(b)(3))
2	Plan the dig and locate utilities	Adjacent walls, sidewalks or foundations are undermined	**Engineering control:** Shore, brace or underpin structures that the dig could destabilize. (29 CFR 1926.651(i)(1)) **Administrative control:** Have the competent person review nearby loads, traffic and structures before work starts.
3	Set up the site	Vehicles, equipment or spoil pile fall or roll into the trench	**Engineering control:** Keep spoil and equipment at least 2 feet from the edge, or use retaining devices. (29 CFR 1926.651(j)(2)) **Engineering control:** Barricade or flag the open trench so nobody walks or drives into it. **Administrative control:** Plan haul routes and mark where trucks load so they never pass the edge.
4	Set up the site	Struck by traffic	**Engineering control:** Separate the work area from traffic with cones, barriers and flaggers as the plan requires. **PPE:** Wear a high-visibility vest or garment made of reflective material when exposed to public traffic. (29 CFR 1926.651(d))
5	Excavate and install the protective system	Cave-in while the trench is open	**Engineering control:** Protect each employee in the trench with a sloping, benching, support or shield system, unless the stable rock or shallow exceptions apply. (29 CFR 1926.652(a)(1)) **Engineering control:** Select and build sloping and benching or shielding by one of the allowed design options. (29 CFR 1926.652(b)) **Engineering control:** Keep the support system installation close behind the digging. (29 CFR 1926.652(e)(2)(ii)) **Administrative control:** Keep employees out of the trench until the protective system is in place.

No.	Job step	Hazard	Controls (most effective first)
6	Excavate and install the protective system	Excavation below the shield or support	**Engineering control:** Dig no more than 2 feet below the bottom of support members, and only if the system is designed for the full depth. (29 CFR 1926.652(e)(2)(i)) **Administrative control:** Never let members carry more load than they were designed to withstand. (29 CFR 1926.652(e)(1)(iii))
7	Provide a way in and out	Worker cannot get out fast during a collapse or flood	**Engineering control:** Place a ladder, stairway, ramp or other safe means of egress within 25 feet of lateral travel in trenches 4 feet or deeper. (29 CFR 1926.651(c)(2)) **Administrative control:** Keep the ladder top above the edge and clear of spoil.
8	Test the air and control water	Low oxygen or toxic or flammable gas	**Engineering control:** Test the atmosphere before entry in trenches deeper than 4 feet where a hazardous atmosphere could exist, and ventilate as needed. (29 CFR 1926.651(g)(1)(i)) **Engineering control:** Ventilate to prevent flammable gas above the limit in the standard. (29 CFR 1926.651(g)(1)(iii)) **PPE:** Provide respiratory protection when ventilation alone is not enough. (29 CFR 1926.651(g)(1)(ii))
9	Test the air and control water	Water accumulates in the trench	**Engineering control:** Pump or divert water, and have the competent person monitor the pumping. (29 CFR 1926.651(h)(2)) **Administrative control:** Keep workers out of trenches with accumulated or accumulating water unless precautions protect them. (29 CFR 1926.651(h)(1))
10	Inspect daily	Changes in soil, rain or vibration weaken the walls	**Administrative control:** Have a competent person inspect the excavation, adjacent areas and protective system daily, before work starts and as conditions change. (29 CFR 1926.651(k)(1)) **Administrative control:** Remove workers from the area if the competent person sees signs of a cave-in, system failure or hazardous atmosphere. (29 CFR 1926.651(k)(2))
11	Work in the trench and handle loads	Struck by a load, bucket or pipe	**Eliminate:** Set pipe and materials from the surface with equipment when the job allows. **Administrative control:** Do not permit anyone under loads handled by lifting or digging equipment. (29 CFR 1926.651(e)) **Administrative control:** Use hand signals or a signal person between the operator and the pipe layer. **PPE:** Wear a hard hat, steel-toe boots and gloves.

No.	Job step	Hazard	Controls (most effective first)
12	Remove protection and backfill	Collapse while the support is removed	**Engineering control:** Start removal at the bottom of the excavation and release members slowly, watching for any sign of failure or cave-in. (29 CFR 1926.652(e)(1)(v)) **Engineering control:** Backfill together with removal of the support system. (29 CFR 1926.652(e)(1)(vi)) **Administrative control:** Add extra support before temporarily removing any member. (29 CFR 1926.652(e)(1)(iv))

Required PPE

- Hard hat
- High-visibility vest or garment when near traffic (29 CFR 1926.651(d))
- Steel-toe boots
- Work gloves
- Respirator where the atmosphere requires one (29 CFR 1926.651(g)(1)(ii))

OSHA sections

29 CFR 1926.651 Specific excavation requirements; 29 CFR 1926.652 Requirements for protective systems; 29 CFR 1926.21 Safety training and education

Reviewed with the crew. Names and signatures

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