



Excavation and Confined Spaces (During Dig)

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Before you dig:

- Remove or support potentially hazardous surface encumbrances.
- Locate utilities.
- Design structural ramps for access and egress.
- Provide workers with reflector vests if they will be exposed to vehicular traffic.
- Inspect and classify the soil by type. Visual *and* Manual tests to determine which type of soil you will be digging.
- Use the soil classification to configure the steepness of the excavation slope.

During the dig:

- Underground Utilities (Detect and remove or support).
- Ramp—uniform thickness, all parts connected, cleats.
- Stairways, ramps, or ladders in trenches > 4 feet deep
- Reflective vests (if exposed to traffic).
- Equipment
 - Workers out from under
 - Warning System (e.g. barricades, hand signals, stop logs)
 - 2 feet away from edge of hole
- Lifelines for deep or confined footing excavations.
- Keep ground water out of the excavation.
- Protect workers from mudslide (for example, use a shield system, a pump system for drainage, or lifelines).
- Support nearby structures.
- Protect workers from falling loose rock or soil on the pit face (scale the face, install protective barricades).
- Keep equipment at least two feet from the edge of the excavation edge.

- Inspect the excavation site daily for evidence of possible cave-in or failure of safety systems.
- Use guardrails on walkways that cross six feet over the excavation.
- Testing and controls to prevent exposure to hazardous atmospheres.

Protective systems where workers in hole > 5 feet deep:

- Follow the manufacturer's specifications and recommendations on how to use your support system.
- Keep at the dig site a copy of the tabulated data on soil that you use to select your support system.
- When removing the support system, start at the bottom and work up. Backfill the hole as the support system is removed.
- Install shield system to prevent sudden lateral movement if there is a cave-in.
- Do not allow workers in the shield system when it is being installed, repositioned, or removed.

Confined Spaces: storage tanks, sewers, acid tanks, tunnels, manholes, boilers, etc.

Before entering a confined space:

- Disconnect or blind all pumps and lines to prevent the possibility of air contamination.
- Make accidental reconnection of the lines or valves impossible.
- Lock off all electrical equipment and mechanical devices capable of causing injury, and leave the key with person working in the confined space.
- Empty, purge, or flush the confined space to remove dangerous substances.
- Ventilate any hazardous atmosphere (unless workers use protective equipment).
- Inspect equipment for defects and ignition hazards.
- Install a railing to prevent an accidental fall through the opening.

Testing the air:

- Test the air in the confined space from outside the confined space, as far as possible.
- For workers entering without protective gear, test for:
 - Oxygen
 - Flammables
 - Toxic materials expected to be present.

Inside the confined space:

- At least one worker entering the confined space must wear an alarm device that reads the air for oxygen and dangerous gasses.

- If an attendant is present outside the space, he must test the air no less than once per hour.

If the air inside is dangerous:

- Workers must wear a harness and retrieval line and appropriate protective equipment, including a breathing apparatus.
- An attendant must be stationed outside the confined space, and he must be able to call for help.
- Rescue teams must be available.
- No sources of ignition can enter, including:
 - Fans that might spark a fire
 - Cylinders of compressed gasses
 - Electric tools with exposed wires

Employer must keep a written entry permit system, which shall include:

- the minimum standards necessary for entry into the confined space;
- the record of atmospheric tests;
- calibration dates for the oxygen detector and combustible gas indicator;
- the signature of the person responsible for the permit;
- a written description of the work to be done;
- an expiration time of no more than twelve hours for any permits granted.

Training requirements:

- Train all employees entering the space in hazard recognition, equipment use, tagging, and emergency procedures.
- Train rescue teams to use their equipment, to remove a body through an opening the size of the real space. At least one member of the rescue team must hold current CPR and first aid certifications.

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