

Wastewater Safety

- Types of Hazards
 - Physical injuries
 - Infections and infectious diseases
 - Confined Spaces
 - Oxygen deficiency
 - Toxic or suffocating gases or vapors
 - Explosive gas mixtures
 - Electrical shock

Safety

- The most common physical injuries
 - Cuts and bruises
 - Strains and sprains
 - Falls
- Most of these injuries can be avoided by proper use of hand tools, ladders, proper lifting techniques, use of personal protective equipment and by following established safety procedures.

Safety

- As an operator you can be exposed to
 - Cholera
 - Dysentery
 - Gastroenteritis
 - Polio
 - Typhoid fever
 - Tetanus
 - Hepatitis

How To Minimize Your Risks

- Wash hands frequently, and thoroughly and always prior to eating and drinking or smoking.
- Eat, drink or smoke only in designated areas, never while working in direct contact with wastewater.
- Always wear personal protective equipment

How To Minimize Your Risk

- Personal Protective Equipment
 - Coveralls
 - Goggles, safety glasses or face shield
 - Waterproof latex gloves
 - Water proof rubber boots
 - Respiratory protection (If exposed to mist or spray)

How To Minimize Your Risks

- Practice Good Hygiene
 - To prevent transmitting diseases wash and change into clean clothes before going home.
 - Clean contaminated tools with a 2% bleach solution.
 - Wash and treat cut and abrasions promptly.
 - Keep your fingernails short and clean.
 - Make sure your tetanus shot is up to date.

Confined Spaces

- WHAT IS A CONFINED SPACE?
 - Large enough, or so configured, that an employee can bodily enter and perform assigned work.
 - Has a limited or restricted means for entry or exit.
 - Is not designed for continuous occupancy.

Permit Required Confined Space

- A permit required confined space must meet the definition of a confined space and has one or more of the following characteristics:
 - Contains or has the potential to contain a hazardous atmosphere.
 - Contains a material that has the potential for engulfing the entrant.
 - Has an internal configuration that might cause an entrant to be trapped or asphyxiated.
 - Contains any other safety or health hazards.

A Non Permit Confined Space

- Is a confined space that does not contain, nor has the potential to contain, any hazard capable of causing death or serious physical harm (with respect to atmospheric hazards.)

Confined Space Entry Preparation

- Use the following steps when preparing the confined space for entry:
 - Have in place warning signs and/or barriers.
 - Have in place tools, safety equipment, and monitoring equipment.
 - Isolate all mechanical and/or electrical hazards.
 - Ventilate the confined space.

Test the Atmosphere

- If the oxygen content is **Less than 19.5%** or **greater than 21.5%**, you will need to perform additional ventilation, then shut off ventilation equipment and re-test the oxygen content.
- If the oxygen content is **between 19.5%** and **21.5%**, continue entry preparation.

Test for Flammable Gas Levels

- Less than 10% of the Lower Explosive Limit (LEL), continue with entry preparations.
- Above 10% of the LEL, continue ventilation then, shut off and re-test.
- If the reading is still above 10% LEL the confined space must be cleaned before entry.
- Never enter a confined space at levels exceeding the Permissible Exposure Limits without Personal Protective Equipment. (PPE)

Atmospheric Testing Procedures

- Equipment shall be calibrated as instructed by the manufacturer.
- Test equipment in a known atmosphere to insure its accuracy.
- Ventilation equipment must be shut off before conducting any atmospheric testing.
- Atmosphere must be continuously monitored at the top, middle and bottom of the confined space while work is being done.

Utilizing Safety Equipment

- Where practical, all personnel entering a confined space should be equipped with a retrieval line secured at one end to the entrant by a full-body harness with its other end secured to a tripod lifting hoist.

Complete and sign the Permit

- Assemble all personnel involved and review safety issues and emergency rescue procedures.
- The entry supervisor will then add any needed information, then complete and sign the permit.

Confined Space Cleaning Procedures

- If cleaning must be conducted in a confined space to achieve acceptable atmospheric conditions, the following procedures must be followed:
 - All entrants must be equipped with **designated safety equipment.**
 - All entrants must be equipped with an **SCBA.**
 - No **spark-producing** tools will be allowed.

Training Responsibilities

- Everyone involved in a confined space project has certain responsibilities that requires a certain amount of training. It is very important that every individual is familiar with their responsibilities.
- This section outlines the responsibilities and training requirements of each individual involved in a project.

Responsibilities and Training

- Department Heads or Their Designated Representative
- Authorized Entrants
- Standby Persons (Attendants)

Responsibilities and Training Requirements

- Department Heads or Their Designated Representative
- Authorized Entrant(s)
- Standby Person(s) - (Attendants)

Responsibilities of the Department Head

- Identifying confined spaces within the facilities under their control.
- Identifying hazards within a confined space under their control.
- Insuring that the required atmospheric tests are performed and recorded at the confined space.
- Obtaining and maintaining all equipment necessary to complete the confined space entry.

Responsibilities of the Department Head

- Authorize entry by signing the entry permit after all conditions for a safe entry have been met.
- Terminating the entry and canceling the permit when:
 - Entry operations covered by the entry permit have been completed.
 - A condition that is not allowed under the entry permit arises in or near the permit space.

Responsibilities of the Authorized Entrants

- The person(s) authorized to enter a confined space shall be responsible for and receive training in the following:
 - The knowledge of possible hazards during entry, including the mode, signs or symptoms, and consequences of the exposure.
 - The knowledge of atmospheric testing, monitoring equipment and ventilating equipment needed to obtain acceptable entry conditions.
 - Communication equipment necessary to maintain contact with standby.

Responsibilities of the Entrants

- Proper use of personal protective equipment, traffic barriers, ladders, needed for a safe ingress and egress or any other equipment needed for a safe entry into or rescue from permit spaces.
- Communication with the attendant is necessary to monitor the entrant status and enable the attendant to alert entrants of the need to evacuate the space if required.

Responsibilities of the Entrants

- Alert the attendant whenever:
 - The entrant recognizes any warning sign of exposure to a dangerous situation, or detects a prohibited condition.
 - **Exiting the permit space whenever:**
 - An order to evacuate has been given by the attendant or the entry supervisor;
 - The entrant recognizes any warning or symptom of exposure to a dangerous situation;
 - The entrant detects a prohibited condition: or the evacuation alarm is activated.

Responsibilities of the Standby Person (Attendant)

- Persons authorized to perform duties as attendant shall be responsible for and receive training in the following:
 - Knowing the hazards during entry, including the mode, signs or symptoms, and consequences of the exposure.
 - Is aware of possible behavioral effects of hazard exposure in the authorized entrant.
 - Continuously maintaining an accurate list of authorized entrants in the permit space.

Responsibilities of the Standby Person

- Remains outside the permit space during entry operations until relieved by another attendant.
- Attempting ***non-entry*** rescue if proper equipment is in place and the rescue attempt will not present further hazards to the entrant or attendant.
- Communicating with the entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space when conditions warrant.

In the Event of an Emergency

- Never enter a confined space that might have a hazardous and/or toxic atmosphere, even to help a co-worker. Many workers die trying to rescue other workers
 - In an emergency call 911 immediately, then try to help your co-worker from outside the confined space.

Trench Safety

- Most trenches are dug to install new or repair existing pipe. This includes but is not limited to Utility mains and service lines.
- Many fatality accidents occur in trenches every year because workers do not take the time or safety steps to protect themselves or co-workers from possible injury or death.

Types of Hazards

- Cave-ins *(most deaths in trenches are from cave-ins)*
- Falls
- Being hit from falling objects
- Electrocution
- Combustible, toxic gas or oxygen deficiency

Trench Safety

- The Occupational Safety and Health Administration (OSHA) has regulations to protect workers in trenches.
- OSHA regulations must be followed at all times unless.
 - The trench is in stable rock.(This decision must be made by a competent person)
 - The trench is less than 5 feet deep and a competent person finds no reason to expect a cave-in

Competent Person

- Means one who is capable of and has been trained to identify existing and predictable hazards in the surroundings.
- Is able to recognize working conditions which are unsanitary, hazardous or dangerous to employees.
- Has the authorization to take prompt corrective measures to eliminate them

Designated Competent Person

- The designated competent person shall have training/experience and knowledge of:
 - Soil analysis
 - Use of protective systems
 - OSHA requirements of 29 CFR Part 1926 (Subpart P.)
 - Conditions that could result in cave-ins.
 - Failures in protective systems
 - Hazardous atmospheres
 - Other hazardous conditions, including those associated with confined space.

Competent Person

- A competent person must check the soil to determine the correct worker-protection system to use.
 - A trench can be in stable rock, or type A, type B or type c soil. Stable rock and type A are the safest. Most soils are type B. Sand and trenches with water are type C soils.
 - Water in a trench can mean danger to workers. You will need to use special support or shield systems, water removal equipment, safety harness and life lines.

Before Excavating

- Check all equipment to see that it is in good working condition.
- This includes emergency rescue equipment if a hazardous atmosphere exists or can reasonably be expected to exist.
- Call 1-800-Dig Safe to request a locate of the underground utilities in the excavation area.
 - (This need to be done three working days prior to excavating).

During Excavation

- Water in a trench can mean danger to workers. You will need to use special support or shield systems, water removal equipment, safety harness and life lines in conformance with 29 CFR 1926.104
- You will need to use sloping, benching or shoring to prevent cave-ins.
- Trenches 4 feet or more in depth must be provided with a fixed means of egress.

During Excavation

- Spacing between ladders or other means of egress must be so placed that a worker will not have to travel more than 25 feet laterally to the nearest means of egress.
- Ladders must be secured and extend a minimum of 36 inches above the landing.
- Metal ladders should be used with caution, particularly when electric utilities are present.

During Excavation

- Employees must be protected from falling loads, to prevent materials, rocks, soil or tools from falling into the trench; use barriers, and keep your hard hat on at all times.
- The competent person should test the air as often as needed to see that the trench is free of atmospheric contaminants.
- Employees should not work in hazardous and/or toxic atmospheres.

During Excavation

- Some trenches qualify as confined spaces. When this occurs, compliance with confined space standard is also required. Never enter or send an employee into a confined space without having had confined space training.

Safety Reminder

- Never enter a trench that is caving in, or that might have a hazardous and/or toxic atmosphere.
- **No job is worth putting yourself or other workers in a position to be maimed or killed.**