

## ENTRY OF CONFINED SPACES AND TRENCH EXCAVATION

### 1.0 Purpose:

The procedures set forth in this document are designed to protect the health of employees and significantly reduce the possibilities of accidental injury and death associated with entering, working in and exiting from confined spaces and performing trench excavation.

### 2.0 Scope:

These procedures are designed not only to make the confined space and trench safe for the worker, but also to make the worker aware of the hazards associated with this work area and the safe work practices necessary to deal with these hazards.

### 3.0 Policy:

#### 3.1 Definition of Confined Space:

- A space which by design has limited openings for entry and exit, unfavorable natural ventilation which could contain or produce dangerous air contaminants, and which is not intended for continuous employee occupancy. Any space where an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes and tapers to a smaller cross section. Contains any other recognized serious safety or health hazard.

Confined spaces include but are not limited to storage tanks, pits, sewers, tunnels, underground utility vaults and pipelines.

#### 3.2 The City of Lake Forest's policy is that personnel **do not enter** a confined space if it is confirmed to have the potential for causing injury and/or illness. If a confined space must be entered for service work, these procedures must be followed:

1. **Permit.** A confined space entry permit completed and signed by a qualified person. (See attached classification table.)
2. **Entry Checklist.** No person shall enter any confined space before reviewing the confined space entry checklist.
3. **Atmospheric Testing.** The complete testing of the atmosphere in the confined space prior to entry and in accordance with NIOSH permitting procedures. The City's portable gas detector simultaneously tests the following conditions:
  - A. Oxygen -- Monitors a safe level and sounds an alarm when at or below 19.5% oxygen or if oxygen exceeds 25%. Ventilation is required to insure the oxygen level is between a range of 19.5% - 21%.
  - B. Combustible Gas -- Monitors a safe level and sounds an alarm at 20% of the lower flammable limit of the gas.

- C. Carbon Monoxide -- monitors a safe level and sounds an alarm at 50 PPM (parts per million).
  - D. Hydrogen Sulfide -- Monitors a safe level and sounds an alarm at 10 PPM (parts per million).
4. **Ventilation and Monitoring.** In the event there is a need to ventilate a confined space to insure a safe entry, a Homelight 111B Power ventilator and 15-foot air duct is available. To ventilate the space, a sewer manhole for example, the point of entry would be ventilated as well as other structures upstream and downstream, if possible. After ventilating, personnel would retest the atmosphere to ensure safe levels are present before allowing anyone to enter the structure. Anytime ventilation is needed, continuous monitoring of the confined space is required. Before entering a class "A" or class "B" confined space, the qualified person will notify Police/Fire personnel of the intent to enter. The qualified person will notify Police/Fire personnel again when work in the confined space is complete.
5. **Visual Inspection.** Before entering the confined space, personnel will inspect for and remove any loose material that may fall on anyone working in the confined space.

Entry steps in the confined space:

- A. Are they available?
- B. Check their condition.

When entering an intake well, safety climbing equipment will be installed on all ladders and each time an employee enters or leaves the intake well, he/she will be required to wear this equipment. The standby person at the top of the intake well will also wear a full harness and have a DBI/SALA safety block that will be attached to a beam above. This retractable cable has an automatic locking system that will prevent the worker from falling. In the event that someone should be injured or get sick and not be able to climb the ladder on their own, the DBI/SALA safety block system has a hand winch that can be used to hoist them up. In the event of such an injury, the Fire Department will be called upon to help in rescue operations. Entry into any of the mixing or settling basins will be accomplished using the DBI/SALA safety block as well. The safety block can be attached to any of the ½-inch stainless steel eyebolts located above the entry points in mixing/ settling basin. It should be attached to the upper bracket on the ladders. The safety block may also be used when working on equipment in #1 mixing/settling basin. For this use, the block may be attached to 3/8-inch stainless steel cable so the worker will have the ease of moving around. When using the safety block system, the employee would then attach the cable to the full body harness and climb down the ladder into the basins. After safely entering the basin, the employee can remove the cable from the harness and let it retract so it will be ready when the employee exits the basin. No employee will enter or exit basins without the body harness and safety block attached.

6. **Entry and Rescue.** The City of Lake Forest utilizes a DBI/SALA Rescue and Retrieval System. This is the main method of rescue from the confined space and is used in conjunction with the DBI/SALA ANSI Class III full body harness with shoulder retrieval D-Rings. The secondary method of rescue would be a DBI/SALA nylon rope retrieval tag line with spreader bar to attach to a tripod system. The Lake Forest Fire Department is also equipped with a tripod and rescue rope systems.

### 3.3 Trench Excavation Procedures:

When working in an excavation, employees will utilize the angle of repose method 1.5/1 or hydraulic shoring. A trench shielding box can also be utilized. The soil in Lake Forest is considered Class C, and each excavation should be treated under this classification.

Safety procedures for excavations are as follows:

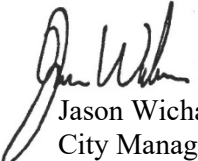
1. Call JULIE for utility locates.
2. All personnel on job-site will utilize proper personal safety equipment.
3. For each excavation, a competent person will decide whether to use angle of repose 1.5/1, hydraulic shoring or an approved trench shielding box.
4. While excavating, the backfill materials, tools, equipment and vehicles will be placed at least 2 feet from the edge of the excavation.
5. When the area to be repaired is excavated, the hydraulic shoring shall be installed starting from the top of the excavation and working down.
6. When the excavation is properly shored, the actual repair may proceed utilizing a ladder as a means of egress. The ladder will be within 25 feet of personnel in the excavation, and extend 3 feet above the top of the trench wall.
7. When the necessary repairs are complete and all personnel have exited the excavation, the shoring may be removed starting from the bottom and finishing at the top.
8. Backfill excavation using caution when filling around utilities.

Personnel in an excavation are to be closely monitored by personnel above-ground. Any problems that may be encountered by personnel in the excavation are handled by the above-ground person. If an emergency situation develops, above-ground personnel have the available communication (cellular phone and two-way radio) to contact emergency crews.

- 3.4 City employees will follow normal safety practices for personnel as defined in the City personal protective equipment checklist. There is always a standby person posted above-ground and in communication with the worker in the confined space. This standby person has at his disposal a radio system and provides direct communication with the Police/Fire Departments and available rescue units should the need arise.

### 4.0 Distribution:

Employee Information website, [www.citylf.org](http://www.citylf.org), and employees performing confined space entry duties.

  
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