
SANITARY AND STORM SEWER SAFETY PROCEDURES FOR MANHOLES AND LIFT STATIONS

Confined Space Entry

1. All crews assigned to enter sanitary and storm manholes shall be provided with proper safety equipment. The following safety equipment shall be used:
 - a. approved gas detector (properly calibrated);
 - b. fresh air blower;
 - c. safety harness, rope, and tripod safety system; and
 - d. an approved hard hat.
2. All sanitary and storm sewer manholes, which have been designed to be entered for inspection and maintenance on a regular basis, shall follow the following procedures **BEFORE ENTERING THE CONFINED SPACE**:

Before allowing anyone inside the confined space, test the space for all three atmospheric conditions.

- a. Oxygen content must be at least 19.5% in the confined space, measured at all levels (bottom, middle, and top). The safe oxygen level is between 19.5% and 21%. **Do not enter the confined space if the oxygen level is below 19.5% or above 21%.** Due to the extreme danger of suffocation in confined spaces, constant and continuous oxygen monitoring is required throughout each work period. An oxygen content above 23% can cause explosions or vigorous burning of flammable materials, including your hair or clothing.
- b. After you have determined oxygen content, **use the detector to measure flammability at all levels of the confined space (bottom, middle, and top).** Flammability is measured in terms of the Lower Flammable Limit (LFL) or Lower Explosive Limit (LEL). This is the smallest concentration of a combustible gas in air that will explode when it contacts a spark or open flame.
- c. Finally, test the atmosphere for any toxic concentrations of vapors. Toxicity is measured in terms of the Threshold Limit Value (TLV). **Use the detector to measure toxicity at all levels of the confined space (bottom, middle, and top).** Since toxic concentrations may be lighter or heavier than air, they can be present at the top or the bottom of the confined space.

Note: The confined space must be tested at three levels for each atmospheric condition. Each level must be tested for a minimum of 60 seconds. The gas detector itself can be lowered into the confined space atmosphere with a safety line or the detector can be used with an aspirator pump so the detector is not lowered into the confined space. **Consult the detector operating procedures manual if you have any operating questions.**

- d. A fresh air blower ventilation system shall be set up and in operation **before and during** all inspection and maintenance procedures.
- e. After the air blower ventilation system has been in operation and the confined space has been tested and determined to be safe for entry, the operator shall be equipped with:
 1. A safety harness and lifeline which is attached to the tripod safety retrieval system.

2. An approved, properly calibrated gas detector that is in operation the entire time the employee is in the confined space. This is necessary due to the possibility of a rapid change in the confined space atmosphere.
 3. An approved hard hat.
- f. If permanent ladder steps are not provided in the confined space, an aluminum ladder in good operating condition, shall be used to enter the confined space.
 - g. One person shall be stationed above ground for support purposes whenever a confined space is entered.
3. Entering sanitary and storm sewer lift stations that are designed to be entered regularly, shall have the power apparatus **locked out (off)** while the employees are working on the lift station system. Locking out the power apparatus prevents an accidental pump start while employees are working on the system.
 4. Emergency Action Plan

No person shall enter a confined space (manhole, wet well, dry well, or underground vault) to retrieve someone who is unconscious without having required personnel above ground to assist. The person entering the confined space for rescue purposes must be equipped with the required rescue equipment and follow the specific rescue procedure.
 5. A qualified person shall inspect all safety devices and instruct all involved employees on proper confined space safety procedures. All defective safety devices shall be reported to the foreman immediately.
 6. It shall be the foreman's responsibility to insure that crews assigned to enter confined spaces have the required safety devices in their possession. The foreman must assure the assigned employee is trained to operate all safety equipment and understands all safety procedures.

Date