



Village of Menands

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VILLAGE OF MENANDS Confined Space Entry Program

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INTRODUCTION

Employees may be required to enter confined spaces as part of their work activities. This document has been developed to ensure the safety of personnel required to enter and conduct work in confined spaces. The program contained herein describes reasonable and necessary policies and procedures for any and all facilities, departments, and individuals who are associated with confined space entry operations. This program and all parts of 29 CFR 1910.146 shall apply to all confined space entry operations. As it is the policy of The Village of Menands to provide its employees with a safe working environment, the Village requires conformance with the safety standards set herein. A site-specific program may be used, providing it meets or exceeds the requirements set forth in this manual.

CONTENTS OF THIS MANUAL

This manual has been organized into five sections:

I. Identifying Confined Spaces

Department Heads or their designated representatives should determine if any personnel under their supervision are required to enter or conduct work in confined spaces as defined in this section.

II. Identifying Confined Space Hazards

This section gives information on the types of hazards that may be present in a confined space. It should be reviewed whenever the hazards of a confined space are being evaluated.

III. Confined Space Entry Program

If it is determined that department personnel are required to perform duties in confined spaces, the program outlined in "The Permit System" should be implemented.

IV. Personnel Responsibilities and Training Requirements

This section lists the responsibilities and training requirements of each individual involved in a confined space entry.

I. IDENTIFYING CONFINED SPACES

The first step toward conducting a safe confined-space entry is to identify the space as potentially hazardous. All Confined Spaces shall be considered "permit-required" until pre-entry procedures demonstrate otherwise. To clarify what constitutes a Confined Space, the following definition will be used.

A Confined Space is any space that has the following characteristics:

- Large enough or so configured that an employee can bodily enter and perform assigned work.
- Has limited or restricted means for entry or exit. Confined-space openings are limited primarily by size and location. Openings may be small in size and may be difficult to move through easily. However, in some cases openings may be very large; for example, open-topped spaces such as pits or excavations. Entrance and exit may be required from top, bottom, or side. Size or location may make rescue efforts difficult.
- Is not designed for continuous employee occupancy.

Most confined spaces are not designed for employees to enter and work on a routine basis. They may be designed to store a product, enclose materials and process, or transport products or substances. Therefore, occasional employee entry for inspection, maintenance, repair, cleanup, or similar tasks, is often difficult and hazardous. The hazards associated with entry may come from

chemical or physical elements within the space.

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).

A Permit-Required Confined Space (permit space) is a confined space that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential for engulfing an entrant.
- Has an internal configuration such that an entrant could be trapped or asphyxiated.
- Contains any other recognized serious safety or health hazard.

Based on the definition, many types of spaces may be considered "confined," and therefore, hazardous. Some examples of confined spaces might be sewers, (manholes, catch basins), water metering pits, or other similar types of enclosures.

It is the responsibility of department heads to evaluate potentially hazardous spaces within facilities or areas under their control and ensure that the proper precautions are taken for safety. This responsibility may be delegated to a competent person within the department provided he/she is qualified. It may be determined that a space does not present a hazard to employees. However, until the space has been evaluated and tested, it shall be assumed to be confined and potentially hazardous. Once a space has been evaluated and it has been determined that confined space characteristics are present, the Physical Plant along with the affected Department shall determine if the Confined Space requires a permit and will apply appropriate labeling.

II. IDENTIFYING CONFINED SPACE HAZARDS

Once a space has been identified as confined, the hazards that may be present within the confined space must be identified. Confined-space hazards can be grouped into the following categories:

- Oxygen-deficient atmospheres
- Flammable atmospheres
- Toxic atmospheres
- Mechanical and physical hazards

Every confined space must be evaluated for these four types of hazards. The three types of atmospheric hazards are often the most difficult to identify since they are normally invisible.

Oxygen-Deficient Atmospheres

The normal atmosphere is composed of approximately 21% oxygen and 79% nitrogen. An atmosphere containing less than 19.5% oxygen shall be considered oxygen-deficient. The oxygen level inside a confined space may be decreased as the result of either consumption or displacement.

There are a number of processes which consume oxygen in a confined space. Oxygen is consumed during combustion of flammable materials, as in welding, cutting, or brazing. A more subtle consumption of oxygen occurs during bacterial action, as in the fermentation process. Oxygen can also be consumed during chemical reactions such as in the formation of rust on the exposed surfaces of a confined space. The number of people working in a confined space and the amount of physical activity can also influence oxygen consumption. Oxygen levels can also be reduced as the result of oxygen displacement by other gases.

Flammable Atmospheres

Flammable atmospheres are generally the result of flammable gases, vapors, dust mixed in

certain concentrations with air, or an oxygen-enriched atmosphere.

Oxygen-enriched atmospheres are those atmospheres which contain an oxygen concentration greater than 23.5%. An oxygen-enriched atmosphere will cause flammable materials such as clothing and hair to burn violently when ignited.

Combustible gases or vapors can accumulate within a confined space when there is inadequate ventilation. Gases that are heavier than air will accumulate in the lower levels of a confined space. Therefore, it is especially important that atmospheric tests be conducted near the bottom of all confined spaces.

The work being conducted in a confined space can generate a flammable atmosphere. Work such as spray painting, coating, or the use of flammable solvents for cleaning can result in the formation of an explosive atmosphere. Welding or cutting with oxyacetylene equipment can also be the cause of an explosion in a confined space and shall not be allowed without a hot work permit. Oxygen and acetylene hoses may have small leaks in them which could generate an explosive atmosphere and, therefore, should be removed when not in use. The atmosphere shall be tested continuously while any hot work is being conducted within the confined space.

Toxic atmospheres

Toxic atmospheres may be present within a confined space as the result of one or more of the following:

- The Product Stored in the Confined Space

When a product is stored in a confined space, the product can be absorbed by the walls and give off toxic vapors when removed or when cleaning the residual material. The product can also produce toxic vapors which will remain in the atmosphere due to poor ventilation.

- The Work Being Conducted in the Confined Space

Toxic atmospheres can be generated as the result of work being conducted inside the confined space. Examples of such work include:

Welding or brazing with metals capable of producing toxic vapors, painting, scraping, sanding, etc. Many of the solvents used for cleaning and/or degreasing produce highly toxic vapors.

- Areas Adjacent to the Confined Space

Toxic fumes produced by processes near the confined space may enter and accumulate in the confined space. For example, if the confined space is lower than the adjacent area and the toxic fume is heavier than air, the toxic fume may "settle" into the confined space.

Mechanical and Physical Hazards

Problems such as rotating or moving mechanical parts or energy sources can create hazards within a confined space. All rotating or moving equipment such as pumps, process lines, electrical sources, etc., within a confined space must be identified.

Physical factors such as heat, cold, noise, vibration, and fatigue can contribute to accidents. These factors must be evaluated for all confined spaces.

Excavations could present the possibility of engulfment. Employees shall be protected from cave-ins by sloping, benching, or shoring systems when the depth of the excavation is more than four feet, in accordance with 29 CFR 1926.652.

III. CONFINED SPACE ENTRY PROGRAM

Identifying All Confined Spaces

All confined spaces should be identified. Once the space has been identified as Confined the department head shall determine if a permit is required.

All employees shall be made aware of these confined spaces through training or instruction provided by department heads or their designated representatives.

Preventing Unauthorized Entry

All employees shall be instructed by department heads or their designated representatives that entry into a confined space is prohibited without an authorized permit.

Department heads or their designated representatives shall instruct all employees to list their names on the authorized permit before they will be allowed to enter a confined space.

The Permit System

When a confined space must be entered, a permit shall be completed and authorized by department heads, supervisors, or their designated representatives prior to entry of the confined space. This permit shall serve as certification that the space is safe for entry. The permit shall contain the date, the location of the space, and the signature of the person providing the certification.

A permit shall not be authorized until all conditions of the permit have been met.

Planning the Entry

The first step towards conducting a safe confined-space entry is to plan the entry. This will allow for the identification of all hazards, and for the determination of all equipment necessary, to complete the project. Use the following steps as a guideline:

1. Gathering General Data

- Identify the confined space. Give the name or location of the confined space.
- Give the reason for entering the confined space. Be specific. Also, identify what work will be done.
- Identify the contents of the confined space. This refers to any chemicals or other materials and energy that are usually present in the confined space.

2. Identifying the Hazards

NOTE: It is recommended that atmospheric tests be conducted by the entry supervisor prior to the opening of any covers.

- The entry supervisor will determine the oxygen content and describe the testing procedures and equipment used.
- The entry supervisor will determine flammable gas content and describe the testing procedures and type of analyzer used.
- If a toxic substance is determined to be in the confined space during testing by the entry supervisor, obtain a Material Safety Data Sheet or other chemical information to determine what type of personal protective equipment is required, the potential health effects, the Permissible Exposure Limits, and any other information needed to safely conduct the work.
- Department heads or their designated representatives will determine mechanical and physical hazards. They should list all items and energy that will require lockout/tagout, blanking and bleeding, disconnecting, or securing. Physical hazards should also be listed.

3. Ventilation of the Confined Space

- Indicate whether mechanical or natural ventilation will be used. Describe the procedures to be used.

NOTE: If mechanical ventilation is to be used, the exhaust must be pointed away from personnel or ignition sources. Also, mechanical ventilators should be bonded to the confined space.

4. Isolating the Confined Space

- Describe the procedures for disconnecting equipment or lockout and tagout. All mechanical, electrical, or heat-producing equipment should be disconnected or locked and tagged out. This would also include any pumps that pull fluid from, or pump fluid into, the confined space.

5. Purging/Cleaning the Confined Space

- Indicate if the confined space will be purged. Purging with inert gas is not recommended. If the space must be purged, describe the procedures.
- Indicate the type of cleaning methods to be used. If chemical cleaners are to be used, name the type and describe the procedures. The MSDS for the chemical should be consulted prior to use.

NOTE: When introducing a chemical into a confined space, the compatibility of that chemical with the contents of the confined space must be checked.

6. Placement of Warning Signs

- Indicate if warning signs or barriers will be needed to prevent unauthorized entry or to protect workers from external hazards. If the confined space will be left open and unattended for any length of time, warning signs and barriers will be required.

7. Identifying All Personnel

- List all employees that will be required to prepare the confined space and complete the work inside the space.

8. Identifying Necessary Equipment

- List all equipment that will be necessary to complete the project.

Some basic Confined Space Entry and Rescue Equipment shall include, but not be limited to:

Barricades (as required) Combustible Gas Detector/Air Monitor

Fire Extinguisher First Aid Kit

Gas Monitor Hard Hats

Lock Out/Tag Out Kit Manhole Access Bracket

Manhole Hook (or pick) Men Working Signs (as required)

Rescue Telephone Number Retrieval system

Safety Cones Safety Flags

Safety Glasses Safety Harness

Safety Ladder Safety Rope

Safety Shoes Safety Vest

Self Contained Air Units Two-way Radio

Utility Ropes Ventilation Fan

Conducting Pre-Entry Training

Once the entry has been planned, department heads or their designated representatives must train all employees who will be involved in the entry. The training should be conducted no earlier than one day before entry is to be made.

The following outline should be used for the training:

1. Identify the confined space and the reason(s) for entry.

2. Identify the work detail.

- Assign each employee the job(s) he/she is to perform in the entry project (entrant, standby person, etc.).
- If an employee is required to use a piece of equipment, be sure that he/she is capable of using the equipment properly.

- Inform all personnel that no one is to enter the confined space unless the standby person(attendat) is present at the work site.
3. Inform entrants of all known or suspected hazards.
 - Inform personnel of any access or exit problems.
 - Inform personnel of all equipment that must be locked out or tagged out.
 - Inform personnel of the contents of the confined space.
 - Inform personnel of all atmospheric levels that must be maintained before entering and while working in the confined space.
 - If a toxic atmosphere or substance is present or could become present, the following additional training must be completed:
 - If respiratory protection is not going to be used, inform personnel of the maximum permissible exposure level (PEL) that can exist within the confined space, and the method used to monitor PEL.
 - Inform personnel of the potential health effects of exposure to the toxic atmosphere or substance.
 - Inform personnel of the signs and symptoms of exposure to the toxic fume.
 - Inform personnel of the personal protective equipment (PPE) that they will be required to wear.
 - If entrants are unaware of the proper use of the PPE, they must be trained in the proper use of this equipment.
 - Persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. A local physician shall determine what health and physical conditions are pertinent. The respirator user's medical status should be reviewed periodically (for instance, annually).
 4. Identify isolation procedures.
 - Inform the personnel responsible for the lockout/tagout of all equipment that must be isolated.
 - Inform the personnel responsible for performing this function of the methods to be used.
 5. Identify purging and/or ventilation procedures.
 - Inform all personnel responsible for performing this function of the methods to be used.
 6. Identify all equipment needed.
 - Inform personnel involved in the project of all equipment that will be necessary to complete the project.
 - Make sure that all employees are capable of using their assigned equipment properly.
 7. Determine necessary personal protective equipment.
 - Inform personnel of all PPE that must be used to ensure their safety.
 - Make sure that all personnel required to use PPE are trained in the proper use of the equipment.
 8. Establish communication.
 - Inform all entrants that they are required to maintain communication with the standby person.
 - Inform standby person(attendat) that he/she must maintain constant contact with all entrants.
 - Inform personnel of the type of communication they are to use.

9. Protect from external hazards.

- Inform personnel where signs and barriers will be placed to prevent unauthorized entry and protect entrants from external hazards.

10. Pre-plan rescue procedures.

- The designated standby person(s) should be informed of the rescue procedures to be followed. The standby person should be informed that he/she can have no other duty but to maintain contact with personnel inside the confined space.
- Inform the standby person(s) that they must not enter the confined space under any circumstances.

11. Place the confined space back into service.

- Inform personnel of the steps to be taken to place the confined space back into service.

Preparing the Confined Space for Entry

Once the entry has been planned and personnel have been trained, the next step is to prepare the confined space for entry.

The following steps are to be followed when preparing the confined space for entry:

1. If warning signs or barriers are to be used to prevent unauthorized entry or to protect entrants from external hazards, they should be placed on or around the confined space as planned and discussed in training.
2. Place all tools, safety equipment, monitoring equipment, etc., near the confined space.
3. Isolate all mechanical and/or electrical hazards as planned and discussed in training.
4. Purge/ventilate the confined space as planned and discussed in training.
5. The entry supervisor will test the atmosphere as discussed in training.
 - If oxygen content is less than 19.5% or greater than 23.5%, perform additional ventilation. Then, shut off ventilation equipment and re-test the oxygen content.
 - If oxygen content is between 19.5% and 23.5%, continue entry preparation.
6. The entry supervisor will test for flammable gas level as planned and discussed in training.
 - If the meter reading is less than 10% of the lower explosive limit (LEL), continue entry preparations.
 - If the meter reading is above 10% of the LEL, continue ventilation of the confined space. Then, shut off the ventilation and have the atmosphere re-tested.
 - If the meter reading is still above 10% of the LEL, the confined space must be cleaned before entry is permitted. If the confined space must be entered for cleaning purposes, the procedures outlined in the Confined Space Cleaning Procedures of this section must be followed.
7. The entry supervisor will determine the toxicity of the atmosphere as planned and discussed in training.
 - If a toxic atmosphere is present, no person should be permitted to enter the confined space at a level exceeding the Permissible Exposure Limit(PEL) without proper Personal Protective Equipment.
8. Assemble all personnel involved and conduct a simulated rescue drill.
9. The entry supervisor will then add any needed information, then complete and sign the permit.

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.

Atmospheric Testing Procedures

1. All testing equipment shall be calibrated as instructed by the manufacturer.
2. All of the manufacturer's operating instructions must be followed.
3. The test equipment should be tested in a known atmosphere to insure its accuracy.
4. Ventilation equipment must be shut off before conducting any atmospheric tests.
5. The atmosphere must be tested at the bottom, top, and middle of all confined spaces.
6. The atmosphere must be continuously monitored while work is being conducted in the confined space.
7. If the confined space is left for any reason, the atmosphere must be re-tested before re-entering the space.

Rescue Procedures

In the event of an emergency, the standby person(attendan) shall:

1. Immediately contact the Menands Dispatcher at 463-1681 or 911.
2. Attempt to remove the victim by use of the retrieval line from outside the confined space if this can be accomplished without creating further hazard for the entrant or the attendant.
3. If the standby person is able to remove the victim with the retrieval line, he/she should administer aid within the limits of his/her training until emergency medical services (EMS) arrive.
4. If the standby person is unable to remove the victim by using the/retrieval line, he or she must wait for help to arrive. The standby person(s) is **not** to enter the confined space for any reason.
5. Give EMS personnel any information they request.

IV. PERSONNEL RESPONSIBILITIES & TRAINING REQUIREMENTS

Everyone involved in a confined-space entry project has certain responsibilities and 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:

- Department Heads (or their Designated Representatives)
- Authorized Entrants
- Standby Persons (Attendants)

Responsibilities of the Department Head

The Department Head or his/her designated representative shall be responsible for the following:

- Review and update of the Confined Space Entry Program to conform with current CFR standards.
- Insure compliance with standards set forth in the program by periodic inspection of entry sites and canceling permits where unsafe conditions are present.
- Assisting Supervisors with:
 - Providing training as set forth in the program
 - Identification of confined spaces
 - Identifying spaces that require a permit for entry
 - Labeling Permit-Required Confined Spaces

- Perform a single annual review covering all entries performed during a 12-month period to ensure employees participating in entry operations are protected from permit space hazards.

Responsibilities and Training Requirements of Department Heads

(or Their Designated Representatives)

Department heads or their designated representatives shall be responsible for the following:

- Identifying confined spaces within facilities or areas under their control.
- Identifying hazards within a confined space under their control.
- Documenting that all training requirements for a specific confined space entry have been met by signing the Entry Authorization space on the entry permit.
- Insuring that the required atmospheric tests are performed at the confined space and results recorded on the permit prior to entry authorization.
- Obtaining and maintaining all equipment necessary to complete the confined-space entry project.
- Authorize entry by signing the Entry Authorization space on 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.
- Determining, whenever responsibility for a permit space entry operation is transferred, and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

Responsibilities and Training Requirements of Authorized Entrants

The person(s) authorized to enter a confined space shall be responsible for and receive training in the following:

- The knowledge of hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of the exposure.
- Proper use of equipment, which includes:
 - Atmospheric testing and monitoring equipment.
 - Ventilating equipment needed to obtain acceptable entry conditions.
 - Communication equipment necessary to maintain contact with the standby person.
 - Personal protective equipment as needed.
 - Lighting equipment as needed.
 - Barriers and shields as needed.
 - Equipment, such as ladders, needed for safe entry and exit.
 - Rescue and emergency equipment as needed.
 - Any other equipment necessary for safe entry into and rescue from permit spaces.
- Communication with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space if required.
- Alert the standby person (attendant) whenever:
 - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation

- The entrant detects a prohibited condition
- Exit the permit space as quickly as possible whenever:
 - An order to evacuate has been given by the attendant or the entry supervisor
 - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation
 - The entrant detects a prohibited condition
 - An evacuation alarm is activated

Responsibilities and Training Requirements of Standby Persons (Attendants)

Persons authorized to perform duties as attendant shall be responsible for and receive training in the following:

- Knowing the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of exposure.
- Is aware of possible behavioral effects of hazard exposure in authorized entrants.
- Continuously maintaining an accurate count of authorized entrants in the permit space and ensures that the means used to identify authorized entrants accurately identifies who is in the permit space.
- 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 authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space when conditions warrant.
- Monitoring activities inside and outside the space to determine if it is safe for entrants to remain in the space and ordering the authorized entrants to evacuate the permit space immediately under any of the following conditions:
 - If the attendant detects a prohibited condition
 - If the attendant detects the behavioral effects of hazard exposure in an authorized entrant
 - If the attendant detects a situation outside the space that could endanger the authorized entrants
 - If the attendant cannot effectively and safely perform all the duties required by this program
- Summoning rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.
- Taking the following actions when unauthorized persons approach or enter a permit space while entry is underway:
 - Warn the unauthorized persons that they must stay away from the permit space.
 - Advise the unauthorized persons that they must exit immediately if they have entered the permit space.
 - Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space.
- Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

V. CONFINED SPACE LOCATIONS & SPECIFIC ENTRY PROCEDURES

All confined spaces shall have atmospheric monitoring performed prior to entry. The following locations have been recognized as defined confined spaces:

All Sewer System Points of Entry (Manholes/Catch Basins)

[29 CFR - 1910.146 Appendix E]

Sewer entry differs in three vital respects from other permit entries; first, there rarely exists any way to completely isolate the space (a section of a continuous system) to be entered; second, because isolation is not complete, the atmosphere may suddenly and unpredictably become lethally hazardous (toxic, flammable or explosive) from causes beyond the control of the entrant or employer, and third, experienced sewer workers are especially knowledgeable in entry and work in their permit spaces because of their frequent entries. Unlike other employments where permit space entry is a rare and exceptional event, sewer workers' usual work environment is a permit space.

(1) Adherence to procedure. The employer should designate as entrants only employees who are thoroughly trained in the employer's sewer entry procedures and who demonstrate that they follow these entry procedures exactly as prescribed when performing sewer entries.

(2) Atmospheric monitoring. Entrants should be trained in the use of, and be equipped with, atmospheric monitoring equipment which sounds an audible alarm, in addition to its visual readout, whenever one of the following conditions are encountered: Oxygen concentration less than 19.5 percent; flammable gas or vapor at 10 percent or more of the lower flammable limit (LFL); or hydrogen sulfide or carbon monoxide at or above 10 ppm or 35 ppm, respectively, measured as an 8-hour time-weighted average. Atmospheric monitoring equipment needs to be calibrated according to the manufacturer's instructions. The oxygen sensor/broad range sensor is best suited for initial use in situations where the actual or potential contaminants have not been identified, because broad range sensors, unlike substance-specific sensors, enable employers to obtain an overall reading of the hydrocarbons (flammables) present in the space. However, such sensors only indicate that a hazardous threshold of a class of chemicals has been exceeded. They do not measure the levels of contamination of specific substances. Therefore, substance-specific devices, which measure the actual levels of specific substances, are best suited for use where actual and potential contaminants have been identified. The measurements obtained with substance-specific devices are of vital importance to the employer when decisions are made concerning the measures necessary to protect entrants (such as ventilation or personal protective equipment) and the setting and attainment of appropriate entry conditions. However, the sewer environment may suddenly and unpredictably change, and the substance-specific devices may not detect the potentially lethal atmospheric hazards which may enter the sewer environment.

Although OSHA considers the information and guidance provided above to be appropriate and useful in most sewer entry situations, the Agency emphasizes that each employer must consider the unique circumstances, including the predictability of the atmosphere, of the sewer permit spaces in the employer's workplace in preparing for entry. Only the employer can decide, based upon his or her knowledge of, and experience with permit spaces in sewer systems, what the best type of testing instrument may be for any specific entry operation.

The selected testing instrument should be carried and used by the entrant in sewer line work to monitor the atmosphere in the entrant's environment, and in advance of the entrant's direction of movement, to warn the entrant of any deterioration in atmospheric conditions. Where several entrants are working together in the same immediate location, one instrument, used by the lead entrant, is acceptable.

(3) Surge flow and flooding. Sewer crews should develop and maintain liaison, to the extent possible, with the local weather bureau and fire and emergency services in their area so that sewer work may be delayed or interrupted and entrants withdrawn whenever sewer lines might be suddenly flooded by rain or fire suppression activities, or whenever flammable or other hazardous materials are released into sewers during emergencies by industrial or transportation accidents.

(4) Special Equipment. Entry into large bore sewers may require the use of special equipment. Such equipment might include such items as atmosphere monitoring devices with automatic audible alarms, escape self-contained breathing apparatus (ESCBAs) with at least 10 minute air supply (or other NIOSH approved self-rescuer), and waterproof flashlights, and may also include boats and rafts, radios and rope stand-offs for pulling around bends and corners as needed.

Water Metering Pits

All Water Metering Pits will be considered Permit Required Confined Spaces.

A flooding hazard exists in a Water Metering Pit when work is being performed. It is therefore imperative that proper Lockout-Tagout be performed before beginning any work.

See All Sewer System Points of Entry above for other specific hazards.

- deficient atmosphere.

LIST OF TERMS

Authorized Entrant

A person who is approved or assigned by the department head in charge of the entry to perform a specific type of duty or duties or to be at a specific location at the job site.

Confined Space

"Confined space" means a space that:

- (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- (2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and
- (3) Is not designed for continuous employee occupancy.

Department Head

Department Heads are those people in charge of employees.

Entry

The action by which a person passes through an opening into permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry Permit

The written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in this program.

Entry Supervisor

Department Head or the designated representative (such as the foreman or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this program.

Note: An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this program for each role he or she

fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of entry operation.

Hazardous Atmosphere

An atmosphere that may expose employees to the risk of death incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one more of the following causes:

Flammable gas, vapor, or mist in excess of 10% of its flammable limit (LFL).

Airborne combustible dust at a concentration that meets or exceeds its LFL.

NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet or less.

Atmospheric oxygen concentration below 19.5% or above 23.5%.

Atmospheric concentration of any substance for which a dose or permissible exposure limit is published in Subpart Z, Toxic and Hazardous Substances, of 29 CFR 1910 and that could result in employee exposure in excess of its dose or permissible exposure limit.

NOTE: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

Any other atmospheric condition that is immediately dangerous to life or health.

NOTE: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with the Hazard Communication Standard, section 1910.1200, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

Immediately Dangerous to Life or Health (IDLH)

An atmosphere that poses an immediate threat of loss of life: May result in irreversible or immediate severe health effects; may result in eye damage/irritation; or other condition that could impair escape from a confined space.

Lower Explosive Limit (LEL)

The minimum concentration of a combustible gas or vapor in air that will ignite if an ignition source is introduced.

Non-Permit Required Confined Space

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).

Oxygen-Deficient Atmosphere

An atmosphere that contains an oxygen concentration of less than 19.5% by volume.

Oxygen-Enriched Atmosphere

An atmosphere that contains an oxygen concentration greater than 22% by volume.

PPE - Personal Protective Equipment

Any devices or clothing worn by the worker to protect against hazards in the environment. Examples are respirators, gloves, and chemical splash goggles.

PEL - Permissible Exposure Level

Concentration of a substance to which an individual may be exposed repeatedly without adverse effect.

Permit-Required Confined Space

"Permit-required confined space (permit space)" means a confined space that has one or more of the following characteristics:

- (1) Contains or has a potential to contain a hazardous atmosphere;
- (2) Contains a material that has the potential for engulfing an entrant;
- (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- (4) Contains any other recognized serious safety or health hazard.

Purging

The removal of gases or vapors from a confined space by the process of displacement.

Retrieval system

Equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Standby Person (Attendant)

A person designated by the department head in charge of entry to remain outside the confined space and to be in constant communication with the personnel working inside the confined space.

REFERENCES

10. Title 29 of the Code of Federal Regulations Part 1910.146 - Permit- Required Confined Spaces. U.S. Government Printing Office.
11. National Safety Council Data Sheet 1-704-85 - Confined Space Entry Control System for R&D Operations, National Safety News.
12. N.I.O.S.H. Training and Resource Manual - Safety and Health in Confined Workspaces for the Construction Industry.
13. N.I.O.S.H. 87-113 - A Guide to Safety in Confined Spaces.
14. Title 29 of the Code of Federal Regulations Part 1926.652 - Requirements for Protective Systems.
15. Title 29 of the Code of Federal Regulations Part 1910.150 - The Control of Hazardous Energy.
16. Department of Consumer and Industry Services General Industry Safety Standards Part 90 - Confined Space Entry
17. Title 29 of the Code of Federal Regulations Part 1910.134 - Respiratory Protection.

ATTACHMENTS

Confined Space Entry Form
