



## APPENDIX L. CONFINED SPACE ENTRY SAFETY PROGRAM Sept. 2023

### PURPOSE

VSC Fire & Security, Inc. (hereinafter “VSC”) has established this program that contains the requirements and procedures to protect employees from the hazards associated with confined spaces.

### REGULATORY SCOPE

This program addresses the regulatory requirements found under 29 CFR 1910.146 In addition to these OSHA standards, VSC will comply with the owner or general contractor’s confined space entry programs when designed to address the specific hazards associated with their operation or environment.

### CONFINED SPACE - DEFINED

OSHA defines Confined Space as a space:

- Large enough and so configured that a person can bodily enter the space and perform assigned work in the space.
- Is not designed for continuous employee occupancy; and
- Has a limited or restricted means of entry and or exit.
- Examples include, but are not limited to pits, tanks, silos, hoppers, vessels, manholes, and vaults.

### NON-PERMIT CONFINED SPACE

A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

### PERMIT REQUIRED CONFINED SPACE

A permit required confined space has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere.
- Contains a material with the potential to engulf someone who enters the space.
- 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; and/or
- Contains any other recognized serious safety or health hazards.
- Note: ***VSC employees are prohibited from entering a hazardous atmosphere. All hazardous atmospheric contaminants must be removed with proper ventilation prior to entry.***

### HAZARD ASSESSMENT OF VSC CONFINED SPACE JOB TASKS

Tasks that may require entry to confined space-

- Test, inspection, and installation of Tapper switches in utility vaults, pits or mechanical spaces labeled as “confined space”.
- Backflow and relief valve test, inspection, or installation in in-ground utility vault, pits or mechanical rooms labeled “Confined Space”.
- Test, inspection, and installation of smoke & heat detection units in air handling units & duct work, attics, mechanical spaces labeled “confined space”.
- Installation or repair leaks in pipe, fittings & components in in-ground, utility vaults, pits, mechanical spaces, cooling towers or attics.

- Inspection and installation of Low voltage conduit & wire, and junction boxes in attics, mechanical spaces & inside ventilation systems labeled “confined space”, utility vaults, pits.

Examples of confined spaces VSC employees may enter:



Utility vaults



Pits



Mechanical spaces



Attic



Air handling units



Cooling

**TRAINING**

VSC's Safety Department (hereinafter “Safety”) will ensure that all employees, prior to entering a confined space as described throughout this Program, are trained to perform all required duties safely. Ensuring employees understanding, knowledge, and possession of skills necessary to safely perform their duties will be documented via certification. In addition, VSC employees involved with a customer or contractors confined space program will receive the necessary training to comply with jobsite specific procedures and processes.

Training shall be provided for each of the following assigned duties:

- Authorized Entry Supervisor (Competent Person).
- Attendant.
- Authorized Entrant.

**TRAINING & ASSIGNED DUTIES - Authorized Entry Supervisor (Competent Person)**

*Definition of Authorized Entry Supervisor:* An employee, such as a Superintendent or Foreman, who is responsible for determining if acceptable entry conditions are present at a permit space where an entry is planned. An Authorized Entry Supervisor is also responsible for authorizing entry, for overseeing entry, and for terminating entry.

Training will focus on the following responsibilities:

- Know the hazards which employees may face during entry, including the mode, signs, or symptoms and consequence of the exposure.
- Conduct pre-entry briefing with Entrants and Attendant.
- Complete CSE Contractor OSHA requirements checklist. (See Exhibit B. of this Program for a sample checklist)
- If Customer or General Contractor has determined the confined space to have conditions that are immediately dangerous to life and health (IDLH) **STOP** and immediately notify the VSC District Office and Risk-Safety.
- Verify that acceptable conditions for entry exist *before* endorsing the permit and allowing entry to begin.
- Verify atmospheric test instrument is calibrated, operational and provided.
- Verify ventilation equipment is operational and provided.
- Ensure Entrant understands task and procedures to be performed in the space.
- Ensure a ladder of appropriate height is provided for vertical entry and exit of the confined space.
- Terminate the entry and cancel the permit when entry operations are complete or a prohibited condition arises.
- Verify that rescue services are available and the means for summoning the services are operable.
- Remove unauthorized individuals who enter or who attempt to enter the permit space during entry operations.
- Determine that entry operations remain consistent with terms of entry permit and that acceptable entry conditions are maintained.
- Note: The Entry Supervisor may also serve as the Attendant.

#### TRAINING & ASSIGNED DUTIES – Attendant

*Definition of Attendant:* Employee who is stationed outside one or more permit spaces to monitor authorized entrants. An authorized Attendant must be present and monitoring the entry at all times. The Attendant will not be assigned any other duties that may interfere with his/her attendant duties. This person also performs all Attendant duties assigned in the employer's permit space program.

Training will focus on the following responsibilities:

- Know the hazards which employees may face during entry, including the mode, signs, or symptoms and the consequences of the exposure.
- Maintain and document Entry(s) on permit during CSE.
- Know how to operate atmospheric test instrument. Read and record monitor results on permit.
- Perform pre-entry and periodic testing of atmosphere and record readings.
- Know how to operate and monitor ventilation equipment.
- Know how to operate fall arrest and retrieval equipment or lifeline, if in use.
- Awareness of possible behavioral effects of the hazard exposure in authorized Entrants.
- Continuously maintain and document an accurate count and identity of authorized Entrants.
- Remain outside the permit space during entry operations until relieved by another Attendant.
- Communicate with Entrants as necessary to monitor Entrant status and to alert Entrants of the need to evacuate.
- Awareness of the presence and proper use of barriers that may be needed to protect an Entrant from hazards.
- Monitor activities inside and outside the permit space to determine if it is safe for Entrants to remain in the space and *order evacuation* when necessary.
- In case of emergency, even one involving the Entrant, the Attendant **shall not enter** the confined space.
- Summon rescue and emergency services when assistance for an emergency exit from permit space is necessary.
- Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:
  - Warn them to stay away or to exit immediately if they have entered the permit space.
  - Inform the Entrants and Entry Supervisor if unauthorized persons enter the permit space.
  - Perform non-entry rescues as specified by company procedure.
  - Perform no duties that might interfere with the Attendant's primary duty to monitor and protect authorized Entrants.

#### TRAINING & ASSIGNED DUTIES – Authorized Entrant

*Definition of Entrant* - Employee authorized by employer to enter permit space.

Training will focus on the following responsibilities:

- Know the hazards that may be faced during entry, including information on mode, signs or symptoms & consequences of exposure.
- Be familiar with the proper use of entry and emergency equipment.

- Communicate with the Attendant as necessary to enable the Attendant to monitor Entrant's status and to alert Entrants of the need to evacuate the permit space.
- Alert the Attendant whenever the Entrant recognizes any warning signs or symptoms of exposure to a dangerous situation or detects a prohibited condition.
- Understand what PPE is needed for safe entry into and out of the permit space.
- Use required PPE and fall protection equipment.
- Know the job task and procedures to be performed in the space.
- Exit from the permit space as quickly as possible whenever:
  - An order to evacuate is given by the Attendant or the Entry Supervisor, or when an evacuation alarm is activated.
  - The Entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or detects a prohibited condition.

Affected employees will:

- Not enter spaces unless the space is labeled and the employee is trained and authorized to enter.
- Recognize the characteristics of the confined space.
- Anticipate and be aware of the hazards that may be faced during entry.
- Recognize the adverse health effects that may be caused by the hazardous exposure.
- Not enter confined spaces to rescue other employees, unless they have been specifically appointed, trained, and equipped to do so.

Note: If there is a change in operations or in an employee's duties that presents a new hazard to the employee, VSC will provide additional training before allowing the employee to proceed with the assigned task.

Recordkeeping

Risk-Safety will maintain training records of all employees who have been trained to enter confined spaces or other dangerous atmospheres. Records will include: employee name, training topic to include course content and level of training (Competent Person, Attendant, Entrant), date of training, certification (where applicable), and date of future training to maintain certification.

**PERMIT REQUIRED CONFINED SPACE**

Permit Required Confined Space Entry

*VSC employees will receive site specific Confined Space Entry (CSE) training for working within a permit required confined space. No employee shall enter such space prior to receiving training from VSC Management or the customer or the general contractor's designated Competent Person knowledgeable in site specific conditions.*

- When entrance covers are removed, the opening will be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space.
- All permit required confined spaces will be identified by the Entry Supervisor. Exposed employees will be informed of such spaces through the posting of warning signs or other equally effective means.
- Only trained and qualified employees will be authorized as permit space Entrants, Attendant, or Entry Supervisor.
- Any permit required confined space will have a minimum of 3 people on site for the duration of the work inside the CS. The Supervisor, Attendant, and Entrant. At least one member to the CS team will be certified in first aid and CPR.
- No employee shall enter a permit space without having a properly completed entry permit signed by an Entry Supervisor. The VSC "Confined Space Entry Permit" is attached to this safety program as Exhibit A.
- Entry Supervisor must ensure ventilation equipment is adequate for the size and configuration of the confined space. This will include ensuring vent tubes are of sufficient length for vertical height and size of confined space and determining if a blower or exhaust system is needed.
- When a change alters conditions within a tested confined space or other dangerous atmosphere, work in the affected space or area will be stopped. Work shall not resume until the affected space or area is visually inspected and retested by the Entry Supervisor and found to comply with the standards set forth in this program. A new entry permit shall be completed.
- The Entry Supervisor, upon completion of the work, will cancel entry permits, or when any prohibited condition arises. Cancelled entry permits will be retained on file for a minimum of one year for the annual review.
- The CSE Supervisors department manager will maintain the original CSE permit records and send a scanned copy to the VSC Regional Safety Manager.

Employees of VSC shall follow the procedures provided below:

- Entrants and Attendant will obtain an entry permit from the Entry Supervisor prior to an entry into a confined space.
- Entrant will not enter space until Entry Supervisor has verified all pre-permit actions required for entering the space, such as atmospheric testing and hazard control/elimination actions are accomplished, and all required equipment is on hand.
- Entrant and Attendant will verify rescue services and that a means of communication is provided by supervisor.
- The Entry Supervisor will complete all items on the permit.
- Only an authorized Entry Supervisor who is required to sign the entry permit will authorize the entry. If any item on the permit is checked as "NO" (meaning not yet completed or available), the permit will not be signed.
- A copy of the entry permit along with any safety data sheet for chemicals used in the CS will be maintained outside the confined space until all appropriate personnel have cancelled the permit with their signature.

#### Equipment Required for Permit Required Confined Space Entry

Required equipment includes equipment required for:

- Testing and Monitoring.
- Ventilating.
- Communications between Entrant and Attendant.  
Note: if constant communication cannot be maintained by voice or hand communication, radios shall be used.
- Communications for summoning rescue personnel/operations. The attendant must have direct communication with rescue personnel.
- Personal Protection (i.e. required PPE).
- Lighting.
- Barriers/shields for openings.
- Means of Ingress/Egress.
- Other equipment identified through the JHA for safe entry and rescue.

#### VSC Inspection divisions equipment requirements

A four-way atmospheric tester will be provided on each inspection vehicle.

#### Service and inspections work in attics.

Attics must not be entered unless they have flooring and safe access. DO NOT crawl or step on trusses or beams of unfinished attic spaces.

#### Written Permit

The entry permits that documents compliance with this procedure and authorizes entry to a permit space shall identify the:

- Permit space to be entered.
- Purpose of the entry.
- Date and the authorized duration of the entry permit.
- Authorized Entrants within the permit space, by name or by such other means.
- Name of individual currently serving as Attendant.
- Name of individual currently serving as Entry Supervisor with space for signature or initials.
- Hazards of the permit space to be entered.
- Measures used to isolate the permit space and to eliminate or control permit space hazards before entry.
- Acceptable entry conditions.
- Results of initial and periodic tests, with the names or initials of the testers and date the tests were performed.
- Rescue and emergency services that can be summoned and the details for the means of summoning them.
- Communication procedures used by authorized Entrants and Attendants to maintain contact during the entry.
- Equipment to be provided to achieve the requirements outlined for entry into Permit Required Space. Examples include: PPE, Testing, Communications, Alarm System, & Rescue Equipment.
- Other equipment necessary to ensure employee safety.
- Additional permits that have been issued for work within the permit space. Example: a permit for Hot Work.

## HAZARDS

### Atmospheric Hazards

Before any employee enters the space, the internal atmosphere must be tested for hazardous atmosphere with a calibrated direct-reading instrument. ***VSC employees are prohibited from entering a confined space with a hazardous atmosphere. All hazardous atmospheric contaminants must be removed with proper ventilation prior to entry.***

Examples of hazardous atmosphere include:

- Oxygen Deficient or Oxygen Enriched Atmosphere.
- Toxic Atmosphere.
- Atmosphere that may expose employees to the risk of death, incapacitation, or impairment of their ability to self-rescue (i.e. unaided escape from permit space). Also an atmosphere that may expose the employee to injury or acute illness from one or more following causes: flammable gas, vapor or mist in excess of 10% of Lower Flammable Limit (LFL).
- Airborne combustible dust at concentration that meets or exceeds LFL.
- Atmospheric concentration of any substance whose dose or PEL (Permissible Exposure Limit) could result in employee exposure in excess of dose or PEL.
- Any other atmospheric condition that is Immediately Dangerous to Life and Health (IDLH).

**NO VSC EMPLOYEE IS ALLOWED TO ENTER A CONFINED SPACE WITH EXISTING OR POTENTIAL CONDITIONS THAT ARE IDLH OR PERFORM TASKS THAT CAN CREATE IDLH CONDITIONS.**

Examples of IDLH:

- Toxic chemicals requiring supplied air respirator.
- Operating Mechanical equipment that can cause physical injury.
- Small space where entrant can become stuck.
- Tasks involving the use of hot work that is a fire hazard.
- Release of fire main water supply that is not shut off / lock out tagged out.
- Any condition which poses an immediate threat to the health of life on an entrant, or;
- Would cause irreversible adverse health effects, or;
- Would interfere with an individual's ability to escape unaided from a permit space.

### Testing and Monitoring Atmospheric Hazards

- The space shall be tested to determine if acceptable entry conditions exist *before* beginning entry operations. Initial testing of the atmosphere must be done from outside the confined space *prior to any entry*. If the space is large or part of a continuous system (such as a sewer), entry conditions will be continuously monitored where entrants are working.
- When testing the atmosphere test first for oxygen, then for flammable and explosive gases and vapors, and then for toxic gases and vapors.
- Test all levels of the confined space (top, middle and bottom) and all corner or pocket areas.
- The space shall be monitored continuously to determine if acceptable entry conditions are being maintained during the course of entry operations.
- Atmospheric test equipment and calibration kit owned by VSC must be maintained and calibrated as per the manufacturer's recommendations by an assigned person. Each VSC department manager will designate a person to this position who has received training in maintenance and calibration of equipment.

### Atmospheric Conditions:

- Oxygen Safe: An oxygen atmosphere that contains a level between 19.5% to 23.5% oxygen.
- Oxygen Deficiency: When conditions inside the space may create an atmosphere which is less than 19.5% oxygen.
  - At 16% oxygen - you will feel disoriented;
  - At 12% - 8% oxygen – you will become UNCONSCIOUS.
  - At 6% oxygen – you experience difficulty breathing with a risk of death.
- Oxygen Enriched: When the atmosphere contains 23.5% oxygen, the condition becomes an explosion or fire hazard.
- Toxic Contaminates: The work being performed in confined spaces can give off toxins that can overcome the Entrant. A Test to ensure that none of the possible toxic materials are greater than its PEL will need to be conducted. An example of this would be a welding operation that gives off carbon monoxide.
- Flammability: Explosive fumes and vapors are serious dangers and will ignite quickly in the trapped air of confined spaces. The concentration of flammable gasses must be less than 10% of the LFL.

Parameters for non-hazardous atmospheres are:

- Oxygen: 20.8%
- Toxicity: 0%
- LFL: 0%

*If any of the atmospheric readings are different than these non-hazardous readings, then all personnel exposed to the hazardous atmosphere must be aware of the hazards which are causing, or may cause, adverse conditions prior to entering the space. The hazardous atmospheric contaminates must be removed (Abated) with proper ventilation prior to entry.*

### Physical Hazards

Physical Hazards that are present within or adjacent to the space can create conditions that could cause serious injury and death to employees. (Example: caught in the material that falls into or fills the space.) The following lists examples of hazards that need to be identified, abated, or protected against:

- Engulfment:
  - Becoming entrapped by material such as liquid (i.e. water, oil or fuel contained in underground piping that is broken, or piping that was not properly locked out/tagged out and is reinstated allowing the liquid to flow freely into the space); flow-able solid substances (i.e. quicksand, mudslide); and physical material (i.e. earth/soil aligning a pit that caves in/upon the pit).
  - Liquids can quickly fill the space which presents the danger of choking and drowning.
  - Flow-able solid substances and physical material can exert force upon the body leading to crushing, constriction or strangulation.
- Shock, Electrocutation, Pinning, Asphyxiation:
  - Activated electrical tools and equipment can result in electric shock or electrocution when used in a damp confined space or one that contains any standing water. Any presence of high voltage electricity within the space can also pose a hazard due to the close proximity of the Entrant to the exposure.
  - Mechanical equipment can fall onto an employee or malfunction, producing hazardous gases within the confined space.
- Extreme Noise, Temperatures, Steam
  - Extreme Noise can adversely affect an employee's hearing. This physical hazard must be abated. When abatement is not possible refer to Appendix J. "Hearing Protection Safety Program" of the VSC Health & Safety Program for additional direction. In addition, extreme noise can create a communication barrier between the Entrants, as well as between the Entrant and Attendant. When this physical hazard is present, it must be taken into consideration when developing the communication plan to monitor the status of the Entrant, to alert Entrants of the need to evacuate, as well as to implement the Rescue and Emergency Plan.7

- Extreme Heat can lead to Heat Stress/Stroke, and Extreme Cold can lead to frost-bite or Hypothermia. When this physical hazard cannot be abated, pre-cautions outlined in the VSC “Temperature Extreme Management Plan” must be followed.
- Steam can cause first, second and even third degree burns. It also poses a risk of creating a hazardous atmosphere that can lead to asphyxiation.
- Physical Barriers
  - An obstruction that, by its physical size or position within the space, would complicate rescue efforts. (I.e. scaffolding or ladders being used in the space)
- Power Failure
  - Power failures can create lack of light within the space creating additional risks for the employee as he/she performs the assigned work, attempts normal exit procedures, or during evacuation/emergency rescue efforts. Additional sources of light need to be determined during the JHA process specific to the jobsite/confined space.

Note: Effort is to be made to prevent materials from entering a confined space. Pipelines or other material transportation systems that can carry materials into spaces will be disconnected, blanked off, or otherwise blocked by a positive method to prevent materials from entering or being discharged from the space. Where these transportation systems are under the control of the Owner or General Contractor, VSC’s Entry Supervisor is to coordinate this effort with the Owner/GC. Refer to Appendix H. “Lockout/Tagout Safety Program” of the Health& Safety Program for additional direction.

#### Other Hazards

Other hazards that need to be identified, abated or protected against include:

- Falling Objects that are part of the physical space or are brought into the space.
- Unstable or dangerous work surfaces
- Insects (i.e. spiders, ants, hornets).
- Reptiles (i.e. snakes, bats).
- Rodents/Animals (i.e. rats, gophers, hibernating animals).

#### **RESCUE & EMERGENCY SERVICES**

- The permit shall list the name and telephone number of the emergency rescue provider and the method of emergency services should they be required. Before entry, it shall be verified how the service will be contacted, who and how a rescue procedure will be conducted, the approximate length of time to respond, and all equipment that may be needed.
- Non-entry rescue is the preferred method for rescue of personnel from a permit-required space. Employees will not enter a permit space for rescue unless they have been specifically trained and equipped for such rescue.
- To facilitate non-entry rescue, retrieval systems or methods shall be put in place/used whenever an authorized Entrant enters a permit space, unless the retrieval equipment would increase overall risk of entry or would not be of value to any rescue.
- Retrieval systems shall meet the following requirements:
  - Each Entrant shall use a chest or full body harness with a retrieval line attached at the center of the back, near shoulder level, or other appropriate point. Personal fall protection equipment, arrest and retrieval system must have ANSI standards data labels.
  - The other end of the retrieval line shall be attached to a mechanical device or fixed point outside of the permit space enabling its immediate use. A mechanical device will be used to retrieve personnel from vertical type permit spaces more than five feet deep.
  - If injured Entrant is exposed to any substance with a required SDS or similar document, the SDS or document will be made available to the medical facility treating the Entrant.
- If rescue should become necessary, the Attendant will:
  - Notify and summon the rescue team/service.
  - Attempt Non-Entry rescue procedures, to the extent possible, given the circumstances.
  - Monitor the situation and be ready to give rescuers information on how many victims, their status, and all known details pertaining to the existing hazards (i.e. Atmospheric Hazards, Physical Hazards, and Other Hazards).
- Only designated personnel will enter permit spaces for rescue purposes. Each designated rescue team member will be trained in the following:
  - Use of PPE and rescue equipment necessary for making the rescue from the permit space.
  - Performance of assigned rescue duties and also that training required of authorized Entrants.
  - Basic first aid and cardiopulmonary resuscitation (CPR). At least one member of the rescue team will hold current certification in first aid and CPR.



Note: VSC will rely on local or host authorities to handle rescue operations. When a job is being conducted at a host facility, the Entry Supervisor will make arrangements with the host facility to handle rescue operations prior to work being performed.

#### **PERMIT SPACE RECLASSIFICATION**

If the permit space has no actual or potential atmospheric hazards, and there is no potential for an atmospheric hazard to arise, the space may be reclassified as a non-permit confined space. In order to reclassify a space as non-permit, all hazards within the permit space must be eliminated. Once elimination of all hazards occurs, the space can be temporarily reclassified "non-permit" and will remain reclassified as long as the hazards are eliminated. If entry is required to eliminate hazards, it shall be done according to regulations.

Hazards may be eliminated by such actions as: Purging, Inerting tanks/vessels of contaminants, Emptying material from hoppers/bins, and Use of company lock out/tag out procedures for electrical and mechanical hazards.

Note: The control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazard; it only controls the hazard! In this case, the Alternate Entry Procedures previously outlined must be applied!

Entry Supervisors will certify in writing that all hazards in permit space have been eliminated and make this document available to each Entrant.

If hazards arise in a reclassified non-permit space, employee(s) shall exit and the employer shall determine whether to reclassify space. If hazard(s) arise which reclassify the space to be IDLH STOP and immediately notify the VSC District Office and Risk-Safety.

**NOTE:** A combination of reclassification procedures and alternate entry procedures (e.g. using lockout/tagout to eliminate a physical hazard, and then continuous forced air to control an atmospheric hazard) may not be used together. Situations as such must be entered under the permit program.

**EXCHANGE OF HAZARD INFORMATION BETWEEN EMPLOYERS**

VSC will make available all information on the hazards, safety rules, and emergency procedures concerning confined spaces and atmospheres to other companies that authorize their employees to enter the same spaces that VSC employees enter.

If a confined space that VSC employees will be working in is near an area that contains flammable or combustible liquids or gases without signs prominently posted prohibiting sources of ignition, VSC employees must advise the customer and not proceed to enter that space until the space is in compliance with the proper signage prominently posted.

**SUB-CONTRACTORS**

VSC will inform any of its sub-contractors whose employees will enter permit spaces about:

- The permit spaces and permit space entry requirements.
- Any identified hazards;
- The employer’s experience with the space, such as knowledge of hazardous conditions; and
- Precautions or procedures to be followed when in or near permit spaces.

VSC will give these sub-contractors any other pertinent information regarding hazards and operations in permit spaces and will be debriefed at the conclusion of entry operations by the sub-contractors employees.

**HOT WORK**

VSC employees are prohibited from performing Hot Work in a confined space.

**PROGRAM REVIEW**

The Confined Space Program will be reviewed annually to revise the program as necessary to ensure employees are protected from confined space hazards.

