

# **Chapter 19 – Confined Space**

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## 19.1 Introduction

The County of Santa Clara is committed to the protection of employee health and safety, the protection of the environment, and the protection of county resources and physical assets.

This Confined Spaces Program (CSP) is intended to protect County employees working in confined spaces by establishing a framework for identifying confined space hazards, providing procedures, materials, and equipment guidance as well as employee safety training.

The CSP complies with California Occupational Safety and Health Administration's Cal-OSHA Regulation, Title 8, California Code of Regulations, Section 5156-5159, Confined Spaces. This regulation sets the standards for preventing employee exposure to confined space hazards. The regulation link is provided as **Appendix 1**. Definitions are provided as **Appendix 2**.

This program will be made available and accessible to worksites affected by confined space risks. It is available to employees on the OSEC website.

## 19.2 Confined Space Entry Limitations

Typical confined spaces may include storage tanks, deep trenches, tank trucks, pits, ventilation, and exhaust ducts, building crawl spaces, sewers, pumping stations with wet wells, tunnels, underground utility vaults, manholes, vats, and boilers. Based on a survey of hazards and characteristics of each confined space in the County, spaces will be labeled and treated as Non-permit Required Confined Spaces (NPRCS) or Permit Required Confined Spaces (PRCS). Permit Required Confined Spaces are confined spaces that include additional hazards, such as:

- Existing ventilation is insufficient to remove dangerous air contamination, oxygen enrichment and/or oxygen deficiency which may exist or develop.
- Ready access or egress for the removal of a suddenly disabled employee is difficult due to the location and/or size of the opening(s).

Santa Clara County employees may only enter non-permit required confined spaces (NPRCS). County employees will not enter a permit required confined space (PRCS). It is the policy of Santa Clara County to employ licensed, trained contractors with the appropriate monitoring and rescue equipment to enter permit required spaces prior to granting entry.

Santa Clara County employees that enter non-permit required confined spaces (NPRCS) will do so only after each space has been reviewed and evaluated for the following:

- Confined space usage that may affect the atmosphere
- Physical characteristics, configuration, and location of the confined space
- Existing or potential hazards: oxygen deficient or enriched atmospheres, flammable/explosive atmospheres, toxic atmospheres, biological hazards, and mechanical hazards
- Scope and magnitude of hazard exposure
- Likelihood of hazard occurrence
- Potential for altering conditions or activities
- Controlling hazards
- Impact of hazards on emergency rescue response

This program sets forth minimum standards for all County departments where confined spaces exist and may be entered. It also contains requirements for establishing and regulating specialty Department Confined Space Programs. Individual departments may implement more stringent, non-conflicting, standards than this County program. Copies of Department programs are to be labeled, made available to affected employees, and provided to OSEC.

## **19.3 Roles and Responsibilities**

### **19.3.1 Office of the County Administrator**

- Allocates the resources necessary to provide a safe working environment
- Provides leadership by active participation and a demonstrated interest in the CSP
- Approves safety and health policies

19.3.2 Occupational Safety and Environmental Compliance (OSEC), The County Safety Officer, and/or designee is responsible for the following:

- Establishes the Confined Space Entry Program (CSP)
- Oversees County CSP implementation, evaluation and updates
- Provides resources and input to assist with Department specialized CSPs
- Facilitates communication about confined space hazards with departments
- Performs an annual review of the County CSP and updates as necessary

### **19.3.3 Agency/Department Head**

The Department Head is responsible for the overall implementation of the Department's CSP and specialized safety procedures, and fulfills the following responsibilities:

- Establishes the Department's CSP goals and objectives
- Ensures the implementation of the Department CSP
- Provides the resources to effectively implement the CSP and protect employees entering confined spaces, including but not limited to equipment, gas monitoring systems, air quality sampling, and contract services.

### **Ensures 19.3.4 Agency/Department Safety Coordinator**

Each Department is responsible for identifying at least one Safety Coordinator and an alternate with the following responsibilities:

- Develops and implements the Department CSP, routes a copy to OSEC, and make a copy available to all affected employees
- Identifies all employees who are required to work in confined spaces
- Identifies all supervisors of employees who are required to work in confined spaces
- Coordinates and tracks Confined Space Entry Program training.

- Provides an annual review of the Department CSP and updates it as needed
- Maintains a file of all departmental confined space entry permits for one year
- Evaluates implementation of the Confined Space Entry Program annually to ensure that:
  - Pre-entry checklists are completed.
  - Warning signs are clear, in good repair, and posted as needed.
  - Permits are issued/retained for one year.
  - Training is provided. Records are kept.
  - Cal/OSHA updates are complied with.

### **19.3.5 First Line Supervisor**

Managers and Supervisors have the following responsibilities:

- Ensure that the requirements in the CSP are implemented
- Ensure that all affected employees are trained on mandated topics specified in the Training Section
- Ensure implementation of CSP procedures when employees or contractors are required to work around or enter a confined space
- Review and authorize all department confined space entry plans.
- Provide necessary equipment including but not limited to personal protective equipment, procedures, forms, and support services to enter and work in authorized confined spaces.
- Require submittal of all required forms and documentation for confined space entries within specified timeframes.
- Inform employees by sign, placard, or other effective means of the location of confined spaces to prevent unauthorized entry.
- Know the hazards associated with the confined spaces in their areas or affecting their employees. Institute all necessary precautions to prevent employee injury during confined space entry.
- Evaluate employees based on their compliance with this program

### **19.3.6 Employee**

Employees that enter confined spaces have the following responsibilities:

- Comply with the provisions of the Confined Space Program.  
Attend and understand training on the Confined Space Program, and associated personal protective equipment, procedures, monitoring, forms, and other requirements.
- Know and recognize confined space hazards including exposure effects.
- Avoid entry into spaces not authorized to enter.
- Know and follow emergency and rescue procedures.
- Provides feedback to supervisors regarding any suspected hazard involving confined space entry.

### **19.3.7 Contractors and Visitors**

For purposes of this policy, a contractor is defined as an employee of a firm that the County has contracted with to perform confined space work of a limited duration. A contractor is not a person who is under the day-to-day control and supervision of the County.

It is the responsibility of contractors, visitors, or other personnel on-site who are not Santa Clara County employees to ensure compliance with the Confined Spaces Program. If the confined space entry requires a permit, a contractor will do the work to obtain required documents.

Management must inform and coordinate with contractors on the following:

- Identification of the confined spaces for entry.
- The hazards identified within the confined spaces based on experience with the space(s).
- Precautions to take to protect employees in and around the confined space.
- Enforcement that permit-required confined space entry is allowed only through compliance with the County confined space program.
- Verify the permit is complete and that procedures, training, equipment, and controls are properly in place prior to permit-required confined space entry.
- Verify all paperwork, forms, and checklists are complete and submitted to the Department Safety Coordinator for recordkeeping.
- Debrief with the contractor at the end of the entry operations regarding hazards or issues encountered during confined space entry.

The contractor is required to:

- Receive the approval of the Manager/Supervisor and/or Department Safety Coordinator prior to confined space entry.
- Obtain information about the hazards anticipated in the space during planned project work.
- Coordinate entry operations with the responsible County employee(s).
- Ensure staff are current with all required training.
- Provide all appropriate personal protective equipment (PPE), equipment, and other required resources to their employees for safe confined space entry.
- Provide copies of completed checklists, forms, safety data sheets, and other required recordkeeping items to the designated County contact.
- Debrief with County representative regarding hazards confronted or created during entry operations.
- Ensure emergency and rescue procedures are prepared and available if needed.

### **19.3.8 Occupational Medical Provider**

- Provides medical diagnosis for occupational exposures, injuries, or accidents.
- Maintains employee health records in confidential files for the terms prescribed by law.

## 19.4 Confined Space Requirements

### Confined Space Identification

All County employees who are required to work in confined spaces are included in this Confined Spaces Program (CSP). It is each Department's responsibility to identify worksites, job tasks, and employee classifications that fall under this program or a Department's own specialty program.

Each county area and operation will be surveyed using the checklist in Appendix 3 to identify potential confined space hazards such as scope and magnitude of hazard exposure, impact of hazard on emergency responders, and what type of atmosphere is present.

All confined spaces will be treated as Permit Required until they are determined by this survey process to be Non-Permit Required.

Appendix 4 contains a confined spaces list and identification example that can be used to list and characterize identified confined spaces, tasks, and employees included in this program.

Appendix 5 contains the Contractor's Confined Space Entry Advisement Form, which must be used to notify contractors of the hazards and characteristics of each confined space.

## 19.4.1 Confined Space Definition

By definition, a confined space:

- Is large enough and configured such that an employee can enter and perform assigned work; and
- Is not designed for continuous employee occupancy; and
- Has limited or restricted means for entry or exit.

Confined spaces typically include storage tanks, deep trenches, tank trucks, pits, ventilation and exhaust ducts, budding crawl spaces, sewers, pumping stations with wet wells, tunnels, underground utility vaults, manholes, vats and boilers.

## 19.4.2 Non- Permit-Required Confined Space Entry

Due to the deadly nature of confined spaces, entry supervisors should consider eliminating the need for employees to enter them. Supervisors may be able to accomplish this by:

- *Eliminating the* confined space altogether. This may involve changes that allow the removal of the tank, vat, or other confined space.
- *Modifying* work methods to eliminate the need to enter the space. This may involve the use of special tools or robots.
- *Contracting* out certain infrequently performed tasks that involve confined spaces.

By eliminating the need to enter confined spaces, supervisors will be free from the need to comply with these and other procedures. *Most important, eliminating the need to enter the permitted space will be providing a safer workplace.*

### 19.4.2.1 Non-Permit Confined Space

A non-permit required confined space (NPRCS) is a space that does not contain, or have the potential to contain, any hazard capable of causing death or serious physical harm to an entrant. Confined spaces may be entered without a written permit or attendant provided that the space is determined to be non-permit required and can sustain safe working conditions.

The following steps shall be followed when entering a NPRCS that is new, has changed, or has new or obvious hazards identified prior to entry.

### 19.4.2.2 NPRCS Pre-Entry Procedures

Atmospheric testing shall be performed prior to confined space entry. Measurements shall be taken at the top, middle, and bottom of the confined space to assess the potential hazards. Information must be recorded on the Confined Space Pre-Entry Checklist (Appendix 6) and read in the following order:

- Oxygen content (between 19.5% and 23.5% by volume)
- Flammable gases and vapors (more than 10% of LEL), and
- Potential toxic air contaminants (greater than the PEL)



**If the atmospheric measurements are not within acceptable limits, do not enter the space.** Immediately contact the area manager/supervisor or an emergency contact person if atmospheric conditions are not within acceptable limits.

**Prior to entry, the pre-entry checklist shall be completed and posted near the confined space entry area. In order to enter the space without a permit, all questions on the form must be answered, "YES."**

**If "NO" is answered to any questions, do not enter the confined space.** Immediately contact the area manager/supervisor or an emergency contact person.

Managers/Supervisors will provide pre-entry orientation for the employees who may enter the confined space. The following items will be communicated in the orientation:

- Existing and potential hazards
- Appropriate Safety Data Sheets and hazard information
- Procedures and required equipment
- PPE to be utilized
- Emergency communication process
- Emergency procedures

Each employee who enters a confined space shall be trained in the safety aspects of the work they will perform in accordance with this CSP or other specific Departmental CSPs. Barricades or guards shall be placed appropriately to prevent unauthorized entry to the confined space and to prevent objects from falling on the entrant in the space. A "No smoking" policy will be in effect during the confined space entry.

### **19.4.3 Permit Confined Space Entry**

A permit-required confined 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 by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- Contains any other recognized serious safety or health hazard.

#### **14.3.1 Pre-Entry Procedures**

All new and modified spaces shall be considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise. County employees will not enter permit required confined spaces. Only qualified contractors may enter permit required confined spaces after following all applicable procedures. Entry into a permit-required confined space shall be by permit only (Appendix 7). A permit is required whenever a confined space indicates one or more of the following:

- Atmospheric testing indicates dangerous air contamination or oxygen deficiency/enrichment.
- Atmospheric conditions are safe but unsafe conditions can reasonably be expected to develop.

- The confined space contains materials that have the potential for engulfing an entrant.
- Internal configuration is such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which sloped downward and tapers to a small cross section.
- Contains any other recognized serious safety or health hazard.

### **14.3.2 Permit Required Entry Procedures**

The Manager or Supervisor of the affected area shall ensure that the contractor:

- Conducts all entries into PRCs only after evaluating the potential hazards associated with the entry and eliminating or mitigating each hazard to the extent feasible.
- Tests for dangerous atmospheres inside confined spaces prior to any entry; each hazardous condition identified, and its abatement shall be identified on the entry permit.
- Obtains and completes the Confined Space Entry Permit and other permits as required.
- Assures that all entry participants are qualified with proper training prior to the entry of the confined space.
- Identifies and verifies that all necessary and appropriate safety equipment is available, utilized, in good working condition prior to the entry.

## **19.4 Entry Procedures**

### **19.4.1 NPRCS Working Procedures**

The Manager, Supervisor, or designee will ensure that the space is evaluated to determine size, entry and exit access, oxygen content, and work to be performed. To facilitate safe entry into the confined space:

- Confined spaces shall be ventilated when necessary, or as a precaution, to ensure that the atmosphere is free of dangerous air contamination and/or oxygen deficiency.
- If workers need additional lighting it shall be portable and explosion-proof.
- The surrounding area will be isolated with barrier tape and/or warning signs to eliminate the entry of unauthorized entrants, or hazardous materials.
- A pre-entry checklist will be completed.
- Test the air routinely throughout the operation.

### **19.4.2 PRCs Working Procedures**

#### **19.4.2.1 Manager or Supervisor Responsibilities**

The Manager or Supervisor responsible for the space and the contractor must ensure the following for entry and work inside a permit required confined space.

- Necessary personnel and equipment are on site and available during the entry
- Portable blowers are used to augment natural ventilation; additional space openings shall be opened to increase air circulation wherever possible

- Entrant(s) required to wear a safety harness with an attached lifeline. The free end of the line shall be secured outside the entry opening. When entering through a top opening, the safety harness shall suspend a person upright, and hoisting device shall be available for lifting workers out of the space.
- At least one employee stands by on the outside of the confined space, hereby known as the 'attendant'. This person must monitor the conditions of the space and be prepared to provide assistance in case of an emergency.
- A rescue procedure is established and discussed with affected employees prior to entrance into the confined space.
- An entry permit is issued and posted
- The entry permit is terminated immediately if the hazards in the confined space increase or a previously unrecognized hazard is identified or that all the aforementioned conditions cannot be satisfied.

The entrant into the confined space is responsible for the following:

- Is knowledgeable of the hazards of the confined space, including information on the mode, signs, or symptoms, and consequences of the exposure.
- Uses appropriate equipment for the hazards encountered in the confined space
- Tests communication equipment with attendant prior to and immediately after entry into a confined space and alerts attendant when hazardous conditions exist
- Communicates with and alerts the attendant as necessary or when a hazardous or unsafe condition occurs.
- Implements emergency or rescue procedures when needed
- Exits from the permit space when an order is given to exit, an evacuation alarm is activated, or warning signs or symptoms of exposure occur.

The attendant, standby, or guard is responsible for the following:

- Knowledge of the hazards of the confined space
- Remains outside the confined space to monitor the activities of the confined space work.
- Communicates and maintains an accurate count of authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space.
- Knows when to call for help and order entrant(s) to exit if unsafe condition exists; provides emergency assistance if necessary
- Prohibits entry of unauthorized persons
- Performs non-entry rescue services.

The entry supervisor is responsible for the following:

- Knows the hazards that may be faced during entry, including information on the mode, signs, or symptoms, and consequences of the exposure.
- Verifies appropriate entries are provided on the permit, that all tests specified, and procedures, equipment are performed or in place before endorsing the permit and allowing entry to begin.
- Terminates the entry and cancels the permit.

- Verifies that rescue services are available and that the means for alerting additional services are operable.
- Removes unauthorized individuals who enter or attempt to enter the permit space during entry operations.
- Determines, 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.
- The entry supervisor must confirm that the emergency rescue services are trained in, are capable of, and have annual drills in performing confined space rescue in spaces similar to the confined space in question.

Note: An entry supervisor also may serve as an attendant or as an authorized entrant, if, that person is trained and equipped as required by this section 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 an entry operation.

## 19.8 Equipment

Although various confined spaces require different equipment, certain types of equipment are commonly used. Equipment, such as personal protective equipment, alarm systems, testing equipment, communications equipment, and rescue equipment are provided and shall be maintained in compliance with this program.

### 19.8.1 Air Testing Equipment

Oxygen and miscellaneous gas monitors perform two main functions:

- 1) testing the air for oxygen content and flammable/toxic gases and vapors prior to entry, and
- 2) monitoring the air once you are inside.

Prior to entry, the atmosphere within the space will be tested to determine whether dangerous air contamination and/or oxygen deficiency exists. Detector tubes, alarm only type gas monitors, and explosion meters are examples of equipment that may be used to test permit space atmospheres. Testing shall be performed by **the entrant, attendant, or supervisor** with calibrated direct-reading instruments. Testing can only be performed by those who have successfully completed the gas detector training for the monitor(s) he/she will use.

Due to the wide variety of test equipment available, you may need expert advice to determine which type of device is needed to test the confined space you intend to enter.

### 19.8.2 Order of Testing

The prescribed order for testing the air in a confined space is:

1. Oxygen (deficiency or over-saturation)
2. Combustible gas (Lower flammable limits – LFL)
3. Toxic gases or vapors (Hydrogen Sulfide)

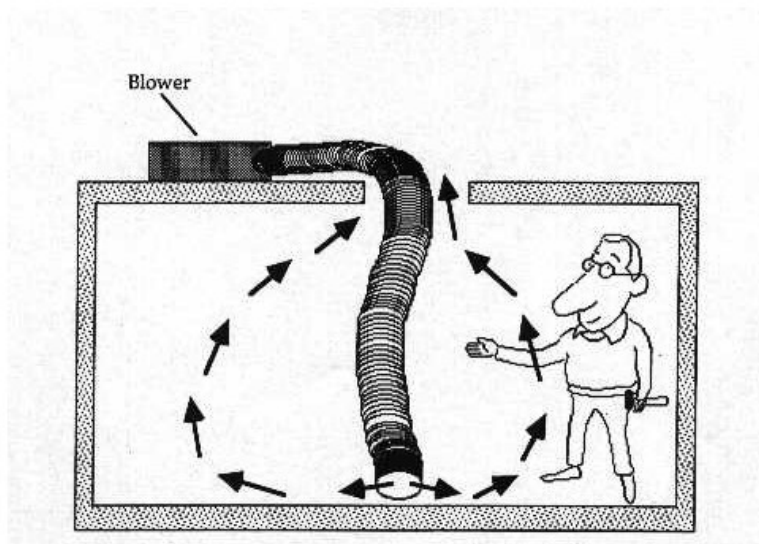
Entry may not begin until the testing has demonstrated that the hazardous atmosphere does not exist or, upon retesting, has been eliminated. **Also, if the confined space is vacated for a substantial period (e.g., members of the confined space entry team break for lunch), the space must be tested prior to reentry.**

**Any employee who enters the space shall be provided an opportunity to observe the pre-entry testing and be provided with the results.**

### 19.8.3 Ventilation Equipment

If natural ventilation is insufficient to maintain a safe atmosphere, a mechanical ventilation system must be used. The ventilation system must be set to utilize 100% outside air to ventilate the space before entry and must be able to maintain air quality once inside. Where possible, open additional manholes to increase air circulation. Use portable blowers to augment natural circulation if needed. The continuous air supply for the forced air ventilation shall be from a clean source. Designs and requirements vary, devices must be adequate and reliable. Special work being done within a confined space, such as welding, must have additional considerations when choosing adequate ventilation options.

The following illustration shows a portable ducted blower being used in a typical confined space.



### 19.8.4 Rescue equipment

To facilitate non-entry rescue, retrieval systems shall be used whenever an entrant enters a permit space. Each entrant shall use a chest or full body harness, with a retrieval line (shall be a minimum of ½-inch diameter and 2,000-pounds tested) attached at a suitable point so that when rescued, the entrant presents the smallest possible profile.

The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5-feet deep. The retrieval equipment shall not increase the overall risk of entry or rescue of the entrant.

### 19.8.5 Communication equipment

The best kind of communication is direct line of sight between the person inside and the standby person. When this is not possible, direct voice contact is the next best method. Where this is not possible, a continuous powered radio must be used. This may be a standard two-way portable radio, or it may be a radio device that senses

movement and alerts a remote operator if movement stops. All affected employees shall be trained in the use of such communication equipment. The equipment shall be tested before each use to confirm its effective operation. Communication equipment requirements vary with the degree of hazard, but in general, the more risk, the greater the standby person's ability should be to monitor the person inside. Communications between attendant and entrant shall be maintained throughout entry.

### **19.8.6 Personal Protective Equipment**

An important type of personal protective equipment for work in a confined space is the respirator. Not all confined spaces require a respirator, but if you use one, you must follow the procedures in the County's Respiratory Protection Program. The respirator used in confined spaces, and that are in accordance with this document are supplied air - either an approved airline or a self-contained breathing apparatus (SCBA).

You may also need goggles, welding helmets, hard hats, gloves, coveralls, foot protection, or hearing protection. For further information on personal protective equipment refer to the County's Personal Protective Equipment Program. If you need hearing protection, be sure to refer to the County's Hearing Conservation Program.

## **19.9 Training**

Training shall be provided to all employees whose work requirements are affected by this program. Employees shall acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned. The training must cover this document, the equipment you will be using, hazard recognition, lockout of energized equipment and atmospheric testing and rescue operations. Training shall be performed before first attempting assigned duties, before there is a change in assigned duties, when a new hazard is identified, or when there are any inadequacies in the procedures.

Supervisors shall provide training and make sure it is fully understood. Supervisors will keep training documentation and make it available to Occupational Safety and Environmental Compliance (OSEC) upon request.

## **19.10 Planning to Enter a Confined Space**

### **19.10.1 Permits**

Any entry into a permit-required confined space requires a permit (Appendix A) which must be signed by the authorized Entry Supervisor. The permit certifies that all existing hazards have been evaluated by the qualified person. A permit also ensures that all necessary protective measures have been taken. Permits are valid for only one shift **and are immediately canceled if conditions change within the confined space. It is the entry supervisor's responsibility to assure that the** hazards and safety procedures of the permit must be reviewed with the entry crew.

For each shift, the designated entry supervisor must complete and sign a Pre-entry Checklist and Confined Space Entry Permit and make sure it is clearly posted near the point of entry before they allow anyone to enter the confined space.

### **19.10.2 Orientation**

Supervisors will provide pre-entry orientation for those entering the confined space and for standby persons. The orientation must cover information on the Confined Space Data Sheet (Appendix B) including:

- Existing and potential hazards.
- Appropriate Safety Data Sheets and hazard information.

- Job procedures and equipment, including PPE
- Air testing procedures and equipment.
- Type and frequency of communication between entering and standby personnel.
- Emergency communication.
- Rescue procedures.

### 19.10.3 Barricading/Signing

A sign shall be posted warning employees of the existence and location of and the danger posed by the permit space. If an entrance cover is removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening or foreign objects entering the space.

## 19.11 Entry and Working Procedures

Perform entry duties and responsibilities as previously stated in the Confined Space Program. Reference Appendix C - the Permit-Required Confined Space Decision Flow Chart, for assistance.

### 19.11.1 Evaluation

Evaluate the situation carefully. The evaluation will assess the size of the confined space, entry/exit access, chemicals inside, oxygen content, and work to be done. Reference the Confined Space Data Sheet (Appendix B) for evaluation.

### 19.11.2 Safe Entry

- Confined spaces shall be ventilated when necessary, or as a precaution, to ensure that the atmosphere is free of dangerous air contamination and/or oxygen deficiency.
- If workers need additional lighting it shall be portable and explosion-proof.
- A harness/lifeline apparatus shall be worn by the entrant when entering a permit-required confined space.
- A hoist apparatus shall be used for top entries and/or descents of five feet or more and shall be capable of being operated by one person. **If the entrant is going to be lowered a vertical distance of more than five feet into a space, the tripod or crane will be provided with an "inertia reel" to stop the fall of the entrant if the main line should fail.**
- Confirm that rescue services are readily available, both on- and off-site
- Isolate the surrounding area with barrier tape and/or warning signs to eliminate the entry of any hazardous situations or materials. Refer to Lockout Tag section if necessary.
- Have an entry permit issued and posted.
- Test the air routinely throughout the operation.
- Finish the job as quickly and as safely as possible.



### 19.11.3 Lockout and Tagout

Confined spaces may have pipes, passages, or wires leading to or through them (flow of liquid, gas, or electricity). Lockout and tagout (LOTO) procedures are an integral part of most confined space work. It is not sufficient to turn off the switches, valves, etc. - they must be locked off and tagged according to procedures described in the County's Lockout and Tagout Program. As described in that document, there are standard lockout devices and tags available that can effectively lock switches, valves, breaker boxes, etc.

### 19.11.4 Contractors

Contractors may, if necessary, enter a dangerous confined space.

County entry supervisors must make sure that contractors who enter confined spaces take the following precautions:

- Personnel must be trained.
- The contractor must have the proper permits.
- The person inside must wear a self-contained breathing apparatus (SCBA) or air-supplied respirator and be equipped with appropriate air monitoring equipment.
- At least two persons trained and qualified in self-contained breathing apparatus (SCBA), cardiopulmonary resuscitation (CPR) and first aid are required to be at the work site. The standby persons must be able to pull the "dead" weight of the person making horizontal entry into the workspace to safety. If the entrant will be making a vertical entry of five feet or more, the contractor must provide a tripod and hoist or a crane to facilitate non-entry rescue of the entrant. SCBAs must be available, inspected, and ready for immediate use by at least one of the persons trained and qualified in SCBA in addition to the attendant (resulting in two people with SCBAs ready to use on site).
- Mechanical lifting devices must be used for any underground work and other jobs which allow for such a device.
- The entrant must be equipped with the following safety devices and trained in their use:
  - Safety harness and lifeline at least ½ inch in diameter and 2,000-pound test.
  - Respiratory protection that uses an independent air supply, equipped with a device to warn of a low air supply.
  - Personal Protective Equipment as required for the job to be done.
  - Communication devices that provide continuous interaction with the person(s) working in the confined space and the standby person. The communication devices must be tested before each use to confirm their effective operation.
- Another method of retrieving an injured worker must be established when the use of a lifeline is not possible due to obstructions in the work area or shape of the space.
- All sources of ignition must be excluded from the work area until testing determines that a flammable or explosive atmosphere is not present.
- Lighting must be of the portable and explosion-proof type.
- Lockout/tagout of energized systems in the work area must be in effect.

- Work should be scheduled to minimize prolonged exposure to the hazardous conditions.

## 19.12 Rescue Procedures

Take the following steps:

- Call 911 or notify County communications immediately. Give as many details as the dispatcher asks for - and do not hang up first.
- Summon help from authorized (trained) employees or bystanders.
- Use non-entry rescue methods and tools such as - ropes, hoists, hooks, pulleys, etc. to attempt to remove a potential victim from a confined space. **Do not enter the space** - even for a moment!

## 19.13 Welding and cutting

(See the County's Welding and Cutting procedures for more detail.)

- Supervisors must complete and post a welding permit before allowing any welding or cutting to be done. A sample welding permit is found in the Welding Procedures [chapter](#).
- Do not introduce any source of ignition into the confined space until testing confirms that no flammable or explosive atmosphere exists. Maintain continuous monitoring of oxygen concentration and flammable levels.
- Use local exhaust ventilation during all welding operations in confined spaces.
- Under NO circumstances are welding gas cylinders permitted inside a confined space. Turn the gas off at the cylinder valve when not in use and remove unattended torches and hoses from the confined space.
- If you cannot ensure a safe atmosphere you may not perform welding or cutting inside the confined space. Welding or cutting work which must be performed inside a confined space with the use of a SCBA shall be performed by a contractor.
- **Never, under any conditions, use compressed oxygen to provide "fresh air" to someone working in a confined space.**

Beware of hazardous materials used during welding or cutting, including base metal, fluxes, coating, plating, and filler material. Toxic substances include, but are not limited to, beryllium, cadmium, chromium, fluorides, lead, mercury, zinc, inert-gases, fumes from metal arc welding or oxygen cutting of stainless steel.

Supervisors shall, in all cases, make arrangements to provide sufficient surveillance and monitoring to ensure safe conduct of the work and safe exit from the space when the work is done.

## **19.14 Secure the Site**

Once all entrants have left the permit space, the site must be secured and returned to its normal state. Reverse any procedures used to isolate the space, such as lockout/tagout. Put doors or covers to the space back in place. Once the entrance is secured, remove barriers or cones used to protect the space during entry. The entry supervisor dates and cancels the permit.

## **19.15 Applicable Regulations**

CAL/OSHA, Title 8, California Code of Regulations, Sections 5156 through 5158

Federal OSHA, Title 29, Code of Federal Regulations, Section 1910.146

## **19.16 Appendices**



## 19.16.1 Appendix A: Confined Space Permit

### Pre-Entry Checklist

(All applicable items shall be "Yes" for the permit to be valid.)	<u>YES</u>	<u>NO</u>	<u>DOES NOT APPLY</u>
<b>1. Procedure Provided, Reviewed and Enforced?</b>	_____	_____	_____
a. All procedures reviewed and understood? Training completed?	_____	_____	_____
b. Person on site at all times to enforce all procedures?	_____	_____	_____
c. Safety Data Sheets (SDS) reviewed?	_____	_____	_____
<b>2. Welding, Cutting, Open Flame Present?</b>			
a. Welding permit obtained and posted?	_____	_____	_____
<b>3. Confined Space Isolated?</b>			
a. Lockout and Tagout Procedure followed?	_____	_____	_____
b. Power sources "OFF"? Locked out?	_____	_____	_____
c. Electrical hazards isolated, removed, tagged?	_____	_____	_____
d. Rotating equipment locked out, removed or disconnected?	_____	_____	_____
e. Lines carrying materials to and from confined space blanked off, section removed or locked by two valves and drained? Drain valve locked open and tagged?	_____	_____	_____
f. Contents removed and space flushed?	_____	_____	_____
<b>4. Confined Space Atmosphere Prepared and Monitored?</b>			
a. Purged of flammable gases and toxins?	_____	_____	_____
b. Flanges/access doors removed? Manholes opened?	_____	_____	_____
c. Continuous ventilation provided?	_____	_____	_____
d. Oxygen level maintained over 19.5% but less than 23.5%?	_____	_____	_____
e. Continuous air monitoring equipment provided and operational?	_____	_____	_____
<b>5. Personal Protective Equipment Provided?</b>			
a. Specific instructions given for its use?	_____	_____	_____
b. Airlines, self-contained breathing apparatus or other approved respirators provided?	_____	_____	_____
c. Safety harness with "D" ring and life line provided?	_____	_____	_____
d. Safety harness, "D" ring, and life line pass inspection?	_____	_____	_____
e. Head, hearing, hand, foot and body protection provided?	_____	_____	_____
f. Lighting equipment of approved type provided and grounded?	_____	_____	_____
g. Fire extinguishers readily available?	_____	_____	_____
h. Walking/working surfaces protected from slippage?	_____	_____	_____
<b>6. Attendant Present?</b>			
a. Standing outside of space, trained, and prepared to respond to emergencies as instructed?	_____	_____	_____
b. Rescue equipment provided at the confined space?	_____	_____	_____
c. Emergency alarms or communications available?	_____	_____	_____

NOTE: This list of items is not intended to be all inclusive. Certain jobs may require additional specifications.

## 19.16.2 Appendix B: Confined Space Data Sheet

### COUNTY OF SANTA CLARA CONFINED SPACE DATA SHEET

Page 1 of 2

Confined Space ID No. \_\_\_\_\_

Bldg. # \_\_\_\_\_ Address: \_\_\_\_\_ Floor No.: \_\_\_\_\_ Room No.: \_\_\_\_\_

Other Locational Information: \_\_\_\_\_

**Type of Space:** (check as many as apply)

<input type="checkbox"/> Manhole	<input type="checkbox"/> Boiler
<input type="checkbox"/> Vault	<input type="checkbox"/> Tank
<input type="checkbox"/> Compartment	<input type="checkbox"/> Shaft
<input type="checkbox"/> Crawl Space	<input type="checkbox"/> Tunnel
<input type="checkbox"/> Above Ground Level	<input type="checkbox"/> Below Ground Level
<input type="checkbox"/> Electrical	<input type="checkbox"/> Sewer or Piping
<input type="checkbox"/> Other: _____	

**Type of Entrance:**

<input type="checkbox"/> Top	<input type="checkbox"/> Hinged Door
<input type="checkbox"/> Side	<input type="checkbox"/> Bolted Cover
<input type="checkbox"/> Bottom	<input type="checkbox"/> Gravity Cover
<input type="checkbox"/> Outside Locking Device	<input type="checkbox"/> Inside Release
<input type="checkbox"/> Other: _____	

**Potential Hazards:**

Contains or has a potential to contain a hazardous atmosphere:

Lack of oxygen  
 Explosive atmosphere  
 Toxic atmosphere  
 Describe: \_\_\_\_\_

Contains a material that has the potential for engulfing an entrant:

Describe: \_\_\_\_\_

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.

## 19.16.2 Appendix B: Confined Space Data Sheet

### COUNTY OF SANTA CLARA CONFINED SPACE DATA SHEET

Page 2 of 2

#### Potential Hazards (cont'd):

\_\_\_\_\_ Contains any other recognized serious safety or health hazard, such as:

\_\_\_\_\_ High voltage electricity

\_\_\_\_\_ High temperatures

\_\_\_\_\_ High pressures

\_\_\_\_\_ Exposed wiring

\_\_\_\_\_ Sharp objects

\_\_\_\_\_ Moving parts

\_\_\_\_\_ Friable asbestos

\_\_\_\_\_ Other: \_\_\_\_\_

#### Evaluator's Rating:

\_\_\_\_\_ **Non-Permit** - if the only hazard is an actual or potentially hazardous atmosphere and continuous forced air ventilation can keep the space safe.

\_\_\_\_\_ **Permit Required** - if the confined space cannot qualify as non-permit.

#### Procedures Required for Entry:

\_\_\_\_\_ Atmospheric Testing

\_\_\_\_\_ Cleaning

\_\_\_\_\_ Isolation

\_\_\_\_\_ Lockout

\_\_\_\_\_ Blank-off

\_\_\_\_\_ De-energize

\_\_\_\_\_ Purge-flush

\_\_\_\_\_ Ventilation

\_\_\_\_\_ Other: \_\_\_\_\_

#### Life Safety Equipment Required for Entry:

\_\_\_\_\_ Gas Detector

\_\_\_\_\_ Air Blower

\_\_\_\_\_ Personal Monitoring Unit

\_\_\_\_\_ Safety Harness and Life Line

\_\_\_\_\_ Respirator

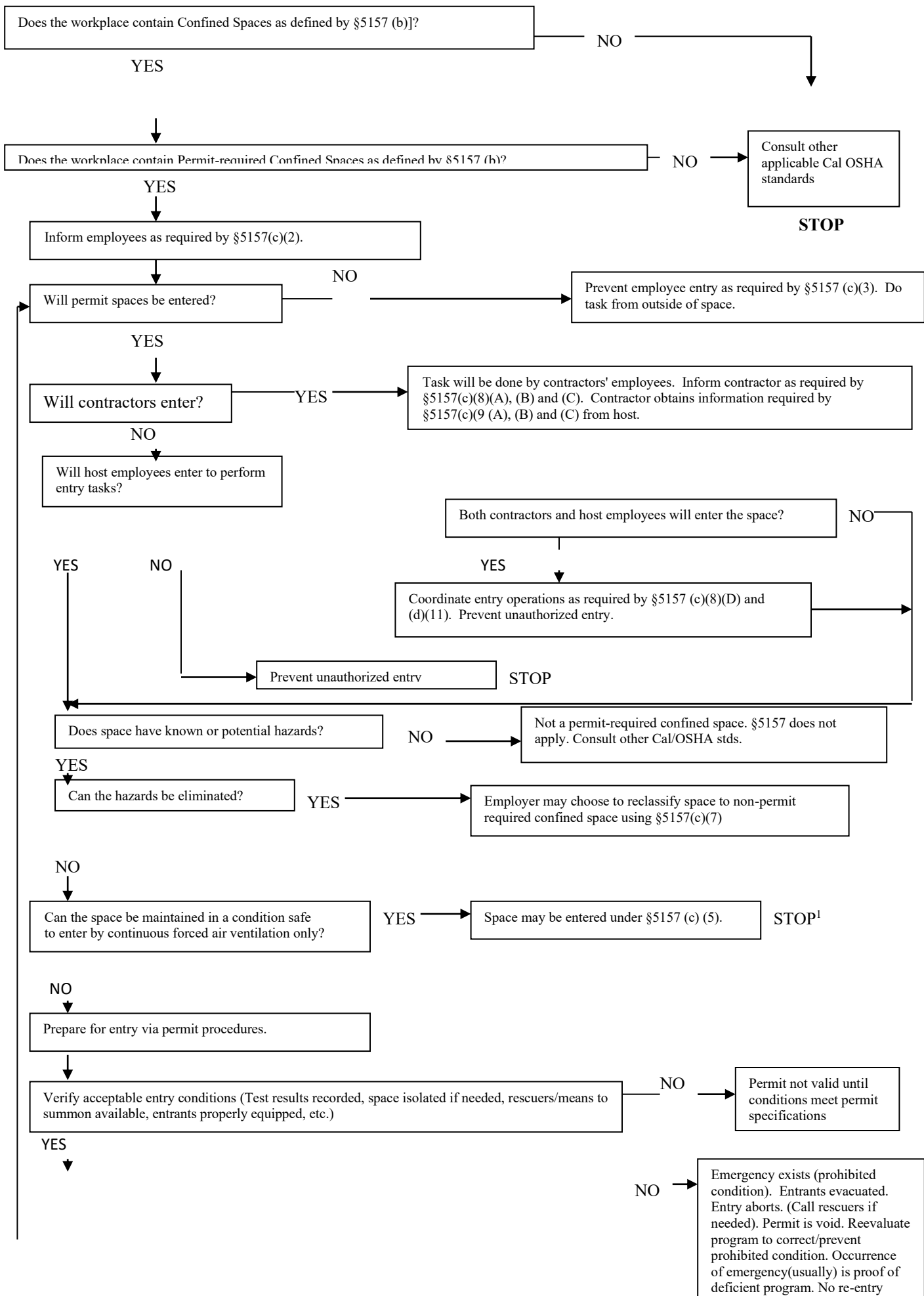
\_\_\_\_\_ Hoist

#### Evaluated By:

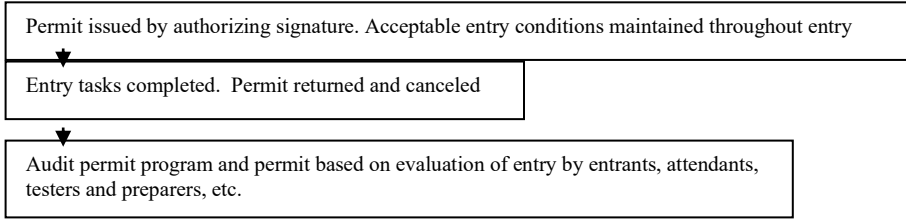
**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Original - Department

Copy - Department Safety Coordinator







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<sup>1</sup> Spaces may have to be evacuated and re-evaluated if hazards arise during entry