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1.0 Purpose and Scope

The University of Southern California Confined Space Program is designed to protect workers entering confined spaces to perform maintenance, cleaning, or other types of work. The Program provides information and guidelines for working with all classifications of confined spaces. This Confined Space Program has been designed to comply with California Code of Regulations (CCR) Title 8 Section 5157. Telecommunication utility manholes/vaults are regulated under CCR Title 8 Section 8616.

The principle objective of the USC Confined Space Program is to establish practices and procedures that will ensure the health and safety of personnel entering and working in campus confined spaces. This objective is met by:

1. Identifying all campus confined spaces.
2. Determining which spaces are permit-required confined spaces.
3. Posting appropriate signage and providing training so individuals will recognize confined spaces and will not enter unless authorized.
4. Authorizing individuals to work in confined spaces and ensuring they have received proper training.
5. Implementing a permit system to ensure safe and legal entry into permit-required confined spaces.

Additionally, through the requirements described in this document, it establishes procedures and responsibilities for USC employees, students, and volunteers while engaged in University related activities.

The University’s Confined Space Program:

- Identifies and classifies the known confined spaces at the USC and discusses the reclassification of areas.
- Identifies the necessary components for entry into confined spaces including monitoring and equipment which may be required.
- Identifies rescue and emergency procedures of confined spaces and the responsibilities of authorized employees in such instances.
- Identifies USC’s Permit System including preparation, use, and cancellation of permits. The Permit System includes outside contractors.
- Provides training to employees involved with confined space work and identifies their duties.
- Provides for a review of individual operations involving confined spaces and an annual program review.
State
Cal/OSHA
Group 1. General Physical Conditions and Structures.
Electrical Safety Orders 2320

Injury and Illness Prevention Program
Title 8, Section 3203 of the California Code of Regulations requires every California employer to have an effective Injury and Illness Prevention Program (IIPP). The purpose of an IIPP is to establish a framework for identifying and correcting workplace hazards, ensuring employee training and compliance, and communicating information related to employee safety and health.

The university has developed over 110 individual IIPPs - each created to address the needs of a specific school or division. An effective IIPP requires the support and participation of all stakeholders - employees, supervisors and management – and must be reviewed regularly and updated (if necessary) to reflect the current work environment. This manual is intended to be used as a guide for ensuring that all university activities are injury and accident free. The information contained within should be viewed and applied in a manner that supports and respects the IIPP of the responsible school or department.

Insert your Department’s IIPP on the next page.
School/Department IIPP (Insert here)
Federal
ANSI Standard Z359 where mandated by OSHA

The following university policies and standards have been established to create a safe and productive working and learning environment and ensure compliance with all regulatory requirements. If you are a faculty member, student or staff employee working on an elevated platform or in or around a subterranean area, it is your responsibility to familiarize yourself with these policies and adhere to them at all times. Questions or concerns about individual policies should be directed to the “Responsible Office” listed at the end of each policy. The university reserves the right to revise the following policies at any time:

- Injury and Illness Prevention [https://policy.usc.edu/injury-prevention/](https://policy.usc.edu/injury-prevention/)
- Confined Space
- Training Requirements and Opportunities [https://policy.usc.edu/training-requirements-and-opportunities/](https://policy.usc.edu/training-requirements-and-opportunities/)
- Smoke Free [https://policy.usc.edu/smoke-free/](https://policy.usc.edu/smoke-free/)
- USC Drug-Free [https://policy.usc.edu/drug-free/](https://policy.usc.edu/drug-free/)
- Personal Protective Equipment Standard [https://ehs.usc.edu/research/manage/ppe/](https://ehs.usc.edu/research/manage/ppe/)
3.0 Roles and Responsibilities

Clearly defined roles and responsibilities serve to help one more fully understand their own role and responsibilities as well as that of others in the management structure. Having clearly defined roles minimizes confusion by making expectations known ahead of any problems that might arise. While the expectations are understandably different for every party involved, one that is shared by all is to always *Make Safety Your 1st Operational Thought!*

**Department Heads and Chairs**

Department Heads and Chairs are responsible for:

- Providing the necessary resources to ensure the health and safety of their employees.
- Identifying individuals as supervisors and ensuring they are trained on their health and safety responsibilities.
- Ensuring departmental compliance with campus health and safety policies and procedures.
- Ensuring hazards workplace hazards are identified and controlled.

**Space Owners (Departments, Principal Investigators)**

Space owners are responsible for:

- Space Identification
- Labeling
- Contractor Awareness
- EH&S Notification

**Space Identification**

It is the space owner’s responsibility to ensure spaces under their control are identified, and evaluated and classified. Each department shall designate an individual or individuals to assist with this inventory and evaluation.

The survey shall be:

- Conducted by the space owner (department) in conjunction with EH&S.
- Include an assessment of any real or potential hazards within the space.
- Describe how hazards present will be mitigated prior to entry if entries are to take place.

A confined space inventory shall be maintained by each department with confined spaces. A master inventory for the campus will be maintained current by EH&S, with updates initiated by the Space Owner as needed.
Labeling/Signage

Signage for non-permit required confined spaces is not required, however it is recommended for spaces that may be accessed by untrained personnel. Recommended signage is as follows:

![Non-Permit Required Confined Space Signage](image1.png)

Permit-Required Confined Space, which could be inadvertently entered, shall be labeled as such using the following language:

![Permit-Required Confined Space Signage](image2.png)

Contractor Awareness

In the event that a contractor needs to enter a confined space, the contracting department shall:

- Provide the contractor with a completed Contractor Pre-Entry Information Sheet prior to confined space entry, which informs the contractor of the following:
  - Identified hazards associated with the space, past experience with the space, and whether it is a Permit-Required Confined Space;
  - Precautions and procedures that must be implemented for the protection of employees in or near the confined space area; and
  - Available methods to activate the emergency notification system.
- Coordinate entry operations with the contractor when both campus personnel and contractor personnel will be working in or near confined spaces.
• Consult with the contractor at the conclusion of entry operations regarding any hazards confronted or created in confined spaces during entry operations.
• Instruct the contractor to complete and submit the Contractor Debriefing Form to the contracting department within 48-hours of termination of entry.

**EH&S Notification**
Departments shall notify EH&S immediately if the following occurs:
• Unauthorized entry of a permit space.
• The occurrence of an injury or near-miss during a confined space entry.
• A change in the use or configuration of a permit space.

**Managers, Supervisors, and Principal Investigators**
Supervisors have the primary responsibility of ensuring the health and safety of those they supervise.

Specific confined space responsibilities include:
• Identifying confined spaces that their employees may enter and ensuring they have been classified.
• Designating persons who are to have active roles (i.e., authorized entrants, attendants, entry supervisors, or persons who test or monitor the atmosphere in a permit space) in entry operations, identify the duties of each such employee and provide each such employee with the training required.
• Ensuring their employees are properly trained and training is documented.
• Ensuring all hot work is authorized through the Fire Safety & Emergency Planning on a separate Hotwork Permit form and attached and noted on the entry permit.
• Ensuring a copy of all entry permits is retained by the department and a copy is also submitted to the EH&S Confined Space Program Manager.
• Developing and implementing special procedures for confined space entry as needed.

**Outside Contractors**
Each contractor who is retained to perform work that will require permit space entry operations shall:
• Furnish a written permit space program that complies with Cal-OSHA regulations.
• Meet or exceed USC’s Confined Space Entry Program requirements.
• Obtain any available information regarding permit space hazards and entry operations from the Department.
• Coordinate entry operations with the Department when both the contractor and campus personnel will be working in or near permit spaces.
• Inform the Department, either during a briefing or during entry operations, the procedures the contractor will follow and any hazards confronted or created in permit spaces.
• Contractor’s written Confined Space Entry Program must be approved in writing by a USC Confined Space Entry Supervisor prior to commencement of any entry into a confined space.
• The contractor must conduct their own testing with their own equipment, and use their own entry permits.
• The contractor must complete and submit the Contractor Debriefing Form to the contracting department within 48-hours of termination of entry.
• The contracting department scans and emails a copy of the Contractor Debriefing Form to EH&S at injuryprevention@usc.edu.

**Employees, Students, and Volunteers**

Employees, Students and Volunteers responsibilities:

• Understand and comply with campus health and safety policies and procedures.
• Annually attend Confined Space Entry training provided by EH&S, or equivalent:
  ◦ Persons who enter confined spaces, and those assigned to the required Attendant position, must attend Confined Space Entrant and Attendant training.
  ◦ Persons who will be assigned the position of Entry Supervisor must attend Confined Space Entry Supervisor training.
• Perform assigned duties according to the procedures listed in this Program.
• Maintain confined space safety equipment in ready-to-use condition, keeping it clean and functional per manufacturer’s directions.
• Never perform a confined space entry unless all provisions of this Program are observed.
• Immediately notify their supervisor of any problems or questions regarding confined space work.

**“The Entry Supervisor”**

The Entry Supervisor responsibilities in a Permit-Required Confined Space (PRCS):

• Know space hazards, including information on the mode of exposure (e.g., inhalation or dermal absorption), signs or symptoms, and consequences of the exposure.
• Ensure atmospheric testing and proper preparation is performed prior to entry.
• Verify safe conditions have been attained.
• Ensure that acceptable entry conditions are maintained.
• Ensure that proper equipment is onsite and operational.
• Make sure the site is clear of unauthorized personnel.
• Verify emergency plan.
• Confirm rescue team availability.
• Sign Confined Space Entry Permit.
• Cancel the permit once the operation is completed.
• Assure the person assigned to be the Attendant has received Confined Space Entrant and Attendant training, and understands confined space hazards and standby procedures.
• Assure that all persons who will enter the confined space have received Confined Space Entrant and Attendant training.
• Minimize the number of employees permitted to enter confined spaces, and list every involved employee on the Confined Space Entry Permit.
• Review the job duties and entry permit requirements for the permit-required confined space.
• Assure that all safety equipment and job tools necessary to safely complete the assigned work in the confined space are present and in good working condition.
• Ensure the functionality of the communication method between Entrants and Attendants.
• Assure that the entry conditions are acceptable.
  ◦ Verify that the confined space has been decontaminated of hazardous materials to the extent feasible before entry.
  ◦ Where potential exists for electrical shock, ensure that:
    ◦ Appropriate electrical equipment is used, including protections such as GFCI (ground fault circuit interrupters), assured grounding systems, double insulated tools, and low voltage systems; and
    ◦ Any electrical equipment used in hazardous locations meets appropriate requirements of Article 500 of the National Electrical Code (NFPA-70).
  ◦ Specify, and include on the entry permit, any pre-entry procedures necessary to eliminate or isolate hazardous energy sources that could be expected to cause injury or illness to entrants if not isolated, including electrical, mechanical, hydraulic, pneumatic chemical, thermal, radioactive and gravitational sources:
    ◦ Isolation methods may include securing, relieving pressure, blinding, blanking, double block and bleed, and lockout/tagout.
    ◦ In confined spaces where complete isolation is not possible, specify as rigorous isolation as practical, and assure that a hazard evaluation is conducted prior to entry.
• Specify on the entry permit the air monitoring necessary to ensure a continued safe work environment, and assure that the Attendant understands the monitoring requirements.
• Assure that all entrants review the air monitoring results prior to entry and if a respirator is required, that all entrants have appropriate respiratory equipment and current USC Certification to wear the respirator that they intend to use.
• Complete and sign the entry permit prior to entry, but only after all entry requirements are fully understood and completed, including:
  ◦ Ventilation requirements as specified on the permit
  ◦ Procedures to isolate all hazardous energy sources
• Assure that all employees entering the confined space know and understand their duties, the potential hazards that the space presents, the time required to do the work, the equipment and tools required, and the methods of communication with a standby employee.
• Post a copy of the entry permit at the entry site.
• Terminate the entry permit after assuring that all entrants have safely exited the space, and the space is secured.
• Scan and email a copy of the Confined Space Entry Permit to EH&S at injuryprevention@usc.edu.

“The Attendant”
Attendant responsibilities:
• Do not enter the confined space.
• Remain outside the confined space until relieved by another Attendant.
• Prepared to perform non-entry rescue.
• Prepared to call rescue team.
• Know the known and potential hazards.
• Maintain an accurate count of the authorized entrants in the space.
• Is alert to possible behavior changes of entrants.
• Monitor inside/outside confined space to ensure entrants’ safety.
• Prevent unauthorized entry into the space.
• Communicate with the Entrants.
• Order evacuation if problem arises.
• Conduct air monitoring and hazard assessment as specified on the Confined Space Entry Permit by the Entry Supervisor.
• Prohibit entry whenever monitoring indicates that oxygen, flammability or toxicity are not within acceptable limits or until appropriate controls are implemented or appropriate personal protective equipment is provided. Acceptable limits are as follows (in order of testing):
  ◦ Oxygen: 19.5% to 23.5%
  ◦ Flammability: Less than or equal to 10% of the lower explosive limit (LEL)
  ◦ Hydrogen Sulfide: Less than 5 ppm
  ◦ Carbon Monoxide: Less than 10 ppm
  ◦ Toxicity (substances listed on Entry Permit under “other”): Less than 50% of the Cal-OSHA Permissible Exposure Limit (PEL) or ACGIH TLV (Threshold Limit Value)
• Require ventilation, when feasible, to remove atmospheric contaminants from the confined space until the atmosphere is within the acceptable range.
• Assure that ventilation is drawn from a clean source and will not increase the hazards in the space;
• When utilizing forced ventilation, periodically test the atmosphere to ensure that the ventilation is preventing the accumulation of a hazardous atmosphere.
• When ventilation is not feasible, establish alternate protective measures prior to authorizing entry.
• Terminate the entry whenever a safety concern arises or an unauthorized person enters the area.

“The Authorized Entrant”

Authorized Entrant responsibilities:
• Know space hazards, including information on the mode of exposure (e.g., inhalation or dermal absorption), signs or symptoms, and consequences of the exposure.
• Use appropriate PPE (personal protective equipment) properly (e.g., eye and face protection and other forms of barrier protection such as gloves, aprons and coveralls).
• Use proper entry equipment.
• Performs assigned job safely.
• As necessary, maintain communication (i.e., telephone, radio, visual observation) with attendant to enable the attendant to monitor the entrant’s status as well as to alert the Entrant to evacuate.
• Alert the Attendant when a prohibited condition exists or when warning signs or symptoms of exposure exist.
• Evacuate immediately when ordered by an authorized person, when the entrant recognizes the warning signs or symptoms of exposure exist, when a prohibited condition exists, or when an automatic alarm is activated.

Environmental Health and Safety (EH&S)
The Office of Environmental Health and Safety (EH&S) will oversee the administration of the Confined Space Entry Program, but ultimate responsibility for its implementation is with each department that conducts confined space entry or hires a contractor who enters a confined space.

EH&S responsibilities:
• Developing and maintaining the USC Confined Space Program, and ensuring it meets all applicable regulatory requirements.
• Assisting departments in identifying and classifying confined spaces.
• Assisting with atmospheric testing and equipment selection as needed.
• Developing and providing confined space entry training.
• Reviewing all entry permits on an annual basis.
• Maintaining a master list of campus confined spaces.
• Assessing the effectiveness of the program as described in this document.

Fire Safety and Emergency Planning (FSEP)
FSEP responsibilities:
• Administration of the Hotwork Permit. This program is to prevent injury or loss to property while ensuring safe work conditions during welding, cutting, brazing, and grinding operations.
4.0 Confined Space Classification and Hazards

Confined spaces can be below or above ground, and can be found in almost any workplace. A confined space, despite its name, is not necessarily small. Examples of confined spaces include silos, vats, hoppers, utility vaults, tanks, sewers, pipes, access shafts, truck or rail tank cars, aircraft wings, boilers, manholes, manure pits and storage bins. Ditches and trenches may also be a confined space when access or egress is limited.

**Space Classification**

All confined space must be evaluated and classified as a non-permit or permit-required confined space.

A non-permit required confined space meets the definition of a confined space but does not have any additional known or potential hazards. A permit-required confined space is a confined space with one or more actual or potential hazard. Below are the legal definitions of the two classifications of confined spaces:

A “Confined Space” is a space which has all three of the following characteristics:

1. Large enough for an employee to enter and perform assigned work; and
2. Has limited or restricted means for entry or exit; and
3. Is not designed for continuous employee occupancy.

A simple assessment of limited or restricted means for entry or exit is determining whether entry/exit or rescue is slowed down or impeded by:

- Use of hands (crawling, climbing)
- Contort body
- Physical obstructions
- Posture

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

1. Contains or has the potential to contain a hazardous atmosphere;
2. Contains a material that has the potential for engulfing an entrant (e.g. water, sand, dirt);
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 (such as electricity, biological hazards, radiation hazards, or moving parts of machinery).
Classifying Work Space Flow Chart

Do I have a confined space?

**CONFINED SPACE CRITERIA**

1. Space is large enough for an employee to enter and perform the assigned work.
2. Space has limited or restricted means of entry or exit.
3. Space is not designed for continuous employee occupancy.

---

Space meets criteria?  
NO  
Not a Confined Space.

YES

Do I need a permit for my confined space?

**A CONFINED SPACE REQUIRES A PERMIT WHEN:**

1. The confined space contains or has the potential to contain a hazardous atmosphere.
2. Material (or materials) in the space has the potential to engulf an entrant.
3. The internal configuration of the space is 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.
4. The confined space contains any other recognized serious safety or health hazard.

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Space meets criteria?  
NO  
No permit required.

YES

How do I get a permit?

**PARTICIPATE IN THE PERMIT-REQUIRED CONFINED SPACE PROGRAM:**

The program entails the following:

- Permit system - Written procedures for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.
- Prohibited Condition – Conditions that are not allowed in a permitted confined space during the period of authorized entry.
- Rescue Services – Personnel designated to rescue entrants from permitted confined spaces.
- Retrieval System – equipment used for non-entry rescue of entrants from permitted confined space. Testing – includes specifying the tests that are to be performed in the permitted confined spaces to identify and evaluate the hazards that may confront entrants.
Confined Space Hazards

Hazardous atmospheres are atmospheres presenting a potential for death, disablement, impairment of ability to self-rescue, injury, or acute illness. These may occur when the lack of adequate mechanical or natural ventilation or the presence of stored or introduced materials (such as chemicals), or the work process being performed in a confined space causes, or has the potential to cause, one or more of the following:

- **Oxygen-Deficient Atmospheres**: An oxygen-deficient atmosphere has less than 19.5% available oxygen. Any atmosphere with less than 19.5% oxygen shall not be entered unless personnel have been properly trained and have an approved self-contained breathing apparatus (SCBA). This is an atmosphere that is Immediately Dangerous to Life and Health (IDLH). Oxygen deficient atmospheres may develop in the following situations:
  - Ambient oxygen is consumed by the work being performed, such as welding, cutting or brazing, or it can be decreased by certain chemical reactions (for example, the rusting of metal) or through bacterial action.
  - Ambient oxygen is displaced by another gas, such as carbon dioxide or nitrogen (inerting).

- **Oxygen-Enriched Atmospheres**: Oxygen enrichment refers to air containing more than 23.5 percent oxygen. This dangerous condition is an extreme fire hazard in which static electricity from materials such as hair or clothing can provide the ignition source needed to start a fire. This environment also allows any fire to burn more readily. Oxygen enrichment does not occur naturally and should be investigated.

- **Flammable Atmospheres**: Different gases have different flammable ranges. An atmosphere is considered hazardous if the concentration of any substance exceeds 10% of its lower explosive limit (LEL). If a source of ignition (such as a sparking or electrical tool) is introduced into a space with a flammable atmosphere, an explosion will result. For an atmosphere to be flammable there must be:
  - A sufficient amount of oxygen, or other oxidizing gases, in the air; and
  - A flammable gas, vapor, or dust present in the proper proportion.

- **Toxic Atmospheres**: Most substances (liquids, vapors, gases, mists, solid materials, and dusts) can present a hazard in a confined space. Toxic atmosphere contain an atmospheric concentration of one or more substances at or above their Permissible Exposure Limit (PEL), and include any other atmospheric condition that are IDLH. Toxic substances can come from the following:
  - A product stored in the space.
  - The work being performed in the space. Examples include welding, cutting, brazing, painting, scraping, sanding, degreasing, use of solvents, etc.
  - Toxic materials stored in areas adjacent to the confined space. Examples include chemicals or fuel stored in leaking underground storage tanks, or sections of the steam tunnels that may overlay or lie adjacent to a leaking sewer system.

Additional Hazards

Additional hazards which may require a confined space to be classified as a permit-required confined space:

- **Mechanical & Electrical Hazards**: Moving equipment or parts and energized or pressurized systems can be dangerous. Examples include shafts, couplings, gears, belts, conveyors, mixers, rotors, and compressing devices. A permit space must be isolated, or removed from service, and completely protected against the release of energy or materials into the space. This is accomplished by:
- Blanking, blinding, misaligning or removing sections of lines, pipes or ducts.
- A double block and bleed system.
- Lockout or blockout of all sources of energy, including mechanical, electrical, chemical, pressurized systems, thermal (e.g. systems which operate at a temperature, either hot or cold, that could cause physical injury upon contact) or potential (for example, elevated platforms that could shift and then lower upon an entrant).
- Blocking or disconnecting all mechanical linkages to prevent movement.

- **Entrapment Hazards**: Entapment hazards in confined spaces include inwardly converging walls or floors that slope downward and taper to a smaller cross-section. Examples include hoppers for air pollution dust collectors (i.e., bag houses, electrostatic precipitators), bottom-mounted unloading chutes for railcars and trucks, cyclones and funnels.

- **Engulfment Hazards**: This refers to the surrounding or burial of the worker in a liquid or loose, finely divided solid material, such as sand or grain. Such materials can suffocate a worker (Ref: Dangers of Engulfment and Suffocation in Grain Bin: [https://www.osha.gov/Publications/hazard-alert_grain_bins.pdf](https://www.osha.gov/Publications/hazard-alert_grain_bins.pdf)). Examples include:
  - Accidental dumping of a product on a worker.
  - A worker walking on unstable material such as settled grain.

- **Thermal Hazards**: A thermal hazard is a dangerous condition caused by excessive heat or cold or a hot surface. Employees engaged in continuous heavy work while wearing PPE (e.g., body suit and respirator) in warm surroundings are particularly susceptible to thermal hazards. Heat stress may lead to heat exhaustion, heat cramps, heat stroke, loss of consciousness, or death. A confined space entry permit must address any hazards from heat or cold within confined spaces.

- **Other Hazards**: Snakes, rodents, spiders, poor lighting, obstructions, falling objects, wet surfaces, trip/slip and fall hazards, electrical shock, radioactive materials, and acute chemical hazards may also need to be addressed.
5.0 Training and Communication

Departments are responsible for ensuring their employees are properly trained prior to entering or performing work in confined spaces. Training must be documented and training records shall be kept for as long as it is reasonably expected an employee will be working in confined spaces. The costs associated with any necessary equipment or training contracted shall be paid for by the Department.

Training is required at least annually for all Confined Space Entry Supervisors, and Authorized Entrants.

The following components are included in Confined Space training classes:

- Authorized Entrants, Attendants, and Entry Supervisors will be instructed in the nature of hazards involved in confined space entry, and informed of possible consequences that may occur if the procedures in this program are not followed.
- Confined Space Entry Supervisors will be instructed that he/she is responsible for a final assessment of the hazards associated with each entry for which they complete an Entry Permit, for assuring that hazards are controlled or eliminated, for assuring that Authorized Entrants and Attendants are trained and understand the nature of the hazards and the control methods used for the entry, and for completing and posting the Entry Permit.
- Instruction will cover proper entry procedures, hazard identification, control methods, monitoring, and proper use and adjustment of the equipment used in entry.
- Authorized Entrants and Attendants must pass both a written and a practical test to become certified for confined space entry.
- Confined Space Entry Supervisors must pass a written exam to be certified as a Confined Space Entry Supervisor.
- Records of training will be maintained by each department that conducts confined space entry, and made available for EH&S review.
  - Documentation of training provided by will be forwarded to the department supervisor.
- Supervisors will maintain a current list of all departmental Authorized Entrants and Attendants, and Confined Space Entry Supervisors.

All Confined Space Work

All personnel involved in confined space work shall receive appropriate training in hazard recognition, personal protective equipment, safety equipment, communications equipment, procedures for calling rescue services and proper use of non-entry rescue equipment as needed. This training shall:

- Be conducted before the employee engages in confined space duties, when there is change in assigned duties, whenever there is a change in operations that presents a hazard about which an employee has not previously been trained and whenever the employer has reason to believe either
that there are deviations from confined space entry procedures or that there are inadequacies in the employee’s knowledge or use of these procedures.

- Establish employee proficiency in their duties and introduce new or revised procedures as necessary.
- Be documented and contain each employee’s name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.
- Include conditions or work practices that may produce a hazard in a non-permit confined space that may require that the space be reevaluated by the entry supervisor prior to entry.

**Permit-Required Confined Space Work**

Specialized training is required based upon an individual’s role when entering a PRCS. Specialized training including duties and responsibilities shall be provided for the following roles:

**Entry Supervisors**

This person is responsible for determining if acceptable entry conditions are present in a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this document. The entry supervisor may also perform the roles of the attendant.

The Entry Supervisor shall be trained on and is responsible for:

- Ensuring each entry is performed in a safe manner.
- Knowing the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Ensuring the entry permit filled out completely and correctly.
- Verifying that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
- Ensuring all hot work is authorized through the Fire Safety & Emergency Planning on a separate Hotwork Permit and attached and noted on the entry permit.
- Signing the permit prior to allow entry and ensuring that entry operations remain consistent with the terms on the permit. The entry shall be terminated if a potential hazardous situation occurs which exceeds the conditions authorized on the permit.
- Ensuring the permit is available at the work site outside the confined space.
- Verifying that rescue services are available and that the means for summoning additional services are operable.
- Notifying unauthorized individuals who enter, or attempt to enter, the permit space during entry operations to leave.
- Terminating the entry and canceling the permit when entry operations covered by the entry permit have been completed, or when a condition that is not allowed under the permit arises in or near the permit space.
- Ensuring a copy of all completed entry permits are turned in to the departmental supervisor and EH&S.
Attendants

The individual stationed outside the permit spaces who monitors the authorized entrants and who performs attendant’s duties as required by this program.

Attendants shall be trained on the following:

- The hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Possible behavioral effects of hazard exposure in authorized entrants.
- How to continuously maintain an accurate count of authorized entrants in the permit space and ensures that the means used to identify authorized entrants is available and correct.
- How to communicate with authorized entrants to monitor entrant status and to alert entrants of the need to evacuate the space.
- Their responsibility to remain outside the permit space during entry operations until relieved by another attendant.
- To not perform other duties that might interfere with their primary duty to monitor and protect the authorized entrants.
- How to monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space, and to order 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 hazards exposure in an authorized entrant.
  - If the attendant detects a situation outside the space that could endanger the authorized entrants, or
  - If the attendant cannot effectively and safely perform all the duties required.
- How to initiate on-site rescue procedures and, if necessary, summon additional rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.
- To take 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 and
  - Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space.
- Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.
- How to perform non-entry rescues if required.
**Authorized Entrants**

The Authorized Entrants shall be trained on the following:

- The hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- How to properly use all equipment and necessary PPE.
- How to communicate 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.
- To alert the attendant whenever:
  - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation; or
  - The entrant detects a prohibited condition.
- Exit from the permit space as quickly as possible whenever:
  - An order to evacuate is 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; or
  - An evacuation alarm is activated.
One of the options for entry may be No Entry. Determine if there is a safer/smarter method to accomplish the job task to avoid entry completely. Examples include using gauges, flow meters, remote cameras, or binoculars to monitor conditions from the outside space.

**Non-Permit Confined Space Entry Procedures**

Workers must notify their supervisor prior to entering and performing work in confined spaces and should work in pairs whenever possible. The following procedures shall be followed prior to entering any confined space:

- Any condition making it unsafe to remove an entrance cover will be eliminated before the cover is removed.
- When the cover has been removed, the opening(s) shall be promptly guarded to prevent accidental fall into the opening and prevent objects from falling into the opening.
- Appropriate vehicle and pedestrian barriers shall be used to protect workers.
- All safety policies and procedures shall be followed.
- Metal ladders shall not be used when working around electrical equipment.
- There shall be no smoking in a confined space.
- Any use of chemicals must be pre-approved by the Supervisor, in consultation with EH&S.
- Safety Data Sheets (SDSs) shall be available for all hazardous materials used or may be encountered during the entry.
- Welding, soldering, cutting, or other hot work requires a Hotwork Permit approved by the Fire Safety & Emergency Planning.
- Adequate lighting must be provided and used.
- Personal protective equipment shall be provided and worn by workers as necessary for safe entry into confined space.
- Contractors who send their employees into confined spaces under the control of USC will be informed of the potential hazards, safety rules, and emergency procedures by the department.
- When there are changes in the use of a non-permit confined space or if hazards are introduced to the space, the space shall be reevaluated and classified as a permit-required space if necessary. The entry supervisor and/or EH&S shall be consulted to reevaluate and reclassify confined spaces as necessary depending upon the work activities to be performed in spaces. For example, reclassification would be required:
  - During application of solvents, paints, chemicals or other materials that could potentially create a hazardous atmosphere in a confined space.
  - During welding, cutting, brazing or soldering in some confined spaces with limited ventilation.
  - If any other real or potential hazards are introduced into the space.
Permit Confined Space Entry Procedures

Permit-required confined spaces shall only be entered after all hazards have been eliminated and the space has been reclassified into non-permit required confined space. If a space cannot be reclassified the entry shall not take place.

Reclassification of a Permit-Required Confined Space to a Non-Permit Required Confined Space

All permit-required confined spaces shall be reclassified to non-permit required confined spaces prior to entry. If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as all hazards remain eliminated. Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards. The department shall document the basis for determining that all hazards in a permit space have been eliminated on the entry permit. If it is necessary to enter the space to remove any residual hazards, then the entry shall not take place. If hazards arise within a permit space that has been declassified to a non-permit space, employees shall exit the space immediately. The entry supervisor and EH&S shall then be notified and the space must be reevaluated prior to reentry. The permit space may be reclassified as a non-permit confined space for as long as all hazards are eliminated. Examples of hazard elimination are as follows:

- Lockout/Tagout of all hazardous energy in a space.
- Emptying tanks/vessel to remove engulfment hazards.
- Shutting boilers down, opening all access ports to allow for temperature reduction and natural ventilation, and by taking all appropriate.

Additional PRCS Entry Requirements

In addition to the items listed in the Non-Permit Confined Space Entry Procedures section, the following procedures shall be followed prior to entering any permit-required confined space:

- The entry supervisor shall designate the persons who are to have active roles (authorized entrants, attendants, and atmospheric testing personnel) in entry operations and ensure they have received adequate training.
- An entry permit must be completed by a qualified person and signed by the entry supervisor. The entry permit shall be kept outside of the confined space and made available to the authorized entrants for review.
- Pre-entry atmospheric testing is completed and documented.

During the entry:

- At least one attendant shall be stationed outside the permit space into which entry is authorized for the duration of entry operations.
- Atmospheric testing is completed and documented.
• Entry supervisors shall notify EH&S if either of the following occur during entry:
  ◦ Detection of a permit space hazard not covered by the permit, or
  ◦ Detection of a condition prohibited by the permit.

**Equipment and Supplies**

The following equipment is required to perform permit-required confined space entry:

- Combustible Gas Indicator (CGI).
- Volatile Organic Compound (VOC) detector, or Photoionization Detector (PID) if organic vapors are reasonable to expect.
- Any other device(s) necessary to monitor a hazardous environment, as appropriate for hazards identified on permit.
- Extraction harness, tripod and wench.
- Means of communication between Attendant and Authorized Entrant(s), e.g., handheld radio in areas without explosion hazard, rope and tug signal system, etc.
- Means of communication to immediately summon emergency rescue personnel.

**Atmospheric Testing Procedures**

Atmospheric testing is required prior to entering all permit-required confined spaces. It is also recommended prior to entering a non-permit required confined spaces, and is required if a potential atmospheric hazard is introduced into the space during entry. Properly calibrated direct reading gas monitors shall be used for all atmospheric testing. Additionally, direct reading gas detector tubes or other acceptable means may also be used to test potentially toxic atmospheres as needed. Only personnel who have successfully completed training, provided or approved by EH&S, may perform atmosphere testing. Atmospheric testing instruments shall be calibrated on a schedule and in the manner recommended by the manufacturer, and be field checked immediately prior to use to ensure that it is operating properly. Any atmospheric testing instrument that has not been calibrated within thirty (30) days shall be recalibrated or bump tested prior to a confined space entry.

**Non-Entry Conditions**

If any of the following atmospheric conditions are encountered before or during the entry, the permit shall be canceled and entry shall not take place:

- Oxygen levels below 19.5% or greater than 23.5% by volume.
- Combustible gas levels greater than 10% of the lower explosive limit (LEL).
- Hazardous substance levels exceeding Cal/OSHA or American Conference of Governmental Industrial Hygienists (ACGIH) limits, or where exposure could result in death, acute illness or impairment of ability to self-rescue. (Department to consult with EH&S in identifying these substances.)
- Airborne combustible dust or other particulates obscures vision to five feet or less, or
- Any atmospheric condition recognized as immediately dangerous to life or health (IDLH) is present.
Pre-Entry Atmospheric Testing

The atmosphere in all permit-required confined space atmospheres shall be tested for oxygen concentration, combustible gases, carbon monoxide, hydrogen sulfide and any known or suspected toxic or hazardous substances prior to entry. Pre entry sampling shall be conducted from outside of the space and cover various levels within the space (i.e. at least top, middle and bottom), and around all conduits, pipes, or cables. Intrinsically safe equipment shall be used if a flammable atmosphere is present, or is suspected of being present. All atmospheric testing results shall be recorded on the entry permit. If more than 15 minutes have elapsed between pre-entry atmospheric testing and the actual entry, all tests shall be repeated prior to entry.

Post-Entry Atmospheric Testing

Continuous monitoring shall be conducted for oxygen, combustible gases, carbon monoxide, hydrogen sulfide and any known or suspected toxic or hazardous substances during all permit-required confined space entries. All monitoring devices shall be equipped with an audible alarm. Testing results shall be recorded on the permit at least every 15 minutes during entry. Both the entry supervisor and EH&S shall be notified immediately if an unacceptable atmospheric condition is encountered during entry.

Completing the Entry Permit

An entry permit shall be properly completed and signed by the Entry Supervisor prior to entry into all permit-required confined spaces. Additionally the entry supervisor shall ensure:

- The entry permit is kept outside of the confined space and made available to the authorized entrants for review.
- The duration of the permit does not exceed the time required to complete the assigned task of job identified on the permit.
- A permit may remain valid for the duration of the entry operation or a single work shift, not to exceed 8-hours. When the same entry team is used for overtime work, the permit may be extended for up to 4-hours if conditions are reassessed by the Entry Supervisor and air monitoring continues. The Confined Space Entry Supervisor must pay special attention to fatigue when assessing the ability of an entry team to continue work on overtime.
- The entry permit shall be terminated when:
  - The entry operations covered by the entry permit have been completed or
  - A condition that is not allowed under the entry permit arises in or near the permit space.
- A copy of all completed entry permits must be submitted to the departmental supervisor and EH&S.
- Scan and email a copy of the Confined Space Entry Permit to EH&S at injuryprevention@usc.edu.
This section applies to manholes and street openings, where telecommunications field work is performed on or with underground lines. If hazards exist that cannot be controlled, permit-required confined space procedures shall be followed. Before an employee enters a manhole or unvented vault, the following steps shall be taken:

- When covers of manholes or vaults are removed, the opening shall be promptly guarded by a railing, temporary cover, or other suitable temporary barrier which is appropriate to prevent an accidental fall through the opening and to protect employees working in the manhole from foreign objects entering the manhole.
- The internal atmosphere shall be tested for oxygen, combustible gases, carbon monoxide, hydrogen sulfide and any other known or suspected hazardous substances.
- While work is being performed in a manhole occupied jointly by an electric utility and a telecommunication utility, an employee with basic first-aid training shall be available in the immediate vicinity to render emergency assistance as may be required. The employee whose presence is required in the immediate vicinity for the purposes of rendering emergency assistance is not to be prevented from occasionally entering a manhole to provide assistance other than in an emergency.
- Portable reinforced plastic ladders having non-skid rungs shall be used to enter and exit manholes exceeding 4 feet in depth. No metal ladders shall be used.
8.0 Rescue and Emergency Procedures

Rescue and Emergency Services

- Non-entry is preferred! You must utilize retrieval systems unless they would not be effective in the space.
- In addition to the attendant, there must be at least one standby person at the site who is trained and immediately available to perform rescue and emergency services.
- Practice simulated rescue operations at least every twelve months in actual space or representative spaces based on opening size, configuration, and accessibility.
- “Call 911” is NOT a rescue plan!

Types of Rescue

There are three types of rescue:

- Self-rescue (escape)
- Non-entry rescue
- Entry rescue

USC employees shall not enter confined spaces to perform rescue under any circumstances unless properly trained to do so. If rescue is necessary during an entry the following procedures shall be followed:

1. The attendant shall immediately call DPS (Department of Public Safety) if on campus, or 911 if off campus, to inform them that a confined space emergency has occurred.
   a. At UPS campus, call (213) 740-4321; or
   b. At HSC campus, call (323) 442-1000; or
   c. Off campus, call 911.
2. After notifying emergency services, the attendant will attempt to retrieve the worker using the retrieval line or other non-entry procedures if applicable. Under no circumstance will the attendant or any other person enter the confined space until emergency services have arrived. All individuals participating in the rescue effort must have received training in confined space rescue techniques provided, or approved by EH&S.
3. If entry to perform the rescue is required, the attendant or entry supervisor shall inform rescue services of any hazards they may encounter during entry. Where practical, rescuers will be connected to a safety line attached to a point outside the confined space. An attendant shall remain outside of the confined space at all times while the rescue is being performed.

In the event of any emergency situation requiring rescue from a confined space, USC employees shall not attempt to enter the space to perform a rescue.
The attendant on duty shall immediately implement the predetermined emergency rescue system, and contact the predetermined dispatch office, e.g., Department of Public Safety dispatch, X04321, or Facilities Management Services dispatch.

Rescue services that can be performed safely from outside the confined space (e.g. hoisting a harnessed entrant) shall be undertaken. Other entrants in the space shall immediately exit the space and only provide assistance which does not endanger themselves.

The Los Angeles Fire Department is the primary emergency rescue facility associated with both University Park and Health Sciences confined space entries.
9.0 Recordkeeping

- Training must be documented and training records shall be kept for as long as it is reasonably expected an employee will be working in confined spaces.
- A Confined Space Entry Permit must be completed by the Entry Supervisor and Attendant before each entry into a Confined Space, and posted at the entry site for the duration of the entry operation. “The employer shall retain each canceled entry permit for at least 1 year to facilitate the review of the permit space program required.” [8CCR5157(e)(6)]
- Each department that conducts confined space entries will keep every Confined Space Entry Permit generated until reviewed by the Environmental Health and Safety (EH&S) Confined Space Review Committee.
- Each department that hires a contractor for any job in which a person will enter a confined space will provide the contractor with a completed Contractor Pre-Entry Information Sheet prior to confined space entry, and will assure that the contractor’s Entry Supervisor completes the Contractor Debriefing Form or equivalent within 48 hours of termination of the Entry Permit. Forward a copy of both forms to EH&S, and keep a copy of each in department files until reviewed by the EH&S Confined Space Review Committee.
- A copy of all completed entry permits must be submitted to the departmental supervisor and EH&S.
- Scan and email a copy of the Confined Space Entry Permit to EH&S at injuryprevention@usc.edu.
10.0 References

- Cal-OSHA Confined Space Emphasis Program: http://www.dir.ca.gov/dosh/Confined_Space_Emphasis_Program.html
- Cal-OSHA regulations 8CCR5157, “Permit-Required Confined Spaces” (includes general industries, manufacturing facilities): https://www.dir.ca.gov/title8/5157.html
- Cal-OSHA 8CCR5158, “Other Confined Space Operations” (includes construction, agriculture, marine terminals, grain handling, telecommunications, natural gas and electric utilities, and shipyard operations): http://www.dir.ca.gov/Title8/5158.html
- Cal-OSHA 8CCR8616, “Underground Lines” (provisions apply to the guarding of manholes and street openings, and to the ventilation and testing for gas in manholes and unvented vaults, where telecommunications field work is performed on or with underground lines): https://www.dir.ca.gov/title8/8616.html
<table>
<thead>
<tr>
<th><strong>ACCEPTABLE ENTRY CONDITIONS</strong></th>
<th>The conditions that must exist in a permit space to allow entry so that employees involved with a permit-required confined space entry can safely enter into and work within the space.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ALTERNATE ENTRY PROCEDURE</strong></td>
<td>A procedure that may be used to enter a Permit-Required Confined Space if the only hazard present in the space is atmospheric and is controllable by mechanical ventilation alone, and the atmosphere will not become immediately dangerous to life and health if the mechanical ventilation fails.</td>
</tr>
<tr>
<td><strong>ATTENDANT</strong></td>
<td>A person who remains outside the confined space, verifies safe entry conditions, maintains constant communication with those inside the space, and whose primary duty is to summon help should there be any indication of endangerment to those inside the space (see Confined Space Entry Procedures).</td>
</tr>
<tr>
<td><strong>BLANKING OR BLINDING</strong></td>
<td>The absolute closure of a pipe, line, or duct by the fastening of a solid plate that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.</td>
</tr>
</tbody>
</table>
| **CONFINED SPACE** | A space that meets the following criteria:  
• Is large enough and so configured that an employee can bodily enter and perform assigned work; and  
• Has limited or restricted means for entry or exit (e.g., tanks, vessels, storage bins, vaults, pits, and excavations are spaces that may have limited means of entry); and  
• Is not designed for continuous employee occupancy. |
<p>| <strong>DOUBLE BLOCK AND BLEED</strong> | Closure of a line, duct or pipe by locking closed two in-line valves, and tagging or locking open a drain or vent valve in the line between the two closed valves. |
| <strong>EMERGENCY</strong> | Any occurrence (including any failure of hazard control or monitoring equipment) or event, internal or external, to the permit space that could endanger entrants. |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EMERGENCY RESPONSE TEAM</strong></td>
<td>The group of individuals trained to perform emergency rescue operations who are designated by the University as the Emergency Response Team. Currently, the local Los Angeles Fire Department has agreed to provide emergency response rescue as necessary.</td>
</tr>
<tr>
<td><strong>ENGULFMENT</strong></td>
<td>The surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.</td>
</tr>
<tr>
<td><strong>ENTRANT</strong></td>
<td>Employee who is authorized to enter a permit space.</td>
</tr>
<tr>
<td><strong>ENTRY</strong></td>
<td>Action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and occurs as soon as any part of the entrant’s body breaks the plane of the opening of the space.</td>
</tr>
<tr>
<td><strong>ENTRY PERMIT</strong></td>
<td>The written or printed USC-generated document giving authorization for entry into a Permit-Required Confined Space under established conditions for a stated purpose during a specified work shift.</td>
</tr>
<tr>
<td><strong>ENTRY SUPERVISOR</strong></td>
<td>The person responsible for determining whether entry conditions are acceptable at the confined space immediately prior to entry, for authorizing the entry and specific entry operations, and for terminating the entry as described in this program. (Not necessarily an actual supervisor; this is a confined space term only.)</td>
</tr>
</tbody>
</table>
| **HAZARDOUS ATMOSPHERE**            | An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness from one or more of the following causes:  
  • Flammable gas, vapor, or mist in excess of 10 percent of its lower explosive limit (LEL);  
  • Airborne combustible dust at a concentration that meets or exceeds its LEL;  
  • Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;  
  • Atmospheric concentration of any substance for which a dose or a published exposure guideline is available and which could result in employee exposure in excess of its dose or permissible exposure limit. |
<p>| <strong>HAZARDOUS ATMOSPHERE ONLY SPACE</strong> | A confined space in which the only hazard posed is an actual or potential hazardous atmosphere which can be controlled by continuous forced ventilation. |</p>
<table>
<thead>
<tr>
<th><strong>IMMEDIATELY DANGEROUS TO LIFE OR HEALTH (IDLH)</strong></th>
<th>Any condition that poses an immediate or delayed threat to life or what would cause irreversible adverse health effects or that would interfere with an individual’s ability to escape unaided from a permit space.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ISOLATION</strong></td>
<td>The process of removing from service a hazard source associated with a Permit-Required Confined Space, and completely protecting the space from inadvertent release of energy or material into the space. Means of isolation include: blanking (skillet-type metal blank between flanges); blinding; misaligning or removing sections of pipes, lines or ducts; a double block and bleed system; lock-out or tag-out of all sources of power; and blocking or disconnecting all mechanical linkages.</td>
</tr>
<tr>
<td><strong>NON-PERMIT CONFINED SPACE</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>
| **PERMIT REQUIRED CONFINED SPACE (PRCS)**        | A confined space that has one or more of the following characteristics:  
  • Contains or has the 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. |
| **POSTING**                                      | A danger sign or other equally effective means to inform employees who work in an area that contains a permit-required confined space, of the existence, location and danger posed by the permit space. Note: A sign reading “DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER” or using other similar language would satisfy the requirement for a sign. |
| **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 a person from a permit space. |
| **TESTING**                                      | The process by which hazards or potential hazards of a Permit-Required Confined Space are identified and evaluated. |
Appendix B  Confined Space Entry Flow Chart

SCOPE OF ENTRY & HAZARD ASSESSMENT

Permit-required confined spaces shall only be entered after all hazards (e.g., atmospheric, LOTO, emptying tanks/vessels, shutting down boiler, opening all access points for temp reduction and natural ventilation) have been eliminated and the space has been reclassified into non-permit required confined space. If a space cannot be reclassified, the entry shall not take place.

CONFINED SPACE ENTRY BY CONTRACTOR

1. Inform the Contractor in writing the workplace contains permit spaces and entry is only allowed under a Cal-OSHA compliant PRCS program.
2. Verify Contractor PRCS program.
3. Apprise Contractor of space hazards and campus procedures for space entry.
4. Coordinate entry with Contractor.
5. Department consults with Contractor at end of PRCS Entry regarding hazards encountered or created during entry and communicates problems to EH&S.

RECLASSIFIED NON-PERMIT REQUIRED ENTRY

1. Prepare site for entry and check for hazards or unusual conditions,
2. Open access to space and guard as necessary,
3. Evaluate for acceptable entry conditions,
4. Perform atmospheric monitoring,
5. Document reclassification on permit.
6. Enter. NOTE: if hazards arise during entry, stop work immediately and exit space.
7. Return space to normal operating mode.
8. Submit completed permit to Supervisor and copy EH&S.

STOP! ATMOSPHERE CONTROLLED ENTRY REQUIRES EH&S CONSULTATIONS/APPROVAL

YES

Will work or change in use of the space create a hazard?

NO

STOP! ELIMINATE HAZARDS BEFORE ENTRY

YES

Is space a PRCS because of real or potential atmospheric hazards?

NO

STOP! DO NOT ENTER CONFINED SPACE

YES

Is the work within a PRCS?

NO

STOP! DO NOT ENTER CONFINED SPACE

YES

Will work or change in use of the space create a hazard?

NO

STOP! DO NOT ENTER CONFINED SPACE

YES

Is the entry being made by a non-USC employee (Contractor)?

NO

STOP! DO NOT ENTER CONFINED SPACE

YES

Is the work in the confined space defined?

NO

STOP! DO NOT ENTER CONFINED SPACE

YES

Have all entrants completed Confined Space Entry Training?

NO

STOP! DO NOT ENTER CONFINED SPACE

YES

Was a hazard assessment performed?

NO

STOP! DO NOT ENTER CONFINED SPACE

YES

Can all hazards be eliminated prior to entering space?
Confined Space Evaluation Form

Space Location and Characteristics
Confined Space Location (area; building/room#):
Confined Space Owner: Department:
NEW evaluation Re-evaluation of existing space

Opening Type

<table>
<thead>
<tr>
<th>Portal Size (inches)</th>
<th>Configuration (round; oval; square; rectangle)</th>
<th>Accessibility (vertical top or bottom; horizontal)</th>
</tr>
</thead>
</table>

Space Identify type
Examples: boiler; bunker; degreaser; equipment housing; furnace; hopper; manhole; pipeline; pit; stack; tank; test chamber; trench; tunnel; vat; vault; or vessel

Describe Past and Current Uses:

Hazard Identification and Evaluation
1. Space is large enough and so configured that an employee can bodily enter and perform assigned work. Yes No
2. Space has limited or restricted means of entry or exit. Yes No
3. Space is NOT designed for continuous employee occupancy. Yes No
4. Space contains or has the potential to contain a “hazardous atmosphere”. Yes No
5. Space has internal configuration such that entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section. Yes No
6. Space contains material(s) that can engulf entrant. Yes No
7. Welding/burning will take place in confined space. Yes No
8. Biological hazards are associated with the confined space. Yes No
9. Space contains mechanical hazards. Yes No
10. Space contains physical agents (e.g., electrical; thermal; radiological; or compression). Yes No
11. Identify any other recognized serious safety and health.

Classification
Permit Required Non-Permit Non-Confined Space

Notes

Evaluator Name Signature Date
**Contractor Pre-Entry Information Sheet**

**General Information**

Name of Contractor:  
USC Project Manager:  
Department:  
Location(s) of Confined Space(s):  

**Type of Entry**

<table>
<thead>
<tr>
<th>Permit Required</th>
<th>Alternate Procedure</th>
<th>Non-Permit Required</th>
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If Permit Required, explain why:  
Purpose of Entry:  

**Hazards** (List all hazards associated with entry)

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<thead>
<tr>
<th>Problems Associated with this Confined Space</th>
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<tr>
<td>No problems associated with this confined space</td>
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**Hazard Assessment**

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<tr>
<th>Hazard Assessment</th>
<th>Air Monitoring</th>
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<tr>
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<tr>
<th>Openings</th>
<th>Barricading</th>
<th>Guarding</th>
<th>Flagging</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

**Other**

<table>
<thead>
<tr>
<th>Other Precautions and Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Emergency Notification System Activation Method(s)**

**Dept. Supervisor:** Provide completed form to Contractor(s) and email a copy to EH&S at injuryprevention@usc.edu. File completed form with Entry Permits for annual EH&S review.
An Entry Permit is valid for the duration of the entry operation or a single work shift, not to exceed eight (8) hours. If the same team is used for overtime work, the permit may be extended up to four (4) hours provided conditions are reassessed by the Entry Supervisor and air monitoring continues. **Instructions:** See Page 2 for Description and Procedures.

### General Information

**Confined Space #/Location:**

**Date Issued:**

**Time Issued:**

**Permit Expiration Time:**

**Purpose of Entry:**

**Hazards (List all hazards associated with entry):**

### Preparation

<table>
<thead>
<tr>
<th>Drained</th>
<th>Flushed</th>
<th>Inerted</th>
<th>Purged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilated</td>
<td>Other:</td>
<td>Inerted</td>
<td>Purged</td>
</tr>
</tbody>
</table>

**OPENINGS**

| Barricaded | Guarded | Tagged |

**Specify procedures:**

**Isolation**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locked out/Tagged</td>
<td>Disconnected</td>
</tr>
</tbody>
</table>

**Specify procedures:**

### Communications at Confined Space

- **Voice**
- **Radio**
- **Intercom**
- **Rope Signals**

**Emergency Rescue System Check**

- **FMS Dispatch**
- **DPS Dispatch**

**System check completed (initials):**

**Other (specify):**

**Special Equipment Required**

- **Safety harness/lifeline (if < 5’):**
- **Hoist:**
- **Other (specify):**

**Personal Protective Equipment Required**

- **Head:**
- **Eye:**
- **Respirator:**
- **Gloves:**
- **Hearing:**
- **Foot:**
- **Clothing:**
- **Other:**

### Roster

**Entry Supervisor:**

**Entry Approved:**

**Entry Terminated:**

**Permit Transferred:**

**Attendant:**

**Init.:**

**Dept/Shop:**

**Entrant:**

**Init.:**

**Entrant:**

**Init.:**

**Entrant:**

**Init.:**

### Air Monitoring Readings

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Acceptable conditions</th>
<th>Pre-Entry Check (at 4’ intervals)</th>
<th>After Ventilating and/or Isolation</th>
<th>Periodic Checks. Take average every 15 min. unless specified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen</td>
<td>19.5 – 23.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEL</td>
<td>≤ 10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H₂S</td>
<td>&lt; 5 ppm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>&lt; 10 ppm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>&lt; 50% PEL/TLV</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Time:**

**Initials:**

**Instrument make; model; serial#:**

**Date of calibration:**

**Signature of Tester:**

### Notes/Additional comments/Problems during entry:

**NOTE:** Post this permit in a conspicuous place at job site. Return Permit to Supervisor immediately after completion. Retain permit in department files. Email a copy to EH&S at injuryprevention@usc.edu.
Confined Spaces have the following characteristics: a) large enough to enter and perform work; b) having limited or restricted means of entry and exit; and c) not designated for continuous worker occupancy.

Permit-Required Confined Spaces have one or more of the following characteristics: a) Contains a known or potentially hazardous atmosphere; b) Contains a material that can engulf entrants (e.g., soil); c) Inward sloping walls or dangerously sloping floor; or d) Contains any other serious safety or health hazard.

Entering a Permit-Required Confined Space
1. Entry Supervisor physically inspects the space to determine potential hazards and if the entry is a “Permit-Required,” “Alternate Procedure,” or “Non-Permit” entry. Entry Supervisor then completes all items on this Confined Space Entry Permit.
2. At least one Attendant externally monitors the Permit Space being entered for the duration of the entry operation.
3. Maintain retrieval equipment and use all safety equipment as specified on the permit.
4. Attendant verifies acceptable entry conditions by identifying, and controlling or eliminating, any hazards; by testing the atmosphere with an oxygen/gas detector at 4’ intervals, and a PID if organic vapors are detected or expected, and other appropriate testing equipment for other known or expected contaminants; and by complying with all entry permit conditions.
5. Attendant directs the Entrant(s) to enter and exit the space, and conducts periodic checks of hazard controls.
6. Attendant orders immediate evacuation of the space if safety equipment fails or if the space becomes, or has the potential to become, immediately hazardous. If necessary, Attendant summons emergency responders, but NEVER ENTERS space.
7. When confined space operation is complete, Entry Supervisor accounts for all Entrants, and terminates entry by initialing in the appropriate section.

Entering a Permit Confined Space using “Alternate Procedure”
A. This Alternate Entry Procedure may be used if the only hazard present in the confined space (as determined by Entry Supervisor) is: 1) atmospheric in nature, and 2) the atmospheric hazard can be controlled by mechanical ventilation alone, and if 3) the Permit Space atmosphere will not become immediately dangerous to life and health (IDLH) if the mechanical ventilation fails.
B. After evaluating the “Permit Required Confined Space,” and establishing appropriate atmospheric controls, the Entry Supervisor may classify the Permit Space as an Alternate Entry Space by checking the appropriate box in Section #1 of the Confined Space Entry Permit, and completing applicable parts of “Sections 2, 3, 4, 5, 8, 9, 10, 11, 12, and 13” of the Entry Permit.
C. The Entrant (see note below) may enter the confined space without the assistance or use of an Attendant, following below procedure.
D. When entering the Alternate Entry Confined Space, the Entrant will:
   a. Establish and ensure that the mechanical ventilation system is operational and providing clean, fresh air to the Entrants work location within the space during the entire entry;
   b. Test the atmosphere of the Permit Space prior to entry into the space;
   c. Use and continually operate a personal gas detector during the entire confined space operation;
   d. Immediately evacuate the space if ventilation fails, or if the portable air sampling equipment fails or enters alarm mode; and
   e. Immediately evacuate the space if you discover, or become aware of a previously unrecognized hazard. If this occurs, immediately notify the Entry Supervisor (or Entrant’s line supervisor, if Entrant is also Entry Supervisor). The Entry Supervisor re-evaluates the Permit Space and implements appropriate safety precautions prior to resuming the confined space operation.

Note: Entry Supervisor may act as Entrant during Alternate Entry Confined Space operations. No Attendant is necessary for Alternate Procedure entries, unless assistance is needed to accomplish safe entry and exit by the Entrants (i.e., a tripod to enter a tank, etc.).
E. All steps taken to reclassify the Permit Space to an Alternate Entry Space must be written on the entry permit. All confined spaces shall be considered Permit-Required until the pre-entry procedures demonstrate otherwise.

Entering a Non-Permit Confined Space
A. If no inherent hazard is associated with the space, or if all inherent hazards have been “ELIMINATED” (not just controlled, but eliminated), the space may be entered using the following guidelines.
B. When entering the Non-Permit Confined Space, the Entrant(s) will:
   a. Survey the surrounding area for potential hazards and sources of drifting vapors and gases before entry;
   b. Always test a Non-Permit Confined Space with an oxygen/explosive gas detector before and during entry; document pre-entry tests;
   c. Follow USC safety rules and use generally acceptable safe work practices when entering and working in the space;
   d. Never use paints, thinners, chemicals, or weld or create any other atmospheric hazard while working in the space;
   e. Never introduce any other atmospheric, mechanical, engulfing, or electrical hazard into the space.

Note: introduction of a hazard (e.g., paint thinner) into a confined space requires that the full permit process be followed.
C. No attendant or arrangement for rescue service is necessary when workers enter Non-Permit Spaces.
D. All steps taken to reclassify a Permit-Required Space to a Non-Permit-Required Space must be written on the entry permit.
# USC Confined Space Entry Program

## Contractor Debriefing Form

<table>
<thead>
<tr>
<th>General Information</th>
<th>CONTRACTOR DEBRIEFING FORM</th>
<th>CONFINED SPACE ENTRY PROGRAM</th>
<th>Office of Environmental Health &amp; Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Contractor:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USC Project Manager:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location(s) of Confined Space(s):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date entered:</td>
<td>Time entered:</td>
<td>Time completed:</td>
<td></td>
</tr>
<tr>
<td>Purpose of Entry:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Type of Entry

- Permit Required
- Alternate Procedure
- Non-Permit Required

## Hazards (List all hazards associated with entry)

## Problems Encountered

- No problems encountered with this confined space

## Hazard Assessment

- Identification
- LockOut/TagOut
- Other

## Equipment

- Air Monitoring
- Other

## Line/Valve/Power Source

- Disconnecting
- Blanking
- Blocking
- Bleeding

- Isolating
- Purging
- Inerting
- Draining
- Flushing

-フラッジング
- Other

## Openings

- Barricading
- Guarding
- Flagging
- Other

## Other

## Notes

The information above is accurate to the best of my knowledge.

<table>
<thead>
<tr>
<th>Contractor Supervisor Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor:</td>
<td>Return form to hiring department’s Supervisor within 48 hours of job termination.</td>
<td></td>
</tr>
<tr>
<td>Dept. Supervisor:</td>
<td>Notify EH&amp;S of the entry by emailing form to <a href="mailto:injuryprevention@usc.edu">injuryprevention@usc.edu</a>. Fix identified problems and note completion. File completed form with Entry Permits for annual EH&amp;S review.</td>
<td></td>
</tr>
</tbody>
</table>