

California State University, Bakersfield
Confined Space Entry Program



CALIFORNIA STATE UNIVERSITY
BAKERSFIELD
Safety and Risk Management

| Date Revised: | Revision Type: |
|---------------|---|
| June 2022 | Formatting, Added sections, Annual Review |
| February 2023 | Annual Review |
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Safety and Risk Management

California State University, Bakersfield
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THE CALIFORNIA STATE UNIVERSITY

1.0 Introduction

The Federal Occupational Safety and Health Administration (OSHA) estimates that 1.6 million workers enter confined spaces annually. From these entries, it is determined that approximately 5700 results in injury (88% are “lost time”). Every year, on average, 53 workers lose their lives in confined spaces; 60% of these workers die attempting a rescue. Sadly, in 2011, California confined space fatalities accounted for over 13% of the national total.

The hazards associated with confined space entry are numerous, which include, but are not limited to, flammable, toxic, and/or oxygen deficient atmospheres, and the potential for entrapment and engulfment. This program details the requirements that must be strictly followed to ensure the safety of California State University, Bakersfield personnel who work in and/or around confined spaces.

2.0 Scope

This Program specifies the minimum requirements to be followed by employees assigned to enter confined spaces that are regulated by the California Division of Occupational Safety and Health (Cal/OSHA). This program, therefore, complies with the content of the following Title 8, California Code of Regulations (8 CCR, Article 108):

- Section 5156. Scope, Application, and Definitions
- Section 5157. Permit-Required Confined Spaces
- Section 5158. Other Confined Space Operations

3.0 Definitions

- **Confined Space:** A confined space has the following characteristics:
 - Is large enough for a person to enter and perform work.
 - Entrance and exit are restricted.
 - Is not designed for continuous occupancy.

Examples of confined spaces include but not limited to underground vaults, ventilation or exhaust ducts, storage tanks and sewers.

- **Alternate Entry Procedure:** A procedure that may be used if the only hazard present in the confined space (as determined by the Entry Lead Person) is:
 - Atmospheric in nature
 - The atmospheric hazard can be controlled by mechanical ventilation alone, and Confined Space Entry Program 8 CCR 5157
 - The space atmosphere will not become immediately dangerous to life and health (IDLH) if the mechanical ventilation should fail.
- **Attendant:** An employee who is trained in confined space entry and rescue procedures and has been assigned the responsibility of monitoring permit space operations. If the Entry Lead Person leaves the site, the Attendant is responsible for maintaining entry conditions as specified on the permit and must order an evacuation if permit conditions change.
- **Continuous Entry:** An entry in which there are no breaks in activity other than for short rest breaks and food breaks. Confined space work activities where one work crew is immediately followed by a second work crew on a different shift would be considered a “continuous entry”.
- **Entrant:** An employee trained in confined space entry procedures who have been

assigned to enter a confined space.

- **Entry Lead Person:** Any appropriately trained employee who has been assigned the responsibility of overseeing the confined space entry by their line manager (OSHA refers to this person as the “Entry Supervisor”)
- **Hot Work:** Torch cutting, welding, and grinding
- **Hot Work Permit:** Written form documenting the type of hot work to be performed in areas with ignition hazards, the special procedures required in order to make the work safe, and the names of employees conducting the work and performing fire watch duties.
- **Non-Permit Confined Space:** is a confined space that does not have any hazards.
- **Permit Required Confined Space (or Permit Space):** Permit spaces have 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 that slopes downward and tapers to a smaller cross-section, where the entrant could become trapped, injured, etc.
 - Contains any other recognized safety or health hazard that cannot be eliminated.
- **Standby Person:** An employee who is trained in confined space entry and rescue procedures and who assists the Attendant during permit space operations.
- **Testing:** Process of identifying and evaluating hazards in the permit space.
 - Section 2540.2 if electronic or thermal equipment is used to perform such test, and possibility exist of an explosive substance or a hazardous atmosphere due to flammable gases and vapors, then the testing equipment must be approved for use in such explosive or flammable conditions.

4.0 Hazards in Confined Spaces

California State University, Bakersfield employees can be exposed to hazards inside a confined space. These hazards include:

- Toxic gases, such as hydrogen sulfide or carbon monoxide
- Explosive or flammable gases
- Oxygen deficient or oxygen enriched atmospheres
- Engulfment by liquid or sludge
- Electrocutation
- Introduction of a hazard associated with entry (i.e., welding gases, paint vapors, etc.)

5.0 Personnel Responsibilities

Entry Lead Persons are responsible for:

- Ensuring that all personnel participating in a Permit Required and Alternate Confined Space Entry operation are trained in accordance with Section 12.
- Obtaining an Entry Permit for each Permit Required Confined Space Entry.
- Terminates the entry and cancels permit.
- Determining the hazards of, and establishing control procedures for the confined space, and for classifying each confined space as requested by the Entry Permit.
- Ensuring that canceled and closed permits are returned to their department’s document management person for filing.

- Removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations. Entry Lead Persons are not required to be present during the entire confined space entry operation. However, if the Entry Lead Person acts as an Attendant, Entrant or Standby Person he/she is required to complete all duties of the appointed assignment in accordance with this document.

Attendants are responsible for:

- Reviewing and understanding (with the Entry Lead Person, Entrant and Standby Person(s)) the hazards of entry into the Permit Required Confined Space, including symptoms of exposure to toxic substances.
- Attending to the following general responsibilities:
 - Obtaining, inspecting and installing safety equipment as specified on the Entry Permit.
 - Keeping visual and/or audio contact with the Entrant at all times and continuously keeping accurate count of authorized entrants in the permit space.
 - Not performing other duties that interfere with monitoring the Entrant(s).
 - Staying in position until relieved by another Attendant.

Note: Attendants may enter a permit space if the employer's permit entry program allows attendant fore rescue. They have to be trained and equipped for the rescue operations and if they have been relieved.

- Tending the Entrant(s) retrieval device or safety line (when required by the permit).
- Ensuring that lockout, tag-out, block out or isolation of pipelines and equipment remain in place (when required by the permit).
- As determined appropriate, monitoring the air quality inside the permit space by using appropriate gas detection equipment.
- Maintaining conditions to ensure that external hazards and unauthorized persons do not enter the space.
- Establishing and maintaining communication with the Standby Person who shall summon emergency services and assist in emergency rescue operations, when needed.
- Ordering an evacuation if he/she:
 - Detects a hazard such as toxic release, potential engulfment, or equipment malfunction.
 - Detects symptoms of toxic exposure in an Entrant.
 - Detects a condition outside the permit space that could endanger Entrant(s), such as drifting vapors from tanks, piping, or sewers.
 - Cannot effectively and safely perform all required duties.
 - Performing non-entry retrievals as needed, provided the activity does not interfere with his/her primary duties as an Attendant, (but shall not participate in an entry rescue unless relieved by another trained Attendant (see Section 9 of this document)).
 - Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards

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- Must take following actions when unauthorized persons approach or enter a permit space:
 - Must let unauthorized persons to stay away from the permit space.
 - Let unauthorized persons to exit immediately.
 - Inform authorized entrants and entry supervisor.

Standby Persons are responsible for:

- Remaining at the entry area during the entire permit required confined space operation.
- Assisting in the maintenance of the safety controls specified by the permit.
- Performing duties as assigned by the Entry Lead Person or Attendant.

Entrants are responsible for:

- Staying in contact (by sight, voice, or radio communication) with the Attendant when performing a Permit Required Confined Space entry.
- Exiting the space whenever he/she becomes aware of or detects a hazard such as toxic exposure, potential engulfment, or malfunctioning equipment.
- Using appropriate safety equipment.
- Promptly obeying the safety instructions of the Attendant.

6.0 Pre-Entry Requirements

- All confined spaces are to be evaluated by an Entry Lead Person prior to authorizing entry.
- An Entry Lead Person shall:
 - Identify the hazards of the space. These include but are not limited to pipelines that carry flammable, harmful or incapacitating substances.
 - Automatic fire suppression systems that use harmful or oxygen displacing substances.
 - Potential for engulfment.
 - Potential for liberation of hydrogen sulfide.
 - The oxygen concentration is above 19.5 percent and below 23.5 percent.
 - Hazards introduced into the space such as solvents, coatings or hot work.
 - Fall hazards.
 - Entanglement hazards.
 - A survey of the surrounding area for drifting vapors from tanks, piping and sewers
- Classify the space by checking the appropriate box of the Confined Space Entry Permit and Record Sheet.
- Oversee the setup of any safety equipment required by the permit, including blowers, SCBA, emergency escape breathing devices, full body harnesses, tripods, and traffic control systems.
- Complete a Hot Work Permit if hot work is conducted in a confined space area with ignition hazards.
- Establish appropriate rescue procedures, specific to the confined space entry operation at hand, and list the procedures on the permit.
- Review the permit conditions, entry precautions and rescue procedures with the Attendant, Standby Person and the Entrant, prior to allowing entry into the permit space.
- Sign the permit to verify that appropriate safety precautions have been established and reviewed with the Attendant, Standby Person and Entrant(s) prior to allowing entry.
- Cancel the permit at the end of each work shift unless he/she has determined that the confined space entry is a "Continuous Entry".

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7.0 Entering a Confined Spaces

- At a minimum, one Attendant, one Standby Person and an Entrant shall participate in each Permit Required Confined Space entry.
- Rescue equipment shall be maintained at the space during the permit space operation.
- The Entrant shall wear retrieval equipment or wear an escape breathing device and use any other safety equipment.
- The Attendant shall verify that the entry conditions are acceptable.
- The Entrant shall enter and exit the space as directed by the Attendant.
- The Attendant shall order an immediate evacuation of the space if safety equipment fails or if the space becomes, or has the potential to become, immediately hazardous.

Vertical Entries Greater Than 5 Feet Deep

- Mechanical retrieval equipment is required when vertical entries greater than 5 feet deep are made unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the Entrant.
- A full body harness shall be attached to the Entrant. If a retrieval system is not practical, the entrant shall be equipped with a ten (10) minute escape breathing device and a full body harness with shoulder "D-Ring" attachments emergency evacuation.
- When electrical hazards are present, non-conducting lifelines shall be used.

Horizontal Entries & Traveling Distances in Permit Spaces

- Entrants who must travel significant distances from entry points into a storm drain, or wastewater collection system, may do so with the following provisions:
- The entrant shall carry a ten (10) minute escape breathing device and a gas detector, in addition to the gas detector monitored by the Attendant.
- At the first indication of a dangerous situation or toxic atmosphere, the Entrant must evacuate the space.
- A means of continual communication must be established (e.g., hand signals, light signals, audio, etc.)
- Rescue methods must be identified, practiced, and utilized when horizontal entries are conducted.

Entering an "Alternate Entry Procedure" Permit Space

- After evaluating the Permit Required Confined Space the Entry Lead Person may reclassify the Permit Space to an Alternate Entry Space. The Entry Lead Person's Supervisor or a member of Environmental Health and Safety must authorize the reclassification of a Permit Required Confined Space.
- The Entry Lead Person shall indicate that the Permit Space reclassification was approved by writing the name of the person approving the reclassification, the time approval was given and the means of communication for obtaining the approval (e.g., written, phone, in person, etc.) in the "Notes and Additional Comments" section of the Confined Space Entry Permit and Record Sheet.
- When entering the Alternate Entry Confined Space, the Entrant shall:
 - 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,
- Test the atmosphere of the permit space prior to entry into the space,
 - Continually operate an appropriate gas detector during the entire confined space operation,
 - Immediately evacuate the space if the ventilation fails, or if the portable air sampling equipment fails, and
 - Immediately evacuate the space if he/she discovers or becomes aware of a previously unrecognized hazard. If this occurs, the Entry Lead Person (or the Entrant's line supervisor, if the Entrant is also the Entry Lead Person) shall be immediately notified, the entry permit shall be canceled, the permit space shall be re-evaluated by the Entry Lead Person, and appropriate safety precautions implemented prior to resuming the confined space operation

Note: Authorized Entry Lead Persons may act as Entrants during Alternate Entry Confined Space operations.

- No Attendant or Standby Person is necessary for Alternate Entry Procedure entries (i.e., a single appropriately trained person may enter the space without the assistance of accompanying workers).

Entering a Non-Permit Confined Space

- After evaluating the Permit Required Confined Space, the Entry Lead Person may reclassify the Permit Space to a Non-Permit Required Confined Space. The Entry Lead Person's Supervisor or a member of Environmental Health and Safety must authorize the reclassification of a Permit Required Confined Space.
- The Entry Lead Person shall indicate that the Permit Space reclassification was approved by writing the name of the person approving the reclassification, the time approval was given and the means of communication for obtaining the approval (e.g., written, phone, in person, etc.) in the "Notes and Additional Comments" Section of the Confined Space Entry Permit and Record Sheet.
- Employees may enter Non-Permit Required Confined Spaces by following generally acceptable safe work practices.
- Employees shall not use paints, thinners, or other chemicals; weld or create any other atmospheric or mechanical hazard while working in a Non-Permit Confined Space.
- No Attendant or Standby Person is necessary when Confined Space Entry Operation Trained employees perform Non-Permit Space entries (i.e., a single, appropriately trained person may enter the space without the assistance of accompanying workers).

8.0 Atmospheric Control

Monitoring Confined Space Air Quality

- The Entry Lead Person must determine the type of atmospheric hazards present in a Permit or Alternate Entry confined space. Gas detectors typically used for entry into CSUB's confined spaces cannot be used to evaluate atmospheric hazards such as welding fumes, solvent vapors, or excessive heat. Under these conditions, a different air monitoring approach may be necessary.
- Prior to entering a Permit Required or Alternate Entry confined space, prepare the gas

detector by following the manufacturer's recommendations, making sure that the sampling filter and probe are attached.

- Procedures for sampling confined space air quality shall be conducted in accordance with the gas detector manufacturer's recommendations.
- Conduct a "functional bump test". Connect the instrument to a four-in-one gas cylinder to determine whether all monitor readings are within plus or minus 10% of the calibration gas. Recalibrate the instrument if reading does not fall within this range.
- Sample the air quality of the space by slightly opening the access port, or by testing the space through a suitable sampling port prior to completely opening the space.
- Lower the probe slowly, allowing time for the instrument to detect atmospheric changes at different heights and locations within the space.
- The gas detector shall remain "ON" during the entire entry operation. The Attendant shall inspect the gas detector frequently to ensure proper operation and record readings at least hourly and shall record hourly reading on the entry permit.
- If any of the following conditions occur, abort entry and report this condition to the Entry Lead Person's Supervisor immediately:
 - An oxygen reading less than 19.5% or greater than 23.5%
 - A combustible gas reading greater than 9% LEL
 - A H₂S reading greater than 9 ppm
 - A CO reading greater than 24 ppm
- The Permit Space may be re-entered after conditions return to acceptable concentrations.

Note: After initial testing and logging of results and proper downgrading of a Permit Required Confined Space, intermittent recording of atmospheric results is not required during Alternate Procedure or Non-Permit Space entries.

Note: Gas detectors are not required for confined spaces that have been reclassified as non-Permit or for spaces which do not contain any atmospheric hazards.

Ventilating the Confined Space

- A. Set up blower(s) to provide adequate ventilation for the space.
- B. Ensure ventilation air supply is obtained from a clean source.
- C. Allow enough time for the blower(s) to clear the permit space atmosphere before entering.
- D. Ensure that the blower(s) operate at all times during permit space operations. If the blower(s) fails, Entrants must leave the Permit Space or Alternate Entry Space until ventilation is reestablished.

9.0 Permit Required Confined Space Emergency Rescue

Historically, more rescuers are killed each year attempting rescues than Entrants. Considering this, all entries confined space entries must be designed to allow for nonentry rescue. If the type and conditions of the space require entry rescue procedures to be developed, employees will be trained in entry rescue or an outside contractor, skilled in entry rescue procedures, will be hired.

- In all emergencies requiring personnel rescue, members of a trained rescue team shall perform non-entry rescues, if possible.

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- The Entry Lead Person must anticipate the types of Permit Space incidents that could occur during a particular Permit Space entry, prepare, and list appropriate emergency procedures on the entry permit and review the procedures with the Attendant, Entrant and Standby Person prior to authorizing a Permit Space entry. Emphasis must be given to planning work so that incapacitated Entrants can be rescued without having to enter the confined space.
- Employees assigned to perform “Confined Space Entry Rescue” activities shall be:
 - provided with and trained in the proper use of appropriate personal protective equipment.
 - trained to perform Permit Space entry and assigned rescue duties.
 - required to conduct a practice Permit Space rescue at least once every 12 months.
- Employees relying solely upon outside emergency teams to conduct Permit Space rescues shall inform these teams of the confined space hazards they may confront and provide them with access to CSUB Permit Spaces for the purpose of strategy development and rescue practice.

10.0 Confined Space Entry

- Confined Space Entry Permits are to be distributed to the Entry Lead Person under the supervision of a Confined Space Entry Operation trained line supervisor.
- Canceled and closed permits are to be returned to the Supervisor issuing the permit or to the department’s document management person for filing as directed.
- Each department is required to maintain their completed permits for no less than one year.

11.0 Contractor work in CSUB’s Confined Spaces

- When contractors will be performing work that involves entry into a CSUB’s confined space, the CSUB employee responsible for interfacing with the contractor shall review the following with the contractor:
 - That the space(s) the contractor’s employee(s) are going to work in are considered confined spaces and that entry is allowed only by following an OSHA compliant Confined Space Entry Program.
 - Apprise the contractor of identified hazards of the space and the CSUB experience with entry into the space.
 - Notify the contractor of the CSUB precautions and procedures implemented to protect employees entering the confined space.
 - Coordinate entry operations with the contractor, when both CSUB personnel and contractor personnel will be working in a Permit Space at the same time.
 - Debrief the contractor following the entry operation about any hazards confronted or created during entry.
- Contractors are authorized to enter CSUB controlled, Permit Required confined spaces only by following an OSHA compliant Permit Required Confined Space Entry Program. Contractors must certify by affidavit that they are following an OSHA compliant program.
- Whenever practical, contractors should be informed, through the contract process, of the need for Confined Space Entry Procedures that meet regulatory requirements.
- When co-entering a CSUB controlled confined space, contractors must enter the confined

space at a "LEVEL" equal to or greater than the "LEVEL" required by the CSUB employees.

12.0 Confined Space Entry Training

- All employees (reporting to CSUB employed supervisory personnel) who are required to enter Permit Required or Alternate Entry Confined Spaces must be trained in the requirements of this program prior to participating in a Permit Required or Alternate Entry Confined Space project.
- CSUB personnel must be trained in Confined Space Entry Rescue techniques and first aid/CPR prior to participating in "Entry" rescue operations.
- Attendants and/or Standby Persons participating in Permit Required and/or Alternate Entry confined space operations shall be trained in first aid/CPR.



Confined Space Entry Permit and Record Sheet

1. General Information

| | | |
|--------------------------|--------------|---|
| Confined Space Location: | | |
| Reason for Permit: | | |
| Date Issued: | Time Issued: | Emergency Rescue: Call UPD at 661-654-2111 |
| Entry Supervisor: | | Date /Time Permit Expires: |

2. Entrants

3. Attendants

4. Standby Person(s)

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5. Type of Confined Space:

Entry This is a **“PERMIT REQUIRED”** Confined Space. Complete all sections below.

This is an **“Alternate Entry Procedure”** Confined Space. Complete Sections(#10, 11, &14) Use Section #15 for notes & comments.

This is a **“NONPERMIT REQUIRED CONFINED Space.”** All hazards have been eliminated.

6. Confined Space Pre-Entry Checklist

Instructions: The Entry Supervisor shall answer and initial each checklist item as it is completed. The Entry Supervisor shall authorize work to begin by signing below, only after all checklist items have been appropriately addressed. The Entry Supervisor shall cancel the permit by signing below after work is completed, or if conditions arise that are out of compliance with the checklist.

| | Yes | No | N/A | Initial |
|---|-----|----|-----|---------|
| A. Have all personnel been appropriately trained and instructed in CSE procedures? | | | | |
| B. Have emergency communications and action procedures been identified and explained? | | | | |
| C. Have on-site Emergency Services been verified and available by Entry Supervisor? Call CSUB University Police Dispatch (661) 654- 2677 – Supply: Location, # entrants, hazards, & length of entry | | | | |
| H. Is the gas detector within calibration limits and operating properly? | | | | |
| I. Is the space and surrounding area free of harmful vapors and gases? | | | | |
| J. Has the appropriate fall protection/retrieval equipment been installed and inspected? | | | | |
| K. Has the body harness been properly donned and inspected? | | | | |
| L. Is a fire extinguisher available? | | | | |
| M. Is explosion proof equipment required (i.e., lighting, radios, blowers, etc.)? | | | | |
| N. Is an appropriately maintained First Aid Kit available? | | | | |
| O. Is the entry area secured and marked with barriers? | | | | |
| P. Is traffic control equipment in place? | | | | |
| Q. Is other safety equipment necessary (i.e., hard hat, SCBA, etc.)? | | | | |

7. List of Potential Hazards of the Space

8. List Safety Equipment Required

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9. Method of Attendant/Entrant Communication

10. Method for Contacting Emergency Services Personnel

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14. Notes and Additional Information

Sampling Equipment:

Manufacturer:

Model and Serial Number:

Calibration Date:

NOTE: This Permit must be maintained in your department for no less than one (1) year.

15. Confined Space work is complete. This permit is hereby cancelled. *Call CSUB UPD Dispatch*

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| | |
| Entry Supervisor's Signature | Date and Time |