Santa Barbara SIPE
Joint Powers Self Insurance

Confined Space Entry 7/20/21

This program describes the procedures for SBCEO SIPE member districts and employees regarding safe practices when entering confined spaces (e.g., communications vaults, pipe vaults).

I. Purpose/Scope

- Purpose: To establish a procedure for confined space entry for SBCEO SIPE member districts.
- Scope: The requirements of this document apply to all SBCEO SIPE member district employees.

II. Definitions

- Alternate Energy Procedure: A procedure that may be used to enter a confined space if the only hazard present in the space is atmospheric in nature and:
    - The atmospheric hazard can be controlled by mechanical ventilation alone; and
    - The permit space could not become immediately dangerous to life and health (IDLH) if the mechanical ventilation should fail.
- Attendant: An individual stationed outside one or more permit required confined spaces who monitors the authorized entrants and who performs all Attendant's duties as assigned in this program.
- Authorized Entrant: An employee who is authorized by the campus to enter a permit required confined space.
- Confined Space: A confined space means that a space:
    - 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 (for example, manholes, vaults, and pits are spaces that may have limited means of entry or exit); and
    - Is not designed for continuous employee occupancy.
- Permit Required Confined Space: Meets the 3 definitions of a confined space and has a serious safety hazard that hinders self-rescue.
- Entry Permit: The written document provided by SBCEO which allows and controls entry into a permit required confined space.
- Entry Supervisor: The person responsible:
    - For determining if acceptable entry conditions are present at a permit space where entry is planned,
    - For authorizing entry and overseeing entry operations, and,
    - For terminating entry as required by this program.
- Hazardous Atmosphere: An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, or acute illness resulting from the following:
    - Flammable gas, vapor, or mist in excess of 10 % of its lower explosive limit (LEL).
    - Airborne combustible dust at a concentration that meets or exceeds its LEL; (note: this condition may be approximated as a condition in which the dust obscures vision at a distance of 5 feet or less).
    - Atmospheric oxygen concentration below 19.5% or above 23.5%.
    - Atmospheric concentration of any substance which could result in an exposure greater than the Permissible Exposure Level (PEL).
    - Any other atmospheric concentration that is immediately dangerous to life and health (IDLH).
- Immediately Dangerous to Life or Health (IDLH): Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a confined space.
- Lower Explosive Limit (LEL): The minimum vapor concentration of a flammable liquid in air, below which flame propagation does not occur on contact with an ignition source.

- Non-Permit confined Space: A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.
- Oxygen Deficient Atmosphere: An atmosphere containing less than 19.5 % oxygen by volume.
- Oxygen enriched Atmosphere: An atmosphere containing more than 23.5 % oxygen by volume.
- Permit Required Confined Space: A confined space that has one or more of the following characteristics:
    - Contains or has a potential to contain a hazardous atmosphere.
    - Contains a material that has the potential for engulfing an entrant.
    - Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
    - Contains any other recognized safety or health hazard.
- Testing: The process by which hazards that may confront entrants of a permit space are identified and evaluated
- Ventilation: A process used to control the atmospheric hazards of confined spaces by replacing unsafe air with clean, breathable air.

III. Exemptions/Exclusions

None

IV. Responsibilities

- Districts:
    - Establish and update the written Confined Space Entry Program.
    - Ensure that all employees who are involved with a confined space entry (including Authorized Entrant, Entry Attendant, and Entry Supervisor), have received training (Section V. Training).
    - Ensure that all confined space entries involving employees are conducted according to this procedure.
    - Annually review records of confined space entry operations.
    - Provide consultation to departments that enter confined spaces.

- Provide and maintain equipment that is needed for confined space entry including, but not limited to: atmospheric testing equipment, protective barriers, ventilation devices, and rescue equipment.
- Maintain records of all confined space entries (Section VII. Procedures).

- Confined Space Entry Supervisor:
  - Ensure that all persons involved in a confined space entry are properly trained (Section V. Training) and follow the procedures outlined in Section VII. Confined Space Entry Procedures.
  - Evaluate and classify the confined space prior to entry.
  - Complete the Confined Space Entry Permit.
  - Ensure that canceled permits are properly filed. Note: The Entry Supervisor does not need to be present during the entire confined space entry operation.
- Confined Space Entrants(s):
  - Must have completed the training outlined in Sections V. Training and VII. Procedures.
  - Must stay in constant contact with the Attendant (i.e. sight, voice, or radio) during a Permit Required Confined Space entry.
  - Use the appropriate safety equipment as specified on the Entry Permit.
- Entry Attendant:
  - Must have completed the training outlined in Section V. Training.
  - Obtain and install the required safety equipment for Confined Space entries.
  - Monitor pedestrian barriers to protect entrant(s) from external hazards.
  - Monitor the atmosphere within the confined space during the entire entry operation.
  - Must remain in position until relieved by another trained Attendant.
  - Ensure that all lockout / tagout measures (if implemented) remain in place.

- Responsible for ordering an evacuation if a situation develops that could endanger the Entrant.

V. Training

- All SBCEO district employees who participate in Permit Required or Alternate Entry Procedures including Entrance Supervisors, Attendants, and Entrants, must receive training in the requirements of this program.
- All SBCEO districts employees who are designated as rescue personnel must be trained in proper rescue techniques as well as certified in CPR and First Aid.

VI. Procedures

- Confined Space Entry Procedures:
  - All confined spaces are to be evaluated by an Entry Supervisor prior to authorizing an entry. The primary purpose of the evaluation will be to determine if the entry will be via "Alternate Entry Procedures" or by "Permit Required Entry Procedures".
    - To be reclassified as an "Alternate Entry" space, the following conditions must exist:
    - The only hazard in the space is the potential for a hazardous atmosphere; and
    - The potential hazard can be eliminated through the use of continuous forced ventilation; and
    - Previous and current atmospheric monitoring data (gas tests) must demonstrate that the above is true (i.e. there has never been a record of an atmospheric hazard during an entry).
  - If the above conditions are true and the gas test(s) indicate that the atmosphere is non-hazardous the space may be entered using "Alternate Entry Procedures". If the potential for atmospheric hazard cannot be eliminated with ventilation, the space must be entered using the "Permit Required Entry Procedures".
- Alternate Entry Procedures:
  - Entry Supervisor shall ensure that space has been classified as an Alternate Entry.

- If an entrance cover must be removed, the opening shall be promptly guarded by railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and will protect each employee working in the space from foreign objects entering the space.
- All hazardous sources of energy shall be locked and/or tagged out.
- Ensure that the air has been tested for hazardous air contaminants and that the tests were negative. Note: this should have been completed prior to reclassifying space as "Alternate Entry". Log the sampling results in "Confined Space Entry Permit and Record Sheet" (see attachment sample). The gas detector, capable of measuring the gases identified below shall be used during the entire entry procedure.
- Test for the following contaminants, in the order listed:
  - Oxygen content;
  - Flammable gases and vapors; and
  - Potentially toxic air contaminants.
- Entry Supervisor shall fill out the "Confined Space Entry Permit".
- Set up adequate ventilation for the space that will be entered. Ensure that the supply air is taken from a clean source and that the ventilation is allowed to operate for at least 5 minutes prior to entering the space. If the ventilation ceases to operate, all Entrants must leave the space immediately.
- The Entrant shall immediately evacuate the confined space if he/she becomes aware of a previously unrecognized hazard. If this occurs, the Entrance Permit shall be canceled, and the space must be reevaluated by an Entry Supervisor prior to re-entry. Note: The Entry Supervisor may act as an entrant during "Alternate Entry Procedure" entries.
- An Entry Attendant or Standby person is still necessary for "Alternate Entry Procedure" entries.
- When the confined space entry has concluded, the completed Record Sheet shall be filed and kept on file for a minimum of one (1) year.

- Permit Required Entry Procedures:
  - At a minimum, an Entry Supervisor, Entry Attendant and Entrant shall be designated to participate in each Permit Required Confined

Space Entry. Note: The Entry Supervisor may act as the Entry Attendant as well.

- Acquire, inspect and setup safety equipment required by the permit including blowers, full body harness, rescue tripod, and traffic control systems.
- The Entry supervisor shall establish appropriate rescue procedures specific to the space entry and shall list these procedures on the permit (see sample attachment sheet).
- All hazardous sources of energy shall be locked and/or tagged out.
- If an entrance cover must be removed, the opening shall be promptly guarded by railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and will protect each employee working in the space from foreign objects entering the space.
- Test the air for hazardous contaminants and enter the results on the Confined Space Entry Permit and Record Sheet (See attached sample sheet). Continuously sample and record results throughout the entire entry procedure. Refer to "Monitoring Confined Space Air Quality" section below.
- The Entry Supervisor shall complete and sign the Confined Space Entry Permit (all Sections) and Record prior to space entry. The permit conditions, entry precautions, and rescue procedures shall be reviewed with the Attendant and Entrant prior to entry.
- Prior to entry, the Attendant shall verify that the entry conditions are acceptable.
- The Entrant must wear retrieval equipment during the entire entry operation.
- The Attendant will continuously monitor the portable gas detector and record the readings every hour (minimum).
- An immediate evacuation of the space shall be ordered if the safety equipment fails or if the space becomes, or has the potential to become, immediately hazardous.
- Upon completion of the job, the Entry Supervisor shall cancel the permit and ensure that the completed permit is placed in the proper department file.
- Hazard Control:
    - Monitoring Confined Space Air Quality

- Calibrated Gas Detector capable of measuring oxygen content, LFL, and potentially toxic atmospheres.
- Prior to entering a Permit Required or Alternate Entry confined space, prepare the gas detector by ensuring the device has been recently calibrated (check manual for frequency) and is in good working order.
- Conduct a "bump test". Breathe into the gas detector probe and look for a decrease in the oxygen concentration - the detector should alarm due to the lack of oxygen.
- Sample the air quality of the space by slightly moving the lid, or by testing the space through the hole in the lid (if available) before completely opening the space.
- Lower the probe slowly, allowing time for the instrument to detect atmospheric changes at different vertical heights within the space.
- Measure in the following order:
    - Oxygen
    - LEL
    - H2S
    - CO
- Record the results on the Confined Space Entry Permit Record Sheet.
- The gas detector shall remain on during the entire entry operation and shall be regularly inspected by the Attendant. The Attendant shall also record the gas readings on the Record Sheet at a minimum of one (1) hour intervals.
- Cease entry operations and remove entry personnel if the following concentrations are exceeded at any time:
    - Oxygen reading less than 19.5% or greater than 22.5%
    - Combustible gas reading greater than 9% LEL
    - H2S reading greater than 9 ppm
    - CO reading greater than 34 ppm

- Ventilating a Confined Space:

- Set up one or more blowers to provide adequate ventilation for the space.
- Ventilation must be forced draft discharge of clean air into space (not exhaust of space).
- Ensure that the ventilation air supply is from a clean source.
- Allow enough time for blowers to clear the space before entering.
- Ensure that the blowers remain on during the entire entry operation. If the blower fails, the Entrant must leave the space immediately. (Note: This applies to both Permit Required and Alternate Entry procedures.)

- Emergency Rescue from Permit Required Confined Spaces
  - Historically, more rescuers are killed while attempting a rescue than entrants. In light of this fact, Emergency rescues within confined spaces should only be attempted by persons who are properly trained and have the proper rescue equipment.
  - All rescues attempted by SBCEO SIPE district personnel will be Non-Entry Rescues (i.e. rescuer will not enter the space at any time during rescue).
  - Retrieval equipment is required for all Permit Required vertical entries greater than 5 ft. Retrieval equipment shall include (but not be limited to) the following:
    - Rescue harness (chest or full body)
    - Rescue tripod
    - Rope or cable (inspected for damage)
  - Entry Supervisor must determine how emergency medical personnel (fire department) will be notified - i.e. radio call to work control.
  - All persons involved in the rescue must have received training and practiced a rescue within the last 12 months.
  - At least one member of the rescue team (e.g, Attendant) must have current training in CPR and First Aid

VIII. Contractors

- Contractors that enter confined spaces on SBCEO SIPE member district facilities must comply with the Confined Space Standard as defined in Section 5156, 5157 & 5158 of Title 8 of the California Code of Regulations.

IX. References

California Code of Regulations, Title 8, Section 5157 Permit-Required Confined Spaces
California Code of Regulations, Title 8, Section 5158 Other Confined Space Operations
Code of Federal Regulations Title 29 Part 1910.146 Permit-required confined spaces
Cal/OSHA publication: "Is it safe to enter?"

Attachments

Appendix D to §1910.146 -- Sample Permits

Appendix D-1

Confined Space Entry Permit

Date and Time Issued: _____ Date and Time Expires: _____

Job site/Space I.D.: _____ Job Supervisor:_____

Equipment to be worked on: _____ Work to be performed: _____

Stand-by personnel: _____ _____ _____

1. Atmospheric Checks: Time _____

Oxygen _____%

Explosive _____% L.F.L.

Toxic _____PPM

2. Tester's signature: _____

3. Source isolation (No Entry):	N/A	Yes	No
Pumps or lines blinded,	( )	( )	( )
disconnected, or blocked	( )	( )	( )

4. Ventilation Modification:	N/A	Yes	No
Mechanical	( )	( )	( )
Natural Ventilation only	( )	( )	( )

5. Atmospheric check after

   isolation and Ventilation:

   Oxygen _____% > 19.5 %

   Explosive _____% L.F.L < 10 %

   Toxic _____PPM < 10 PPM H(2)S

   Time _____

   Testers signature: _____

6. Communication procedures: _____

_____

7. Rescue procedures: _____

_____

_____

_____

8. Entry, standby, and back up persons:	Yes	No
Successfully completed required training?		
Is it current?	( )	( )

9. Equipment:	N/A	Yes	No
Direct reading gas monitor - tested	( )	( )	( )
Safety harnesses and lifelines for entry and standby persons	( )	( )	( )
Hoisting equipment	( )	( )	( )
Powered communications	( )	( )	( )

SCBA's for entry and standby persons	( )	( )	( )
Protective Clothing	( )	( )	( )
All electric equipment listed Class I, Division I, Group D and Non-sparking tools	( )	( )	( )

10. Periodic atmospheric tests:

Oxygen	____%	Time ____	Oxygen	____%	Time ____
Oxygen	____%	Time ____	Oxygen	____%	Time ____
Explosive	____%	Time ____	Explosive	____%	Time ____
Explosive	____%	Time ____	Explosive	____%	Time ____
Toxic	____%	Time ____	Toxic	____%	Time ____
Toxic	____%	Time ____	Toxic	____%	Time ____

We have reviewed the work authorized by this permit and the information contained here-in. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid unless all appropriate items are completed.

Permit Prepared By: (Supervisor)_____

Approved By: (Unit Supervisor)_____

Reviewed By (Cs Operations Personnel) :

_____ _____

(printed name) (signature)

This permit to be kept at job site. Return job site copy to Safety Office following job completion.

Copies: White Original (Safety Office)

Yellow (Unit Supervisor)

Hard(Job site)

Appendix D - 2

ENTRY PERMIT

PERMIT VALID FOR 8 HOURS ONLY. ALL COPIES OF PERMIT WILL REMAIN AT JOB SITE UNTIL JOB IS COMPLETED

DATE: - - SITE LOCATION and DESCRIPTION _____

PURPOSE OF ENTRY _____

SUPERVISOR(S) in charge of crews Type of Crew Phone #

_____

_____

COMMUNICATION PROCEDURES _____

RESCUE PROCEDURES (PHONE NUMBERS AT BOTTOM) _____

_____

* BOLD DENOTES MINIMUM REQUIREMENTS TO BE COMPLETED AND REVIEWED PRIOR TO ENTRY*

REQUIREMENTS COMPLETED	DATE	TIME
Lock Out/De-energize/Try-out	____	____
Line(s) Broken-Capped-Blanked	____	____
Purge-Flush and Vent	____	____
Ventilation	____	____
Secure Area (Post and Flag)	____	____

Breathing Apparatus	____	____
Resuscitator - Inhalator	____	____
Standby Safety Personnel	____	____
Full Body Harness w/"D" ring	____	____
Emergency Escape Retrieval Equip	____	____
Lifelines	____	____
Fire Extinguishers	____	____
Lighting (Explosive Proof)	____	____
Protective Clothing	____	____
Respirator(s) (Air Purifying)	____	____
Burning and Welding Permit	____	____

Note: Items that do not apply enter N/A in the blank.

**RECORD CONTINUOUS MONITORING RESULTS EVERY 2 HOURS

CONTINUOUS MONITORING**	Permissible	_____							
TEST(S) TO BE TAKEN	Entry Level								
PERCENT OF OXYGEN	19.5% to 23.5%	___	___	___	___	___	___	___	___
LOWER FLAMMABLE LIMIT	Under 10%	___	___	___	___	___	___	___	___
CARBON MONOXIDE	+35 PPM	___	___	___	___	___	___	___	___
Aromatic Hydrocarbon	+ 1 PPM * 5PPM	___	___	___	___	___	___	___	___
Hydrogen Cyanide	(Skin) * 4PPM	___	___	___	___	___	___	___	___
Hydrogen Sulfide	+10 PPM *15PPM	___	___	___	___	___	___	___	___
Sulfur Dioxide	+ 2 PPM * 5PPM	___	___	___	___	___	___	___	___
Ammonia	*35PPM	___	___	___	___	___	___	___	___

* Short-term exposure limit: Employee can work in the area up to 15 minutes.

+ 8 hr. Time Weighted Avg.: Employee can work in area 8 hrs (longer with appropriate respiratory protection).

REMARKS:_____

GAS TESTER NAME & CHECK #	INSTRUMENT(S) USED	MODEL &/OR TYPE	SERIAL &/OR UNIT #
_____	_____	_____	_____
_____	_____	_____	_____

SAFETY STANDBY PERSON IS REQUIRED FOR ALL CONFINED SPACE WORK

SAFETY STANDBY PERSON(S)	CHECK #	CONFINED SPACE ENTRANT(S)	CHECK #	CONFINED SPACE ENTRANT(S)	CHECK #
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

SUPERVISOR AUTHORIZING - ALL CONDITIONS SATISFIED_____

DEPARTMENT/PHONE _____

AMBULANCE 2800 FIRE 2900 Safety 4901 Gas Coordinator 4529/5387