SDIS
SPECIAL DISTRICTS
INSURANCE SERVICES

**NEW CHANGES TO THE CONFINED SPACES STANDARD**

On October 20, 2014, OR-OSHA adopted changes to the Confined Spaces Standard for General Industry and Construction. These changes go into effect January 1, 2015 for general industry, which applies to most SDIS members. The SDAO Risk Management Team worked closely with stakeholder groups on the changes and believes they will be beneficial and relatively easy to comply with. To help your district with compliance, we have developed a toolkit with all of the information you need and attached it to this email. If you have any questions, please contact SDAO risk management staff at losscontrol@sdao.com.

**SDIS Confined Space Toolkit**

SDIS Special Districts Insurance Services

**MEMORANDUM**

**Date**: December 19, 2014

**To:** SDIS Member Districts

**From:** SDAO Risk Management Department

**Subject:** Changes to OR-OSHA Confined Spaces Standard

OR-OSHA has recently adopted a new standard for permit required confined spaces (PRCS). Your SDAO risk management team has been working diligently to develop a toolkit to assist you in reviewing your program to make sure that your district's PRCS program is up to speed when the rule goes into effect on January 1, 2015. Below is list of some of the changes that have occurred to the rule:

- Some definitions were deleted, some added, and some re-written for clarification.
- You must determine if any of your confined spaces are PRCS. All PRCS must have a documented evaluation as part of your PRCS program.
- Rescue teams, whether in house or contracted, must practice rescues prior to the entry and no more than 12 months before an entry in the actual space being entered or a simulated space with similar size, configuration, and accessibility issues.
- Contracted rescue teams must agree to be the rescue team prior to the entry. As a best practice, SDAO recommends this agreement be in writing.
- Clarified ventilation and atmospheric monitoring requirements when entering under alternate entry procedures.
- Requires awareness training be provided to employees whose work operations are or may be in an area where PRCS are present.
- Clarified communication requirements between districts and contractors if the contractor is working in your PRCS.

One thing we expect will continue to be a challenge for our members is PRCS that must be entered for rescue operations such as pipelines and siphons. These types of spaces typically do not lend themselves to be able to use non-entry rescue techniques, such as those of a vault or manhole where a tripod with a winch and a harness can be used. From our experience, most SDIS members with these types of spaces use a third party contractor to perform entry rescue operations. Item 3.3 in the toolkit is a great document to assist you in evaluating a rescue team.

If you have any questions or need assistance, please do not hesitate to email us at losscontrol@sdao.com or call us at 800-285-5461.

Oregon
John Kitzhaber MD, Governor

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October 23, 2014

Text of changes
New text only

# Oregon OSHA – Adopted Changes to Confined Spaces Standard for General Industry and Construction

Oregon OSHA in consultation with stakeholders, developed a rule proposal to amend our current general industry/construction standard OAR 437-002-0146 Confined Spaces, to clarify certain areas of concern in the state-initiated rule adopted in 2012. These amendments were proposed in July with one hearing held in August 2014.

Changes from the proposed rule to the adopted rule include:

The proposed rule contained requirements that employers identify all confined spaces. The final rule requires only that employers identify their permit-required confined spaces.

There was a typo in the proposed rule regarding the exemption for excavation work. The final rule reflects that excavation work is exempt from the confined space rules except when workers must bodily enter a sewer space.

An exemption was added for power generation work regulated by the newly adopted federal OSHA rules on power generation in the construction industry. While Oregon OSHA has yet to adopt these rules, it is highly unlikely that the referenced rule will change dramatically.

Language was added to clarify that, when energy isolation is used to isolate the hazards of a permit space, employers must follow all of the provisions of 1910.147 The Control of Hazardous Energy (Lockout/Tagout). A note was added in the section regarding alternate entry that tagout alone does not eliminate a hazard.

A written agreement with third party entry rescue service providers is no longer required. A note was added to remind employers who plan on using an off-site rescue service that they need to contact that service and coordinate the evaluations required by the rule, and that simply posting a phone number or relying on emergency services is not adequate.

Language was added to clarify that retraining is necessary when previously unidentified hazards are discovered.

These rule amendments are adopted and will become effective for general industry on January 1, 2015, and for construction on March 1, 2015.

This is Oregon OSHA Administrative Order 5-2014, **adopted October 20, 2014, and effective January 1, 2015 (construction industry: effective March 1, 2015).**

Oregon OSHA Contact: Dave McLaughlin, Central Office @ 503-947-7457; or e-mail at dave.j.mclaughlin@state.or.us

Please visit our web site www.orosha.org Click 'Rules' in the left vertical column and view our proposed, adopted, and final rules.

Note: In compliance with the Americans with Disabilities Act (ADA), this publication is available in alternative formats by calling 503-378-3272.

Secretary of State
Certificate and Order for Filing

# PERMANENT ADMINISTRATIVE RULES

I certify that the attached copies* are true, full and correct copies of the PERMANENT Rule(s) adopted on October 20, 2014 by the
Date prior to or same as filing date

Department of Consumer & Business Services/Oregon Occupational Safety & Health Division 437
Agency and Division — Administrative Rules Chapter Number

Sue Joye 350 Winter Street NE, Salem OR 97301-3882 503-947-7449
Rules Coordinator — Address — Telephone

to become effective January 1, 2015 as Oregon OSHA Administrative Order 5-2014.
Date upon filing or later

Rulemaking Notice was published in the August 2014 *Oregon Bulletin*.**
Month and Year

## RULE CAPTION

Adopt amendments to the Confined Spaces standard in general industry and construction.
**Not more than 15 words that reasonably identifies the subject matter of the agency's intended action.**

## RULEMAKING ACTION

**AMEND:** OAR 437-002-0146.

**ORS** 654.025(2), 656.726(4)
Stat. Auth.

**ORS** 654.001 through 654.295
Stats. Implemented

## RULE SUMMARY

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Please visit our web site www.orosha.org Click 'Rules' in the left vertical column and view our proposed, adopted, and final rules.

| /s/Michael D. Wood | Michael D. Wood | 10/15/2014 |
|---|---|---|
| Authorized Signer | Printed name | Date |

*****With this original, file one photocopy of certificate, one paper copy of rules listed in Rulemaking Actions, and electronic copy of rules.
******The *Oregon Bulletin* is published on the 1st of each month and updates rules found in the OAR Compilation. For publication in Bulletin, rule and notice filings must be submitted by 5:00 pm on the 15th day of the preceding month unless this deadline falls on a weekend or legal holiday, when filings are accepted until 5:00 pm on the preceding workday. ARC 930-2005

# OAR 437, Oregon Occupational Safety and Health Division
# Oregon OSHA Administrative Order 5-2014
# Filed October 20, 2014, effective January 1, 2015

## DIVISION 2, GENERAL INDUSTRY

## Subdivision J – General Environmental Controls

**437-002-0146 Confined Spaces**

(1) Purpose and application. This rule applies to all activities in confined spaces and provides requirements to protect employees from the hazards of entering and working in confined spaces.

(2) Exceptions. This standard does not apply to the following:

(a) Construction work regulated by Division 3/P Excavations, except for entry into sanitary sewer spaces that are large enough to bodily enter.

(b) Construction work regulated by Division 3/S Underground Construction, Caissons, Cofferdams and Compressed Air, except for sewers.

(c) Enclosed spaces regulated by 1910.269 in Division 2/R Electric Power Generation, Transmission and Distribution, except when that standard requires compliance with this standard.

(d) Enclosed spaces regulated by 1926.953 in Division 3/V Electric Power Generation, Transmission and Distribution, except when that standard requires compliance with this standard.

(e) Manholes and vaults regulated by 1910.268(o) in Division 2/R Telecommunications, unless the space cannot be made safe to enter even after following the requirements of 1910.268(o).

(f) Welding in confined spaces regulated by Division 2/Q Welding, Cutting & Brazing, when the only hazards are related to the welding process.

(g) Grain bins, silos, tanks, and other grain storage structures regulated by 1910.272, Grain Handling Facilities.

(h) Diving operations regulated by Division 2/T, Commercial Diving Operations.

(i) Except for (a) through (h) above, when any other applicable standard addresses work in confined spaces or additional hazards that may be present, you must comply with the provisions of that standard and this standard. Where the requirements of one standard are more restrictive than the other, follow the more stringent requirements.

(3) Definitions.

Acceptable entry conditions: The conditions that must exist in a permit-required confined space to allow safe entry and work.

Alternate entry – An alternative process for entering a permit space under very specific conditions. The space remains a permit space even when entered using alternate entry and even though no entry permit is required in those circumstances.

Atmospheric hazard (see the definition of hazardous atmosphere).

Atmospheric testing – see “Testing.”

Attendant – An individual stationed outside one or more permit spaces to monitor the authorized entrants and who performs all attendants duties assigned in the employer's permit space program.

Authorized – Approved by the employer or controlling contractor.

Authorized entrant – An employee who is authorized by the employer to enter a permit space.

Barrier – A physical obstruction that blocks or limits access.

Blanking or blinding – The absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) 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.

Calibration – The checking of a direct-reading instrument against an accurate standard (such as a calibration gas) to determine any deviation and correct for errors.

Note: A similar process may also be referred to as a “bump test” in which an instrument is tested with an accurate standard to ensure it is still reading correctly. For the purposes of this rule, a “bump test” performed in accordance with the manufacturer’s instructions can be used to verify calibration.

Confined space – A space that meets all of the following:

> Large enough and so configured that an employee can fully enter the space and perform work.
>
> Has limited or restricted means for entry and/or exit.
>
> Is not designed for continuous human occupancy.

Continuous system – a confined space that meets all of the following:

> Part of, and contiguous with, a larger confined space (for example, storm sewers, sanitary sewers, or steam tunnels).

Subject to a potential release from the larger confined space that can overwhelm control measures and/or personal protective equipment, resulting in a hazard that is immediately dangerous to life and health.

Control or controlling – Authority to regulate, direct or influence.

Controlling contractor – The employer that has overall responsibility for construction at a worksite.

Note: A controlling contractor who owns or manages a property is both a controlling contractor and a host employer.

Double block and bleed – The closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency – Any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

Engulfment hazard – A physical hazard consisting of a liquid or flowable solid substance that can surround and capture an individual. Engulfment hazards may cause death or serious physical harm if: the individual inhales the engulfing substance into the respiratory system (drowning, for example); the substance exerts excessive force on the individual's body resulting in strangulation, constriction, or crushing; or the substance suffocates the individual.

Entrant (see the definition of authorized entrant).

Entry – The action by which any part of an employee's body breaks the plane of an opening into a confined space. Entry (or entry operations) also refers to the period during which an employee occupies a confined space.

Entry Permit – Written authorization from the employer, controlling contractor, or host employer to enter a permit-required confined space and perform work.

Entry supervisor – The person (such as the employer, foreman, or crew chief, or any other designated employee) responsible for:

Determining if acceptable entry conditions are present at a permit space where entry is planned; and

Authorizing entry and overseeing entry operations; and

Terminating entry as required.

Hazard – For the purpose of this rule, hazard means a physical hazard or hazardous atmosphere.

Hazard control – The action taken to reduce the level of any hazard inside a confined space using engineering methods (for example, by isolation or ventilation), and then using these methods to maintain the reduced hazard level. Hazard control also refers to the engineering methods used for this purpose. Personal protective equipment is not a hazard control.

Hazard elimination – The action taken to remove a hazard from the work environment. For confined spaces, this includes isolation. For a hazard to be eliminated, the conditions that create or cause the hazard no longer exist within the confined space.

Hazardous atmosphere – An existing or potential atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to escape unaided from a permit space, injury, or acute illness from one or more of the following:

A flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit.

An airborne combustible dust at a concentration that meets or exceeds its lower explosive limit.

Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 meters) or less.

An atmospheric oxygen concentration below 19.5 percent (oxygen deficient) or above 23.5 percent (oxygen enriched).

An airborne concentration of a substance that exceeds the dose or exposure limit specified by an Oregon OSHA requirement.

Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to escape unaided, injury, or acute illness due to its health effects is not covered by this provision. You must still follow all other applicable Oregon OSHA requirements to protect employee health.

An atmosphere that presents an immediate danger to life or health (IDLH).

Host employer – An employer who owns or manages the property on which confined space work is taking place.

Immediately dangerous to life or health (IDLH) – Means 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 permit space.

Note: Some materials – hydrogen fluoride gas and cadmium vapor, for example – may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12 - 72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.

Inerting – The displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

Note: This procedure produces an IDLH oxygen-deficient atmosphere.

Isolate or isolation – The elimination or removal of a physical or atmospheric hazard by preventing its release into a confined space. Isolation includes, but is not limited to, the following methods:

blanking and blinding;

misaligning or removing sections of lines, pipes, or ducts;

a double-block-and-bleed system;

machine guarding;

blocking or disconnecting all mechanical linkages;

locking out or tagging out energy sources.

Note: When using lockout/tagout, you must follow all of the requirements of 1910.147, "The Control of Hazardous Energy".

Mobile worker – An employee who performs work in multiple locations such as customer sites, company offices, private homes, vendor offices, or construction sites.

Monitor or monitoring – The process used to identify and evaluate the atmosphere in a permit space after an authorized entrant enters the space. This is a process of checking for changes in the atmospheric conditions within a permit space and is performed in a periodic or continuous manner after the completion of the initial testing of that space. (See also "testing.")

Non-entry rescue – Retrieval of entrants from a permit space without entering the permit space.

Permit-required confined space (permit 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 to engulf an entrant.

Has an internal configuration such that an entrant could become 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 serious safety or health hazard that can inhibit an entrants ability to escape unaided.

Physical hazard – An existing or potential hazard that can cause death or serious physical harm in or near a confined space, or a hazard that has a reasonable probability of occurring in or near a confined space, and includes, but is not limited to:

Explosives; mechanical, electrical, hydraulic, and pneumatic energy; radiation; temperature extremes; engulfment; noise; and inwardly converging surfaces; and

Chemicals that can cause death or serious physical harm through skin or eye contact (rather than through inhalation).

Potential hazards – All reasonably anticipated conditions within the space and outside the space that can adversely affect conditions within the space.

Rescue – Retrieving employees who are unable to remove themselves from a permit space. Rescue can be entry or non-entry, and can be conducted by the employer's employees or a third-party.

Rescue service – The onsite or offsite personnel who the employer designates to engage in non-entry and/or entry rescue of employees from a permit space.

Retrieval system – The equipment, including mechanical retrieval devices, used for non-entry rescue of authorized entrants from a permit space.

Serious physical harm – An impairment in which a body part is made functionally useless or is substantially reduced in efficiency. Such impairment may include loss of consciousness or disorientation, and may be permanent or temporary, or chronic or acute. Injuries involving such impairment would usually require treatment by a physician or other licensed health-care professional while an illness resulting in serious physical harm could shorten life or substantially reduce physical or mental efficiency by impairing a normal bodily function or body part.

Simulated Permit-Required Confined Space – Is a confined space or a mock-up of a confined space that has similar entrance openings, and is similar in size, configuration, and accessibility to the permit space the authorized entrants enter. A simulated space does not need to contain any physical or atmospheric hazards.

Testing – The process of identifying and evaluating the atmospheric hazards that entrants may be exposed to in a permit-required confined space. Testing includes specifying the initial tests that are to be performed in the permit space. (See also "monitor or monitoring")

Note: Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to and during entry.

Ventilate or ventilation – Controlling an actual or potentially hazardous atmosphere using either powered equipment, such as fans and blowers, or reliable natural air flow, or a combination of the two, to reduce an otherwise hazardous atmosphere below the level that makes it a hazardous atmosphere. Ventilation is a method of hazard control, not hazard elimination.

You – The employer.

You can use this table to determine which requirements to follow.

| Requirements for Confined Spaces | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| For spaces that are | The requirements in the following paragraphs apply | | | | | | | | | |
| | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| | Evaluation | Permit-required confined space entry programs and permits | Permit Entry | Equipment | Personnel | Rescue | Alternate entry | Training | Multi-employer worksites | Records |
| Confined spaces | X | | | | | | | | | |
| Permit-required confined spaces | X | X | X | X | X | X | | X | X | X |
| Never entered | X | | | | | | | | | |
| | | | | | | | | | | |
| If you only: | | | | | | | | | | |
| Use alternate entry procedures | X | | | X | | | X | X | | |
| Have other employers enter your space | X | | | | | | | | X | X |
| Are a rescue service provider | | X | X | X | X | X | | X | | X |

(4) Evaluation.

(a) You must determine if any of your confined spaces are permit-required confined spaces. This evaluation must include:

(A) Any known or anticipated hazard.

Note: If the only hazard associated with a confined space is a fall hazard, it is not covered by the Confined Space rule. If the space contains other hazards that make it a permit space, the fall hazard must be addressed on the permit.

(B) The determination from any previous evaluation of that space.

(C) Any precautions and procedures previously implemented for entering the space.

(b) Exceptions:

(A) Employers of mobile workers (for example, contractors, electricians, plumbers) where they are not the property owner or controlling contractor are not required to perform this evaluation for the entire site. Mobile worker employers must evaluate the areas they are responsible for or where their employees will be working and must follow the requirements of (4)(e).

(B) Controlling contractors on sites with existing confined spaces are responsible for performing this determination only for the area under their control.

(C) On sites where confined spaces are being built, the host employer or controlling contractor is responsible for ensuring this determination is accomplished only when:

(i) Any of their employees enter that space.

(ii) An agent of the employer enters that space.

(iii) Employees of an employer accountable to that controlling contractor or host employer enter that space.

(iv) They assume control over that space.

(D) Before employees of another employer enter a confined space at your workplace that is under your control, and you have information related to paragraph (4)(a), you must provide it to that employer.

(c) When a space has hazards that make it a permit space:

(A) Develop and implement a means so employees can identify that space. Signs, labels, or tags are methods that can be used to accomplish this.

(B) Allow employees or their representatives to observe the evaluation or re-evaluation of the space.

(C) When conditions within a confined space or a permit space change, re-evaluate it.

(D) Take all necessary measures to prevent unauthorized employees from entering permit spaces.

(d) Prevent employees from entering any unevaluated confined space until it is fully evaluated.

(e) When your employees are mobile, you must determine if they will be exposed to permit-required confined spaces at their assigned work locations. This determination must include information, if any, from the host employer or controlling contractor.

(A) Identify any physical and atmospheric hazards that make the space a permit-required confined space.

(B) Allow employees or their representatives to observe the evaluation or re-evaluation of the space.

(C) When conditions within a confined space or a permit space change, re-evaluate it.

(D) Take all necessary measures to prevent unauthorized employees from entering permit spaces.

(E) Prevent employees from entering any unevaluated confined space until it is fully evaluated.

(5) Permit-Required Confined Space Entry Program and Permits.

(a) When employees must enter a permit space, develop and implement a written program that describes the means, practices, and procedures to safely identify and enter permit spaces.

(b) Include the following in the program:

(A) Documentation of entry permit procedures.

(B) Measures taken to prohibit unauthorized persons from entering permit spaces.

(C) Designation of employee roles, such as entrants, attendants, entry supervisors, rescuers, or those who test or monitor the atmosphere in a permit space.

(D) Identification of designated employee duties.

(E) Training on the written program and entry permits.

(F) Training employees on their designated roles.

(G) Instructions to identify and evaluate hazards.

(H) Methods to eliminate and/or control hazards.

(I) Instructions on equipment use and maintenance.

(J) Instructions to coordinate entry with another employer.

(K) Procedures necessary for concluding the entry and canceling the permit after entry operations have been completed.

(c) On fixed sites, include the following additional elements:

(A) The location of all permit spaces.

(B) The reason for the classification of each permit space or each type of permit space.

Note: Where there are multiple permit spaces of the same type that have the same hazards, such as sewers, water vaults, or valve pits, the exact location of each space does not need to be identified so long as there is enough information so that employees can readily identify each type of space and its hazards at each location.

(C) Exception: The locations of permit spaces at remote unmanned locations do not need to be added to the program until the first time employees go to that location after the effective date of this rule.

(d) Provide employees and their representatives access to the written program.

(e) Provide entrants or their authorized representatives access to the completed permit before entry so they can confirm that pre-entry preparations have been completed.

(f) Review the permit program when there is any reason to believe that employees are not adequately protected, and revise it as necessary.

(A) Situations that require this review include:

(i) Unauthorized entry of a permit space.

(ii) Discovery of a previously unrecognized hazard.

(iii) Existence of a condition prohibited by the permit or permit program.

(iv) An injury or near-miss during entry.

(v) An employee reports of concerns about the effectiveness of the program.

(vi) Any other condition that affects employee safety or health.

(B) When revising the permit program to correct hazard-related deficiencies, do not allow entries into affected permit spaces to be made until the revisions are complete.

(C) Provide employees and their representatives access to the revised permit program.

(g) Review permits within one year of their cancellation to evaluate:

(A) The permit program.

(B) The protection provided to employees entering permit spaces.

(6) Permit Entry.

(a) Develop and implement procedures for issuing permits. Procedures must include how to:

(A) Evaluate the hazards of the space.

(B) Evaluate hazards of the work to be performed.

(C) Identify safe entry conditions.

(b) Entry permits must include the following information:

(A) The space to be entered.

(B) The purpose of the entry.

(C) The date, start, and stop times of the permit.

(D) The hazards of the space.

(E) Acceptable entry conditions.

(F) Results of initial tests and periodic monitoring performed to evaluate and identify the hazards and conditions of the space, or the period for continuous monitoring, accompanied by the names or initials of the testers and by an indication of when the tests were performed.

(G) Appropriate measures used before entry to isolate the space and eliminate or control hazards.
Examples of appropriate measures include the de-energizing and lockout or tagging of equipment, and procedures for purging, inerting, ventilating, and flushing permit spaces.

(H) Names of entrants and current attendants.

(I) The signature of the original supervisor authorizing entry.

(J) The current entry supervisor.

(K) Communication procedures for entrants and attendants to maintain contact during the entry.

(L) Equipment provided for safe entry, such as:

(i) Personal protective equipment (PPE).

(ii) Testing and monitoring equipment.

(iii) Communications equipment.

(iv) Alarm systems.

(v) Rescue equipment.

(M) Rescue services available, and how to contact them.

(N) Other information needed for safety in the particular permit space.

(O) Additional permits issued for work in the space, such as for hot work.

(P) Any problems, if any, encountered during the entry.

(c) Perform initial testing for atmospheric hazards, where necessary, before entry is made.

(d) Provide each entrant or their authorized representative with the results of any initial testing before they enter the space.

(e) Maintain safe entry conditions for the duration of the entry.

(A) When the space is too large to isolate, or is part of a continuous system, such as a sewer, ensure continuous monitoring where entrants are working for the duration of the entry.

(B) When an entrant or their authorized representative has reason to believe that the testing or monitoring was inadequate, re-test the space.

(f) Follow all actions and precautions identified on the permit.

(g) When conditions require the space to be evacuated, do not allow re-entry unless you:

(A) Re-assess the conditions of the space to ensure it is safe for re-entry and ensure the permit reflects the evacuation and subsequent re-assessment; or

(B) Issue a new permit.

(h) Allow entrants or their authorized representatives the opportunity to observe monitoring, testing, and all other actions taken to eliminate or control the hazards of the space.

(7) Equipment.

(a) When employees enter permit spaces, provide the following equipment as necessary:

(A) Testing and monitoring equipment.

(B) Ventilating equipment, when needed, used to obtain and maintain acceptable entry conditions.

(C) Communication equipment, such as a two-way radio, for effective communication between the attendant and all entrants and to initiate rescue when necessary.

(D) Lighting equipment needed to ensure employees can see well enough to work safely and exit the space quickly in the event of an emergency.

(E) Barriers or shields to protect entrants from external hazards, such as pedestrians and vehicles.

(F) Ladders or other equipment to safely enter and exit the space.

(G) Rescue and emergency equipment necessary to safely and effectively rescue entrants.

(H) Any other equipment necessary to safely enter and exit the space.

(I) Personal protective equipment as mandated by any applicable Oregon OSHA standard or as otherwise required by the employer's assessment of the hazards.

(b) Provide all necessary equipment at no cost to employees.

(c) Ensure all equipment is maintained and used in accordance with the instructions from the manufacturer.

(d) Train all employees who use equipment in the use of that equipment.

(8) Personnel.

(a) Before employees enter permit spaces, designate entrants, attendants, and entry supervisors.

Note: The entry supervisor can also be either the attendant or entrant.

(b) Entrants must:

(A) Know the hazards that may be faced during entry, including information on the type of hazard, as well as signs, symptoms, and consequences of exposure to those hazards.

(B) Communicate with the attendant as necessary so the attendant can monitor the entrant's status and to enable the attendant to alert entrants of the need to evacuate the space.

(C) Alert the attendant whenever the entrant detects a dangerous or hazardous condition or warning sign or symptom of exposure to a dangerous situation.

(D) Exit from the permit space as quickly as possible whenever:

(i) An order to evacuate is given by the attendant or the entry supervisor, or

(ii) The entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or

(iii) The entrant detects a dangerous or hazardous condition, or

(iv) An evacuation alarm is activated.

(c) Attendants must:

(A) Know the hazards that may be faced during entry, including information on the type of hazard, as well as signs, symptoms, and consequences of exposure to those hazards.

(B) Be aware of possible behavioral effects of hazard exposure in authorized entrants.

(C) Continuously maintain an accurate count of authorized entrants in the permit space and ensure that the means used to identify authorized entrants accurately identifies who is in the permit space.

(D) Remain outside the permit space during entry operations until relieved by another attendant.

(E) Communicate with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space.

(F) Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and order the authorized entrants to evacuate the permit space immediately under any of the following conditions:

(i) If the attendant detects a dangerous or hazardous condition;

(ii) If the attendant detects the behavioral effects of hazard exposure in an authorized entrant;

(iii) If the attendant detects a situation outside the space that could endanger the authorized entrants; or

(iv) If the attendant cannot effectively and safely perform all the duties required of the attendant.

(G) Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.

(H) Take the following actions when unauthorized persons approach or enter a permit space while entry is underway:

(i) Warn the unauthorized persons that they must stay away from the permit space;

(ii) Advise the unauthorized persons that they must exit immediately if they have entered the permit space; and

(iii) Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space.

Note: The employer can give the attendant the authority to remove unauthorized individuals who enter or who attempt to enter the permit space during entry operations, so long as the attendant does not enter the space.

(I) Perform non-entry rescues as specified by the employer's rescue procedure; and

(J) Perform no duties that might interfere with the attendant's primary duty to monitor and protect any authorized entrant.

NOTE: An attendant may monitor more than one space at a time, but the duties in relation to one space may not interfere with the duties for any other spaces. If an attendants' attention is focused on one space, such as to initiate the rescue procedures, all other spaces that the attendant is monitoring must be evacuated or another attendant must take over those duties first.

(d) Entry supervisors must:

(A) Know the hazards that may be faced during entry, including information on the type of hazard, as well as signs, symptoms, and consequences of exposure to those hazards.

(B) Understand the means and methods to control and/or eliminate the hazards of the permit space.

(C) Verify, by checking 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.

(D) Inform entrants and attendants of the hazards and conditions associated with the space and the methods used to eliminate and/or control those hazards.

(E) Terminate the entry and cancel the permit as required by the permit entry program.

(F) Verify that rescue services are available and that the means for summoning them are operable.

(G) Remove unauthorized individuals who enter or who attempt to enter the permit space during entry operations.

(H) Reevaluate the conditions within the space whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space.

(9) Rescue.

(a) Before employees enter a permit space, develop and implement procedures to remove entrants in the event of an emergency or when they are unable to evacuate without outside assistance. These procedures must include:

(A) The process for summoning rescue services.

Note: At a minimum, if an off-site rescue service is being considered, the employer must contact the service to plan and coordinate the evaluations required by the standard. Merely posting the service's number or planning to rely on the 911 emergency phone number to obtain these services at the time of a permit space emergency would not comply with the rescue requirements of the standard.

(B) The process for summoning emergency medical services or transporting injured entrants to a medical facility.

(C) If an injured entrant is exposed to a substance for which a Safety Data Sheet (SDS) or other similar written information is required to be kept at the worksite, that SDS or written information must be made available to the medical facility treating the exposed entrant.

(b) Ensure rescue personnel can respond to a rescue call in a timely manner. Timeliness is based on the identified hazards of the space. Rescuers must be able to reach potential victims within an appropriate time frame based on the identified hazards of the permit space.

Note: When there are multiple entrants in a permit space, the rescue plan needs to address how all entrants will be removed in a timely manner.

(c) Ensure all rescuers, including non-entry, entry, and third-party, are knowledgeable in basic first aid and cardiopulmonary resuscitation (CPR). At least one member must be certified in first aid and CPR.

Note: Additional medical training, such as oxygen administration, the use of automated external defibrillators (AEDs), and personnel decontamination should be considered.

(d) Rescuers must practice performing permit space rescues prior to entry and no more than 12 months before an entry.

(A) The practice rescue must include every type of space in which the rescue team may perform rescues.

(B) The practice rescue must include removing persons, dummies, or manikins from the actual permit spaces, or representative spaces (simulated permit-required confined spaces) that have similar opening size, configuration, and

accessibility issues as the actual permit spaces where rescue may be performed.

Note: Reliance upon “self rescue” does not constitute an acceptable rescue program.

(e) Where feasible, use non-entry retrieval systems or methods whenever an authorized entrant enters a permit space, unless it would increase the overall risk to the entrant or would not contribute to the rescue of the entrant.

(A) Non-entry Rescue. Use a retrieval system that meets the following requirements.

(i) Each authorized entrant must use a chest or full body harness, with a retrieval line attached at the center of the entrant’s back near shoulder level, above the entrant’s head, or at another point which you can establish presents a profile small enough for the successful removal of the entrant. Wristlets or ankle straps or other equally effective means may be used in lieu of the chest or full body harness if you can demonstrate that the use of a chest or full body harness is infeasible or creates a greater hazard and that the use of other methods are the safest and most effective alternative.

(ii) Attach the other end of the retrieval line to a mechanical device or fixed point outside the permit space so that rescue can begin as soon as the attendant becomes aware that rescue is necessary. Ensure a mechanical device is available to retrieve personnel from vertical type permit spaces more than 5 feet (1.52 m) deep.

(B) Entry Rescue.

(i) Where non-entry rescue is not feasible or would increase the overall risk to the entrant, designate a rescue team before employees enter any permit space.

(ii) Ensure the rescue team:

(I) Can efficiently rescue employees from permit spaces.

(II) Has the appropriate equipment to rescue employees from all permit spaces employees enter.

(iii) Inform each rescue team or service about the hazards they may confront when called to perform rescue.

(iv) Provide the rescue team or service with access to all permit spaces from which rescue may be necessary.

(v) Provide rescue team members with personal protective equipment (PPE) needed for safe entry and any other equipment required to safely conduct rescues.

(vi) Rescue team personnel must have the same training and proficiencies as a permit space entrant, attendant, and/or entry supervisor.

(vii) When a third-party rescue service is used, ensure that the service is:

(I) Aware that they are so designated and agree to it prior to entry.

(II) Capable of performing all required rescue operations.

(III) Knowledgeable in first aid and CPR, and at least one member is certified in first aid and CPR.

(10) Alternate Entry.

(a) Permit spaces may be entered without a permit when:

(A) All hazards have been eliminated; or

(B) All physical hazards, if any, have been eliminated and all atmospheric hazards are controlled with continuous ventilation.

Note: For purposes of this rule, tagout alone does not eliminate a hazard.

Note: Continuous ventilation does not eliminate atmospheric hazards. It only controls the hazards.

(b) Exception: Alternate entry cannot be used to enter a continuous system unless you can isolate the area to be entered from the rest of the space, can demonstrate that the conditions that caused the hazard or potential hazard no longer exist within the system during the entry, or can demonstrate that engulfment cannot occur and continuous ventilation in the area to be entered is sufficient to control atmospheric hazards.

(c) When employees enter permit spaces under alternate entry, you do not need to comply with the requirements of paragraphs (5), (6), (8), (9), (12), and (13) of this rule for those entries.

(d) Develop and implement procedures for each space that can be entered with alternate entry procedures. These procedures must address:

(A) Who can authorize alternate entry procedure and is responsible for ensuring safe entry conditions.

(B) The hazards of the space.

Note: When fall hazards (if any) have been addressed and all other physical hazards, if any, have been eliminated and all atmospheric hazards have been eliminated, or are controlled with continuous ventilation, alternate entry is allowed.

(C) The methods used to eliminate hazards.

(D) The methods used to ensure that the hazards have been eliminated.

(E) The methods used to test the atmosphere within the space, where applicable, for all atmospheric hazards.

(F) The methods used to determine if unsafe conditions arise before or during entry.

(G) The criteria and conditions for evacuating the space during entry.

(H) The methods for training employees in these procedures.

(I) The methods for ensuring employees follow these procedures.

(e) When using ventilation to control atmospheric hazards:

(A) Use only properly calibrated direct-reading meters to test the atmosphere.

(B) Test the atmosphere for all identified atmospheric hazards before entering the space.

(C) Do not allow employees to enter until testing verifies that all identified atmospheric hazards are adequately controlled by the ventilation.

(D) Perform continuous monitoring for all atmospheric hazards during the entry.

(E) Immediately evacuate the space:

(i) When monitoring indicates the return of atmospheric hazards.

(ii) Upon any failure with the direct-reading instrument.

(iii) Upon any failure with the ventilation.

(iv) When a new hazard is introduced or conditions within the space change.

(f) Provide all employees who will conduct the entry or their representatives the opportunity to observe all activities used to comply with this section.

(g) Provide all employees who conduct entry an effective means of communication, such as a two-way radio, cell phone, or voice if other employees are present, to summon help while within the space.

(h) When a space is evacuated, it cannot be re-entered as an alternate entry unless:

(A) The conditions that necessitated the evacuation are corrected; and

(B) The re-entry is treated and documented as a new entry.

(i) Document each entry. This documentation must include:

(A) The location of the space.

(B) The hazards of the space.

(C) The measures taken to eliminate the hazards.

(D) When applicable, the measures used to control the atmospheric hazards.

(E) When applicable, the identity of the direct-reading instruments used to test the atmosphere.

(F) When applicable, the results of the atmospheric testing.

(G) The date of the entry.

(H) The duration of the entry.

(I) When applicable, any and all conditions that required the evacuation of the space.

(J) The name, title, and signature of the person responsible for ensuring the safe entry conditions.

(j) Maintain this documentation for the duration of the entry at the location of the entry.

Note: Additional record retention requirements may apply under 1910.1020. “Access to Employee Medical and Exposure Records.”

(11) Training.

(a) Train each employee involved in permit space activities so they acquire the understanding, knowledge, and skills necessary to safely perform their duties, according to their assigned responsibilities.

(A) Provide training:

(i) For all new employees.

(ii) Before an employee is assigned permit space duties.

(iii) Before there is a change in an employee’s assigned duties.

(iv) When there is a hazard for which the employee hasn’t already been trained, or when there is a change in the hazards of an existing confined space.

(v) When there are changes to the permit program.

(vi) When the permit audit shows deficiencies.

(vii) Whenever there is a deviation from the established procedures or employee knowledge of the procedures is inadequate.

(B) Document employee training. Ensure the documentation:

(i) Contains the employee's name, the name and signature of the trainer, and the date of training.

(ii) Contains the responsibilities for which they were trained.

(iii) Is available for inspection by employees and their authorized representative.

(b) Ensure each employee is proficient in their assigned duties.

(c) Awareness training:

(A) Provide all employees whose work operations are or may be in an area where permit spaces are present with a basic overview of:

(i) The permit space program.

(ii) The entry permit system.

(iii) The alternate entry procedures, if used.

Note: Awareness training is not required for employees whose exposure is negligible, such as office workers who walk in a parking lot that has a sewer manhole or workers entering a building with a baghouse near it, as long as those employees have no other exposures to permit spaces. Similarly, when all permit spaces cannot be accessed or opened by employees, awareness training is not required.

An example of this are spaces that are locked or require a specialized tool, access to the key or tool is controlled, and access without the key or tool would require extraordinary means (such as a chop saw or cutting torch).

(B) Provide this training:

(i) For all new affected employees.

(ii) For all employees whose duties change to include work in areas with permit spaces.

(iii) When inadequacies in an employee's knowledge indicate that the employee has not retained the requisite understanding.

(iv) When there is a change in the permit program.

(v) When there are new or previously unidentified permit spaces.

(C) Ensure all employees understand how to recognize permit spaces in their work area.

(12) Multi-employer worksites.

(a) Unless you fall within an exemption under paragraph (4)(b), before employees of another employer enter permit spaces under your control, you must:

(A) Inform the employer and their employees:

(i) That the workplace contains permit spaces and can be entered only when the applicable requirements of this rule are met.

(ii) Of the identified hazards and your experience with each permit space they will enter.

(iii) Of any precautions or procedures you require to protect employees in or near spaces where the work will be performed.

(B) Coordinate entry operations with the employer, when employees of different employers will be working in or near the same permit spaces.

(C) Discuss entry operations with the employer after they are complete. This discussion must include:

(i) The program followed during permit space entry,
and

(ii) Any hazards confronted or created.

(b) When your employees enter a permit space under the control of another entity, at the conclusion of entry operations, inform the controlling contractor and host employer about the precautions and procedures you followed and any hazards that were present or that developed during entry operations.

(13) Records. Keep cancelled permits for at least one year from the date the permit expires for review (see paragraph (5)(g)).

Note: Additional record retention requirements may apply under 1910.1020 “Access to Employee Medical and Exposure Records.”

(14) Effective dates. For work covered under Division 3, Construction, these rules are effective as of March 1, 2015.

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 6-2012, f. 9/28/12, ef. 4/1/13.
OR-OSHA Admin. Order 5-2014, f.10/20/14, ef. 1/1/15.

# Confined spaces and permit spaces

**How to comply with *Oregon*OSHA's confined space rule 437-002-0146 for general industry and construction work**

# About this guide

Confined spaces are harmless as long as they are not occupied. But when workers enter a confined space to inspect equipment, fix leaks, or do construction work, they can encounter toxic gasses, corrosive chemicals, flammable solvents, or machines that start unexpectedly. If something goes wrong, a confined space can be difficult or impossible to exit. And would-be rescuers can share the fate of those they are trying to rescue.

This guide explains how to identify confined spaces and how to protect general-industry and construction workers who may need to enter them.

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# Contents

# About Oregon OSHA's confined space rule: 437-002-0146

Oregon OSHA's confined space rule – **437-002-0146** – protects general industry and construction industry employees who enter confined spaces that have serious or life-threatening hazards.

## What 437-002-0146 requires you to do

**The rule requires you to:**

- Survey your workplace to identify permit spaces
- Inform employees about the location of the permit spaces and the hazards associated with those spaces
- Keep unauthorized employees out of the spaces
- Prepare a written permit-space program to protect employees who must enter a permit space
- Include a catalog of your permit spaces in your written program that describes why they are permit spaces
- Ensure that any equipment is used in accordance with the manufacturer's instructions and that your employees who use the equipment have been trained
- Ensure that employees who work around permit spaces are trained so that they understand the presence, location, and hazards associated with the spaces, and they are aware of your permit-space program
- Have an agreement with another rescue service provider if your employees will not provide rescue services

## Exceptions to 437-002-0146

**The rule does not apply to:**

- Construction work regulated by Division 3/P Excavations, except for entry into sanitary sewer spaces that are large enough to bodily enter.
- Construction work regulated by Division 3/S Underground Construction, Caissons, Cofferdams and Compressed Air, except for sewers.
- Enclosed spaces regulated by 1910.269 in Division 2/R Electric Power Generation, Transmission and Distribution, except when that standard requires compliance with this standard.
- Enclosed spaces regulated by 1926.953 in Division 3/V Electric Power Generation, Transmission and Distribution, except when that standard requires compliance with this standard.
- Manholes and vaults regulated by 1910.268(o) in Division 2/R Telecommunications, unless the space cannot be made safe to enter even after following the requirements of 1910.268(o).
- Welding in confined spaces regulated by Division 2/Q Welding, Cutting & Brazing, when the only hazards are related to the welding process.
- Grain bins, silos, tanks, and other grain storage structures regulated by 1910.272, Grain Handling Facilities.
- Diving operations regulated by Division 2/T, Commercial Diving Operations.

## Key sections of 437-002-0146

**Oregon OSHA's confined space rule has 13 sections:**

1. Purpose and application
2. Exceptions
3. Definitions
4. Evaluation
5. Permit-required confined space entry programs and permits
6. Permit entry
7. Equipment
8. Personnel
9. Rescue
10. Alternate entry
11. Training
12. Multi-employer worksites
13. Records

The table below shows which of the rule's key sections apply to confined spaces, permit spaces, and confined spaces that are never entered. The table also shows which sections apply if you use alternate entry procedures, have other employers enter your confined space, or if you provide rescue services.

| | Key sections of Oregon OSHA's confined space rule: 437-002-0146 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| **For spaces that are:** | *Evaluation* | *Permit space entry programs and permits* | *Permit Entry* | *Equipment* | *Personnel* | *Rescue* | *Alternate entry* | *Training* | *Multi-employer worksites* | *Records* |
| ■ Confined spaces | ✓ | | | | | | | | | |
| ■ Permit spaces | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| ■ Never entered | ✓ | | | | | | | | | |
| **If you only:** | | | | | | | | | | |
| ■ Use alternate entry procedures | ✓ | | | ✓ | | | ✓ | ✓ | | |
| ■ Have other employers enter your space | ✓ | | | | | | | | ✓ | ✓ |
| ■ Are a rescue service provider | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ |

## Common questions about 437-002-0146

**Q:** I have a permit-space program for my facility that meets the requirements for federal OSHA's confined space rule, 1910.146, and my employees follow those requirements when they enter permit spaces. Are the requirements for 1910.146 and 437-002-0146 the same?

**A:** Many of the requirements are the same; however, there are also new requirements under 437-002-0146 as shown in the table below.

| Similar requirements under 1910.146 and 437-002-0146 | New requirements under 437-002-0146 |
|---|---|
| • **Definition of a confined space**<br>• **Definition of a permit space**<br>• **Requirement for a written program when employees enter a permit space**<br>• **Roles, responsibilities, and training of entrants, attendant, and entry supervisors**<br>• **Requirement that unauthorized persons do not enter a permit space**<br>• **Process for entering, performing work, and exiting a permit space**<br>• **Information required on the entry permit (1910.146 requires the duration of the entry; 437-002-0146 requires starting and stopping times).**<br>• **Requirement for pre-planning non-entry and entry rescues**<br>• **Training requirements, practice, and qualifications of rescue personnel** | • **Include a catalog of your permit spaces in your written program that describes why they are permit spaces.**<br>• **Ensure that any equipment is used in accordance with the manufacturer's instructions and that employees who use the equipment have been trained.**<br>• **Ensure that employees who work around permit spaces are trained so that they understand the presence, location, and hazards associated with the spaces, and they are aware of your permit-space program.**<br>• **Have a signed agreement with another rescue service provider if your employees will not provide rescue services.** |

**Q:** We enter a confined space under the alternate entry procedures in 1910.146(c)(5) or reclassify the space according to 1910.146(c)(7). Are these requirements included in Oregon OSHA's confined space rule?

**A:** No. Oregon OSHA's confined space rule does not include these requirements. Under Oregon OSHA's rule, workers can use alternate entry procedures to enter a permit space without a permit (documentation is required to verify safe entry) and attendants, an entry supervisor, and rescue services are not required. See Page 25 in this guide for more information on alternate entry procedures.

## What is a confined space?

**A confined space is a space that meets all of the following conditions:**

- It is large enough and so configured that an employee can fully enter the space and perform work.
- It has limited or restricted means for entry, exit, or both.
- It is not designed for continuous human occupancy.

**It is large enough and so configured that an employee can fully enter the space and perform work.** A space that is just large enough for a person to squeeze into, but not perform any work, is not a confined space. Similarly, a space that is too small for a person to enter completely is not a confined space.

**It has limited or restricted means for entry, exit, or both.** If a person must contort his or her body to enter or move around inside a space, it probably has a limited means of entry and exit. Climbing through a porthole to enter a space or crawling through a tunnel toward an exit are examples of spaces that have limited means of entry and exit.

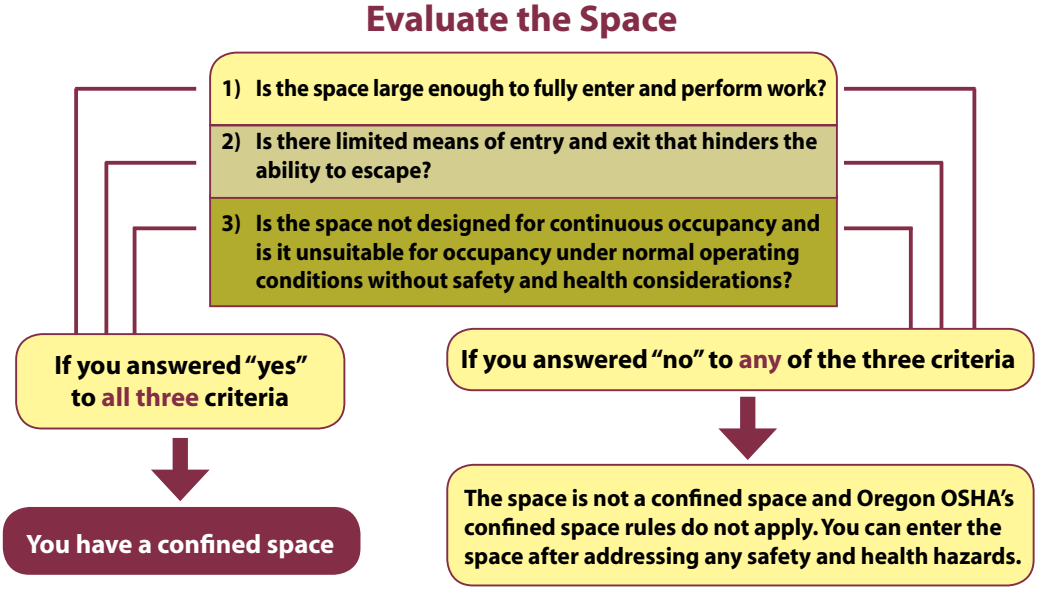
**Another way of measuring limited means of entry and exit is to determine how difficult it would be to remove an injured person from the space; if there is a need for a technical rescue to remove an injured person, you probably have a limited means entry and exit.** Evaluate each space on a case-by-case basis.

**It is not designed for continuous human occupancy.** What is the primary function and purpose of the space? A space that is designed for periodic occupancy is not the same as a space that is designed for continuous occupancy.

**The presence of a fixed ladder, lighting, or ventilation does not always mean that the space was designed for continuous occupancy.** Is the space designed for a person to work there or is it designed to house and protect equipment that needs to be monitored or occasionally maintained? For example, a space may have lighting for periodic occupancy that may be necessary to safely enter and exit, read gauges, or perform maintenance or repairs. Similarly, ventilation may be necessary to keep equipment from overheating or to provide fresh air for temporary job assignments or tasks. In both cases, the work performed is intermittent or temporary.

## Examples of confined spaces

| Confined spaces include those with depth and open tops and those with narrow openings. | |
|---|---|
| **Spaces with depth and open tops** | **Spaces with narrow openings** |
| Pits | Ship compartments |
| Wells | Silos |
| Vats | Pipes |
| Bins | Tunnels |
| Hoppers | Tanks |
| Degreasers | Casings |
| Kettles | Sewers |



## What is a permit space?

A permit space is a confined space that has one or more of the following characteristics:

- It has — or could have — a hazardous atmosphere.
- It contains material that could trap or bury a person.
- It is shaped so that a person could become trapped or asphyxiated.
- It has other safety or health hazards that could harm a person.

### Hazards in permit spaces

Most accidents in permit spaces happen when workers and untrained rescuers do not recognize hazards in the spaces or they do not control the hazards before they enter. Never assume a permit space is safe to enter.

Permit spaces can have two types of hazards: hazardous atmospheres and physical hazards.

#### Hazardous atmospheres

A hazardous atmosphere affects the air in the space and can cause death or acute illness, or impair the ability of workers to escape. Hazardous atmospheres include:

- **Corrosive atmospheres.** Corrosive atmospheres accumulate from some manufacturing processes and biological or chemical reactions. Some cause immediate damage to the skin and eyes; some have no immediate effect, but cause cancer with prolonged exposure.
- **Flammable or explosive gasses, liquids, vapors, mists, fibers, or dusts.** Flammable gasses such as acetylene, butane, propane, hydrogen, and methane are common in permit spaces. Grain, nitrated fertilizers, and ground chemicals can produce combustible dusts.
- **Air or oxygen displacement.** Some substances (such as inerting gasses) can displace air or oxygen in a confined space; examples include nitrogen, helium, steam, Freon, argon, and carbon dioxide.
- **Oxygen deficiency.** Oxygen-deficient atmospheres (oxygen concentration below 19.5 percent) affect heart rate, muscle coordination, and breathing. Unprotected workers cannot survive in an oxygen-deficient atmosphere.
- **Oxygen enrichment.** Oxygen-enriched atmospheres (oxygen concentration above 23.5 percent), which can be caused by welding and from the improper use of oxygen for breathing air, increase the risk of fire or explosions.
- **Toxic dusts, mists, fumes, smoke, vapors, fibers, or gasses.** These can be released by manufacturing processes, stored materials, and work tasks. A hazardous atmosphere that poses a threat to life, would cause irreversible adverse health effects, or that would interfere with an individual's ability to escape from a confined space is called immediately dangerous to life or health (IDLH).

Some hazardous atmospheres (hydrogen fluoride gas and cadmium vapor, for example) may cause serious health effects that result 12 to 72 hours after exposure.

*Air-monitoring equipment:* Trained employees can use an air-monitoring meter to test for hazardous atmospheres. However, they must first calibrate the meter and use it according to the manufacturer's instructions. Inaccurate instruments can expose workers to excessive levels of toxic gas or an oxygen-deficient atmosphere. The only way to guarantee that an instrument will detect gas accurately is to test it.

"Bump test" your air-monitoring meter every day – before you use it. A bump test verifies that an air-monitoring meter is properly calibrated. You perform a bump test by exposing the meter to a known concentration of test gas. Compare the instrument reading to the actual quantity of gas present. If the instrument's response is within an acceptable tolerance range of the actual concentration, then the meter is calibrated properly.

## Physical hazards

Physical hazards come in many different forms and can cause death or serious physical harm. Examples include:

- **Access problems.** In an emergency, entrants may not be able to exit quickly.
- **Absorbed chemicals.** Chemicals can be absorbed through the skin or other tissues or membranes such as the eyes.
- **Corrosive chemicals.** Corrosive chemicals can cause severe eye or skin damage if exposed workers are not wearing protective clothing or eyewear.
- **Falling objects.** Objects can fall into the space because topside openings are unguarded or improperly guarded.
- **Illumination problems.** Poor lighting makes it difficult for workers to enter, work in, and exit a permit space.
- **Inwardly converging surfaces.** Inwardly converging walls and downward sloping floors that taper to a smaller cross section can trap a worker.
- **Material that could trap or bury a person.** Loose materials drawn from the bottom of storage bins can suffocate or bury a worker. Liquids or materials that are suddenly released into the space can have the same effect.
- **Mechanical, electrical, hydraulic, and pneumatic energy.** Mechanical and hydraulic equipment can move unexpectedly. Workers servicing mechanical and hydraulic equipment can be seriously injured or killed if the energy is not properly controlled.

- **Noise.** Noise interferes with essential communication between workers in a confined space and those who are monitoring their work on the outside. High noise levels can impair hearing and cause hearing loss. Permit spaces can amplify sounds produced by tools and equipment.
- **Radiation.** Sources of radiation include x-rays, isotopes, lasers, and welders.
- **Slippery surfaces.** Wet, slippery surfaces increase the risk of falls. Leaks, spills, and condensation are common in permit spaces.
- **Extreme temperatures.** Hot environments put workers at risk for heat stress, especially when they do strenuous work or are wearing protective clothing. Cold environments make their tasks more difficult to accomplish.

**Eliminating physical hazards.** Ways to eliminate physical hazards in a confined space include:

- Locking out equipment (following the requirements in 1910.147, Lockout/Tagout)
- Blanking and blinding piping systems
- Physically separating piping systems from the space

Always evaluate the space in its normal state before eliminating hazards.

## Evaluating confined spaces and permit spaces: 437-002-0146(4)

Determine if any of your confined spaces have hazards that make them permit spaces.

Do not allow any employees to enter a confined space until it has been fully evaluated.

At workplaces where confined spaces are being built, host employers or controlling contractors do not need to evaluate confined spaces unless:

- One of their employees will enter the space
- An employee of an employer responsible to the host employer or controlling contractor will enter the space
- A host employer or controlling contractor assumes control over the space

If your workplace has a permit space, your employees must know where it is located, that it is hazardous, and that it is a permit space.

- Allow employees to observe the evaluation of the space.
- Identify the space as a permit space. You can use signs, labels, or tags to identify the space.
- When conditions within the space change, re-evaluate it.
- Prevent unauthorized employees from entering the space.

If someone else will enter a permit space under your control (employees of another employer, for example), inform them:

- About all hazards or potential hazards in the spaces
- If the spaces have been evaluated before and what that evaluation discovered
- What your precautions or procedures are for entering the spaces

If your employees will enter a permit space, they must follow the requirements of your written permit-space program.

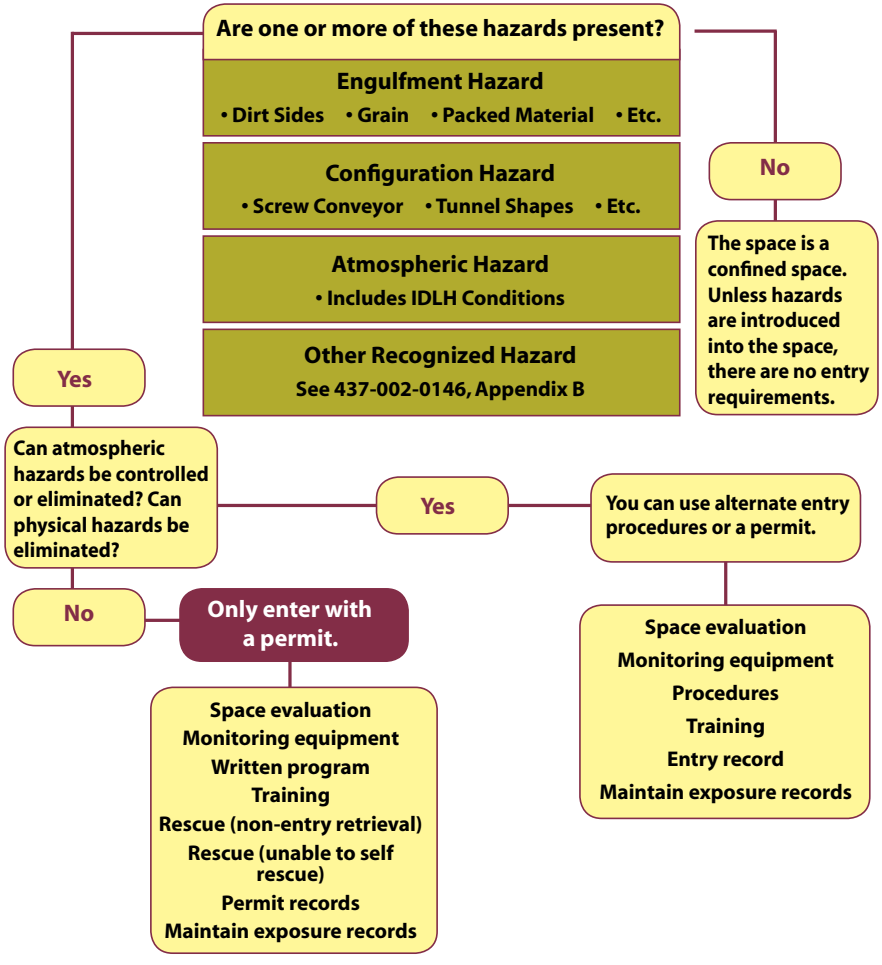
If you have mobile employees, you must determine whether there are confined spaces at the sites where they will be working. If confined spaces are present, the space must be evaluated to identify any physical or atmospheric hazards that make it a permit space.

# The permit-space program and the entry permit: 437-002-0146(5)

If your employees will enter a confined space that has one or more of the hazards shown in the chart to the right, the space is a permit space and you must prepare a written permit-space program before they enter. Entry occurs when any part of a worker's body enters the space opening.

- An entry permit is required if atmospheric and physical hazards cannot be controlled or eliminated.
- You can use alternate entry procedures to enter a permit space if all physical hazards can be eliminated and all atmospheric hazards can be eliminated or controlled with continuous forced-air ventilation.

## You determined that you have a confined space.



## Requirements for a written permit space program

**A written permit-space program must include:**

- A procedure for issuing an entry permit
- Provisions for training employees about the written program and entry permits
- Measures taken to prohibit unauthorized employees from entering permit spaces
- The roles of entrants, attendants, entry supervisors, rescuers, and those who test or monitor the atmosphere in the space
- Provisions for training employees about their roles
- Duties of designated employees
- Instructions for identifying and evaluating hazards
- Methods for eliminating or controlling hazards
- Instructions for using and maintaining equipment
- Instructions for coordinating entry with another employer
- Procedures for concluding entry and canceling the entry permit

At fixed sites, the written program must include a list of all of your permit spaces (or the types of permit spaces if you have several of the same kind). For example, if you have sewer manholes, you do not have to include each one on the list; identify them as "sewer manholes," describe how to recognize them, and describe the hazards that make them permit spaces.

Employees must have access to the written permit-space program before entering a permit space.

## Requirements for the entry permit

The entry permit describes acceptable entry conditions and verifies that a permit space is safe for workers to enter. No one can enter a permit space until a completed entry permit verifies that the hazards in the space have been eliminated or controlled. An entry supervisor must sign the entry permit, post it on the space where employees can see it, and cancel it after the work is finished.

**The entry permit must include the following information:**

- Description of the space that will be entered
- Purpose of the entry
- Entry date and the start and stop times of the work
- Hazards associated with the space
- Acceptable entry conditions
- Results of tests and monitoring performed to evaluate hazardous atmospheres
- Names or initials of the testers and the date the tests were performed
- Measures used before entry to isolate the space and eliminate or control hazards
- Names of entrants and attendants
- Name of the current entry supervisor
- Signature of the entry supervisor
- Communication procedures necessary for entrants and attendants to maintain contact during the entry
- Equipment necessary for safe entry
- Rescue services available and contact information for the service providers
- Permits for other work in the space (such as hot work)
- Description of problems encountered during entry

**You must also develop a procedure for issuing an entry permit that describes how to:**

- Evaluate the space's hazards
- Evaluate work-related hazards
- Identify safe entry conditions

Employees must have access to the completed permit before they enter a permit space so they can confirm that pre-entry preparations have been completed.

**You must review your entry program when there is any reason to believe employees are not protected.** Situations that require a review include:

- Unauthorized entry
- When a new hazard is identified
- When a condition prohibited by the permit occurs during entry
- When an injury or near miss occurs during entry
- When an employee reports concerns about the permit's effectiveness or the procedure for issuing the permit

When you revise your program, do not allow anyone into the affected space until the revisions are complete.

## Permit entry: 437-002-0146(6)

Before workers enter a permit space, you must ensure that the hazards associated with the space have been eliminated or controlled. A completed entry permit verifies that hazards have been eliminated or controlled and the space is safe.

The entry supervisor must certify that the space is safe to enter, sign the entry permit, and post it on the space so that authorized entrants can see it.

### Establishing safe entry conditions

**Essential conditions for safe entry include:**

- **Guarding the space.** Use warning signs or barriers to keep out unauthorized people and to protect entrants from falling objects.
- **Isolating the space.** Disconnect, lock out, or tag out hazardous equipment in the space. If you lock out equipment, remember that "lock out" includes testing to ensure the lockout method works.
- **Testing the space for hazardous atmospheres.** Test the atmosphere from outside the space for all potential atmospheric hazards, which may include oxygen; flammable gasses, dusts, or vapors; toxic gasses or vapors; and corrosive atmospheres. Provide entrants with test results. Re-test the space if an entrant believes that initial testing was inadequate.
- **Eliminating or controlling hazardous atmospheres.** Eliminate or control the hazards in the space then document the method and the steps necessary to eliminate or control the hazards. Allow entrants to observe testing, monitoring, and any other activity necessary to eliminate or control hazards.
- **Providing necessary equipment.** Ensure that entrants have the equipment they need to do their jobs (including rescue equipment) and that they know how to use the equipment.
- **Planning for emergencies.** Attendants must know how to respond to emergencies, including who to contact and how to remove entrants.

## Maintaining safe entry conditions

**When work begins inside the space, you must ensure safe conditions are maintained until the work is finished.** Essential conditions for maintaining safe entry include:

- **Monitoring activity inside and outside the space.** Attendants must constantly monitor the space for hazards while employees are inside.
- **Maintaining communications between attendants and entrants.** Attendants and entrants must keep in contact with each other. They must know what communications equipment to use and how to use it.
- **Keeping unauthorized people away from the space.** The entry supervisor and the attendants are responsible for keeping people away.

**If the space must be evacuated, do not allow re-entry unless you do either of the following:**

- Evaluate the conditions in the space to ensure it is safe for re-entry and ensure that the permit notes the evacuation
- Issue a new entry permit

## Equipment necessary for entering a permit space: 437-002-0146(7)

**You must have all necessary equipment to ensure safe entry into permit spaces.** This equipment can include:

- Testing and monitoring equipment
- Ventilating equipment to maintain acceptable entry conditions
- Communication equipment, such as a two-way radio, for communication between the attendant and entrants, and to initiate a rescue
- Appropriate lighting, so they can see and can exit the space quickly in an emergency
- Barriers or shields to protect them from hazards outside the space such as pedestrians and vehicles
- Ladders or similar equipment so they can enter and exit the space
- Rescue equipment, if they are unable to evacuate in an emergency
- Appropriate personal protective equipment

The equipment must be available to the employees at no cost, must be used in accordance with the instructions from the manufacturer, and the employees must be trained to use it properly.

## Employees' duties and responsibilities: 437-002-0146(8)

Working in a permit space involves entrants, attendants, and entry supervisors. Before anyone enters, you must designate who has each of these duties.

Entrants are the employees you allow to enter a permit space. Attendants monitor the entrants' activities from outside the space. The entry supervisor ensures that attendants and entrants follow entry procedures.

### Entrants must

- Know the about hazards that they may face during entry and the signs, symptoms, and consequences of exposure
- Communicate with the attendants so the attendants can monitor their status and warn them when they need to evacuate
- Tell the attendants about hazardous conditions in the space or symptoms of exposure
- Leave the space immediately when:
  - An order to evacuate is given by an attendant or the entry supervisor
  - An entrant recognizes any warning sign or symptom of exposure to a dangerous situation
  - An entrant detects a dangerous or hazardous condition
  - An evacuation alarm is activated

### Attendants must

- Know the hazards entrants may face during entry and the signs, symptoms, and consequences of exposure
- Be aware of the behavioral effects of hazards on entrants
- Keep an ongoing count of entrants and ensure that the count identifies who is in the space
- Remain outside the space during entry operations until relieved by another attendant
- Communicate with entrants to monitor their status and to alert them if they need to evacuate
- Summon emergency responders as soon as entrants need to escape from the space
- Perform non-entry rescues following your established rescue procedure
- Do nothing that would interfere with monitoring and protecting an entrant

- Monitor activity inside and outside the space and order an immediate evacuation when:
- There is a hazardous condition in the space
- An entrant's behavior is affected by exposure to a hazard
- A situation outside the space could endanger the entrants
- It is not possible to perform the duties required of an attendant

An attendant can monitor more than one space at a time if the duties for one space do not interfere with duties for another space. If an attendant's attention is focused on one space – during a rescue, for example – all other spaces that the attendant is monitoring must be evacuated or another attendant must take over those duties.

When unauthorized people approach or enter a permit space while entry is under way, attendants must:

- Warn them to stay away from the space
- Tell them that they must exit immediately if they have entered the space
- Inform the authorized entrants and the entry supervisor if unauthorized people have entered the space

You can give attendants authority to remove unauthorized people who attempt to enter a space during entry operations as long as the attendants do not enter the space.

## Entry supervisors must

- Know the hazards that entrants may face during entry, including the signs, symptoms, and consequences of exposure
- Understand how to control or eliminate hazards associated with the space
- Verify that all tests specified by the entry permit have been conducted and that all procedures and equipment specified by the permit are in place before signing the permit and allowing entry to begin
- Inform entrants and attendants about the hazards and conditions associated with the space and the methods used to eliminate or control the hazards
- Terminate the entry and cancel the entry permit as required by the entry procedure
- Verify that rescue service providers are available and that they can be contacted in an emergency
- Remove unauthorized people who enter or who attempt to enter the space during entry operations
- Re-evaluate conditions in the space whenever responsibility for an entry operation is transferred, new hazards are identified, or when the work performed in the space changes

## Performing rescues: 437-002-0146(9)

Before you authorize employees to enter a permit space, you must ensure that trained emergency responders will be available if an entrant needs help. Responders must be able to reach the site promptly and know how to deal with the emergency. You can use an on-site rescue team or a third-party rescue service as long as the responder meets your needs in an emergency. Third-party rescue services must agree to provide the service. (Emergency responders are not required when you use alternate entry procedures.)

Those who do not understand permit-space hazards or who respond inappropriately are often the victims in many permit-space accidents. Keep in mind that many fire departments are not equipped to respond to permit-space emergencies.

Firefighters who are not on your designated rescue team and who respond to emergency (911) calls for a confined space rescue must comply with Subdivision 2/L, 437-002-0182, Oregon Rules for Fire Fighters.

### Developing a rescue procedure

Before your employees enter a permit space, you must have a procedure for removing them when they are unable to evacuate. The procedure must include the process for summoning rescue services and transporting injured entrants to a medical facility. Safety Data Sheets (SDS) must be kept at worksites. If an entrant is exposed to a hazardous substance, that written material must be made available to the treating medical facility.

### Performing non-entry rescues

**Use non-entry rescue methods and equipment unless they would increase the overall risk to an entrant.** Each entrant must use a chest or full-body harness with a retrieval line attached at the center of the entrant's back near shoulder level, above the entrant's head, or at a similar point that makes it possible to remove the entrant from a confined space. Equipment such as wristlets or ankle straps may be used if a chest or full-body harness is not feasible.

The other end of the retrieval line must be attached to a mechanical device or to a fixed point outside the space so that the rescue can begin immediately. A mechanical device must be available to retrieve entrants from permit spaces greater than five feet deep.

**Designate a rescue person or team to perform rescues in a timely manner.** Response time is based on the hazards associated with the space. For example, immediately dangerous to life or health (IDLH) hazards require an immediate response and responders must be available on site for the duration of the entry. All rescuers must be knowledgable in basic first aid and cardiopulmonary resuscitation (CPR) and at least one rescuer must be certified in first aid and CPR.

Rescuers must practice non-entry rescues within 12 months before an entry. Practice rescues must include:

- Every type of space in which the rescue team might perform rescues
- Removing people or mannequins from the actual permit spaces or a simulated space that has similar characteristics

## Performing entry rescues

Consider entry rescues only when a non-entry rescue would increase the overall risk to an entrant or is not feasible.

Designate a rescue team that can respond in a timely manner, can rescue entrants efficiently, and has the appropriate equipment. Ensure that the rescue team has:

- Information about the hazards it may encounter during a rescue
- Access to the permit spaces they need to enter
- Appropriate personal protective equipment (PPE)
- Any other equipment necessary for safe entry

The team must practice rescues within12 months before an entry. Rescues must involve removing people or mannequins from the actual permit spaces or from spaces that have similar characteristics. Rescuers must have the same training as entrants, attendants, and entry supervisors. All rescue team members must be knowledgeable in basic first aid and CPR and at least one rescuer must be certified in first aid and CPR.

Experienced emergency responders must be available if an entrant needs help.

## Mobile workers and rescue

When your workers are mobile, they do not need to do an annual practice rescue (either entry or non-entry) if the rescue team does a practice rescue in the space that needs to be entered.

The rescue team must have access to the space before the entry because they need to develop a rescue plan and practice before the actual entry. If the team has access to a space similar to the one that needs to be entered, they can use that space for the practice rescue instead.

## Third-party rescue service providers

**When a third-party rescue service is used, ensure that the service:**

- Agrees to provide the service
- Is capable of performing all necessary rescue operations
- Is knowledgable in first aid and CPR and at least one member is certified in first aid and CPR

**Third-party rescue service providers must:**

- Obtain the evaluation information about every permit space they may need to enter
- Be familiar with procedures necessary to remove entrants from permit spaces in an emergency or when they are not able to evacuate
- Use the entry permit to identify all physical and atmospheric hazards in the space and determine the procedure to follow for entering the space

Third-party rescue services must be capable of performing all necessary rescue operations.

# Alternate entry: 437-002-0146(10)

## What is alternate entry?

Alternate entry is a set of specific procedures for entering a permit space without an entry permit; however, the space remains a permit space under alternate entry. The following sections of 437-002-0146 apply under alternate entry:

- Evaluation, 437-002-0146(4)
- Equipment, 437-002-0146(7)
- Alternate entry, 437-002-0146(10)
- Training, 437-002-0146(11)

**Employees may enter a permit space under alternate entry only after you do one of the following:**

- Eliminate all physical hazards and hazardous atmospheres in the space so that conditions that caused the hazards no longer exist
- Eliminate all physical hazards in the space and control all hazardous atmospheres with continuous ventilation

## Alternate entry procedures

**Develop and implement alternate entry procedures that address:**

- The hazards associated with the space
- The methods used to eliminate the hazards
- The methods used to ensure that the hazards have been eliminated
- The methods used to test the space for all hazardous atmospheres
- The methods used to determine if unsafe conditions occur before or during entry
- The criteria and conditions for evacuating the space
- The methods for training employees in these procedures
- The methods for ensuring employees follow these procedures

**Ensure that all employees who enter:**

- Have the opportunity to observe the activities required to comply with the alternate entry procedures
- Have an effective means of communication, such as a two-way radio, cellphone, or voice (if other employees are present) to request help in an emergency

## Documenting alternate entry

**Document each entry.** Include:

- The location of the space
- The hazards associated with the space
- Measures taken to eliminate the hazards
- Measures used to control hazardous atmospheres (when applicable)
- The identity of the direct-reading instruments used to test the atmosphere (when applicable)
- The results of atmospheric testing (when applicable)
- The entry date
- The duration of the entry
- Any conditions that caused the evacuation of the space
- The name, title, and signature of the person responsible for ensuring that the space is safe to enter

Keep the document where the space is located for the duration of the entry.

## Alternate entry in continuous systems

Alternate entry cannot be used to enter a permit space that is a continuous system (such as a sewer) unless you segregate the area to be entered from the rest of the space, demonstrate that engulfment can't happen and the only hazard is atmospheric, or you demonstrate and document that the hazardous conditions do not exist within the entire system during the entry.

## Alternate entry with continuous forced air ventilation

**When using ventilation to control hazardous atmospheres:**

- Use only properly calibrated direct-reading meters to test the atmosphere
- Ensure that direct-reading instruments are used and tested according to the manufacturer's instructions
- Test the space for hazardous atmospheres before entering
- Ensure that employees do not enter the space until testing has verified that all hazardous atmospheres are controlled by ventilation
- Perform continuous monitoring for all hazardous atmospheres while employees are in the space

## Rescue procedure not required under alternate entry

There is no requirement for a rescue procedure when workers enter a confined space under alternate entry because hazards in the space have been eliminated or controlled.

## Evacuating a permit space under alternate entry

**Employees must immediately evacuate a space:**

- When monitoring indicates the presence of a hazardous atmosphere
- When a direct-reading meter used for monitoring fails
- When ventilation fails
- When a new hazard is identified or conditions in the space change

When a space is evacuated, it cannot be re-entered unless the conditions that caused the evacuation are corrected.

Re-entry must be treated and documented as a new entry.

# Training employees: 437-002-0146(11)

## Training employees involved in permit space work

Train employees involved in permit space activities so they acquire the understanding, knowledge, and skills necessary to safely perform their duties and their assigned responsibilities.

**Training is required for new employees and for all other employees:**

- Before an employee is assigned permit-space duties
- Before there is a change in an employee's assigned duties
- When there is a new permit space hazard for which an employee has not been trained
- When there are changes to the written permit-space program
- When a review of an entry permit identifies problems with an entry
- When there is a deviation from established procedures or an employee's knowledge of the procedures is inadequate

Record each employee's training, including the employee's name, the trainer's signature, the training date, and the employee's responsibilities. Employees must be able to inspect their training records.

## Awareness training for employees

Awareness training is required for employees who work in areas (or who may work in areas) where permit spaces are present. The purpose of awareness training is to ensure that employees understand that their employer has permit spaces, there is a process for entering the spaces, and that they can identify the spaces.

Awareness training is not required for employees when the exposure to those spaces is negligible – such as office workers walking in a parking lot that has a sewer manhole or entering a building with a baghouse near it – as long as those employees have no other exposures to permit spaces. Awareness training is also not required when the entrances to all permit spaces are locked and access would require extraordinary means (such as a chop saw or cutting torch).

**Awareness training must provide a basic overview of:**

- The written permit-space program
- How to recognize a permit space
- How entry is authorized by the entry permit
- How entry is authorized by the alternate entry procedures (if used)

Repeat the training when there is a change in the written permit-space program and when there are new or previously unidentified permit spaces.

# Entry operations at multi-employer worksites: 437-002-0146(12)

## Before someone else's employees enter permit spaces under your control

Let their employers know about the hazards of those spaces and about any precautions or procedures that you require to protect your employees.

When your employees are working in a space, and someone else's employees will be working in or around that space, coordinate entry operations with the other employers so your employees are not exposed to hazards created or discovered by the other employees, and vice-versa.

After the operations are finished, discuss any hazards that employees created or encountered.

## After your employees enter someone else's permit space

Let whoever is in control of that space (it might be a property owner or a general contractor) know about the precautions and procedures you followed and about any hazards that you or your employees found during entry.

## Recordkeeping: 437-002-0146(13)

**Permit entry.** Keep cancelled entry permits for at least one year from the date the permit expires. Review permits within one year of their cancellation to ensure that the procedures for issuing them are still effective and the information on them still protects employees who enter the space.

**Alternate entry.** Keep the entry document where the space is located for the duration of the entry; after the entry, there is no requirement to keep it. However, the document may be helpful when you review the effectiveness of your confined space program.

## Notes:

# *Oregon*OSHA Services

**Oregon OSHA offers a wide variety of safety and health services to employers and employees:**

## Appeals

**503-947-7426; 800-922-2689; admin.web@state.or.us**

- Provides the opportunity for employers to hold informal meetings with Oregon OSHA on concerns about workplace safety and health.
- Discusses Oregon OSHA's requirements and clarifies workplace safety or health violations.
- Discusses abatement dates and negotiates settlement agreements to resolve disputed citations.

## Conferences

**503-378-3272; 888-292-5247, Option 1; oregon.conferences@state.or.us**

- Co-hosts conferences throughout Oregon that enable employees and employers to learn and share ideas with local and nationally recognized safety and health professionals.

## Consultative Services

**503-378-3272; 800-922-2689; consult.web@state.or.us**

- Offers no-cost, on-site safety and health assistance to help Oregon employers recognize and correct workplace safety and health problems.
- Provides consultations in the areas of safety, industrial hygiene, ergonomics, occupational safety and health programs, assistance to new businesses, the Safety and Health Achievement Recognition Program (SHARP), and the Voluntary Protection Program (VPP).

## Enforcement

**503-378-3272; 800-922-2689; enforce.web@state.or.us**

- Offers pre-job conferences for mobile employers in industries such as logging and construction.
- Inspects places of employment for occupational safety and health hazards and investigates workplace complaints and accidents.
- Provides abatement assistance to employers who have received citations and provides compliance and technical assistance by phone.

## Public Education

**503-947-7443; 888-292-5247, Option 2; ed.web@state.or.us**

- Provides workshops and materials covering management of basic safety and health programs, safety committees, accident investigation, technical topics, and job safety analysis.

## Standards and Technical Resources

**503-378-3272; 800-922-2689; tech.web@state.or.us**

- Develops, interprets, and gives technical advice on Oregon OSHA's safety and health rules.
- Publishes safe-practices guides, pamphlets, and other materials for employers and employees
- Manages the Oregon OSHA Resource Center, which offers safety videos, books, periodicals, and research assistance for employers and employees.

**Need more information? Call your nearest Oregon OSHA office.**

### Salem Central Office

350 Winter St. NE, Rm. 430
Salem, OR 97301-3882

**Phone:** 503-378-3272

**Toll-free:** 800-922-2689

**Fax:** 503-947-7461

**en Español:** 800-843-8086

**Web site:** www.orosha.org

### Bend

Red Oaks Square
1230 NE Third St., Suite A-115
Bend, OR 97701-4374
541-388-6066
*Consultation*: 541-388-6068

### Eugene

1140 Willagillespie, Suite 42
Eugene, OR 97401-2101
541-686-7562
*Consultation*: 541-686-7913

### Medford

1840 Barnett Road, Suite D
Medford, OR 97504-8250
541-776-6030
*Consultation:* 541-776-6016

### Pendleton

200 SE Hailey Ave.
Pendleton, OR 97801-3056
541-276-9175
*Consultation:* 541-276-2353

### Portland

1750 NW Naito Parkway, Suite 12
Portland, OR 97209-2533
503-229-5910
*Consultation:* 503-229-6193

### Salem

1340 Tandem Ave. NE, Suite 160
Salem, OR 97303
503-378-3274
*Consultation*: 503-373-7819

# Written program for permit spaces

# Contents

## The written program

# Company policy and responsibilities

## Company policy

(Type the name of your company) is committed to a safe, healthful workplace for its employees. The purpose of this written program is to identify all permit spaces at this workplace and ensure that all authorized employees will enter, work in, and exit the spaces safely. (Type the name of your company) will inform all affected employees when there are changes to this written program.

(Type the name of your company) will do the following to ensure the health and safety of those who work in and around permit spaces:

- Evaluate each confined space to determine if it has the characteristics of a permit space.
- Develop a catalogue of all permit spaces
- Inform all employees of the location and the hazards in each permit space.
- Prevent unauthorized persons from entering a permit space.
- Train authorized entrants, attendants, and entry supervisors so that they have the skills necessary to fulfill their duties.
- Provide all necessary equipment for permit-space work at no cost to employees, maintain the equipment, and ensure that employees use the equipment properly.
- Inform contractors about the permit-space program and coordinate entry operations.

## Responsibilities for managing the program

(Type the name of your company) designates the following persons to manage the permit-space program:

| Person's name or position | Person's responsibility |
|---|---|
| | **Managing the overall program.** Overall implementation and maintenance of the written program, including employee certification or training that satisfies the requirements of 437-002-0146. |
| | **Identifying permit-space locations.** Location and identification of all permit spaces at this workplace. |
| | **Training affected employees.** Ensure that authorized entrants, attendants, entry supervisors, and on-site emergency responders are properly trained and have periodic refresher training. Ensure that all other effected employees have awareness training. |
| | **Planning for emergencies.** Ensure that emergency rescue is available and that responders are informed about all permit spaces at the workplace and have access to the spaces for drills and training exercises. |
| | **Equipment.** Ensure that all equipment for authorized attendants and entrants is properly maintained and is available when needed. |

## Confined space and permit space identification

(Type the name or position of the person responsible) has identified and evaluated all enclosures that have the characteristics of confined spaces and permit spaces as shown below.

| Location | Is a permit required? | Description | Potential hazard | Contaminants/gases |
|---|---|---|---|---|
| | | | | |

# Procedures for entering a permit space

## If only workers of other employers (contract workers) will enter the space

If contract workers only will enter the permit space (type the name or position of the person responsible) will inform the contractor about all hazards in the space, the permit-space program, and company safety rules. (Type the name or position of the person responsible) will review and discuss each contracted job with the contractor before the work begins. The contractor will inform (type the name or position of the person responsible) about the permit-space program that the contractor will follow. If the contractor's permit-space program is less effective than the company's program, the contractor will follow the company's program.

## If contract workers and host employees will enter the space

(Type the name of the person responsible) will coordinate entry operations with the contractor so that contract workers and company employees work together, following this company's permit space-program.

## If host employees only will enter the space

### 1. Pre-entry procedure

**Task**

- Obtain an entry permit.
- Specify the acceptable conditions for entering the permit space. Entry into a permit space is prohibited until the atmosphere has been determined to be safe from outside the space. If direct reading instrumentation is used it must include those for *oxygen content*, *flammability*, and *toxic gasses*, in that order. The percentage of oxygen for entry must not be less than 19.5 percent or more than 23.5 percent at normal atmospheric pressure. If the percentage of oxygen falls below 19.5 percent, entrants must use appropriate air-supplying respirators. The atmosphere in the space must be checked at least every (indicate the time interval) or continuously monitored.
- Provide authorized entrants with the opportunity to observe any monitoring or testing of the space.
- Isolate the permit space from sources of hazardous energy. Disconnect hazardous equipment from the sources of hazardous energy, whenever possible. All chemical and steam pipes, treating agents, and lines must be blanked or removed. Electrical isolation must be accomplished by locking out circuit breakers or disconnects in the off position with a key-type lock. The key must remain with the authorized entrant. If more than one person enters the space, a group lockout procedure is allowed (see *The control of hazardous energy*, 1910.147).

| Task |
| --- |
| ■ Purge, flush, or ventilate the space to eliminate or control atmospheric hazards. Initial testing of the atmosphere must be performed from outside the space. Continuous ventilation must be maintained in the space, when possible. |
| ■ Ensure that entrants have the equipment they need to do their jobs (including rescue equipment) and they know how to use the equipment. |
| ■ Set up barriers, if necessary, to protect entrants from external hazards. |
| ■ Post a warning at the entrance to the space that says: WARNING, PERMIT-REQUIRED CONFINED SPACE. ENTRY BY PERMIT ONLY. If special equipment is required for entry, the appropriate information may be included on the signs; for example: RESPIRATOR REQUIRED FOR ENTRY or LIFELINE REQUIRED FOR ENTRY. |
| ■ Verify that conditions in the space are safe for the duration of entry. |
| ■ Complete and sign the entry permit to authorize entry into the permit space. |
| ■ Display the completed entry permit at the time of entry so that authorized entrants can confirm that pre-entry preparations have been completed. |

## 2. Conditions during entry

- All electrical equipment in the space must be properly grounded.
- The space must have adequate illumination.
- All unauthorized persons must be kept away from the space.
- Welding and burning equipment other than torches and hoses must not be taken into the space. Gas cylinders or welding machines must remain outside the space. They must be blocked if they are on wheels. All welding equipment must have quick shut-offs that are under control of the attendant. When gas welding or cutting is suspended, the gas supply must be cut off at the cylinder and the torch removed from the confined space.
- The attendant must know how to shut down welding and burning equipment when entrants perform hot work.
- If entrants need a ladder to enter a permit space, the ladder must be secure and must not be removed when they are in the space.
- Entrants must leave the permit space immediately when any of the following occurs: **1.** An order to evacuate is given by the attendant or entry supervisor. **2.** An entrant recognizes any warning sign or symptom of exposure. **3.** An evacuation alarm is activated. **4.** An entrant is unable to communicate with the attendant. 5. An entrant recognizes any other physical hazards that are unsafe.
- An attendant immediately outside the space must monitor authorized entrants. The attendant must have a means of continuous communication with entrants.
- If entrants are injured or become ill, the attendant must contact (identify who to contact and how to contact them).

## 3. Procedure following entry

- The entry supervisor will terminate entry and cancel the entry permit when entry operations have been completed or an emergency occurs in or near the space.
- (Type the name of your company) will retain each canceled entry permit for at least one year to evaluate the permit-space program.

## Completing the entry permit

Before employees enter a permit space, the entry supervisor must complete and sign an entry permit that verifies the permit space is safe for employees to enter. The entry permit must be posted at the permit-space entry and include the following information:

- Location of the permit space.
- Purpose of entry.
- Entry date and the time employees will enter.
- Authorized entrants' names.
- Authorized attendants' names.
- Entry supervisor's name and signature.
- Hazards in the space.
- How hazards will be controlled so that the space is safe to enter.
- Acceptable entry conditions.
- Testing data and testers' initials that certify the space is safe to enter.
- Names of emergency responders and instructions for contacting them.
- Communication procedures used by entrants and attendants.
- A list of all equipment, including PPE, necessary to ensure entrants' safety.
- A description of any other permits that entrants need to work in the space.

### The procedure for completing an entry permit

- Obtain an entry permit before employees enter the space.
- Accomplish all pre-permit activities required for entering the space.
- Complete all items on the entry permit.
- Sign the permit. If any item on the permit is checked as "NO" (meaning not yet completed or available), the permit must not be signed.
- Attach a copy of the entry permit outside the confined space. Keep it there until the entry operations are finished and the entry supervisor cancels it.

## Duties of entrants, attendants, and entry supervisors

Authorized entrants, attendants, and entry supervisors have the following duties and responsibilities:

| Duty/responsibility | Entrant | Attendant | Supervisor |
|---|---|---|---|
| Keep unauthorized entrants away from the space. | | x | x |
| Remove unauthorized individuals who enter or who attempt to enter the permit space. | | | x |
| Communicate with entrants, monitor their status, and tell them when to evacuate. | | x | |
| Inform the entrants and the entry supervisor if unauthorized persons enter the permit space. | | x | |
| Communicate with the attendant regularly. | x | | |
| Remain outside the space during entry operations until relieved by another attendant. | | x | |
| Know the number and identity of authorized entrants. | | x | |
| Use all equipment properly. | x | x | |
| Determine that acceptable entry conditions are maintained. | | x | x |
| Order entrants to evacuate the space in an emergency | | x | |
| Exit from the permit space immediately upon an order to evacuate, an alarm warning, or a sign of a hazardous condition. | x | | |
| Know permit-space hazards, including the mode, symptoms, and consequences of exposure. | x | x | x |
| Notify the attendant of any signs or symptoms of exposure to a hazardous condition | x | | |
| Terminate the entry and cancel the permit when entry operations are finished or if a prohibited condition arises. | | | x |
| Verify that entry conditions are acceptable before signing the permit and allowing entry. | | | x |
| Perform **non-entry** rescues if necessary. | | x | |
| Verify that rescue services are available and the means for summoning them are effective. | | | x |
| Summon emergency responders when entrants need their services. | | x | |

**Entry supervisors are (list names):**

1.
2. .
3.
4.

**Authorized entrants are (list names):**

1.
2. .
3.
4.

**Authorized attendants are (list names):**

1.
2. .
3.
4.

## Alternate procedure for entering a permit space

**If the space has hazards that can be eliminated, or atmospheric hazards that can be controlled by forced-air ventilation, or both, employees can enter the space if they follow this procedure:**

- Identify the hazards of the space.
- Identify and follow the methods to eliminate the hazards; verify that the methods used successfully eliminated those hazards.
- When you have hazards that can be controlled with continuous forced-air ventilation, identify those atmospheric hazards. Test the air within the space with direct-reading instruments before entering the space to ensure that all identified hazards are adequately controlled. The oxygen content must be between 19.5% and 23.5%, but should also be within 0.1% of the oxygen level outside of the space. Ensure that all other identified atmospheric hazards are absent before entering the space. Continuously monitor the space during the entire duration of the entry.
- When using a direct-reading instrument to test the air, ensure that it passes a "bump test" at the beginning of the work shift it will be used.
- Ensure that any condition in the space that makes it unsafe to remove the entrance cover is eliminated before the cover is removed.
- Ensure the entrant has a positive means of communication while in the space.
- Set up barriers, if necessary, to protect entrants from external hazards.
- Follow the written program and obtain an entry permit if it is necessary to enter the space to eliminate hazards or to test the space for atmospheric hazards**.**
- Document each entry. Include:
  - The location of the space
  - The hazards associated with the space
  - Measures taken to eliminate the hazards
  - Measures used to control hazardous atmospheres (when applicable)
  - The name of direct-reading instruments used to test the atmosphere and the calibration date (when applicable)
  - The results of atmospheric testing (when applicable)
  - The entry date
  - The duration of the entry
  - Any conditions that caused the evacuation of the space
  - The name, title, and signature of the person responsible for ensuring that the space is safe to enter

  Keep the document where the space is located for the duration of the entry.
- Document any deviation from alternate entry procedures.

## Training employees

(Type the name of your company) will train all authorized entrants, attendants, and entry supervisors so that they have the understanding, knowledge, and skills necessary to perform their jobs.

Training will be provided in the following manner:

- Before the employee is first assigned duties.
- Before there is a change in the employee's assigned duties.
- When there is a change in permit-space operations that presents a hazard for which the employee has not been trained.
- When the employee does not follow entry procedures.

(Type the name of your company) will certify that employees have been trained by recording each employee's name, the type of training, the trainer's signature, and the training date. The record will be available for inspection by employees and their authorized representatives.

**Provide awareness training to all employees who work in areas where permit spaces are present.**

Repeat awareness training when there is a change in the written program and when there are new or previously unidentified permit spaces.

Awareness training must explain:

- The written permit-space program
- How to recognize a permit space
- How entry is authorized by the entry permit
- How entry is authorized by the alternate entry procedures (if used)

## Employee training record

| Employee name | Type of training | Trainer's signature | Training date |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# Rescue and emergency services

## Non-entry rescue

Non-entry rescue is the preferred method for rescuing an entrant from a permit space. A retrieval system must be available to retrieve entrants from vertical permit spaces that are more than five feet deep. The retrieval system must be used to rescue an entrant unless the equipment would increase the entrant's risk of injury. Each authorized entrant must use a properly attached chest harness or full-body harness. Entrants may use wristlets if chest or full-body harnesses put them at a greater risk of injury in an emergency. The other end of the retrieval line must be attached to a personnel retrieval system outside the permit space so that rescue can begin immediately.

If an entrant could be exposed to a substance for which a safety data sheet (SDS) is required to be kept, that SDS must be made available to the medical facility that treats the entrant.

## Entry rescue

*[**Note to employers:** Before you authorize workers to enter a permit space, you must be sure that experienced emergency responders will be available if an entrant needs help. You can choose an off-site service to respond to permit-space emergencies or you can designate properly equipped and trained on-site employees. What's most important is that the responder meets your needs in an emergency.]*

*If you choose to have an off-site service respond, you must have an agreement for those services in writing.*

**On-site rescue and emergency services**

Employees will not enter a permit space to respond to an emergency unless they have been properly trained and equipped. If a permit-space rescue is necessary, the attendant is responsible for doing the following:

- Summoning emergency responders.
- Attempting to rescue entrants using **only non-entry** rescue equipment.
- Monitoring the emergency and informing responders about the number of victims, their condition, and the hazards in the space.

Only properly equipped, trained employees are permitted to enter a permit space during an emergency. Each employee who will enter a permit space in an emergency must do the following:

- Complete training required to establish proficiency as an authorized entrant.
- Complete training in basic first aid and CPR.
- Complete training in use of personal protective and rescue equipment.
- Use appropriate personal protective and rescue equipment.
- Perform assigned rescue duties during a permit-space emergency.
- Practice a permit-space rescue at least once every 12 months.

**Third-party rescue and emergency services**

When a third-party rescue service is used, ensure that the service:

- Agrees in writing to provide the service
- Is capable of performing all necessary rescue operations
- Is trained in first aid and CPR and at least one member is certified in first aid and CPR

Third-party rescue service providers must:

- Obtain the evaluation information about every permit space they may need to enter
- Be familiar with procedures necessary to remove entrants from permit spaces in an emergency or when entrant are not able to self-rescue
- Use the entry permit to identify all physical and atmospheric hazards in the space and determine the procedure to follow for entering the space

(Type the name of your company) has evaluated the ability of third-party emergency service providers to rescue entrants from the permit spaces identified at this site and has arranged with the following responder to provide rescue and emergency services:

| **Emergency service provider information** |
|---|
| Name of provider: |
| Address of provider: |
| Phone number: |
| Approximate response time: minutes |

(Type the name of your company) has informed (type the name of emergency service provider) of hazards that may exist in the permit spaces identified at this site and has given the provider access to the spaces to develop appropriate rescue plans and to practice rescues. The provider has also agreed, in writing, to provide the service.

## Annual program review

Within one year of an entry operation, (type the name of the position or person responsible) must review canceled entry permits to identify program deficiencies. The review must be sooner if there is reason to believe that the program does not adequately protect employees. Actions to correct deficiencies must be documented and affected employees must be retrained.

# Confined space evaluation survey

**Name/description of this space** _____

**Location of this space** _____

**Person performing this survey** _____

**Date of this survey** _____

## Section 1 — Use this section to determine if the space is a confined space

| | | |
|---|---|---|
| **Yes** ☐ | **No** ☐ | Is the space large enough and so configured that an employee can enter and perform assigned work? |
| **Yes** ☐ | **No** ☐ | Does the space have restricted means for entry or exit? Doorways and other portals through which a person can walk are normally not considered restricted means for entry or exit. |
| **Yes** ☐ | **No** ☐ | Is the space *not* designed for continuous employee occupancy? |

**If *all three* answers are *Yes*, this is a confined space. Proceed to Section 2.**

## Section 2 — Use this section to determine if the space is a permit space

| | | |
|---|---|---|
| **Yes** ☐ | **No** ☐ | Does the space contain or have a potential to contain a hazardous atmosphere? Examples: combustible dusts, flammable mixtures, or oxygen deficiency that may expose employees to the risk of death, incapacitation, or acute illness. |
| **Yes** ☐ | **No** ☐ | Does the space contain a material that has the potential for engulfing an entrant? Examples: liquids or granular solids. |
| **Yes** ☐ | **No** ☐ | Does the space have an internal configuration such as inwardly converging walls or a sloping floor that could trap or asphyxiate an entrant? |
| **Yes** ☐ | **No** ☐ | Does the space contain another serious safety or health hazard? Examples: radiation, noise, electricity, and moving parts of machinery. |

**If *any* answer is Yes, this is permit space. An entry permit is required for entry and you need to fill out section 3.**

# Permit space evaluation form

**Permit space name and location:** _____ **Immediately dangerous to life or health (IDLH)?**

**Tasks to be performed in this space:** _____ **YES ☐ NO ☐**

**Oxygen, combustible atmospheres, toxic gasses**

☐ **Oxygen (19.5-23.5%)** _____ **%**

☐ **Combustible atmospheres (lower flammability limit <10%)** _____ **%**

☐ **Toxic gases (list below)**

_____ _____ **PPM**

_____ _____ **PPM**

| **Other hazards in the space** | **Action necessary to eliminate or control the hazard** |
|---|---|
| ☐ **Extreme temperature** | |
| ☐ **Mechanical** | |
| ☐ **Electrical** | |
| ☐ **Radiation** | |
| ☐ **Engulfment** | |
| ☐ **Entrapment** | |
| ☐ **Noise** | |
| ☐ _____ | |
| ☐ _____ | |

**Equipment necessary for entry – including PPE**

- _____
- _____
- _____
- _____
- _____
- _____
- _____

**Are there any other exposures, precautions or procedures noted from previous evaluations or entries? If yes please note them below.**

- _____
- _____
- _____

# Entry permit

**Permit date:** / / **Work shift:** 1st ☐ 2nd ☐ 3rd ☐ **Expires:** / /

Time started: _____

Permit space to be entered (name and location of space): _____

Purpose of entry: _____

## Names of trained, authorized individuals

- Entry supervisor: _____
- Entry attendant: _____
- Authorized entrants: _____
- Authorized entrants: _____

## Emergency contact information

Emergency responder: _____ Phone number: _____

Contact person: _____ Time: _____

## Pre-entry requirements

| Requirements | Yes | No | N/A | Requirements | Yes | No | N/A |
|---|---|---|---|---|---|---|---|
| Lockout - tagout/de-energize | ☐ | ☐ | ☐ | Hot work permit | ☐ | ☐ | ☐ |
| Pipes(s) broken or capped or blanked | ☐ | ☐ | ☐ | Fall arrest harness/lifeline/tripod | ☐ | ☐ | ☐ |
| Purge or flush or drain | ☐ | ☐ | ☐ | Personal protective equipment | ☐ | ☐ | ☐ |
| Ventilation (natural or mechanical) | ☐ | ☐ | ☐ | *Hardhat* | ☐ | ☐ | ☐ |
| Secure area | ☐ | ☐ | ☐ | *Gloves* | ☐ | ☐ | ☐ |
| Safe lighting | ☐ | ☐ | ☐ | *Safety glasses* | ☐ | ☐ | ☐ |
| Non-sparking tools | ☐ | ☐ | ☐ | *Respirator, type* | ☐ | ☐ | ☐ |
| Communication method | ☐ | ☐ | ☐ | *Other PPE:* | ☐ | ☐ | ☐ |
| Contractor employees involved | ☐ | ☐ | ☐ | *Other PPE:* | ☐ | ☐ | ☐ |

| Space-monitoring results | | Test 1 | Test 2 | Test 3 | Test 4 |
|---|---|---|---|---|---|
| **Monitor at least every four hours** | **Permissible entry levels** | Time:<br>Initial: | Time:<br>Initial: | Time:<br>Initial: | Time:<br>Initial: |
| Percent oxygen | 19.5% to 23.5% | | | | |
| Combustible gas | Less than 10% LEL | | | | |
| Other toxic gas | | | | | |
| Other toxic gas | | | | | |
| Other toxic gas | | | | | |

# Entry permit (continued)

| Possible atmospheric hazards | Yes | No | N/A |
|---|---|---|---|
| Lack of oxygen | ☐ | ☐ | ☐ |
| Combustible gases | ☐ | ☐ | ☐ |
| Combustible vapors | ☐ | ☐ | ☐ |
| Combustible dusts | ☐ | ☐ | ☐ |
| Toxic gases/vapors | ☐ | ☐ | ☐ |
| **Possible non-atmospheric hazards** | | | |
| Noise | ☐ | ☐ | ☐ |
| Chemical contact | ☐ | ☐ | ☐ |
| Electrical hazard | ☐ | ☐ | ☐ |
| Mechanical exposure | ☐ | ☐ | ☐ |
| Temperature extreme | ☐ | ☐ | ☐ |
| Engulfment | ☐ | ☐ | ☐ |
| Entrapment | ☐ | ☐ | ☐ |
| Other non-atmospheric hazard | ☐ | ☐ | ☐ |

## Pre-entry checklist

**Do not enter this permit space until the following "needs action" conditions are corrected.**

| OK | Needs action | |
|---|---|---|
| ☐ | ☐ | Before entering the permit space, the supervisor or designee must notify the rescue team. IDLH conditions require at least one rescue team member located outside the space. |
| ☐ | ☐ | A minimum of two employees must be assigned to work involving permit space entry. One employee must remain outside the permit space at all times. |
| ☐ | ☐ | The surrounding area must be surveyed to show that it is free of hazards such as drifting vapors from tanks, piping, sewers, or vehicle exhaust. |
| ☐ | ☐ | Those responsible for operation of the gas monitor have been trained. |
| ☐ | ☐ | Gas monitor calibration tests and functional test (fresh air calibration) have been performed this shift on the gas monitor. If so, by whom? _____ |
| ☐ | ☐ | The atmosphere will be continuously monitored while the space is occupied, if required by entry procedure. |

## This permit has been terminated for the following reason:

☐ Work completed ☐ Canceled Time: Note:

Supervisor's signature Time: Date: / /

**Return this completed permit to _____. Review, then file for one year.**

# Alternate entry form

| Location of space: | |
|---|---|
| Entry date: | Duration of entry: |

| List entrants' names |
|---|
| |
| |
| |

| List physical hazards in the space | List atmospheric hazards in the space |
|---|---|
| | |
| | |
| | |

| List each action taken to eliminate physical and atmospheric hazards in the space | |
|---|---|
| Action | Description |
| | |
| | |
| | |

| Ventilation | | |
|---|---|---|
| Is ventilation required? | **YES** ☐ | **NO** ☐ |
| If "Yes," type of ventilation: | | Amount of ventilation (cfm or AC/hr) |

| Air monitoring | | | | | |
|---|---|---|---|---|---|
| Substance monitored | Unit | Permissible levels | | Monitoring results | |
| | | | | Initial Test | Peak reading during entry |
| | | | | | |
| | | | | | |
| | | | | | |

| Instruments used for air monitoring | |
|---|---|
| Model # or type: | Calibration (or bump test) date: |
| | |
| | |
| | |

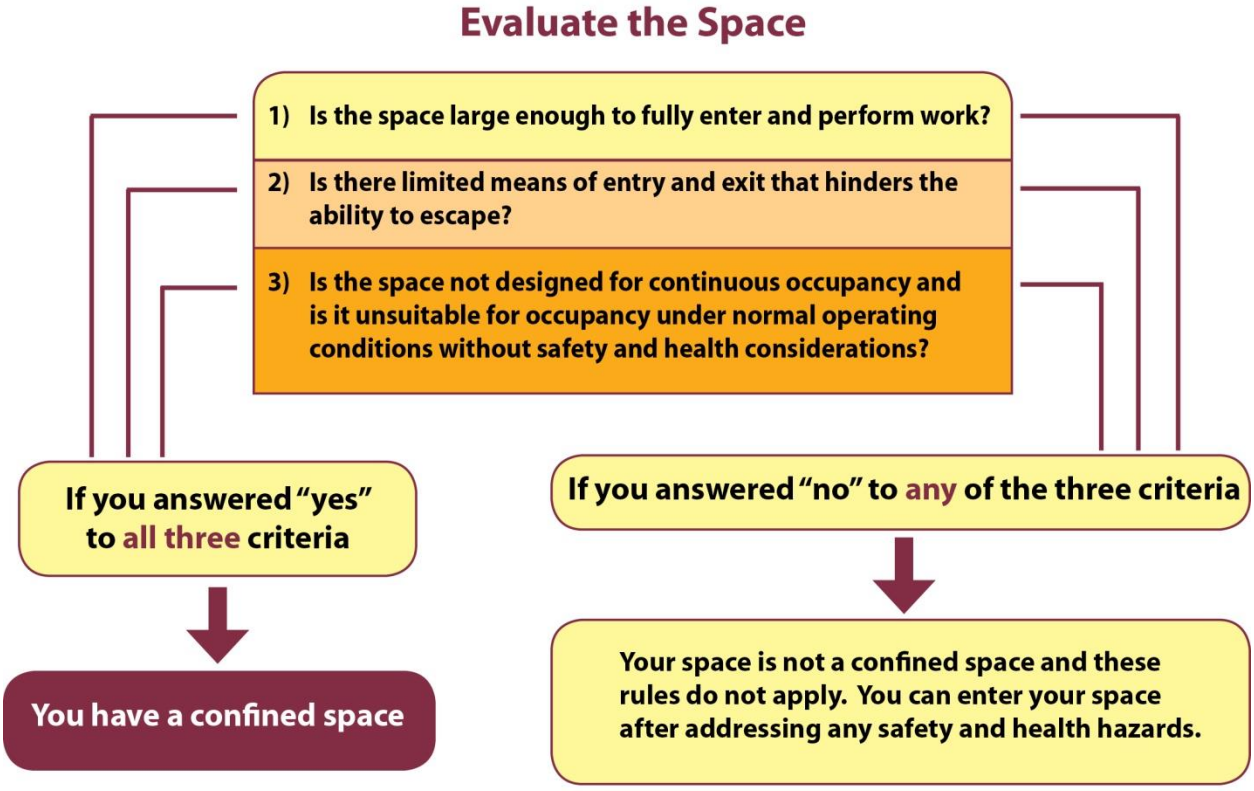
| Additional notes about the space and entry (including whether evacuation was necessary) |
|---|
| |
| |
| |

| **Person responsible for ensuring the space is safe to enter** | |
|---|---|
| Name: | Job title: |
| Signature: | |

# OAR 437-002-0146 Confined Spaces

# Non-Mandatory Appendices A, B, C, and D for OAR 437-002-146 Confined Spaces

**Non-Mandatory Appendix A**
**Part I: Evaluate the space to determine if you have a confined space.**




**Evaluation of confined spaces**

A confined space is defined as having **three** distinct characteristics.
It must meet all three in order to be a confined space.

**1 – It must be large enough to enter.**

First, it must be large enough and so configured that an employee can fully enter and perform work. A space that is just large enough that an employee could just barely squeeze into, but cannot perform any work does not meet this definition. Similarly, a space that is large enough that an employee can only get part of their body into, but can't fully enter, does not meet this definition. While there may be hazards associated with these types of spaces, they are not addressed with this particular rule.

**2 – It must have limited means of entry and exit.**

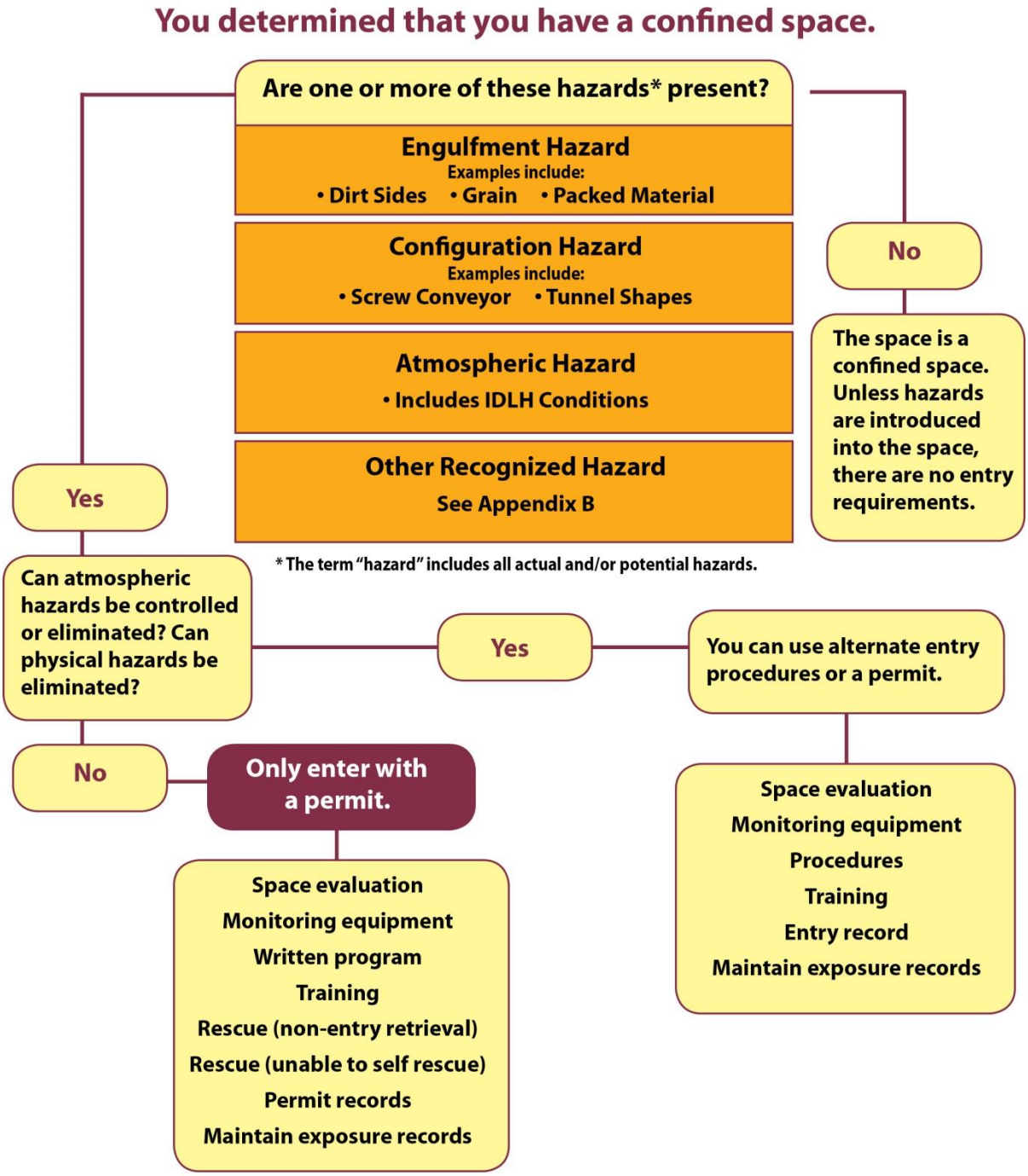
Second, it must have a limited means for entry and exit. Typically, if you must contort your body to enter a space it may be limited means of entry and exit. Examples of this include having to climb through a porthole, climb up a ladder, or crawling through a tunnel in order to exit.

Another way of measuring limited means of entry and exit is to determine how difficult it would be to extract an injured person from the space. If there is a need for any type of technical rescue operation to remove an immobilized person from the space then you likely have limited entry and exit. It is important to recognize that each space should be evaluated on a case by case basis and a limitation in one set of circumstances may not be a limitation elsewhere.

**3 – It is not designed for continuous occupancy.**

Third, it is not designed for continuous human occupancy. This particular characteristic can cause a certain amount of confusion and discussion. A space that is designed for periodic occupancy is not the same thing as a space that is designed for continuous occupancy. The presence of a fixed ladder, lighting, or ventilation does not automatically mean that the space was designed for continuous occupancy. One must look at the primary function and purpose of the space. A space may have lighting to facilitate periodic occupancy. This lighting may be needed to safely enter and exit, read gauges or perform maintenance or repairs to equipment in the space. Similarly, ventilation may be necessary to keep equipment from overheating or provide fresh air for temporary job assignments or tasks. In both cases the work required to be performed in these spaces is intermittent or temporary in nature. Was the space designed for an employee to be permanently assigned to perform work there or was the space designed to house and protect operating equipment that needs to be monitored or occasionally maintained?

**PART II: Determine if you have a permit-required confined space.**



## Evaluation of Permit-Required Confined Spaces

**A permit space is a confined space with an actual or potential hazard that can inhibit an entrant's ability to safely exit the space.**

Once a confined space is identified, the next step is to determine if it is a permit-required confined space (permit space). There are 2 types of actual or potential hazards. Atmospheric hazards can include an oxygen-deficient or oxygen-rich atmosphere, a toxic atmosphere, or an explosive atmosphere. Physical hazards can include entrapment, engulfment, electrocution, heat stroke, moving machinery, or any other serious hazard.

**Atmospheric Hazards:**
In evaluating the atmospheric hazards, it is important to include conditions within the space, systems connected to the space, conditions outside of the space, and anything that is brought into the space in order to perform assigned tasks. For example, workers may need to enter one part of a tunnel where there are no obvious sources of atmospheric hazards, but workers in another part of the tunnel may be creating an atmospheric hazard that has the potential to migrate to other parts of the system. These need to be identified by all affected parties. Another example of overlooked hazards can be with a space with a particularly small volume with several workers inside. In these situations the simple act of breathing can create an oxygen-deficient atmosphere.

Another consideration for evaluating atmospheric hazards is using air monitoring equipment to evaluate conditions within a permit space. Any air monitoring equipment must be used according to the manufacturer's instructions, and employees using those meters must know how to use them. There have been several fatalities in permit required confined spaces where the air monitoring equipment alarms identified an unsafe condition but were ignored by the operator. If there is any indication of equipment failure all permit required confined space operations must stop until the equipment is repaired.

Also, there can be a tendency to oversimplify the results of oxygen testing when evaluating an oxygen-deficient atmosphere. While the rule clearly identifies 19.5% as an oxygen-deficient atmosphere; that does not mean that nothing more needs to happen if the meter reads 19.6% oxygen. Typically, the normal atmospheric concentration of oxygen is around 20.8% to 21.5%. If your meter reads 20.9% outside of the space, and 19.9% inside the space that is telling you that something has displaced 1% of the oxygen inside the space, which can equate to at least 10,000 parts-per-million of another gas. To put this into perspective, an atmosphere containing 1200 parts-per-million of carbon monoxide is considered to be immediately dangerous to life and health. It is vitally important to identify that other gas to adequately identify all of the hazards of that space.

**Physical Hazards:**
Physical hazards can come in many different forms. The hazard could be related to the configuration of a space, equipment inside the space or materials which can flow into a space and entrap an entrant. There are several ways of eliminating physical hazards through lockout/tagout, blanking and blinding or a physical separation on piping systems from the confined space.

In evaluating physical hazards, it is important to understand that the confined space must be evaluated as it normally operates. There can be a tendency to evaluate a space after protective actions, such as lockout/tagout, are taken, and then not designate it as a permit space. If any actions, such as lockout/tagout, are necessary to make the space safe for entry, then it is a permit space. While lockout/tagout is recognized as an elimination of hazards, it is only a temporary elimination that exists only as long as the lock is in place. Once the lock is removed, the hazard is no longer eliminated. Another consideration for using lockout/tagout is that all of the requirements for the control of hazardous energy in 1910.147, where applicable, still apply. Any hazards that still remain after applying lockout/tagout must still be addressed.

# Non-Mandatory Appendix B

## Potential Confined Space Hazards

What follows is a compilation of hazards and conditions which may compromise safe confined space entry and/or rescue procedures. The list is not exhaustive. Specific confined spaces may have hazards unique to that space. All hazards need to be evaluated and eliminated or controlled prior to entry. Consider hazards that may be present initially as well as those that may develop during the course of work.

Atmospheric hazards:

- Oxygen deficiency
- Oxygen enrichment
- Inert gases used to exclude oxygen (for example, nitrogen, helium, steam, freons, argon, or carbon dioxide)
- Flammable or explosive gases, liquids, vapors, mists, fibers, or dusts
- Toxic dusts, mists, fumes, smoke, vapors, fibers, or gases
- Airborne biological contaminants, including molds, bacteria, viruses and other potential disease-inducing agents

Engulfment hazards – presence of materials that can capture or surround an entrant:

- Avalanche of materials
- Surrounding and suffocating
- Trenching cave-ins
- Drowning
- Bridged materials which collapse when stepped on

Falls from heights

Falling objects (tools, structural materials, debris)

Harness or lifeline snag points (e.g., agitator blades, piping, screws, etc.)

Configuration of space:

- Complexity of internal structure
- Inwardly sloping walls or floors
- Tight and/or narrow diameter spaces – entrapment
- Access restricting rescue

Ignition sources – examples include:

- Grinding
- Welding, cutting, burning, brazing
- Space heaters
- Hand tools
- Power tools
- Exposed light bulbs
- Sources of static electric discharge (e.g., synthetic clothing, transfer of liquids or gases not bonded and grounded)
- Non-intrinsically safe equipment

Illumination – insufficient in quality or quantity

Moving mechanical equipment:

- Agitators
- Tumblers
- Crushers
- Mixing blades
- Screw conveyors
- Shakers

Electrical power sources
- Transmission lines
- Junction boxes
- Transformers
- Electrically powered equipment taken into the space or installed in the space

Hydraulically or pneumatically powered equipment

Pressurized lines
- Steam
- Hydraulic
- Pneumatic
- Fuel and other gas
- Water

Radiation
- Ionizing
- Non-ionizing (including lasers)

Process material lines, open or leaking lines which introduce:
- Toxic materials
- Flammable or combustible
- Oxidizing materials
- Corrosive materials
- Heated liquid or gaseous substances (such as steam) containing hydraulic oils, other fluids, or gases
- Other substances hazardous to health or that may displace oxygen

Isolation is difficult or impossible – Examples of environments in which significant isolation issues may arise:
- Wastewater sewer systems
- Stormwater drain systems
- Dams
- Hydro-electric plants
- Nuclear plants

Hazards originating in adjacent areas:
- Exhaust or flue gases
- Chemical releases

Mobile confined spaces that are not adequately secured prior to entry:

- Moving (such as ships and barges; or rail cars or tank trucks that do not have chocks or wheel blocks)
- Rotating (cement or other trucks which may not be properly locked out)

- Shifting (tank trucks lacking a cab or jack stand)
- Crushing (garbage trucks which may not be properly locked out)

Noise (preventing the ability to communicate or hear warnings)

Slippery surfaces

Surface contaminants – liquids and solids on floors, walls, ceilings, or other interior surfaces that may cause eye or skin irritation, burns, or other adverse health effects upon contact

Thermal (heat and cold) extremes:
- Surfaces (radiant or conduction)
- Air temperature (convection)

Tripping hazards

Uncontrolled lateral movement or swing potential with suspended loads

Vibration – Vibrating equipment or vibration of the confined space

Work or equipment introducing additional hazards:
- Hot work (welding, cutting, burning, grinding)
- Inerting
- Abrasive blasting
- Surface coating and painting
- Use of solvents, degreasers, and other cleaning agents
- Demolition activities
- Use of internal combustion engines
- Use of space heaters
- Use of equipment which is not approved or fit for use in the type of confined space, such as non-intrinsically safe or no GFCI when needed.

# Non-Mandatory Appendix D
# Rescue Service Considerations

**(1)** This appendix provides guidance to employers in choosing an appropriate rescue service. It contains criteria that may be used to evaluate the capabilities both of prospective and current rescue teams. Before a rescue team can be trained or chosen, however, a satisfactory permit program, including an analysis of all permit-required confined spaces to identify all potential hazards in those spaces, must be completed. Oregon OSHA believes that compliance with all the provisions of 437-002-0146 will enable employers to conduct permit space operations without recourse to rescue services in nearly all cases. However, experience indicates that circumstances will arise where entrants will need to be rescued from permit spaces. It is therefore important for employers to select rescue services or teams, either on-site or off-site that are equipped and capable of minimizing harm to both entrants and rescuers if the need arises.

**(2)** For all rescue teams or services, the employer's evaluation should consist of two components: an initial evaluation, in which employers decide whether a potential rescue service or team is adequately trained and equipped to perform permit space rescues of the kind needed at the facility and whether such rescuers can respond in a timely manner, and a performance evaluation, in which employers measure the performance of the team or service during an actual or practice rescue. For example, based on the initial evaluation, an employer may determine that maintaining an on-site rescue team will be more expensive than obtaining the services of an off-site team, without being significantly more effective, and decide to hire a rescue service. During a performance evaluation, the employer could decide, after observing the rescue service perform a practice rescue, that the service's training or preparedness was not adequate to effect a timely or effective rescue at his or her facility and decide to select another rescue service, or to form an internal rescue team.

**a. Initial Evaluation**

**i.** The employer should meet with the prospective rescue service to facilitate the evaluations required by 437-002-0146(9). At a minimum, if an off-site rescue service is being considered, the employer must contact the service to plan and coordinate the evaluations required by the standard. Merely posting the service's number or planning to rely on the 911 emergency phone number to obtain these services at the time of a permit space emergency would not comply with the rescue requirements of the standard.

**1.** The capabilities required of a rescue service vary with the type of permit spaces from which rescue may be necessary and the hazards likely to be encountered in those spaces. Answering the questions below will assist employers in determining whether the rescue service is capable of performing rescues in the permit spaces present at the employer's workplace. What are the needs of the employer with regard to response time

(time for the rescue service to receive notification, arrive at the scene, and set up and be ready for entry)? For example, if entry is to be made into an IDLH atmosphere, or into a space that can quickly develop an IDLH atmosphere (if ventilation fails or for other reasons), the rescue team or service would need to be standing by at the permit space. On the other hand, if the danger to entrants is restricted to mechanical hazards that would cause injuries (e.g., broken bones, abrasions) a response time of 10 or 15 minutes might be adequate.

2. How quickly can the rescue team or service get from its location to the permit spaces from which rescue may be necessary? Relevant factors to consider would include: the location of the rescue team or service relative to the employer's workplace, the quality of roads and highways to be traveled, potential bottlenecks or traffic congestion that might be encountered in transit, the reliability of the rescuer's vehicles, and the training and skill of its drivers.

3. What is the availability of the rescue service? Is it unavailable at certain times of the day or in certain situations? What is the likelihood that key personnel of the rescue service might be unavailable at times? If the rescue service becomes unavailable while an entry is underway, does it have the capability of notifying the employer so that the employer can instruct the attendant to abort the entry immediately?

4. Does the rescue service meet all the rescue requirements of the standard? If not, has it developed a plan that will enable it to meet those requirements in the future? If so, how soon can the plan be implemented?

5. For off-site services, is the service willing to perform rescues at the employer's workplace? (An employer may not rely on a rescuer who declines, for whatever reason, to provide rescue services.)

6. Is an adequate method for communications between the attendant, employer and prospective rescuer available so that a rescue request can be transmitted to the rescuer without delay? How soon after notification can a prospective rescuer dispatch a rescue team to the entry site?

7. For rescues into spaces that may pose significant atmospheric hazards and from which rescue entry, patient packaging and retrieval cannot be safely accomplished in a relatively short time (15-20 minutes), employers should consider using airline respirators (with escape bottles) for the rescuers and to supply rescue air to the patient.

8. If the employer decides to use SCBA, does the prospective rescue service have an ample supply of replacement cylinders and procedures for rescuers to enter and exit (or be retrieved) well within the SCBA's air supply limits?

9. If the space has a vertical entry over 5 feet in depth, can the prospective rescue service properly perform entry rescues? Does the service have the technical knowledge and equipment to perform rope work or elevated rescue, if needed?

10. Does the rescue service have the necessary skills in medical evaluation, patient packaging and emergency response? Where necessary, can the rescue service perform patient decontamination before being transported to a medical facility?

11. Does the rescue service have the necessary equipment to perform rescues, or must the equipment be provided by the employer or another source?

**b. Performance Evaluation**

Rescue services are required by paragraph (9)(d) of the standard to practice rescues prior to an entry or within 12 months of an entry, provided that the team or service has not successfully performed a permit space rescue within that time. As part of each practice session, the service should perform a critique of the practice rescue, or have another qualified party perform the critique, so that deficiencies in procedures, equipment, training, or number of personnel can be identified and corrected. The results of the critique, and the corrections made to respond to the deficiencies identified, should be given to the employer to enable it to determine whether the rescue service can quickly be upgraded to meet the employer's rescue needs or whether another service must be selected. The following questions will assist employers and rescue teams and services evaluate their performance.

i. Have all members of the service been trained as permit space entrants, at a minimum, including training in the potential hazards of all permit spaces, or of representative permit spaces, from which rescue may be needed? Can team members recognize the signs, symptoms, and consequences of exposure to any hazardous atmospheres that may be present in those permit spaces?

ii. Is every team member provided with, and properly trained in, the use and need for PPE, such as SCBA or fall arrest equipment, which may be required to perform permit space rescues in the facility? Is every team member properly trained to perform his or her functions and make rescues, and to use any rescue equipment, such as ropes and backboards, that may be needed in a rescue attempt?

iii. Are team members trained in the first aid and medical skills needed to treat victims overcome or injured by the types of hazards that may be encountered in the permit spaces at the facility?

iv. Do all team members perform their functions safely and efficiently? Do rescue service personnel focus on their own safety before considering the safety of the victim?

v. If necessary, can the rescue service properly test the atmosphere to determine if it is IDLH?

vi. Can the rescue personnel identify information pertinent to the rescue from entry permits, hot work permits, and SDSs?

vii. Has the rescue service been informed of any hazards to personnel that may arise from outside the space, such as those that may be caused by future work near the space?

viii. If necessary, can the rescue service properly package and retrieve victims from a permit space that has a limited size opening (less than 24 inches (60.9 cm) in diameter), limited internal space, or internal obstacles or hazards?

ix. If necessary, can the rescue service safely perform an elevated (high angle) rescue?

x. Does the rescue service have a plan for each of the kinds of permit space rescue operations at the facility? Is the plan adequate for all types of rescue operations that may be needed at the facility? Teams may practice in representative spaces, or in spaces that are “worst-case” or most restrictive with respect to internal configuration, elevation, and portal size. The following characteristics of a practice space should be considered when deciding whether a space is truly representative of an actual permit space:

    1. Internal configuration.

        a. Open – there are no obstacles, barriers, or obstructions within the space. One example is a water tank.

**b.** Obstructed – the permit space contains some type of obstruction that a rescuer would need to maneuver around. An example would be a baffle or mixing blade. Large equipment, such as a ladder or scaffold, brought into a space for work purposes would be considered an obstruction if the positioning or size of the equipment would make rescue more difficult.

**2.** Elevation.

**a.** Elevated – a permit space where the entrance portal or opening is above grade by 4 feet or more. This type of space usually requires knowledge of high angle rescue procedures because of the difficulty in packaging and transporting a patient to the ground from the portal.

**b.** Nonelevated – a permit space with the entrance portal located less than 4 feet above grade. This type of space will allow the rescue team to transport an injured employee normally.

**3.** Portal size.

**a.** Restricted – A portal of 24 inches or less in the least dimension. Portals of this size are too small to allow a rescuer to simply enter the space while using SCBA. The portal size is also too small to allow normal spinal immobilization of an injured employee.

**b.** Unrestricted – A portal of greater than 24 inches in the least dimension. These portals allow relatively free movement into and out of the permit space.

**4.** Space access.

**a.** Horizontal – The portal is located on the side of the permit space. Use of retrieval lines could be difficult.

**b.** Vertical – The portal is located on the top of the permit space, so that rescuers must climb down, or the bottom of the permit space, so that rescuers must climb up to enter the space. Vertical portals may require knowledge of rope techniques, or special patient packaging to safely retrieve a downed entrant.

# Confined Space Awareness Training



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# Confined Space

"Why is this training important to me
I don't work in confined spaces?"



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# Why We Are Talking About Confined Spaces

- Two workers died from asphyxiation due to oxygen deprivation – one was attempting rescue.
- Five workers cleaning a storage tank killed from explosion at refinery.
- Five farmers overcome by methane fumes from manure pit. Four of the deaths were from rescue attempts. There was about a foot of manure in the 12-foot deep pit.
- Wastewater supervisor died entering manhole deficient of oxygen. Second supervisor died attempting rescue.
- Two wastewater worker drowned when pipe gallery flooded during entry.
- Meter reader died due to methane and CO in a meter vault.
- Maintenance worker drowned in wet well.
- Two sewer workers and police officer died at bottom of pumping station.
- Worker died entering 8 foot vault to bleed line.
- Worker died when inflatable sewer plug bursts.
- Two workers drown when sewer plug fails.
- Worker died from asphyxiation while working inside residential sewer.
- **Rescuers account for over 60% of all confined space fatalities!**



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# Confined Space

What constitutes a confined space?

1. Limited means of entrance & egress
2. Not intended for continuous occupancy
3. Large enough to enter



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# Confined Space

What makes a confined space a permit required confined space?



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# Confined Space

## Examples of Confined Spaces:

- Tanks
- Manholes
- Boilers
- Sewers
- Silos
- Hoppers
- Reservoirs
- Vaults
- Pipes
- Trenches
- Tunnels
- Ducts
- Bins
- Pits



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# Confined Space

- **Confined Space Program**
- **Entry Permit**
- **Alternate Entry Procedures**



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# Confined Space Awareness Training

*Questions?*

*Risk Management Department*
*(800) 285-5461*
*(503) 371-8667*

*The mission of the Special Districts Association of Oregon is to assist special service districts in providing cost-effective and efficient public services to the people of Oregon.*



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| EMERGENCY MANAGEMENT | Author | Length | Available in Spanish | Coming Soon |
|---|---|---|---|---|
| Emergency & Disaster Preparedness | Michael Dorn | 33 mins | | |

| EMPLOYMENT PRACTICES/SUPERVISORY | Author | Length | Available in Spanish | Coming Soon |
|---|---|---|---|---|
| Discrimination: *Avoiding Discriminatory Practices* | Catherine Mattice | 30 mins | | |
| Sensitivity Awareness | Catherine Mattice | 25 mins | | |
| Sexual Harassment: *Policy & Prevention* | Elizabeth R. Ison | 70 mins | | |

| ENVIRONMENTAL | Author | Length | Available in Spanish | Coming Soon |
|---|---|---|---|---|
| Accident Investigation Training | Jeremy Norton | TBD | | * |
| Asbestos Awareness | Dr. Joseph Guth | 20 mins | | |
| Back Injury & Lifting | Vaughan & Sommer | 14 mins | SP | |
| Chemical Spills Overview | Linda Stroud | 23 mins | | |
| Compressed Gas Safety | Mike Peterman | 13 mins | | |
| Confined Spaces | Bryan Visscher | 20 mins | | |
| Electrical Safety | Bryan Visscher | 23 mins | | |
| Eye & Face Protection | Jim Vaughan | 10 mins | | |
| Fall Protection | Bryan Visscher | 23 mins | | |
| Fire & Explosive Hazards | Mike Peterman | TBD | | * |
| Fire Extinguisher Safety | Mike Peterman | 13 mins | SP | |
| Forklift Safety | Jeremy Norton | 16 mins | | |
| General Ergonomics | Jim Vaughan | 14 mins | | |
| General Safety Orientation | Steve Lyons | 15 mins | | |
| Hand & Power Tool Safety | Jeremy Norton | 20 mins | | |
| Hazard Communications: *Right to Understand* | Linda Stroud | 25 mins | | |
| Hearing Loss Prevention | Vaughan & Sommer | 11 mins | SP | |
| Heat Illness Prevention | Staff | 9 mins | SP | |
| Ladder Safety | Vaughan & Sommer | 26 mins | SP | |
| Lockout/Tagout: Energy Release | Vaughan & Sommer | 17 mins | | |
| Office Ergonomics | Vaughan & Sommer | 14 mins | | |
| Personal Protective Equipment (PPE) | Vaughan & Sommer | 14 mins | SP | |
| Respiratory Protection | Jeremy Norton | 18 mins | | |
| Safety Committee Operations | Jeremy Norton | TBD | | * |
| Safety Data Sheets (SDS) | Linda Stroud | 19 mins | | |

| ENVIRONMENTAL, CONT. | Author | Length | Available in Spanish | Coming Soon |
|---|---|---|---|---|
| Scaffolding Safety | Jeremy Norton | TBD | | * |
| Slips, Trips & Falls | Vaughan & Sommer | 17 mins | SP | |
| Trenching & Excavation Safety | Jeremy Norton | 19 mins | | |
| Welding, Cutting & Brazing Safety Awareness | Jeremy Norton | 22 mins | | |

| HEALTH | Author | Length | Available in Spanish | Coming Soon |
|---|---|---|---|---|
| Bloodborne Pathogens Exposure Prevention: *Complete* | Vaughan & Sommer | 23 mins | SP | |
| Bloodborne Pathogens Exposure Prevention: *Refresher* | Vaughan & Sommer | 13 mins | SP | |
| Stress Management | Catherine Mattice | 29 mins | | |

| HUMAN RESOURCES | Author | Length | Available in Spanish | Coming Soon |
|---|---|---|---|---|
| Customer Service Overview | Staff | 11 mins | | |
| Discrimination Awareness in the Workplace | Catherine Mattice | 14 mins | | |
| Diversity Awareness: *Staff-to-Staff* | Catherine Mattice | 23 mins | | |
| Drug Free Workplace | Jeremy Norton | 22 mins | | |
| General Ethics in the Workplace | Catherine Mattice | 18 mins | | |
| Sexual Harassment: *Staff-to-Staff* | Elizabeth R. Ison | 21 mins | SP | |
| Workplace Bullying: *Awareness & Prevention* | Catherine Mattice | 15 mins | | |
| Workplace Violence: *Awareness & Prevention (Employee)* | Catherine Mattice | 19 mins | | |
| Workplace Violence: *Awareness & Prevention (Supervisor)* | Catherine Mattice | 27 mins | | |

| TRANSPORTATION | Author | Length | Available in Spanish | Coming Soon |
|---|---|---|---|---|
| Defensive Driving | Patrick Fitzpatrick | 22 mins | | |
| Winter Driving | Patrick Fitzpatrick | 17 mins | | |

*Revised 4/25/14*

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# Risk Management Department Trainings

- Accident & Injury Reporting
- Accident Investigation*
- Adult & Pediatric CPR/First Aid with AED Train the Trainer
- Asbestos Awareness*
- Back Safety*
- Bloodborne Pathogen*
- Board Training
- Building Inspections
- CFL and Haz Waste Awareness
- Confined Space*
- Defensive Driving- Staff
- Ergonomics*
- Fall Protection*
- Fire Extinguisher
- Forklift / Aerial Lifts*
- General Hazard Identification
- General Liability
- Hazard Communication*
- Hearing Conservation*
- Human Resources
- Indoor Air Quality*
- Ladders*
- Lead Awareness*
- Lockout/Tagout*
- Mandatory Reporting
- Motivating Safe Behavior*
- MRSA
- Personal Protective Equipment (PPE)*
- Playground Hazard ID
- Respirator Safety
- Return to Work*
- Risk Management 101
- Safety Committee*
- Safety Meetings*
- Safety 101 (Top 5 Injuries)*
- Sexual Harassment
- Slip/Trip/Falls
- Stretch & Flex*
- Workplace Violence

## Other Services

- Loss Control Inspection
- Noise Sampling*
- Online Training
- Online Reference Library
- Safety and Security Matching Grants
- Ergonomic Evaluations*
- Written Safety Plan Review*
- Indoor Air Quality Sampling*

** Workers Compensations related trainings available to SDIS Workers Compensation Pool members only*

**To schedule trainings or other services, call (800) 285-5461 and request to speak with a Risk Management Consultant or email losscontrol@sdao.com**

# Confined Space Entry

Article 4.05.90

Revision Date (s)
4/16/13

Related policies: Articles 3.15.220; 4.05.30; 4.05.50; 4.05.60; 4.05.70; 4.05.100; 4.05.140; 4.05.150; 4.05.240

Author/Position: Mike Jacobs, Safety Coordinator

## I. Overview

The Purpose of this program is to establish safe entry procedures for confined space work and to comply with Oregon Occupational Safety and Health Administration (OR-OSHA) rules.

This program applies to all activities in confined spaces. This program will also apply to activities in excavations if there is a possibility that a hazardous atmosphere, as defined in this program, could exist.

## II. Roles & Responsibilities

A. General Roles and Responsibilities:

1. District Management will provide the support and the commitment to furnish affected employees with the appropriate training and equipment to protect themselves from known hazards while working in and around confined spaces. Whenever possible, the District will attempt to eliminate the hazards of confined spaces by means of engineering controls and design.
2. The Safety Coordinator will provide and document confined space training; maintain the District's Confined Space Entry (CSE) Program, and provide support to supervisors in the administration of the program.
3. Supervisors will ensure that the CSE program is implemented and ensure compliance within their respective crews.
4. Employees who perform confined space work are responsible for following all applicable requirements of the CSE program.

## III. Definitions

A. **Acceptable entry conditions** - Free of hazardous atmosphere and physical hazards that can cause death or serious physical harm.

B. **Air Monitor -** District provided instruments that test for hazardous atmospheres in confined spaces. District instruments are equipped with Oxygen (**O2**), Hydrogen Sulfide (**H2S**), Carbon Monoxide (**CO**) and Flammable **(LEL**) sensors.

C. **Alternate Entry Procedures** - Procedures that are used when entering a permit required confined space (PRCS) to eliminate or control a hazardous atmosphere and eliminate physical hazards. Specific alternate entry procedures are a part of this program.

D. **Calibrate/Calibration** – The checking of an air monitor against an accurate standard (such as a calibration gas) to determine any deviation and correct for errors.

Note: A similar process may also be referred to as a "bump test" in which an instrument is tested with an accurate standard to ensure it is still reading correctly. For the purposes of this rule, a "bump test" performed in accordance with the manufacturer's instructions can be used to verify calibration.

E. **Confined space/space** – A space that meets all of the following:

1. Large enough and so configured that an employee can fully enter the space and perform work.
2. Has limited or restricted means for entry and/or exit.
3. Is not designed for continuous human occupancy.

Note: A space that is designed for periodic occupancy is not the same thing as a space that is designed for continuous occupancy. The presence of a fixed ladder, or lighting, or ventilation does not automatically mean that the space was designed for continuous occupancy. One must look at the primary function and purpose of the space. A space may have lighting to facilitate periodic occupancy. This lighting may be needed to safely enter and exit, read gauges or perform maintenance or repairs to equipment in the space. Similarly, ventilation may be necessary to keep equipment from overheating or provide fresh air for temporary job assignments or tasks. In both cases, the work required to be performed in these spaces is intermittent or temporary in nature. You must ask yourself, was the space designed for an employee to be permanently assigned to perform work there or was the space designed to house and protect operating equipment that needs to be monitored or occasionally maintained.

F. **Confined Space Entry Form** - This form will be used to document that the requirements of this program are followed. The form will serve as both an evaluation tool and a permit to perform an entry.

G. **Continuous system** – A confined space that meets all of the following:

1. Part of, and contiguous with, a larger confined space (for example, storm sewers, sanitary sewers, or steam tunnels)
2. Cannot be isolated from the larger confined space
3. Subject to a potential release from the larger confined space that can overwhelm control measures and/or personal protective equipment, resulting in a hazard that is immediately dangerous to life and health.

H. **Control** - The action taken to maintain acceptable entry conditions in a PRCS. An example of a control is ventilating a space to maintain a safe atmosphere.

Note: Personal protective equipment (PPE) is not a control.

Note: A control does not eliminate a hazard. In other words, if the ventilation was discontinued, the space's hazardous atmosphere would return.

I. **Emergency** - Any occurrence (including any failure of hazard control or monitoring equipment) or event, internal or external to the confined space, that could endanger entrants.

J. **Engulfment hazard** - A physical hazard consisting of a liquid or flowable solid substance that can surround and capture an individual. Engulfment hazards may cause death or serious physical harm if: the individual inhales the engulfing substance into the respiratory system (drowning, for example); the substance exerts excessive force on the individual's body resulting in strangulation, constriction, or crushing; or the substance suffocates the individual.

K. **Entry** - The action by which any part of an employee's body breaks the plane of an opening into a confined space. Entry (or entry operations) also refers to the period during which an employee occupies a confined space.

L. **Hazard** - A physical hazard or hazardous atmosphere.

M. **Hazardous atmosphere** - An existing or potential atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following:

1. A flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit.
2. An airborne combustible dust at a concentration that meets or exceeds its lower explosive limit.

   Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 meters) or less.
3. An atmospheric oxygen concentration below 19.5 percent (oxygen deficient) or above 23.5 percent (oxygen enriched).
4. An airborne concentration of a substance that exceeds the dose or exposure limit specified by an Oregon OSHA requirement.

   Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, and impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.
5. An atmosphere that presents an immediate danger to life or health (IDLH).

N. **Immediately dangerous to life or health (IDLH)** means 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 permit space.

Note: Some materials – cadmium vapor, for example – may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12 - 72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such

materials in hazardous quantities are considered to be "immediately" dangerous to life or health.

O. **Isolation** - The process by which a permit-required confined space is removed from service and completely protected against the release of energy and material into the space by such means as:

1. Blanking or blinding.
2. Misaligning or removing sections of lines, pipes, or ducts.
3. A double block and bleed system.
4. Lockout or tagout of all sources of energy.
5. Blocking or disconnecting all mechanical linkages.

Note: For the purpose of this program, isolation is a form of hazard elimination.

P. **Monitor or monitoring** – Using an air monitor to evaluate the atmosphere in a confined space after an entrant enters the space. This is a process of checking for changes in the atmospheric conditions within a space and is performed in a periodic or continuous manner after the completion of the initial testing of that space.

Q. **Non-entry Rescue** - A rescue done, without entering the confined space, by the attendant if the entrant has been injured, fallen unconscious, or unable to self-rescue.

R. **Permit-required confined space (PRCS)** – A confined space that has one or more of the following characteristics:

1. Contains, or has a potential to contain, a hazardous atmosphere.
2. Contains a material that has the potential to engulf an entrant.
3. Has an internal configuration such that an entrant could become trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
4. Contains any other recognized serious safety or health hazard that can inhibit an entrants ability to self-rescue.

Note: Any confined space where the only actual or potential hazard is from a fall would not be classified as a permit-required confined space solely for the falling hazards.

S. **Physical hazard** - An existing or potential hazard that can cause death or serious physical harm in or near a confined space, or a hazard that has a reasonable probability of occurring in or near a confined space and includes, but is not limited to:

1. Explosives; mechanical; electrical, hydraulic, and pneumatic energy; radiation; temperature extremes; engulfment; noise; and inwardly converging surfaces; and
2. Chemicals that can cause death or serious physical harm through skin or eye contact (rather than through inhalation).

T. **Potential hazards -** All reasonably anticipated conditions within the space and outside the space that can adversely affect conditions within the space.

U. **Retrieval system -** Any mechanical device used for non-entry rescue of authorized entrants from a permit space.

V. **Self-rescue** - The immediate evacuation of the confined space under the authorized entrants own power.

W. **Serious physical harm** - An impairment in which a body part is made functionally useless or is substantially reduced in efficiency. Such impairment may include loss of consciousness or disorientation, and may be permanent or temporary, or chronic or acute. Injuries involving such impairment would usually require treatment by a physician or other licensed health-care professional while an illness resulting in serious physical harm could shorten life or substantially reduce physical or mental efficiency by impairing a normal bodily function or body part.

X. **Testing** - The process of identifying and evaluating the atmospheric hazards that entrants may be exposed to in a confined space using an air monitor.

Y. **Ventilate or ventilation** - Controlling a hazardous atmosphere using powered equipment, such as fans and blowers, to continuously move air.

## IV. District Confined Spaces

A. The District has a large number of confined spaces that are located at the District's main office, remote and unmanned District facilities, and in public easements and right-of-ways.

B. These confined spaces can be characterized as the following:

1. Utility vaults
2. Steel water reservoirs
3. Concrete water reservoirs
4. Pump stations (that don't have walk-in access)
5. Reservoir drain/de-chlorination pits
6. Storm vaults (reservoir sites)

C. Hazards that have been associated with these spaces that can potentially make them a PRCS are:

1. Hazardous atmospheres
2. Pressurized water lines
3. Electrical equipment
4. Mechanical equipment
5. Engulfment hazards
6. Unsafe access and egress
7. Poor lighting

8. Vehicle traffic
9. Poor communication
10. The space is part of a continuous system (the only District spaces that are part of a continuous system are storm vaults).
11. Slip, trip, and fall hazards

D. Hazards associated with the work to be done in the spaces may also make them a PRCS.

E. The District will provide employees involved in confined space entry with training that includes: descriptions of District confined spaces, and how to identify hazards within these spaces. The District will rely on this training as an effective means of ensuring employees can recognize confined spaces and can determine whether or not the space is a PRCS.

F. The District will maintain the location of each of its confined spaces. Those spaces that are off District property, in public easements and/or right-of-ways will be located on the District's GIS mapping system. Those spaces that are on District facilities (i.e., pump stations, reservoir sites) will be located on site plans, and/or site logs kept by the Distribution Crew, and/or in the District's CAD system.

G. To prevent entry by anyone other than District employees, all District confined spaces require a District key or special tool to gain access.

## V. General Entry Requirements

A. These requirements apply to all entries into District confined spaces. If no actual or potential hazards are identified, the space is not a PRCS and may be entered using only these general entry procedures.

B. A copy of this CSE Program and all CSE records will be kept in a CSE Binder in each of the following departments:

1. Distribution
2. Engineering
3. Field Customer Service
4. Field Operations

C. Employees shall not perform confined space work until they have received training as outlined in this program.

D. Confined Space Evaluation:

1. Because the majority of the District's confined spaces are located off District property or at remote District facilities, there is a potential that conditions in and surrounding a confined space can change without notice. Also, work to be performed in the space can introduce hazards into the space. For these reasons the space to be entered and the work to be done in the space shall be evaluated prior to each entry.

2. This evaluation shall include:
   a. The assessment of the confined space and its surroundings to determine whether or not there are any actual potential hazards present.
   b. Evaluation of hazards associated with the work to be done in the space.
3. Section 2 of a CSE form must be completed to document this evaluation. The CSE form must be signed by all involved in the entry.
4. Every effort has been made to ensure that, based upon previous evaluations of District confined spaces, all potential hazards have been included on the form.
   a. If a hazard is identified that is not included on the form, the entry supervisor must terminate the entry until the hazard can be evaluated and a procedure to maintain acceptable entry conditions can be developed and approved by the department supervisor and/or the Safety Coordinator.
   b. The Safety Coordinator makes appropriate updates to the CSE form; and, if necessary, will ensure that employees involved in CSE are trained on the hazard.
   c. If an actual or potential hazard is found, Section VI of this program must be followed.
5. All completed forms shall be returned to the binder from which they were taken and turned into the Safety Coordinator, annually on April 1st.

E. Personnel
1. Three roles, requiring a minimum of two people, are required for any confined space entry:
   a. Entrant
   b. Attendant
   c. Entry Supervisor
2. Employees that fill these roles must be trained so that they understand the hazards that may be faced during entry, including information on the types of hazards, as well as signs, symptoms, and consequences of exposure to those hazards. They must also understand the means and methods to identify, control and/or eliminate the hazards of a PRCS space.
3. Entrant: The entrant is the employee that enters the confined space and does the work. Depending on the task, there may be multiple entrants. The entrant may also be the entry supervisor.
4. Attendant: The attendant is the safety watch for the entry and is responsible for the well being of all those involved in the entry. The attendant is also responsible of ensuring the public is not exposed to the

hazards of the entry. The attendant may also be the entry supervisor. The attendant must:

a. Continuously maintain an accurate count of entrants in the space.

b. Remain outside the space during entry operations until relieved by another attendant.

c. Perform no duties that might interfere with the attendant's primary duty to monitor and protect any entrant.

d. An attendant may monitor more than one space at a time, but the duties in relation to one space may not interfere with the duties for any other spaces. If an attendant's attention is focused on one space, such as to initiate the rescue procedures, all other spaces that the attendant is monitoring must be evacuated or another attendant must take over those duties first.

5. Entry Supervisor: The entry supervisor is in charge of the entry and is responsible for ensuring that all applicable procedures are being followed. The entry supervisor may also be an entrant or the attendant. The entry supervisor must**:**

a. Verify that the space has been properly evaluated, that all applicable procedures and equipment are in place before endorsing the CSE form and allowing entry to begin.

b. Inform entrants and attendants of the hazards and conditions associated with the space and the methods used to eliminate and/or control those hazards.

c. Terminate the entry as required by this program.

6. Under specific conditions, solo-entries are allowed into confined spaces:

a. If no actual or potential hazards are found.

i. If the space is determined to be a PRCS, solo-entry is not allowed.

b. The purpose of entry is for routine inspection, monitoring, and/or to obtain a reading.

c. The entrant's immediate supervisor has been notified and approved the entry.

i. The entrant shall notify his/her immediate supervisor prior to entry and give an expected duration of the entry.

ii. The supervisor shall then be notified when the entrant has exited the confined space.

d. Sections 3 of the CSE form must be completed and the form must be signed by the entrant and the entrant's supervisor.

F. Atmospheric Testing & Monitoring

1. The atmosphere must be tested, prior to entry, with an air monitor that has been calibrated per manufactures recommendations. If bump testing an air monitor, the calibration must also be current. The calibration and/or bump test must be recorded in the CSE Binder.
2. Testing shall be done at all levels of the space following manufacturer's recommended time intervals. In all cases the "max" readings must be checked and noted in Section 4 or the CSE form. If the monitor alarms, the space is a PRCS and Sections VI requirements must be followed.
   a. If the oxygen reading is below 20.9 or the other readings are above zero, the space is a PRCS and must be ventilated.
3. The atmosphere of a confined space shall be monitored by the entrant(s) continuously throughout all confined space work to verify the absences of a hazardous atmosphere. The monitor shall be kept in the breathing space of the entrant(s).
4. All readings will be noted in section 4 of the CSE form in ½ hour intervals.
5. If the atmospheric monitor should alarm, acceptable entry conditions no longer exist and entry shall be immediately terminated and the entrant(s) evacuated. The space will then be considered a PRCS.
   a. The confined space shall be re-evaluated and efforts will be made to determine the exact cause of the alarm.
6. One air monitor will be kept with each CSE Binder (two with Field Customer Service).
7. If an air monitor is in need of repair, it should be turned in to the Safety Coordinator. The Safety Coordinator will ensure that monitor is properly repaired and provide a replacement, if necessary.

G. Communication

1. The employees involved with a confined space entry must communicate with each other during all phases of the entry. The attendant will remain in continuous contact with the entrant during the confined space work.

H. Personal protective equipment (PPE)

1. All PPE shall be appropriate for the task being performed and potential hazards in the space (see appropriate PPE Matrix). Standard PPE shall be considered a minimum requirement. Additional PPE may be required as determined by the entry supervisor. The Material Safety Data Sheet (MSDS) may also be consulted for additional information.

   Note: Personal protective equipment (PPE) does not eliminate or control a hazard.

2. For nuisance level dust, mist, and odors, a disposable filtering face piece may be voluntarily donned by those employees who have complied with the District's Respiratory Protection program.
3. All PPE necessary for confined space entry will be provided by the District.
4. If appropriate PPE is not available, stop entry, and notify the Safety Coordinator.

I. Other Equipment

1. All equipment used to perform confined space entry will be provided by the District.
2. The Inventory and Stores Buyer and the Safety Coordinator will be responsible to ensure that all appropriate equipment is available.
3. This equipment shall be inspected by the user, prior to each use.
4. If defective the equipment will be taken out of service and replaced.

## VI. PRCS Entry

A. If actual or potential hazards are identified, the space shall be considered a PRCS. District employees are prohibited from entering a PRCS unless acceptable entry conditions can be achieved by using alternate entry procedures (Section VII).

1. Procedures used must be documented in section 5 of the CSE form.
2. If it is determined that a procedure not covered in section 5 of the CSE form must be used, the entry supervisor must terminate the entry. The procedure must be evaluated by the department supervisor and/or Safety Coordinator to ensure it meets the requirements of an alternate entry procedure.

B. If it is determined that a PRCS must be entered and acceptable entry conditions cannot be achieved.

1. A job safety analysis (JSA) must be completed which addresses:
   a. The actual or potential hazards associated with the entry that cannot be controlled or eliminated;
   b. How the entrant(s) are protected from the hazards (i.e., PPE etc.); and,
   c. A non-entry rescue plan that meets the requirements of this program.
2. This JSA must be approved by the department supervisor and/or the Safety Coordinator prior to entry. The approval shall be documented in section 6 of the CSE form and the JSA shall be attached to the form.
3. The JSA must be attached to the CSE form.

C. All requirements of Section V must be followed.

D. The completed CSE form and, if necessary, the JSA must be reviewed with the entrant(s) and attendant prior to entry. The entrant(s) and attendant shall sign section 7 of the form.

E. Under no circumstances shall an employee enter a PRCS with an IDLH atmosphere.

## VII. PRCS Alternate Entry Procedures

The following alternate entry procedures have been designed to address hazards that have been associated with District confined spaces. When entering a PRCS using these alternate entry procedures, a PRCS section 5 of the CSE form must be completed. Alternate entry procedures must be performed without entering the space.

A. Ventilation

1. Ventilation equipment shall be used when atmospheric hazards are present or when work to be done, or the surrounding environment introduces potential atmospheric hazards, in order to obtain or maintain acceptable entry conditions. Typical situations requiring ventilation include:
   a. District confined spaces often contain organic material and sources of metallic corrosion which can reduce oxygen levels in the space;
   b. Confined spaces located in high traffic areas, especially near busy intersections, may contain high levels of Carbon Monoxide (CO);
   c. When Hot Work (see below) is being done; and,
   d. When chemicals are being used.
2. When ventilation is used to provide and maintain a safe atmosphere in the confined space, the following needs to be considered:
   a. Atmospheric monitoring is still required;
   b. Ventilation needs will be determined by the size of the space, the direction of air flow and capabilities of the ventilation equipment (volume of air delivered per minute);
   c. Prior to entering a space that contains an atmospheric hazard, the space's air must be turned over at least three times (as determined by the space's size and the capabilities of the ventilation equipment);
   d. The space must be ventilated continuously during the entry;
   e. The supply needs to come from a clean source, be certain that the intake for ventilation equipment is in an area free of hazards such as vehicle exhaust and other potential hazardous sources; and,
   f. The direction of flow needs to be considered. The air needs to be delivered to the space in such a manner that the fresh air displaces the existing atmosphere.
3. If ventilation equipment does not maintain acceptable atmospheric conditions or otherwise fails, the entry must be terminated until acceptable conditions are achieved.

4. Ventilation equipment shall be stored in the Warehouse, when not in use, to ensure it is accessible.

B. Hazardous Energy

1. District confined spaces must be protected from the release of hazardous energy into the space prior to entry.
2. District utility vaults and pump stations contain three sources of energy:
   a. Pressurized water lines
   b. Electrical equipment
   c. Mechanical Equipment (pumps)
3. Water lines have been designed to withstand system pressures; and therefore, under normal operating conditions, do not present a hazard.
   a. If upon visual inspection of a confined space it is determined that the integrity of water line is compromised (i.e., leaking pipes or fittings); or if work to be done in a confined space will compromise the line (i.e., removal of water meter) the following steps must be taken prior to entering the space:
      i. Without entering the space, close valves inside and outside to ensure two valves have been closed on either side of the space.
         (a) If space must be entered to close valves, a non-entry rescue plan is required.
      ii. If there is a backflow preventer immediately adjacent to the space, it may be used to assist with the isolation of the space.
   b. The space may then be entered and the lines must be drained in a manner that does not create a hazard.
4. Electrical equipment in the District's confined spaces is covered and protected by ground fault circuit interrupter (GFCI).
   a. If work must be done that requires the removal of the protective covers, the following steps must be taken prior to beginning work:
      i. The electrical equipment must be isolated using the procedures found in the District's Lock Out/Tag Out program.
5. Mechanical equipment (pumps) in District confined spaces are guarded; and, therefore, does not present a hazard.
   a. If guards must be removed, the following steps must be taken prior to beginning work:

i. The mechanical equipment must be isolated using procedures found in the District's Lock Out/Tag Out program.

C. Communication

1. If visual/vocal communication cannot be maintained or is not adequate, phone or radio communication shall be provided.
2. If visual contact cannot be maintained, the attendant and entrant must establish a check-in schedule.

D. Access and Egress

1. Where permanent ladders are not installed, portable ladders for safe access and egress must be in place, in use, and extend 3' above the landing.

E. Lighting

1. Lighting equipment and/or flashlights will be used, if needed, to enable employees to see well enough to work safely and to exit the space quickly in an emergency.
2. All lighting equipment must be battery operated or GFCI protected. It must also be intrinsically safe.

F. Tools & Equipment

1. Electrical tools and equipment used in confined space work shall be protected with a GFCI and intrinsically safe.
2. Tools and equipment shall be kept away from the edge of a space's opening to prevent them from falling on entrants.
3. Fuel-powered equipment; including cut-off saws, shall not be used in a confined space without the use of ventilation to maintain acceptable entry conditions.

G. Chemicals

1. Prior to using a chemical in a confined space, the MSDS shall be reviewed (prior to entry) by employees involved in the entry.
2. If the MSDS indicates that inhalation exposures can be controlled by ventilation, ventilation is required.
3. If PPE is required to prevent serious physical injury or respiratory protection is required; JSA must be completed and approved and a non-entry rescue plan must be in place.

H. Fall protection

1. All applicable requirements of the District's Fall Protection program must be followed including:
   a. A davit arm with a full body harness must be used to protect entrants from falls from 10 feet or greater; and

b. A davit arm may also be used to protect the attendant from falling into spaces with a depth of 10 feet or greater or when over water (full reservoir).

c. If a davit arm is not used to protect the attendant, a physical barrier must be in place between the attendant and the edge of the opening.

2. Entrants shall not perform work while standing on water lines without the use of davit arm and full body harness.

I. Hot Work

1. Hot Work is the performance of the following tasks in a confined space: welding, torch cutting, and/or brazing. These types of activities create an ignition source, fumes and/ or smoke within the space. When performing Hot Work:

a. Ventilation is required;

b. The gas cylinders and welding machines shall be left on the outside. Before operations are started, heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement.

c. When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine disconnected from the power source.

d. In order to eliminate the possibility of gas escaping through leaks of improperly closed valves when gas welding or cutting, the torch valves shall be closed and the fuel-gas and oxygen supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. Where practical the torch and hose shall also be removed from the confined space.

e. After welding operations are completed, the welder shall mark the hot metal or provide some other means of warning other workers.

J. Engulfment

1. All District confined spaces have the potential to contain water. Water reservoirs contain water during normal operation. The following measures are used to eliminate the hazard of drowning in District confined spaces.

a. Some spaces are equipped with sump pumps to prevent water accumulation.

b. If necessary, portable pumps are used to remove accumulated water.

i. It may be necessary to pump continuously during entry to prevent water from re-accumulating.

c. Water reservoirs are drained and isolated and removed from service (per the District's Lock Out/Tag Out program) prior to entry.

K. Vehicle/Pedestrian Traffic

1. All applicable requirements of the District's Work Zone Traffic Control program must be followed.
2. When pedestrians may be exposed to falling into the confined space, an attendant shall be responsible for ensuring their safe passage around the space. Cones may be used to assist the attendant.
3. The attendant shall take the following actions when unauthorized persons approach or enter a space while entry is underway:
   a. Warn the unauthorized persons that they must stay away from the space;
   b. Advise the unauthorized persons that they must exit immediately if they have entered the space; and,
   c. Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the space.

L. Suspended loads

1. All applicable requirements of the District's Crane Operations program must be followed.
2. When being placed in a confined space, all loads must be controlled by a non-conductive tag line until secured in place.

## VIII. Rescue

A. The District utilizes two rescue techniques: self rescue and non-entry rescue:

1. Self-rescue will be the primary rescue for all confined space entries.
   a. Self-rescue will be the only rescue plan required when the confined space to be entered:
      i. Is determined to have no actual or potential hazards; or
      ii. The space is determined to be a PRCS and can be entered using alternate procedures.
   b. The entrant(s) will exit from the confined space (self-rescue) as quickly as possible whenever:
      i. An order to evacuate is given by the attendant or the entry supervisor; or ,
      ii. The entrant(s) recognizes any warning sign or symptom of exposure to a dangerous situation; or,
      iii. The entrant(s) detects a dangerous or hazardous condition, or the air monitor alarms.

c. The attendant shall monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and order the entrant(s) to evacuate the space immediately under any of the following conditions:

i. If the attendant detects a dangerous or hazardous condition; or,

ii. If the attendant detects the behavioral effects of hazard exposure in an entrant; or,

iii. If the attendant detects a situation outside the space that could endanger the entrants; or,

iv. If the attendant cannot effectively and safely perform all the duties required of the attendant

2. A non-entry rescue is the District's primary form of rescue when a PRCS is entered and alternate entry procedures are not used to achieve acceptable entry conditions. Circumstances that require a non-entry rescue plan are:

a. A chemical is used that requires respiratory protection or has the potential to create physical hazards (as defined by this policy).

i. Exception: A reservoir may be chlorinated if it can be done without entering the reservoir.

b. A welder must enter a confined space through a manhole or other small opening.

c. The confined space is part of a continuous system (i.e., storm vault).

d. Any other atmospheric hazard that cannot be controlled or a physical hazard that cannot be eliminated.

e. The requirements of a non-entry rescue are as follows:

i. The rescue team may consist of one person or multiple people. The attendant will be in charge of the non-entry rescue.

ii. A retrieval system (davit arm) or other means of mechanical retrieval must be set up ready to perform rescue.

iii. Entrant(s) must be wearing a full-body harness and attached to the retrieval system.

Exception: If being attached to the retrieval system creates a hazard, it is not required for the entrant(s) to be attached.

iv. At least one of the rescue team members must hold a current certification in First-Aid and Cardiopulmonary Resuscitation (CPR).

v. The entry supervisor shall notify Tualatin Valley Fire & Rescue and develop a plan to contact emergency medical services.

vi. The attendant shall summon rescue and other emergency services as soon as the attendant determines that entrants may need assistance to escape from space hazards.

vii. The rescue team must have simulated a similar rescue within the last twelve months.

3. District employees shall not enter a confined space to perform a rescue unless an entrant(s) is unable to self-rescue due to a medical condition. If the space is a PRCS, the rescuer must be protected from the actual or potential hazards of the space prior to entering. If the need to rescue is due to a hazard of the space or cannot be determined, District employees shall not enter.

## IX. Terminated Entries

A. If an entry is terminated due to an emergency, the department supervisor and Safety Coordinator must be notified immediately. Events surrounding the emergency termination will be documented, this program will be evaluated; and appropriate action to avoid reoccurrence will be taken.

## X. Contractors

A. If employees of another employer will be performing work in a District confined space, the District employee responsible for the work will ensure they are aware of potential hazards of confined space entry and they are provided this program and instructed on how to use the District's CSE form. The contractor must meet all applicable requirements of this program. A copy of the completed CSE form must be turned in to the Safety Coordinator.

## XI. Training

A. Each employee involved in confined space activities will be trained so they acquire the understanding, knowledge, and skills necessary to safely perform their duties, according to their assigned responsibilities. All aspects of this program including, procedures and equipment use and maintenance shall be covered. Training will be provided:

1. For all new employees
2. Before an employee is assigned confined space work
3. Before there is a change in an employee's assigned duties
4. When there is a hazard for which the employee hasn't already been trained
5. When there are changes to the program
6. When an audit of evaluation forms and permits shows deficiencies
7. Whenever there is a deviation from the established procedures or employee knowledge of the procedures is inadequate

B. Training documentation will include:
   1. The employee's and trainer's name and signature and the date of training.
   2. The responsibilities for which they were trained.

C. Awareness training will be provided to all employees whose work operations are or may be in an area where permit spaces are present to explain the confined space program.
   1. Training will be provided;
      a. For all new affected employees
      b. For all employees whose duties change to include work in areas with permit spaces
      c. When inadequacies in an employee's knowledge indicate that the employee has not retained the requisite understanding
      d. When there is a change in the permit program
      e. When there are new or previously unidentified permit spaces

## XII. Program Evaluation

A. This program will be reviewed when there is any reason to believe that employees are not adequately protected, and will be revised as necessary.

B. Situations that require this review include:
   1. Unauthorized entry of a confined space.
   2. A previously unrecognized hazard is discovered.
   3. A condition prohibited by the program exists.
   4. An injury or near-miss occurs during entry.
   5. An employee reports concerns about the effectiveness of the program.
   6. Any other condition that affects employee safety or health.

C. When revising the permit program to correct hazard-related deficiencies, do not allow entries into affected permit spaces to be made until the revisions are complete.

D. All employees will be trained on any revisions made to the program

E. CSE forms will be reviewed within one year of their cancellation to evaluate:
   1. The permit program; and,
   2. The protection provided to employees entering permit spaces.

# Tualatin Valley Water District Confined Space Entry Form

## Section 1: Space/Work Description

| | | |
|---|---|---|
| **Name (Entry Supervisor):** | | **Monitor #:** |
| **Location:** | | |
| **Description of Work:** | | |
| | | |
| **Date/Time of Evaluation:** | **Start Time:** | **End Time:** |

## Section 2: Evaluation

If you answer NO to any of the question below, Section 5 must be completed prior to entry. If a hazard is identified that is not covered by this form, STOP WORK and notify your supervisor and Safety Coordinator.

| Space | Yes | No | N/A |
|---|---|---|---|
| Based on air testing at all level of the space, is the space free of atmospheric hazards?(note readings) | | | |
| Does a survey of the surrounding area show that it appears to be free of atmospheric hazards? | | | |
| The space is not part of a continuous system? | | | |
| Are waterlines in good condition? | | | |
| Is electrical equipment properly guarded? | | | |
| Is mechanical equipment properly guarded? | | | |
| Is the space free of engulfment hazards (i.e. drowning) | | | |
| Does the space have a safe means of access and egress? | | | |
| Is lighting in the space adequate to safely perform work? | | | |
| Is it true that the space is not located in normal vehicle or pedestrian traffic lanes? | | | |
| The space is less than 10 feet deep? | | | |
| Visual or verbal communication is possible? | | | |
| **Work** | | | |
| Is atmosphere being monitored continuously during entry? (note readings every ½ hour) | | | |
| Is it true that no chemical will be used in the space? | | | |
| Is it true that no hot work will be performed in the space? | | | |
| Have all of the crew been informed of their duties and properly trained? | | | |
| Visual or verbal communication can be maintained throughout the entry | | | |
| Is it true that work will not compromise the integrity of the water lines? | | | |
| Is it true that no guards or covers that prevent exposure to hazardous energy will be removed? | | | |
| Is it true that suspended loads are not part of the work to be done? | | | |
| Is it true that no electrical tools are being used in the space? | | | |
| Is it true that a gas powered cut-off saw is not being used in the space? | | | |
| Are all employees trained in the District's Confined Space Entry Program and their roles? | | | |
| Employees are using appropriate Personal Protective Equipment (PPE)per the District's PPE program | | | |

## Section 3: Solo-Entry

If you answer NO to any of the questions below, solo-entry is prohibited

| | | | |
|---|---|---|---|
| Were all of the questions above were answered **YES**? | | | |
| Has your supervisor been notified and approved the entry? | | | |
| Have you provided your supervisor with entry & exit times and a plan for making contact after exiting? | | | |

## Section 4: Atmospheric Testing / Monitoring:

| Contaminant | Pre-entry | Monitor ½ hour | Monitor 1 hour | Monitor 1 ½ hours | Monitor 2 hours | Alarm Level |
|---|---|---|---|---|---|---|
| Oxygen Content (%): | | | | | | **19.5 – 23.5%** |
| Flammability (LEL %): | | | | | | **10% LEL** |
| Carbon Monoxide (PPM): | | | | | | **35 PPM** |
| Hydrogen Sulfide (PPM): | | | | | | **10 PPM** |
| If work exceeds 2 hours, record readings on page 2 of this form | | | | | | |

# Tualatin Valley Water District Confined Space Entry Form

## Section 5: Safe Entry Pre-Cautions and Procedures

This section is intended to document safe entry pre-cautions and procedures, if any. If you answered NO Section 1, please check all procedures that will be used to achieve acceptable entry conditions. If you would like to use a procedure that is not covered by this form, STOP WORK, and contact your supervisor and the Safety Coordinator.

| Procedure | Yes |
|---|---|
| Mechanical ventilation will be used to maintain acceptable atmospheric conditions | |
| Lock Out/Tag Out (LO/TO) procedures will be used, per the District's LO/TO program, to safely work on; | |
| - Electrical equipment | |
| - Mechanical equipment | |
| - Water lines | |
| A portable ladder will be used to safely entry and exit the space | |
| Portable lighting will be used to ensure the space is adequately lit | |
| An attendant will ensure that pedestrians are not exposed to fall hazards | |
| Work zone traffic control (WZTC), per the District's WZTC program, will be established | |
| A communication plan, including the use of phone/two-way radio will be used. | |
| MSDS for chemicals used are on-site and have been reviewed to ensure **no** atmospheric/physical hazards. | |
| Hot work procedures are being used **(Note: Rescue plan is required)** | |
| Suspended loads are secured with non-conductive tag lines | |
| Fall protection equipment (davit arm) is place and being used for entry and exit | |
| Davit arm or barrier being used to protect the attendant from falling into space | |
| Portable pump is used to remove accumulated water | |
| Electrical tools are Ground Fault protected and intrinsically safe | |

## Section 6: Job Safety Analysis

If acceptable entry conditions cannot be achieved, work must stop and a job safety analysis (JSA) must be completed and approved by your department supervisor and the Safety Coordinator. The (JSA) must be attached to this form.

| |
|---|
| The actual or potential hazards that cannot be controlled or eliminated have been evaluated |
| Measures to protect entrant(s) from hazards in place |
| Rescue plan is in place |
| Department Supervisor Signature: |
| Safety Coordinator Signature: |

## Section 7: Entry Team Signatures

By my signature below, I confirm and verify that the conditions necessary for a safe confined space entry have been explained, completed and reviewed with me before entry into the confined space.

| Role | Name/Signature | Role | Name/Signature |
|---|---|---|---|
| Entrant | | Entrant | |
| Entrant | | Entrant | |
| Entrant | | Entrant | |
| Attendant | | Attendant | |
| Entry Supervisor: | | | |

### Exit & Return to Service

| Question | Yes | No |
|---|---|---|
| Have all entrants been accounted for? | | |
| Has the opening been closed and secured to prevent unauthorized entry? | | |
| Any follow up required to improve the safety of this space or equipment used? | | |

***Return all closed out forms to your confined space entry binder. All forms must be retained for review for at least one full year.***