**Confined Space Entry Plan**

**{Template}**

***[Enter Department/Organization Name]***

*[Instructions: Use this template document to customize department/organization specific responsibilities and procedures for meeting the* [*UW Confined Space Entry Program*](http://www.ehs.washington.edu/fsophyssafe/confinedsp/csprogram.docx) *requirements.* *UW Environmental Health & Safety (EH&S) will work with departments and organizations to help them meet the requirements of the Confined Space Entry Program.]*

**1. Introduction**

This document is a companion to the University of Washington Confined Space Entry Program that documents detailed responsibilities and procedures for safe entry into the specific permit-required confined spaces managed by *[Enter dept./org. name]*. All applicable elements in the UW Confined Space Entry Program must be followed, which is required by the Washington Administrative [Code 296-809 (Confined Spaces)](http://apps.leg.wa.gov/wac/default.aspx?cite=296-809).

**2. Roles and Responsibilities**

*[Describe how the department/organization manages the confined spaces in their area and responsible employees/positions to meet the overall requirements of the* *UW Confined Space Entry Program**.]*

*[Enter dept. specifics on plan management and responsible employees/positions]*

 **3. Inventory of Confined Spaces**

The *[Enter dept./org. name]* will work with EH&S to evaluate confined spaces. All confined spaces are evaluated using the [Confined Space Evaluation form](http://www.ehs.washington.edu/fsophyssafe/confinedsp/csevalform.pdf). The classifications of confined spaces are:

* NON-PERMIT REQUIRED
* PERMIT-REQUIRED

 *[Insert or attach inventory (Excel spreadsheet, Word table or other) of permit-required confined spaces that are managed by the dept./org. The inventory should include at a minimum the confined space identification, location, description and location details, hazards, evaluation date, designation if space is a permit-required confined space, and any comments about the space.]*

**Posting**

All Permit-Required Confined Spaces must be labeled with a sign as designated in the UW Confined Space Entry Program or on the [EH&S Web site](http://www.ehs.washington.edu/fsophyssafe/confinedsp/index.shtm). *[Enter dept./org. name]* is responsible for posting signs on their Permit-Required Confined Spaces. If a space cannot be labeled, consult with EH&S about an alternative method of preventing entry into the space.

*[Enter dept. specifics on posting]*

**Reclassification of Permit Space**

Refer to the UW Confined Space Entry Program

**Reevaluation of Non-Permit Space**

Refer to the UW Confined Space Entry Program

**4. Permit system**

**Permit Required Entry**

A written [UW Confined Space Entry Permit](http://www.ehs.washington.edu/fsophyssafe/confinedsp/csepermit.doc) must be completed in full prior to all Permit-Required Confined Space entries. The Permit form can be used as a checklist for the job, along with forms for lockout/tagout and hot work procedures, if applicable. Upon conclusion of entry operations, the Entry Supervisor will cancel the Permit and file appropriately.

*[Enter dept. specifics on Permit, customized Permit form (if applicable)]*

**Procedures for Entry without Permit**

* **Alternate Entry**

Alternate entry procedures may be used for Permit-Required Confined Spaces where the only hazard is an actual or potentially hazardous atmosphere, which can be controlled with ventilation. Document using UW Hazardous Atmosphere Elimination (Make Link) to certify how the hazards were eliminated from the space, including date, location and signature of person making the determination. Post certification at space entrance. Follow procedures given in the UW Confined Space Entry Program.

Alternate entry procedures can be used for the spaces listed below:

|  |  |  |
| --- | --- | --- |
| **Confined Space Name or Number** | **Potential Hazardous Atmosphere** | **Ventilation Equipment Required** |
| [insert specific information] |  |  |
|  |  |  |

* **Classify Confined Space as Non-Permit Space**

A confined space may be classified temporarily (no longer than 8 hours) as a non-permit confined space for as long as the hazards, both atmospheric and physical hazards, remain eliminated. Document using UW Certificate of Confined Space Hazard Elimination (Make Link) to certify how the hazards were eliminated from the space, including date, location and signature of person making the determination. Post certification at space entrance.

The following spaces can be classified as non-permit spaces by following the listed methods of hazard elimination:

|  |  |  |
| --- | --- | --- |
| **Confined Space Name or Number** | **Hazards** | **Method of Hazard Elimination** |
| (insert specific information) |  |  |
|  |  |  |

**5. Equipment**

*[List equipment that is available for confined space entries in a table, with description, location and who is in charge of maintenance, calibration, etc. Examples of typical equipment used in confined space entries are given in Appendix A.]*

Determine and document the equipment needs for a confined space entry on the [UW Confined Space Entry Permit](http://www.ehs.washington.edu/fsophyssafe/confinedsp/csepermit.doc) form. The hazards and potential hazards in the space and the hazards of the work being planned must be evaluated to determine the proper equipment needed to complete a safe and successful entry.

*[Click here to enter dept. specifics on equipment]*

**Air Monitoring**

*[Include a listing of the air monitors used in the department and information entrants and attendants need to know about operation. Include location of written manuals or provide link to user manual online, and any reference material users should know. For example, the Quick Guide for the MSA ALTAIR 4X Multigas Detector is shown in Appendix A.]*

*[Click here to enter dept. specifics on air monitors]*

 *[Details of special air monitoring procedures and challenges for confined spaces in the department/organization should be documented. Some commonly used resources are given in Appendix A.]*

The air should be tested at several levels in the space since gases may settle into layers. Continuous air monitoring should be done if the atmosphere can change, such as during welding, painting, descaling, cleaning with chemicals or working in sewers. Continuous air monitoring is recommended for all entries, taking readings every 15 minutes.

*[Click here to enter dept. specifics on air monitoring procedures]*

**Ventilation**

The minimum length of time needed to ventilate a space before it is considered safe to enter must be calculated as given below. Basically, a volume of clean air equal to at least 20 times the volume of the space is blown into the space to purge the atmosphere. The following parameters must be known:

* Volume of space (cubic feet)
* Ventilation device flow rate (CFM or cubic feet/min.)

To determine the minimum time the ventilator should operate before testing the air prior to entry, divide the volume of the space by the flow rate of the blower. Multiply that by the number of air changes required.



Continue to ventilate the space as long as necessary.

**6. Training**

Employees must be trained before performing any entries into any UW Permit-Required Confined Space. Employees will be trained in the duties of all positions involved in the entry. In addition to the basic training provided by EH&S described in the UW Confined Space Entry Program and in the sample table of duties in Appendix B, *[Enter dept./org. name]* must provide training on specific procedures and safety precautions related to the confined spaces in their areas, and when certain work is done in a confined space. Employees must receive periodic refresher training and additional training anytime there is a change in assignment, operation, or procedures. All confined space training will be documented with the date of training and a listing of trainees.

*[Enter dept. specifics on training]*

 **7. OUTSIDE Contractors**

Outside contractors must be informed of the following:

* Presence of a confined space that requires a permit for entry
* Hazards of the space
* UW’s experience with the space
* Precautions and procedures UW has implemented for protecting employees in or around the space

If a UW employee works in or near the space, coordinated entry operations are necessary. In such cases, a copy of the contractor's permit or a UW permit must be obtained before entry.

**8. Emergency Procedures and Rescue Services**

**Rescue Services**

*[A rescue plan and rescue services must be determined before any entry into a permit-required confined space. Rescue services must be evaluated that they have the proper equipment, training and capability of entering the space and retrieving an entrant. At least one person on the rescue team must have first aid/CPR certification. Rescue services of differing capabilities may be needed by the department/organization because of complex confined spaces. Appendix C gives resources for selecting rescue services and describes Seattle Fire Dept. rescue services and requirements.]*

Rescue involving confined space entry will **not** be performed by UW employees.

*[A rescue plan must address how to extract entrants when a space presents challenges to an effective retrieval before entry occurs. Some conditions that may warrant having an on-site rescue resource during entry include:*

* *Entries into spaces where traditional retrieval equipment is not practical*
* *Entries into spaces where the atmosphere cannot be made safe without the use of supplied air respiratory equipment*
* *Spaces with openings not large enough to allow entry by personnel with typical rescue gear (SCBA, etc.)*
* *Entries into spaces fully or partially submerged in water requiring special equipment for access]*

*[Click here to enter the Rescue Service(s) that will be used by the department/organization, their capabilities, contact information, and procedures to follow]*

**Self-Rescue**

Entrants must Self-Rescue if they feel ill, are injured, detect a problem or prohibited condition or if directed to leave the space. An entrant should have the foresight and ability to remove themselves from the hazard before it becomes a bigger problem requiring Assisted or Entry Rescue.

**Non-Entry Rescue (or Assisted Rescue)**

When an entrant is not capable of self-rescue, the attendant assists removing the entrant from the space using a mechanical retrieval device that is attached to the entrant. This must only be done from outside the space and if it is safe. A vertical confined space more than 5 feet deep requires a mechanical retrieval device and entrants to wear a chest or full-body harness attached to a retrieval line.

**Entry Rescue by Rescue Service**

Entry rescues must only be performed by a highly trained and equipped entry rescue team. The rescue service designated on the Permit must be contacted prior to starting the entry when self-rescue or non-entry rescue is not feasible. It must be clear on the Permit how to summon the rescue service (calling 911 may **not** ensure the most rapid response).

**Supervisor and Attendant Responsibilities during Entry Rescue**

* Provide the rescue service with information on the work being done and any chemicals in use or other hazardous atmosphere producing activities.
* Provide the Entry Permit to rescue service personnel.
* Provide rescue service with any observations or information about the emergency.
* Keep unauthorized personnel out of the area.

**Accident and Incident Reporting**

For all incidents and near misses, the involved person or supervisor completes and submits the [UW Online Accident Reporting System](http://www.ehs.washington.edu/ohsoars/index.shtm) (OARS) form within 24 hours (8 hours if serious injury or hospitalization). If there is a death or several people are seriously hurt contact EH&S immediately after providing first aid and/or getting help.

* During business hours (M-F/8-5) call 206-543-7262.
* After hours call 206-685-UWPD (8973) to be routed to the EH&S staff on call.

*[Click here to enter dept. specifics on Emergency procedures]*

**9. EMPLOYEE RIGHTS**

Refer to the UW Confined Space Entry Program

**10. POST-ENTRY Review**

Refer to the UW Confined Space Entry Program

**11. Procedures**

Basic procedures for confined space entry must be followed as given in the UW Confined Space Entry Program. *[A “*Sample Procedures for Permit-Required Confined Space Entry*” is given in Appendix D*.*]*

*[Specific procedures for certain spaces or types of spaces must be developed and documented by the department or organization to ensure safe entries. Employees entering those spaces must be trained in the specific procedures. Procedures must also be developed for certain work tasks that will be performed in a confined space. Appendix D gives some examples with resources for proper procedures to follow. The individual confined space, its configuration or other factors, may also dictate how certain work may be safely performed in the space.]*

*[Click here to enter dept. specifics on confined space entry procedures]*

**Lockout/Tagout Procedures**

All lockout/tagout procedures for permit-required spaces must follow the [UW Lockout/Tagout program](https://www.ehs.washington.edu/fsophyssafe/loto.shtm).

*[Click here to enter dept. specifics on lockout/tagout procedures]*

**Hot Work**

Any work that has the potential to provide a source of ignition in a confined space must be authorized in writing with a [UW Hot Work Permit](http://www.ehs.washington.edu/fsofire/hotw.shtm), to perform work such as riveting, welding, cutting, burning, and heating. If hot work releases toxic gases or fumes special ventilation and air testing is required. A local exhaust system with intake close to the work should be used to capture toxic vapors before they enter the atmosphere in the space.

*[Click here to enter dept. specifics on hot work]*

**Appendix A – Equipment and Air Monitoring Resources**

|  |  |  |  |
| --- | --- | --- | --- |
| **Equipment** | **Description****Mfr./I.D.** | **Location** | **Maintenance/Calibration****Responsibility**  |
| Ventilating equipment: forced air blower, elephant trunk, exhaust ventilation system |  |  |  |
| Air testing and monitoring equipment: oxygen/LEL/toxic gas monitors, special monitors |  |  |  |
| Communication equipment |  |  |  |
| Personal protective equipment (PPE): chemical or other gloves, chemical protective clothing, safety shoes, hard hats, safety glasses, hearing protection, respirators |  |  |  |
| Lighting equipment |  |  |  |
| Barriers and shields |  |  |  |
| Ingress and egress equipment: ladders  |  |  |  |
| Fire extinguisher |  |  |  |
| Rescue and emergency equipment: full body harnesses, tripod with winch, rescue line, escape respirators |  |  |  |
| Personal Alert Safety System (PASS) devices |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

*{example monitor procedure}*



|  |  |
| --- | --- |
| **Air Monitoring Resources** | **Source** |
| [Atmospheric Testing of Permit-required Confined Spaces (44 KB PDF)](http://www.lni.wa.gov/Safety/Rules/Chapter/809/HelpfulTools/HT7.pdf)  | WA Labor & Industries |
| [Procedures for Atmospheric Testing in Confined Spaces](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CDQQFjAB&url=https%3A%2F%2Fwww.osha.gov%2FOshDoc%2Fdata_Hurricane_Facts%2Fatmospheric_test_confined.pdf&ei=Z2vUVNH7MoraoASQqYDwAQ&usg=AFQjCNGIU44Qs2omno25C5BD-P_TyO0y3w&bvm=bv.85464276,d.cGU) | OSHA Fact Sheet |
| [Calibrating and Testing Direct-Reading Portable Gas Monitors](https://www.osha.gov/dts/shib/shib093013.html) | OSHA Bulletin September 30, 2013 |
|  |  |
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For entry or reentry, the minimum concentration levels for air contaminants must be:

|  |  |
| --- | --- |
| **Contaminant** | **Concentration** |
| Carbon Monoxide (CO) | < 35 PPM |
| Hydrogen Sulfide (H2S) | < 10 PPM |
| Oxygen (O2) | 19.5 – 23.5% |
| Lower Explosive Limit (LEL) | < 10% |
|  |  |
|  |  |

The air should be tested at several levels in the space since gases may settle into layers. Continuous air monitoring should be done if the atmosphere can change, such as during welding, painting, descaling, cleaning with chemicals or working in sewers. Continuous air monitoring is recommended for all entries, taking readings every 15 minutes.

**Appendix B – Duties of Entry Participants**

*[List names or positions of employees that will actively participate in permit-required confined space entries as in the sample table below.]*

|  |  |  |
| --- | --- | --- |
| **Permit-Required Confined Space Entry Participant** | **Duties** | **Name or Title**  |
| **Entrants** Authorized to enter a permit space and do work | • Know the hazards that they may encounter during entry• Properly use equipment • Communicate with attendant as needed alerting of hazards• Exit from permit space whenever ordered to evacuate, a hazard is recognized, or an evacuation alarm is activated | *[Click here to enter names or positions.]* |
| **Attendants** Stationed outside of a permit space to monitor entrant activity and perform duties listed on the permit | • Know the hazards of the space• Know the symptoms of hazard exposure in entrants• Keep an accurate count of the number of entrants in the permit space• Remain outside the space during operations until relieved• Monitor the work area for hazardous conditions• Summon rescue and emergency services• Communicate with entrants to relay information and monitor the status of the entrants• Order the evacuation of the entrants from the space if a hazardous condition is encountered• Keep unauthorized employees away from the space• Perform no duties that might interfere with the attendant's primary duty to monitor and protect the entrants• Perform non-entry rescues | *[Click here to enter names or positions.]* |
| **Entry Supervisor** Authorize and supervise permit-required confined space entry operations | • Recognize potential hazards during entry, signs/symptoms of exposure• Before entry, determine that area conditions meet requirements of the permit• Provide necessary equipment, hazardous material information, and assuring rescue services are in place• Assure entrants and attendants are trained prior to entry• Determine that entry operations and conditions remain consistent with the terms of the permit• Remove unauthorized individuals from area during entry operations• Cancel the permit at the conclusion of the entry | *[Click here to enter names or positions.]* |

**Appendix C – Emergency Procedures/Rescue Services**

|  |  |
| --- | --- |
| **Rescue Services Evaluation Resources** | **Source** |
| [Evaluating Rescue Teams or Services (94 KB doc)](http://www.lni.wa.gov/Safety/Rules/Chapter/809/HelpfulTools/HT6.doc)  | WA Labor & Industries Confined Spaces Helpful Tools |
|  |  |

The Seattle Fire Department will provide confined space emergency rescue services at UW facilities in Seattle. The following requirements must be met:

* Responsible person for the entry must determine if the resources of the Fire Department are adequate for the entry being performed.
* The Fire Department must evaluate the entry conditions and space to determine if their rescue service is within the scope of what is needed for safe rescue from the space.

**Planning Ahead**

Do the following to ensure a safe entry:

* Fill out Permit correctly and completely to address all possible hazards
* Perform continuous air monitoring
* Hook entrants to mechanical retrieval system at all times
* Provide clean fresh air throughout the entry
* Ensure all entrants have with them an emergency escape air bottle to allow self-rescue

**Appendix D – Resources for Procedures**

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| --- |
| **Sample Procedures for*** **Specific Work in Confined Spaces**
* **Certain Confined Spaces**
 |
| **Work done in Confined Space** | **Resources** | **Regulation** |
| Welding, cutting, brazing | [Welding, Cutting, Brazing: Confined Spaces](http://app.leg.wa.gov/WAC/default.aspx?cite=296-24&full=true#296-24-69507)  | WAC 296-24-69507 |
| [Welding, Cutting, Brazing: Ventilation in confined spaces](http://app.leg.wa.gov/WAC/default.aspx?cite=296-24&full=true#296-24-71507)  | WAC 296-24-71507 through 71519 |
| [Welding, Cutting, Brazing: Work in confined spaces](http://app.leg.wa.gov/WAC/default.aspx?cite=296-24&full=true#296-24-70007)  | WAC 296-24-70007 |
| Construction | [Construction: Confined Spaces](http://app.leg.wa.gov/WAC/default.aspx?cite=296-155&full=true#296-155-203)  | WAC 296-155-203 |
| Electrical | http://www.lni.wa.gov/common/images/pdficon.gif[Electrical Work and Confined Space Under WAC 296-45 & 62](http://www.lni.wa.gov/Safety/Rules/Policies/PDFs/WRD1840.pdf)  | WAC 296-45&62 (WRD 18.40) |
|  |  |  |
|  |  |  |
| **Certain Confined Spaces** |
| Elevator pits | http://www.lni.wa.gov/common/images/pdficon.gif[Elevator Pits and the Confined Spaces Standard](http://www.lni.wa.gov/Safety/Rules/Policies/PDFs/WRD1255.pdf)  | WRD 12.55 |
| Telecommunication vaults | [Telecommunications: Underground Lines and Cable Vaults](http://app.leg.wa.gov/WAC/default.aspx?cite=296-32&full=true#296-32-340)  | WAC 296-32-340 |
| Sewer entry | http://www.lni.wa.gov/common/images/pdficon.gif[Sewer System Entry (44 KB pdf)](http://www.lni.wa.gov/Safety/Rules/Chapter/809/HelpfulTools/HT5.pdf) | WA Labor & Industries Confined Spaces Helpful Tools |
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**Sample Procedure**

**Sample Procedures for Permit-Required Confined Space Entry**

1. REVIEW: Carefully review the space to be entered, types of hazards, safety precautions, control measures and assess the work to be done in the space.
2. COMPLETE: Obtain and fully complete a Permit-Required Confined Space Entry form.
3. ENSURE: Ensure all participants in the entry have been trained. Assign duties to all participants.
4. IDENTIFY: Proper PPE, ventilation, air monitoring and rescue equipment needed for entry is available, assembled, and in working order.
5. COMMUNICATE: Determine method of communication between entrants and attendant.
6. VERIFY: Air monitors have been calibrated and are in working order.
7. ALERT: Call the emergency rescue service to alert them of the planned confined space entry.
8. ELIMINATE: Eliminate any condition making it unsafe to remove the entrance cover.
9. GUARD: After opening confined space, immediately guard the area so no one can fall in when open. Erect signs, barriers and barrier tape as necessary. Provide traffic control if necessary.
10. LOCK-OUT: Before entering, lock and tag out (LOTO) any mechanical hazards, gas, water lines, or electrical power. Try to turn the system on after locking out to ensure that there is no energy available.
11. CHECK: Set up and check out all rescue equipment (e.g. tripod, body harness, rescue line) prior to entry.
12. MONITOR THE AIR: Monitor the air in the space to ensure that no atmospheric hazards are present. Monitoring must always be conducted immediately before entering any confined space.

### Safe Air Limits for Confined Space Entry:

Oxygen: Between 19.5% and 23.5%

LEL: Less than 10% of known LEL (LEL = Lower Explosive Limit)

H2S: Less than 10 ppm

CO: Less than 35 ppm

If the air quality inside the confined space is safe with no fresh air ventilation, and if the only hazard is an actual or potentially hazardous atmosphere that can be controlled by continuous forced air ventilation, the space may be reclassified temporarily as an “Alternate Entry Procedures” space.

1. RECORD: Write air monitoring results and time taken on the Permit.
2. VENTILATE: If air monitoring results or the work to be done in the space indicates that ventilation is needed, set up the ventilation blower so that it takes in clean, uncontaminated air. Do not place intake next to vehicles, gas-powered equipment, or exhaust vent from a lab or other potentially contaminated work area. Attach ducting to blower, turn on, and place exhaust end well inside confined space. Run the blower for the minimum amount of time needed to purge the space for 20 air changes based on the calculations made on the Permit.
3. RETEST: After ventilation, check the atmosphere in the space again to confirm that acceptable entry conditions are present.
4. SIGN: If all entry conditions are met, the entry supervisor signs the permit allowing entry to the space.
5. CONNECT: Entrant puts on body harness and connects to line from tripod, and secures communication device if necessary.
6. ENTER: Entrant enters the space and checks for hazards that may not have been detected.
7. MONITOR: Continue to monitor the atmosphere in the space throughout entry and record results at least every 30 minutes.
8. COMMUNICATE: Attendant communicates with entrant for entire entry.
9. **EMERGENCY EXIT: Exit the space immediately if any of the following occurs:**
* A hazardous atmosphere is detected.
* Any health or safety hazard is detected.
* If entrant shows signs of exposure to atmospheric hazards, feels ill, notices strong odors or has other safety concerns.

Re-evaluate space and/or modify entry procedure before re-entering.

1. NORMAL EXIT: When work completed, return space to proper condition and secure opening.
2. FILE: Return the Entry Permit to the entry supervisor for filing.