**CHAPTER 8**

**CONFINED SPACE**

# 1.0 REFERENCES AND RESOURCES:

[WAC 296-809](http://apps.leg.wa.gov/wac/default.aspx?cite=296-809) Confined Spaces

[SPPM 2.68 Confined Spaces](https://policies.wsu.edu/prf/index/manuals/2-00-contents/2-68-confined-spaces/)

# 2.0 APPENDICES:

Appendix A Confined Space Survey Summary

Appendix B Confined Space Entry Form

# 3.0 PURPOSE and SCOPE:

The EHS Confined Space Program establishes policy to protect employees from hazards, associated with confined space entry. A confined space must meet all of the following requirements to be subject to the requirements in this chapter:

1. Large enough for an employee to enter fully and work;
2. Limited or restricted entrance and exit e.g. tanks, vessels, silos, storage bins, hoppers, vaults, excavations, and pits;

Note: Examples of limited or restricted entrance or exit include, but are not limited to, trip hazards, poor illumination, slippery floors, inclining surfaces and ladders.

1. Not primarily designed for continuous human occupancy.

A permit required confined space meets the above requirements *and one or more of the following characteristics*:

1. Contains or has a potential to contain a hazardous atmosphere;
2. Contains a material with the potential for engulfing someone who enters;
3. Has an internal configuration that could allow someone entering to be trapped or asphyxiated by inwardly converging walls or by a floor, which slopes downward and tapers to a smaller cross section;
4. Contains any physical hazard. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts;
5. Contains any other recognized serious safety or health hazard that could either:

(a) Impair the ability to self-rescue; or

(b) Result in a situation that presents an immediate danger to life or health.

**EHS employees will not enter permit required confined spaces.** However, alternate entry procedures may be utilized to control/eliminate hazards as described in the following sections.

# 4.0 RESPONSIBILITIES:

**Supervisors** are responsible for identifying projects and tasks subject to this chapter and verifying conditions allowing for entry into a non-permit required confined space.

*Note: It is possible that in the course of assigning employees work, a supervisor may unknowingly assign employees to tasks which require confined space entry; therefore:*

**Employees** are responsible for identifying tasks requiring confined space entry to their supervisor if encountered.

# 5.0 TRAINING REQUIREMENTS:

This program provides guidance on classifying permit required and non-permit required confined spaces, along with identifying designated employee duties and use of required equipment.

* Supervisors must receive sufficient training to evaluate hazardous atmospheres and other potential hazards outlined in Section 3.0 defining a permit required confined space. Supervisors may consult with additional subject matter experts as needed to support this evaluation.
* Employees must receive sufficient training to:
  + Identify a confined space as defined in Section 3.0;
  + Understand the controls in place e.g. lock-out-tag-out (see Chapter 20) to render the space “non-permit required.”
* Facilities Services will provide protective measures such as posting signs reading; Danger-Permit Required Confined Space, DO NOT ENTER" or other similar wording, or protective measure that may include bolted covers, or locks.
* EHS personnel may be trained as attendants to assist Facilities Services personnel entering permit required confined spaces.

**NON-PERMIT REQUIRED CONFINED SPACE ENTRY PROCEDURE:**

The supervisor is responsible for determining if a confined space meets non-permitted conditions. Non-permit required confined spaces are identified in Appendix A. EHS OHS may be consulted if questions arise during this process. The following requirements and conditions must be met in order to classify a confined space as non-permitted:

* The confined space does not containanyactual or potential hazards or hazardous atmosphere, capable of causing death or serious physical harm. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts, etc.
* Document how you determined the confined space contained no permit-required confined space hazards, including atmospheric hazards, by completing the non-permit confined space form provided as Appendix B. This form must be signed by the supervisor or a qualified individual identified by the supervisor e.g. lead.

All employees must exit the confined space if a hazard is identified/develops.

**UTILITY TUNNEL CONFINED SPACE ENTRY PROCEDURE:**

Utility tunnel hazards include: pressurized steam leaks, potential burn hazards where steam pipes are exposed, heat stress, potential exposed electric wires, damaged asbestos pipe insulation and slip, trip and fall hazards. Facilities Services schedules utility tunnel inspections at least annually to identify and mitigate these hazards. Asbestos air samples are collected regularly to support tunnel work activities and document airborne fiber concentrations. Utility tunnel entry procedures include the procedures identified above for non-permit required confined space entry as well as the following:

Tunnel Inspections:

* Prior to entering the tunnel sections to be inspected, personnel evaluate exit locations, and identify preferred exits.
* Prior to tunnel entry, inspection personnel evaluate the tunnel atmosphere with a 4-gas meter (oxygen, flammability, carbon monoxide and hydrogen sulfide) and probe attachment. Based upon historic data, the utility tunnels are well ventilated, and a hazardous atmosphere is unlikely to develop; however, at least one inspection team member shall wear a 4 gas meter in utility tunnels during the inspection and shall alert the team should hazardous conditions develop. If a hazardous atmosphere is identified, do not enter the tunnel, or, leave the tunnel immediately, as applicable, and refer to this Chapter’s alternative methods section. Information obtained from 4-gas monitoring shall be recorded on the completed confined space entry form provided in Appendix B.
* All tunnel entrants shall wear a bump cap (preferred) or hard hat and will carry an EHS assigned or personal mobile phone.
* All tunnel entrants shall carry a flashlight, should tunnel lighting fail.

Tunnel Work:

* The supervisor or designee identifies 2 exit locations in opposite directions from the work area. These exits are prepared e.g. manhole covers removed and above ground fall protection barricades are installed.
* Prior to tunnel entry, the supervisor or designee evaluates the tunnel atmosphere with a 4-gas meter (oxygen, flammability, carbon monoxide and hydrogen sulfide) and probe attachment. At least one project team member shall wear a 4-gas meter in utility tunnels while work is performed and shall alert the team should hazardous atmospheric conditions develop. If a hazardous atmosphere is identified, do not enter the tunnel, or, leave the tunnel immediately, as applicable, and refer to this Chapter’s alternate entry procedures section. Information obtained from 4-gas monitoring shall be recorded on the completed confined space entry form provided in Appendix B.
* All tunnel entrants shall wear a bump cap (preferred) or hard hat and have an EHS assigned or personal mobile phone.
* All tunnel entrants will carry a flashlight should tunnel lighting fail.
* The supervisor or designee evaluates ladder access and installs a ladder supporting entry and egress if: a permanent ladder is not installed, the permanent ladder is defective, or the permanent ladder is obstructed by utilities.
* The supervisor or designee evaluates the tunnel for pressurized steam leaks, potential burn hazards where steam pipes are exposed, heat stress, potential exposed electric wires, damaged asbestos pipe insulation and slip, trip and fall hazards and any other observed potential hazards. These hazards shall be recorded on the completed confined space entry form provided in Appendix B.
* Identified hazards shall be controlled/eliminated by applying engineering controls (e.g. shutting off steam to tunnel sections, repairing lights) and administrative controls (e.g. housekeeping, identifying trip hazards, exposed steel pipes, rotating out employees to reduce heat exposure) before proceeding with tunnel work. Contact the OHS AD for assistance as needed. Means for controlling these hazards shall be recorded on the completed confined space entry form provided in Appendix B.
* The supervisor or designee shall identify the 2 previously prepared exit locations to project personnel prior to their entering the tunnel.

Steam Leaks:

Small steam leaks, where a gasket has been compromised, or pinhole leaks at fittings or welds are not uncommon. These leaks do not present sufficient hazard to render the utility tunnel a permit required confined space. Small leaks, by definition, do not present a physical hazard to individuals in the vicinity. However, when identified during inspections or utility tunnel projects, a work order shall be submitted by the identifying employee or their supervisor, to repair the leak.

Large steam leaks do present a burn hazard to personnel in the vicinity and render the area a permit required confined space. EHS employees shall not enter the area until the leak is controlled. The extent of the leak’s impacts must be assessed and a steam valve supplying steam to the area of concern, located outside the area of impact, shall be identified to eliminate the steam hazard before repairs are performed.

**CONFINED SPACE Alternative Methods:**

Alternate entry procedures shall be applied to all non-permit required confined spaces. EHS OHS may be consulted if questions arise during this process. The following requirements and conditions apply when entering confined spaces:

Note: To apply alternative methods, you must document monitoring and inspection information supporting the following:

* All physical hazards are eliminated e.g. lock-out tag-out, line breaking or blanking.
* The only potential or actual remaining hazard is a hazardous atmosphere. **DO NOT ENTER A CONFINED SPACE TO EVALUATE ATMOSPHERIC HAZARDS. USE A 4-GAS METER AND ATTACHED PROBE.**
* If hazardous atmospheric conditions are identified, forced air ventilation must be sufficient to control the atmospheric hazard.
* Document atmospheric monitoring data collection and applicable controls on the confined space entry form provided in Appendix B. This information must be immediately available to all entrants.

Follow these alternative methods for confined space entry.

* Eliminate any unsafe conditions before removing an entrance cover.
  + - When entrance covers are removed, promptly guard the opening with a railing, temporary cover, or other temporary barrier to prevent accidental falls through the opening and protect entrants from objects falling into the space.
    - Certify that pre-entry measures have been taken (such as safe removal of the cover and having protection needed to gather pre-entry data), with the date, location of the space, and signature of the person certifying. Enter this information in the confined space entry form provided in Appendix B.
    - Make the pre-entry certification (Appendix B) available before entry to each entrant.
* Before an employee enters the confined space, test the internal atmosphere with a calibrated, direct-reading instrument and probe (do not enter the space) for all of the following, in this order:
  + - Oxygen content.
    - Flammable gases and vapors.
    - Potential toxic air contaminants (hydrogen sulfide and carbon monoxide).
* Provide entrants, or their authorized representatives, with an opportunity to observe pre-entry and periodic atmospheric testing.
* Ensure the atmosphere within the space is not hazardous when entrants are present e.g. continuous monitoring and forced air ventilation as necessary.
* When hazardous atmospheres are identified, use continuous forced air ventilation, as follows:
  + - Wait until the forced air ventilation has controlled the hazardous atmosphere before allowing entry.
    - Direct forced air ventilation toward the immediate areas where employees will enter and work, and continue ventilation until all employees have left the space.
    - Provide the air supply from a clean source and make sure it does not increase hazards in the space.
* Continually monitor the atmosphere within the space to ensure hazards do not accumulate.
* If a hazardous atmosphere is detected while personnel are in the confined space, do all of the following:
  + - Evacuate employees from the space immediately.
    - Evaluate the space to determine how the hazardous atmosphere developed.
    - Implement measures to protect employees from the hazardous atmosphere before continuing the entry operation.
    - Verify the space is safe for entry before continuing the entry operation, under a new, revised confined space entry form.

**CONFINED SPACE RECORD KEEPING:**

Completed entry forms shall be submitted to the OHS AD for filing and retention. The OHS AD will keep entry forms for at least one year. In some special circumstances, records may be kept for longer than the one year period. Some special circumstances include:

* There was an unauthorized entry of a permit required space.
* A new hazard was identified.
* A prohibited condition occurred.
* An injury or near miss occurred.
* There is a change in the use or configuration of the space.
* Employee complaint.

The OHS AD will monitor and assist first line supervisors in completing annual evaluations of confined space permits. This permit review will be done jointly with both parties. Annual reviews led by the OHS AD will include the following items:

* The overall confined space program.
* Individual confined space forms that were completed in the last calendar year.

The protection provided to employees entering confined spaces.

## CONFINED SPACE EQUIPMENT:

Confined space atmospheres will be evaluated with a 4 gas meter and/or other direct reading instruments as necessary (whenever there is reason to suspect a hazardous atmosphere), *EHS personnel will not enter confined spaces with hazardous atmospheres*. Engulfment sources or sources of hazardous energy and/or equipment will be locked-out (see Chapter 20) to render the space not permit required *prior to personnel entry*. All criteria in Section 3.0 defining a permit required confined space shall be eliminated *prior to personnel entry*.

**Appendix A: Confined Space Survey Summary Confined Space Survey Summary**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Location** | **Space** | **CS** | **PRCS** | **APCS** | **Sign** | **Notes** |
| 44 | CA Steam Plant | Coal Bin #1 | Y | Y | N | No | No entry required except to demo |
| 45 | CA Steam Plant | Coal Bins #3, 4 & 5 | Y | Y | N | No | No entry required except to demo |
| 38 | Feed Mill | Roof Top Grain Bins | Y | Y | N | Yes | A new sign is needed |
| 43 | GW Steam Plant | Oil Tank | Y | Y | N | No | A sign is needed |
| 1 | Beef Center | Large Bin | Y | N | N | Yes | No entry required |
| 2 | Beef Center | Medium Bin | Y | N | N | No | No entry required |
| 3 | Beef Center | Small Bin | Y | N | N | No | No entry required |
| 4 | Cattle Feeding Labs | Grain Bin 1 | Y | N | N | No | No entry required |
| 5 | Cattle Feeding Labs | Grain Bin 2 | Y | N | N | No | No entry required |
| 6 | Cattle Feeding Labs | Grain Bin 3 | Y | N | N | No | No entry required |
| 7 | Cattle Feeding Labs | Grain Bin 4 | Y | N | N | No | No entry required |
| 8 | Cattle Feeding Labs | Grain Bin 5 | Y | N | N | No | No entry required |
| 9 | Cattle Feeding Labs | Grain Bin 6 | Y | N | N | No | No entry required |
| 10 | Cattle Feeding Labs | Grain Bin 7 | Y | N | N | No | No entry required |
| 11 | Cattle Feeding Labs | Grain Bin 8 | Y | N | N | No | No entry required |
| 12 | Cattle Feeding Labs | Grain Bin 9 | Y | N | N | No | No entry required |
| 13 | Cattle Reproduction Labs | Grain Bin N | Y | N | N | No | No entry required |
| 14 | Cattle Reproduction Labs | Grain Bin S | Y | N | N | No | No entry required |
| 15 | Central Stores | N Filling Shed | N | N | N | NA | This operation is moving |
| 16 | Creamery | Cheese Vat | Y | N | N | Yes | LOTO from outside the space |
| 17 | Creamery | Pasteurizer Vat | Y | N | N | Yes | LOTO from outside the space |
| 19 | Dairy Center | CUDS Milk Storage Tank | Y | N | N | Yes | LOTO from outside the space |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Location** | **Space** | **CS** | **PRCS** | **APCS** | **Sign** | **Notes** |
| 20 | Dairy Center | Grain Bin 1 | Y | N | N | No | Hazards controlled from outside space |
| 25 | Dairy Center | Grain Bin 10 | Y | N | N | No | Hazards controlled from outside space |
| 26 | Dairy Center | Grain Bin 12 | Y | N | N | No | Hazards controlled from outside space |
| 27 | Dairy Center | Grain Bin 13 | Y | N | N | No | Hazards controlled from outside space |
| 21 | Dairy Center | Grain Bin 2 | Y | N | N | No | Hazards controlled from outside space |
| 23 | Dairy Center | Grain Bin 8  (labeled 7 2030) | Y | N | N | No | Hazards controlled from outside space |
| 24 | Dairy Center | Grain Bin 9  (labeled 2012) | Y | N | N | No | Hazards controlled from outside space |
| 22 | Dairy Center | Grain Bins 3-6 | Y | N | N | No | Hazards controlled from outside space |
| 18 | Dairy Center | Mothballed Grain Bin | Y | N | N | No | Bin is moth-balled; used for parts |
| 28 | Dairy Center | Knott Milk Storage Tank | Y | N | N | Yes | LOTO from outside the space |
| 29 | Feed Mill | L1 Elevator Leg Access Pit | Y | N | Y | No | A sign is needed |
| 30 | Feed Mill | Big Fat Tank | Y | N | N | Yes | No entry required |
| 31 | Feed Mill | South Elevator Pit | Y | N | Y | No | A sign is needed |
| 32 | Feed Mill | Weigh Hopper | Y | N | N | Yes | No entry required |
| 33 | Feed Mill | Molasses Tank (disabled) | Y | N | N | Yes | No entry required |
| 34 | Feed Mill | L2 Elevator Pit | Y | N | Y | No | A sign is needed |
| 35 | Feed Mill | Old Fat Tank (disabled) | Y | N | N | Yes | No entry required |
| 36 | Feed Mill | Outside Molasses Tank | Y | N | N | Yes | No entry required |
| 37 | Feed Mill | Sump | Y | N | Y | Yes | A new sign is needed |
| 39 | Golf Course | Backflow Preventer Pit | Y | N | N | No |  |
| 40 | Golf Course | Water Meter Pit | Y | N | N | No |  |
| 41 | Nat. Res. Airport Way | Water Shut-Off Valve | Y | N | N | No |  |
| 42 | Nat. Res. Airport Way | Pump House | N | N | N | No |  |
| 46 | Swine Center | Grain Bin 1002 | Y | N | N | No | No entry required |
| 47 | Swine Center | Grain Bin 1021 | Y | N | N | No | No entry required |
| 48 | Swine Center | Grain Bin 1 | Y | N | N | No | No entry required |
| 49 | Swine Center | Grain Bin 2 | Y | N | N | No | No entry required |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Location** | **Space** | **CS** | **PRCS** | **APCS** | **Sign** | **Notes** |
| 50 | Swine Center | Grain Bin 3 | Y | N | N | No | No entry required |
| 51 | Swine Center | Grain Bin 4 | Y | N | N | No | No entry required |
| 52 | Swine Center | Grain Bin 5 | Y | N | N | No | No entry required |
| 53 | Swine Center | Grain Bin 6 | Y | N | N | No | No entry required |
| 54 | Swine Center | Grain Bin 7 | Y | N | N | No | No entry required |
| 55 | Swine Center | Grain Bin 8 | Y | N | N | No | No entry required |
| 56 | Swine Center | Grain Bin 9 | Y | N | N | No | No entry required |
| 57 | Tukey Farm | Water Meter Pit | Y | N | N | No |  |
| 58 | Fuel Pump Area | 3 Wells | Y | N | Y | No | Procedures documented |
| 59 | Campus Wide | Sanitary Sewer System | Y | N | Y | No | Procedures documented |
| 60 | Campus Wide | Storm Water System | Y | N | Y | No | Procedures documented |
| 61 | Campus Wide | Utility Tunnels | Y | N | Y | No | Procedures documented |

**CS**: Confined Space **PRCS**: Permit Required Confined Space **APCS**: Alternate Procedures Confined Space

**Appendix B**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **VALID FOR 1 WORKSHIFT ONLY.**  **ALL PERMIT COPIES MUST REMAIN AT THE SITE UNTIL JOB IS COMPLETED.** | | | | | | |
| Site location or description:  Identify entry and exit points  Entry:  Exit: | | | | | | |
| Purpose of entry:  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | | |
| Supervisor(s) in charge of crews: | | Unit (Plumbing, electrical, Steam Plant, etc) | | | | |
|  | |  | | | | |
|  | |  | | | | |
| Job duration (no more than 10 hrs – new form must be completed each day):  Issue time: expiration time: | | | | | | |
| Communication procedures (including equipment):  Mobile phone will be used to notify unit supervisor of time of entry into the space and projected exit time. Primary communication will be direct visual and verbal communication between employees performing work.  Additional information: | | | | | | |
| REQUIREMENTS COMPLETED(Put N/A if item doesn’t apply) | **DATE** | | **TIME** | REQUIREMENTS COMPLETED(Put N/A if item doesn’t apply) | **DATE** | **TIME** |
| Lockout/De-energize/Try-out |  | |  | Secure Area (Post and Flag) |  |  |
| Line(s) Broken-Capped-Blank |  | |  | Ventilation |  |  |
| Purge-Flush and Vent |  | |  | Respirator(s) (Air Purifying) |  |  |
| Lighting (Explosive Proof) |  | |  | Protective Clothing |  |  |
| Hotwork Permit |  | |  | Standby safety personnel (N/A if alternate entry) |  |  |
| REQUIREMENTS COMPLETED (Put N/A if item doesn’t apply) | **DATE** | | **TIME** | REQUIREMENTS COMPLETED (Put N/A if item doesn’t apply) | **DATE** | **TIME** |
| Fire Extinguishers |  | |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AIR MONITORING | | | | | | | | | | |
| Substance Monitored | Permissible Levels | | | Monitoring Results – Record time below | | | | | | |
| Oxygen | 19.5% to 23.5% | | |  |  |  |  |  |  |  |
| LEL | Less than 10% | | |  |  |  |  |  |  |  |
| CO | Less than 35 ppm | | |  |  |  |  |  |  |  |
| H2S | Less than 10 ppm | | |  |  |  |  |  |  |  |
| Cl2 | Less than 1 ppm | | |  |  |  |  |  |  |  |
| Other |  | | |  |  |  |  |  |  |  |
| **Continuous Monitoring**: ❑ Yes ❑ No  **REMARKS:**  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | | | | | | |
|  | | | | | | | | | | |
| Air Tester Name | | Detector Unit ID# |  | | | | | | | |
|  | |  | **Honeywell BW GasAlert XT** | | | | | | | |
|  | |  | **Honeywell BW GasAlert XT** | | | | | | | |
| **REMARKS**: | | | | | | | | | | |
| **SUPERVISOR AUTHORIZATION - ALL CONDITIONS SATISFIED**  Print name Sign name | | | | | | | | | | |
| **Pullman Fire Department is the primary rescue per MOU.**  **Emergency Contact Phone Numbers:**  **911 to activate Pullman Fire Dept. as per MOU.**  **335-9000 to contact Facilities Operations dispatch.**  **Further information:** | | | | | | | | | | |
| Return this form to Supervisor and OHS AD upon job completion. | | | | | | | | | | |