Reed College
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Confined Space Program

Effective Date: November 15, 2007
Revision Date:

I. PURPOSE

Reed College has many confined spaces, for example, the physical plant boiler, electrical vaults, and the crawl space under Eliot Hall. By definition, a confined space is a small place that is difficult to enter and exit, large enough to work in, and not designed to be occupied. These spaces may also contain one or more hazards, such as hazardous atmospheres, oxygen deficiency, or physical hazards. Our Confined Space Program identifies when permits are required to work in these enclosed spaces and provides the minimum safety requirements so that all those authorized can safely enter, work in, and exit the spaces.

II. SCOPE

Employees at Reed College and contractors may need to enter a confined space to inspect, clean, fix, or maintain them, to do construction work, to rescue someone, or to do some other activity. Our Confined Space Program limits entry to spaces that do not require a permit, i.e., confined spaces that have no hazards or those where all of the hazards have been eliminated.

III. REFERENCES

- Occupational Safety and Health Administration (OSHA). 29 CFR (Code of Federal Regulations) 1910.146: Confined Space Standard. 1999.
- Oregon Occupational Safety and Health Administration (OR-OSHA). OAR (Oregon Administrative Rules) 437 Division 2, Subdivision J: 1910.146. 1999.

IV. RESPONSIBILITIES

Reed College Administration

- Provides commitment, leadership, and financial resources to support this program and reasonable assurance that all provisions of the program are met.
- Establishes and approves the policy and procedures for confined space entry for Reed College.

Supervisors

- Identify appropriately trained and medically qualified employees as authorized supervisor, entrant, and attendant.
- Provide equipment and supplies necessary for making safe entries into confined spaces.
- Provide and document appropriate training for affected employees.
- Inform all employees of the location and the hazards in each confined space, including posting permit-required confined spaces with a sign reading: "Permit-

Required Confined Space. Do Not Enter."

- Incorporate the elements of the Confined Space Program into written procedures for energized equipment maintenance.
- Inform contractors about the Confined Space Program and coordinate entry operations.
- Work with Environmental Health and Safety to identify confined spaces and to review and update the Confined Space Program as needed.

Affected Employees

Working in confined spaces is a team effort involving authorized entrants, attendants, and supervisors. All affected employees need to participate in training and follow all policies and procedures in this program.

Authorized Supervisors

- Know how to recognize, evaluate, and eliminate confined space hazards.
- Determine if the space requires a permit or is non-permitted.
- Use appropriate test instruments, specify necessary safety precautions, and properly complete the required entry or other work forms or permits.
- Prevent unauthorized persons from entering a confined space.
- Verify that entry conditions are acceptable before signing the non-permit confined space form (Appendix A) and allowing entry.
- Determine that acceptable entry conditions are maintained.
- Verify that rescue services are available and the means for summoning them are effective.

Authorized Entrants

- Know how to recognize, evaluate, and eliminate confined space hazards.
- Communicate with the attendant regularly.
- Test for atmospheric hazards in confined spaces.
- Use equipment properly.
- Notify the attendant of any signs, symptoms, or consequences of exposure.
- Exit from the confined space immediately when given an order to evacuate, an alarm warning, or a sign of a hazardous condition.

Authorized Attendants

- Know how to recognize, evaluate, and eliminate confined space hazards.
- Remain outside the space during entry operations until relieved by another attendant.
- Monitor the safety of the entrants.
- Prevent unauthorized persons from entering a confined space.
- Communicate with entrants, monitor their status, and tell them when to evacuate.

- Know the number and identity of authorized entrants.
- Terminate the entry and cancel the non-permit form when entry operations are finished or if a prohibited condition arises.
- Perform non-entry rescues if necessary.
- Summon emergency responders when entrants need their services.

Environmental Health and Safety

- Works with supervisors to identify confined spaces and to review and update the Confined Space Program as needed.
- Administer the Confined Space Program.
- Coordinates initial and refresher training as needed.
- Evaluates program effectiveness to provide reasonable assurance that the program procedures reflect current, applicable regulations and industry-accepted standards.

V. OSHA DEFINITIONS OF CONFINED SPACES

A. Non-Permit Confined Space:

"Low hazard space that does not contain or, with respect to atmospheric hazards, has the potential to contain any hazard capable of causing death or serious physical harm."

B. Permit Required Confined Space:

- "Contains or has the potential to contain a hazardous atmosphere.
- Contains a material with the potential for engulfment of an entrant.
- Has an internal configuration such than an entrant could be trapped or asphyxiated by inwardly converging walls or floor.
- Contains any other serious safety or health hazard."

VI. TRAINING

Reed College will provide training to affected employees:

- Before their first assigned confined space duties or whenever these duties change.
- Whenever a change in operations poses a hazard for which the employee has not received training.
- Whenever an employee deviates from the entry procedures required or the employee's knowledge or use of these procedures is inadequate.
- To establish employee proficiency in confined space duties and introduce new or revised procedures, as necessary.
- At least once every 3 years if none of the preceding requirements apply.

Topics covered will include:

- Definitions of confined space and permit-required confined space.

- Roles and duties of entrants, attendants, and entry supervisors.
- Confined space pre-entry evaluation.
- Confined space entry procedure.
- Atmospheric testing requirements.
- Site security.
- Isolation and elimination of hazards.
- Additional training as required by a specific job task, such as:
    - Asbestos Awareness
    - Control of Hazardous Energy (Lockout/Tagout)
    - Fall Protection
    - Hazard Communication / Right-to-Know
    - Machine Guarding
    - Personal Protective Equipment
    - Respiratory Protection
    - Working in Extreme Temperature Environments

VII. APPENDIX A: REED COLLEGE NON-PERMIT CONFINED SPACE FORM

This document must remain near the entrance of the confined space.

It is null and void if conditions for which it was issued change.

Non-Permit Confined Space Procedure

1. Identify all hazards associated with this space and remove them.
2. Fill out a lock-out/tag-out [LOTO] permit if needed.
3. Have all equipment on hand.
4. Begin atmospheric testing. Document your results on page 2.
5. Complete all items on the entry form.
6. Have all parties sign the entry form. If any item on the non-permit form is checked as "NO" (meaning not yet complete or available), do not sign the form.
7. Place this document in entrance of confined space until completion of work.
8. Re-energize and remove all LOTO equipment and signs.
9. Return equipment to service, if appropriate.
10. Record work completion:

    - Date: _____
    - Time: _____

11. Place completed form in Physical Plant file.

Reed College Non-Permit Confined Space Checklist

Space ID/Location:	Date:
Scope of Work:	Time:
	Expires (max of 1 shift):

Yes	No	Remove hazards associated with this space:
		No chemicals, solvents, or paints brought into the space?
		No hazardous operations performed in or around the space under this entry document?
		Space barricaded or coned off to prevent access to area by vehicle and pedestrian traffic?
		All energy sources eliminated through lock-out/tag-out procedures?

Atmospheric Tester:	Calibration Date:

Continuous Air Monitoring Required; Log Results And Time Initially and Every 20 Minutes or When Appropriate

Test Gas/Vapor (Acceptable Level)	Initial Result	Time	Repeat Result	Time	Repeat Result	Time	Repeat Result	Time	Tester Initials
O_2, Oxygen 20.5% to 21.0%									
Flammables (0% LEL)									
CO, Carbon Monoxide (<10 ppm)									
H_2S, Hydrogen Sulfide (0 ppm)									
Other Toxics (list) (Less than ½ PEL)									

Yes	No	Other Hazards:
		No unusual odors or residues in or around this space?
		No standing water in this space?
		Access good: ladder rungs in good shape, rungs all the way to top or bottom, etc.? Portable ladder in position and extends 3 feet above access point, etc.?
		Other (list):

If the above checklist indicates any potential hazards associated with the space, then you must consider this a Permit Required Confined Space. If you are not sure whether there are hazards associated with this space, contact your supervisor or EHS before proceeding with entry.

Your signature below acknowledges that the confined space has been evaluated to determine that no hazards exist in or around the space.

Entrant: _____ Attendant: _____

Supervisor: _____ Date: _____

VIII. APPENDIX B: REED CONFINED SPACE INVENTORY

Space ID	Space Location	Atmospheric Hazard	Specify Other	Entry Hazards	Other Hazards	Permit Status
Boiler #1	Physical Plant, lower level	Oxygen Flammables Carbon Monoxide Dust Ash Residuals Other...	Fuel bi-products	Very tight entry points into steam and mud drums	1. Elevated heat potential, contact and ambient 2. Potential energy sources are to be locked out/tagged out (steam, natural gas, fuel oil, igniters, mechanical devices such as forced draft fans), reduce all energy sources to zero 3. Falls from entrances to boiler access points.	Permit always required
Boiler #2	Physical Plant, lower level	Oxygen Flammables Carbon Monoxide Dust Ash Residuals Other...	Fuel bi-products	Very tight entry points into steam and mud drums	1. Elevated heat potential, contact and ambient 2. Potential energy sources are to be locked out/tagged out (steam, natural gas, fuel oil, igniters, mechanical devices such as forced draft fans), reduce all energy sources to zero 3. Falls from entrances to boiler access points.	Permit always required
Boiler #20266 (1000 ft3)	Chemistry Building, Boiler room	Oxygen Flammables Carbon Monoxide Dust Ash Residuals		Small confined space	1. Elevated heat potential, contact and ambient 2. Potential energy sources are to be locked out/tagged out (steam, natural gas, fuel oil, igniters, mechanical devices such as forced draft fans), reduce all energy sources to zero	Permit always required
Boiler #20678 (250 ft3)	Chemistry Building, Boiler room	Flammables Carbon Monoxide Dust Ash Residuals Oxygen		Small confined space	1. Elevated heat potential, contact and ambient 2. Potential energy sources are to be locked out/tagged out (steam, natural gas, fuel oil, igniters, mechanical devices such as forced draft fans), reduce all energy sources to zero	Permit always required

Cistern (drywell)	NW corner of campus in field above pond (north of old community garden area)	Oxygen Flammables Carbon Monoxide		Deep space, varying depths of water	1. Pedestrian and vehicle traffic 2. Fall into space via unguarded edge Careful consideration should be given to the depth of water if considering Non- Permit status.	Candidate for Non-Permit status
Communications/ Fiber optic Vault	Elliot Circle	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic 2. Potential low voltage exposure 3. If entrants are at risk of shock by coming in contact with energized electrical systems, they shall be trained in accordance with OAR 437, Division 2, Subdivision S: Electrical 1910.332 4. Fall into space via unguarded edge	Candidate for Non-Permit status
Communications/ Fiber optic Vault	Steele Hall at SW corner in grass	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic 2. Potential low voltage exposure 3. If entrants are at risk of shock by coming in contact with energized electrical systems, they shall be trained in accordance with OAR 437, Division 2, Subdivision S: Electrical 1910.332 4. Fall into space via unguarded edge	Candidate for Non-Permit status
Condensate return tank	Physical Plant, lower level	Oxygen		Very tight entry point (14.5 inches)	1. Elevated heat potential, contact and ambient 2. Contact with boiler treatment chemicals mixed into boiler water	Permit always required

Crawl space under Elliot Hall	Crawl space is accessed via the M1-12 Mechanical space (utility tunnel)	Asbestos		Very warm in space due to steam piping, very tight quarters due to piping	1. Elevated heat potential, contact and ambient 2. There are several entrances to this crawl space via Elliot Hall, all "hatches" are concealed under carpet/flooring 3. Very confining space Use appropriate PPE for asbestos if ACM materials are damaged or impacted	Candidate for Non-Permit status
Deaerator Tank	Physical Plant, lower level	Oxygen		Very tight entry point (14.5 inches)	1. Elevated heat potential, contact and ambient 2. Contact with boiler treatment chemicals mixed into boiler water	Permit always required
Electrical Vault	Between Library & ETC	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic and vehicle traffic (in several cases) 2. Contact with electrical 3. Ensure electrical is locked out/tagged out before working on 4. Remove standing water from vault prior to entry 5. If entrants are at risk of shock by coming in contact with energized electrical systems, they shall be trained in accordance with OAR 437, Division 2, Subdivision S: Electrical 1910.332	Candidate for Non-Permit status
Electrical Vault	West parking lot, north end in grass	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic and vehicle traffic (in several cases) 2. Contact with electrical 3. Ensure electrical is locked out/tagged out before working on 4. Remove standing water from vault prior to entry 5. If entrants are at risk of shock by coming in contact with energized electrical systems, they shall be trained in accordance with OAR 437, Division 2, Subdivision S: Electrical 1910.332	Candidate for Non-Permit status

Electrical Vault	SW corner of Steele Hall	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic and vehicle traffic (in several cases) 2. Contact with electrical 3. Ensure electrical is locked out/tagged out before working on 4. Remove standing water from vault prior to entry 5. If entrants are at risk of shock by coming in contact with energized electrical systems, they shall be trained in accordance with OAR 437, Division 2, Subdivision S: Electrical 1910.332	Candidate for Non-Permit status
Electrical Vault	Facilities Service Bldg., east side of road	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic and vehicle traffic (in several cases) 2. Contact with electrical 3. Ensure electrical is locked out/tagged out before working on 4. Remove standing water from vault prior to entry 5. If entrants are at risk of shock by coming in contact with energized electrical systems, they shall be trained in accordance with OAR 437, Division 2, Subdivision S: Electrical 1910.332	Candidate for Non-Permit status
Electrical Vault	East parking lot	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic and vehicle traffic (in several cases) 2. Contact with electrical 3. Ensure electrical is locked out/tagged out before working on 4. Remove standing water from vault prior to entry 5. If entrants are at risk of shock by coming in contact with energized electrical systems, they shall be trained in accordance with OAR 437, Division 2, Subdivision S: Electrical 1910.332	Candidate for Non-Permit status

Electrical Vault	Woodbridge at SW corner in sidewalk	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic and vehicle traffic (in several cases) 2. Contact with electrical 3. Ensure electrical is locked out/tagged out before working on 4. Remove standing water from vault prior to entry 5. If entrants are at risk of shock by coming in contact with energized electrical systems, they shall be trained in accordance with OAR 437, Division 2, Subdivision S: Electrical 1910.332	Candidate for Non-Permit status
Electrical Vault	Woodbridge at SE corner in sidewalk	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic and vehicle traffic (in several cases) 2. Contact with electrical 3. Ensure electrical is locked out/tagged out before working on 4. Remove standing water from vault prior to entry 5. If entrants are at risk of shock by coming in contact with energized electrical systems, they shall be trained in accordance with OAR 437, Division 2, Subdivision S: Electrical 1910.332	Candidate for Non-Permit status
Electrical Vault	McKinley on south side in grass	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic and vehicle traffic (in several cases) 2. Contact with electrical 3. Ensure electrical is locked out/tagged out before working on 4. Remove standing water from vault prior to entry 5. If entrants are at risk of shock by coming in contact with energized electrical systems, they shall be trained in accordance with OAR 437, Division 2, Subdivision S: Electrical 1910.332	Candidate for Non-Permit status

Electrical Vault	Elliot Circle (2x)	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic and vehicle traffic (in several cases) 2. Contact with electrical 3. Ensure electrical is locked out/tagged out before working on 4. Remove standing water from vault prior to entry 5. If entrants are at risk of shock by coming in contact with energized electrical systems, they shall be trained in accordance with OAR 437, Division 2, Subdivision S: Electrical 1910.332	Candidate for Non-Permit status
Fire line Meter Vault	At entrance to East Parking lot, in the grass	Oxygen Flammables Carbon Monoxide		No ladder	1. Pedestrian foot traffic 2. Fall into space via unprotected edge	Candidate for Non-Permit status
Fire line Meter Vault	At entrance to East Parking lot, in the grass	Oxygen Flammables Carbon Monoxide			1. Pedestrian foot traffic 2. Fall into space via unprotected edge	Candidate for Non-Permit status
Freight/side walk elevator	West side of Physics Bldg.	Oxygen Flammables Carbon Monoxide		No ladder	1. Pedestrian traffic 2. Vehicle traffic 3. Lockout/tag out electrical and hydraulics. Reduce all energy sources to zero. 4. Fall into space via unguarded edge	Candidate for Non-Permit status
Hot Water Heater	Chemistry Building, Boiler room	Oxygen Flammables		Small entry point (14.5 inches) and small confined space	1. Elevated heat potential, contact and ambient 2. All inlets/outlets are to be secured to prevent entry of water.	Candidate for Non-Permit status
Hot Water utility vault	Facilities Service Bldg., east side in the roadway	Oxygen Flammables Carbon Monoxide		Deep space	1. Pedestrian and vehicle traffic 2. Elevated heat potential, contact and ambient 3. Fall into space via unguarded edge	Candidate for Non-Permit status

Hot Water utility vault	North end of Dam	Oxygen Flammables Carbon Monoxide		Deep space	1. Pedestrian and vehicle traffic 2. Elevated heat potential, contact and ambient 3. Fall into space via unguarded edge	Candidate for Non-Permit status
Hot Water utility vault	Woodbridge, SE corner in sidewalk	Oxygen Flammables Carbon Monoxide		Deep space	1. Pedestrian and vehicle traffic 2. Elevated heat potential, contact and ambient 3. Fall into space via unguarded edge	Candidate for Non-Permit status
Hot Water utility vault	Chittick, east end in landscape	Oxygen Flammables Carbon Monoxide		Deep space	1. Pedestrian and vehicle traffic 2. Elevated heat potential, contact and ambient 3. Fall into space via unguarded edge	Candidate for Non-Permit status
Irrigation Vault	Facilities Services Bldg., East side in parking area near lake	Oxygen Flammables Carbon Monoxide		Deep space	1. Pedestrian and vehicle traffic 2. Fall into space via unguarded edge	Candidate for Non-Permit status
Lab Sink Sump	Chemistry Building, Boiler room	Oxygen Flammables Other...	Toxics (anything dumped down lab sinks)	Very confined space	1. Unknown materials being dumped down lab sinks 2. Contact with the materials	Permit always required
Sanitary Lift Station	Physics Bldg.	Oxygen Flammables Other...	Hydrogen sulfide, unknowns from materials dumped into space	No ladder, very tight entry points	1. Employee foot traffic 2. Contact with effluent 3. Lockout/tagout of space energy sources and secure pipelines that feed station 4. Very small space	Permit always required
Sanitary Lift Station	Chemistry Bldg.	Oxygen Flammables Other...	Hydrogen sulfide, unknowns from materials dumped into space	No ladder, very tight entry points	1. Employee foot traffic 2. Contact with effluent 3. Lockout/tagout of space energy sources and secure pipelines that feed station 4. Very small space	Permit always required
Sanitary Lift Station	Library basement (LL2)	Oxygen Flammables Other...	Hydrogen sulfide, unknowns from materials dumped into space	No ladder, very tight entry points	1. Employee foot traffic 2. Contact with effluent 3. Lockout/tagout of space energy sources and secure pipelines that feed station 4. Very small space	Permit always required

Sanitary Lift Station	Vollum Hall basement	Oxygen Flammables Other...	Hydrogen sulfide, unknowns from materials dumped into space	No ladder, very tight entry points	1. Employee foot traffic 2. Contact with effluent 3. Lockout/tagout of space energy sources and secure pipelines that feed station 4. Very small space	Permit always required
Storm Interceptor Vault	Between the Library and the ETC	Oxygen Flammables		Varying depths of water	1. Pedestrian foot traffic 2. This space cannot be isolated from the storm sewer system so entry should only be done during dry periods with no rain and low to no runoff. 3. Because this space cannot be isolated from the rest of the storm sewer system, during entry conditions air monitoring is required	Candidate for Non-Permit status
Utility Vault (Fire main valve vault)	In the library quad	Oxygen Flammables		No ladder	1. Pedestrian foot traffic 2. Fall into space via unprotected edge	Candidate for Non-Permit status
Utility Vault (Fire main valve vault)	South end of west parking lot in landscape	Oxygen Flammables		No ladder	1. Pedestrian foot traffic 2. Fall into space via unprotected edge	Candidate for Non-Permit status
Utility Vault (steam & condensate lines)	In the library quad	Oxygen Flammables Carbon Monoxide		No ladder	1. Pedestrian traffic 2. Elevated heat potential, contact and ambient 3. Fall into space via unprotected edge	Candidate for Non-Permit status
Utility Vault (steam & condensate lines)	Elliot Circle	Oxygen Flammables Carbon Monoxide		No ladder	1. Pedestrian traffic 2. Elevated heat potential, contact and ambient 3. Fall into space via unprotected edge	Candidate for Non-Permit status
Water Backflow Vault	South of Elliot Circle in front lawn	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic 2. Fall into space via unguarded edge	Candidate for Non-Permit status
Water Backflow Vault	Elliot Hall, NE corner	Oxygen Flammables Carbon Monoxide		Varying depths of water	1. Pedestrian foot traffic 2. Fall into space via unguarded edge	Candidate for Non-Permit status