

Program Subject: Confined Space Entry Program

1. PURPOSE

- 1.1 To protect UW-Eau Claire employees from the serious hazards associated with entering confined spaces to perform maintenance, cleaning, or other types of work.
- 1.2 To ensure that safe work practices are utilized during all activities regarding the permit space to prevent personal injuries and illnesses that could occur.
- 1.3 To inform interested persons, including employees and/or contractors, that UW-Eau Claire is complying with the OSHA Confined Space Standard, Title 29 CFR 1910.146.
- 1.4 To reduce and/or eliminate whenever possible hazards, all confined space hazards to reclassify permit-required confined spaces to non-permit required confined spaces.

2. SCOPE

- 2.1 Identification of spaces on campus, such as equipment, manholes, pipe chases, tunnels, boilers, tanks, and vaults that Facilities shops enter to perform work, and which are properly identified as Confined Spaces.
- 2.2 Identification of confined spaces that are "Permit required" confined spaces.
- 2.3 Establish safe practices and procedures that are required when entering, exiting and working in these confined spaces.

3. RESPONSIBILITIES

- 3.1 Department of "Risk Management, Safety and Sustainability" (RMSS)
 - 3.1.1 Be responsible for ensuring the development and implementation of this policy.
 - 3.1.2 Provide necessary resources as available to carry out the program.
 - 3.1.3 Establish and update the written Permit-required Confined Space Entry Program, as necessary.
 - 3.1.4 Provide awareness level training for employees who may encounter a confined space during the performance of their daily duties.
 - 3.1.5 Review records of confined space entry operations and maintain training records.
 - 3.1.6 Assist supervisors in identifying "Permit required" and "Non-permit required" confined spaces.
 - 3.1.6.1 Classify and post "Permit Required Confined Space" signage as required.
 - 3.1.7 Evaluate the overall effectiveness of the confined space entry program and ensure that employees participating in entry operations are protected from permit space hazards.
 - 3.1.8 Provide instruction to personnel on the proper use and selection of appropriate equipment that meet requirements of confined space entry.
 - 3.1.9 Maintain log of all confined spaces.

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3.2 Supervisors

- 3.2.1 Identify and report job areas and locations that are or may be confined spaces. A list of confined spaces that are identified shall be submitted to (RMSS).
- 3.2.2 Identify and evaluate the hazards of permit spaces before employees enter them.
- 3.2.3 Identify employees who will enter confined spaces.
- 3.2.4 Identify and schedule all affected employees for initial training in Confined Space Entry with (RMSS).
 - 3.2.4.1 Ensure that all employees who perform any confined space entry receive the appropriate level of training.
- 3.2.5 Provide necessary personal protective equipment to employees.
- 3.2.6 Conduct work site inspections to review shop compliance with confined space entry procedures.
- 3.2.7 Inform outside contractors of all permit-required confined spaces.
- 3.2.8 Inform the contractor of any precautions or procedures that need to be observed in or near the permit space.
- 3.2.9 Coordinate entry operations with the contractor when University employees are working in or near a permit space.
- 3.2.10 All canceled entry permit shall retain for at least one (1) year to facilitate the review of the permit required confined space program.

3.3 Employees

- 3.3.1 Attend Confined Space training if required.
- 3.3.2 Be familiar with confined space locations they may be required to work in.
- 3.3.3 Follow the requirements of this policy when working in confined spaces.
- 3.3.4 Report changes in hazardous conditions of a confined space to immediate supervisor.

3.4 Contractors and their employees (See section 4.12 for more details).

- 3.4.1 Comply with UW-Eau Claire's confined space entry program and/or have a Confined Space Entry Procedure that meets OSHA requirements.
- 3.4.2 Notify the Facilities Project Manager, or other person designated by the Project Manager, prior to commencing work in a confined space.

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4. PROGRAM COMPONENTS

4.1 Definitions

- 4.1.1 **Attendant** = an employee designated to remain outside the confined space and maintain constant communication with the entrant who performs the assigned duties inside the confined space.
- 4.1.1 **Atmospheric Testing Equipment** = the equipment used to monitor levels of oxygen, flammable, combustible and toxic gases prior to and periodically during work in a confined space.
- 4.1.2 **Authorized entrant** = an employee who is authorized by the employer to enter a permit space.
- 4.1.3 **Confined Space** = a space that is:
- Large enough and so configured that an employee can bodily enter and perform assigned work.
 - Has limited or restricted means for entry or exit; and
 - Is not designed for continuous employee occupancy.
- 4.1.4 **Engulfment** = the surrounding and effective capture of a person by finely divided particulate matter or a liquid substance that can cause asphyxiation, drowning, or can exert enough force on the body to cause death by strangulation, constriction or crushing.
- 4.1.5 **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 to the confined space.
- 4.1.6 **Entry** = any action resulting in any part of the person's body breaking the plane of any opening of the confined space, which includes any ensuring work activities inside the confined space, and all the periods of time that the confined is occupied.
- 4.1.7 **Entry Permit** = the written or printed document provided by entry supervisor that must be completed before entry into a permit required confined space for a stated purpose during a specified time.
- 4.1.8 **Entry Supervisor** = a person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry.
- 4.1.9 **Hazardous Atmosphere** = an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury or acute illness.
- 4.1.10 **Lower Explosive Limit (LEL)** = minimum concentration of a flammable gas or vapor in air which will ignite if an ignition source is present. At concentrations lower than the LEL, the mixture is too "lean" to burn.
- 4.1.11 **Rescue Service** = any service called to the confined space by the 9-911 operator.
- 4.1.12 **Upper Explosive Limit (UEL)** = highest concentration of a substance in air that will produce a flash of fire when an ignition source (heat, arc, or flame) is present. At concentrations higher than the UEL, the mixture is too "rich" to burn.

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4.2 Identification of Confined Spaces

- 4.2.1 Spaces in which Facilities employees perform work must be evaluated for hazards, both known and potential.
- 4.2.2 Spaces that meet ALL the following criteria must be identified as a confined space. **(See Appendix A)** for more details.
 - 4.2.2.1 A space that is large enough and so configured that an employee can bodily enter and perform assigned work.
 - 4.2.2.2 A space that is not intended for continuous employee occupancy.
 - 4.2.2.3 A space that has limited or restricted means for worker entry or exit due to the number, size, or location of openings.
- 4.2.3 Categories of Confined Space:
 - 4.2.3.1 **Non-Permit Required Confined Space**
 - a. A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.
 - 4.2.3.2 **Permit Required Confined Space** – A confined space will be classified as Permit-Required if it is known or suspected to present one or more of the following hazardous conditions:
 - a. Contains or has a potential to contain a hazardous atmosphere.
 - b. Contains a material that has the potential for engulfing an entrant.
 - c. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section; or
 - d. Contains any other recognized serious safety or health hazard.

NOTE: If a space is identified as Permit-Required, a sign reading “DANGER- PERMIT REQUIRED CONFINED SPACE, DO NOT ENTER” must be posted to warn employees of danger.

 - e. If it is necessary to “**ENTER**” a permit-required space to eliminate hazards that space, (RMSS) do not allow employees entering the space to eliminate the hazards. Facilities supervisor must contract for contractors to perform the job.
 - f. If a permit required confined space on UW-Eau Claire campus CANNOT be reclassified to non-permit required, Facilities Project Manager and/or supervisor must contact the contractors to perform the job. See section 4.12 and **Appendix C** for more details.

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4.2.2.3 **Reclassification of Confined Space (See Appendices B & D)** for more details.

- a. When there are changes in the use or configuration of a non-permit confined space that might increase the hazards to entrants, Facilities shall re-evaluate that space and, if necessary, reclassify it as a permit-required confined space.
- b. A permit-required confined space may be reclassified as a “Non-Permit Confined Space” per 29 CFR 1910.146(c)(7) under the following conditions:
 - ✓ If the permit space poses no actual or potential atmospheric hazards, are eliminated without entry into the space.
- c. If a hazard arises within a reclassified space, all employees must leave the space immediately and the space must be re-evaluated to determine whether it must once again be classified as permit required.
- d. Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program requirement.

4.3 **Evaluation of Confined Spaces** – Confined spaces need to be evaluated for hazards that exist which could cause severe injury or health problems for employees who enter them. (See Appendix E) for more details.

4.3.1 **Hazards that require classification as a Permit-required Confined Space.**

4.3.1.1 **Oxygen Deficient Atmospheres**

- a. An atmosphere containing less than 19.5% oxygen is considered oxygen deficient.
- b. The oxygen level inside a confined space may be decreased as the result of either consumption or displacement.
 - ✓ Oxygen is consumed during combustion of flammable materials, as in welding, cutting, or brazing.
 - ✓ Oxygen can also be consumed during chemical reactions such as in the formation of rust on the exposed surfaces of a confined space.
 - ✓ Oxygen levels can also be reduced as the result of oxygen displacement by other gases.

4.3.1.2 **Flammable Atmospheres**

- a. Flammable atmospheres are generally the result of flammable gases, vapors, dust mixed in certain concentrations with air, or an oxygen-enriched atmosphere.
 - ✓ Oxygen enriched atmospheres are those atmospheres which contain an oxygen concentration greater than 23.5%.
- b. Combustible gases or vapors can accumulate within a confined space when there is inadequate ventilation.

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4.3.1.3 Toxic Atmospheres

- a. Chemical substances stored in the confined space may cause a toxic atmosphere.
- b. Toxic fumes produced by processes near the confined space may enter and accumulate in the confined space.
- c. Hazardous fumes or atmosphere caused by **a & b** above may result from:
 - ✓ Products or substances absorbed by the walls giving off toxic vapors when removed or when the residual material is cleaned up.
 - ✓ Toxic vapors from products or substances remaining in the atmosphere due to poor ventilation.
 - ✓ Toxic vapor resulting from work being conducted inside the confined space.

4.3.1.4 Mechanical and Physical Hazards

- a. Conditions such as rotating or moving mechanical parts or energy sources.
- b. Materials that could present the possibility of engulfment.
- c. Physical factors such as heat, cold, noise, vibration, and fatigue that can contribute to accidents.

4.3.2 Management and Engineering Controls to reduce or eliminate Risk

4.3.2.1 **Elimination** – The ideal solution would be to eliminate the confined space hazard altogether, by eliminating the need to enter the confined space.

- a. Performing the task or process from outside the confined space.
- b. Retrieving an object with long handled tools.
- c. Removing unwanted chemical substances in the confined space.

4.3.2.2 **Substitution** – When possible:

- a. Substitute a hazardous chemical with a less dangerous one.
- c. Replace flammable substances with non-flammable ones.
- d. Substitute a less hazardous material to control a vapor hazard.
- e. Use non-toxic substances instead of toxic ones.

4.3.2.3 **Isolation** – Accomplish all the following that are necessary to completely protect against the release of energy and material into the confined space:

- a. Prevent the introduction of hazardous materials from interconnecting equipment such as piping, ducts, vents, drains or other means.
- b. De-energize all electrical, mechanical, pneumatic, and hydraulic systems and all other energy sources.
- c. Block or disconnect all mechanical linkages.
- d. Turn off and lock out all sources of ignition within the space, and those nearby which are close enough to pose a hazard.
- e. Guard or remove hazardous equipment from the area.
- f. Ensure all necessary isolation procedures are fully implemented.

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4.3.2.4 Personal Protective Equipment (PPE)

a. Use appropriate PPE based on anticipated exposure to hazard.

Note: See Personal Protective Equipment Policy for more details.

b. Use of respiratory protection must be in accordance with the Respiratory Protection Policy.

4.4 Entering Confined Spaces

4.4.1 **General Requirement** – Before entry into any confined space, the following general procedures shall be followed.

4.4.1.1 Guard or barricade entry opening to prevent unauthorized entry; and to protect entrants from external hazards.

4.4.1.2 All hazards of the confined space must be identified and evaluated before employees can enter.

4.4.1.3 Prior to entry, atmospheric testing outlined in section 4.5 of this policy shall be completed.

4.4.1.4 The confined space must be isolated as outlined in Section 4.3.2.3.

4.4.1.5 Atmospheric hazards must be eliminated or controlled by removal or ventilation.

4.4.1.6 Emergency communication equipment (at a minimum, a two-way radio) should be at the site.

4.4.1.7 The attendant (stand-by person) must be stationed at the site, trained equivalent to the entrant, and trained in the duties of the attendant.

4.4.1.8 All entrants must be trained in the duties of the entrant.

4.4.1.9 Equipment needed for safe entry, egress or rescue shall be provided.

4.4.1.10 Employees who enter the confined space have a right to review and observe all checks on the confined space prior to entering the space.

4.5 **Air Monitoring** – The atmosphere of a space shall be analyzed using equipment of enough sensitivity and specificity to identify and evaluate any hazardous atmospheres that may exist.

4.5.1 Prior To Entry

4.5.1.1 Air monitoring shall be completed to test for oxygen levels, flammability, and for sulfur dioxide, carbon monoxide, and any other suspected or known atmospheric hazard.

a. Entry is NOT allowed if Oxygen levels are less than 19.5% or more than 23.5% by volume.

b. Entry is NOT allowed if concentration of Flammable/Explosive Gases, vapors or mists are above 10% of the Lower Flammable Limit (LFL) or Lower Explosive Limit (LEL), is detected.

c. Entry is NOT allowed if toxin levels less than the PEL, TLV, STEL, Ceiling, or manufacturer's recommendations are detected.

4.5.1.2 Other atmospheric conditions, such as temperature extremes, that may present a hazard must also be monitored.

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- 4.5.2 **Air Monitoring During Entry**
 - 4.5.2.1 The entrant(s) must wear or carry the monitoring devices with them into the space to detect changes in oxygen content or the presence of flammable and/or toxic gases
 - 4.5.2.2 To the extent feasible, periodic monitoring, no less than an hour increments, shall be conducted throughout the entry to ensure that atmospheric conditions remain within the acceptable limits identified in 4.5.1 above.
 - 4.5.2.3 Entrant(s) must leave the space immediately if atmospheric conditions develop that are outside the acceptable limits identified in 4.5.1
- 4.6 **Ventilation**
 - 4.6.1 If the atmosphere is found to lack oxygen or to contain unsafe levels of toxic gas or vapor, the space must be mechanically ventilated to acceptable levels before entry.
 - 4.6.1.1 Use of an air blower is required to ensure acceptable environmental conditions. **FUEL-SUPPLIED BLOWERS SHALL NOT BE USED.**
 - 4.6.1.2 Place the air blower in take sufficiently upwind or away from the entry point to prevent mixing of the intake air with exhausted air.
 - 4.6.1.3 Direct the forced air ventilation to ventilate the immediate areas where any entrant is or will be present within the space.
 - 4.6.1.4 Continue forced air ventilation until all entrants have left the space.
- 4.7 **Entering Procedures:**
 - 4.7.1 Once the confined space requirement of the sections 4.4 to 4.6 are fully executed, the authorized entrants may enter the confined space.
 - 4.7.2 The attendant shall retest the air periodically while the employees are in the confined space to ensure that atmospheric conditions are acceptable. **(See Appendix C)**
 - 4.7.2.1 If air tests are not acceptable, the attendant will order entrant(s) out of the confined space immediately.
 - 4.7.3 The authorized entrant(s) must stay in touch with the attendant by sight and/or verbal communication throughout the work.
 - 4.7.4 If circumstances cause an interruption in the work, a new confined space entry permit must be completed.
 - 4.7.4.1 The current/existing permit must be canceled anytime employees exit the space.
 - 4.7.4.2 Before each entry, the air must be tested, and a new permit filled out and approved by the Entry Supervisor.
 - 4.7.5 A written record of the pre-entry test results will be made on the confined space entry permit and kept at the work site for the duration of the job.
 - 4.7.6 Once work in the confined space is completed:
 - 4.7.6.1 Ensure that all workers and all equipment are out of the confined space.
 - 4.7.6.2 Remove any ventilation devices.
 - 4.7.6.3 Close the access cover to the confined space.
 - 4.7.6.4 Remove locks/tags from devices locked out and re-energize the equipment.
 - 4.7.6.5 Return all canceled permits to the immediate or entry supervisor.

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4.8 Duties of Entry Supervisor

- 4.8.1 Know the hazards which may be faced during entry.
- 4.8.2 Make sure entry permit is completed before authorizing or allowing entry.
- 4.8.3 Make sure the necessary procedures, practices, and equipment for safe entry are in effect before allowing entry.
- 4.8.4 Determine that entry operations remain consistent with the terms of the entry permit, and that acceptable entry conditions are maintained.
- 4.8.5 Take the necessary actions when terminating an entry operation, such as closing off a permit space and canceling the permit, once the work authorized by the permit has been completed.
- 4.8.6 Take appropriate measures to remove unauthorized personnel who are in or near entry permit spaces. **Note: An Entry Supervisor may also serve as an attendant or authorized entrant.**

4.9 Duties of Entrant

- 4.9.1 Complete training as required for confined space entry.
- 4.9.2 Comply with the confined space entry procedures.
- 4.9.3 Recognize potential permit space hazards, including information on the mode, signs and symptoms and consequences of exposure.
- 4.9.4 Use proper equipment, which includes:
 - 4.9.4.1 Atmospheric testing and monitoring equipment.
 - 4.9.4.2 Ventilating equipment needed to obtain acceptable entry conditions.
 - 4.9.4.3 Communication equipment necessary to maintain contact with the authorized attendant.
 - 4.9.4.4 Personal protective equipment, as needed.
 - 4.9.4.5 Lighting equipment, barriers, and shields, as needed.
 - 4.9.4.6 Other equipment necessary for safe entry into and rescue from permit space.
- 4.9.5 Communicate with the attendant to enable the attendant to monitor entrant status and to alert entrant of the need to evacuate the space if necessary.
 - 4.9.5.1 Alert the attendant whenever:
 - a. The entrant recognizes any warning signs or symptoms of dangerous exposure.
 - b. The entrant detects a condition prohibited by the permit.
 - 4.9.5.2 Understand emergency procedures in case of an accident in a confined space.
 - 4.9.5.3 **Exit the permit space as soon as possible whenever:**
 - a. The attendant orders evacuation.
 - b. The entrant recognizes any warning signs or symptoms of dangerous exposure.
 - c. The entrant detects a prohibited condition.
 - d. An evacuation alarm is activated.
 - e. The entrant perceives there is danger.

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4.10 Duties of Attendant

- 4.10.1 Remain outside the permit space(s) always during entry operation until relieved by another attendant.
- 4.10.2 Recognize potential permit space hazards, including information on the mode, signs and symptoms, and consequences of exposure.
- 4.10.3 Communicate with authorized entrants to monitor entrant status and to alert entrants of the need to evacuate the space when conditions warrant.
- 4.10.4 Monitor activities inside and outside the permit space to determine if it is safe for entrants to remain in the space and ordering the authorized entrants to evacuate the permit space immediately under any of the following conditions:
 - 4.10.4.1 The attendant detects a prohibited condition.
 - a. The attendant detects the behavioral effects of hazard exposure in an authorized entrant.
 - b. The attendant detects a situation outside the space that could endanger the authorized entrants.
 - c. The attendant cannot effectively and safely perform all the duties required by this program.
 - 4.10.4.2 Summon rescue and other emergency services as soon as the attendant determines that escape is required from the space hazards:
 - a. Warn unauthorized persons away from the permit space.
 - b. Request unauthorized persons to exit immediately if they have entered the permit space.
 - c. Inform the entry supervisor if unauthorized persons have entered the permit space.
 - 4.10.4.3 Do not enter the permit space to attempt rescue of entrants.
 - 4.10.4.4 Use proper rescue equipment provided for that use and performs any other assigned rescue and emergency duties without entering the permit space.

4.11 Facilities Rescue Plan

- 4.11.1 A telephone (or 2-way radio to contact the Facilities office) must be available at all entries to facilitate calling for emergency services.
- 4.11.2 Facilities has selected to use 9-911 as a method of obtaining emergency services.
- 4.11.3 When calling for emergency services, be prepared to provide the following information:
 - 4.11.3.1 Identify the location as a "Permit-required" confined space.
 - 4.11.3.2 The specific location of the space (Building and room number).
 - 4.11.3.3 The nature and details of the emergency.
 - 4.11.3.4 The types of hazards that are present in the space.
- 4.11.4 If injured and entrant is exposed to a chemical or material that has an SDS, have that sheet immediately available to the medical response team.
- 4.11.5 Do not enter the confined space until help arrives.

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4.12 Contractor Work in University Permit-Required Confined Space

- 4.12.1 The Project Manager and/or supervisor of the shop hiring a contractor to perform work that involves entry to a permit space must:
 - 4.12.1.1 Inform the contractor that the workplace contains permit spaces that can only be entered by use of a code compliant permit space program.
 - 4.12.1.2 Inform the contractor of the characteristics that make the space a permit space.
 - 4.12.1.3 Inform the contractor of any precautions or procedures that Facilities has implemented to protect employees in or near the permit spaces where the contractor will be working.
 - 4.12.1.4 Debrief the contractor after the entry operations regarding the permit space program followed and any hazards confronted or created during the entry operations.
- 4.12.2 The contractor shall have a Confined Space Entry Procedure that meets OSHA requirements, and:
 - 4.12.2.1 Obtain any information from Facilities regarding permit space hazards and entry operations.
 - 4.12.2.2 Notify the Facilities Project Manager, or other person designated by the Facilities Project Manager, prior to commencing work in a confined space.
 - 4.12.2.3 Inform Facilities of the permit space program that the contractor will follow and of any hazards they confront or create.
- 4.12.3 When both Facilities and contractor employees will be working in or near permit spaces, entry operations must be coordinated between Facilities and the contractor.
- 4.12.4 Facilities Supervisor shall complete the confined space entry permit (**See Appendix C**) before approval can be given to enter a permit-required confined space.

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5. TRAINING

5.1 General Training

5.1.1 All University of Wisconsin Eau Claire employees who will enter confined spaces shall be adequately trained in their functional duties prior to any confined space entry. The training shall include:

5.1.1.1 An explanation of the general hazards associated with confined spaces.

5.1.1.2 A discussion of specific confined space hazards associated with the building, location, or operation.

5.1.1.3 A discussion of the reason for the proper use of, and the limitations of, personal protective equipment (PPE) and additional safety equipment required for permit space entry.

5.1.1.4 An explanation of permits and other procedural requirements for conducting a confined space entry in this policy.

5.1.1.5 A clear understanding of what conditions would prohibit entry.

5.1.1.6 Information on the proper methods to respond to permit space entry emergencies.

5.1.1.7 A description of how to recognize symptoms of overexposure to probable air contaminants in themselves and co-workers, and methods for alerting the attendant(s).

5.2 Specific Training

5.2.1 Training for atmospheric monitoring personnel shall include proper use of monitoring instruments, including instruction of the following:

5.2.1.1 The proper use of the equipment.

5.2.1.2 The calibration of the equipment.

5.2.1.3 The sampling strategies and techniques.

5.2.1.4 The nature of the work to be performed

5.2.1.5 The hazardous exposure limits (PEL, TLV, LEL, UEL, etc.).

Appendices

- A. [Confined Space Identification](#)
- B. [Procedures for Confined Space Entry](#)
- C. [Confined Space Entry Permit](#)
- D. [Permit Required Confined Space Reclassification Form](#)
- E. [Confined Space Evaluation Form](#)