

YOUNGSTOWN STATE UNIVERSITY

CONFINED SPACE ENTRY PLAN

Revised April 2007

Introduction

On January 14, 1993 the Occupational Safety and Health Administration (OSHA) published in the Federal Register (58 Federal Register, No. 9, pp. 4549-4563) its final rule concerning the safe entry into confined spaces. This rule was codified into law as 29 CFR §1910.146 and is entitled Permit-required Confined Spaces with an implementation date of April 15, 1993.

The purpose of the standard is to protect workers who may have the occasion to enter into areas identified as Confined Spaces where they may be exposed to serious atmospheric hazards, such as, toxic vapors and/or oxygen deficient environments. The standard also recognizes that physical hazards including explosions, fires, suffocation by engulfment in either dry or wet materials, and the hazards presented by electrical equipment and machinery are possible when employees enter a Confined Space unless they have well defined procedures specifically designed to assure their safety.

This manual was specifically developed for Youngstown State University in its attempt to protect employees from the hazards associated with entrance into confined spaces which include but are not limited to manholes, exhaust ducts, pipelines, deep sumps, elevator shafts, storage tanks, processing vessels and all other areas as defined in 29 CFR §1910.146. It depicts the policies and procedures of Youngstown State University for administering a Permit-Required Confined Space Program as required by law to protect all employees from the dangers associated with entrance in Confined Spaces.

1.0 Policy Statement

It is the intention of Youngstown State University to comply with the Public Employees Risk Reduction Act (PERRA) by implementing a Permit-Required Confined Space Program as described in 29 CFR §1910.146. In our attempt to comply with PERRA, it is our policy to establish protocols and procedures which will assure worker safety by adopting acceptable standards which will:

- a. identify and document all confined spaces and permit-confined spaces within our facilities

- b. implement a training program for employees who will be required to enter confined spaces and those employees who will be required to assist in the implementation of our Confined Space Program
- c. develop a written permit system for the entrance into Permit-Required Confined Spaces
- d. assure that entrant supervisors, attendants, rescue teams, atmospheric testers, and entrants be competent in their ability to administer this program
- e. assure that a designated person shall authorize all pre-preparation procedures
- f. assure that all tools, meters, and equipment used in the program are approved by authorized and competent personnel

2.0 Program Responsibility

2.1 Administration

It is understood that the administration has the ultimate responsibility for the identification of confined spaces in and on facilities operated by Youngstown State University. The Administration of Youngstown State University assumes the responsibility for developing a written Permit-Confined Space Entry Program which includes the following elements:

- a. a survey of the workplace to identify all areas which meet the definition of a confined space as defined in 29 CFR §1910.146
- b. informing all employees through the use of signs or other effective means of the existence, location, and the danger associated with each identified Confined Space
- c. permanently blocking or clearly posting with warning signs those areas which are never to be entered
- d. develop procedures for preventing unauthorized entry into Confined Spaces
- e. identifying and evaluating hazards, testing and monitoring equipment, and physical and environmental conditions for the safe entrance into Confined Spaces
- f. proper training and follow-up training of entrants, attendants, and all personnel associated with the program in the following
 - 1. hazard recognition
 - 2. communications

3. personal protective equipment
4. monitoring
5. exit procedures
6. acceptable entry conditions
7. when to terminate entry
8. proper rescue techniques
- g. establishing a permit entry system in areas where permits are required
- h. develop rescue procedures for removing disabled workers from Confined Spaces
- i. assignment of competent personnel to act as entry supervisors, attendants, rescue team members, and entrants
- j. coordinate activities with outside contractors involving their entrance into Confined Spaces
- k. provide and maintain all necessary tools, meters, rescue gear, and equipment associated with this Permit-Required Confined Space Entry Program
- l. implement an on-going audit and review program to assure the effectiveness of the program

2.2 Confined Space Coordinator

For the purpose of implementing this Permit-Required Confined Space Program, Youngstown State University designates the **Director of Environmental and Occupational Health and Safety** as the Confined Space Coordinator for the Permit-Required Confined Space Entry Program. The Confined Space Coordinator is responsible for ensuring that:

- a. all confined spaces and permit confined spaces are identified according to the definition as found in 29 CFR §1910.146 (b)
- b. signs are posted near identified permitted spaces alerting employees to the dangers inherent to that particular space and that only authorized personnel may enter the space
- c. rescue drills are conducted for all rescue team members on an annual basis and documentation of these drills are filed
- d. proper pre-entry preparation procedures are followed and documented

- e. all air monitoring equipment is properly calibrated and available in the necessary quantity to assure the proper operation of the program
- f. all tools, personal protective equipment, and rescue equipment are properly evaluated and a record of availability and authorization for use be kept on file
- g. conduct inspection and audits of all equipment, methods, and procedures as required. All inspection and audits records will be kept on file
- h. the proper training of all personnel involved in the Permit-Required Confined Space Entry Program is conducted and the personnel are competent to perform their designated tasks as outlined in the program. All training records will be kept on file
- i. a permit system for the entrance of Permit-Required Confined Spaces is implemented and that records of all permits are retained on file for a period not less than twelve (12) months
- j. outside contractors have the qualification and capabilities to ensure an effective Confined Space Entry Program

2.3 Entry Supervisor

For the purpose of implementing this program, all employees with the following job classification(s) will be designated as an Entry Supervisor: **Director and Associate Director, Manager of Facilities Maintenance, Facilities Engineer---Facilities Maintenance, Chief Engineer---Central Utilities Plant, Administrative Assistant III---Support Services.**

The Entry Supervisor has the responsibility for overseeing all activities at a Permit-Confined Space site. This includes the following program elements:

- a. terminate entry permit if hazardous atmosphere is detected or when hazard conditions develop or when the job is completed
- b. verify that the permit space is safe for entry by filling out the permit in its entirety and then signing it
- c. assure that a communication link between the entrant(s), attendant(s) and the rescue team is established prior to entry
- d. assure that all tools, personal protective equipment, and rescue devices are approved and suitable for the environment to be entered
- e. assure that continuous atmosphere testing is performed when indicated

- f. assure that the condition around the space are monitored to protect entrants from hazardous conditions that may develop outside of the space
- g. determine procedures to be used for safe entry using the knowledge obtained on each space as a guide and re-evaluate the known hazards as they change
- i. establish measures to prevent unauthorized or accidental entry
- j. eliminate all conditions making a permit space unsafe before allowing entry
- k. coordinate entry operations with outside contractors
- l. will have completed the same training course as entrants

2.4 Attendant(s)

For the purpose of implementing this program, all employees with the following job classification(s) will be designated as an Attendant:

Building Maintenance Repairman I, II and III, Plumber I and II Carpenter I and II, Painter I and II, Sheet Metal Worker I and II, Communication Technician, Electrician I, II, and III, Electronic Technician I, II, and III, Administrative Assistant III in Telephone Repair, Administrative Assistant II and Lab Machinist I in the School of Engineering, All Personnel Designated as Entrants and Entry Supervisors under this program.

An Attendant has the responsibility for the following duties:

- a. be required to monitor the conditions both inside and outside the confined space the entire time an Entrant is inside of the space
- b. monitor the entry conditions without being responsible for any other duties which might distract him/her from entrants activity inside of the space or conditions outside of the space which might threaten the health and/or safety of entrants inside of the space
- c. maintain communication with entrants and emergency rescue services
- d. perform non-entry rescue as deemed appropriate
- e. complete formal training as an Attendant
- f. will under no circumstances leave the entrance of the space without being relieved by another trained attendant
- g. will not enter a permit required confined space to perform rescue procedures unless properly trained in rescue techniques and is replaced by another certified attendant

2.5 Atmosphere Tester

For the purpose of this standard individual(s) with the following job classification(s) will be designated as Atmosphere Tester(s):

Environmental Scientists, Director of Environmental and Occupational Health and Safety and all individuals designated as Entrants under this program.

Atmosphere Testers have the responsibility for the following duties:

- a. to assure that all direct reading instruments are calibrated according to manufacturers specifications prior to use
- b. be familiar with the proper techniques for testing and monitoring atmospheres
- c. assure that all entrants into confined spaces are familiar with proper monitoring procedures before entering

2.6 Entrants

For the purpose of this standard individuals with the following job classifications will be designated as entrants:

Building Maintenance Repairman I, II and III, Plumber I and II, Carpenter I and II, Painter I and II, Sheet Metal Worker I and II, Communication Technician, Electrician I, II, and III, Electronic Technician I, II, and III,

Administrative Assistant III in Telephone Repair, Administrative Assistant II and Lab Machinist I in the School of Engineering, All Personnel Designated as Attendants under this program.

Entrants have the responsibility for the following duties:

- a. follow the instructions that are present on the entry permit
- b. continuously monitor the atmospheric conditions of the space as per the entry permit
- c. secure the appropriate monitoring instrumentation from an Atmospheric Tester prior to entering a confined space
- d. be familiar with the proper use of atmospheric test equipment prior to entering a confined space
- e. complete a formal training course prior to entering a permit-required confined space

f. utilize only approved personal protective equipment and tools within a permit-required confined space

g. immediately evacuate a permit-required confined space upon instructions from the Entry Supervisor, Attendant, or whenever a hazardous situation is detected by instrumentation or any other means

2.7 Rescue Service Personnel

Rescue services may be provided by contracting with outside emergency rescue services or in-house rescue teams. Whenever emergency services are contracted out, the administration will assure that all applicable OSHA standards concerning emergency rescue are met. In-house rescue teams will adhere to the following standards:

a. will complete the same training program as Entrants

b. will maintain acceptable certification in both first aid and cardiopulmonary resuscitation

c. will participate in refresher rescue training simulation every twelve (12) months

d. will assist outside emergency teams as necessary

The administration of Youngstown State University recognizes that "self rescue" is the safest and most efficient rescue method. It is for this reason that the primary focus of this permit-required confined space program will be focused upon providing entrants all of the necessary safeguards to permit "self-rescue from a permit-required confined space.

3.0 Confined Space Evaluation

3.1 Inventory

All spaces which meet the criteria for a Confined Space and Permit-Required Confined Space as defined in this program will listed on the official inventory list of confined spaces as found in this document.

3.2 Hazards

All spaces will be initially evaluated to determine the extent of the hazard present. If it is determined that no hazards are present the space will be re-evaluated as circumstances change that might effect the classification of the space.

4.0 Authorization and Training

4.1 Authorization

No individual may act as a entry supervisor, attendant, entrant, atmosphere tester, or rescue team member without authorization from the Confined Space Coordinator.

4.2 Training

All individuals acting in the capacity of entry supervisor, attendant, entrant, atmosphere tester, or rescue team member must complete a training program specific to the capacity in which the individual will perform.

An outline of the training modules for each specific job duty is contained in Appendix G of this document. Annual refresher courses will be mandatory for all individuals acting in any capacity involved with Permit-Required Confined Space entry.

The **Coordinator of Training and Development** will be responsible for assuring that initial and annual training is provided for all individuals serving in any capacity involved with Permit-Required Confined Space entry.

5.0 Permit System

5.1 Pre-Entry Procedures

Before entering any area listed as a Permit-Required Confined Space, the entrant must obtain an entry permit. The entry permit must be filled out in its entirety and signed by an authorized entry supervisor.

The entry permit is a written approval for the individuals listed on the permit to enter and work in a Permit-Required Confined Space and assures that all hazards have been evaluated and precautions to ensure worker safety have been taken.

5.2 Expiration of Permits

Permits will be valid for only one (1) eight (8) hour shift after which time a new permit must be re-issued. At that time the space must again be evaluated and atmospheric testing be performed.

5.3 Immediate Threat to Life and/or Health

No permits will be issued for entrance into environments which:

- a. might expose workers to toxic air concentrations that would be potentially life threatening, acute illness, incapacitation, or otherwise impair their ability for self-rescue
- b. contains flammable vapors in excess of 10% of the Lower Flammable Limits (LFL)
- c. contain radioactive, or uncontrollable electrical, mechanical or engulfment hazards

d. contain less than 19.5% or more than 23.5% oxygen

5.4 Required Permit Information

Permits are to be filled out in their entirety. Entry Supervisors must fill out a blank permit as found in this document. The permit must contain the following information:

- a. entrants name
- b. tools and equipment required
- c. estimated length of time of occupancy
- d. description of task to be conducted
- e. description/location of the confined space
- f. date of work to be done
- g. attendant's name
- h. pre-entry preparation details
- i. data on atmospheric testing

After all of the above information is recorded on the entry permit, the entry supervisor will sign the permit. Entry authorization will be given only if all required conditions for safe entry are met.

5.5 Posting of Permit

Permits will be posted at the entrance of the Permit-Required Confined Space for the entire time that the work is in progress. At the conclusion of the work a copy of the permit will be forwarded to the Confined Space Coordinator.

6.0 Pre-Entry Preparation

6.1 Decision Flow Chart

Prior to entry into any permit confined space the entry supervisor should work through the Decision Flow Chart found in this document with the entrant and the attendants.

6.2 Evaluation of Means of Entrance/Egress

Means of entrance/egress should be evaluated by the entrant and the entry supervisor prior to entry into the space. It should be determined that the means of entrance/egress will accommodate the size of the worker in both the normal and incapacitated state.

6.3 Means of Isolation

All pumps, lines, etc. which may under any circumstances convey hazardous substances into a confined space must be disconnected, blinded or isolated by some other means. Valves and disconnected pipes must be "locked out" in such a manner as to assure that inadvertent opening or re-connecting will not occur.

6.4 Mechanical/Electrical Energy

All devices producing mechanical or electrical energy that have the potential to inflict injury must be brought to a "zero energy state" and "locked out". Refer to Youngstown State University's Lockout/Tagout Program.

6.5 Hot Work Permits

Prior to welding, cutting, brazing, or performing any other type of "hot work" in a confined space, a "hot work" permit must be issued as per company policy.

6.6 Purging/Flushing Confined Spaces

Prior to entering a confined space where the concentration of toxic substances are above the Permissible Exposure Level (PEL) the space will be flushed, emptied, or purged such that the air concentration of toxic substance is below the PEL.

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6.7 Use of Mechanical Ventilation

The use of mechanical ventilation equipment may be used to reduce and maintain air contaminants to safe levels so that workers can enter the space without the use of respiratory equipment if feasible. In the event this cannot be achieved suitable personal protective equipment will be issued. If respirators are needed they will be issued in accordance with Youngstown State University's Respiratory Protection Program.

Spaces with atmospheric condition at or above the Immediately Dangerous to Life and Health (IDLH) level must be made safe before entry.

7.0 Atmospheric Testing

7.1 Pre-Entry Testing

Pre-entry testing will be performed in such a way as to test the atmosphere without entering the space. Remote sensors or any other means which will assure the safety of the worker may be used.

Atmosphere will be tested in the following order:

- a. Oxygen Levels
- b. Flammability
- c. Toxic Materials (known or expected)

7.2 Instrumentation

Direct reading instrumentation is required to conduct atmospheric tests. The instrumentation must be properly calibrated and in good working condition prior to use. When not in use the atmosphere test instruments will be stored by the Program Coordinator and requisitioned from the Program Coordinator by the Entry Supervisor Prior to each job.

All atmospheric test equipment will be calibrated on a timetable as recommended by the manufacturer and field tested prior to use.

7.3 Monitoring Procedure

Atmospheric monitoring will be performed as frequently as deemed necessary by the Entrant Supervisor but in no instance less frequently than every hour for the duration of the time work is being performed in the space. Whenever possible continuous monitoring will be performed by the entrant(s) using personal monitors.

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The results of the atmospheric tests will be recorded on the space provided on the Entry Permit.

Under no circumstance will entry be permitted into an atmosphere at or exceeding the Immediately Dangerous to Life and Health (IDLH) levels.

8.0 Authorized Tools

1.1 Lighting

All lighting to be used in spaces containing flammable vapors or combustible dust must be approved for use in Class I, Division I or Class II, Division I (explosion proof) environments respectively. This includes flashlights, drop lights, etc.

All service lighting must be properly grounded and electrical cords must contain a grounding plug. Service outlets must be polarized (three contact type) and properly grounded.

Ground fault circuit interrupters must be used where wet conditions exist.

8.2 Power Tools

Power tools used in Permit-Required Confined Spaces may be either pneumatic or electrical. Electric tools shall either be protected by a ground fault circuit interrupter or be double insulated.

All power tools used in potentially flammable atmosphere or atmospheres containing combustible dusts shall be approved respectively for Class I, Division I or Class II, Division I locations.

8.3 Non-Powered Tools

All non-powered tools used in atmospheres potentially containing flammable vapors must be spark-proof.

8.4 Compressed Gas and Flame Producing Equipment

Cylinders of compressed gas of any type other than those mentioned below are not to be taken into Permit-Required Confined Spaces at any time.

Self Contained Breathing Apparatus (SCBA) may be taken into confined spaces.

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Welding equipment may not be used in environments containing flammable vapors or combustible dusts or any other combustible materials.

Entrants may not carry matches, lighters or any other spark or flame producing devices into confined spaces containing flammable vapors or combustible dusts.

8.5 Ventilation Equipment

All fans or other equipment used for ventilating spaces potentially containing flammable vapors or combustible dusts must be approved for use in Class I, Division I or Class II, Division I environment respectively.

9.0 Authorized Personal Protective Equipment

Specifications regarding the use and type of Personal Protective Equipment (PPE) worn by entrants, attendees, and rescue workers will be established prior to entering a Permit-Required Confined Space. The selection will be made based on statutory requirements when they exist, acceptable industry standards (ex. ANSI standards), and the best available information available at the time. Guidelines for the selection of authorized PPE is shown below.

9.1 Entrants

All PPE will be selected based on the information obtained specific to the type of hazard present in each Permit-Required Confined Space. The Pre-Entry Procedures described in Section 6.0 of this document serve as a guide in the selection of the specific type of PPE necessary to safely enter a confined space.

9.2 Attendants

Attendees will not be provided PPE unless they are required to enter the space as a rescue team member. NOTE: Attendees may not enter a space as a rescue team member unless they are relieved of their duty by another authorized attendee.

9.3 Rescue Team Members

Rescue Team Members will be provided the same type of PPE as the entrant(s) with the exception that they will be required to wear Self Contained Breathing Apparatus (SCBA)/Airline.

10.0 Emergency Rescue

10.1 Attendants

An authorized attendant will be stationed outside of every confined space that has an environment found to have the potential to have a hazardous atmosphere, the potential for engulfment, or any other hazard that could potentially threaten the life, health, or safety of the entrant.

The attendant is to remain at the entrance of the space at all times that an entrant is in the space. The attendant will have a means of communicating with the entrant(s) at all times. In addition, the attendant will have immediately available means to communicate with the rescue team, and other emergency services such as the fire department and medical service.

Under no circumstances will an attendant enter a confined space as a rescue team member unless he/she is relieved of duty by another authorized attendant.

10.2 Rescue Teams

Rescue teams will be available in all instances where entry into a Permit-Required Confined Space becomes necessary. Rescue teams may be properly trained in-house personnel or properly trained contracted personal.

10.3 Rescue Equipment

10.31 Communication Equipment

Attendants will be provided the necessary communication equipment to assure that they are able to maintain contact with entrants as well as rescue team members. This may include such devices as telephones, beepers, radios, distinctive alarms.

10.32 Body Harness and Retrieval Lines

A chest or body safety harness will be worn by all entrants in a Permit-Required Confined Space. The harness will be such as to permit easy lifting and/or dragging of incapacitated entrants safely from the space either at both shoulders or a single line connection between the shoulders and the back. Safety Harnesses shall be of the parachute type (full body harness)

The only exception to wearing a safety harness/safety line would be where the construction of the space would cause the harness/line to become a hazard in themselves because of the potential for entanglement with equipment, lines, etc. within the space. The Program Coordinator alone will determine if this exception can be made.

10.33 Hoisting Devices

Whenever entry to the space is through a man-hole or other top or vertical opening a hoisting device must be provided. The hoisting device may not be electrically or pneumatically powered. Instead the hoisting device must be manually powered using mechanical advantage such as pulleys, ratchets, etc.

The hoist must be designed so as to assure that the descent speed of suspended loads is slow enough to prevent injury to entrants who might fall during rescue attempts.

Whenever a overhead structure is not provided or is not suitable for mounting the hoist, a tripod system with sufficient strength and height must be mounted over the entrance to the space. This system must be constructed so as to be able to safely remove the entrant from the space and swing him/her to the adjacent walk.

10.34 Ladders

A ladder meeting OSHA specifications shall always be used when entering or leaving a vertical opening, manhole, pit, vault, or other similar openings.

10.4 Rescue Procedures

Attendants are not to enter confined spaces for purposes of rescue unless they are authorized, trained rescue team members and are relieved of their duties as an attendant by another authorized, trained attendant.

Attendants who are assigned to more than one Permit-Confined Space are not authorized to act in any other capacity.

Rescue team members are not permitted to enter a confined space unless there is an authorized, trained attendant stationed at the entrance to the space.

No rescue team member shall enter a Permit-Required Confined Space for the purpose of rescue without a safety harness and retrieval line.

For each Permit-Required Confined Space a written rescue procedure must be established. This procedure must include provisions for medical treatment, transportation to a medical facility, and emergency telephone numbers.

All emergency rescue procedures must be tested prior to adoption as part of this Confined Space Entry Program.

11.0 Program Audit

Youngstown State University will establish an on-going Permit-Required Confined Space audit program to assure that all aspects of this program are being implemented in accordance with 29 CFR §1910.146 and are effective in assuring the safety of employees who may be required to enter Permit-Required Confined Spaces. The audit of this program will include the following

11.1 Equipment

11.11 Respiratory Protective Equipment

Respirators and other forms of Respiratory Protection Equipment will be inspected and maintained as required by Youngstown State University's Respiratory Protection Program.

11.12 Atmospheric Test Equipment

Test equipment will be calibrated in accordance with manufacturer's recommendations and inspected by the Confined Space Coordinator prior to each use.

11.13 Safety Harnesses/Retrieval Lines and Hoists

Safety retrieval equipment will be inspected prior to each use by the Entry Supervisor.

11.14 Electrical Tools and Equipment

Electrical tools and equipment will be inspected by the Entry Supervisor and the entrant(s) prior to each use

11.2 Procedure

The Confined Space Coordinator will be responsible for formally reviewing all aspects of the Permit-Required Confined Space Program.

11.21 Procedures Used by Entrants and Attendants

All procedures used by Entrants and Attendants will be reviewed informally on a quarterly basis and formally reviewed on annual basis.

11.22 Procedures Used by Rescue Team Members

Procedures used by Rescue Team members will be formally reviewed and audited semi-annually. This will include an actual observation of a mock rescue from each different type of Permit-Required Confined Space on an annual basis.

11.23 Procedures Used for Testing Hazardous Atmospheres

Procedures used for monitoring hazardous atmospheres will be formally reviewed quarterly.

Confined Space Inventory

ID Number	Location	Permit Yes/No	Identified Hazards
01-B105-1	Basement Pool Sump Pit	Y	Confined Deep Pit, Environmental
01-B105-2	Basement B165 & 166	Y	Limited Movement & Environmental
01-257-3	Room 257, South Wall Access	Y	Limited Movement & Ventilation
05-B121-4	Basement B121, Elec. Vault	Y	Live Electrical Exposed Bus Bars
06-B-5	Basement Crawl Space	Y	Limited Movement & Ventilation
13-1-6	NE Entrance Under Steps	Y	Steam Hazard
13-B25-7	Basement B25 Crawl Space	Y	Limited Movement & Ventilation
13-B26-8	Basement B26 Crawl Space	Y	Limited Movement & Ventilation
14-B1025-9	Basement 1025 Elec. Vault	Y	Open Wiring to Transformer
14-3036-10	Third Floor Rms 3036 & 3037	Y	Radiation Exposure
16-1023-11	Room 1023, Tunnel Entry	Y	Environmental Hazard
16-1024-11	Room 1024, Tunnel Entry	Y	Environmental Hazard
26-122-13	Loading Dock Tunnel	Y	Environmental Hazard
26-123-14	Loading Dock Tunnel	Y	Environmental Hazard
27-T-15	Tunnel SW Corner	Y	Environmental Hazard
27-BLR-16	Boilers on 1 st Floor	Y	Environmental Hazard
29-105-17	Room 105 Electrical Vault	Y	Exposed Wiring & Transformer
00-T1-18	Utility Tunnel System	Y	Environmental & Ventilation
00-T2-19	Utility Tunnel System	Y	Environmental & Ventilation
00-T3-20	Utility Tunnel System	Y	Environmental & Ventilation
00-T4-21	Utility Tunnel System	Y	Environmental & Ventilation
00-T5-22	Utility Tunnel System	Y	Environmental & Ventilation
00-MH-23	All Manholes	Y	Environmental & Ventilation

Approved Tool List for Permit-Required Confined Spaces

ID Number	Location	Approved Tools
01-B105-1	Basement Pool Sump Pit	8.1, 8.2 & 8.5
01-B105-2	Basement B165 & 166	8.1 & 8.5
01-257-3	Room 257, South Wall Access	8.1 – 8.5
05-B121-4	Basement B121, Electrical Vault	8.1, 8.2 & 8.5
06-B-5	Basement Crawl Space	8.1 – 8.5
13-1-6	NE Entrance Under Steps	8.1 – 8.5
13-B25-7	Basement B25 Crawl Space	8.1 – 8.5
13-B26-8	Basement B26 Crawl Space	8.1 – 8.5
14-B1025-9	Basement 1025 Electrical Vault	8.1, 8.2 & 8.5
14-3036-10	Third Floor Rms 3036 & 3037	8.1 – 8.5
16-1023-11	Room 1023, Tunnel Entry	8.1 – 8.5
16-1024-11	Room 1024, Tunnel Entry	8.1 – 8.5
26-122-13	Loading Dock Tunnel	8.1 – 8.5
26-123-14	Loading Dock Tunnel	8.1 – 8.5
27-T-15	Tunnel SW Corner	8.1 – 8.5
27-BLR-16	Boilers on 1 st Floor	8.1 – 8.5
29-105-17	Room 105 Electrical Vault	8.1 – 8.5
00-T1-18	Utility Tunnel System	8.1 – 8.5
00-T2-19	Utility Tunnel System	8.1 – 8.5
00-T3-20	Utility Tunnel System	8.1 – 8.5
00-T4-21	Utility Tunnel System	8.1 – 8.5
00-T5-22	Utility Tunnel System	8.1 – 8.5
00-MH-23	All Manholes	8.1 – 8.5

Outline of Permit-Required Confined Space Training

A. ENTRANTS (industrial Training and Annual Refresher)

1 Recognition of Physical Hazards

a. Fire, explosion, engulfment, electric shock, mechanical hazards

definitions

b. Plant application

2. Recognition of Health Hazards

a. Oxygen deficiency, air contaminants, warning symptoms

b. Plant application

3. Respiratory Protection

a. Limitation of respiratory protection

b. Selection of equipment

C. Company respiratory policy description

4. Lock-Out/Tagout Procedures

5. Atmospheric Monitoring Equipment and Procedure

6. Rescue/Retrieval Equipment

B. ATTENDANTS

1. Repeat Training in Section A for Entrants

C. RESCUE TEAM MEMBERS (initial Training and Annual Refresher)

1 . Repeat Training in Section A for Entrants

2. Use of Self-Contained Breathing Apparatus (SCBA) Equipment

3. Rescue Procedures and Equipment Operation

D. ATMOSPHERIC TESTERS

1 . Repeat Training in Section A for Entrants

2. Training in Use of Test Equipment

E. ALL OTHER EMPLOYEES NOT INCLUDED ABOVE

1 Discussion of Permit-Required Confined Space Program.

2. List of identified Permit Spaces.

3. Explanation of Danger Signs.

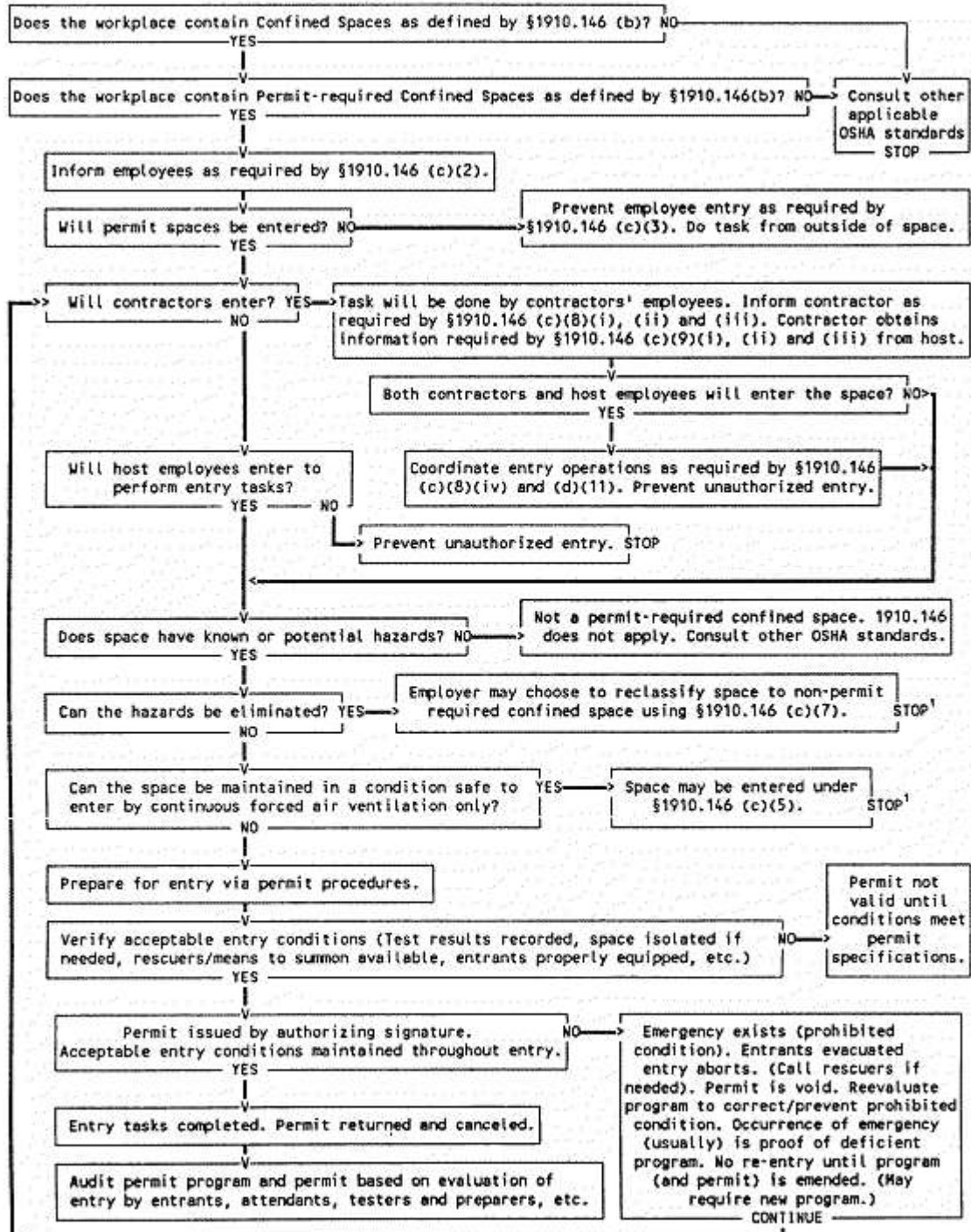
4. Establishment of Company Policy and Safety Rule.

F. RECORD KEEPING

1. A list of all employees completing formal training shall be maintained by
Confined space Entry Coordinator.

2. Dates, attendees, and any quiz results shall be maintained by the Confined
Space Coordinator.

CONFINED SPACE FLOWCHART



¹ Spaces may have to be evacuated and re-evaluated if hazards arise during entry

CUTTING - WELDING - HOT WORK PERMIT

This form is to be filled out in its entirety by the responsible person actually performing the "HOT WORK" and then brought to the Department of Environmental and Occupational Health and Safety (EOHS) for approval prior to beginning the project.

Company:	Date:
Responsible Person:	Start Time:
Work to be performed:	Building:
	Room Number, Area or Equipment:
Is it possible to perform this work in the shop? Yes <input type="checkbox"/> No <input type="checkbox"/>	

Please place a check mark ✓ if the following items have been completed

Flame or spark-producing equipment to be used has been inspected and found in good repair	
Sprinklers, where provided, are in commission and will not be taken out of service while this work is being done.	
There are no combustible fibers, dusts, vapors, gases, or liquids in the area. Tanks and equipment previously containing such materials have been purged. The absence of gases or vapors has been verified by a combustible gas detection instrument. If there is a possibility of a leak developing in nearby piping, equipment, or tanks, this area is to be continuously monitored. Call EOHS at Ext 3700 if assistance is needed to test area.	
Fire alarms will not be taken out of service while work is being performed. If alarm system must be inactivated during work then EOHS will be contacted prior to taking alarm out of service so that a suitable "Fire Watch" can be coordinated with campus police. Under no circumstances will fire alarms be taken out of service without contacting EOHS.	
The work will be confined to the area or equipment specified on this permit.	
Surrounding floors have been swept clean and, if combustible, wet down.	
Contractor has ample portable fire extinguishers available and trained personnel to use them.	
All combustibles have been relocated 35 feet from the operation and the remainder protected with metal guards or flame-proofed curtains or covers (not ordinary tarpaulins).	
All floor and wall openings within 35 feet of the operations have been tightly covered.	
Responsible personnel have been assigned to provide a "Fire Watch" for dangerous sparks in the work area, as well as on floors above and below while work is being performed.	
Arrangements have been made to provide a "Fire Watch" to patrol the are, including floors above and below, during any lunch or rest period and for at least one-half hour after the work has been completed.	

I attest that the above precautions have been taken _____
Person Responsible for Performing Hot Work

Approved _____
Director EOHS

_____ Date

NOTE: This permit expires 24 hours after the designated "start time." If work is to continue another permit must be issued

PERMIT-REQUIRED CONFINED SPACE ENTRY PERMIT

This permit is not valid unless completed in its entirety--POST PERMIT AT JOB SITE UNTIL WORK IS COMPLETE

This permit is valid for one (1) eight (8) hour shift only. All copies of this permit must remain at the job site until all work is completed.

SPACE ID # _____ DATE _____ TIME _____ ENTRY SUPERVISOR _____

LOCATION _____ PURPOSE OF ENTRY _____

PRE ENTRY CHECKLIST

REQUIREMENTS COMPLETED	✓	DATE	TIME	REQUIREMENTS COMPLETED	✓	DATE	TIME
LOCKOUT/DE-ENERGIZED				FULL BODY HARNESS W. D-RING			
PROTECTIVE CLOTHING (LIST TYPE BELOW)				EMERGENCY RETRIEVAL EQUIPMENT (LIST TYPE BELOW)			
SPACE: PURGED, FLUSHED, VENTED				FIRE EXTINGUISHER(S)			
ADEQUATE VENTILATION				EXPLOSION PROOF LIGHTING			
SECURE AREA--POST AND FLAG				LINES: BROKEN, CAPPED, BLANKED			
BREATHING APPARATUS				AIR PURIFYING RESPIRATOR(S)			
RESUSCITATOR--INHALER				LIFELINES			
STANDBY SAFETY PERSONNEL ALERTED				BURNING AND WELDING PERMITS			

NOTE: IF ITEM DOES NOT APPLY ENTER N/A IN THE TIME AND DATE SPACE

RECORD INSTRUMENT READING HOURLY

CONTINUOUS MONITORING	REQUIRED	PEL	TIME	TIME	TIME	TIME	TIME	TIME	TIME
AVAILABLE OXYGEN (% VOLUME)	YES	19.5%-23.5%							
LOWER FLAMMABLE LIMITS (LFL)	YES	2%-5%							
HYDROGEN SULFIDE		PPM							
CARBON MONOXIDE		PPM							
OTHER (LIST)		PPM							

NAME OF ATMOSPHERE TESTER	AUTHORIZED ENTRANT(S)	AUTHORIZED ATTENDANT
INSTRUMENT(S) USED		
MODEL OR TYPE		
SIGNATURE OF ENTRY SUPERVISOR _____	EMERGENCY TELEPHONE NUMBERS	
TELEPHONE: _____	RESCUE:	FIRE: AMBULANCE:
DATE ISSUED: _____	PROGRAM COORDINATOR:	OTHER:
JOB COMPLETED YES <input type="checkbox"/> NO <input type="checkbox"/> REMARKS:		
JOB TERMINATED YES <input type="checkbox"/> NO <input type="checkbox"/> IF YES STATE REASON FOR TERMINATION:		

ORIGINAL COPY TO PROGRAM COORDINATOR DUPLICATE COPY TO BE FILLED BY ENTRANT SUPERVISOR

List of Definitions Used in this Document
Source: 29 CFR §1910.146

The following words and terms, when used in this policy and its procedures, shall have the

following meaning, unless the context clearly indicates otherwise.

"Attendant" means an individual stationed outside one or more permit spaces who monitors the authorized entrants.

"Blind" or "blinding" or "blanking" means the absolute closure of a pipe line or duct to prevent passage of any material (e.g., by fastening a solid plate or "cap" across the pipe).

"Calibration" or "re-calibration" means a laboratory or bench-top resetting of alarm points, spans and zeros, if applicable, according to manufacturer's specifications. "Calibration" or "re-calibration" shall be conducted by a factory authorized service center, a factory trained technician, or a trained company technician.

"Confined Space," means any space that:

- a. has a limited means of entrance/egress
- b. and is large enough and so configured that a worker can bodily enter and perform assigned work
- c. and is not designed for continuous worker occupancy.

Typically, a confined space can generally include, but is not limited to hoppers, storage tanks, process vessels, storage rooms, bins, boilers, ventilation or exhaust ducts, sewers, manholes, underground utility tunnels, acid tanks, digesters, ovens, diked areas around tanks, and pipelines. Open top spaces more than four feet in depth such as pits, tubs, vaults, and vessels may also be confined spaces if any of the three criteria above are met.

See Permit-Required Confined Space

"Engulfment" means the surrounding and effective capture of a person by finely divided particulate matter or a liquid.

"Entrant" means any employee who is authorized to enter a Permit-Required Confined Space.

"Entry" means any action resulting in any part of the employee's body breaking the

plane of any opening of the confined space, and includes any ensuing work activities inside the confined space.

"Entry Permit" means the written authorization for employee entry into a confined space under defined conditions for a stated purpose during a specified time.

"Entry Supervisor" means the 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 as required by this section.

"Hazardous atmosphere" means an atmosphere presenting a potential for death, incapacitation, impairment of ability to self-rescue, injury, or acute illness from one or more of the following causes:

A flammable gas, vapor, or mist in excess of 10% of its lower explosive limit (LFL);

An oxygen-deficient atmosphere containing less than 19.5% oxygen or an oxygen enriched atmosphere containing more than 23.5% oxygen;

An atmosphere concentration of any substance listed in Subpart Z of Part 1910 Standards above the listed numerical value of the permissible exposure limit (PEL);r

Airborne combustible dust at a concentration that meets or exceeds its LEL, e.g., approximated where dust obscures vision at a distance of five feet or less;

A condition immediately dangerous to life or health as defined in this subsection.

"Immediately Dangerous to Life or Health (IDLH)" means any condition that poses an immediate or delayed threat to life, or which is likely to result in irreversible adverse health effects, or would interfere with an individual's ability to escape from a permit space.

"Isolation" means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space.

"Lockout or Tagging" means placing locks or tags on the energy-isolating device. Tags shall indicate that the energy-isolated device shall not be operated until the removal of the tag.

"Permit Required Confined Space" means a confined space that has the following additional qualifying characteristics:

Contains or has potential to contain a hazardous atmosphere;

Contains a material that has the potential for engulfing an entrant;

Has internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section, or

Contains any other serious safety or health hazard, e.g. electrical, radioactive, moving machinery parts, thermal, toxic.

"Prohibited condition" means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

"Rescue team" means those persons designated to perform rescues from confined spaces. A rescue team may consist of external emergency personnel, provided the training requirements of applicable OSHA standards have been met.

APPENDIX K (Continued)

"Retrieval line" means a line or rope secured at one end to a workers' safety belt, chest or body harness, (or wristlets, if appropriate) with the other end secured to an anchor point or lifting device located outside the entry portal. The anchor point shall not be a motor vehicle. Retrieval lines must be of sufficient strength to remove an entrant when necessary.

"Zero mechanical state" means that the mechanical potential energy of all portions of the machine or equipment is set so that the opening of the pipe(s), tube(s), hose(s) or actuation of any valve, or button, will not produce a movement which could cause injury.

"Class I Division I Location" is a location in which (1) ignitable concentrations of flammable gases or vapors can exist under normal operating conditions; or (2) ignitable concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or (3) breakdown of faulty operation equipment or processes might release ignitable concentrations of flammable gases or vapors and might also cause simultaneous failure of electric equipment.

"Class II Division I Location" is a location in which (1) combustible dust in the air under normal operating conditions in quantities and sufficient to produce explosive or ignitable mixtures; or (2) mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electrical equipment, operation of protection devices, or from other causes; or (3) combustible dusts or an electrically conductive nature may be present in hazardous quantities.