

COLLEGE *of*
CHARLESTON

ENVIRONMENTAL
HEALTH AND SAFETY

**Confined Space Entry
Program**

September 21, 2020

Contents

1. Introduction	1
1.1. Scope and Application.....	1
1.1.1 Scope.....	2
1.1.2 Application	2
1.1.3 Policy	2
1.1.4 General Requirements.....	2
1.1.5 Responsibilities	2
1.1.6 Contractor Requirements	3
2. Permit Required Confined Space Entry Program.....	5
2.1 Purpose, Scope, and Policy	5
2.1.1 General OSHA/College of Charleston Position Guidelines and Requirements.....	6
2.1.2 Conditions for Entry without a Permit.....	11
2.1.3 Conditions for Space Reclassification	12
2.1.3.1 Non-Permit to Permit Space:	12
2.1.3.2 Permit to Non-Permit:	13
2.2 Permit System	13
2.2.1 Entry Permit	14
2.2.2 Training	14
2.2.3 Duties of the Entry Supervisor	15
2.2.3 Duties of the Authorized Entrant(s).....	16
2.2.4 Duties of the Attendant(s)	17
2.2.5 Rescue and Emergency Services	17
3. NON-PERMIT REQUIRED CONFINED SPACES	18
3.1 Electrical Confined Space Entry Policy	18
3.2 Telecommunication Confined Space Entry Policy.....	19
Appendix I: Definitions.....	21
Appendix II: Permit Confined Space Entry Forms	25
Appendix III: OSHA Permit-Required Confined Spaces.....	Error! Bookmark not defined.
Appendix IV: OSHA Electrical Power Generation, Transmission, and Distribution Standard Section Reference	Error! Bookmark not defined.
Appendix V: OSHA Telecommunication.....	Error! Bookmark not defined.

1. Introduction

1.1. Scope and Application

Background

Confined spaces are regulated under OSHA 29 CFR 1910.146 and OSHA 29 CFR 1926 Subpart AA. The College of Charleston (CofC) workplace contains potentially hazardous enclosed spaces that may be classified as permit-required confined spaces or non-permit-required confined spaces.

Examples of confined spaces include manholes, vaults, tanks, tunnels, boilers, silos, bins, pits, crawl spaces, storm/sanitary drains, and sumps. Employees may be required, as part of their job duties, to enter these spaces to perform inspection, repair, or maintenance activities. Spaces such as those mentioned above may contain hazardous atmospheres, including chemical (toxic/flammable) vapors and/or oxygen deficiency.

This program contains the procedures and practices for safe entry into locations at The College of Charleston which are classified as permit-required and non-permit-required confined spaces. The Confined Spaces Safety Program applies to all CofC employees whose job duties require them to enter or monitor confined spaces.

Routine maintenance, preventive maintenance, and special projects activities require College of Charleston employees and contractors to enter potentially hazardous enclosed spaces. These spaces may be identified as confined spaces and may have atmospheric conditions and/or physical hazards present and may include: manholes, wet-wells, vaults, tanks, boilers, bins, pits, sumps, and sanitary and storm sewers. In addition, toxic and/or flammable gases and vapors may accumulate in these locations because of insufficient ventilation and deficient oxygen levels may be present as the result of corrosion and/or organic debris digestion. The restricted or limited access to these locations complicates the entry work, and consequently the retrieval of anyone incapacitated.

The purpose of this Confined Space Entry Program and all related policies and procedures is to insure a safe and healthy workplace, assure compliance with applicable OSHA or SCOSHA regulations.

In accordance with the following OSHA Standards, the College of Charleston has developed this program to meet or exceed the requirements contained therein.

The OSHA, SCOSHA Standards referenced in this document are:

- 29 CFR 1910.146; Permit-required Confined Spaces
- 29 CFR 1910.269; Electrical Transmission and Distribution
- 29 CFR 1910.268 Telecommunications

In addition, where more supportive information or guidance is required for this program's effectiveness, the following supportive documents have been used:

- NFPA 350, “Guide for Safe Confined Space Entry and Work” 2016
- ANSI/ASSE Z7117.1-2016 “Safety Requirements for Entering Confined Spaces

1.1.1 Scope

This program contains requirements for the safe entry into identified spaces/locations by an employee(s) of the College of Charleston that either meet the definition or the description as outlined in the above regulations or are accepted as “best practice” as defined by OSHA or SCOSHA in posted compliance directives by either organization.

This program and policy supersede any previous written policy or program, and/or any implied or written agreement between any employee, contractor or vendor for the College.

1.1.2 Application

This program shall apply to all personnel at the College of Charleston who have a need to enter or support operations in or near any confined space or potential confined space as described in this document. In addition to the main campus, this program applies to facilities such as the North Charleston campus, the Sailing Center, Patriot’s Point, Dixie Plantation, and Grice Marine Laboratory and any related College facilities and operations where employees are at risk due to activities in or adjacent to confined spaces.

1.1.3 Policy

It is the policy of the College of Charleston to take every reasonable precaution to provide a safe and healthy work environment free from recognized hazards for its employees.

1.1.4 General Requirements

The College, in accordance with South Carolina and Federal regulations, has implemented this program to ensure *safe* entry into confined spaces. Before entry into any confined space all potential hazards must be identified and controlled. A formalized training program has been designed to enable employees to recognize potential hazards and take the appropriate actions to control those hazards.

For most work operations in electrical and telecommunication manholes safeguards and controls can be completed without entry into the location and in such cases the permit system is not required. If entrance into the enclosed space is required to implement hazard controls, then the permit-required confined space program **must** be used to accomplish these controls.

1.1.5 Responsibilities

Environmental Health and Safety (EHS) with assistance from Fire and Life Safety will review all campus locations to identify either known or suspected confined space locations. This information shall be collected by EHS for final determination and appropriate notifications. Documentation will include the use of the space, the need for entry, and what constitutes this space as permit or non-permit confined space.

The Director of Environmental Health and Safety, or his designee, shall be responsible for

establishing and maintaining the Confined Space Entry Program. EHS is responsible for maintaining current location listings of both permit-required and non-permit required confined spaces; generating and updating the written confined space program, maintaining files on completed permits; identifying and approving equipment needed for safe entry; conducting and maintaining calibration and calibration records on air monitoring meters, and to provide training and maintain training records.

Supervisors must identify locations that their employees enter and provide a list of employees requiring training. Supervisors are also required to attend training in accordance with the requirements pertaining to the locations their employees are required to enter.

Employees must complete the training as required by Facilities Management and to follow the procedures as outlined in the training when entering a confined space. A written exam will be given to provide documentation of training proficiency. Employees should also assist in identifying potential confined space locations and notify their supervisor if they witness an unsafe entry.

Fire and Life Safety Department for the College of Charleston will assume the responsibility of the on-site rescue team and mutual aid need, and the on-site first-aid responder coordination of activity. By utilizing the non-mandatory requirements of 29 CFR 1910.146, Appendix F for "Rescue Team or Rescue Service Evaluation Criteria" the Director of Fire and Life Safety will assure, in writing, to the Director of EHS, that the necessary accessibility of trained and qualified confined space rescue is available any time a confined space entry is made for the College of Charleston, at any location. In addition, annual practice extrications will be conducted at different locations to assure the proficiency of the responding rescuers. These drills will be planned in advance and documented with post-drill evaluations conducted and documentation provided to the Director of EHS.

1.1.6 Contractor Requirements

Any work at the College of Charleston in a confined space must be conducted in accordance with the regulations set forth in this document including identifying any hazards and/or hazard reduction activities specific to that location.

Duty of Contractors

Contractors must have a written confined space program that complies with the regulation pertinent to the areas to be entered. All contractors must provide copies of their written program(s) and employee training documentation to the EHS department 24 hours prior to the project commencing that requires entry into a confined space. Failure to submit a written program and the training documentation will delay the start of the project for which the contractor has been obtained and may cancel a contract. Contractors are also responsible to supply all needed equipment to perform safe entry and non-entry rescue (where required specific to the individual space).

For permit required confined entries the contractor shall complete Form CCCS-4 Contractor Debriefing with a College of Charleston representative and provide a copy to the EHS Department along with a copy of the permit following the termination of the permit. In addition, contractors are required to coordinate emergency rescue notification with Fire and Life Safety using Form CCCS-2.

When a contractor is required to enter or work in proximity to a permit required confined space, the contracting department will furnish a written copy of the hazards previously identified in that space to the contractor. However, this process does not remove or diminish the contractors' responsibility to conduct their own hazard assessment, including air monitoring, prior to entry into the space. The Contractor will coordinate entry operations with the supervising department when both College personnel and contractor personnel will be working in or near permit spaces, as required by this program.

No College of Charleston personnel will authorize, permit, or verify any of the requirements for confined space entry of which the contractor follows. All contractors of the College that enter permit required confined spaces, as identified by the EHS Department of the College, are responsible and accountable for having a confined space entry program in accordance with the letter and intent of the OSHA Standard identified above. In addition, no College of Charleston equipment or personnel will be provided or used to assure any contractor of the safe conditions for entry of any confined space.

Duty to other Employers (Contractors)- When the College of Charleston arranges to have employees of another employer (Contractor) perform work that involves permit required confined space entry, the supervising department shall:

- a) Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this program.
- b) Apprise the contractor of the elements, including the hazards identified and the College's experience with the space that makes the space in question a permit required confined space.
- c) Apprise the contractor of any precautions or procedures that have been implemented for the protection of College employees in or near permit spaces where contractor personnel will be working.
- d) Coordinate entry operations with the contractor, when both College of Charleston personnel and contractor will be working in or near permit spaces. When employees of more than one employer are working simultaneously as authorized entrants in a permit space, the entry operations of one employer shall not endanger the employees of any other employer.
- e) Debrief the contractor at the end of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations and complete Form CCCS-4 and return to EHS.

2. Permit Required Confined Space Entry Program

For confined space locations containing atmospheric or physical hazards, where neither the electrical generation and distribution nor telecommunication regulations apply, the permit required confined space regulation (29 CFR 1910.146) must be utilized and the standards enforced. The provisions of this regulation require the employer to provide the means, procedures, training, and equipment to mitigate hazards. Documentation is required to verify compliance using a written permit. This permit required confined space program has the following elements:

- a. *Location Listings and Hazard Identification:* A list of permit-required confined spaces locations. The listing contains the location information, including a map when possible, and identifies the hazards of each location. The master list will be maintained by Environmental Health and Safety and updated annually, with copies provided to Public Safety and Fire and Life Safety.
- b. *Employee Training:* EHS shall provide training to all employees required to enter permit-required confined spaces and electrical and telecommunications manholes. Training must be conducted before the employee can participate in entries.
- c. *Permit System:* A written permit (form CCCS-1) must be completed at the entry location and before entry occurs to identify hazards, hazard controls, verification of availability of emergency rescue team and listing entry team members. Form CCCS-2 must be completed and delivered to Fire and Life Safety at least 24 hours before the entry is to occur. The duration of the permit is a maximum of 8 hours. Completed permits are the responsibility of the initiating department to maintain.
- d. *Safety Equipment:* Safety equipment for use in permit-required confined space entry or confined space entry shall be approved by EHS. Fire and Life Safety will assure proper calibration of all confined space entry monitors in accordance with manufacturer specifications. Purchase and repair costs for equipment shall be the responsibility of the department owning the equipment.
- e. *Special Hazards:* Special permits may be required (i.e. hot work permit) where welding or an open flame is to be used inside a building and involves permit-confined space entry, in addition to the confined space entry permit.

2.1 Purpose, Scope, and Policy

This section outlines the practices and procedures to protect the College of Charleston employees and contract employees from the hazards associated with permit required confined space entry, as specified in OSHA/SCOSHA Confined Space Standard 29 CFR 1910.146. This document shall serve as the written program and shall apply to all personnel at any College of Charleston related facilities and operations.

The Director of Environmental Health and Safety (EHS) or [his/her] designees shall be responsible for establishing and maintaining the Permit-Required Confined Space Entry Program. As stated, it is the policy of the College of Charleston, as required by the OSHA Permit-Required Confined Space Standard 29 CFR 1910.146, (Appendix II, attached) to ensure that atmospheric and physical hazards

are identified that are associated with confined spaces and that this information and safe entry requirements be communicated to employees responsible for entry into such space.

The procedures and practices necessary for safe permit-required confined space entry, as outlined in this confined space training manual, include:

- a. Specifying acceptable entry conditions;
- b. Isolating the permit required space;
- c. Purging, inerting, flushing, or ventilating the permit-required space to eliminate or control atmospheric hazards;
- d. Providing pedestrian, vehicle or other barriers, as necessary, to protect the entrant from external hazards and;
- e. Verifying conditions in the permit-required space are acceptable for entry for the duration of an authorized entry.
- f. Ensuring procedures and entry permits are accurately completed, reviewed, and appropriate employee training and confined space entry permit records are kept.¹
- g. Contact EHS and Fire and Life Safety before entry into any potential or known IDLH confined space is allowed.
- h. Ensuring confined space entry equipment is properly maintained and stored.
- i. Ensuring all entry permits are completed and signed upon termination of entry and appropriately filed or submitted to EHS.

2.1.1.1 General OSHA/College of Charleston Position Functions and Requirements

The Department Supervisor shall:

- a) Identify confined space(s) encountered by their employees, submit a list of the confined spaces identified to EHS, and post or distribute the list to affected employees.

The list shall include:

1. Location
2. Physical dimensions and construction
3. Reason for employee entry
4. Potential hazards
 - Frequency of entry
- b)
 - Submit the confined space list to EHS within 60 days of the effective date of this program.
- c)
 - Update the confined space list annually and whenever there are changes affecting work conditions or when new confined spaces are identified.

¹ NOTE: Completed permits shall be maintained for a period of at least 1-year from the date of termination. Training records shall be maintained for at least 1 year from the date of an affected employee's termination.

- d)** • Ensure that all associated safety equipment is maintained and routinely inspected.
- e)** • Submit a list of those employees affected by a confined space entry to EHS.
- f)** • Update the list of affected employees whenever there are additions or deletions.
- g)** • Attend training for individuals in charge of or authorizing the entry or designating such individuals.
- h)** • Assure affected employees receive training as outlined below:
 - Employees working in proximity to permit required confined spaces shall receive awareness training that shall consist of:
 - Understanding what constitutes a confined space
 - Identification of potential hazards requiring permit entry procedures.

Employees who are required to enter any location defined as a permit entry required confined space shall receive confined space entry training:

- a)** Before there is a change in assigned duties;
- b)** Whenever there is a change in permit space operations that presents a
- c)** hazard about which an employee has not been previously trained and;
- d)** Whenever the employer has reason to believe that there are deviations from the permit space entry procedure required by this program or that there are inadequacies in the employee's knowledge or use of these procedures.

The Employee shall:

- a)** Notify the supervisor of any confined space encountered not on the confined space list.
- b)** Notify their supervisor whenever work operations may require a hot work permit or
- c)** work operations may result in chemical exposure or generation of hazardous atmosphere.
- d)** Attend permit entry confined space training.
- e)** Report to the supervisor jobs requiring entry into permit entry confined spaces.
- f)** Comply with the requirements outlined when directly involved in entry of permit-confined
- g)** spaces.

Environmental Health and Safety shall:

- a)** Develop the written Confined Space Program and review the program annually and revise the program as necessary.
- b)** Approve all monitoring equipment, safety equipment, and materials for safe work operations.
- c)** Conduct all employee training.

- d) Approve employees to serve as authorized attendants, entrants, or entry supervisor.
- e) Establish employee proficiency in the duties required, including new or revised
- f) procedures. Certification shall contain each employee's name, training outline, signature of trainer, and date of training.
- g) Inspect [potential] Permit Confined Space locations with Fire and Life Safety for determination of hazards.
- h) Provide signs for Permit Entry Confined Spaces.
- i) Annually review completed permits.

Fire and Life Safety shall:

- i) Assure periodic calibration of confined space entry air monitoring equipment.
- j) Provide confined space entry monitoring for permit required confined spaces (where space follows the continuous monitoring guideline, as outlined in this policy, is required and the work activity will be more than two hours, Fire and Life Safety can make the determination, with EHS, to train the entrant and attendant the proper response procedures in the event of an alarm).
- k) •Assume the role of the "In-Plant Rescue Team," or, assure that the role of a confined space rescue team has been acknowledged by the responding fire or rescue service in accordance with *the Non-Mandatory Appendix F -- Rescue Team or Rescue Service Evaluation Criteria (OSHA 29 CFR 1910.146) or equivalent such as NFPA 350, Chapter 10, "Rescue"*.
- l) Ensure that at least one member of each rescue team maintains current certification in
- m) basic first aid and cardiopulmonary resuscitation (CPR).
- n) Inspect and maintain emergency retrieval equipment (if College owned or rented).
- o) Conduct rescue team practice at least annually, simulating permit space rescues in
- p) which team member remove dummies, mannequins or personnel through
- q) representative openings and portals whose size, configuration and accessibility closely
- r) approximate those of the permit spaces from which rescues may be required.
- s) Provide documented notification of the locations of confined spaces where College employees will be conducting work activities on an annual basis. This notification will be in the form of a map identifying the building and address and indicating the Permit Entry Confined Spaces. Any rescue or fire response team for College of Charleston facilities will receive a notification following the annual review of this program that either adds new locations or demonstrates that there are no new locations or information from the previous year. All correspondence and notification in writing to the responding agencies will have copies provided to EHS for the College official files.

Requirements

The Permit Required Confined Space Entry Program Shall Consist of:

- Implementation of the necessary measures to prevent unauthorized entry.
- Identification and Evaluation of the hazards of permit spaces before entry.
- The Following means, procedures, and practices necessary for safe permit space entry as outlined in the confined space training including any:
 - Specification of acceptable entry conditions.
 - Isolation of the permit space.
 - Purging, inerting, flushing, or ventilating the permit space as to eliminate or control atmospheric hazards.
 - Provision for pedestrian, vehicle or other barriers as necessary to protect entrant from external hazards.
 - Verification that conditions in the permit space is acceptable for entry throughout the duration of an authorized entry.

The supervising department shall provide the following equipment at no cost to the employee:

- Testing and monitoring equipment needed to evaluate oxygen content, explosive gases/vapor concentrations and specific toxic agents (e.g., carbon monoxide, hydrogen sulfide), that is within factory calibration.
- Ventilating equipment needed to obtain acceptable entry conditions.
- Communications equipment necessary for summoning rescue and emergency services.
- Personal protective equipment where feasible engineering and work practice controls do not adequately protect employees.
- Proper electrical and lighting equipment needed to enable employees to see well enough to work safely and exit the space.
- Barriers and shields as required protecting the entrant from external hazards.
- Equipment, such as ladders, needed for safe ingress and egress by authorized entrants.
- Rescue and emergency equipment, except equipment provided by rescue services.
- Any other equipment necessary for safe entry into and rescue from permit spaces.

Evaluate permit space conditions as follows when entry operations are conducted:

- Conditions shall be tested in the permit space to determine if acceptable entry conditions exist before entry is authorized to begin; except, if isolation of the space is not possible because the space is large or is part of a continuous system (such as a sewer). Pre-entry testing shall be performed to the extent feasible before entry is authorized and, if entry is authorized, entry conditions shall be continuously monitored in the areas where authorized entrants are working.
- Test or monitor the permit space as necessary to determine if acceptable entry conditions are being maintained during entry operations.
- When testing for atmospheric hazards, test first for oxygen, then for combustible gases and vapors, and then for toxic gases or vapors.²

² Note: Atmospheric testing for sewer entry: Minimum tests are oxygen deficiency, lower explosive limit and hydrogen sulfide concentration.

- At least one attendant shall be provided outside the permit space into which entry is authorized for the duration of entry operations.
- If multiple spaces are to be monitored by a single attendant, include in the permit program the means and procedures to enable the attendant to respond to an emergency affecting one or more of the permit spaces being monitored without distraction from the attendant's responsibilities as outlined under Duties of Attendant(s) section of this document (see below).
- Individuals shall be designated on the entry permit who are to have active roles (as, for example, authorized entrants, attendants, entry supervisors, or persons who test or monitor the atmosphere in a permit space) in entry operations, identify the duties of such employees and provide each with the training specified in the Training section.
- Procedures for summoning rescue and emergency services, for rescuing entrants from permit spaces, and/or providing necessary emergency services to rescued employees and for preventing unauthorized personnel from attempting a rescue.
- A system for the preparation, issuance, use, and cancellation of entry permits.
- Procedures to coordinate entry operations when employees of more than one employer are working simultaneously as authorized entrants in a permit space, so that employees of one employer do not endanger the employees of any other employer.
- Procedures (such as closing off a permit space and canceling the permit) necessary for concluding the entry after entry operations have been completed.
- Review entry operations when there is reason to believe that the measures taken under the permit space program may not protect employees and revise the program to correct deficiencies found to exist before subsequent entries are authorized.³
- Review the permit required confined space program using the canceled permits and revise the program as necessary to ensure that employees participating in entry operations are protected from permit space hazards.

Employee Information: Signs shall be posted where feasible near permit spaces to notify employees what hazards may be present and that only authorized entrants may enter the permit space. Where signage is not feasible, potentially exposed employees shall be trained about the danger of unauthorized entry of permit spaces. EHS shall be responsible for arranging signage of permit spaces.

Equipment: Including testing, monitoring, communication and personal protective equipment, shall be provided, maintained, and properly used. EHS will specify minimum equipment requirements for each permit space.

³ *Note: Examples of circumstances requiring the review of the permit required confined space program is any unauthorized entry of permit space, the detection of a permit space hazards not covered by the permit, the detection of a condition prohibited by the permit, the occurrence of an injury or near-miss during entry, a change in the use or configuration of a permit space, and employee complaints about the effectiveness of the program.*

Hazard Identification: Each permit space shall be identified and evaluated, including a determination of the severity of the hazard. The supervisory staff shall report potential permit spaces to EHS, who shall maintain a listing of all permit and non-permit confined spaces.

Permit System: A written permit system shall be utilized for entry into permit spaces. EHS shall develop the written permit system.

Prevention of Unauthorized Entry: Unauthorized entry into permit spaces shall be prevented. Prevention measures include training, signs, and security measures. All employees in or around confined spaces shall attend confined space awareness training.

Protection from External Hazards: Barriers necessary to protect entrants from external hazards (pedestrian, vehicle, etc.) shall be in place prior to entry into a permit space. EHS will work with Public Safety and Fire and Life Safety to determine the safety of occupants and non-occupants to identify warning methods for each entry location.

Rescue: Rescue procedures and equipment shall be in place prior to entry into a permit space. The use of retrieval equipment shall be required where there exists a potential for an IDLH atmosphere, engulfment, or vertical entries. There must be adequate attachment points outside the confined space for tying-off or otherwise securing retrieval lines for all authorized entrants. Where retrieval lines themselves could constitute an entanglement hazard or otherwise cannot be used, an equivalent method for rescue shall be used.

2.1.2 Conditions for Entry without a Permit

The alternate procedure below, as permitted by the OSHA standard, may be used, provided that the following conditions are met:

- All employees involved in the entry (entry supervisor, entrant, and attendant) shall have received the training required by this program.
- The only existing hazard in the permit space is an actual or potential hazardous atmosphere;
- Continuous forced air ventilation is sufficient to maintain a safe atmosphere for entry.
- Monitoring and inspection data is developed showing that the only existing hazard is atmospheric and that forced air ventilation is adequate in removing the hazard, and this information is documented and made available to each entrant; and
- Ventilation and monitoring of the space is adequately conducted without entry. If entry is necessary, all procedures of permit entry must be followed.

For entries performed without a permit, which meet the set conditions above, the following entry procedure shall be used and documented using form CCCS-3:

- Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed.

- When entrance covers are removed, the opening shall be promptly guarded by a railing, cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space.
- Before an employee enters the space, the internal atmosphere shall be tested with a calibrated direct-reading instrument for the following conditions and in the order given (confined space monitors are programmed to test in this order):
 - Oxygen content,
 - Flammable gases and vapors, and
 - Potential toxic air contaminants.

*Whenever any employee is inside the space, there may be **no hazardous atmosphere**.*

*Continuous forced air ventilation **shall** be used, as follows:*

- An employee may not enter the space until the forced air ventilation has
- eliminated any hazardous atmosphere;
- The forced air ventilation shall be directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space; and
- The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.
- The atmosphere within the space shall be continually monitored to ensure
 - t)** that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere.

If a hazardous atmosphere is detected during entry, each employee shall leave the space immediately. Then:

- The space shall be evaluated to determine how the hazardous atmosphere
 - u)** developed
- Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place
- The authorized entry supervisor shall verify that the space is safe for entry and that the measures required in Reclassification of Permit to Non-permit Space section have been taken. A written certification containing the date, the location of the space, and the signature of the person providing the certification. This certification shall be confirmed to each employee entering the space.

2.1.3 Conditions for Space Reclassification

2.1.3.1 Non-Permit to Permit Space:

When there are changes in the use or configuration of a non-permit confined space that could increase the hazards to entrants, EHS and Fire and Life Safety shall re-evaluate the space and, if necessary, reclassify it as a permit required confined space.

2.1.3.2 Permit to Non-Permit:

- v) A space classified as a permit required confined space can be reclassified as a non-permit confined space under the following procedure:
 - If the permit space possesses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards remain eliminated.
 - If it is necessary to enter the permit space to eliminate the hazards, such entry shall be performed under the permit entry system of this program. If testing and inspection during that entry demonstrate that the hazards within the permit space are eliminated the space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated.
 - The maintenance work unit (i.e., Central Energy, Facilities Management) is responsible for documenting that all hazards in a permit space have been eliminated through a certification that contains the date, location of the space, and the signature of the person making the determination. The certification shall be confirmed to each employee entering the space.
 - If hazards arise within a permit space that has been declassified to a non-permit space, each employee in the space shall exit the space immediately. EHS and Fire and Life Safety shall then reevaluate the space and determine whether it must be reclassified as a permit space in accordance with the applicable provisions of this program.

2.2 Permit System

The Entry Permit form, CCCS-1, shall be completed before authorizing entry into the permit-required confined space.

Before the entry begins:

- Hazard determination measures shall be documented by preparing an entry permit as outlined below.
- The entry supervisor, identified on the permit, shall sign the entry permit to authorize entry.

The entry supervisor shall terminate entry and cancel the entry permit when:

- The entry operation covered by the entry permit has been completed; or
- A condition that is not allowed under the entry permit arises in or near the permit space.

The supervising department shall retain each canceled entry permit for at least 1 year to facilitate the review of the permit required confined space program. Any problems encountered during an entry operation shall be noted on the permit so that appropriate revisions to the permit space program can be made.

2.2.1 Entry Permit

The entry permit authorizing entry into a permit space shall identify:

- The permit space to be entered.
- The purpose of the entry.
- The date and duration of the authorized entry permit.
- The name of each authorized entrants within the space.
- The personnel, by name, currently serving as entry supervisor, with a space for the signature or initials of the entry supervisor who originally authorized entry.
- The hazards of the permit space to be entered.
- The measures used to isolate the permit space and to eliminate or control permit space hazards before entry.
- The acceptable entry conditions.
- The results of initial and periodic tests accompanied by the names or initials of the testers and by an indication of when the tests were performed.
- The rescue and emergency services available and the means (such as the equipment to be used and numbers to call) for summoning those services.
- The communication procedures used by authorized entrants and attendants to maintain contact during the entry.
- Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment to be provided.
- Any other information whose inclusion is necessary, given the circumstances of the particular confined space, in order to ensure employee safety.
- The documentation for additional permits, such as for hot work, issued to authorized work in the permit space.

A sample print is in Appendix I, Document CCCS-1

The authorized entry permit shall be made available at the time of entry to all authorized entrants, by posting it at the entry portal or by any other equally effective means, so that the entrants can confirm that pre-entry preparations have been completed.

The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit in accordance with the purpose of the entry. At no time will a single permit be in effect for more than 8 hours. If the task involves multiple shifts or multiple crews in a 24-hour period; each crew shall create a new permit for their respective group and cancel the permit when the work shift is finished.

2.2.2 Training

Confined space awareness training shall be provided for College employees not required to enter permit required confined spaces as a part of their job duties, but who work in proximity to these areas. Awareness training shall consist of:

- Understanding what constitutes a confined space.
- Identifying potential hazards requiring permit entry procedures.
Confined space entry training shall be provided for employees required to enter any location defined as a permit entry required confined space. Training shall be provided to each affected employee:
 - Before the employee is first assigned duties under this program.
 - Before there is a change in assigned duties.
 - Whenever there is a change in permit space operations that presents a hazard about
 - w)** which an employee has not been previously trained.
 - Whenever the supervising department has reason to believe either that there are
 - x)** deviations from permit space entry procedures or that there are inadequacies in the
 - y)** employee's knowledge or use of these procedures.

The training shall establish employee proficiency in the duties required by this program and shall include new or revised procedures, as necessary, for compliance with this program.

EHS shall certify that the training has been accomplished. The certification shall contain each employee's name, the signatures of the trainers, and the dates of training. The certification, refer to form CCCS-6, shall be available for inspection.

2.2.3 Duties of the Entry Supervisor

- Know the hazards that may be faced during entry, including the mode, signs or
 - z)** symptoms, and consequences of the exposure;
- Verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and
 - aa)** equipment specified by the permit are in place before endorsing the permit and allowing
 - bb)** entry to begin;
- Terminate the entry and cancel the permit as required when:
 - The entry operation covered by the entry permit has been completed; or
 - A condition that is not allowed under the entry permit arises in or near the permit
 - cc)** space;
- Verify that rescue services are available and that the means for summoning them are
 - dd)** operable.
- Remove unauthorized individuals who enter or who attempt to enter the permit space
 - ee)** during entry operations.
- Determine, whenever responsibility for a permit space entry operation is transferred to a
 - ff)** different entry supervisor and at intervals dictated by the hazards and operations
 - gg)** performed within the space that entry operations remain consistent with terms of the
 - hh)** entry permit and that acceptable entry conditions are maintained.
 - ii)**

2.2.3 Duties of the Authorized Entrant(s)

- Know the hazards that may be faced during entry, including the mode, signs or **jj)** symptoms, and consequences of the exposure.
- Use equipment properly in accordance with training received.
- Communicate with the attendant as necessary to enable the attendant to monitor **kk)** entrant status and to alert the attendant to the need to evacuate the space as required.
- Alert the attendant whenever:
 - The entrant recognizes any warning signs or symptoms of exposure to a dangerous situation, or
 - The entrant detects a prohibited condition.
 - The entrant must exit from the space as quickly as possible whenever:
 - An order to evacuate is given by the attendant or the entry supervisor,
 - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation,
 - The entrant detects a prohibited condition, or
 - An evacuation alarm is activated.
- Authorized entrant(s) shall:
 - Implement non-entry rescue, retrieval systems or methods whenever an authorized **ll)** entrant enters a permit space, unless the retrieval equipment would increase the overall **mm)** risk of entry or would not contribute to the rescue of the entrant.
 - Use a chest or full body harness, with a retrieval line attached at the center of the **nn)** entrants back near shoulder level, or above the entrant's head. Wrist-lets may be used **oo)** in lieu of the chest or full body harness if it can be demonstrated that the use of a chest **pp)** or full body harness is infeasible or creates a greater hazard and that the use of wrist-lets is the safest and most effective alternative.
 - Ensure the other end of the retrieval line is attached to a mechanical device or fixed **qq)** point outside the permit space in such a manner that rescue can begin as soon as the **rr)** rescuer becomes aware that rescue is necessary. A mechanical device shall be **ss)** available to retrieve personnel from vertical type permit spaces more than 5 feet deep.
 - Be provided with the necessary personal protective equipment.
 - Use all personal protective equipment, such as retrieval lines, respirators, or clothing **tt)** needed for safe entry and exit in accordance with training received.
 - Know of the external barriers needed to protect entrants from external hazards and of **uu)** the proper use of those barriers (e.g., traffic barriers).
 - Wear full body harness during all entries requiring portable ventilation.

Self-Rescue -Authorized entrant(s) shall exit the Permit Space when:

1. The attendant orders evacuation;
2. An automatic monitoring equipment alarm is activated; or
3. The authorized entrant(s) perceive they are in danger.

2.2.4 Duties of the Attendant(s)

- Know the hazards that may be faced during entry, including the mode, signs or **vv)** symptoms, and consequences of the exposure.
- Be aware of possible behavioral effects of hazardous exposure in authorized entrants.
- Maintain a continuous accurate count of authorized entrants in the permit space and **ww)** ensure that the means used to identify authorized entrants accurately identifies who is **xx)** in the permit space.
- Remain outside the permit space during entry operations until relieved by another **yy)** authorized attendant.
- Communicate with authorized entrants as necessary to monitor entrant status and to **zz)** alert entrants of the need to evacuate the space.
- Monitor activities inside and outside the space to determine if it is safe for entrants to **aaa)** remain in the space and orders the authorized entrants to evacuate the permit space **bbb)** immediately under any of the following conditions:
 1. If the attendant detects a prohibited condition;
 2. If the attendant detects the behavioral effects of hazards exposure in an authorized entrant;
 3. If the attendant detects a situation outside the space that could endanger the authorized entrants; or
 4. If the attendant cannot effectively and safely perform all the duties required under this section.
- Summon rescue and other emergency services as soon as the attendant determines **ccc)** that authorized entrants may need assistance to escape from permit space hazards.
- Take the following actions when unauthorized persons approach or enter a permit **ddd)** space while entry is underway:
 1. Warn unauthorized persons that they must stay away from the permit space;
 2. Advise the unauthorized persons that they must exit immediately if they have entered the permit space; and
 3. Inform the authorized entrants and entry supervisor if unauthorized persons have entered the permit space.
- Perform non-entry rescue as specified by the rescue procedure.
- Perform no duties that might interfere with the primary duty to monitor and protect the authorized entrants.

2.2.5 Rescue and Emergency Services

- Personnel assigned to a rescue team shall be provided with and trained to make proper **eee)** use of the personal protective equipment, including respirators, and rescue equipment **fff)** necessary for making rescues from Permit and Non-permit spaces.

- The rescue team shall be trained to perform the assigned rescue functions and shall be **ggg)** trained as authorized entrants.
- Rescue teams shall practice making rescues at least once every twelve months by **hhh)** means of simulated rescue operations in which they remove dummies, mannequins, or **iii)** personnel through representative openings and portals whose size, configuration and **jjj)** accessibility closely approximate those of the spaces from which rescues may be **kkk)** required on the main College of Charleston campus or other properties.
- Each member of each rescue team shall be currently certified in basic first aid and **lll)** cardiopulmonary resuscitation (CPR) skills. At least one member of the rescue service **mmm)** holding current certification in first aid and CPR shall be available.
- When the College of Charleston arranges to have persons other than College employees **nnn)** perform permit confined space rescue, the College shall:
 1. Inform the rescue service of the hazards they may confront when called on to perform rescue at College facilities, and
 2. Provide the rescue service with access to all permit spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue pre-planning and practice operations.

3. NON-PERMIT REQUIRED CONFINED SPACES

3.1 Electrical Confined Space Entry Policy

This policy shall be used to identify and control hazards before initiating entry into a confined space as outlined in 29 CFR 1910.269, Electrical Power Generation, Transmission and Distribution, (Appendix III, attached). If conditions exist and/or hazards are not controlled through the use or application of this portion of the policy, the permit-entry confined space policy requirements must be used to ensure that adequate controls are used.

All electrical employees required to enter below grade unventilated locations, as a portion of their work responsibilities, shall receive formal training on confined space entry before performing such work.

Pre-entry procedures for entry into below grade locations:

1. An evaluation shall be conducted to check for the excessive heat, pressure by touching and then carefully removing the manhole lid. Following removal of a manhole lid, the opening shall be promptly guarded with a railing, temporary cover or other barrier intended to prevent an accidental fall through the opening and to protect entrant from falling objects.
2. Before entry the internal atmosphere shall be tested for the following:
 - Oxygen content (safe entry range - 19.5% to 23.5%)

- Combustible gases or vapors -(safe entry range - < 10% Lower Explosive Limit [LEL])
- Toxic levels within range of this policy specifications for the environment
If the testing identifies levels outside the safe entry ranges, as specified above, forced air ventilation may be used to bring the atmospheric levels back into the safe entry ranges before entry is initiated.

Continuous atmospheric monitoring shall be conducted when conditions require forced air ventilation to be used before entry.

Attendants for manholes

- While performing in a manhole containing energized electrical equipment, an employee with basic first aid and CPR training shall be *immediately* available to render emergency assistance.
- The attendant may enter a manhole for brief periods in the process of his/her job duties:
 - Following the verification of NO atmospheric hazards or conditions,
 - For the purpose of inspection, house-keeping, taking readings or other similar work,
 - An employee working alone may enter, for brief periods of time, a manhole where
- energized electrical equipment is in service, *if* it can be demonstrated that the employee will be protected from electrical hazards (ie; lockout, barriers)

3.2 Telecommunication Confined Space Entry Policy

The purpose of this portion of the College of Charleston policy is to identify and control hazards before initiating entry into a confined space as outlined in 29 CFR 1910.268(o), *Underground Lines*, Telecommunication, (Appendix IV, attached). If conditions exist and/or hazards are not controlled in the application of this policy the permit-entry confined space policy must be used to ensure that adequate controls are used.

Guarding of manholes and street openings

Upon removal of a manhole lid or hatch, one of the following methods will be used to prevent an accidental fall through the opening:

- Use of a portable railing to enclose the opening or;
- Use of cone to demarcate the opening or;
- Any other *equally* effective means.

Entry opening located where safety hazards are created by traffic patterns (i.e., vehicle or pedestrian) require:

- Placement of flags, cones or other traffic control devices placed conspicuously to alert oncoming traffic or;
- Placement of a vehicle as a barrier in the direction of the oncoming traffic.
- Notification of the College of Charleston Public Safety

Pre-entry requirements for manholes and un-vented vaults

Before entry the internal atmosphere shall be tested for the following:

- Oxygen content (safe entry range - 19.5% to 23.5%)
- Combustible gases or vapors -(safe entry range - < 10% Lower Explosive Limit [LEL])
- Toxic levels within range of this policy specifications for the environment

If the testing identifies levels outside the safe entry ranges, as specified above, forced air ventilation may be used to bring the atmospheric levels back into the safe entry ranges before entry is initiated.

Continuous atmospheric monitoring shall be conducted when conditions require forced air ventilation to be used before entry.

- A fuel tank or cylinder (e.g., propane) may not be in a manhole unless for immediate use.
- A ladder shall be used to enter and exit all locations greater than 4 foot in depth.

An employee trained in basic first-aid shall be available at the work site during entries if any of the following conditions exist:

- Entry is required into a manhole or vault where joint utilities exist and consist of energized electrical power;
- Where the opening to the underground location cannot be adequately guarded to prevent an accidental fall through the opening or from foreign objects entering the location.
- Where adequate controls (e.g., lights, barricades etc.) cannot be placed to provide employees a safe work environment from the hazards generated from traffic.

Appendix I: Definitions

Acceptable Entry Conditions: the conditions that must exist in a space to allow entry and to ensure that the employees involved with a confined space entry can safely enter and work within the space.

Attendant: An individual stationed outside one or more spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's confined space program.

Authorized Entrant: An employee who is authorized by the employer to enter a confined space.

Blanking or Blinding: the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that can withstand the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Confined Space: a space large enough and so configured that an employee can bodily enter and perform assigned work; and has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and is not designed for continuous employee occupancy.

Double Block and Bleed: the closure of a line, duct, or pipe by closing and locking or tagging two inline valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency: any occurrence (including any failure of hazard control or monitoring equipment) or event(s) internal or external to the confined space, which could endanger entrants.

Engulfment: the surrounding and effective capture of a person by a liquid or finely divided solid (flowable) substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry: the act by which a person intentionally passes through an opening into a permit required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry Permit: the written or printed document provided by the employer to allow and control entry into a permit space and that contains the information specified in section (f) of the Permit Required Confined Space standard. Refer to forms CCCS-1 and CCCS-2 in Appendix 1 of the written program.

The entry permit:

Defines the conditions under which the permit space may be entered.

States the reason(s) for entering the space.

Lists the anticipated hazards of the entry.

For entries where the individual authorizing the entry does not assume direct charge of the entry:

Lists the eligible attendants, entrants, and the individuals who may be in charge of the entry; and

Establishes the length of time for which the permit may remain valid.

Establishes special procedures, hot work permits etc. that are required to ensure safe entry and work operations.

Entry Supervisor: the person (such as the employee, foreman, or crew chief) 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

Hazardous Atmosphere: an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is escape unaided from a permit space); injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);
- Airborne combustible dust at a concentration that meets or exceeds its LFL;
- Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.
- Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
- Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this part and which could result in employee exposure in excess of its dose or permissible exposure limit; ⁵

⁴ Note: An entry supervisor may also serve as an attendant or as an entrant, as long as that person is trained and equipped as required by this program for each role he or she fills.

⁵ Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

- Any other atmospheric condition that is immediately dangerous to life or health.⁶

Hot Work Permit: the employer's written authorization to perform operations, which could provide a source of ignition, such as riveting, welding, cutting, burning, or heating.

Immediately Dangerous to Life or Health (IDLH): any condition, which poses an immediate threat of loss of life, may result in irreversible or immediate severe health effects, may result in eye damage, irritation or other conditions which could impair escape from the permit space.

Immediate Severe Health Effects: any acute clinical sign(s) of a serious, exposure-related reaction manifested within 72 hours after exposure.

Inerting: the displacement of the atmosphere in a permit required space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. It is a process of rendering the atmosphere of a permit required space nonflammable, non-explosive, or otherwise chemically non-reactive by such means as displacing or diluting the original atmosphere with steam or a gas that is non-reactive with respect to that space.⁷

Isolation: the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; mis-aligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tag-out of all sources of energy or mechanical linkages.

Line Breaking: the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

Non-Permitted Confined Space: 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 egregious physical harm. A location that is governed by specific regulations may require special procedures to ensure all hazards are controlled before entry (i.e. telecommunications manholes or high voltage manholes).

Oxygen Deficient Atmosphere: an atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen Enriched Atmosphere: an atmosphere containing more than 23.5 percent oxygen by volume.

⁶ Note: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets, other published information (ACGIH, NIOSH) and internal documents can provide guidance in establishing acceptable atmospheric conditions.

⁷ Note: This procedure produces an IDLH oxygen-deficient atmosphere.

Permit Required Confined Space (Permit Space): a confined space that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entrant
- Has an 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 recognized serious safety or health hazard.

Permit Required Confined Space Program: the employer's overall program for controlling, and where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

Permit System: the employer's written procedures for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

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

Rescue Service: the personnel designated to rescue employees from confined spaces (such as the College of Charleston Fire and Life Safety or Charleston Fire Department).

Retrieval System: the equipment (including a retrieval line, chest or full-body harness, wristlets, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Testing: the process by which the atmospheric hazards that may confront entrants of a space are identified and evaluated. Testing includes specifying the tests that are to be performed in the space. ⁸

⁸ *Note: Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to and during entry.*

Appendix II: Permit Confined Space Entry Forms

Form CCCS-1

Form CCCS-2

Form CCCS-3

Form CCCS-4

Form CCCS-5

Form CCCS-6

