SUMMARY: In order to provide a safe work environment in confined spaces, employees must know safe work practice procedures, have available personal protective equipment and other protective equipment to insure their safety and receive training approved by Public Safety & Environmental Health. This Guideline, along with Appendix A properly completed, will provide departments with an effective written program for confined space entry.

SCOPE: This Guideline applies to all UM-Dearborn personnel involved in permit-required confined space entries. Outside contractor entry is addressed separately at the end of this Guideline.

GOVERNING REGULATIONS: **"**Permit-Required Confined Spaces for General Industry" 29 CFR Part 1910.146; "Confined Space Entry" MIOSHA General Industry Standard, Part 90 (Rule 408.19001)

"Welding and Cutting" MIOSHA General Industry Standard Part 12 (Rule 408.11201)

DEFINITIONS: *Acceptable entry conditions* – the conditions that exist in a permit-required space to allow safe entry and work within the space.

Attendant (spotter) - person stationed outside one or more permit spaces who monitors the authorized employees and performs attendant's duties assigned in this policy.

Authorized Entrant/Employee - person who has received confined space entry training from OSEH as an entrant/supervisor.

Blanking or Blinding - the absolute closure of a pipe, line, or duct by fastening a solid plate (such as a spectacle blind or a skillet blind) completely covering the bore and that is capable of withstanding the maximum pressure of the pipe, line or duct with no leakage beyond the plate. This involves installing a blank between flanges with a leak-proof gasket at a point in the conducting line as close to the confined space area as possible. The blank or blind should be marked identifying its purpose.

Combustible Gas - airborne concentration of gas or vapor which may present the risk of fire or explosion if an ignition source of sufficient

energy is introduced. This term is synonymous with "flammable vapor" and "explosive gas".

Confined Space - a space that meets **all** of the following criteria:

- Is large enough and so configured that an employee can bodily enter and perform assigned work;
- Has limited or restricted means for entry and exit (for example, tanks, tunnels, vessels, silos, storage bins, hoppers, vaults, and pits); 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 in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves. Refer to UMD Lockout/Tagout Guide and the UM OSEH Lockout/Tagout Guideline.

Engulfment - the surrounding or capture of a person by a liquid or finely divided (flowable) solid substance that can cause asphyxiation, drowning, or can exert enough force on the body to cause death by strangulation, constriction or crushing.

Entry Permit - written authorization for entry into a “permit-required confined space.” At the University, permits may be classified as either general, hot work or hazardous.

Entry Supervisor - first-line foreman or designated lead person, responsible for: determining if acceptable entry conditions have been verified and documented at a permit-required confined space where entry is planned; authorizing entry; overseeing entry operations; and terminating entry.

General Permit – type of entry permit used to enter a confined space when all atmospheric and safety hazards have been controlled or eliminated. The general permit is used to verify and document that all hazards have been controlled or eliminated. If an entry is needed to evaluate, control or eliminate the hazardous conditions in the space, then a Hazardous permit will be needed for this portion of the entry.

Hazardous Atmosphere - atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self rescue, injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor, or mist in excess of 10 % of its lower flammable limit.

- Airborne combustible dust that is at or approaching its lower flammable limit. This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet or less.

- Atmospheric oxygen concentration below 19.5% or above 23.5%.

- Any chemical or substance present which may be at concentrations capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects and is above the regulatory limit.

Hazardous Permit – type permit used to enter a confined space when either a hazardous atmosphere and/or a safety hazard has not been completely controlled or eliminated.

Hot Work Operations - cutting, welding, brazing, torch soldering, high speed metal grinding, or use of an open flame.

Hot Work Permit – type permit used to enter a confined space when hot work operations will be performed in the space.

Hot Work Safety Permit - specific written authorization to perform hot work operations in any University space, including confined spaces. This is different from a Confined Space Hot Work Permit, in that it addresses potential fire safety hazards as specified in the UMD Hot Wok Program.

Line Breaking or Misalignment - the intentional and physical disconnection of a pipe, line or duct. Added protection is obtained by misaligning or removing a section of the pipe, line, or duct. When potentially hazardous residues might remain downstream from the disconnecting point, the line should be purged and atmospheric testing conducted.

Lockout/Tagout - A procedure whereby a lock and/or tag device is used to hold an energy-isolating device (such as a switch, valve, etc) in the "off" or safe position. This procedure is fully explained in the UMDs LOTO Guidelines and UM OSEH Guideline, Lockout/Tagout Program.

Lower Explosive Limit (LEL) - lowest concentration at which a gas or vapor can ignite. Concentrations below this level are too lean to burn.

Non-Permit Required Confined Space - confined spaces that do not contain or, have the potential to contain, any hazard capable of causing death or serious physical harm.

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

- Contains or has the potential to contain a hazardous atmosphere. When assessing the potential for a hazardous atmosphere, consideration must be given to portals of entry from other areas, such as pipes, ducts and vents.

- 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.

- Contains any other recognized serious safety or health hazard that may have an immediate effect or inhibit the employee leaving the space unaided. Examples include: exposed electrical parts, extreme temperature.

Upper Explosive Limit - the highest concentration at which a gas or vapor can ignite. Concentrations above this level are too rich to burn.

Work Induced Hazard - hazard created due to nature of work such as welding (generates fumes) and painting (generates solvents in the atmosphere).

RESPONSIBILITY: Deans, Directors, Department Heads

Designate and empower individuals who will be responsible for the preparation and implementation of your departmental confined space entry program. Designated individuals should use this Guideline and Appendix A to develop a program specific to your department's needs.

Ensure an environment where supervisors and employees are encouraged to follow this Guideline.

Ensure access to confined spaces within your department is controlled by: training potential users in how to recognize and evaluate confined spaces; locking all entrances to confined spaces, when feasible; posting warning signs at confined spaces, when feasible. Public Safety & Environmental

Health will provide information on training locations for general confined spaces. Provide "space specific training" for their employees.

Monitor and enforce compliance with this program up to and including the use of progressive discipline.

Supervisors/Foremen/Managers

Be fully familiar with the specific details of their department's confined space program and attend training in confined spaces.

Ensure employees are fully informed and trained about confined space entry requirements and procedures as outlined here, the hazards associated with confined spaces, applicable regulations and safety standards, and prudent safety practices to protect themselves and their fellow employees.

Monitor the need for additional or refresher training for employees based on changes in assigned duties, changes in confined spaces, changes in the UM – Dearborn confined space program or deficiencies in the employee's knowledge.

Follow the "Supervisor's Guideline for Workplace Health" if there is an accident or injury.

Contact Public Safety & Environmental Health to request technical assistance and to coordinate general training.

Collect copies of permits at the end of the job and maintain in departmental files.

Review permits, which are required to be held for one year, document and address any problems with appropriate management personnel.

Identify Department's confined spaces, (Public Safety & Environmental Health must be notified in writing of the location(s), including building and room number; specific hazards present in space (see attached hazard assessment/CS identification survey documents for assistance), signage needs, any special equipment needed for safe entry and any other information relevant to safe entry.

Determine which employees will enter Permit Required Confined Spaces.

Post required signage, or the equivalent to warn individuals of confined spaces and unauthorized entry.

Complete and return the *Confined Space Identification Survey* for newly identified or changed PRCS and forward to Public Safety & Environmental Health.

Coordinate arrangements with Public Safety & Environmental Health for general training. Provide "space specific training" for their employees.

Monitor and enforce compliance with this program up to and including the use of progressive discipline.

Employees

Comply with this CSE Guideline and any other safety recommendations made by the supervisor. Additionally, comply with all aspects of this written program guideline and CFR 29 1910.146 and MIOSHA Rule Part 90.

Asking for assistance or further information, first from their supervisor and then from the EHS Manager, whenever they are unclear as to whether it is safe to enter a PRCS, how to enter safely or if they are unsure of the requirements.

Report all deviations from this program or the standard to their supervisor.

Upon receiving confined space training, conduct assigned tasks as an entrant, attendant or entry supervisor in a safe manner. Wear appropriate personal protective equipment, and only use equipment (such as air monitoring equipment) in which formally trained.

Report any job related injuries or illnesses, questions on health and safety, or any unsafe or unhealthy working conditions to the supervisor.

Facilities Management/ Project Managers

Inform outside contractors of all permit-required confined spaces they will be working in and use the contractor notification form in Appendix E of this Guideline to identify all potential hazards associated with the space.

Require contractors to comply with all applicable state and federal regulations as per the General Standard Conditions and contract specifications.

Conduct pre-entry coordination meeting and de-briefing meetings as required by this Guideline.

Department of Public Safety & Environmental Health

Review and revise the Confined Space Entry Guideline and permit process to assure employees are fully protected. The review will include prior experiences in confined spaces, any problems that occurred, as well as changes in the use or configuration of confined spaces.

Coordinate general training in all aspects of this program and maintain records of this training.

Coordinate practice drills with the Contract On site Rescue Team Marine Pollution Control (MPC).

At the departments request assist in developing and implementing an effective program in their workplace.

PROCEDURE: *General* - Only University staff that have received Confined Space Entry Training approved by Public Safety & Environmental Health may enter permit-required confined spaces or serve as an attendant, entry supervisor or conduct air monitoring.

Prior to working in any confined space, all University staff must follow the steps listed below in order to comply with this Guideline.

- Evaluate the space & identify the hazards
- Complete the permit, using it as an instructional guide
- Monitor hazardous atmospheres
- Implement measures to control the atmospheric and safety hazards
- Select the appropriate personal protective equipment
- Establish appropriate means of communication
- Implement other safety & health controls
- Determine the type permit to be issued
- Plan for evacuation and rescue
- Close out and cancel the permit

When work is performed by outside contractors, Facilities Management or other project representatives will follow the procedure described in "Procedures for Outside Contractors" found of this Guideline.

Evaluation of Confined Spaces

Appendix B is a general listing of confined spaces on campus. The entry supervisor can use this listing and the Confined Space Evaluation Form and related documents to assist in evaluating the space. First, determine if it is a confined space by answering the first three questions on the form. If the answer is "yes" to all three, then it is a confined space.

To identify the hazards, answer the next five questions on the evaluation form. An answer of "yes" to any one question will classify the space as a permit-required confined space. ***Note:*** In evaluating each question, the entry supervisor must take into account the work that is to be performed in the confined space and decide if the work itself would create a hazard.

If none of the hazards listed on the Evaluation Form are present, then it is a non-permit required confined space and the work may proceed as planned and in accordance with all other applicable safety and health regulations and University safety procedures. Again, consider the work to be performed and the potential for a hazard that would change the classification to permit-required.

Except for a few exceptions listed in the table in Appendix B, the University's utility tunnel system is not considered a confined space and does not fall under this Guideline. Safe practices for working in the utility tunnel system is outlined in the UM Plant Tunnel Safety Program.

Complete the Permit

The Permit (Appendix D) is intended to track each step of preparing the space for entry and to track the conditions before, during, and after the job. It also serves as an instructional guide to the entry supervisor, as a warning tag to nearby persons, and provides critical information to emergency responders.

The Entry Supervisor will record all information requested on the permit and sign where indicated. The steps described in this Guideline will assist in completing the hazard information required.

The completed permit will be reviewed by the Entry Supervisor with all authorized entrants and attendants. The permit will also be posted at the work site or otherwise be readily accessible to authorized entrants and emergency personnel.

At the completion of the job, the Entry Supervisor will close out the permit and sign where indicated. The permit will be forwarded to the Departmental Supervisor, Foreman, or Manager who will review it. All canceled permits must be kept on record for a period of one year. Any

problems encountered during an entry operation shall be noted on the permit so that the Supervisor and Public Safety & Environmental Health can investigate and make appropriate revisions to the confined space program.

Monitoring of Hazardous Atmospheres

When it has been determined that a hazardous atmosphere may potentially be present, test the air in the space to determine if acceptable conditions exist before entry is made, using the following procedure:

1. Only employees who have received confined space training can perform the monitoring.

2. Ensure the monitoring equipment has been calibrated according to the manufacturer's instructions and your department's procedures outlined in Appendix A.

3. Monitor remotely for: oxygen, combustibles (lower & upper explosive limit), and toxic gases and vapors. Test first for oxygen, then for combustibles and then for toxic gases and vapors.

4. Types of continuous air monitors used:

    a. Direct reading electronic monitoring devices which continuously monitor for all three of the constituents listed above.

5. The minimum acceptable air quality prior to confined space entry is:

    a. oxygen level: between 19.5% and 23.5% by volume
    b. combustible gas: concentration not more than 10% of the lower explosive limit (LEL)
    c. other toxic contaminants: concentrations shall not exceed the MIOSHA regulatory limit or other recommended exposure limit to insure the safety and health of the authorized entrants.

    Generally, the electronic monitoring equipment most commonly used is fitted with an audible alarm that will sound when any one of these criteria is exceeded.

6. If it is determined that unacceptable air quality exists due to contaminants, do not enter the space. Implement appropriate control measures as outlined in the next section of this Guideline and re-test to assure acceptable entry conditions are obtained.

7. Record initial readings obtained on the permit and any changes in the readings as the preparation or work proceeds. **Air monitoring must be continuous while authorized entrants are working in the space to assure that acceptable conditions are being maintained.** The electronic monitoring devices are designed to be easily carried by the employees.

Implementation of Control Measures

1. Hazardous Atmospheres (or potentially hazardous atmospheres):

   Once the confined space has been determined to contain or potentially contain a hazardous atmosphere, steps must be taken to ventilate the space and eliminate the hazard before entry. Control methods include:

   a. Mechanical dilution ventilation: use of fans or blowers to provide positive pressure, uncontaminated air to the space. Assure that the fan is located away from any source of contamination and use explosion-proof fans if there is a potential combustible atmosphere.

   b. Local exhaust ventilation: this is designed to capture contaminants at or near their point of generation using hoods or enclosures with duct work connected to an exhaust fan. The contaminated air is discharged outside the confined space to a safe area. This method is especially effective for welding, cutting, burning, brazing and other operations where the work induces the atmospheric hazard.

   Ventilation in either application must be continuous during the entire entry procedure. Continuous air monitoring will help ensure that the ventilation remains adequate and atmospheric hazards do not develop.

   c. Cleaning or Purging: if there are residue of hazardous chemicals or materials present which are capable of generating a hazardous atmosphere or may cause sufficient eye or skin irritation sufficient to impair self-rescue, they must be removed and the space purged with an appropriate agent, to the extent feasible. Continuous monitoring must still be conducted after this process, and continuous ventilation may also be needed.

2. Safety Hazards

To achieve acceptable entry conditions, any identified safety hazards must be controlled, using the following guideline:

a. mechanical, moving parts - de-energize and lockout/tagout all equipment in accordance with the LOTO Guidelines or otherwise physically isolate the equipment through guarding, partitions or barriers.

b. electrical equipment - deenergize and lockout/tagout all electrical equipment in accordance with the LOTO Guidelines or physically isolate the equipment by use of barriers or partitions of non-conductive material. Use ground fault circuit interrupters on all electrical equipment used in a damp or wet space. Certified electricians are qualified to work on live parts and will use appropriate personal protective equipment and follow regulatory safe work practices.

c. chemical or gas lines - isolate by one or more of the following methods: blanking and blinding, double-block and bleed, line breaking or misalignment, lockout/tagout.

d. heat stress - use mechanical dilution ventilation as described above, as well as other appropriate safe work practices as per the Heat Stress Guideline.

e. hot work operations - control the potential for fire by using a hot work safety permit in addition to the confined space permit and follow the UM-D Hot Work Safety Program.

f. lighting - install appropriate temporary lighting. If there is a potential flammable/explosive atmosphere, use explosion-proof or intrinsically safe equipment approved for the location. If water is present, use a ground fault circuit interrupter (GFCI). All temporary lighting must be grounded.

g. engulfment - remove the liquid or fine bulk material from the space, or entrant(s) must wear a full body harness and retrieval line and only enter if they can be rapidly pulled out. In addition, the space must be isolated by double blanking & bleeding or line breaking/misalignment to keep out any potential hazardous substances, whether it be a solid, liquid or gas. Isolation cannot be accomplished by closing a valve, or turning a switch.

h. entrapment or configuration - extra care must be taken in properly air monitoring (and if necessary, ventilating) all areas of the space,

especially where the space configuration becomes smaller and gas pockets may develop. Retrieval or life lines may be necessary so that employees can be easily located.

i. ladders/falling/tripping hazards - maintain clear access to and from the space; use good housekeeping practices; check ladders for slippery rungs, cracks or defects before using; tie off ladders; use a full body harness fall protection device if there is a danger of falling; use other appropriate protective equipment (hard hat, safety shoes, etc.)

j. noise - noise levels may be higher than normally expected, due to sound reverberation within the space, and may interfere with communication. In this situation, supplement voice/radio communication with visual hand signals or life lines. Hearing protection in the form of plugs or muffs may also be required to protect the entrant's hearing.

Indicate on the Permit all control measures implemented.

Selection of Personal Protective Equipment (PPE)

Based on the evaluation of specific confined space hazards and the control measures implemented, select the appropriate protective equipment to be worn during the work. Consideration should be given to the need for each of the following types of PPE:

1. face and eye protection
2. hearing protection
3. protective clothing, gloves, boots, blankets
4. head protection
5. respirators
6. emergency portable lighting, e.g. flashlights (use explosion-proof or intrinsically safe equipment if there is a potential for a flammable/explosive atmosphere)
7. full body safety harnesses and lifelines associated with retrieval equipment and/or fall protection

Refer to the Respiratory Protection Guidelines and Personal Protective Equipment Guideline for additional information on the proper selection of PPE. Indicate on the Permit all PPE to be worn by entrants. Contact Public Safety & Environmental Health if assistance is needed and **contact Public Safety & Environmental Health anytime respirators will be required in confined spaces**.

Establish Communication

Decide how entrants will communicate with each other and with attendants on the outside of the space. Communication may be voice, radio, hand signals or life lines, as long as it enables the employees to monitor each other and to alert entrants of the need to evacuate the space. Indicate on the Permit the method of communication to be used.

Note: Attendants will not monitor more than one space at a time.

When radios will be used in remote areas, install a remote antenna lead to the radio. Test the radio function with the attendant or other worker outside the space or test by calling Public Safety before entering. Re-verify radio communication after entering the confined space.

Note: Make sure radios are labeled as intrinsically safe when there is a potential for a flammable/combustible atmosphere.

If the planned communication method is disrupted, entrants will immediately evacuate the space until the problem is corrected.

Other Entry Precautions

The Entry Supervisor is responsible for ensuring all other necessary precautions are taken to address site safety and health concerns, including:

1. Removal of entrance covers: any condition making it unsafe to remove an entrance cover (such as high temperature and pressure) must be eliminated before removing the cover. Conditions may be such that the cover can be loosened gradually to release the pressure. Ventilation may be needed during this process.

2. Guarding entrance covers: When ground level entrance covers are removed, the opening will be guarded by a temporary barrier to prevent accidental falls and protect entrants from foreign objects dropping into the space.

3. Ensure that all equipment is in good repair and functioning properly prior to entering the permitted confined space.

Determine Permit Type: Permits for entry into confined space are classified as either General, Hot Work, or Hazardous Permits due to the unique nature and additional precautions necessary when working in hazardous spaces or when performing hot work. As the Entry Supervisor goes through the process of identifying the hazards and implementing the

appropriate controls, they will use that information to decide the type of Permit to be issued and will indicate this in the space provided at the top of the Permit. All the information on the permit will be reviewed with the entrants and attendants before the work proceeds.

1. GENERAL ENTRY PERMITS:

Use the general entry permit when all atmospheric hazards and safety hazards have been controlled as described earlier in this Guideline, "Implementation of Control Measures."

Note: Even though the hazard is under control, ventilation and air monitoring must still continue throughout the duration of the job as well as all other permit requirements described previously in this Guideline.

In addition, when using a General Entry Permit, the work party must consist of a **minimum of two authorized employees working in a buddy system.** Both employees may work in the space and no attendant is needed. However, as with all other UM safety programs, the supervisor or employees may decide to take additional precautions such as the use of an attendant or retrieval/fall protection equipment.

2. HAZARDOUS ENTRY PERMITS:

When the hazardous atmosphere or safety hazard cannot be brought under control by safety controls, continuous ventilation and verified with continuous monitoring, use a Hazardous Entry Permit. **Work requiring a Hazardous Entry Permit must be prescheduled.**

In addition to all of the permit requirements stated earlier this Guideline, the following procedures must be implemented:

a. Contact your supervisor to review the space, the potential hazards, and control methods implemented. Your supervisor will issue the permit and remain on-site during the initial entry and as necessary during the work. Your supervisor will use the worksheet in Appendix F as a guideline in assessing the space and assuring all proper controls are in place.

b. All entrants will wear a full body retrieval harness while in the space, if feasible, as long as it does not create a greater hazard. In such cases, wristlets can be used in lieu of a harness (Vertical spaces greater than five feet deep call for use of a retrieval harness).

The EHS Manager will review and approve the type respiratory protection to be worn, prior to entry, as well as other PPE. Ensure adequate time for review.

c. There must be at least one attendant on site at all times, monitoring the activities inside and outside the space, in frequent communication with the entrant(s) in the space. The attendant will maintain an accurate count of entrants in the space and know the identity of each entrant. They will not allow unauthorized persons from entering the space or call Public Safety & Environmental Health or their supervisor for assistance. The attendant cannot perform other duties that would distract from monitoring the space.

   The attendant must be trained in the rescue provisions described in this Guideline and be certified in first aid and CPR.

d. There must be a first aid kit at the site ready for use.

e. On-site rescue is required for all Hazardous Entry Permits. If this cannot be accomplished internally than it may be necessary to employ the services of the contract on-site rescue team (Marine Pollution Control). See "Evacuation and Rescue" section of this Guideline for more details on rescue. **IT MAY BE NECESSARY TO EMPLOY THE SERVICES OF THE CONTRACT ON-SITE RESCUE TEAM / Marine Pollution Control (MPC) TO BE PRESENT AT THE OPENING OF THE CS FOR THE DURATION OF THE ENTRY IN ORDER TO COMPLY WITH THESE PROGRAM REQUIREMENTS.**

3. **HOT WORK ENTRY PERMIT:**

When hot work will be conducted in a confined space, the Entry Supervisor will classify the permit as hot work.

The following provisions will be followed in addition to the permit requirements stated in this Guideline:

a. UM-Dearborn Public Safety & Environmental Health will be contacted and the appropriate UMD Hot Work Permit will be completed PRIOR to entry. Any fire watches required will be the responsibility of the department conducting the entry.

b. Ventilation will be needed since fumes will be generated as a result of the work. Fans/ventilators shall be used at the point of

entrance of the confined space and/or adjacent to the work area. If the exhaust is not through an alternate access, necessary precautions will be taken so the exhaust is not affecting another work party that may be in the area.

Note: Pressurized sources of oxygen shall never be used for ventilating purposes, and compressed gas cylinders and welding machines must be secured and left outside the confined space.

c. Entrants may have to use respiratory protection if ventilation controls are insufficient. In this case, the permit should be classified as Hazardous and Public Safety & Environmental Health contacted before proceeding.

d. All entrants will wear full body retrieval harness while in the space, if feasible, as long as it does not create a greater hazard. In such cases, wristlets can be used in lieu of a harness. (Vertical spaces greater than five feet call for the use of a retrieval harness).

e. There must be at least one attendant on site at all times, monitoring the activities inside and outside the space, in frequent communication with the entrant(s) in the space. The attendant will maintain an accurate count of entrants in the space and know the identity of each entrant. S/he will not allow unauthorized persons from entering the space or call Public Safety & Environmental Health or their supervisor for assistance. The attendant cannot perform other duties that would distract from monitoring the space.

f. The attendant must be trained in the rescue provisions described in this Guideline and be certified in first aid and CPR. There must be a first aid kit at the site ready for use.

g. On-site rescue is required for all Hazardous Entry Permits. If this cannot be accomplished internally than it may be necessary to employ the services of the contract on-site rescue team (Marine Pollution Control). See “Evacuation and Rescue” section of this Guideline for more details on rescue. **IT MAY BE NECESSARY TO EMPLOY THE SERVICES OF THE CONTRACT ON-SITE RESCUE TEAM / Marine Pollution Control (MPC) TO BE PRESENT AT THE OPENING OF THE CS FOR THE DURATION OF THE ENTRY IN ORDER TO COMPLY WITH THESE PROGRAM REQUIREMENTS.**

h. Authorized entrants performing hot work will follow all provisions of the Hot Work Safety Program, including the use of a hot work permit to assure that all fire safety precautions have been completed and verified. The attendant will also serve as the fire watch.

i. When arc welding is stopped during lunch or overnight, all electrodes will be removed from the holders and holders located so that accidental contact cannot occur. The machine will be disconnected from the power source.

j. When gas welding or cutting is stopped during lunch or overnight, the valves will be closed and the gas supply positively shut off outside the confined space. Remove the torch and hose from the space, if feasible.

k. Secure all cylinders and machinery associated with hot work.

Evacuation and Rescue Plan

1. Evacuation:

   Under the following circumstances, all entrants must leave the confined space immediately:

   a. If a hazardous atmosphere is detected (that is, if the audible alarm on the air monitor sounds, or there is any other indication of a problem).

   b. Entrant(s) are experiencing signs and symptoms of possible exposure to a hazardous atmosphere or feel that they may become incapacitated in anyway.

   c. Conditions in the space change that would require re-evaluation of the potential hazards. That is, the conditions listed on the permit are no longer in place.

   d. Whenever an attendant is present but s/he is unable to perform the duties of attendant.

   e. Whenever the entrants are notified to evacuate by the attendant or entry supervisor or by evacuation alarm.

   f. Whenever communication with the attendant is disrupted.

2. Rescue:

   Rescue measures may be necessary if the authorized entrant in the confined space becomes incapacitated and is unable to exit the space without assistance. Under these circumstances the authorized entrants or the attendant at the site should follow these procedures:

   a. At the first indication of a problem, contact the Department of Public Safety & Environmental Health by calling 911 from any campus telephone or (59)3-5333 from a non-University telephone or contact them directly using radio communications and request assistance.

   b. If the problem is due to an atmospheric hazard and the entrants are wearing retrieval harness, the attendant and/or other employees present should attempt to activate the retrieval system to remove the entrant from the space. If the lifting device fails to lift the entrant out of the space, the attendant should wait outside the space for help to arrive. **Under no circumstances should the attendant enter the confined space until back up personnel are on site, and adequate protective equipment is available.**

   c. If it can be ascertained that the entrant is incapacitated due to causes not related to the atmosphere in the space (such as a fall or other injury), they should not be moved until the appropriate rescue personnel arrive and direct the removal. First aid, if appropriate, should be rendered.

   d. The Public Safety & Environmental Health will contact the Dearborn Fire Department (DFD) or 911/Local EMS. The employees at the scene should keep Public Safety & Environmental Health advised as to the nature of the emergency so that appropriate notification can be made at the earliest time possible.

   e. Response personnel (DFD and or the Contracted ON-Site Rescue Team/MPC) have been trained in confined spaces and will review the permit and understand the hazards of the space and condition of the entrants before taking any action. The rescue personnel may also conduct additional air monitoring. Rescuers must assure they are properly protected before beginning rescue operations and be equipped with SCBAs.

      i. If the entrant is incapacitated due to the atmosphere in the space and is wearing a safety harness, the rescue personnel

shall use the lifting device to remove the entrant from the confined space.

ii. If the use of the lifting device fails to extract the entrant from the confined space, rescue personnel wearing SCBA, and all other appropriate protective equipment, shall enter the confined space to assist in the rescue effort only if an additional standby person with an SCBA is at the entrance to the space. The rescuer must evaluate the atmosphere for explosive hazards prior to entry.

iii. If the entrant is incapacitated due to causes not related to the atmosphere, the rescue personnel will render first aid as appropriate and remove the individual from the space in the most appropriate manner taking the injuries into account.

When an injured entrant has been exposed to a substance for which a Material Safety Data Sheet (MSDS) or other information is available, that MSDS or other information will be provided to the medical facility treating the exposed entrant.

At least one person on the response team shall hold current certification in CPR and first aid and be trained in the Bloodborne Pathogens program.

Closeout & Cancellation of the Permit

At completion of the work, the entry supervisor will closeout and cancel the permit by signing on the line indicated. The permit will be forwarded to the Departmental Supervisor, Manager, or Foreman who will review and maintain the copy in the departmental file.

All canceled permits will be kept on record for a period of one year by the employees department. Any problems encountered during entry or work in a confined space will be noted on the permit and reviewed with the EHS Manager so it can be investigated and appropriate revisions made to the confined space program.

PROCEDURES FOR OUTSIDE CONTRACTORS

Notification Procedures - When outside contractors will perform work that involves permit-required confined space entry, the University is required to inform the contractor of the following:

1. The location of any permit-required confined spaces.

2. The hazards identified and why the University classifies it as a permit space.

3. Precautions or procedures that the University has in place to protect nearby personnel.

4. The regulatory requirement that the contractor comply with the OSHA Confined Space regulation, 29 CFR 1910.146.

The notification requirements can be accomplished by using the Contractor Notification form in Appendix E of this Guideline.

Coordination with UMD Authorized Entrants

If University personnel will be working in or near the permit spaces(s) where the contractor will be working, then the University and the contractor will coordinate entry operations. Issues to be addressed during these discussions include:

1. What permit system will be used.

2. Scheduling of entry into the space.

3. Procedures that will be used to evaluate the hazards and implement controls.

4. Establishment of lines of communication between contractor and University personnel working in the area.

5. Review of evacuation and rescue plan.

Contractor Confined Space Program

The contractor will inform the University representative of the confined space permit program that will be used. If the contractor encounters or creates any hazards during the entry operation, this information will be communicated to the University representative.

Debriefing

At the conclusion of the entry operation, the University representative and the contractor will hold a debriefing where they will share information

about any problems encountered during the work. The University representative may request the EHS Manager at this meeting. The EHS Manager will make any necessary changes to the program based on information obtained at the debriefing.

TECHNICAL SUPPORT & REFERENCE DOCUMENTS:

Technical support is provided by CS&S (593-4914). All referenced guidelines, regulations, and other documents are available through CS&S.

ATTACHMENTS:

Appendix A - Example department specific Confined Space Entry Program
Appendix B - UM-Dearborn General listing of confined spaces
Appendix C - Confined Space Evaluation Form
Appendix D - UM-Dearborn Confined Space Entry Permit
Appendix E - Contractor Notification Form
Appendix F - Hazardous Confined Safety Entry Worksheet

APPENDIX A

USE THIS FORM TO DEVELOP DEPARTMENTAL SPECIFIC ELEMENTS OF YOUR CONFINED SPACE ENTRY PROGRAM. INSTRUCTIONS ARE ITALICIZED.

DEPARTMENT CONFINED SPACE PROGRAM

This will serve as an appendix to the Confined Space Guideline for entry into confined spaces, outlining implementation issues specific to *Facilities Management.*

POLICY:

All employees who enter permit-required confined spaces (PRCSs) will follow the procedures described in the EHS Guideline. As required by this Guideline, employees who enter PRCSs must first attend general confined space entry training approved by Public Safety & Environmental Health. Specific confined space training is the responsibility of the employee's supervisor, foreman, or manager.

IDENTIFICATION OF PERMIT-REQUIRED CONFINED SPACES:

See Appendix B fore identified confined spaces and their potential safety and health hazards here.

CONFINED SPACE SAFETY EQUIPMENT:

1. Air Monitoring

   List or refer to all air monitoring equipment by brand, model number, serial number, and indicate where the equipment is located.

   - RKI, GX 2001, 499070385, will be located in the Public Safety Officers Room
   - RKI, GX 2001, 499070434, will be located in the Public Safety Officers Room

   Calibration and maintenance of the air monitoring equipment is the responsibility of *the EHS Manager.* All meters will be calibrated at least monthly and checked for good working order. Equipment in need of repair will be serviced by: *ASC Master Tek.*

2. Ventilation equipment

   List or refer to all ventilation equipment by brand, model number and indicate where equipment is located.

   Gary Taylor is responsible for assuring that the ventilation equipment is maintained and in good working order.

Other equipment necessary for making the PRCS safe for entry will be made available to employees, as needed.

RECORDKEEPING:

1. Calibration Records

   Records of calibration of air monitoring equipment will be kept by *the EHS Manager*. The records will be stored in the *EHS Managers Office*.

2. Permits

   All canceled permits will be returned to *Gary Taylor,* and kept on file at *the Facilities Management office* .

3. Training

   General confined space training approved by the *Public Safety & Environmental Health*. The employee's *supervisor* prior to entry must provide specific confined space training. Records of training will be kept by the *employee's department. Facilities Management* will maintain their records of space specific training.

APPENDIX B - GENERAL LISTING OF CAMPUS CONFINED SPACES

University of Michigan-Dearborn Campus Confined Space List

Note: These are examples based on prior knowledge of the space. Supervisors may use this as a guideline in classifying spaces in their departments or in which their employees may need to enter in order to complete work at the work site.

Type of Space	Personnel Involved	Hazard	Most Likely Type of Permit
Certain sections of Utility Tunnels (refer to specific POR listing at end of table*)	Steam fitters, sheet metal workers, plumbers, asbestos workers, welders, pipe coverers, painters	Heat stress, restrictive spaces, high pressure (60 lb. Pressure) steam lines, chemical use, welding	General Permit Required Confined Spaces identified within tunnel system (note listing)
Electrical Manholes	High voltage electricians	High voltage electricity, possible contaminant build-up (gases) due to location	General Permit Required Confined Space
Sanitary sewer system and manholes	Plumbers, electricians, masons	Combustible gases, hydrogen sulfide (use appropriate meter), slippery surfaces, biological contamination, flooding	Hazardous Entry Permit Required Confined Space
Storm sewer	Plumbers, electricians, masons	Carbon monoxide, oxygen deficiency, hydrogen sulfide	General Permit Required Confined Space
Underground storage tanks	Sheet metal workers, welders	Lack of ventilation, residual or stored chemicals and their vapors, explosive or flammable chemicals	Hazardous Entry Permit Required Confined Space
Above ground storage tanks	see above	see above	see above
Crawlspaces	Electricians, welders, plumbers, painters	Restrictive work site	Non-Permit Required Confined Spaces. If lack of natural ventilation or safety hazard, then General Permit Required Confined Space
Boilers (steam sides and fire flu)	Welders	Heat, lack of ventilation, configuration	General Permit Required Confined Space
Sump stations	Plumbers, welders	Contaminants from sump system,	General Permit Required Confined

Type of Space	Personnel Involved	Hazard	Most Likely Type of Permit
		hydrogen sulfide, biological contamination, electrical/mechanic, oxygen deficiency	Space
Electrical Vaults	Electricians	Electrical, lack of ventilation, restrictive work site	General Permit Required Confined Space
Telecommunications manholes	UM-Tel personnel	Vapors/gases can be carried by entrance ducts	General Permit Required Confined Space
Fume Hood Ductwork (interior)	Sheet metal, welders	Toxic or flammable gases or vapors, chemical residues, restrictive work site	General Permit Required Confined Space
Air Handling Units	HVAC personnel	Restrictive work site	Non-Permit Required Confined Space
Chimneys	Masons, powerhouse personnel	Depends on location	Non-Permit Required Confined Space. Exception: if chemical, biological, or radioactive contaminants are burned within, then General or Hazardous Entry Permit Required Confined Space (contact OSEH)
Interstitial Spaces	Maintenance, HVAC, electrical personnel	Restrictive work site	Non-Permit Required Confined Space

Note: A Hot Work Permit is required if performing cutting, welding, brazing, torch soldering, high speed metal grinding, or open flame tasks within any type of confined space.

If a space's characteristics or hazards change, the type of permit required may also change. This is determined by re-evaluating the confined space.

Confined spaces may exist that are not identified within this chart. If there are any questions regarding the status of a space, it should be evaluated or re-evaluated, and entered according to procedures required for the hazards that are present.

University of Michigan – Dearborn ~ Confined Space List

Note: For specific locations and confined space evaluations see your supervisor or the EHS Manager.

APPENDIX C - CONFINED SPACE EVALUATION FORM

SPACE LOCATION: _____
SPACE DESCRIPTION: _____

Complete this form for any space that may be considered a confined space.
A confined space is defined as having those characteristics listed in #1 through #3 below.

YES NO 1. Is the space large enough and shaped so employee can enter and work?

YES NO 2. Does the space have a limited or restricted means for entry or exit?

YES NO 3. Is the space NOT designed for continuous employee occupancy?

If questions #1 through #3 above are "YES", then the space is a confined space.
Continue with questions A through E below to determine if and what type of permit is required to enter.

YES NO A. Does the space contain, or have the potential to contain, a hazardous atmosphere (i.e., oxygen deficiency, flammable vapors, toxic gases or dusts, etc.), or pipes, ducts, vents or other entry points for potentially hazardous substances, or will volatile chemicals be used, or will painting or other work that could create a breathing hazard be done?
Specify potential or known hazards:_____

YES NO B. Does the space contain a material with the potential for engulfment of a worker (for example, grain, sand or water)?
Specify potential or known hazards:_____

YES NO C. Does the space have an internal shape such that a worker could be trapped or suffocated by inwardly converging walls, floor or ceiling?
Specify potential or known hazards:_____

YES NO D. Does the space contain other recognized safety or health hazards, such as:
(check all that apply)

___ mechanical hazards;
___ exposed or vulnerable electrical wires or energized equipment;
___ gas or chemical lines
___ special hazards related to elevation or falling; or
___ temperature extremes/heat stress

Specify potential or known hazards:_____

YES NO E. Will welding, cutting, torch work, or other hot work be done?
Specify potential or known hazards:_____

If you answered NO to all questions A through E, then the space is a Non-Permit Required Confined Space.

If you answered YES to question A, then classify the Permit as either General or Hazardous, depending on the ability to adequately ventilate the space.

If you answered Yes to question B, C or D, then classify the Permit as a General if the hazards can be controlled.

If you answered Yes to question E, then classify the Permit as Hot Work & also issue a Hot Work Safety Permit.

Name: _____ Signature: _____

Department: _____

Refer questions to Public Safety & Environmental Health at (59)3-5333.

APPENDIX D
UNIVERSITY OF MICHIGAN-DEARBORN
CONFINED SPACE ENTRY PERMIT

(Valid for maximum of one eight-hour shift and to be posted at work site)

Type of Entry Permit (check one): **General: _____** **Hazardous: _____** **Hot Work _____**

(Contact Your Supervisor) (Issue Hot Wk Safety Permit)

DATE/TIME ISSUED: _____/ _____ DATE/TIME EXPIRES:_____/_____

SPACE LOCATION: _____

PURPOSE OF ENTRY: _____

AUTHORIZED PERSONNEL:

ENTRY SUPERVISOR(S)	AUTHORIZED ENTRANTS	ATTENDANT/SPOTTER(S)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

RESCUE METHOD: **RESCUE PERSONNEL:**

_____ _____

_____ _____

PRE-ENTRY BRIEFING CONDUCTED BY: _____

HAZARD POTENTIAL IDENTIFICATION (MUST BE ANSWERED YES, NO, OR N/A):

	YES	NO	N/A			YES	NO	N/A
CAN PHYSICALLY ENTER SPACE	[ ]	[ ]	[ ]	If 3 Yes's	ENTRAPMENT	[ ]	[ ]	[ ]
HAS LIMITED ENTRANCE/EGRESS	[ ]	[ ]	[ ]	Space is	CHEMICAL CONTACT	[ ]	[ ]	[ ]
NOT FOR CONTINUOUS HUMAN OCCUPANCY	[ ]	[ ]	[ ]	confined	ELECTRICAL EXPOSURE	[ ]	[ ]	[ ]
LACK OF OXYGEN >19.5%	[ ]	[ ]	[ ]		MECHANICAL EXPOSURE	[ ]	[ ]	[ ]
OXYGEN ENRICHED < 23.5%	[ ]	[ ]	[ ]		TEMPERATURE (HOT/COLD)	[ ]	[ ]	[ ]
COMBUSTIBLE GASES/VAPORS (LEL < 10%)	[ ]	[ ]	[ ]	If any of	FALL POTENTIAL	[ ]	[ ]	[ ]
COMBUSTIBLE DUSTS (VISIBILITY >5')	[ ]	[ ]	[ ]	these are	ADEQUATE LIGHTING	[ ]	[ ]	[ ]
TOXIC CARBON MONOXIDES < 35 PPM	[ ]	[ ]	[ ]	checked	HYDRAULIC ENERGY	[ ]	[ ]	[ ]
TOXIC HYDROGEN SULFIDE <10 PPM	[ ]	[ ]	[ ]	yes -	COMPRESSED AIR	[ ]	[ ]	[ ]
ENGULFMENT	[ ]	[ ]	[ ]	Permit is	GRAVITY	[ ]	[ ]	[ ]
HOT WORK PERMIT NEEDED	[ ]	[ ]	[ ]	required	PRODUCTS IN PIPING	[ ]	[ ]	[ ]

ACCEPTABLE ENTRY CONDITIONS

IF ANY OF THE FOLLOWING APPLICABLE QUESTIONS CANNOT BE ANSWERED "YES", DESCRIBE ALTERNATE SAFETY PROCEDURES IN "**ADDITIONAL INFORMATION"** SECTION.

	YES	NO	N/A		YES	NO	N/A
AFFECTED DEPARTMENTS NOTIFIED	[ ]	[ ]	[ ]	RESCUE PERSONNEL AVAILABLE	[ ]	[ ]	[ ]
SYSTEM LOCKED & TAGGED OUT	[ ]	[ ]	[ ]	PIPING BLANKED/CAPPED OR BROKEN	[ ]	[ ]	[ ]
FALL PROTECTION PROVIDED	[ ]	[ ]	[ ]	SPACE VENTILATED	[ ]	[ ]	[ ]
LIFELINE & HARNESS PROVIDED	[ ]	[ ]	[ ]	FIRST AID KIT AVAILABLE	[ ]	[ ]	[ ]
ELECTRICAL GFCI PROTECTED	[ ]	[ ]	[ ]	ELECTRICAL EXPLOSION-PROOF	[ ]	[ ]	[ ]
FIRE EXTINGUISHER AVAILABLE	[ ]	[ ]	[ ]	AREA SECURED & BARRICADED	[ ]	[ ]	[ ]
OXYGEN LEVEL BETWEEN 19.5 & 23.5 %	[ ]	[ ]	[ ]	PROPER PROTECTIVE CLOTHING PROVIDED	[ ]	[ ]	[ ]
COMBUSTIBLE LEVEL < 10% LEL	[ ]	[ ]	[ ]	PERSONNEL TRAINED IN ASSIGNED DUTIES	[ ]	[ ]	[ ]
CARBON MONOXIDE LEVEL < 35 PPM	[ ]	[ ]	[ ]	PERSONNEL INFORMED OF HAZARDS	[ ]	[ ]	[ ]
HYDROGEN SULFIDE LEVEL < 10 PPM	[ ]	[ ]	[ ]	ALL EQUIPMENT INSPECTED & READY	[ ]	[ ]	[ ]

ADDITIONAL INFORMATION:

_____

_____

_____

MONITORING EQUIPMENT USED: MAKE:_____ MODEL: _____ SERIAL NO.: _____ DATE LAST CALIBRATED: _____

AUTHORIZATION: _____ _____

ENTRY SUPERVISOR DATE/TIME

ATMOSPERIC TESTING RESULTS
(Record results at least every 30 minutes)

TIME	OXYGEN % 19.5 to 23.5	% LEL Under 10	CO PPM Under 35	H2S PPM Under 10	OTHER

CANCELLATION:____ ____________________

ENTRY SUPERVISOR DATE / TIME

APPENDIX E

University of Michigan-Dearborn
Contractor Confined Space Entry Notification

In compliance with 29 CFR Part 1910.146 and applicable state regulations, when the contractor's work may involve entry into permit required confined spaces, the University of Michigan-Dearborn must notify the contractor and inform them of the hazards associated with these spaces.

In the scope of this project, the workplace contains confined spaces and entry is allowed only through compliance with a confined space entry program. Prior to entry, the contractor must submit a copy of their confined space entry program to the Department requesting their services. (Public Safety & Environmental Health is available upon request).

Specific Location of the Permit Required Confined Space(s) (building, street, cardinal direction, type of space):

_____

Atmospheric Hazards (existing or potential):

____ Oxygen content less than 19.5% or greater than 23%
____ LEL greater than 10%
____ Hydrogen sulfide
____ Carbon monoxide
____ Other toxic gases or vapors
____ Combustible dusts
____ Work induced hazards (welding, hot work, painting, use of chemicals, etc.)

Health and Safety Hazards:

____ Mechanical
____ Electrical
____ Engulfment
____ Entrapment
____ Slip, Trip, Fall
____ Fire/Burn
____ Heat Stress or Cold
____ Other (specify)_____
_____

Describe any precautions UM-D will utilize to protect nearby UM-D staff
_____

Will UM-D personnel also be working in the confined space? Yes ____ No ____

If yes, a meeting to coordinate entry activities is required.

At the conclusion of the entry operations the contractor is required to discuss with the UM-D representative the procedures followed and any hazards found or created during entry operations. Copies of permits used will be given to this representative and will be maintained in departmental files.

_____ _____
U of M Representative (print and sign) Contractor Representative
Contractor Company Name and Address:_____

Job or P.O. Number: _____ Date:_____

APPENDIX F

HAZARDOUS CONFINED SPACE ENTRY WORKSHEET

TO BE USED BY EMPLOYEE'S SUPERVISOR IN EVALUATING HAZARDOUS PERMIT CONFINED SPACES PRIOR TO ENTRY

Location of confined space:_____

Hazard Identification:

	Yes/No	Comments
Is entry necessary?		
Is a hazardous atmosphere present or potentially present?		
Are there chemicals or chemical residues present that present an acute hazard?		
Does the space contain rusted interior surfaces?		
Does the space have poor natural ventilation that would allow an atmospheric hazard to develop?		
Are residues going to be scraped off the interior surfaces of the vessel?		
Any flammable/combustible substances present?		
Any decomposing organic matter present?		
Are pipes present which bring chemicals into the space?		
Any materials that can trap or potentially trap, engulf or drown an entrant?		
Is vision obscured by dust at 5 feet or less?		
Does the space contain any mechanical equipment?		
Does the space have converging walls, sloped floors or tapered floor to smaller cross-sections that could trap or asphyxiate an entrant?		
Does the space restrict mobility to the extent that it could trap an entrant?		
Are there any slip, trip or fall hazards?		
Is there excessive noise that would interfere with communication?		
Are there any operations conducted near the space opening that could present a hazard to entrants?		
Are there any hazards from falling objects?		
Are there lines under pressure servicing the space?		
Are cleaning solvents or paints going to be used in the space?		
Is welding, cutting, brazing, riveting, scraping, or sanding going to be performed?		
Is electrical equipment located in or required to be used in the space?		
Are there any corrosives that could irritate the eyes in the space?		
Will entry be made into a diked/excavated area where the dike/excavation is 5 feet or more in height?		
Is there a potential for heat stress due to high temperature, humidity, ppe being worn?		
Is cold stress a potential?		
Are there any conditions that could prevent any entrants self rescue from the space?		
Is there any other hazard present?		

Hazard Control:

	Yes/No	Comments
***Atmospheric Testing/Monitoring*:**		
Is instrument calibration current?		
Has field calibration been performed?		
Is oxygen in the space 19.5 - 23.5%		
Is LEL less than 10%		
Are toxic or oxygen-displacing gases/vapors present?		
Record results on permit	---	
State on permit how continuous monitoring will be performed	---	
Internal cleaning/chemical removal:		
Is internal cleaning necessary? If so, state how		
Has space been cleaned before entry?		
Have chemical or gas pipes been drained, purged and isolated by blanking & blinding, double-block and bleed, line breaking/misalignment and lockout/tagout?		
Ventilation		
Is natural ventilation sufficient?		
Is mechanical ventilation necessary?		
Flammable/combustible areas: explosion-proof motor?		
Is air moving device properly secured?		
Is the air intake for the ventilation system located in an area that is free of combustible dusts, vapors, toxics?		
Is the air moving device volumetric rating sufficient to remove/dilute the atmospheric hazard levels?		
Has the space been ventilated before entry?		
Ventilation continuing during entry?		
Was space re-tested after ventilation, before entry?		
Electrical		
Have all power cords been inspected for proper rating and condition?		
Is all power supplied through a GFCI?		
Is lighting, radios, etc. intrinsically safe? (flammable/combustible area)		
Has all cathodic protection been de-energized and locked?		
Lockout/Tagout		
Has the space been isolated from other systems?		
Has electrical equipment been locked out? Verified?		
Has mechanical equipment been blocked, chocked and disengaged where necessary? Verified?		
Have tags been marked and affixed to all isolation points?		
PPE		
Is special clothing required? specify on permit		
Is respiratory protection required? specify on permit		
Is respirator in proper working order and appropriate?		
Have entrants been trained, medically tested and fitted?		
Can entrants get through opening with respirator on?		
***Air Line Respirators*:**		
Is the air supply grade D		
Have air lines been inspected?		
Are the air lines 300 feet or less in length?		
Is the inlet pressure 125 psig or less?		

Are the connections compatible?		
Are air line connections non-sparking and explosion proof?		
Are 5 minute escape masks available?		
Compressor:		
Will a cascade system be used to supply type D air?		
Will a compressor be used to generate type D air?		
Is the compressor rated to supply type D air?		
Is the compressor oil free?		
Is the compressor oil lubricated?		
Is CO monitor operational and calibrated within last 30 days?		
Is alarm functional?		
Is secondary filter functional, and is a pressure gauge installed?		
Is the compressor staged in a non-classified area?		
Has the grounding system been checked? Verified?		
Are pressure gauges installed and functional?		
SCBAs: UM-Dearborn employees Are NOT Permitted to use SCBA		
Are entrants authorized users of SCBA?		
Has SCBA been inspected in last month?		
Has SCBA been inspected on site and donned in accordance with manufacturer/EHS instructions		
Heat Stress		
Have you determined maximum work time/break schedule?		
Has ventilation been provided?		
Is there drinking water available?		
Have entrants been briefed on signs & symptoms of heat stress?		
Hot Work		
A hot work safety permit must also be issued and all provisions adhered to.		
Is a fire extinguisher available?		
Have gas cylinders been secured and placed outside the confined space and leak tested?		
Electrodes removed from holder and machine power shut off during lunch breaks and overnight?		
Torch valves closed and gas supply shut off during lunch breaks and overnight?		
Ventilation used for all welding & cutting in confined spaces?		
Lighting		
Has adequate lighting been provided?		
Is lighting approved for the location? (flammable/comb.)		
Rescue – for hazardous & hot work confined space permits		
Is attendant present?		
Is the attendant trained in first aid/CPR?		
SHOULD MPC/ THE CONTRACT ON SITE RESCUE TEAM BE CONTRACTED FOR DURATION OF PRCS ENTRY? Are they on site?		
Is the attendant trained in non-entry rescue procedures?		
Has the Public Safety & Environmental Health, MPC or the Dearborn Fire Department been notified of entry?		
Will harness/safety lines/tripod be required? (vertical entries >5 feet)		
Have harness/safety lines been inspected for damage?		
Does attendant know whom to contact in case of emergency?		
Is a first aid kit on site?		
Communications		

How will attendant communicate with entrants?		
How will attendant contact DPS or others if assistance is required? (where is nearest phone)		
Hazard Communication		
Are MSDSs available		
Have MSDSs been review by entrants/attendants?		

After completion of checklist, the employee's supervisor will complete the permit and participate in briefing the entrants, supervisor and attendants. The permit will be posted outside the confined space for the duration of the work. See confined space guideline for further details.