

## **Confined Space Program**

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## CONFINED SPACE ENTRY PROGRAM

### 1.0 PURPOSE

The purpose of this Confined Space Entry (CSE) program is to establish an effective system to identify and control confined spaces to prevent accidents which may cause injury or death to individuals entering confined spaces at Mohawk College facilities.

### 2.0 SCOPE

This program applies to all College Departments, staff and contractors working at any Mohawk College facility, which may perform work in confined or potentially confined spaces.

### 3.0 REFERENCES

Occupational Health and Safety Act (OHSA), R.S.O. 1990.

Ontario Regulation R.R.O.2005, Reg.632, Confined Spaces Regulation

Ontario Regulation R.R.O.2005, Reg.851, Industrial Establishments, Sections119.1– 119.20

Mohawk College Safety Policy CR871

Mohawk College Lockout/Tagout program

American Conference of Governmental Industrial Hygienists [ACGIH] TLVs and BEIs [Threshold Limit Values and Biological Exposure Indices], current edition.

### 4.0 DEFINITIONS

**Attendant:** An individual assigned to ensure the safety of all entrants working in a confined space. The attendant performs all duties outlined under the responsibilities section and will be identified on the CSE permit

**Atmospheric hazards:** Atmospheres which may contain;

- the accumulation of flammable, combustible or explosive agents,
- an oxygen content in the atmosphere that is less than 19.5 per cent or more than 23 per cent by volume, or
- the accumulation of atmospheric contaminants, including gases, vapours, fumes, dusts or mists, that could,
  - result in acute health effects that pose an immediate threat to life, or
  - interfere with a person's ability to escape unaided from a confined space.

**Category:** Designation given to each space to indicate the level of hazard and the required precautionary measures under this confined space program. The classification of a space may change as a result of work or activities performed in the space or from hazard elimination measures taken to protect the space. For example the Category of a space may increase to a higher risk level or, in the event measures are implemented to eliminate the possibility that any atmospheric hazards may occur in the space, then the confined space provision would not apply. There are three space Categories ( A, B, C) under Mohawk College's program:

Category A: These spaces are not confined spaces by definition but are considered to be a "Restricted Access Space" with low hazards requiring minimal precautionary measures. Only authorized personnel can enter restricted access spaces. Examples include elevator pits and air handling units.

Category B: These spaces are low risk confined spaces that can be rendered safe for entry without the requirement for respiratory protection. This can be accomplished through ventilating and continuously monitoring the space. Examples include storm and sanitary manholes, water meter vaults.

Category C: These spaces are high risk confined spaces that, because of the nature of the hazard(s) or location of the space, the space cannot be made safe for entry and workers must wear supplied air respiratory protection such as an airline or self-contained breathing apparatus (SCBA).

**Confined Space (CS):** A space which is fully or partially enclosed, that is not both designed and constructed for continuous human occupancy, and in which atmospheric hazards may occur because of its construction, location or contents or because of work that is done in it.

**CS#:** A unique number assigned to each confined space in Mohawk College's confined space program.

**Hazard Assessment:** An evaluation process conducted on each space to determine its associated hazards, precautions required for entry, and to determine its classification under this confined space program. A written record of each space is prepared to meet the requirement of recognizing where confined spaces exist and assessing the hazards associated with these spaces.

**Confined Space Entry Permit (CSE Permit):** A document completed prior to all confined space entries listing known hazards, entry equipment requirements, rescue protocols, atmospheric testing requirements and all required preparation information. It is a control document signed by all individuals involved in the confined space entry operation.

**Coordination Document:** A document prepared by the lead employer that is used to ensure that employer duties are performed in a way to protect the health and safety of all workers who perform work in the confined space when workers of more than one employer perform work in the same confined space. Refer to Appendix C for a sample coordination document.

**Entrant:** An individual authorized and assigned to enter a confined space for the purpose of performing work or rescue. The entrant performs all duties outlined in the responsibilities section and will be identified on the CS permit.

**Authorized Individual:** An individual authorized because of their training and experience in supervising and monitoring confined spaces. The authorized individual creates and terminates all confined space entry permits and performs all duties outlined in the responsibilities section. The Authorized Individual may be an Entrant or Attendant.

**Emergency Response Team (ERT):** A response team trained to perform entry rescue operations in confined spaces. The ERT is not the same as Emergency Medical Services (Police, Fire and Ambulance).

**Lower Explosive Limit (LEL):** Also known as the "Lower Flammable Limit - LFL". The lowest airborne concentration required to cause an explosion. Concentrations above the LEL (and below the UEL) can ignite if there is a source of ignition.

**Metering/monitoring:** The use of a gas detection meter or monitor to measure the concentration of atmospheric hazards.

**Plan:** The written strategy required under the Confined Space regulation for performing confined space entries. The plan is essentially a work procedure outlining provisions for attendants, controlling hazards, worker duties, attendants, atmospheric testing, PPE, rescue procedures and equipment, communication, access/egress, and energy isolation. The plan is incorporated into the confined space entry permit system under this program.

**Personal Protective Equipment (PPE):** Refers to any equipment that is worn to prevent contact with a chemical agent. Examples include: protective gloves, coveralls, eyewear, boots, respirator, face shield.

**Prohibited Condition:** Any condition identified in the confined space which has not been outlined in the hazard assessment or which is identified but not controlled. This may include atmospheric hazards (oxygen deficiency, flammable gases, toxic gases) the presence of uncontrolled energies (electric, mechanical, pneumatic, hydraulic, product supply, thermal).

**Rescue Protocol:** The means by which an individual can be removed from a confined space in a timely

manner. The time required will be based on the hazards associated with the entry and/or the operation occurring there. Rescue plans are outlined in the Space Hazard Assessment and includes all specialized equipment and procedures.

**Restricted Access Space:** A space which is not a confined space by definition, but is classified as a Category A space under Mohawk College's confined space program. Restricted Access spaces are restricted to authorized personnel only.

**Threshold Limit Value (TLV):** An exposure guideline recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) that refers to the average airborne concentration to which nearly all workers may be exposed without suffering adverse health effects. Ontario has similar exposure limits in O.Reg. 833. There are 3 different guidelines based on the exposure period:

- TLV-TWA (8-hr workday, 40-hr workweek)
- TLV-STEL (15-minutes)
- TLV-C (any part of the workday)

**Time Weighted Average Exposure Value (TWAEV):** An exposure limit regulated by O. Reg 833 "Control of Exposure to Biological or Chemical Agents". These limits refer to the average airborne concentration to which nearly all workers may be exposed without suffering adverse health effects and are similar to the ACGIH's TLVs. The TWAEV is based on an 8-hr workday and 40-hr workweek exposure period. Other exposure limits specified in O.Reg 833 are:

- Short-Term Exposure Value (STEV): 15-minute exposure period
- Ceiling Exposure Value (CEV): Any part of the workday

**Lockout:** The placement of a lock on an energy isolating device or lockout device to physically neutralize all energies in a piece of equipment or machinery ensure the energy isolating device being controlled cannot be operated until the lockout device is removed. Refer to Mohawk College's Lockout/Tagout Program.

**Tagout:** The placement of a tagout device (warning tag) on an energy-isolating device to communicate the equipment must not be reenergized or operated until the tagout device is removed. Refer to Mohawk College's Lockout/Tagout Program.

**Supervisor:** A person who has charge over a workplace or authority over a worker. Depending on the particular reporting relationship, a Supervisor includes, but is not limited to any of the following: Manager, Associate Dean, Director, Vice President or President.

**Upper Explosive Limit (UEL):** Also known as the "Upper Flammable Limit – UFL". Concentrations below the UEL and above the LEL can ignite if there is a source of ignition. Concentrations above the UEL are too "rich" to explode. However, an explosive environment exists as concentrations fall below the UEL.

**Lead Employer:** An employer who contracts for the services of one or more other employers or independent contractors in relation to one or more confined spaces that are located in the lead employer's own workplace or in another employer's workplace.

**Rescue Team:** A team of workers trained and experienced in performing entry type rescues in confined spaces. Rescue teams typically require equipment such as supplied air respiratory protection or specialized retrieval systems. A rescue team is required for entry into all Category C (High Risk) confined spaces and Category B (Low Risk) spaces requiring entry rescue procedures. Mohawk College will subcontract a rescue team where one is required.

## 5.0 RESPONSIBILITIES:

Facilities Management is responsible for:

- Ensuring only trained and qualified employees or contractors perform confined space entries and use the permit system outlined in this program.
- Retaining copies of closed permits for inspection purposes and providing copies to the Occupational Health and Safety Department.
- Ensuring a stand-by rescue team is in place as required.
- Authorizing work to be performed in confined or restricted access spaces.
- Ensuring hazard assessments and entry plans have been completed prior to permitting entry into a confined space.
- Providing contractors with a copy of the confined space program, hazard assessment, confined space entry plan and coordination document as required.
- Providing notification of confined space entries to the Occupational Health and Safety Department prior to the entry being performed.
- Providing resources as may be required to maintain the confined space program.

Supervisors are responsible for:

- Ensuring only trained and qualified employees or contractors perform confined space entries and use the permit system outlined in this program.
- Authorizing work to be performed in confined or restricted access spaces in their area of authority.
- Ensuring hazard assessments and entry plans have been completed prior to permitting entry into a confined space.
- Ensuring a stand-by rescue team is in place as required.
- Providing contractors with a copy of the confined space program, hazard assessment, confined space entry plan and coordination document as required.
- Providing notification of confined space entries to the Occupational Health and Safety Department prior to the entry being performed.

Employees are responsible for:

- Working in compliance with this program if they are required to enter a confined space and use the permit system outlined in this program.
- Receiving training appropriate to the degree of responsibility assigned to fulfill any duties required under the confined space program.
- Reporting any deficiencies or problems associated with the confined space program.

Occupational Health and Safety Department is responsible for:

- Coordinating the development of the Confined Space Entry program including assisting with the identification, hazard assessment and designation all confined spaces at Mohawk College facilities.
- Maintaining and providing a list of confined spaces.
- Providing a documented report to be used to identify hazards, required equipment, rescue protocols and metering requirements for confined spaces. Refer to Appendix A for a sample document (Space Hazard Assessment).
- Retaining copies of completed Confined Space Entry Permits.
- Coordinating confined space training for affected staff.
- Reviewing and updating the Confined Space program.

Contractors are responsible for:

- Working in accordance with Mohawk College's Confined Space Entry program and the confined space entry plan specific to their work location.
- Reading and signing the coordination document before commencing work if applicable (See Appendix C).
- Ensuring a stand-by rescue team is in place as required.

- Ensuring all workers working in or near a confined space have adequate training for performing entries and work in confined spaces.
- Notifying their prime Mohawk College contact of any problems or concerns regarding the confined space entry program.

Authorized Individuals are responsible for:

- Knowing the hazards that may be present during entry, including the routes of potential exposures (i.e., inhalation, skin contact, etc.); signs or symptoms, and consequences of exposure.
- Initiating the CSE permit by identifying the contractor name, the confined space to be entered and the reason for entry, name of entrants/attendants and the time the permit will be valid. Permits may only be issued for a maximum of one shift.
- Evaluating the confined space and any work to be performed using the confined space permit.
- Verifying the necessary precautions on the permit in accordance with CSE procedure
- Inspecting and testing the confined space after the precautions have been implemented to ensure that the space is free from oxygen deficient, flammable and toxic atmospheres, before signing off on the permit.

Note: If it is likely that the operation being conducted inside the CS will result in the changing of atmospheric conditions (i.e., welding, sandblasting, removing debris, grinding, etc.), the appropriate boxes on the permit form for continuous monitoring and/or ventilation must be checked and implemented.

- Verifying that an appropriate rescue protocol is specified and activation of this protocol has been tested. Depending on the type of entry this may include the posting of a rescue team with specialized equipment at the point of entry.
- Periodically monitoring the progress of the work to ensure it is being done properly and within the safety parameters outlined on the permit.
- Preventing the entry of unauthorized individuals during confined space work.
- Checking the confined space after the work has been completed to ensure that it is safe to resume normal operations.
- Debriefing entrants and attendants and note on the permit, any problems encountered during an entry operation.
- Terminating the entry and closing off the permit.
- Providing the closed permit to the Mohawk College contact person or the Occupational Health & Safety Department.

Entrants are responsible for:

- Requesting a CSE permit from the Authorized Individual when there is work to be performed in a CS.
- Implementing the precautions identified on the CSE permit prior to entry. This will include safety equipment and rescue protocols outlined in the entry specific Plan.
- Knowing the hazards that may be present during entry, including the routes of potential exposures (i.e., inhalation, skin contact, etc.); signs or symptoms and consequences of the exposure.
- Ensuring a CSE permit is completed and signed off by each entrant that they understand the hazards and the control equipment needed to safely complete operations in the CS.
- Properly wearing all required personal protective equipment and utilize continuous air monitoring except where noted in the entry specific guidelines and CSE permit.
- Maintaining communication with the Attendant as necessary to enable the Attendant to monitor the status of the Entrant(s) and enable the Attendant to alert the Entrant(s) of the need to evacuate the space.
- Alerting the Attendant whenever:
  - The Entrant recognizes any warning sign or symptom of exposure to a dangerous situation.
  - The Entrant detects a condition that is not allowed by the permit.

- An evacuation alarm is activated.
- Returning the confined space entry permit to the Authorized Individual upon completion of the work and ensuring the permit has been terminated and closed off.
- Informing any other Authorized Personnel involved in the CS entry of any hazards confronted or created in the confined space as soon as hazards or potential hazards are identified.
- Informing the Mohawk College representative, Authorized Individual or Occupational Health and Safety Department of any problems encountered with the confined space program and permit system.

Attendants are responsible for:

- Knowing the hazards that may be present or exist during entry, including the routes of exposure (i.e. inhalation, skin contact, etc.); signs or symptoms, and consequences of the exposure.
- Remaining outside the confined space during entry operations and continuously monitoring the safety of the Entrants inside the confined space at all times. **Note:** The Attendant must never enter the confined space unless relieved by another qualified Attendant.
- Continuously maintaining an accurate count of all Entrants in the confined space and recording all entry and exit times on the confined space permit.
- Order the evacuation of the confined space if:
  - A prohibited condition, which is not allowed on the permit, is observed.
  - If the Entrant exhibits behavioural effects indicative of a hazardous exposure.
  - A situation outside the space is detected which could endanger those working inside the space (such as activation of an emergency evacuation alarm)
  - An uncontrolled hazard is detected inside the space.
  - The Attendant cannot effectively and safely perform all required duties.
- Posting the permit on or near the confined space and ensuring the conditions stipulated on the permit are met.
- Knowing how to activate the prescribed rescue protocol and testing the activation prior to initial entry.
- Initiating and performing non-entry rescue techniques if specified as the preferred rescue protocol in the entry specific Plan.
- Providing first aid or CPR as may be necessary.
- **Note: The attendant must have current CPR training or have immediate access to individuals with current certification in CPR.**
- Not performing duties that may interfere with the primary duty of monitoring and protecting the Entrant(s).

Rescue Team Members are responsible for:

- Setting up all required rescue equipment and standing by the point of egress at Category “C” spaces or Category B spaces requiring entry to perform a rescue.
- Immediately implementing the rescue procedures when an entrant requires assistance to exit the space.

## 6.0 TRAINING REQUIREMENTS

All Mohawk College employees who are required to work in confined spaces or who authorize or contract confined space entries shall receive appropriate training. Contractors hired to perform confined space entries are required to provide proof of suitable training prior to performing a confined space entry.

## 7.0 ASSESSMENT AND CLASSIFICATION OF CONFINED SPACES

All confined spaces are identified based on the following definition as per the confined space regulation. A confined space is;

A space which is fully or partially enclosed, that is not both designed and constructed for continuous human occupancy, and in which atmospheric hazards may occur because of its construction, location or contents or because of work that is done in it.

Atmospheric hazards are atmospheres which may contain;

- the accumulation of flammable, combustible or explosive agents,
- an oxygen content in the atmosphere that is less than 19.5 per cent or more than 23 per cent by volume, or
- the accumulation of atmospheric contaminants, including gases, vapours, fumes, dusts or mists, that could,
  - result in acute health effects that pose an immediate threat to life, or
  - interfere with a person's ability to escape unaided from a confined space.

Hazard assessments will be performed by a person with adequate knowledge, training and experience to assess the hazards of each space having consideration for:

- (a) the hazards that may exist due to the design, construction, location, use or contents of the confined space and
- (b) The hazards that may develop while work is done in the confined space.

Associated hazards to be considered include:

- Oxygen deficiency or enrichment
- Flammable, combustible or explosive atmospheres.
- Toxic atmospheres
- Engulfment
- Mechanical, electrical or hydraulic hazards
- Temperature extremes
- Noise
- Access/egress

All known spaces will be assessed and identified in Mohawk College's Confined Space Entry Hazard Assessment Data Management program. The hazard assessments will be incorporated into the entry permit and the data management program will be maintained by the Occupational Health and Safety Department.

The classification of a space may change depending on the work performed in the space. The Category of the space may increase to a higher risk level if new hazards are introduced into the space. Or, in other cases where measures are implemented to eliminate the possibility that any atmospheric hazards may occur in the space, the space may be reclassified and the confined space provision would not apply. The hazards must be eliminated before anyone enters the space and for the entire time the space is occupied. If the space must be entered to eliminate the hazard, the CS provisions apply until the hazards are eliminated. Elimination of a hazard can be accomplished by lockout/tagout, blanking and double block and bleed but does not include the use of mechanical ventilation.

Where access into a confined space is likely by the general public, the space will be permanently labelled using a standard confined space notification sign. (Refer to Appendix E). All piping and enclosed vessels are potential CS's, but do not need to be permanently labelled if the access is locked, welded or bolted closed.

## **8.0 ATMOSPHERIC TESTING AND METERING REQUIREMENTS**

- All designated confined spaces must be metered by a qualified person using a calibrated, functionally bump tested gas detection meter/monitor. The required points of testing will be

specified on the CSE Hazard Assessment (See Appendix A).

- Calibration of the meter must be within the manufacturer's recommendations and functional bump testing must be completed before each day of use.
- All confined spaces are required to meet the following limits for atmospheric hazard monitoring.

**Note: Actual metering and monitoring requirements for each space have been outlined in the space Hazard assessment.**

Hazard to be tested	Required limits
Oxygen content	Between 19.5% - 23%
CO content	Below 10 ppm
H <sub>2</sub> S content	Below 5 ppm
Flammable gas content	(i) Less than 25% for inspection work with no source of ignition.  (ii) Less than 10% for cold work.  (iii) Less than 5% LEL <u>and</u> less than 23% Oxygen for hot work.

- If there are other known or suspected gases which will require testing, they are to be identified in the CSE Hazard Assessment. All atmospheric testing must be below the posted TLV / TWAEV established for the substance in question.
- Metering must be completed prior to anyone entering the space to verify all accessible parts of the space are safe for entry. This will be achieved using proper stratification of metering points in the spaces. In general the space should be metered every 4-6 feet on vertical and horizontal planes. Additional pockets where gases can pool should also be tested.
- Air testing must be performed in the following order:
  - Oxygen content
  - Flammable/Explosive levels
  - Toxic materials
- All metering results will be kept in a permanent record on the *Mohawk College* CSE Permit. (See Appendix B).

## 9.0 GENERAL ENTRY REQUIREMENTS

Each space is different and will have its own hazards and specific entry procedures to ensure work can be performed safely. Specific information on each space is outlined in the CSE Hazard Assessment.

**Note:** This fact sheet may be obtained through the Facilities Management or Occupational Health and Safety department and must be reviewed prior to each entry.

### 9.1 Category B Confined Space Entry Requirements

Category B spaces are low risk confined spaces with atmospheres that can be rendered safe for entry without the requirement for supplied air respiratory protection. This can be made accomplished through ventilating or continuously monitoring the space.

1. A space specific hazard assessment must be produced from the Mohawk College Database Management system outlining the specifics of the entry, hazard information, preparation information, metering requirements, equipment requirements, and rescue protocols and must be reviewed prior to each entry. These may be obtained through Facilities Management or the Occupational Health and Safety Department. (See Appendix A for an example).
2. Mohawk College CSE permit system must be used and completed for all confined space entries made into designated spaces at Mohawk College facilities. (See Appendix B – Mohawk College CSE Permit).

3. Contractors must be made aware of the specific CSE Plan prior to commencing work in a confined space and shall be required to document their CSE procedures and submit them to Mohawk College upon request. The following information must be provided to a contractor when any of their employees are working in a confined space: Confined Space Program, written hazard assessment and rescue procedures, plan (i.e., work procedure) and entry permit.
4. A coordination document must be completed by the lead employer where workers of more than one employer will perform work in the same confined space or related work with respect to the same confined space. The coordination document must be signed and submitted prior to work commencing. (Refer to Appendix D for a sample Coordination Document).
5. All equipment to be used must be inspected by a competent person before each use. Records of these inspections must be kept in a permanent record and must be signed on the permit prior to each entry. (See Appendix F – Equipment maintenance record).
6. The rescue protocol listed on the CSE Hazard Assessment must be reviewed prior to entry to ensure all required equipment is available and entrants can be removed from the space in a timely manner in the event of an emergency.
7. Isolate and protect the CS during entry operations and while the space is open.
8. Ensure mechanical and electrical sources of energy are isolated and locked out. Verification of isolation must be completed. (See CSE hazard assessment for specifics).
9. Ensure the confined space is protected against the release of hazardous substances into the space from all piping and supply lines by disconnecting, blanking or by other adequate means (such as double- block and bleed). (See CSE hazard assessment for specifics).
10. Ensure any other condition that can create a hazard is controlled or eliminated (See CSE hazard assessment for specifics).
11. Ensure an adequate means for entering and exiting the space is provided.
12. A qualified person must test the atmosphere for the following gases, in the following sequence, as outlined in the “Atmospheric Metering Requirements”. Atmospheric testing must be performed before anyone enters the space. All results must be recorded in a permanent record (Mohawk College CSE Permit – Appendix B):
  - Oxygen content (must be between 19.5-23%)
  - Flammable and combustible gases and vapours:
    - Less than 25% for inspection work with no source of ignition.
    - Less than 10% for cold work.
    - Less than 5% LEL and less than 23% Oxygen for hot work.
  - Other toxic materials:
    - Hydrogen sulphide (H<sub>2</sub>S: must be below 5ppm)
    - Carbon monoxide (CO: must be less than 10ppm)
13. If the qualified person must enter the space to perform the air testing, appropriate respiratory protection and other required personal protection equipment must be worn.
14. If the confined space is determined to have an unsafe atmosphere, ventilate the space for 15 minutes and retest the air. If the atmosphere is determined to be safe, continue ventilating the space and proceed with the confined space entry. If the atmosphere is still unsafe, continue ventilating until it is proven safe by performing additional air tests. Record all air testing results on the CSE permit.
15. The atmosphere must be retested before a worker enters or re-enters the space whenever the space has been unoccupied and unattended (eg. lunch breaks).

16. Entrants shall wear an air monitoring device capable of continuously monitoring the atmosphere for oxygen content, flammable/combustible and toxic gases. The instrument must be equipped with an alarm to warn of hazardous atmospheric conditions. Results shall be recorded at least every 1 hour on the CSE permit.
17. After the confined space has been determined safe to enter and all necessary precautions taken, the authorized individual will sign the CSE permit and the entry can proceed. The permit must be posted at or near the entrance of the confined space.

## **9.2 Category C Confined Space Entry Requirements**

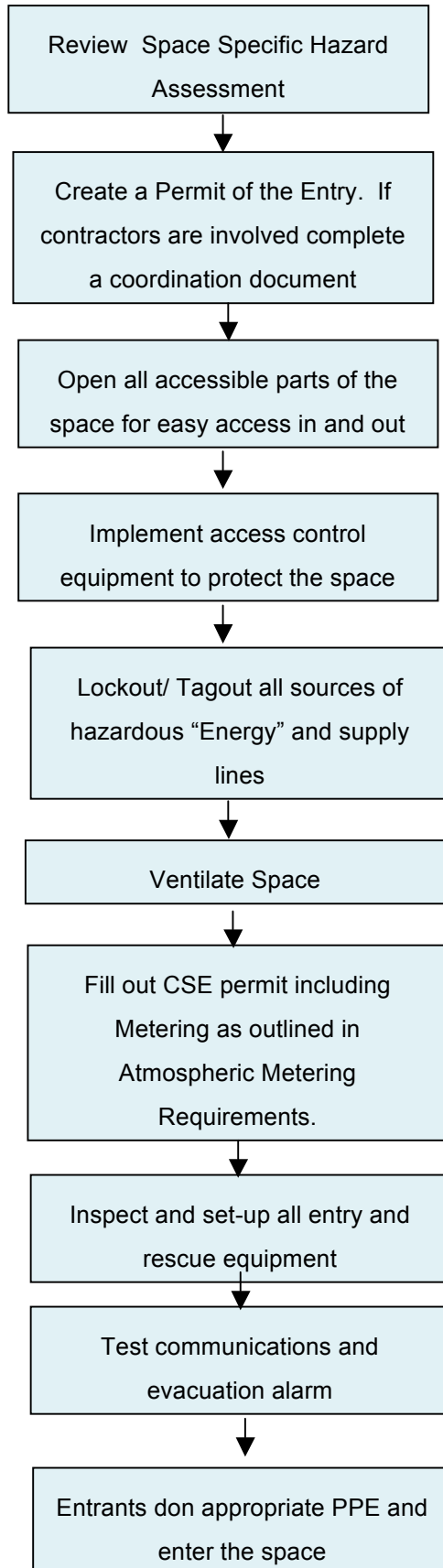
Category C spaces are high risk confined spaces that, because of the nature of the hazard(s) or location of the space, the atmosphere cannot be made safe for entry and entrants must wear supplied air respiratory protection such as an airline or self-contained breathing apparatus (SCBA). Category C spaces require a trained rescue team capable of performing a confined space entry rescue to be stationed outside the space during the confined space work.

1. A space specific hazard assessment must be produced from the Mohawk College Database Management system outlining the specifics of the entry, hazard information, preparation information, metering requirements, equipment requirements, and rescue protocols and must be reviewed prior to each entry. These may be obtained through Facilities Management or the Occupational Health and Safety Department. (See Appendix A for an example).
2. Mohawk College CSE permit system must be used and completed for all confined space entries made into designated spaces at Mohawk College facilities. (See Appendix B – Mohawk College CSE Permit).
3. Contractors must be made aware of the specific CSE Plan prior to commencing work in a confined space and shall be required to document their CSE procedures and submit them to Mohawk College upon request. The following information must be provided to a contractor when any of their employees are working in a confined space: Confined Space Program, written hazard assessment and rescue procedures, plan (i.e., work procedure) and entry permit.
4. A coordination document must be completed by the lead employer where workers of more than one employer will perform work in the same confined space or related work with respect to the same confined space. The coordination document must be signed and submitted prior to work commencing. (Refer to Appendix D for a sample Coordination Document).
5. All equipment to be used must be inspected by a competent person before each use. Records of these inspections must be kept in a permanent record and must be signed on the permit prior to each entry.
6. The rescue protocol listed on the CSE Hazard Assessment must be reviewed prior to entry to ensure all required equipment is available and entrants can be removed from the space in a timely manner in the event of an emergency.
7. Isolate and protect the CS during entry operations and while the space is open.
8. Ensure mechanical and electrical sources of energy are isolated and locked out. Verification of isolation must be completed. (See CSE hazard assessment for specifics).
9. Ensure the confined space is protected against the release of hazardous substances into the space from all piping and supply lines by disconnecting, blanking or by other adequate means (such as double- block and bleed). (See CSE hazard assessment for specifics).
10. Ensure any other condition that can create a hazard is controlled or eliminated (See CSE hazard

assessment for specifics).

11. Ensure an adequate means for entering and exiting the space is provided.
12. A qualified person must test the atmosphere for the following gases, in the following sequence, as outlined in the "Atmospheric Metering Requirements". Atmospheric testing must be performed before anyone enters the space. All results must be recorded in a permanent record (Mohawk College CSE Permit – Appendix B):
  - Oxygen content (19.5 -23% O<sub>2</sub>)
  - Flammable and combustible gases and vapours:
    - Less than 25% for inspection work with no source of ignition.
    - Less than 10% for cold work.
    - Less than 5% LEL and less than 23% Oxygen for hot work.
  - Other toxic materials (e.g. hydrogen sulphide, carbon monoxide)
13. If the qualified person must enter the space to perform the air testing, appropriate supplied air respiratory protection and other required personal protection equipment must be worn.
14. The atmosphere must be retested before a worker enters or re-enters the space whenever the space has been unoccupied and unattended (eg. lunch breaks).
15. Entrants shall wear appropriate supplied air respiratory protection equipment such as a self contained breathing apparatus (SCBA) or supplied airline respirator (SAR) at all times while inside the confined space. Entrants must also wear a 10-minute respiratory escape pack.
16. Entrants shall wear an intrinsically safe air monitoring device capable of continuously monitoring the atmosphere for flammable/combustible gases and vapours and oxygen. The instrument must be equipped with an alarm to warn of hazardous atmospheric conditions. Results shall be recorded at least every 1 hour on the CSE permit.
17. After the all necessary precautions have been taken, the authorized individual will sign the CSE permit and the entry can proceed. The permit must be posted at or near the entrance of the confined space.

### 9.3 Entry Flowchart



## **10.0 EMERGENCY RESCUE PLANS**

### **10.1 General Procedures**

- Entrants must immediately leave the confined space in the event the gas monitoring alarm or ventilation fan alarm sounds.
- Entrants must immediately leave the confined space if they begin to feel or notice adverse health effects.
- The attendant will order the evacuation of entrants from the confined space he/she notices changes in the condition of the space or uncharacteristic behaviour of an entrant.
- The attendant will not enter the confined space unless authorized to do so and relieved by another qualified attendant.

### **10.2 Vertical and Horizontal Non-Entry Rescue**

- Review the rescue protocol outlined in the space specific hazard assessment.
- Inspect and set-up all needed rescue equipment.
- Review evacuation alarm with entrants/ attendants and check mode of communications.
- Complete CSE permit.
- Hook entrant to the retrieval device.
- In the event the entrant requires assistance exiting the space:
  - Communicate with the entrant and identify the nature and cause of the injury.
  - Extract the individual from the space using the mechanical advantage lifting device.
  - Contact Mohawk College Security (extension 55)\_to summon medical assistance or emergency medical services to the site if required.
  - Complete primary and secondary assessment on injured individual and provide assistance and first aid as may be required.

### **10.3 Vertical and Horizontal Entry Rescue**

- Review the rescue protocol outlined in the space specific hazard assessment.
- Inspect and set-up all needed rescue equipment. Stage all rescue technicians equipment at the point of entry.
- Review evacuation alarm with entrants/ attendants and check mode of communications.
- Complete CSE permit.
- In the event the entrant requires assistance exiting the space:
  - Communicate with the entrant and identify the nature and cause of the injury.
  - Contact Mohawk College Security (extension 55) to summon medical assistance or emergency medical services to the site if required.
  - Rescue technician(s) enter the space with proper PPE.
  - Package individual in specialized extraction equipment.
  - Extract the individual from the space using the mechanical advantage lifting device with internal assistance.
  - Complete primary and secondary assessment on injured individual and provide assistance and first aid as may be required.

**APPENDIX A**  
**CONFINED SPACE HAZARD ASSESSMENT FORM**

## Space Specific Hazard Assessment

XYZ Chemical Ltd. - [View Space Information]

File Edit Insert Records Window Help

### Space Information

**Select Confined Space:**

Confined Space Number: **01**

Confined Space Location: NP#1

Additional Location Information: People Mover Yard

Description: Sewage Pump Pit Lift Station

Entry Type: Type 2

Purpose: Cleaning, Maintenance, Inspection

**Hazard Identification:**

Hazards		Controls
Oxygen Deficiency:	Possible Displacement	Ventilate / Atmospheric test to compliance
Flammable Material:	Methane	Ventilate / Atmospheric test to compliance
Toxic Material 1:	Hydrogen Sulphide	Ventilate / Atmospheric test to compliance
Toxic Material 2:		
Toxic Material 3:		
Product Supply 1:	Flow	Life pump lockout / tagout
Product Supply 2:		
Product Supply 3:		
Electricity:	Pump Electric	Breaker isolation and lockout
Pneumatics:		
Thermal:		
Hydraulic:		
Slip Fall:	Fall concern >3 meters	Fall arrest equipment
Mechanical:		
Other:	Head protection	Hard Helmet
Other 2:		

**Equipment Required**

Atmospheric test	Retriever	Hard Hat
Fall protection	CSE permit	Portable lighting
Tripod	Splash protection	

**Entry and Egress**

2'x3'x4' fiber hatches. Vertical entry into lift station.

**Metering and Monitoring**

Monitor Requirements: Oxygen, CO, LEL, H2S,  
 SpcMonitorSamples: 3

**Rescue protocol / Rescue Equipment**

Tripod, retriever, lifeline, 5 point harness. Ventilation fan, alarm.

**Additional Information**

Possible splash protection and air purifying respirator.

Record: 1 of 29

**APPENDIX B**  
**MOHAWK COLLEGE CONFINED SPACE ENTRY PERMIT**

Permit Number

# Confined Space Entry Permit

Page 1 of 2

Address location of CSE \_\_\_\_\_ Date: \_\_\_\_\_  
 ECHELON reference # \_\_\_\_\_ Permit expiration time: \_\_\_\_\_  
 Description of confined space to be entered: \_\_\_\_\_  
 Description of work to be performed: \_\_\_\_\_

**CONTRACTORS:**  
 Company Name \_\_\_\_\_ Company has been prequalified YES \_\_\_\_\_ NO \_\_\_\_\_  
 I have been advised of and will ensure consistency with Vesuvius CSE program.  
 Name (print) \_\_\_\_\_ Signature \_\_\_\_\_

**HAZARD IDENTIFICATION:**

Hazards	Controls
Oxygen deficiency	
Flammable material	
Toxic material 1	
Toxic material 2	
Product supply 1	
Product supply 2	
Electricity	
Pneumatics	
Hydraulic	
Slip/Fall	
Mechanical	
Other	
Equipment required	

The above listed equipment has been inspected to ~~meet~~ meet compliance and is in good working order. Name \_\_\_\_\_  
 Signature \_\_\_\_\_

AUTHORIZED EMPLOYEES:	Name	Signature	Entrant	Attendant
All authorized employees are aware of the hazards, control measure, PPE, and procedures to safely complete work in this confined space				

**PERMIT AUTHORIZATION:**  
 I certify that all required precautions have been taken ~~and~~ and the required equipment has been provided for safe ~~entry~~ entry into the space.  
 Date: \_\_\_\_\_  
 Time: \_\_\_\_\_  
 Name: \_\_\_\_\_  
 Signature: \_\_\_\_\_

**PERMIT TERMINATION:**  
 This permit is terminated. The space is no longer ~~considered~~ considered to be safe. If subsequent entries are ~~are~~ are required a new permit must be issued.  
 Date: \_\_\_\_\_  
 Time: \_\_\_\_\_  
 Name: \_\_\_\_\_  
 Signature: \_\_\_\_\_

METERING RESULTS						
Time	Location	O2 %	LEL %	CO ppm	H2S ppm	Other
Acceptable limits		19.5-23%	0-5% 5-10% 10-25%	25ppm	10ppm	UKN

Meter Make	Meter Model	Meter Serial #

RESCUE PROTOCOL / RESCUE EQUIPMENT

- Vertical extraction  
  Horizontal extraction  
  Combined extraction  
  Non-entry rescue  
  Entry rescue

CONFINED SPACE ENTRY/EXIT LOG										
NAME										
TIME	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry	Exit

**APPENDIX C**  
**COORDINATION DOCUMENT**

**Confined Space Entry Coordination Document<sup>1</sup>**

<b>Contractor Name:</b>			
<b>Confined Space Location:</b>		<b>CS#:</b>	
<b>Date(s) of Entry:</b>			
<b>Describe Purpose/Scope of Work to be Performed:</b>			
<b>Lead Employer</b>	<input type="radio"/> Mohawk College <input type="radio"/> Third Party Contractor (please specify name):		
<b>Company/Contractors</b>	<b>1.</b>	<b>2.</b>	
	<b>3.</b>	<b>4.</b>	
<b>Company/Contractor(s)</b>	<b>Responsibilities</b>		
<b>1.</b>			
<b>2.</b>			
<b>3.</b>			
<b>4.</b>			
<b>Lead Employer's Representative:</b> Please Print:			
Signature:		Date:	
<b>Mohawk College Representative:</b> Please Print:			
Signature:		Date:	

Copy To: Each employer of workers performing work in the same confined space and Joint Health and Safety Committee or Health and Safety Representative (if any) for each employer or workers performing work in the same confined space.

<sup>1</sup> Required when workers of more than 1 employer perform work in a confined space.

**APPENDIX D**  
**CONFINED SPACE SIGNAGE**

