Confined Spaces
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This program was developed by Blu-Metric Environmental for the University of Ottawa.
PURPOSE
This program describes the Confined Space Entry (CSE) program used by the University of Ottawa in the areas inventoried and identified in Appendix A. The program requirements are established to:

1. Protect all workers performing CSE in the identified areas by ensuring that a safe work environment is established and maintained prior to entering, and while performing, work in confined spaces;
2. Ensure compliance with requirements of the Confined Space Regulations made under the Ontario Occupational Health and Safety Act, (OHS) O.Reg 632/05 Confined Spaces; and
3. Provide measures and procedures to accomplish the aforementioned.

APPLICATION
All workers at the University of Ottawa who perform work related to, or in, the confined spaces identified in Appendix A must follow this procedure. Contractors performing work on behalf of the University of Ottawa must meet the requirements of this program. A list of the confined spaces at the University of Ottawa to which this procedure applies is found in Appendix A. It should be noted that spaces not found in the list in Appendix A may require further investigation to meet the intention of the program.

DEFINITIONS
These definitions are derived from the Occupational Health and Safety Act and Regulation 632/05 (Confined Spaces).

“acceptable atmospheric levels” – means:

a) Atmospheric concentration of any explosive or flammable gas or vapour is less than:
   i. 25% of its lower explosive limit (LEL), if paragraph 1 of subsection 19 (4) applies;
   ii. 10% of its LEL, if paragraph 2 of subsection 19 (4) applies;
   iii. 5% of its LEL, if paragraph 3 of subsection 19 (4) applies;

b) Oxygen content of the atmosphere is at least 19.5% but not more than 23% by volume; and

c) Exposure to atmospheric contaminants does not exceed any applicable level set out in a regulation made under the Occupational Health and Safety Act.

“atmospheric hazards” – means,

a) Accumulation of flammable, combustible, or explosive agents;

b) An oxygen content in the atmosphere that is less than 19.5% or more than 23% by volume; or

c) The accumulation of atmospheric contaminants, including gases, vapours, fumes, dusts, or mists, that could:
   i. result in acute health effects that pose an immediate threat to life; or
   ii. interfere with a person’s ability to escape unaided from a confined space.

“attendant” – an assigned individual who is stationed outside and near the entrance to a confined space to monitor the safety of the entrant(s). The attendant does not enter the space or perform any work that may interfere with their role as attendant.

“cold work” – work that cannot produce a source of ignition.

“confined space” – a fully or partially enclosed space:
a) that is not designed or constructed for continuous human occupancy; and
b) in which atmospheric hazards may occur because of its construction, location, or
contents, or because of work done in it.

“confined space rescue team (CSRT)” – all specified persons trained in rescue procedures, in any
necessary equipment required during confined space rescue, and in first aid and CPR.

“competent person” – means a person who:
  a) is qualified due to knowledge, training, and experience to organize the work and its
     performance;
  b) is familiar with all legal requirements of the work; and
  c) has knowledge of any potential and actual dangers to health and safety in the workplace.

“coordination document” – document that is prepared by the “lead employer” and applies if the
workers of more than one employer perform the same work, or related work, in the same confined
space. This document ensures that the duties of employers under Confined Space Regulations (all
sections except general training, personal protective equipment and records) are performed in a
way that protects the health and safety of all workers who perform work in, or work related to, the
confined space.

“entrant” – person entering the confined space for any reason.

“entry” or “confined space entry” (CSE) – action by which a person or part of a person passes
through the plane of the opening into a confined space and includes ensuing work activities. Entry is
considered to occur as soon as any part of the entrant’s body breaks the plane of an opening into
the confined space.

“entry permit” – written or printed document prepared before every CSE, and valid for that
specified entry on the specified date. It allows and controls entry into a confined space and informs
workers of the hazards identified and the controls in place. Prior to any CSE, a permit must be
completed, verified, signed, and posted near the confined space.

“entry supervisor” – in context of this program, is a “competent person” responsible for
coordinating confined space entry and verifying the entry permit prior to entry into a confined
space.

“hazard assessment” – a written document that considers, with respect to each confined space
entry, the hazards that may exist due to the design, construction, location, use, or contents of the
confined space and the hazards that may develop while work is done inside the confined space.

“hot work” – work that could produce a source of ignition, such as a spark or open flame.

“IDLH” – Immediately Dangerous to Life or Health. Any condition that poses an immediate threat to
an entrant’s health or life, or would cause irreversible adverse health effects, or would interfere with
an individual’s ability to escape unaided from a confined space.

“JHSC” – Joint Health and Safety Committee as defined in section 9 of the Occupational Health and
Safety Act
“lead employer” – 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.

“ORM” – Office of Risk Management

“plan” – a specific set of measures and procedures to control hazards identified by the hazard assessment for that confined space to allow workers to enter and work in a specific confined space safely. The plan must include provisions for on-site rescue procedures, rescue equipment and methods of communication, in addition to the other provisions listed above.

“program” – the written document that includes: a method for recognizing each confined space to which the program applies; a method for assessing the hazards to which workers may be exposed; a method for the development of CSE plans (which include on-site rescue procedures); a method for training workers; and an entry permit system. This document constitutes the University of Ottawa CSE program.

“purging” – the use of air displacement to remove contaminants inside a confined space to achieve acceptable atmospheric levels. For example, if a confined space originally contained a toxic gas, air would be blown into the space to reduce the concentration of the toxic gas to below the appropriate atmospheric exposure level.

“related work” – work performed near a confined space in direct support of work inside the confined space.

“rescue procedure” – written steps to outline activities or actions directed toward locating endangered persons in an emergency and removing them from harm.

“Ventilation” – continuous provision of fresh air into the confined space by mechanical means to maintain acceptable atmospheric levels. It must be continued while work is being carried out within the space: to maintain an acceptable oxygen concentration; to provide protection in case of accidental release of chemicals; to remove contaminants generated by the work performed; and/or to cool the enclosure.

**RESPONSIBILITIES**
In addition to the roles and responsibilities established in Procedure 14-1, under Policy 77:

**Senior Management**
- Senior management has the assigned responsibility to appoint only competent persons as supervisors and to ensure that the CSE program is implemented and maintained.
- Senior management will ensure that the program has appropriate assessments, plans, documentation, signage, procedures, training, and auditing.

**Facilities**
- Facilities is responsible for the confined space program, including its implementation and coordination on behalf of the University of Ottawa;
• Identifying and evaluating confined spaces;
• Communicating the requirements of the confined space program to those involved, including other University work units (as applicable) and contractors;
• Ensuring that each entrance to a confined space is adequately secured against unauthorized entry; or has been provided with adequate barricades, adequate warning signs regarding unauthorized entry, or both;
• Ensuring that hazard assessments for all identified confined spaces are completed and verified by a competent worker prior to every confined space entry;
• Coordinating training for all University of Ottawa workers who will be entering confined spaces;
• Ensuring that unauthorized persons do not enter confined spaces. No person is authorized to enter a confined space without proper approval and training;
• Ensuring the entry plan(s) have been designed and applied to all confined spaces;
• Keeping documentation of all CSE conducted by their staff as per O. Reg 632/05;

Office of Risk Management (ORM)
• Collaborating with Facilities to support the implementation and coordination of the confined space program;
• Periodically auditing compliance with the program;
• Reporting deficiencies in the program to management as soon as practically possible.

Deans and directors of affected sectors
Ensuring that workers in their area:
• Follow the requirements of the University of Ottawa CSE program.
• Prevent unauthorized persons from entering confined spaces. No person is authorized to enter a confined space without proper approval and training.
• Understand the hazards and entry plan associated with the confined space they will be entering (if/when applicable);
• Receive the required training prior to entering a confined space (if/when applicable);
• Take all appropriate precautions to protect their health and safety prior to entry (if/when applicable);
• Work in compliance with the Occupational Health and Safety Act and related regulations as well as requirements established by the University of Ottawa.

Confined space entry supervisor
The confined space entry supervisor must:
• Assign an attendant to be stationed outside, or near the entrance to, a confined space and perform the corresponding attendant duties under O.Reg. 632/05 as well as those outlined in this CSE program;
• Appoint a person with adequate knowledge, training, and experience (“competent worker”) to perform adequate tests as often as necessary before and during a CSE to ensure that acceptable atmospheric levels are maintained in the confined space in accordance with the relevant plan. In most cases, the appointed person will be the attendant;
• Keep documentation of all CSE conducted by their staff and forward these documents to Facilities.
Before each CSE, the confined space entry supervisor must ensure that:

- Entry does not occur unless absolutely necessary;
- A hazard assessment has been reviewed for adequacy, signed, and dated;
- A written plan has been developed and is available for the CSE;
- Pre-entry testing and inspections have been conducted according to the plan;
- The precautions and control measures identified in the plan are in place and are being followed;
- Other precautions not directly related to the CSE but required by the *Occupational Health and Safety Act* and its regulations are being followed, including:
  - An entry permit is completed, complies with the corresponding plan, is posted at the entry to the confined space, and is maintained by the attendant throughout the entry, if necessary;
  - The CSE permit is signed prior to its posting and CSE;
  - If changes occur during the entry that affect the safety of the workers, the workers are removed from the space and the adequacy of the safety procedures are reviewed.

**Entrants, attendants and rescue team**

**Entrants will:**

- Ensure that they know and understand the hazards and hazard controls associated with the space;
- Understand and abide by all the requirements of the CSE plan for each confined space;
- Use the equipment, materials, and protective devices, as required;
- Receive the required CSE training;
- Complete the permit to document the precautions taken and results of atmospheric testing;
- Immediately report any health and safety concerns to their direct supervisor;
- Immediately report the absence of, and/or any deficiency in equipment, materials, or protective devices;
- Immediately evacuate a confined space if summoned by the attendant or if an air monitor sounds;
- Not be authorized to enter a confined space without proper approval and training.

**Attendant**

An assigned CSE attendant must:

- Not enter the confined space at any time, including during rescue operations;
- Remain stationed outside and near the entrance to the confined space at all times;
- Remain in constant communication with the entrant(s) through the agreed mode of communication;
- Monitor the safety of all entrants;
- Provide assistance to entrants;
- Summon the rescue team should the need arise;
- Keep a record on the permit of those persons who enter the space and exit the space;
- Prevent any unauthorized entry into the confined space while assigned to a confined space;
- Perform all attendant duties required by this CSE program.

**Rescue Team**

The rescue team will:

- Be ready to immediately deploy (including having the rescue equipment set up and being stationed on site);
• Be directly involved in the rescue of person(s) from a confined space;
• Be trained in rescue procedures, in using any necessary equipment required during confined space rescue, and in first aid and CPR;
• Be responsible for rescue equipment and ensure that equipment has been checked and is in place;
• Be readily available and ensure an immediate response time to initiate a rescue, should the need arise;

Joint Health and Safety Committee (JHSC)
The JHSC has a right to the following CSE documents, when requested:
• A copy of the program;
• A copy of any hazard assessment;
• A copy of any coordination document.

The JHSC also has the following consultation rights:
• Be consulted by the University of Ottawa with regard to the development and maintenance of the confined space program;
• Be consulted in regard to the development of worker training;
• Be consulted by the University of Ottawa with regard to reviewing the confined space training on a regular basis, as well as whenever there is a change in circumstances;
• Be afforded the opportunity to attend the beginning of industrial hygiene testing.

HAZARD ASSESSMENT

Identifying Confined Spaces and Hazards
Potential confined spaces identified were evaluated to determine whether they qualified as a “confined space” under O.Reg. 632/05. The following table is provided to assist in evaluating areas that may or may not be considered a confined space:

<table>
<thead>
<tr>
<th>Is it designed and constructed for continuous human occupancy?</th>
<th>Is it possible to have an atmospheric hazard?</th>
<th>Is this a confined space?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
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<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Workspaces such as offices, arenas, maintenance rooms, control rooms, etc., are obvious places that are designed for humans to occupy for long periods of time (continuously). These spaces are not considered confined spaces, regardless of the atmospheric hazards that may occur in them. Nevertheless, occupational health and safety legislation and regulations apply and must be complied with to protect workers. Spaces that are not designed and constructed for continuous human occupancy and in which an atmospheric hazard can occur are confined spaces. They require considerable planning prior to undertaking work within them.
Hazard Assessment
A hazard assessment has been completed for the confined spaces listed in Appendix A using the confined space hazard assessment form found in Appendix C. Hazard assessments will be available for every entry into the confined spaces listed in Appendix A and shall be reviewed prior to each entry to confirm that the same conditions exist and to verify the adequacy of the plan and permit documents. Once reviewed and determined adequate, the CSE supervisor will sign and date the hazard assessment prior to entry.

A confined space shall be re-assessed whenever changes to the space are introduced that could affect the adequacy of the space’s entry plan instructions and controls, or when inadequacies are identified during an entry or due to an incident occurring during entry.

Confined spaces that do not appear in Appendix A should be reported to the worker’s supervisor and the Facilities Health, Safety and Risk Management team for further evaluation.

A listing of “potentially hazardous spaces” (not considered confined spaces) is included in Appendix H for information purposes. Note that a hazard assessment confirmed that these spaces do not meet the definition of a confined space. However, the work to be performed in these spaces should be re-evaluated for additional, potentially hazardous conditions prior to working in these spaces. Proper control measures for the hazards should be implemented, if required. These “potentially hazardous spaces” are not considered to be confined spaces and hence an entry permit is not required for entry at locations listed in Appendix H only.

A hazard assessment may include any or all of the following hazards/controls:

- Oxygen deficiency/oxygen enrichment;
- Flammable, combustible, or explosive agents;
- Toxic air contaminants, smoke, fumes, and dusts and corresponding exposure levels;
- Residual chemicals/materials;
- Ignition hazards, including hot work, tools, and other potential sources of ignition;
- Chemical contact hazards, including acids, alkanals;
- Physical hazards, including mechanical hazards, thermal stress, humidity, radiation, noise and vibration, working/walking surfaces, engulfing materials, physical obstacles, poor visibility;
- Electrical hazards, including lines and cables, exposed terminals;
- Traffic hazards, including pedestrian, mobile equipment;
- Biological hazards, including animals and biological agents;
- Other hazards related to the confined space, including piping/distribution systems, pressurizing fluids, any type of uncontrolled energy (water, liquid, vapour, electric, magnetic, gaseous, etc.), limited access and egress;
- Necessary precautions for safe entry and work;
- Emergency procedures and equipment required;
- PPE required;
- Attendant requirement.

Atmospheric hazard decision trees are provided in Appendix B.
CONFINED SPACE ENTRY PLAN

Development
The authorizing CSE supervisor will ensure that a base entry plan is created for each CSE for spaces listed in Appendix A. Where CSE has been contracted out to another employer, such as a contractor, the plan will be developed by the respective contractor.

Content
The base plan will include duties of workers, measures, and procedures to control hazards (including isolation of energy sources, ventilation, PPE, etc.), attendants, atmospheric testing, provisions for on-site rescue procedures, rescue equipment and methods of communication, and adequate means for entry and exit.

For the purposes of the CSE program, the University of Ottawa has incorporated a base plan into the entry permit in Appendix D.

If questions concerning confined space entry and assessment arise, contact the:
- Facilities Health and Safety Officer;
- Facilities Health, Safety and Risk Management Lead; and/or
- Office of Risk Management.

CONFINED SPACE ENTRY PERMIT

Verification
All confined space entries require a completed CSE permit. The authorizing CSE supervisor will verify that the permit complies with the corresponding CSE plan and will sign their name to the permit prior to entry. A copy of the corresponding CSE plan will be included and will form part of the CSE permit.

Maintenance
For the duration of the permit, the attendant will record on the CSE permit those persons who enter and exit the confined space. The attendant will also maintain a record of air monitoring results at regular intervals (for example, once every 30 minutes).

Cancellation
Confined space entry permits will be cancelled by the CSE supervisor upon completion of the work or when any prohibited condition arises (such as unexpected atmospheric levels). Permits cannot be left open and “allowed” to expire, even though they are only valid for the date in question. Cancelled permits will be kept by CSE supervisor and the Faculty or Service for one year or the period necessary to ensure at least the two most recent records related to the confined space. A copy of the cancelled permit should also be sent to the Facilities health and safety officer.

Requirements
A sample CSE base plan and permit is found in Appendix D and contains the following required information, as well as other records:
- Location of confined space;
- Description of work to be performed;
• Description of hazards and corresponding control measures;
• Time period for which the entry permit applies;
• Name of the attendant and entrant(s);
• Record of each worker’s entries and exits (time);
• List of the equipment required for entry and rescue, and verification that equipment is in good working order;
• Results of atmospheric testing;
• Any hot work performed (including the permit for it), the provisions adequate for hot work, and corresponding control measures

Other CSE documentation may be incorporated within the entry permit and for the purposes of the CSE program, the University of Ottawa will incorporate the plan, onsite rescue equipment inspection records, and air testing results into the CSE plan and permit document, provided in Appendix D.

CONFINED SPACE ENTRY PROCEDURE
The following section outlines the steps to be taken prior to each confined space entry:
• Complete the hazard assessment;
• Establish plan that includes required procedures and control measures required for entrant(s);
• Establish communication means between entrant(s) and attendant;
• Perform atmospheric testing prior to entry, record results on permit;
• Complete entry permit and post (or make available) the entry permit near the confined space;
• Station the attendant outside the confined space;
• Execute required control procedures (e.g. lockout/tagout, ventilation, etc.);
• Allow entrant(s) to enter space while attendant monitors continuously.

Step 1 – Assess hazards
The hazard assessment shall be reviewed and verified by the CSE supervisor prior to each entry to verify that the same conditions exist. A confined space will be re-assessed when: changes are introduced to the space that could affect the adequacy of the entry plan instructions and controls developed for the space; inadequacies with the plan are identified as a result of an entry; or an incident has occurred during entry.

Any new potential confined spaces not identified in Appendix A should be immediately reported to Facilities in order to be evaluated prior to entry.

The hazard assessment shall include, but is not limited to: atmospheric hazards, such as oxygen content, flammability, and toxic materials; physical hazards, such as energy sources; engulfment hazards; entrapment hazards; and personal safety requirements (refer to the form in Appendix C).

Step 2 – Establish plan, procedures, and protective equipment
Based on the hazard assessment, determine the appropriate control measures and equipment required for CSE. The plan will be incorporated into the entry permit.
Step 3 – Establish communications
The means of communication between the attendant and entrant(s), and between the attendant and rescue team, must be established and in place based on the specific confined space. The means of communication between the attendant and the entrant(s) must be appropriate for the space, especially in areas with high background noise or possible interference from radio or cell phone transmissions.

Possible methods of communication between the attendant and entrant may include verbal, cell phone, two-way radio, hand signals, rope tugs or tapping. Means of communication must be in place and understood prior to entry into the confined space.

Step 4 – Perform atmospheric testing prior to entry
Atmospheric testing shall be performed in accordance with this program. Atmospheric testing shall be monitored prior to every entry and for the duration of the entry at adequate intervals to ensure entrant(s) safety. If ventilation is required, atmospheric testing shall be performed after a 10-minute ventilation period and continuously during entry.

If atmospheric conditions are found to be unacceptable, entry is not permitted until adequate control methods, such as ventilation, are implemented or installed to ensure acceptable levels. If acceptable atmospheric levels are not possible, breathing air supply (using either a supplied air system or self-contained breathing apparatus (SCBA)), is required.

If at any time unacceptable atmospheric conditions develop while the entrant is working in the confined space, no matter what the reason, all personnel shall immediately exit the space and no others shall enter until atmospheric conditions are returned to acceptable levels. The entry permit is cancelled and the cause will be investigated. Work shall not continue until the cause is corrected.

Step 5 – Issue entry permit
Prior to entry, the entry permit shall be correctly and completely filled out. Each entry permit shall be given a unique entry permit number such as (year-building identifier-confined space- #). For example, if entering confined space Number 63 in Power Plant for the first time in 2020, the corresponding entry permit number would be 20-PP-63-01.

The entry permit shall be verified by the entry supervisor and signed. No entry into any confined space is permitted without a valid entry permit.

Step 6 – Post the attendant
The attendant shall be posted near the entrance of the confined space for duration of the work and shall be in constant communication with the entrant(s) while they work in the confined space. The attendant shall not enter the confined space unless relieved by a qualified person (i.e. another attendant) and entry can be safely performed.

Step 7 – Execute required safety procedures
Ensure control measures have been properly performed, including lock-out / tag-out of all necessary equipment. If a hot work permit is required, ensure hot work permit paperwork is properly filled out, with a copy attached to the entry permit.
Step 8 – Enter space, perform work and monitor conditions

All entrants shall use the sign-in log when entering the confined space and sign out when exiting. The attendant shall be responsible for maintaining the sign-in/out log for the duration of the work. Atmospheric conditions shall be monitored continuously while in the confined space.

CONTROLS

Placarding
Every confined space will be identified by a unique number and a placard posted at the entry point to the confined space in order to warn workers of the confined space hazard. The placards corresponding to confined spaces will clearly indicate:

![Placard Example]

An example of the signage installed at the University of Ottawa is depicted in Appendix I.

Entry authorization
All confined space entries will be authorized by a CSE supervisor. The CSE supervisor will grant authorization to enter only after all requirements of the CSE program have been met and the corresponding documented measures are fully in place.

Prevention of unauthorized entry
Prior to CSE, a means of barricading, cordonning off, taping off, and posting will be used to notify persons in the area of restricted access to the confined space entry point as well as related work area.

The CSE supervisor will assign an attendant located outside, or near the entrance of, the confined space. The attendant will not enter the confined space but will remain in constant communication with the entrant while monitoring the entrant’s safety and prevent any unauthorized entry. All entries will be documented by the attendant on the CSE plan/permit.

Energy isolation
Prior to CSE, all energy sources must be isolated and controlled to ensure that no material or contaminants enter the confined space through process lines, drains, vents, etc.

Lock-Out / Tag-Out procedures
Workers must be protected against any hazard(s) associated with equipment or electrical energy inside the confined space by ensuring that they are de-energized or otherwise controlled.

All energy isolation will be done according to the University of Ottawa Lock Out/Tag Out procedures. Refer to the Facilities Lockout Procedure.
Isolating lines
“Blanking” is the insertion of a solid metal barrier, called a blank, between the flanges of two sections of pipe. A confined space extends to the blank.

“Disconnecting” is the removal of a section of piping to ensure that no material can flow into the confined space. Note: care must be taken to ensure that high-pressure or toxic material cannot pass across a disconnected space (e.g. high-pressure steam can cross between sections of pipe if the piece removed is in line with the two sections of pipe).

If blanking or disconnecting piping is not practical for technical reasons, other measures must be taken to adequately prevent the release of hazardous substances into the confined space.

Other measures
Other adequate measures for protecting against hazards associated with equipment or electrical energy may include: a double-block and bleed system, or the formation of a properly engineered freeze plug.

Unguarded equipment, or equipment that may have exposed moving parts or that may create a pinch point, shall be de-energized or blocked to prevent movement. However, a properly guarded pump or fan need not be de-energized. In a confined space where flammable, combustible or explosive agents might accumulate, the same equipment must be de-energized or designed so that it does not create a spark.

Entrance cover removal
Wherever possible, conduct and complete atmospheric testing and eliminate unsafe conditions before removing the entrance cover. After removing an entrance cover to a vertical descent, the confined space opening will be guarded with a railing, temporary cover, or other temporary barrier to prevent accidental falls through the opening from outside the space. Measures must also be put in place to protect entrants from objects falling into the space.

Atmospheric testing
Atmospheric testing is required prior to confined space entries and when the relevant assessment determines that the space may contain atmospheric hazards. The results of testing and calibration information will be documented on the CSE plan/permit.

Where indicated by the hazard assessment and plan, the atmosphere will be tested before CSE with a calibrated instrument in good working order and in a manner that is appropriate for the hazard(s) identified in the relevant assessment.

When monitoring a confined space, use the following procedure:
   a) Test equipment function (i.e., battery test);
   b) Ensure all monitor warning alarms are set appropriately;
   c) Test for the following atmospheric hazards:
      i. Oxygen content between 19.5% and 23.0%
      ii. Flammable gases and vapours:
          1) less than 25% LEL for inspection work;
          2) less than 10% LEL for cold work (work that does not produce sparks or other sources of ignition); and
3) less than 5% LEL for hot work (work that produces sparks or that involves or results in other sources of ignition) and compliance with the requirements for hot work.

   iii. Potential toxic air contaminants: less than the limits established in O.Reg.833 or designated substance regulations (or ACGIH TLVs if not in O.Reg. 833).

d) The first test must be done near the entry point, with the probe or wand placed approximately 5 cm (2 inches) above the entry point;

e) Insert the probe through an inspection port or another opening to take atmospheric reading; provide enough time for the air sample to reach the air monitor

f) If neither combustible nor toxic gases are present, remove the cover and then sample the atmosphere at several levels (heights);

g) Once the readings have been taken, they must be recorded on the confined space entry plan/permit;

h) If an explosive, oxygen-deficient, or toxic atmosphere is detected, entry into the confined space is not permitted. Hazard control measures such as ventilation and/or purging must be implemented and the space re-tested prior to entry.

**Frequency**

Atmospheric testing of the confined space must be performed prior to each and every entry and then continuously while work is underway to ensure that acceptable atmospheric levels are maintained. Entrants must be allowed an opportunity to observe the pre-entry and periodic testing.

Where applicable, testing will be conducted prior to purging/ventilation and again after purging/ventilation, and prior to each new entry into the space. A new entry takes place when all entrants have vacated the space and one of the workers or a new worker is going to enter the space.

**Response to elevated findings and exit procedure during CSE**

If a hazardous atmosphere is detected during CSE, all of the following will occur:

- Evacuate workers from the space immediately;
- Cancel the entry permit;
- Evaluate the space to determine how the hazardous atmosphere developed;
- Implement measures to protect workers from the hazardous atmosphere before re-entry;
- Verify that the plan and new permit correspond, that they are verified, and that the space is safe for entry.

**Ventilation**

**Purging**

If atmospheric hazards exist, or are likely to exist, in a confined space, the confined space shall be purged, ventilated, or both, before any worker enters it to ensure that acceptable atmospheric levels are maintained while any worker is inside. In some cases, the ventilation of the space will continue throughout the CSE.

Where toxic gases or vapours are present, spaces will be purged wherever possible; contaminants will be displaced with fresh supply air to the space.

**Ventilating**

Ventilation of a space will be accomplished either by displacing air and diluting it through the introduction of fresh air or by the continuously removing contaminants by local exhaust ventilation for point sources. To ensure adequate ventilation, the points of air supply and exhaust should be
separated as far as possible. Openings must be provided for the clean replacement air to enter and for the current air to exhaust. Pure oxygen must not be used to ventilate a confined space.

**Failure alarm**
To warn of ventilation failure and facilitate the safe exit of entrants from the space, an adequate warning system, such as an audible or visual alarm, and an exit procedure shall be provided. The alarm should be activated by a flow or pressure switch in the air stream rather than by electrical failure or other motive power failure. Refer to section entitled *Response to elevated findings and exit procedure during CSE* for exit procedure during alarm.

**Other precautions**
If it is not practical to ventilate or purge, for technical reasons, a worker entering the confined space shall use:
- Adequate respiratory protective equipment (signed off as appropriate on the entry permit);
- Adequate equipment to allow persons outside the confined space to locate and rescue the worker if necessary; and
- Such other equipment as is necessary to ensure the worker’s safety.

All personal protective equipment (PPE) must be inspected by a person with adequate knowledge, training, and experience, appointed by the employer. The PPE shall be in good working order before the worker enters the confined space.

**Hot Work Precautions**
In the case of an explosive or flammable gas or vapour, the space must be either:
- Made safe by inerting the space with an inert gas and continuously monitoring the atmosphere, particularly with regard to oxygen concentration. Workers must wear adequate respiratory protective equipment as well as equipment that would allow persons outside the confined space to locate and rescue them, if necessary; or
- The following precautions must be taken:
  - The space is purged and continuously ventilated to maintain an atmosphere of less than 5% of the LEL;
  - The space is purged and continuously ventilated to maintain an oxygen concentration ranging between 19.5% and 23%;
  - The atmosphere in the confined space is continuously monitored;
  - The entry permit includes adequate provisions for hot work and specifies the appropriate measures to be taken; and
  - An alarm and exit procedure are in place to provide adequate warning and allow safe escape if the levels specified in a) or b) are not met. It is good practice to incorporate a safety factor that provides for adequate warning should the alarm levels be approached.

**Permit**
A completed University of Ottawa Hot Work Permit must be attached to the CSE permit before entry can be authorized.
Personal Protective Equipment (PPE)
All workers entering a confined space must have adequate personal protective equipment (PPE) based on the hazard assessment. This PPE must be identified in the plan and comply with respective regulations.

RESCUE PROCEDURES
Identify team
The entry supervisor will ensure that before a confined space entry can occur, rescue procedures are in place and the members of the rescue team are immediately available for the duration of the entry.

On-site rescue procedures
If at any time there is questionable action or non-movement by an entrant inside the confined space, the attendant will immediate conduct a communication check. If there is no response or a questionable response, the attendant will order the entrant to evacuate the confined space immediately or immediately summon the confined space rescue team (CRST). Under no circumstances shall the attendant enter the confined space to perform a rescue.

If the entrant is disabled due to a fall or impact, the attendant shall activate the CSRT and the entrant will not be removed from the confined space until paramedics arrive unless there is immediate threat to life and/or health.

The University of Ottawa on-site rescue team procedures are detailed in Appendix E.

Training requirements and records
The University of Ottawa confined space rescue team (CSRT), or the contracted rescue service, will provide the training records of rescue personnel to the Facilities. The rescue team members must have the following qualifications:
- Have completed a minimum one-day confined space awareness course that includes a half-day practical component;
- Be trained in confined space rescue procedures including scenarios;
- Have received training in confined space rescue equipment;
- Have undergone respiratory fit testing and be capable of wearing a respirator;
- Have received training in first aid and cardiopulmonary resuscitation (CPR).

All members of the rescue team shall have all required elements of training.

Rescue equipment
Rescue equipment may include harnesses and lifelines, hoist/retrieval systems, sked basket, self-contained breathing apparatus, fall arrest equipment, protective footwear, protective gloves, personal flotation device and/or protective headgear. The rescue equipment and procedures will be documented on each CSE plan and available and present at the CSE point prior to entry taking place. The emergency equipment shall be inspected and verified to be in good working condition prior to the confined space entry. This inspection will be documented.

Rescue procedure and the CSE plan
The University of Ottawa confined space rescue team will ensure that the rescue plan can effectively remove a worker who has been overcome in a specific confined space.

If entry is required to perform a rescue, rescue personnel must be properly trained and protected against all hazards within the specific confined space.

A minimum of two rescue team members should be included in each rescue plan.

The attendant will not be part of the rescue team and will remain in place, stationed outside and near the entrance to the confined space. The attendant may assist the rescue from outside the space, as long as doing so does not impede the attendant’s duties.

**PRIOR TO CSE, ON-SITE RESCUE PROCEDURES SHALL BE INCLUDED IN THE PLAN DEVELOPED FOR EACH CONFINED SPACE.**

**CONTRACTORS**

**Regulatory and Program Requirements**

**NOTE:** Contractors must comply with O.Reg.632/05 as well as the requirements of the University of Ottawa CSE program.

A copy of this CSE program will be provided to each contractor performing CSE work.

Contractors will have their own CSE program and the contractor program must meet or exceed legislative requirements.

**Coordination document**

If there is more than one employer performing work within the same confined space at a given time, a coordination document is required. A sample coordination document is provided in Appendix F.

The coordination document must be prepared by the “lead employer”.

The coordination document ensures that employer duties with respect to the following subject areas are performed in a way that protects the health and safety of all workers performing CSE or CSE-related work:

- Confined space program;
- Hazard assessment;
- Written plan;
- Plan-specific training (if applicable);
- Entry permits;
- Written on-site rescue procedures and equipment;
- Isolation of energy and control of material movement;
- Attendants;
- Entering and exiting;
- Unauthorized entry;
- Atmospheric testing;
- Explosive and flammable substances; and
• Ventilation and purging of atmospheric hazards.

TRAINING

Content
Supervisors, attendants, entrants and rescue team members must be adequately trained in: O.Reg. 632/05; this CSE program, plan, permit process; hazard assessment/identification and controls; rescue awareness; equipment to be used; personal protective equipment; and documentation. Workers with emergency rescue responsibilities will need training related to rescue response as well as the training outlined in the relevant section of this program.

Training must include hands-on experience with the required equipment, including the personal protective equipment required for the confined space entry.

Minimum training requirements
Minimum training requirements for various positions are outlined below. All training outlined herein must be documented and kept on file by the CSE supervisor and/or Facilities. Training requirements and needs should be reviewed on an annual basis.

CSE supervisor:
• Must be aware of all hazards associated with a confined space and communicate this to the workers;
• Must communicate and monitor to ensure that the procedures surrounding safe entry and work are followed;
• Must communicate how to work safely around the hazards identified. Supervisor must enforce the proper use and care of required PPE (eyes, ears, and foot protection);
• Must ensure all workers assigned to a confined space have undergone the prescribed training.

Confined space worker (entrant, attendant) – This encompasses all individuals preparing, entering, guarding, or testing the confined space. Every worker who works in or with a confined space must receive adequate training in the recognition of hazards associated with confined spaces and training to be able to safely perform the assigned duties for that specific confined space.

On-site rescuers – An adequate number of on-site rescue workers must be available to perform rescue in accordance with the rescue plan. In addition to general confined space training, they will need to be trained in first aid and CPR, on-site rescue procedures, and use of rescue equipment.

All workers – Basic awareness of confined spaces (given at health and safety meetings) including their location and entry to all confined spaces is prohibited unless authorized by supervisor.

<table>
<thead>
<tr>
<th>Training</th>
<th>Personnel / Positions to be Trained</th>
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<tr>
<td>Basic awareness of confined spaces</td>
<td>Entrant, Attendant, CSE Supervisor, Rescue Team</td>
</tr>
<tr>
<td>CSE program and hazards</td>
<td>Entrant, Attendant, CSE Supervisor, Rescue Team</td>
</tr>
<tr>
<td>CSE plans</td>
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<tr>
<td>Confined Space Emergency Procedures</td>
<td>Entrant, Attendant, CSE Supervisor, Rescue Team</td>
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<td>First Aid, CPR</td>
<td>Rescue Team</td>
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</table>
Training Personnel / Positions to be Trained

<table>
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<tr>
<th>Training</th>
<th>Personnel / Positions to be Trained</th>
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</thead>
<tbody>
<tr>
<td>Gas testing</td>
<td>Entrant, Attendant, CSE Supervisor, Rescue Team</td>
</tr>
</tbody>
</table>

Review
Training will be reviewed with, or by, Facilities, with assistance from the ORM when necessary, whenever there are changes to the Confined Space program or at least annually. A copy of the most recent training program and records identifying workers who have received the training will be forwarded to, and retained by, the Office of Risk Management.

**DOCUMENTATION AND RECORDKEEPING**
Required written documents:
- Coordination document (if applicable)*
- Program*
- Hazard assessment
- Plan
- Training records
- CSE permit
- On-site rescue procedures*
- On-site rescue equipment inspection records
- Air testing results

All of the above documents are incorporated into the entry permit (except for those with an asterisk*). For the purposes of the CSE program, the University of Ottawa has incorporated the plan, on-site rescue equipment inspection records, and air testing results into one document (i.e., the permit in Appendix D).

Retention
The University of Ottawa must retain all the above documents for at least one year after they are created, and retain at least the two most recent records of each document, with the exception of the confined space program, which must be maintained at all times if the workplace includes a confined space that workers may enter to perform work.

For construction projects, these documents must be retained for the duration of the project and at least one year after completion of the project. Documentation must be retained with all health and safety records related to the construction project.

Distribution and availability
The coordination document and confined space program document must be provided to the JHSC and other employers, where applicable.

The hazard assessment document must be provided, upon request, to the JHSC.

Entry permits must be readily available to every person who enters the confined space or performs related work during the time for which the permit applies. Permits must be posted at the entry site.

The plan, training records, on-site rescue procedures, rescue equipment inspection, and air testing results documents should be readily available at the workplace.
For construction projects:

- The University of Ottawa must keep available for inspection at the project the hazard assessment, plan, co-ordination document, record of training, entry permit, record of inspection of rescue equipment, and air testing records.
- After completion of the project, the University of Ottawa must keep a copy of these documents for at least one year.
APPENDIX A – INVENTORY OF CONFINED SPACES
<table>
<thead>
<tr>
<th>CS NUMBER</th>
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<td>X</td>
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<td>Campus Area</td>
<td>Campus</td>
<td>X</td>
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<tr>
<td>ZZ</td>
<td>Campus Area</td>
<td>Campus</td>
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<td>PM-4</td>
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APPENDIX B – ATMOSPHERIC HAZARDS DECISION TREE – CHART 1
Assess hazards, including atmospheric hazards, that may exist or be created in the confined space.

Determine appropriate testing procedure, select and calibrate appropriate testing device.

Test for levels of oxygen, and for flammable, combustible, and explosive agents and toxic substances.

Can acceptable atmospheric levels be achieved and maintained, with or without purging and ventilating?

Are flammable, combustible, or explosive agents present?

- Can confined space be rendered inert?
  - YES
  - Render inert and monitor.
  - ENTRY NOT PERMITTED.
  - NO
  - Enter with appropriate precautions, respiratory protection, and equipment.

- Are flammable, combustible, or explosive agents present?
  - YES
  - Achieve and maintain acceptable atmospheric levels. Purge and ventilate if necessary.
  - NO
  - Enter, test per plan, and maintain records.
  - Is combustible dust airborne, creating a hazard of explosion?
    - YES
      - Go to Chart 2.
    - NO
      - NO
APPENDIX B – ATMOSPHERIC HAZARDS DECISION TREE – CHART 2
Chart 2 – Decision Tree for Work in Flammable or Explosive Gas or Vapour

Starting from Chart 1.

- Concentration of flammable or explosive gas or vapour < 5\% LEL?
  - YES: Concentration of oxygen < 23\%?
    - YES: HOT WORK PERMITTED.
    - NO: COLD WORK PERMITTED.
  - NO: HOT WORK NOT PERMITTED.

- Concentration of flammable or explosive gas or vapour < 10\% LEL?
  - YES: COLD WORK PERMITTED.
  - NO: COLD WORK NOT PERMITTED.

- Concentration of flammable or explosive gas or vapour < 25\% LEL?
  - YES: INSPECTION PERMITTED.
  - NO: ENTRY NOT PERMITTED.
APPENDIX C – HAZARD ASSESSMENT FORMS

Please consult Facilities.
APPENDIX D – ENTRY BASE PLAN AND PERMITS

Please consult Facilities.
APPENDIX E – RESCUE PROCEDURES
This procedure was developed by Blu-Metric Environmental for the University of Ottawa.
**PURPOSE**

This document describes the procedure to be followed for a Confined Space Entry (CSE) rescue in the event that rescue is required within a CSE at the University of Ottawa. This procedure is supplemental to the CSE program and is an emergency procedure within the framework of the University of Ottawa Emergency Management and Recovery Program.

These rescue procedures are established to:
- ensure the most safe and timely removal of a worker from a confined space in the event of an emergency evacuation;
- provide a written rescue procedure that is ready to implement prior to any entry into a confined space.

**SCOPE**

This procedure applies to CSE carried out by the University of Ottawa in the confined space areas identified in Appendix A under the CSE program.

**RESPONSIBILITIES**

It is the responsibility of those involved in confined space entry and rescue at the University of Ottawa to comply with this written rescue procedure. Only members of the confined space rescue team (CSRT) will be directly involved in the rescue of anyone from a confined space.

For the purposes of the CSE program, the University of Ottawa may contract external rescue services during CSE activities under the CSE program. In those instances, external rescue service personnel will be deemed part of the CSRT and must be immediately available for on-site rescue procedures during CSE by University of Ottawa workers and/or contractors under the CSE program.

Each member of the CSRT must:
- a. Have completed at least a one-day confined space awareness course with a half-day practical component
- b. Be trained in confined space rescue procedures, including scenarios
- c. Have received training in confined space rescue equipment
- d. Have undergone respiratory fit testing and be fit to wear respiratory protection appropriate to the circumstances, in accordance with CSA Z94.4
- e. Have received training in first aid and cardiopulmonary resuscitation (CPR).

**DEFINITIONS**

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

“attendant” – an assigned individual who is stationed outside and near the entrance to a confined space and monitors the safety of the entrant(s).
“confined Space” – a fully or partially enclosed space:
   a) that is not designed or built for continuous human occupancy, and
   b) in which atmospheric hazards may occur because of its construction, location, or contents, or because of the work that is done in it.

“competent person” – a person who is:
   a) qualified due to knowledge, confined space awareness training, and experience, to organize the work and its performance;
   b) is familiar with all legal requirements of the work; and
   c) has knowledge of any potential and actual dangers to health and safety in the workplace or confined space.

A “competent person” is different from a “competent worker” or a person having “adequate knowledge, training, and experience”. This “competent person” has the added responsibility of also having “to organize the work”, which is associated with supervisory responsibility.

“competent worker” – in relation to specific work, means a worker who is qualified because of knowledge, training, and experience to perform the work, is familiar with all legal requirements that apply to the work, and has knowledge of any potential and actual dangers to health and safety in the work to be performed.

“confined space rescue team” (CSRT) – all specified persons within the University of Ottawa who are trained: in rescue procedures; in the use of any necessary equipment required during a confined space rescue; and in first aid and cardiopulmonary resuscitation (CPR). Rescue personnel may be external personnel.

“entrant” – person entering the confined space for any reason.

“entry” – action by which a person, or part of a person, passes through the plane of the opening into a confined space and includes the ensuing work activities.

“entry supervisor” – In context of this program for the University of Ottawa, is a competent person responsible for verifying the entry permit and other relevant documentation (rescue plan, air monitoring records, etc.) prior to entry and coordinating the entry activities into the confined space.

“external confined space rescue team” – all specified persons contracted externally (outside the University of Ottawa) who are trained in rescue procedures, in the use of any necessary equipment required to conduct a confined space rescue, and in first aid and cardiopulmonary resuscitation (CPR).

“IDLH” – Immediately Dangerous to Life or Health. Any condition that poses an immediate threat to the health or life of an entrant or that would cause irreversible adverse health effects or would interfere with an individual’s ability to escape unaided from a confined space.

“ORM” – Office of Risk Management of the University of Ottawa

For additional definitions refer to the University of Ottawa CSE program
TYPES OF EMERGENCIES IN CONFINED SPACES

There are four types of rescue situations typically involved in confined spaces. These are:

a. **Self-rescue** – Entrant is able to extract themselves from the confined space with little or no help from those outside
b. **Assisted** – Assistance from the attendant is required to remove entrant from the space by operating a retrieval system, such as a tripod and winch system.
c. **IDLH** – This situation occurs when the atmosphere is immediately dangerous to life and health (IDLH) due to a toxic gas or oxygen-deficient atmosphere. In this scenario, the rescue team must wear a self-contained breathing apparatus (SCBA) and retrieval should be done within minutes or as soon as possible of the entrant’s respiratory arrest.
d. **Extrication** – Involves the deliberate packaging and retrieval of an injured entrant. This situation is typically done under acceptable atmospheric conditions.

Upon being summoned by the attendant, the CSRT will immediately assess the situation to determine whether entry is required, whether the space is IDLH, and the nature of any injuries to the entrant (if applicable).

TYPES OF ENTRY

The CSRT members should be familiar with the confined space entry permit that was completed prior to accessing the entrant; these details of entry must be known when completing the confined space rescue plan. In general, there are five types of access plans that take into account the entry point location and the direction typically taken by the entrant. The entries include:

a. Top access with horizontal travel;
b. Top access with vertical travel;
c. Side access with horizontal travel;
d. Side access with vertical travel;
e. Bottom access with upward vertical travel.

Based on these typical entry and travel scenarios, a base rescue plan identifying distances, number and size of openings, elevation, primary travel direction, vertical distance, and horizontal distance must be identified.

The appropriate retrieval system and location of appropriate anchor points will be based on this entry information.

The rescue plan must be developed and in place prior to the confined space entry.

RESCUE PLAN

Appendix A is a template of a typical rescue plan. One member of the rescue team is responsible for completing and signing the confined space rescue plan. A copy of the confined space rescue plan should be attached to the confined space entry permit.

A confined space rescue plan must be completed for each confined space entry.
ROUTINE RESCUE PREPARATION PROCEDURE STEPS

a) **Identify team** – Each CSRT must contain a minimum of two (2) members. If the confined space rescue plan call for additional CSRT members, the additional number of CSRT members must be clearly marked on the space provided on the rescue plan.

The confined space entry supervisor will ensure that before an entry can occur, rescue procedures are in place and that the members of the rescue team are immediately available at the site. All rescue equipment must be at the site and ready for deployment for the duration of the entry. Appropriate means of communication must be established between the rescue team and the attendant prior to entry.

b) **Verify communication** – Prior to each confined space entry, the CSE supervisor will ensure that a means of effective emergency communication with each of the rescue team members has been identified and will be used, if needed. The attendant and entrant will ensure that a means of communication (as identified on the entry permit) has been established for their use so they can maintain contact with one another during the entry.

c) **Check rescue equipment** – Prior to each confined space entry, the CSE supervisor will ensure that all necessary rescue equipment is at the confined space location, has been inspected, signed off, is in good working order, and is otherwise appropriate for the entry being performed. This may include harnesses and lifelines, hoist/retrieval systems, respiratory equipment (either air supplying or self-contained breathing apparatus), fall arrest equipment, protective footwear, protective gloves, personal flotation devices and/or hard hats. A first aid kit will be included in rescue equipment.

d) **Complete permit information** – CSE supervisor is responsible for ensuring that CSRT is available, that a confined space Rescue Plan is complete, and that rescue equipment for each confined space entry is recorded on each CSE permit.

e) **Monitor during entry** – At all times during the entry, the attendant will monitor the CSE, maintain their post, and remain in communication with the entrant. The attendant must not enter the confined space unless they are released from that duty and another attendant takes over that duty.

RESCUE PROCEDURE STEPS

The following steps must be taken in the event of a confined space rescue. The following procedure applies to both the University of Ottawa confined space rescue team and any external contracted confined space rescue team.

Emergency Activation (Attendant)

a) If, at any time, the entrant inside the confined space initiates a questionable action, offers a questionable response, or is not moving, the attendant will immediately perform a communication check. If there is no response, or a questionable response, from the entrant, the attendant will order the entrant in the confined space to evacuate the space immediately.
b) If possible, the entrant(s) will initiate self-rescue by removing themselves from the confined space.

c) If self-rescue is not possible, the attendant will activate the CSRT with the appropriate means of communication identified in the confined space entry permit and attempt to retrieve the entrant via the connected retrieval line (for vertical entry only).

d) If the entrant needs to be retrieved by a means other than a tripod/winch (vertical entry), the attendant will activate the CSRT with the appropriate means of communication identified in the entry permit and call Protection Services at ext. 5411 (613-562-5411). The attendant must notify Protection Services that the confined space rescue team has been activated and that civic authorities (911) are required for a confined space emergency. The attendant will describe the nature of the situation to Protection Services.

e) If the entrant is disabled due to a fall or impact, the attendant shall activate the CSRT with the appropriate means of communication identified in the confined space entry permit and call Protection Services at ext. 5411 (613-562-5411). The entrant will not be removed from the confined space until paramedics arrive or unless there is immediately danger to life or health.

Simultaneous confined space entries may only occur within the same day and timeframe if there are enough confined space rescue team members available for each of the confined space entries and there is adequate rescue equipment available to be placed at each of the confined spaces during entry.

UNDER NO CIRCUMSTANCES SHALL THE ATTENDANT ENTER THE CONFINED SPACE TO PERFORM OR ASSIST IN THE RESCUE

Protection Services

a. Following call from an attendant or other person, Protection Services will dispatch Protection Services officers to the scene of the confined space incident.

b. Protection Services dispatch will call 911 and request assistance for a confined space emergency.

Protection Services will implement the following emergency steps:

a. Secure the scene:
   a. Prevent unauthorized persons from entering area
   b. Prevent those involved in the incident from leaving the scene (unless seeking medical care).

b. Assist and support CSE rescue team, if required. Protection Services personnel will not enter the confined space.

c. Gather information (once the emergency has ended) and precise details about the events before, during, and after the emergency, including
   a. Obtain statements from all persons involved;
   b. Note signage in area, including confined space signage, posted permits, etc.;
   c. Get preliminary information on cause of incident;
   d. Take photographs of area;
e. Contact the CSE supervisor identified on confined space Entry Permit, if they are not already present, and the Office of Risk Management.

**Emergency Response (Confined Space Rescue Team)**

The CSRT will take the following emergency steps:

a. Assess the scene to determine if entry is required;
b. Ensure confined space is not IDLH;
c. Implement confined space specific rescue plan;
d. If entry is required, the CSE rescue team will don all required personal protective equipment (PPE) as outlined in the confined space rescue plan prior to entry into the confined space.
e. The attendant will remain stationed at the opening of the confined space and be in communication with the CSRT.
f. Perform first aid or cardiopulmonary resuscitation (CPR), as required, to stabilize the entrant(s) and allow for evacuation/extrication to a medical facility as quickly as possible. If the entrant is disabled due to a fall or impact, the attendant shall summon the CSRT with the appropriate means of communication identified in the CS entry permit and call Protection Services at ext. 5411 (613-562-5411). The entrant will not be removed from the confined space until paramedics arrive or unless there is immediately danger to life or health.

**PROHIBITION:** No person shall enter a confined space under rescue conditions if they are not:

a. Part of the CSRT or a City of Ottawa Firefighter;
b. Trained in confined space rescue procedures and equipment;
c. Trained in the confined space rescue plan associated to the specific confined space entry.

**DOCUMENTATION**

The CSE entry permit will be completed by adding information on the emergency evacuation and then cancelled by the CSE supervisor.

A confined space entry permit can be cancelled by recording the date, time, and reason for cancellation in the General Information section under “Duration of Permit”.

The CSE supervisor will ensure that an accident/incident report is completed and sent to Human Resources within 24 hours of completing the rescue and rendering emergency care. The report will include the initial investigation into the circumstances that led to the emergency evacuation of the confined space, as well as corrective action and incident follow up.

**CONFINED SPACE RE-ENTRY**

A confined space shall not be re-entered by any person following an emergency exit and/or rescue procedure until a thorough and accurate evaluation of the space has been conducted to determine the reason for the evacuation. Before any re-entry, a new plan and entry permit, outlining future controls and precautions, will be required.

**TRAINING**

All University of Ottawa personnel identified within this confined space rescue procedure will, as a minimum, receive training and instruction in:

a. The written confined space rescue procedure
b. What the confined space regulation requires of all parties involved
c. The University of Ottawa CSE program and its appendices, including hazards associated with confined spaces

Any contracted external rescue service will be given copies of the CSE program and associated hazard assessments, the confined space rescue procedures, and the base entry permits for the confined space entry to be performed.

**RECORD KEEPING**

The University of Ottawa will ensure that the rescue team provides documentation specifying that the team has performed either a real or mock rescue scenario, at least quarterly, in order to maintain their skills.
Confined Space Rescue Plan

General Information
Confined Space Number:
Confined Space Type:
Building/Location:
CSE Permit Number:
CSE Date:
CSE Time:

Entry Information
Number of Openings:
Opening Size:
Entry Point Access:
☐ Horizontal
☐ Vertical
Travel Direction:
Travel Distance:
Congested Entry:
☐ Yes
☐ No
Potential for IDLH Atmosphere:
☐ Yes
☐ No
Additional Team Members Required:

Method of Rescue
☐ External (retrieval)
☐ Internal (entry required)
☐ Entrant-lowering system
☐ Hauling system
☐ Anchorage overhead
☐ Beam
☐ Support column
☐ Welded steel handrail
☐ Support strut
☐ Anchored steel pipe
☐ Stairwell
☐ Other

Rescue Equipment
☐ Retrieval lifeline system or kit
☐ Pulleys
☐ Full body harness
☐ Equipment bags
☐ Anchor straps
☐ Ladder
☐ Carbineers
☐ Wrist / anklets
☐ Rope grab
☐ Lowering line
☐ Sked basket
☐ Respiratory protection (supplied air)
☐ Lanyard w/shock absorber
☐ Other

☐ All necessary equipment is located at site.
☐ All equipment is inspected and is in a ready, safe operating condition.

**Possible Injuries**

☐ Respiratory distress
☐ Respiratory arrest
☐ Mental distress
☐ Unconsciousness
☐ Fractures
☐ Sprains / contusions
☐ Crush injuries
☐ Punctures
☐ Eye injuries
☐ Lacerations / scrapes
☐ Burns
☐ Spinal
☐ Illness
☐ Other

**First Aid Equipment**

☐ Long / short spinal board
☐ Basket stretcher
☐ Dressings / bandages
☐ Band-Aids
☐ Eyewash
☐ Blankets
☐ Oxygen
☐ AED

**Personal Protective Equipment**

Additional personal protection equipment required:

**Designation of Rescue Personnel**

Confined Space Rescue Team Leader:
Attendant:
Entrant(s):

**Additional Information or Diagram**

Append information to this plan, as necessary.

CSE Supervisor:  
CS Rescue Plan Completed by:  
Phone:  
Date:
Confined Space Entry (CSE) Coordination Document

Lead Employer: ________________________________  Date: ________________________________

Lead Employer Contact: ____________________________  Phone No.: ________________________________

Contractor(s):

1. ________________________________  4. ________________________________
2. ________________________________  5. ________________________________
3. ________________________________  6. ________________________________

Location of confined space to be entered:

________________________________________  Confined Space No.: ____________  CS Plan No.: _______

Lead employer responsibilities: To ensure that contractors are provided with information on hazards associated with the confined spaces as well as CSE program requirements for the CSE being performed.

Contractor responsibilities: To comply with the requirements of the applicable CSE regulation (e.g., O.Reg. 632/05) and the requirements of the lead employer. To ensure that all workers of contractor are trained in the work to be performed and the relevant regulated confined space requirements. The contractor and the workers of the Contractor are to be aware of the University of Ottawa CSE Program requirements.
<table>
<thead>
<tr>
<th>Responsibility:</th>
<th>Lead Employer:</th>
<th>Contractor:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE program**</td>
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<td>X</td>
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<tr>
<td>Hazard assessment</td>
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<td>X</td>
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<tr>
<td>Training*</td>
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<td>X</td>
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<td>Personal Protective Equipment (PPE)*</td>
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<td>X</td>
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<tr>
<td>Entry permit</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Isolation of energy and control of materials movement</td>
<td>X</td>
<td>X</td>
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<td>Attendants</td>
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<td>X</td>
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<tr>
<td>Entering and exiting monitoring and recordkeeping</td>
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</tr>
<tr>
<td>Unauthorized entry prevention</td>
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<td></td>
</tr>
<tr>
<td>Written on-site rescue procedure and equipment</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Atmospheric testing</td>
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<td></td>
</tr>
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<td>Explosive and flammable substances</td>
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<td></td>
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<tr>
<td>Ventilation and purging of atmospheric hazards</td>
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<td></td>
</tr>
<tr>
<td>Rescue plan</td>
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<td>X</td>
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<tr>
<td>Rescue team</td>
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</tr>
<tr>
<td>Documentation/records*</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

* General training, personal protective equipment (PPE) and documentation/records are individual responsibilities of both the lead employer and contractor(s)

** Both lead employer and contractor are required to have a CSE program in place

The signatures below indicate that the contractor(s) and lead employer acknowledge that the employer duties with respect to the above subject matters have been performed in a way that protects the health and safety of all workers performing CSE or CSE-related work at the University of Ottawa:

1. ____________________________  2. ____________________________  3. ____________________________
   Contractor signature            Contractor signature            Contractor signature

4. ____________________________  5. ____________________________  6. ____________________________
   Contractor signature            Contractor signature            Contractor signature

Lead employer signature
APPENDIX G – EQUIPMENT REQUIRED FOR CONFINED SPACE ENTRY

- Head protection
- Eye protection
- Hearing protection
- Gloves
- Approved safety harness
- Approved lifeline
- CSA-approved foot protection
- Calibrated direct-reading monitor (with alarm) with sensors appropriate to confined space (O₂, CO, LEL, H₂S)
- Communication equipment
- Ventilation equipment
- Emergency escape respirator
- Portable lighting
- First aid kit
- Ladders of suitable length and construction
- Hand cleaners and paper towels
- Personal lifting device with winch
- Man-hole cover lifting tool
- Emergency rescue equipment
  - Harnesses and lifelines;
  - Hoist/retrieval systems;
  - Self-contained breathing apparatus;
  - Fall arrest equipment;
  - Safety footwear;
  - Protective gloves;
  - Personal flotation device;
  - Hard hats;
  - First aid kit;
  - Other equipment, as applicable.
A hazard assessment has found that the following locations are not confined spaces. However, prior to working in them, these spaces should be evaluated for potentially hazardous conditions. Proper control measures should be imposed, as required.

<table>
<thead>
<tr>
<th>CS NUMBER</th>
<th>BUILDING</th>
<th>LOCATION</th>
<th>Sec.</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>UU</td>
<td>Campus Area</td>
<td>Campus</td>
<td>X</td>
<td>Elevator Pit</td>
</tr>
<tr>
<td>VV</td>
<td>Campus Area</td>
<td>Campus</td>
<td>X</td>
<td>Access to HVAC Vent Systems W/A</td>
</tr>
<tr>
<td>1</td>
<td>Morisset Hall</td>
<td>Room 12 (inside Room 11)</td>
<td>1</td>
<td>Elevator Sump Pit</td>
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<tr>
<td>9</td>
<td>Roger Guindon</td>
<td>Room 1138 Mezzanine level</td>
<td>4</td>
<td>Reverse Osmoses Water Tank #1</td>
</tr>
<tr>
<td>13</td>
<td>Roger Guindon</td>
<td>Room 1138</td>
<td>4</td>
<td>Reverse Osmosis Water Tank #1</td>
</tr>
<tr>
<td>33</td>
<td>Stanton Residence</td>
<td>Room 04 Mechanical Room</td>
<td>4</td>
<td>Storm Pit</td>
</tr>
<tr>
<td>42</td>
<td>Tabaret</td>
<td>Room 0039 Mechanical room</td>
<td>1</td>
<td>Storm Pit</td>
</tr>
<tr>
<td>44</td>
<td>Marion Hall</td>
<td>Room 005</td>
<td>3</td>
<td>Storm Pit</td>
</tr>
<tr>
<td>45</td>
<td>Colonel By Hall</td>
<td>Room E03B</td>
<td>3</td>
<td>Storm Pit</td>
</tr>
<tr>
<td>46</td>
<td>Colonel By Hall</td>
<td>Room E024 (in E018)</td>
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<td>Storm Pit</td>
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<tr>
<td>47</td>
<td>Colonel By Hall</td>
<td>Room C06</td>
<td>3</td>
<td>Storm Pit</td>
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<tr>
<td>48</td>
<td>Colonel By Hall</td>
<td>Room C012B</td>
<td>3</td>
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<tr>
<td>58</td>
<td>Physical Plant</td>
<td>M09</td>
<td>5</td>
<td>Air Compressor Tank</td>
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<td>69</td>
<td>Physical Plant</td>
<td>O 03</td>
<td>5</td>
<td>Blow-Down Tank Sump Pit</td>
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<tr>
<td>70</td>
<td>Physical Plant</td>
<td>O 03</td>
<td>5</td>
<td>Oil Pit</td>
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<td>76</td>
<td>Physical Plant</td>
<td></td>
<td>5</td>
<td>Ceiling Space</td>
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<td>77</td>
<td>Physical Plant</td>
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<td>5</td>
<td>Supply air from Tunnel to Boiler #3 (blue duct)</td>
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<tr>
<td>79</td>
<td>Colonel By Hall</td>
<td>E02</td>
<td>3</td>
<td>Under Rear Hydraulics Lab (open pit)</td>
</tr>
<tr>
<td>CS NUMBER</td>
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<td>LOCATION</td>
<td>Sec.</td>
<td>DESCRIPTION</td>
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<tr>
<td>80</td>
<td>Colonel By Hall</td>
<td>E02 (in CS79)</td>
<td>3</td>
<td>Sump Pit Hydraulics Lab</td>
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<tr>
<td>82</td>
<td>Colonel By Hall</td>
<td>E020A</td>
<td>3</td>
<td>Combustion Chamber #1</td>
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<td>83</td>
<td>Colonel By Hall</td>
<td>E021a</td>
<td>3</td>
<td>Test Engine Pit #2</td>
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<td>88</td>
<td>Physical Plant</td>
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<td>Tunnel Supplying Air to Boilers #1,2,3</td>
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<tr>
<td>97</td>
<td>Colonel By/SITE</td>
<td>Tunnel</td>
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<tr>
<td>111</td>
<td>D'Iorio</td>
<td>Room 025</td>
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<td>Elevator Sump Pit</td>
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<tr>
<td>113</td>
<td>D'Iorio</td>
<td>Basement Mechanical Room 033</td>
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<td>Compressed Air Tank</td>
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<tr>
<td>118</td>
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<td>Compressed Air Tank</td>
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<td>122</td>
<td>Physical Plant</td>
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<td>Access Stack for Chimneys</td>
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<td>Reverse Osmosis Waste Water</td>
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<td>Colonel By</td>
<td>E022</td>
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<td>Walk-in Fridge</td>
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<td>147</td>
<td>BioScience</td>
<td>Room 008</td>
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<td>Clean Water Tank</td>
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<td>148</td>
<td>LeBlanc</td>
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<td>150</td>
<td>Peter Morand</td>
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<tr>
<td>153</td>
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<td>Tank in Pit, Holding Tank</td>
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<td>Lees Campus</td>
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<td>14 Crawlspace</td>
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<td>164</td>
<td>Lees</td>
<td>Block A</td>
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<tr>
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<td>Lees</td>
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<tr>
<td>173</td>
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<tr>
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<td>Brooks and Fauteux</td>
<td>Garage near CS030; Fauteux Tunnel</td>
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<td>CCS Service Tunnel</td>
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<tr>
<td>191</td>
<td>Vanier</td>
<td>Level 0 Corridor 0100K by Stairwell 0155 Access</td>
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<td>Crawl Space</td>
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<td>45 Mann Residence</td>
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<td>Hot Water Holding Tank</td>
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<td>Penthouse Mechanical Room</td>
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<td>Hot Water Holding Tank</td>
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APPENDIX I – UNIVERSITY OF OTTAWA CONFINED SPACE SIGNAGE