

QUEEN'S UNIVERSITY: CONFINED SPACE (CS) PROGRAM

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1.0 PURPOSE

This procedure describes the Confined Space (CS) Program used by Queen's Facilities. The CS Program requirements are established to:

1. Protect all workers working in or near confined space identified areas by ensuring a safe work environment is established and maintained prior to entering and while performing work in confined spaces and establish rescue procedures in the event they are required.
2. Ensure compliance with requirements of the Confined Space Regulations made under the Ontario Occupational Health and Safety (OHS) Act, O.Reg 632/05.

2.0 APPLICATION

All workers in the Department of Facilities performing work related to or in confined spaces must follow this program. Contractors performing work on behalf of Queen's University must have and implement a confined space program that meets the requirements of the legislation governing the work they are undertaking. In the event both Queen's Facilities Staff are working with Contractors, coordination and roles must clearly be defined and at a minimum follow the procedures of this program.

3.0 DEFINITIONS

"Acceptable Atmospheric Levels" –as per Ontario Regulation 629/05 means:

- a) atmospheric concentration of any explosive or flammable gas or vapour is less than:
 - (i) 25 per cent of its lower explosive limit, if paragraph 1 of subsection 19 (4) applies,
 - (ii) 10 per cent of its lower explosive limit, if paragraph 2 of subsection 19 (4) applies,
 - (iii) 5 per cent of its lower explosive limit, if paragraph 3 of subsection 19 (4) applies,
- b) oxygen content of the atmosphere is at least 19.5 per cent (%) but not more than 23 per cent (%) 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 that is stationed outside and near the entrance to a confined space and monitors the safety of the Entrant(s).

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

“Confined Space (CS)” - a fully or partially enclosed space,

- a) that is not both designed and constructed 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.

“Confined Space Rescue Team (CSRT)” - all specified persons trained in rescue procedures and any necessary equipment required during confined space rescue, as well as First aid and CPR training.

“Competent Person” - 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 H&S in the workplace.

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

“Competent worker”— in relation to specific work, means a worker who:

- a) is qualified due to knowledge, training and experience to perform the work,
- b) is familiar with all legal requirements that apply to the work, and
- c) has knowledge of any potential and actual dangers to H&S in the work.

“Construction and major maintenance projects”- includes erection, alteration, repair, dismantling, demolition, structural maintenance, painting, land clearing, earth moving, grading, excavating, trenching, digging, boring, drilling, blasting, or concreting, the installation of any machinery or plant, and any work or undertaking in connection with a project but does not include any work or undertaking underground in a mine.

“Coordination Document” – document that is prepared by the “lead employer”; applies if the workers of more than one employer perform work in the same confined space or related work with respect to the same confined space; and 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 related work to, the confined space.

“CPP” – Central Power Plant

“Entrant” – person entering the confined space.

“Entry” – 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 Permit” – written, printed document, or digital (prepared before every confined space entry (CSE)) to allow and control entry into a confined space with the purpose of verifying communication to workers about the hazards identified and the controls in place. Requires completion, verification, signature and posting, prior to any CSE.

“Entry Supervisor” – in context of this program for Queen's University, is a “competent person” responsible for coordinating confined space entry and verifying the entry permit prior to entry into a confined space.

“Hazard Assessment” – written document that considers, with respect to each confined space, 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.

“JHSC” – Joint Health and Safety Committee

“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.

“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 CS entry plans (which include on-site rescue procedures); a method for training workers; and an entry permit system. This document constitutes Queen's University CS Program.

“Purging” – removing contaminants inside the confined space by displacement with air 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.

“Restricted Space”- a fully or partially enclosed space,

- a) that is not both designed and constructed for continuous human occupancy, but
- b) in which atmospheric hazards are not present nor likely to occur

“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.

4.0 RESPONSIBILITIES

4.1 DEPARTMENT OF ENVIRONMENTAL HEALTH & SAFETY

- EHS will take the lead in identifying all confined space locations and posting appropriate hazard warning signage. The JHSC will conduct annual inspections to identify any deficiencies and report them to EHS. Maintain the database and inventory of confined spaces.
- For confined spaces, complete initial hazard assessments and provide assessments to the Department of Facilities.
- EHS will collaborate with the Department of Facilities Projects team to ensure that any newly created confined spaces resulting from construction or renovation activities are properly identified and signed and update the database accordingly.
- Audit program compliance periodically and report deficiencies to the appropriate party.

4.2 DEPARTMENT OF FACILITIES

- Responsible to identify which employee's require Confined Space Awareness Training and work with EHS to obtain the training.
- Responsible to identify which employee's require Confined Space Entry Training and Confined Space Rescue Training and work with EHS to obtain the training.
- The Queen's Department of Facilities on main and west campus have the primary responsibility for accessing and authorizing work in most confined spaces. However, there may also be situations where the confined space is owned by a specific researcher or department. In these cases, the responsibility falls to the owner/researcher/department. This applies to both University employees and contractors.
- Management shall ensure that hazard assessments, entry plans, entry permits, on-site rescue plans and co-ordination documents are written for each confined space in which University employees or contractors perform work.

4.3 MANAGERS AND SUPERVISORS RESPONSIBLE FOR WORK INVOLVING CONFINED SPACES

- Be familiar with the requirements of this program and ensure that employees or contractors under their supervision understand the confined space procedures and know how to conduct their confined space tasks safely.
- Ensure that Hazard Assessments for all identified confined spaces are completed and communicated.
- Ensure that all University Employees working in or conducting work related to confined spaces are adequately trained for confined space.
- Ensure the CS Entry Plan(s) have been performed/approved for all confined space work prior to commencing work.

- Responsible for keeping documentation related to confined space entries conducted by their staff.
- 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. The appointed person in most cases will be the Attendant.

Ensure that employees under their supervision:

- Receive the required training prior to entering a confined space
- Follow the requirements of the CS program
- Are aware of the hazards and controls associated with the Entry Plan for the space they will be entering
- Take all reasonable precautions to protect their health and safety prior to entry
- Work in compliance with the OHS Act and Regulations as well as requirements of Queen's University

4.4 QUEEN'S UNIVERSITY EMPLOYEES

- Employees who are required to perform work in or involving, confined spaces shall work in accordance with the University's Confined Space Program.
- Ensure that they know the hazards associated with the space
- Abide by all the requirements of the Entry Plan for each confined space
- Receive the required CSE training
- Communicate any OH&S concerns to their direct supervisor immediately
- No person is authorized to enter a confined space without proper approval and training.

4.5 ENTRANTS, ATTENDANTS, RESCUE TEAM

Entrant is:

- Trained in the hazards of the confined space they are entering to perform work
- Ensure that they are aware of the hazards associated with the space including any plan specific procedures for entry into and work within the space.
- Abide by all the requirements of the Entry Plan for each confined space
- Be in constant communication with the attendant
- Immediately exit the space if instructed to do so by the attendant
- Ensure to report immediately to the Entry Supervisor any issues or concerns that arise

4.6 ATTENDANT

An assigned Confined Space Attendant must:

- not enter the confined space at any time
- remain stationed outside and near the entrance to the space at all times
- remain in constant communication with the entrant, as agreed, in advance of entry
- If there are two or more entrances, the attendant should be stationed at the entrance that will best allow the attendant to perform their duties
- have an agreed upon communication method to summon a rescue response if required
- monitor the safety of the Entrant
- provide assistance to Entrant
- keep a record of those persons who enter the space and exit the space using the applicable Entry Plan Document
- keep a record of the atmospheric test readings using the applicable Entry Plan Document
- prevent any unauthorized entry into the CS while assigned to a CS
- perform all Attendant duties required by this CS Program

4.7 RESCUE TEAM

Due to the equipment, training, and practise requirements, it is highly recommended that the task of the rescue team be contracted to a third-party provider.

The rescue team will:

- be directly involved with the rescue of person(s) from a confined space
- be trained in rescue procedures and any necessary equipment required during confined space rescue as well as First aid and CPR
- be responsible for rescue equipment and ensure equipment has been checked, is in good condition and is in place
- be readily available to immediately implement rescue procedures.

4.8 JHSC

The JHSC has a right to the following CS documents, when requested:

- a copy of any Coordination Document
- a copy of the Program
- a copy of any Hazard Assessment

The JHSC also has the following consultation rights:

- Be consulted with regards to the development and maintenance of the Confined Space Program
- Be consulted in regard to the development of confined space awareness training

The JHSC also has the following responsibility:

- Verify confined space signage is in place and legible as part of the JHSC workplace inspections process and to report any deficiencies, as per SOP-Safety-02.

5.0 HAZARD ASSESSMENT

5.1 IDENTIFYING CONFINED SPACES AND HAZARDS

Potential confined spaces were evaluated to determine if each is a “confined space” per O.Reg. 632/05. The following table is provided to facilitate evaluation of areas that may or may not be considered a confined space:

Is it designed and constructed for continuous human occupancy?	Is it possible to have an atmospheric hazard?	IS IT A CONFINED SPACE?
Yes	Yes	No
Yes	No	No
No	Yes	Yes
No	No	No

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 a confined space, regardless of the atmospheric hazards that may occur in them. Occupational health and safety legislation and regulations apply and must be complied with to protect workers.

5.2 HAZARD ASSESSMENT

A Hazard Assessment has been completed for all confined spaces listed in the inventory in Appendix A, using the CS Hazard Assessment Form in Appendix C or the SOP Hazard Assessment Forms in Appendix D for confined space entries.

Hazard Assessments will be available for each and every entry into the confined space(s) listed in Appendix A and shall be reviewed prior to each entry to verify that the same conditions exist

as well as the adequacy of the Plan and Permit documents. Once reviewed and determined adequate, the hazard assessment will be signed and dated, prior to entry.

A confined space will be re-assessed whenever changes are introduced to the space that could affect the adequacy of the Entry Plan instructions and controls developed for the space or when inadequacies with the Plan are identified as a result of the entry or incident occurring during the entry.

A listing of “potentially confined spaces” (not considered to be confined spaces) is included in Appendix B for information purposes. It should be noted that hazard assessments identified these spaces not to be confined spaces at the time of the initial assessment. However, these spaces must be reassessed by a competent person prior to entry and the tasks to be performed taken into consideration as they may introduce additional hazardous conditions. Proper control measures for the hazards must 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 B only.

A hazard assessment may include, but is not limited to the following hazards and controls:

- Oxygen deficiency/oxygen enrichment environment
- 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, alkalis
- 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 is required

Atmospheric hazard decision trees are provided in Appendix C.

Any new suspect confined spaces not identified on the Inventory list in Appendices A or H should be immediately reported to the Department of Environmental Health and Safety so that and assessment can be conducted prior to entry.

6.0 CONFINED SPACE ENTRY PLAN

Development

The authorizing CS Entry Supervisor will ensure that a Base Entry Plan has been created for the CS being entered. Where CSE has been contracted out to another Employer, such as a Contractor, the Entry Plan will be developed by the respective Contractor in compliance with the provisions of this program and O. Reg 632/05.

Content

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

Queen's University, for the purposes of their CS Program, has incorporated the Entry Plan into the Entry Permit in Appendix D.

If questions concerning confined space entry and assessment arise contact the Queens University Department of Environmental Health and Safety.

7.0 CONFINED SPACE ENTRY PERMIT

Verification

All confined space entries will require that an Entry Permit be completed. The authorizing CS Supervisor will verify that the Entry Permit complies with the corresponding Entry Plan and sign their name, prior to entry. A copy of the corresponding Entry Plan will be included and will form part of the Entry Permit.

Maintenance

The Attendant will keep a record of those persons who enter the space and exit the space, on the Entry Permit for the duration of the Entry Permit.

Cancellation

Confined Space Entry Permits will be cancelled by the CS Entry Supervisor upon completion of the work, or when any prohibited condition arises. Entry Permits cannot be left 'open' and

“allowed to” expire. Cancelled Entry Permits will be kept by CS Entry Supervisor and its faculty or services for 1 year.

Requirements

A sample Confined Space Entry (Base Plan) and Entry Permit is 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
- 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, adequate provisions for the hot work and corresponding control measures

For the purposes of the CS Program, the “Entry Permit” will incorporate the Plan, onsite rescue equipment inspection records and air testing results into the Entry Plan and Entry Permit document, provided in Appendix D.

8.0 CONFINED SPACE ENTRY PROCEDURE

The following section outlines the steps to be taken prior to each confined space entry:

- Complete hazard assessment
- Establish a Plan that includes adequate controls and procedures, including PPE requirements for entrant
- Establish communication between entrant and attendant
- Perform atmospheric testing prior to entry; record results on the Entry Permit form
- Complete Entry Permit and post Entry Permit near confined space
- Station attendant outside confined space
- Execute required control procedures (hot work, lockout/tagout, ventilation)
- Enter space and monitor continuously

Step 1: Hazard Assessment

The hazard assessment shall be reviewed and verified by the CS Entry Supervisor prior to each entry to verify that the same conditions exist. A confined space will be re-assessed

whenever changes are introduced to the space that could affect the adequacy of the entry plan instructions and controls developed for the space or when inadequacies with the Entry Plan are identified as a result of the entry or incident occurring during the entry.

Any space in question, where it has not been identified as a confined space on the Inventory list in Appendices A or H should be immediately reported to the Department of Environmental Health and Safety to be evaluated prior to entry.

The hazard assessment shall include but is not limited to; oxygen content, flammability, toxics, energy, engulfment, entrapment and personal safety (see form in Appendix D).

Step 2: Establish Plan and Procedures & Protective Equipment

Based on hazard assessment, determine appropriate control measures and equipment required for CSE. The “plan” will be incorporated into the “Entry Permit”.

Step 3: Establish Communication

Constant communication between attendant and entrant, and attendant and rescue team must be established and in place depending on the specific confined space. The means of communication between the attendant and the entrant must be appropriate for the space, especially in areas with high background noise, or possible interference with radio or cell phone transmissions.

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

Step 4: Perform atmospheric testing prior to entry

Atmospheric testing shall be performed in accordance with section 9.0 Controls (section on Atmospheric Testing). Atmospheric testing shall be monitored prior to every entry when space is vacant. 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 (either using supplied air system or self-contained breathing apparatus (SCBA)), is required.

If at any time atmospheric conditions are found to be unacceptable 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.

Step 5: 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 identification number/confined space number/sequence number. For example, if entering confined space number 63 in the Central Power Plant (Building ID: 113) in 2025, and it is the first Entry Permit of that year, the corresponding entry permit number would be 25-113-63-01.

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: Station Attendant

Attendant shall be posted near entrance of confined space for duration of work and shall be in constant communication with entrant(s) while working in confined space. Attendant shall not enter confined space unless relieved by qualified person (attendant) and entry can be safely performed.

Step 7: Execute Required 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 and a copy attached to the Entry Permit.

Step 8: Enter Space and Monitor

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

9.0 CONTROLS

Placarding

Every confined space will be identified by a unique number and, where possible, a placard posted at the entry point to the confined space in order to warn workers of the confined space hazard.

Communication corresponding to confined spaces will clearly indicate:



In the case of exterior manholes where placarding is not practical, **all** manholes are to be considered confined spaces and shall be treated as such.

Entry Authorization

All confined space entries will be authorized by a CS Entry Supervisor. Authorization will be granted by the CS Entry Supervisor only after all requirements of the CS Program and corresponding documented measures have been complied with.

Prevention of Unauthorized Entry

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

An Attendant will be assigned by a CS Entry Supervisor, and located outside or near the entrance, to 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 as well as preventing any unauthorized entry. All entries will be documented by the Attendant on the CSE Plan/Permit.

Energy Isolation

Where energy sources will pose a risk to the entrant, the 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 and 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 Department of Facilities Lock Out/Tag Out procedures. Reference PPS SOP 3.4 (Equipment Lockout and Tag 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 the sections of pipe if the piece that has been removed is in-line with the two sections of pipe).

If blanking or disconnecting piping is not practical in the circumstances for technical reasons, the confined space must be adequately protected against the release of hazardous substances into the confined space by other adequate means.

Other Measures

Other adequate measures for protecting against hazards associated with equipment or electrical energy can 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, will be de-energized or blocked to prevent movement. However, a properly guarded pump or fan need not be de-energized. In a confined space in which flammable, combustible or explosive agents might accumulate, the same equipment must be de-energized or designed so that it does not create a spark.

Traffic Control

Where it is necessary to control vehicular and pedestrian traffic, a traffic control plan is required. Individuals acting out the control plan should have the appropriate training. The traffic control plan should be developed utilizing the Ministry of Transportation Ontario Traffic Manual, Book 7 (Temporary Measures) and included with the confined space permit.

Entrance Cover Removal

Wherever possible, all unsafe conditions will be eliminated before removing an entrance cover. After removing an entrance cover, where there is 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. Measures will also be put in place to protect entrants from falling objects.

Atmospheric Testing

Requirements

Atmospheric testing is required when the relevant assessment determines that the confined space may contain atmospheric hazards or the work that is being done may create an atmospheric hazard. The results of testing and calibration information will be documented on the CSE Plan/Permit.

Where indicated by the Hazard Assessment and Entry Plan, before entering a confined space, the atmosphere will be tested 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, the following procedure should be used:

- a) Test equipment function (i.e. battery test and all-level function)
- b) Ensure all monitor warning alarms are set appropriately
- c) Test for the following atmospheric hazards:
 - i) Oxygen content– 19.5% to 23.0%
 - ii) Flammable gases and vapors–
 - 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 (spark producing work or other sources of ignition as a result of the work to be performed) and the requirements of 5.11 are complied with.
 - iii) Potential toxic air contaminants- less than established limits 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 probe placed approximately 2” above the entry point.
- e) Insert the probe through an inspection port or another opening to take atmospheric reading
- f) If neither combustible nor toxic gases are present, remove the cover and then sample the atmosphere at several levels (heights).
- g) After the readings are taken, record 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 purging, must be used and the space re-tested prior to entry (refer to section 8.4.3).

Frequency

Testing of the CS must be performed prior to each and every entry and then continuously while work is underway, to ensure that acceptable atmospheric levels are maintained. Atmospheric testing results must be recorded at adequate intervals during continuous monitoring. 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.
- Notify the supervisor.
- 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.
- Before re-entry into the same space, verify the Entry Plan and new Entry Permit correspond and are verified and that the space is safe for entry.

Continuous Monitoring

Continuous monitoring is required when performing hot work, when there may be a flammable or explosive atmosphere, in an inerted space or where a toxic atmosphere is likely to be generated or present during the CSE or as set out in the Entry Plan. Continuous monitoring will be accomplished using appropriate personal gas detectors worn by all Entrants during CSE.

Ventilation

(a) 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.

(b) Ventilating

Ventilation of a space will either be through displacing air and diluting it through the introduction of fresh air or the continuous removal of 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 entry of clean replacement air or to allow the exhaust of air. Pure oxygen must not be used to ventilate a confined space.

(c) Failure Alarm

To warn of ventilation failure and facilitate safe exit of Entrants from the space, an adequate warning system and exit procedure shall be provided. If practicable, the alarm should be an audible or visual alarm, activated by a flow or pressure switch in the air stream rather than by electrical failure or other motive power failure. If an audible or visual alarm is not practicable, then the attendant shall monitor the ventilation equipment and communicate failures to the entrant. Refer to Section 9 *Response to Elevated Findings and Exit Procedure during CSE* for exit procedure during alarm.

(d) Other precautions

If it is not practical, for technical reasons, to ventilate or purge, a worker entering the confined space shall use,

- (i) Adequate respiratory protective equipment (to be used during CSE and signed off as appropriate on Entry Permit)
- (ii) Adequate equipment to allow persons outside the confined space to locate and rescue the worker if necessary, and
- (iii) Such other equipment as is necessary to ensure the worker's safety.

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

Hot Work

a) Precautions

In the case of an explosive or flammable gas or vapour, the space must be either:

- (i) Made safe by inserting the space with an inert gas and continuously monitoring the atmosphere, particularly with regard to oxygen concentration. Workers must wear adequate respiratory protective equipment and equipment to allow persons outside the confined space to locate and rescue them, if necessary, or

(ii) The following precautions must be taken:

- 1) The space is purged and continuously ventilated to maintain an atmosphere of less than 5% of the LEL;
- 2) The space is purged and continuously ventilated to maintain an oxygen concentration of 19.5% - 23%;
- 3) The atmosphere in the confined space is continuously monitored;
- 4) The Entry Permit includes adequate provisions for hot work and details the appropriate measures to be taken; and
- 5) An alarm and exit procedure are in place to provide adequate warning and allow safe escape if the levels in a) or b) above are not met. It is good practice to incorporate a safety factor that provides for adequate warning should the levels be approached.

b) Hot Work Permit

A completed Queen's University Hot Work Permit will be included with the Entry Permit, prior to authorizing the entry.

Personal Protective Equipment

All workers entering a confined space must have adequate personal protective equipment based on the Hazard Assessment, identified in the Plan and in accordance with respective Regulations.

10.0 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. Due to the equipment, training and practise requirements, it is highly recommended that the task of the rescue team be contracted to a third party provider. If an in-house rescue team is to be used, contact the Department of Environmental Health & Safety for review and approval.

On-Site Rescue Procedures

If at any time there is questionable action or activation of the entrant's personal monitor, the attendant will make an immediate communication check. If there is no response or a questionable response, the attendant will initiate the on-site rescue procedures.

- 1) If possible, the entrant(s) will initiate self-rescue by climbing out of the confined space.
- 2) If self-rescue is not possible, the attendant will activate the Confined Space Rescue Team (CSRT) by the means of communication recorded on the Entry Permit. The attendant

will attempt to retrieve the entrant via the connected retrieval line (for vertical CS entry only).

- 3) If retrieval of entrant is required by means other than a tripod/winch (vertical CS entry), the attendant should immediately summon the CSRT.
- 4) If the entrant is disabled due to falling or impact, the attendant shall activate the CSRT and the entrant will not be removed from the confined space until EMS arrive unless there is an immediate threat to life.

Under no circumstances shall the Attendant enter the space to perform rescue.

Training Requirements and Records

The Rescue Team (contracted rescue service or in-house team) will provide records of training of rescue personnel to Queen's University Department of Facilities. The Rescue Team must have the following:

- Completed a minimum of 1 day Confined Space Entry course with ½ day practical component
- Trained in confined space rescue procedures including scenarios
- Training in confined space rescue equipment
- Respiratory fit testing and be capable of wearing a respirator
- Training in First Aid and 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, self-contained breathing apparatus, fall arrest, safety footwear, protective gloves, personal flotation device and/or hard hats. The rescue equipment and procedures will be documented on each Entry 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 entry. This inspection will be documented by initialling on the Entry Permit.

Rescue Procedures and the CS Entry Plan

The Rescue Team will ensure that the Rescue Plan will be able to 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 must 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 the work does not impede the Attendant's duties.

11.0 CONTRACTORS

Regulatory and Program Requirements

The Contractor will have their own CS Program and the Contractor Program must meet or exceed the Queen's University CS Program. Queen's University will provide the Contractor with its list of identified confined spaces, potentially hazardous spaces, and existing hazard assessments.

Coordination Document

If there is more than one employer performing work within the same confined space at a time, a Coordination Document is required. A sample Coordination Document is provided in Appendix E.

The Lead Employer is responsible for the preparation of the Coordination Document if more than one employer is performing work in the same confined space or related work.

The Lead Employer shall provide, a copy of the Coordination document to,

- a) each employer of workers who perform work in the same confined space or related work with respect to the same confined space; and
- b) the project's Workplace Joint Health and Safety Committee or health and safety representative, if any.

Each employee is required to have a copy of the coordination document prior to entering a confined space or beginning work related to the confined space.

The Coordination Document ensures that employer duties with respect to the following subject matters 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 materials movement;
- attendants;
- entering and exiting;

- unauthorized entry;
- atmospheric testing;
- explosive and flammable substances; and
- ventilation and purging of atmospheric hazards.

12.0 TRAINING

Content

Supervisors, attendants, entrants and rescue team members must be adequately trained in O.Reg. 632/05, this CS 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 those outlined in section 10.0 of this Program.

Training must include hands-on experience with the safety equipment including the personal protective equipment and safety harnesses.

Minimum Training Requirements

Minimum training requirements for various positions are outlined below. All training outlined herein must be documented and kept on file. Training requirements and needs shall be reviewed upon service provider changes.

CS Entry Supervisor - Must be aware of all hazards associated with a confined space and communicate this to his/her workers. Must communicate and monitor the procedures surrounding safe entry and work are followed. Must communicate how to work safely around the hazards identified. The Entry Supervisor must enforce the proper use and care of all required PPE. Must ensure all workers assigned to a confined space have undergone the required training.

Confined Space Worker (entrant, attendant)- Includes 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 in order 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 trade workers – All trade workers within the Queen's University Facilities Department must complete Confined Space Awareness training in order to become aware of the hazards associated with confined space jobs.

Training	Personnel/Positions to be Trained
Basic awareness of confined spaces	Entrant, Attendant, CS Entry Supervisor, Rescue Team
CS Program and Hazards	Entrant, Attendant, CS Entry Supervisor, Rescue Team
CS Entry Plans	Entrant, Attendant, CS Entry Supervisor, Rescue Team
Facility Emergency Response Plan	Entrant, Attendant, CS Entry Supervisor, Rescue Team
Confined Space Emergency Procedures	Entrant, Attendant, CS Entry Supervisor, Rescue Team
First Aid, CPR	Entrant, Attendant, Rescue Team
Gas testing/monitoring	Entrant, Attendant, CS Entry Supervisor, Rescue Team

Note: There could be more than one Entrant, Attendant or CS Entry Supervisor at training session.

Review

Training will be reviewed with or by the Department of Environmental Health and Safety whenever there are changes in the CS Program. A copy of the most recent training program and records identifying workers who received the training will be retained by the Department of Facilities.

13.0 DOCUMENTATION AND RECORDKEEPING

Required written documents:

- Program *
- Co-ordination document (if applicable)
- Hazard Assessment
- Plan
- Training records
- CS Entry permit
- On-site rescue procedures
- On-site rescue equipment inspection records
- Air testing results

All of the above documents are incorporated within the "Entry Permit" except for those with an asterisk. Queen's University, for the purposes of their CS Program, has incorporated the plan, onsite rescue equipment inspection records and air testing results into one document, the Entry Permit, in Appendix D.

Retention

Departments must retain all of the above documents for at least 1 year after they are created, and at least the two most recent records of each document must be retained, 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 and major maintenance projects, these documents must be retained for the duration of the project, and at least one year after the completion of the project.

Distribution and Availability

The Co-ordination document and CS 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 and posted near the entry location so every person who enters the confined space or performs related work during the time for which it applies has access.

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 and major maintenance projects:

Contractors must keep available for inspection at the project the assessment, plan, co-ordination document, record of training, Entry Permit, record of inspection of rescue equipment, and air testing records. After the completion of the project, the Constructor must keep a copy of these documents for at least one year.

APPENDIX A

Inventory - Identified Confined Spaces under Queen's University CS Program

Confined Space Inventory and Hazard Assessments

Confirmed Confined Spaces		
CS ID	Building	Location
CS-177-001	132 Grant Timmins	Main Room
CS-301-001	355 King St	Loading Dock
CS-127-001	Abramsky Hall	4
CS-115-001	Ban Righ Hall	75
CS-188-001	Beamish Munro	100A
CS-188-002	Beamish Munro	115
CS-188-003	Beamish Munro	176
CS-188-004	Beamish Munro	110
CS-138-001	Biosciences Complex/Earl Hall	694
CS-138-002	Biosciences Complex/Earl Hall	1184
CS-170-002	Botterell Hall	Penthouse
CS-170-001	Botterell Hall	B2
CS-198-001	Brant House	105
CS-198-002	Brant House	105A
CS-168-002	Bruce Wing	room 138
CS-168-001	Bruce Wing	102
CS-QC-013	Campus	beside NE entrance to Stuart Parking
CS-QC-004	Campus	courtyard on Mackintosh-Corry Hall & Harrison Lecaine Hall
CS-QC-064	Campus	driveway at KGH E of Emergency ramp
CS-QC-059	Campus	E Albert in front of Watts
CS-QC-031	Campus	E University between Ontario and Grant
CS-QC-056	Campus	eastbound lane Union St north of Douglas
CS-QC-015	Campus	grass E Arch beside Biosciences
CS-QC-055	Campus	grass E of Miller
CS-QC-005	Campus	grass east of 142 Albert
CS-QC-009	Campus	grass NE of Enaayaan-Tkanonsote
CS-QC-036	Campus	grass NW of Victoria B-wing
CS-QC-042	Campus	grass S Donald Gordon Centre parking lot
CS-QC-25E	Campus	grass S of 169 University
CS-QC-25W	Campus	grass S of 169 University

CS-QC-037	Campus	grass SE intersection Union & Albert
CS-QC-100	Campus	grass SE Richardson Stadium
CS-QC-045	Campus	grass W Sir John A N of McArthur
CS-QC-008	Campus	grass west of Mackintosh-Corry B-wing
CS-QC-007	Campus	grass west of Mackintosh-Corry E-wing
CS-QC-101	Campus	gravel S Richardson Stadium
CS-QC-066	Campus	gravel SE GIDRU wing
CS-QC-032	Campus	in front of Fleming Hall
CS-QC-018	Campus	Kathleen Ryan Hall
CS-QC-016	Campus	Kingston sidewalk, corner of Arch and Stuart
CS-QC-014	Campus	N Stuart in front of Richardson Lab
CS-QC-024	Campus	N Union beside Kinesiology parking lot
CS-QC-065	Campus	NE Health Care museum
CS-QC-102	Campus	parking lot SW Richardson Stadium
CS-QC-049	Campus	roadway NE Jean Royce 1
CS-QC-043	Campus	roadway SE intersection Union & Alwington
CS-QC-103	Campus	roadway W Richardson Stadium
CS-QC-001	Campus	S Bader Lane between Chernoff & Stirling
CS-QC-002	Campus	S Bader Lane in front of Ban Righ
CS-QC-030	Campus	S Bader Lane in front of Stirling
CS-QC-062	Campus	S Stuart between Leggett and Lasalle
CS-QC-061	Campus	S Stuart in front of Leggett
CS-QC-060	Campus	SE corner Albert & Stuart
CS-QC-003	Campus	sidewalk between Harrison-Lecaine and Agnes
CS-QC-67E	Campus	sidewalk between Louise D Acton & Cancer Research
CS-QC-67W	Campus	sidewalk between Louise D Acton & Cancer Research
CS-QC-010	Campus	sidewalk between Sutherland and Union Parking
CS-QC-006	Campus	sidewalk between Watson and Harrison-Lecaine
CS-QC-068	Campus	sidewalk E Louise D Acton
CS-QC-047	Campus	sidewalk E refrigeration plant
CS-QC-021	Campus	sidewalk intersection NE of Ontario

CS-QC-033	Campus	sidewalk intersection south of Carruthers
CS-QC-046	Campus	sidewalk N of McArthur
CS-QC-044	Campus	sidewalk NE intersection Union & Sir John A
CS-QC-019	Campus	sidewalk NE of Clark
CS-QC-058	Campus	sidewalk S of Stauffer
CS-QC-039	Campus	sidewalk SE intersection Union & Ellerbeck
CS-QC-038	Campus	sidewalk SE intersection Union & Kensington
CS-QC-040	Campus	sidewalk SW intersection Union & Livingston
CS-QC-048	Campus	sidewalk W Orr Tower
CS-QC-035	Campus	SW corner Lasalle
CS-QC-034	Campus	SW corner McLaughlin parking lot
CS-QC-012	Campus	SW corner Stuart and Lower University
CS-QC-057	Campus	SW corner Union and University
CS-QC-028	Campus	W Albert between McNeill and Brant
CS-QC-027	Campus	W Albert in front of McNeill
CS-QC-026	Campus	W Division beside Kinesiology parking lot
CS-QC-023	Campus	W University in front of Richardson
CS-QC-011	Campus	west side of rugby field close to university
EM-XX	Campus	BADER LANE AT AGNES ETHERINGTON ARTS CENTRE
EM-XX	Campus	BADER LANE AT CHERNOFF HALL - NS44
EM-XX	Campus	BADER LANE AT STIRLING HALL - NS06
EM-XX	Campus	BADER LANE AT VICTORIA HALL
EM-XX	Campus	BADER LANE COURTYARD AT WATSON HALL
EM-XX	Campus	CORNER OF BADER, ALBERT AND QUEEN'S CRESCENT
EM-XX	Campus	CORNER OF UNION AND ALBERT STREETS
CS-EM-107	Campus	EM-107 (LOUISE D. ACTON BUILDING)
CS-EM-125	Campus	EM-125 (CORNER OF UNION AND ARCH STREET)

CS-EM-131	Campus	EM-131 (UNIVERSITY AVE AND CLERGY STREET)
CS-EM-133	Campus	EM-133 (UNION STREET) Policy Studies
CS-EM-135	Campus	EM-135 (UNIVERSITY AVE AND CLERGY STREET)
CS-EM-171	Campus	EM-171 AT POLICY STUDIES BUILDING
CS-EM-49	Campus	EM-49 (MORRIS HALL - NS33 AT KING STREET)
CS-EM-57	Campus	EM-57 (CENTRAL HEATING PLANT - NS31)
CS-EM-70	Campus	EM-70 (CORNER OF STUART AND ARCH STREETS)
CS-EM-71	Campus	EM-71 (ARCH STREET ACROSS FROM EM-72)
CS-EM-72	Campus	EM-72 (ARCH STREET AT ABRAMSKY HALL - IS138)
CS-EM-73	Campus	EM-73 (ARCH STREET AT EARL HALL - NS40)
CS-EM-74	Campus	EM-74 (ARCH STREET AT BIOSCIENCES)
CS-EM-77	Campus	EM-77 (STIRLING HALL, CHOWN HALL AND BAN RIGH HALL - NS06, NS38 AND NS07)
CS-EM-80	Campus	EM-80 (BRUCE WING)
CS-EM-81	Campus	EM-81 (MILLER HALL - NS18)
CS-EM-82	Campus	EM-82 (THEOLOGICAL HALL - NS20)
CS-EM-83	Campus	EM-83 (HARRISON-LECAIN HALL)
CS-EM-85	Campus	EM-85 (WATSON HALL - NS28)
CS-EM-86	Campus	EM-86 (MACKINTOSH-CORRY HALL SOUTH - NS24)
CS-EM-87	Campus	EM-87 (MACKINTOSH-CORRY HALL NORTH - NS22)
CS-EM-91	Campus	EM-91 (UNION STREET)
CS-EM-97	Campus	EM-97 (FRONT OF MACKINTOSH-CORRY HALL SOUTH)
EM-XX	Campus	FRANK TINDALE FIELD AT ALBERT STREET
EM-XX	Campus	FRONT OF MACKINTOSH-CORRY HALL NORTH
EM-XX	Campus	GORDON - BROCKINGTON HALL - NS-51 (COLLINGWOOD STREET)

EM-XX	Campus	KING STREET NORTH SIDE OF THE CENTRAL HEATING PLANT
EM-XX	Campus	LEONARD HALL - NS37 (COLLINGWOOD STREET)
EM-XX	Campus	MCNEILL HOUSE - NS42 (ALBERT STREET)
EM-XX	Campus	MORRIS HALL - NS33 (ALBERT STREET)
EM-XX	Campus	PARKING AREA (ALBERT AND STUART STREETS)
EM-XX	Campus	PARKING AT VICTORIA HALL
EM-XX	Campus	PARKING EAST OF QUEEN'S SUBSTATION
EM-XX	Campus	PARKING NEXT TO EM-171 Policy Studies (NW Corner)
EM-XX	Campus	PARKING NEXT TO EM-87
EM-XX	Campus	PARKING WEST OF QUEEN'S SUBSTATION
EM-XX	Campus	PULL PIT AT GOODES HALL
EM-XX	Campus	QUEEN'S CRESCENT AND ALBERT STREET
EM-XX	Campus	STUART STREET AT FILM STUDIES
EM-XX	Campus	STUART STREET AT LEGGETT HALL - NS50
EM-XX	Campus	STUART STREET EAST OF THE LASALLE BUILDING
EM-XX	Campus	STUART STREET NORTH OF MCLAUGHLIN HALL
EM-XX	Campus	UNIVERSITY AVE AT THE U/G PARKING GARAGE ACROSS FROM BADER LANE
EM-XX	Campus	UNIVERSITY AVE AT THE U/G PARKING GARAGE WEST OF THE ENTRANCE
EM-XX	Campus	UNIVERSITY AVE. AT DUNNING HALL
EM-XX	Campus	UNIVERSITY AVE. AT RICHARDSON HALL AND ELLIS HALL
EM-XX	Campus	WATTS HALL - NS49 (ALBERT STREET)
CS-XX-XXX	Campus	Miller Hall parking lot
CS-MH-XXX	Campus	Manhole for storm water just outside of CHP entrance
CS-MH1	Campus	MH1 - MCLAUGHLIN HALL

CS-MH10	Campus	MH10-UNION AND MACDONALD
CS-MH11A	Campus	MH11A- CHILLER PLANT
CS-MH11	Campus	MH11-CHILLER PLANT
CS-MH12	Campus	MH12-NORTH OF SOCIAL CENT
CS-MH13	Campus	MH13-ORR TOWER TUNNEL
CS-MH2	Campus	MH2 - BAN RIGH HALL
CS-MH3	Campus	MH3 - FRONT OF VICTORIA
CS-MH4	Campus	MH4 - NW CORNER VICTORIA
CS-MH5	Campus	MH5-COLLINGWOOD/UNION ST.
CS-MH6	Campus	MH6-KENSINGTON/UNION STS
CS-MH7	Campus	MH7-ST. MARY'S HOSPITAL
CS-MH8A	Campus	MH8A-BEARANCE'S STORE
CS-MH8B	Campus	MH8B-BEARANCE'S STORE
CS-MH9	Campus	MH9-UNION ST AT STAFF COL
CS-MHB10	Campus	MHB10- CITY PARK AT COURT
CS-MHB11	Campus	MHB11-SYDENHAM ST ANNADAL
CS-MHB12	Campus	MHB12-JOHNSON/SYDENHAM ST
CS-MHB1	Campus	MHB1-EAST OF C.H.P.
CS-MHB2	Campus	MHB2-60 M EAST OF C.H.P.
CS-MHB3	Campus	MHB3-EMERGENCY RAMP KGH
CS-MHB4	Campus	MHB4-TUNNEL BEHIND BURR W (BY ENTRANCE TO CANCER CLINIC)
CS-MHB5	Campus	MHB5-WALDRON TOWERS - NW SIDE
CS-MHB6	Campus	MHB6-BOTTERELL DRIVEWAY - WEST SIDE
CS-MHB7	Campus	MHB7-FRONT OF BOTTERELL - WEST END
CS-MHB8	Campus	MHB8-FRONT OF BOTTERELL - EAST END
CS-MHB9	Campus	MHB9- BAGOT AT CITY PARK
CS-MHBIO-1	Campus	MHBIO-1 - SW CORNER ARCH ST.
CS-MHBIO-2	Campus	MHBIO-2 - SW CORNER OF BIOSCIENCES
CS-MHC1	Campus	MHC1-ABRAMSKY HALL
CS-MHD1	Campus	MHD1- N OF ART CENTRE
CS-MHD2	Campus	MHD2- SE CORNER JEFFERY
CS-MHD3	Campus	MHD3- FRONT OF ELLIS HALL
CS-MHD4	Campus	MHD4- SW OF DOUGLAS LIB
CS-MHD5	Campus	MHD5- W OF POLLOCK WING
CS-MHDG1	Campus	MHDG1 - SOUTH LAWN CLOSE TO UNION ST

CS-MHDG2	Campus	MHDG2-SOUTH WEST CORNER OF D.G.C.
CS-MHE02	Campus	MHE02 - NE CORNER CARRUTHERS
CS-MHE1	Campus	MHE1- EARL HALL
CS-MHG07	Campus	MHG07 - WEST SIDE BEAMISH MUNRO
CS-MHG1	Campus	MHG1- FRONT OF PHYS ED
CS-MHG2	Campus	MHG2- FRONT OF PHYS ED
CS-MHG3	Campus	MHG3- DIVISION/UNION STS
CS-MHG4	Campus	MHG4 - E OF PHYS ED CENTR
CS-MHG5	Campus	MHG5- NE CORNER PHYS ED
CS-MHG6	Campus	MHG6- N OF GOODWIN HALL
CS-MHM1	Campus	MHM1-SW CORNER OF JACKSON
CS-MHM2	Campus	MHM2-SW CORNER BRUCE WING
CS-MHM3	Campus	MHM3-E SIDE OF NICOL HALL
CS-MHQ1	Campus	MHQ1- W OF BAN RIGH 32 QU
CS-MHR1	Campus	MHR1- NORTH OF WATTS HALL NEAR SIDEWALK
CS-MHR2	Campus	MHR2-NE CORNER MCNEILL
CS-MHR3	Campus	MHR3- MORRIS PARKING LOT
CS-MHR4	Campus	MHR4 - NE CORNER OF MORRIS PARKING LOT
CS-MHS1	Campus	MHS1- MANHOLE MAIN CAMPUS
CS-MHS2	Campus	MHS2- MAC-CORRY SOUTH
CS-MHS3	Campus	MHS3- MAC-CORRY NORTH
CS-MHT1	Campus	MHT1-MAIN TUNNEL RICH LAB
CS-MHT2	Campus	MHT2-TUNNEL TENNIS COURTS
CS-MHT3	Campus	MHT3-N - WEST SIDE OF NICOL
CS-MHV1	Campus	MHV1- NE CORNER BAN RIGH
CS-MHV2	Campus	MHV2- W OF MANHOLE 722
CS-MHV3	Campus	MHV3- E OF STIRLING HALL
CS-MHV4	Campus	MHV4- FRONT OF WATSON HAL
CS-XX-XXX	Campus	Mackintosh-Corry Hall & Harrison Lecaine Hall
CS-XX-XXX	Campus	
CS-185-001	Cancer Research Institute	B60
CS-145-001	Cataraqui Building	Penthouse
CS-184-002	Chernoff Hall	187
CS-184-006	Chernoff Hall	600
CS-184-003	Chernoff Hall	154
CS-184-004	Chernoff Hall	154
CS-184-001	Chernoff Hall	103

CS-184-005	Chernoff Hall	166
CS-131-001	Chown Hall	B4
CS-131-002	Chown Hall	B19
CS-113-032	Central Heating Plant	H.R.S.G. No. 1
CS-113-034	Central Heating Plant	H.R.S.G. No. 2
CS-113-067	Central Heating Plant	Boiler No. 6
CS-113-007	Central Heating Plant	Boiler No.6
CS-113-017	Central Heating Plant	Boiler No.7
CS-113-027	Central Heating Plant	Boiler No. 9
CS-113-006	Central Heating Plant	Boiler No.6
CS-113-016	Central Heating Plant	Boiler No.7
CS-113-021	Central Heating Plant	Boiler No. 9
CS-113-001	Central Heating Plant	Boiler No.6
CS-113-011	Central Heating Plant	Boiler No.7
CS-113-031	Central Heating Plant	H.R.S.G No. 1
CS-113-033	Central Heating Plant	H.R.S.G. No 2
CS-113-048	Central Heating Plant	Boiler No. 6
CS-113-025	Central Heating Plant	Boiler No. 9
CS-113-010	Central Heating Plant	Boiler No.6
CS-113-040	Central Heating Plant	Blow down tank
CS-113-008	Central Heating Plant	Boiler No.6
CS-113-019	Central Heating Plant	Boiler No.7
CS-113-020	Central Heating Plant	Forced Draft Fan
CS-113-026	Central Heating Plant	Forced Draft Fan
CS-113-028	Central Heating Plant	Boiler No. 9
CS-113-009	Central Heating Plant	Boiler No.6
CS-113-063	Central Heating Plant	Pit
CS-113-004	Central Heating Plant	Boiler No.6
CS-113-024	Central Heating Plant	Boiler No. 9
CS-113-014	Central Heating Plant	Boiler No.7
CS-113-036	Central Heating Plant	Dearator No. 1
CS-113-038	Central Heating Plant	Dearator No. 1
CS-113-022	Central Heating Plant	Boiler No. 9
CS-113-002	Central Heating Plant	Boiler No.6
CS-113-012	Central Heating Plant	Boiler No.7
CS-113-039	Central Heating Plant	Blow down tank
CS-113-042	Central Heating Plant	Storage tank
CS-113-062	Central Heating Plant	Flue ducts
CS-113-056	Central Heating Plant	Switching Station at bottom of stack
CS-113-045	Central Heating Plant	Bunker Oil Storage Tanks (4)
CS-113-046	Central Heating Plant	Diesel Fuel Storage Tanks (3)

CS-113-018	Central Heating Plant	Boiler No.7
CS-113-015	Central Heating Plant	Boiler No.7
CS-113-035	Central Heating Plant	Dearator No. 1
CS-113-037	Central Heating Plant	Dearator No. 1
CS-113-041	Central Heating Plant	Storage tank
CS-113-066	Central Heating Plant	Boiler No. 6
CS-113-023	Central Heating Plant	Boiler No. 9
CS-113-061	Central Heating Plant	Boiler No.7
CS-113-029	Central Heating Plant	H.R.S.G. No. 1
CS-113-030	Central Heating Plant	H.R.S.G. No. 2
CS-113-003	Central Heating Plant	Boiler No.6
CS-113-013	Central Heating Plant	Boiler No.7
CS-113-005	Central Heating Plant	Boiler No.6
CS-113-053	Central Heating Plant	Brine Tank
CS-113-060	Central Heating Plant	Caustic Tank
CS-113-049	Central Heating Plant	Condensate Tank Below Deaerator Storage Tank
CS-113-064	Central Heating Plant	Degassifier Tank
CS-113-055	Central Heating Plant	Emergency Water Backwash Tank
CS-113-054	Central Heating Plant	Emergency Water Tank
CS-113-059	Central Heating Plant	Manhole by Emergency water backwash tank
CS-113-052	Central Heating Plant	Manholes from GTG Tanks
CS-113-065	Central Heating Plant	New Condensate Tank
CS-113-047	Central Heating Plant	Pipe Trench
CS-113-058	Central Heating Plant	Sulfuric Acid Storage Tank
CS-113-050	Central Heating Plant	Sump Pits (2)
CS-113-051	Central Heating Plant	Valve Pit
CS-113-043	Central Heating Plant	Water Softeners No. 1 & 2 Sulfuric Acid
CS-113-044	Central Heating Plant	Water Softeners No. 3 & 4 Sodium
CS-122-004	Clark Hall	19
CS-122-001	Clark Hall	19
CS-122-003	Clark Hall	Northeast Basement Stairwell
CS-122-002	Clark Hall	18
CS-143-002	Coastal Labs	Test Lab
CS-143-001	Coastal Labs	Wave Generator Room
CS-118-001	Craine Building	Storage Rm South 004
CS-118-002	Craine Building	Mech Rm North 003
CS-167-004	Donald Gordon Conference Centre	mechanical room behind kitchen (58?)

CS-167-002	Donald Gordon Conference Centre	8
CS-167-001	Donald Gordon Conference Centre	63
CS-167-003	Donald Gordon Conference Centre	65
CS-114-002	Douglas Library	196B
CS-114-004	Douglas Library	390
CS-114-001	Douglas Library	186A
CS-114-003	Douglas Library	389
CS-130-001	Dunning Hall	M013
CS-141-004	Dupuis Hall	basement hallway
CS-141-002	Dupuis Hall	B15
CS-141-001	Dupuis Hall	B5
CS-141-003	Dupuis Hall	B22
CS-129-001	Ellis Hall	53
CS-302-001	Endaayaan - Tkanonsote / 156 Albert St	Basement Mech Room 004
CS-128-001	Etherington Hall	Basement Mech Room B2
CS-107-001	Fleming Hall - Jemmett Wing	Steam Room (Outer Pit Space)
CS-181-001	Goodes Hall	P001
CS-181-002	Goodes Hall	LL239
CS-181-003	Goodes Hall	LL246
CS-160-002	Goodwin	112A
CS-160-001	Goodwin	110
CS-139-002	Gordon Brockington Hall	G0023
CS-139-003	Gordon Brockington Hall	G0023
CS-139-001	Gordon Brockington Hall	G0019
CS-111-001	Gordon Hall	148
CS-111-002	Gordon Hall	mechanical room 186
CS-108-001	Grant Hall	019A
CS-108-002	Grant Hall	019B
CS-148-004	Harkness Hall	00014B
CS-148-003	Harkness Hall	18
CS-148-001	Harkness Hall	B0006
CS-148-002	Harkness Hall	B0007
CS-165-001	Harrison Lecaine Hall	75
CS-165-002	Harrison Lecaine Hall	75
CS-192-002	Haynes Hall	97
CS-192-001	Haynes Hall	80
CS-149-001	Humphrey Hall	8
CS-194-001	Isabel Bader Centre	8

CS-162-001	Jean Royce 1	i001
CS-162-002	Jean Royce 1	J0014
CS-150-001	Jeffery Hall	141
CS-120-002	John Deutch University Centre	ALL2-104
CS-120-001	John Deutch University Centre	ALL2-106
CS-110-001	Kathleen Ryan Hall	411
CS-303-004	KCVI - 235 Frontenac St	STOR 004
CS-303-002	KCVI - 235 Frontenac St	3
CS-303-003	KCVI - 235 Frontenac St	20
CS-303-001	KCVI - 235 Frontenac St	Boiler Room MECH001
CS-105-001	Kingston Hall	mechanical room adjacent to steam crawlspace 100B
CS-146-001	LaSalle Building	b101
CS-134-001	Leonard Hall	38
CS-134-002	Leonard Hall	039A
CS-174-001	Louise D. Acton	39
CS-157-006	MacArthur Hall	B-wing basement mech room (B014)
CS-157-005	MacArthur Hall	A-wing basement mech room (A007)
CS-157-004	MacArthur Hall	B014
CS-157-002	MacArthur Hall	B-Wing Hallway (B013)
CS-157-001	MacArthur Hall	A-Wing North Basement Mech Room (A007)
CS-157-003	MacArthur Hall	B-Wing Basement adjacent to aud dressing rooms (B008)
CS-132-001	Law Building - MacDonald Hall	177
CS-132-002	Law Building - MacDonald Hall	79
CS-132-003	Law Building - MacDonald Hall	under stairs 080
CS-183-001	MacGillvray Brown	Custodial Closet B02A
CS-164-002	Mackintosh- Corry Hall	B157
CS-164-001	Mackintosh- Corry Hall	E175
CS-125-001	McNeil House	88
CS-117-001	Miller Hall	B08
CS-151-002	Mitchell Hall	LL127D
CS-151-001	Mitchell Hall	LL100B
CS-126-001	Morris Hall	0005B
CS-126-002	Morris Hall	0005B
CS-195-001	New Medical Building	70
CS-195-002	New Medical Building	86
CS-195-003	New Medical Building	87
CS-106-002	Ontario Hall	112
CS-106-001	Ontario Hall	101

CS-172-001	Robert Sutherland Hall - Policy Studies	193
CS-190-003	Queen's Centre	LL2-B280A
CS-190-001	Queen's Centre	LL1-A300L
CS-190-002	Queen's Centre	LL1-A300L
CS-190-005	Queen's Centre	Lower Level 3
CS-190-004	Queen's Centre	Parking Garage - Zone 30
CS-189-001	Queen's Substation	106
CS-189-002	Queen's Substation	112
CS-197-001	Radioactive Materials Testing Lab	101A
CS-159-002	Refrigeration Plant	
CS-159-001	Refrigeration Plant	1
CS-116-002	Richardson Labs	2
CS-116-001	Richardson Labs	97
CS-156-001	Rideau Building	122
CS-191-001	School of Kinesiology	LL179
CS-180-001	Stauffer Library	051B
CS-180-002	Stauffer Library	054B
CS-180-004	Stauffer Library	074C
CS-180-003	Stauffer Library	073B
CS-180-005	Stauffer Library	076B/75
CS-136-001	Stirling Hall	108
CS-136-002	Stirling Hall	Exhaust Shaft 110
CS-161-001	Stuart underground parking	North of Row V
CS-101-001	Summerhill	Chiller Unit Room
CS-196-001	Union Street UPG	77
CS-196-002	Union Street UPG	96
CS-152-001	University Club	008B
CS-152-002	University Club	Air Handling Room
CS-140-001	Victoria Hall	019D
CS-140-002	Victoria Hall	wing E -019E
CS-175-001	Waldron Tower	1-137
CS-171-001	Walter Light	193B
CS-142-002	Watson Hall	3
CS-142-001	Watson Hall	22

APPENDIX B
List of Potentially Confined Spaces
(NOT CONFINED SPACES)

Confined Space Inventory and Hazard Assessments

Spaces that have the potential to become a Confined Space depending on the type of work being performed (e.g. welding)		
Building	Room	Description
132 Grant Timmins	Main Room	Wind Tunnel against SW wall
355 King St	LL102	Boilers
Biosciences Complex	North Roof	Fume hood Exhaust Fan (4) Ducting
Biosciences Complex	South Roof	Fume hood Exhaust Fan (4) Ducting
Botterell Hall	Penthouse	Fume Hood Exhaust Fan Unit
Brant House	1001	Water Holding Tank (2)
Central Heating Plant	Steam Tunnel	Steam Tunnel
Chernoff Hall	154	Reverse Osmosis Tank
Chernoff Hall	160	Electrical Trench
Chernoff Hall	Penthouse 600/607	Fume hood Exhaust Plenum
Craine Building	Steam Tunnel to Carruthers	Steam Tunnel
CRI	400	Expansion Tank
David C. Smith House	161	Hot Water Storage Tank
David C. Smith House	604	Hot Water Storage Tank (2)
Dupuis Hall	Roof	Fume hood Exhaust Fan Unit
Etherington Hall	Crawlspace- accessed through Mech Rm G020	Crawlspace
Fleming Hall - Jemmett Wing	Steam Room	Steam Tunnel to CHP
Fleming Hall - Jemmett Wing	Steam Room	Steam Tunnels to Various Building
Gordon Brockington	G0019	Steam Tunnel to Leonard Hall
Grant Hall	9 - Underneath building	Crawlspace
Humphrey Hall	10	Pipe Chase
Jean Royce 1	I000	Expansion Tank

Jean Royce 2	K121 - Under building	Pipe Tunnel
Jean Royce 2	P101	Expansion Tank
John Orr	Outside	Steam Tunnel leading to Refrigeration Plant
Kathleen Ryan Hall	12	Steam Tunnel
Kingston Hall	mech room (100B?)	Steam crawlspace
Leggett Hall	4281	Hot Water Storage Tank (2)
Leggett Hall	6081	Hot Water Storage Tank (2)
Leonard Hall	Crawlspace- various access points	
Leonard Hall	Underneath building	Steam Tunnel - Access from 005, 017, and 095
McLaughlin Hall	Duct Shaft	4 Shafts - Rooms 236, 237, 238, 335, 337, and 338
Mitchell Hall	Pipe Chase	Access from Corridor LL1002
New Medical Building	321	Hatch
New Medical Building	426A	Hatch
New Medical Building	VS001	Crawlspace
Nicol Hall	111 - Foundry	Steam Tunnel
Queen's Centre	LL2-B280A	Heating Water Tank (3)
Queen's Centre	Parking Garage LL3 Section B	Hatch
Refrigeration Plant	1	Boilers (3)
Richardson Lab	P600/P600A	Pipe Chase
School of Kinesiology	188	Electric Hot Water Tank
School of Kinesiology	601	Electric Hot Water Tank
Stauffer Library	Level 5 Penthouse	Boilers (3)
Stirling Hall	134	Expansion Tank
Theological Hall	006A	Pipe Chase
Waldron Tower	1-138	Expansion Tank
Watts Hall	785	Hot Water Tanks (3)

APPENDIX C

Confined Space Atmospheric Hazards Decision Trees

Chart 1 – Decision tree for confined space entry

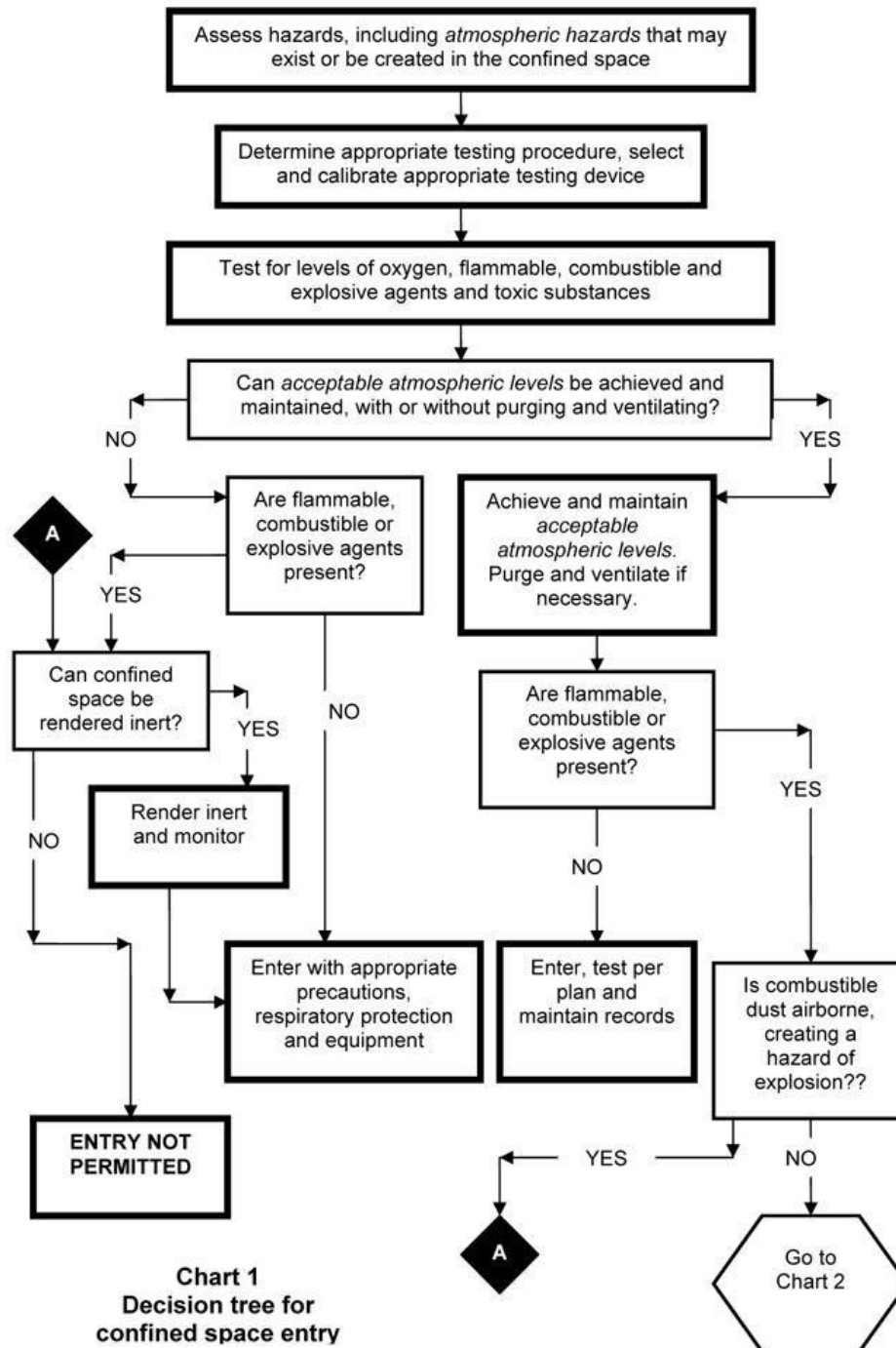


Chart 2 – Decision tree for work in flammable or explosive gas or vapour

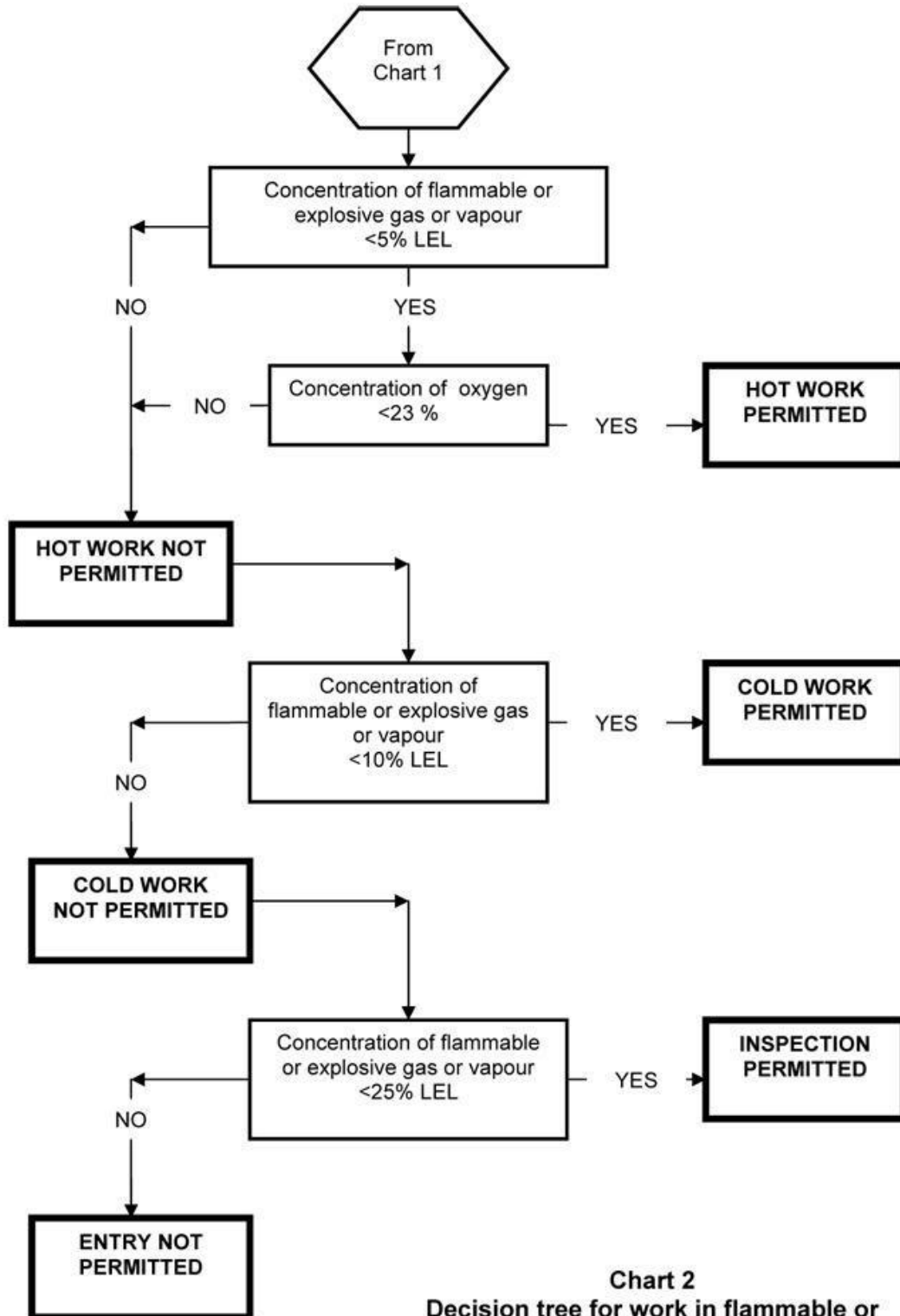


Chart 2
Decision tree for work in flammable or
explosive gas or vapour

APPENDIX D

Confined Space Hazard Assessment, Entry Base Plan and Permit

CONFINED SPACE ENTRY PLAN/PERMIT

Entry into a confined space is not allowed until this permit is completed and authorized.

Author: _____
 Date of Entry: _____
 Type of Space: _____
 Confined Space #: _____
 Site Address: _____
 Description of Work: _____
 Hot work involved? No ☐ Yes ☐ – Refer to specific Hot Work procedures and permit
 Are Multiple Employers Involved? No ☐ Yes ☐ – if yes, also refer to Coordination Document
 Permit Period: From: _____ am/pm To: _____ am/pm

Confined Space Characteristics

Dimensions:
 LENGTH: _____ HEIGHT: _____ WIDTH: _____
 VOLUME: _____

Volume Calculations:

Square/ Rectangular – L x W x H

Cylindrical = 3.152857 x R x L (or height)

Entry Point Details:

	Entry Point Dimension(s)	Entry Point Elevation(s)
Top Entry(s)		
Side Entry(s)		
Bottom Entry(s)		

Notes: _____

HAZARD ASSESSMENT

Hazard Assessment Conducted Immediately Prior to Entry? Yes ☐

The following list outlines potential hazards to consider. However, this list is not exhaustive, and additional hazards should be identified through a comprehensive assessment of each task from start to finish.

- | | | | |
|----------------------|-------------------------------|-------------------------|---------------------------|
| • Allergens | • Lack of Planning | • Bites & Excrement | • Lack of Oxygen |
| • Blocked Pathways | • Loss of Traction | • Blocked Vision | • Weather |
| • Change | • Noise | • Choices | • Oxidizers |
| • Clutter | • Pressure/ Force | • Physical Requirements | • Corrosives |
| • Poison/ Toxics | • Vehicle Traffic | • Reactive Materials | • Remote Isolated |
| • Ignition Sources | • Sharps | • Gravity | • Electro-magnetic Fields |
| • Splashes & Spills | • Engulfment | • States of Mind | • Entanglement |
| • Stored Energy | • Tool Condition | • Lack of Airflow | • Temperature Extremes |
| • Dust/Mists (<10u) | • Combustible Fuels | • Simultaneous Tasks | • Micro-organisms |
| • Electrical Current | • Flammable/ Explosive Fluids | | |

For each step below, review the task from start to finish and consider the various contributing factors, including people, equipment, workplace design, and chemical and biological elements.

Task	Recognize		Control Control(s)	Evaluate Monitor and Review
	Hazards	Risks		

Notes: _____

The following list outlines potential required PPE. Review the tasks and the associated hazards, risks, and control measures, and select the appropriate PPE by checking the applicable boxes. However, this list is not exhaustive, and additional PPE should be identified and recorded under the "Other" section.

Head & Face	<u>Hard Hat</u> ☐ CSA APPROVED ☐ CSA APPROVED FOR SIDE IMPACT ☐ CHIN STRAP / RATCH ADJUSTABLE HEAD BAND ☐ INSULATED LINER OR BRIM BAND ☐ BROAD BRIM FOR SUNNY CONDITIONS ☐ SWEATBAND ☐ SHORT BRIM ☐ VENTED	<u>Air-Purifying Respirator (NIOSH Approved)</u> ☐ FILTER TYPE: ☐ PERScription GLASSES FRAME HOLDER ☐ FULL-FACE MASK ☐ HALF-FACE MASK ☐ DUST MASK ☐ POWDERED FAN ☐ STORAGE CASE	<u>Air-Supplied Respirator (NIOSH Approved)</u> ☐ AIRLINE - LENGTH: ☐ PERScription GLASSES FRAME HOLDER ☐ SELF CONTAINED ☐ EMERGENCY EGRESS SYSTEM - (5min bottle & fast donning face piece)
	<u>Face Shield (CSA Approved)</u> ☐ WELDING SHIELD ☐ TRANSPARENT PLASTIC SHIELD ☐ TINTED FOR WELDING OR SUNNY CONDITIONS ☐ LENS CLEANER AND SOFT CLOTH ☐ SCREEN MESH ☐ FULL-FACE COVERAGE ☐ EYES AND NOSE COVERAGE ONLY	<u>Safety Goggles (CSA Approved)</u> ☐ TINTED FOR WELDING OR SUNNY CONDITIONS ☐ LENS CLEANER AND SOFT CLOTH ☐ PROTECTION FROM : <u>Safety Glasses (CSA Approved)</u> ☐ STANDARD ☐ TINTED FOR WELDING OR SUNNY CONDITIONS ☐ LENS CLEANER AND SOFT CLOTH	<u>Ear Plugs (CSA Approved)</u> ☐ DISPOSABLE ☐ RE-USABLE ☐ RADIO COMMUNICATION SYSTEM INTERFACE ☐ STORAGE CASE & HAND CLEANER <u>Ear Muffs (CSA Approved)</u> ☐ HEAD BAND THAT WORKS WITH HARD HAT ☐ RADIO COMMUNICATION SYSTEM INTERFACE ☐ STORAGE CASE

Torso	<u>Harness (CSA Approved)</u> ☐ FALL ARREST (Dorsal D-ring) ☐ DESCENT CONTROL (Sternal D-ring) ☐ LADDER CLIMBING (Sternal D-ring) ☐ WORK POSITIONING (Hip D-ring) ☐ ENTRY & EXIT OF CONFINED SPACES (Shoulder D-ring) ☐ NON-CONDUCTIVE ☐ HIGH VISIBILITY ☐ FIRE RESISTANT	<u>Coveralls</u> ☐ HIGH VISIBILITY ☐ BREATHABLE ☐ COVERED POCKETS ☐ CHEMICAL RESISTANT ☐ COTTON ☐ FIRE RETARDANT ☐ WATER PROOF ☐ WATER RESISTANT ☐ INSULATED ☐ DISPOSABLE	<u>Partial Body Covering</u> BODY PART: ☐ HIGH VISIBILITY ☐ ABSORBANT ☐ FIRE RETARDANT ☐ WATERPROOF ☐ WATER RESISTANT ☐ ENERGY ABSORBING KEVLAR ☐ CHEMICAL RESISTANT ☐ COOLING <u>Personal Flotation Device</u> ☐ REGULATION LIFE JACKET ☐ VEST-TYPE FOR GREATER MOBILITY
	<u>Gloves</u> ☐ SLEEVE-SUPPORT GUANTLET ☐ GUANTLET LENGTH: ☐ CHEMICAL RESISTANT ☐ WATERPROOF ☐ WATER RESISTANT ☐ ANTI-VIBRATION ☐ LATEX (rubber) ☐ LEATHER COTTON ☐ SYNTHETIC	<u>Work Boots</u> ☐ CSA APPROVED ☐ CHEMICAL RESISTANT ☐ HIGH TOP ☐ ABOVE THE KNEE ☐ METATARSAL PROTECTION ☐ WATERPROOF <u>Knee Pads</u> ☐ NON-ABSORBANT	<u>Other:</u>

RESCUE PLAN

Confined Space #: _____

Dispatcher: _____

Contact Method & Details: _____

Back up Attendant: _____

Retrieval Personnel: _____

First Aid Personnel: _____

Closest Hospital & Address: _____

First Aid Equipment:

☐ Blankets

☐ Basket Stretcher

☐ AED

☐ Non-Adherent

☐ First Aid Kit

☐ Eye Wash

Other: _____

Retrieval System

Anchor Point & Location: _____

Potential Risks: _____

Potential Injuries: _____

Moving System: _____

Packaging Device: _____

Assisting Devices:

☐ Ladder

☐ Rope Protector

☐ Basket Stretcher

☐ Work Seat

☐ Ramp/Deflector

☐ Talis Harness

☐ Drill & Socket

☐ Reaching Pole

☐ Wristlets/Anklets

☐ Creeper

☐ Supplied Air System

☐ Knee Pads

☐ 4:1 Rope Lowering
System

☐ Handle/ Wheels
for Stretcher

☐ Floatation for
Stretcher

☐ Tirfor

Other: _____

Plan Date: _____

Plan Revision Date: _____

I certify that I have inspected all the rescue equipment to be used and found them in good working order and deployed correctly.

Rescuer Name

Rescuer Signature

EMERGENCY RESPONSE PLAN

Activation System: _____

Coms Amongst Team: _____

Directions to Space: _____

Entry Point Description: _____

Emergency Response Roles (provide a detailed description of each individual and their responsibilities): _____

Plan of Action (provide a detailed response plan on rescue activities): _____

Notes: _____

PERMIT

Space: _____

Location: _____

Description of Work: _____

Supervisor Name & Contact Details: _____

ERC Contact Details: _____

EHS Contact Details: _____

Date: _____

Shift: _____

Pre-Entry Testing

Tester: _____

Time of Test: _____

Monitor ID: _____

Last Calibration Date: _____

% of Oxygen		Photo Ionization	
% of LEL's		Sulphur Dioxide	
Carbon Monoxide		Ammonia	
Hydrogen Sulfide		Organic Tube	
Carbon Dioxide		Inorganic Tube	

Other Controls: _____

Certifications

I certify that I have reviewed this permit and the associated risk assessment and authorize the work to proceed in accordance with the controls and conditions outlined.

Supervisor Name

Supervisor Signature

I certify that I have personally examined the confined space and am satisfied that all the requirements listed in the procedures have been met.

Attendant Name

Attendant Signature

I certify that I was informed on how to use the gas monitor, the communication equipment and the retrieval system.

Back Up Name

Back Up Signature

I certify that I have inspected all the safety and rescue equipment to be used and found them all in good working order and deployed correctly.

Rescuer Name

Rescuer Signature

DAILY PRE JOB HUDDLE

Participants' Name and Signature:

Participants Name	Participants Signature

Topics Discussed

1. Scope of Work ☐
2. Training Requirements ☐
3. Hazards ☐
4. Protective Systems ☐
5. LOCKS ON: N/A ☐ Yes ☐
6. Emergency Response Plan ☐
7. Permit Sign Off ☐

Suggestions Offered: _____

Action(s) to be Taken: _____

Appendix E
Coordination Document

Confined Space Entry (CSE) Coordination Document

Lead Employer (Queen's University): _____ **Date:** _____

Lead Employer Contractor(s): _____ **Phone No.:** _____

1. _____ 4. _____

2. _____ 5. _____

3. _____ 6. _____

—

Location of Confined Space to be entered:

Confined Space NO.: _____ **CS Plan NO.:** _____

Lead Employer Responsibilities: To ensure the Contractors are provided with information on hazards associated with the confined spaces as well as the CSE program requirements for the CSE being performed.

Contractor Responsibilities: To comply with the requirements of the applicable CSE regulations and the requirements of the Lead Employer. To ensure that all the workers of Contractor are trained in the work to be performed and the relevant regulated confined space requirements. The Contractor and workers of the Contractor, are to be aware of the Queen's University CSE program requirements.

Responsibility:	Lead Employer:	Contractor:
CSE Program**		
Hazard Assessment		
Written Entry Plan		
Training*		
Personal Protective Equipment*		
Entry Permit		
Isolation of Energy & Controls of Materials Movement		
Attendants		
Entering and Exiting Monitoring & Recordkeeping		
Unauthorized Entry Prevention		
Written On-site Rescue Procedure & Equipment		
Atmospheric Testing		
Explosive and Flammable Substances		
Ventilation & Purging of Atmospheric Hazards		
Rescue Plan		
Rescue Team		
Documentation/ Records*		

*General training, personal protective equipment 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 in place

The signatures below indicate that the Contractor(s) and Lead Employer acknowledged that the employer duties with respect to the above subject matters are performed in a way that protects the health and safety of all workers performing CSE or CSE related work at Queen's University:

1. Contractor Name: _____

1. Contractor Signature: _____

2. Contractor Name: _____

2. Contractor Signature: _____

3. Contractor Name: _____

3. Contractor Signature: _____

4. Contractor Name: _____

4. Contractor Signature: _____

5. Contractor Name: _____

5. Contractor Signature: _____

6. Contractor Name: _____

6. Contractor Signature: _____

Lead Employer Signature: _____

APPENDIX F

List of Possible Equipment for Confined Space Entry

- Head protection
- Eye protection
- Hearing protection
- Gloves
- Approved safety harness
- Approved Life-line
- CSA-approved foot protection
- Calibrated direct-reading monitor (with alarm) with sensors appropriate to CS (O₂, CO, LEL, H₂S)
- Communication equipment
- Ventilation equipment
- Emergency escape respirator
- Portable lighting
- First aid kit
- Ladders or 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,
 - safety footwear,
 - protective gloves,
 - hard hats
 - first aid kit