UNIVERSITY
OF WOLLONGONG
AUSTRALIA

UOW SAFE@WORK

WORKING IN CONFINED SPACES GUIDELINES

Contents

1. Introduction

Working in confined spaces presents a variety of hazards and an increased risk of injury to those in the immediate area. Confined spaces are usually not designed as work areas and often have poor ventilation which allows hazardous atmospheres to develop quickly. Hazards can often not be visibly obvious and can change from one entry into the confined space to the next.

The Work Health and Safety Regulation 2011 NSW establishes specific requirements for working safely in confined spaces. This guideline details the risk controls to be adopted in accordance with the legislation for entry to or around a confined space to ensure safety.

2. Scope

This document provides practical guidance on how to meet the legislative requirements for work being conducted in a confined space. These guidelines have been developed in accordance with legislative requirements and guidance material including:

- NSW WHS Regulation 2011
- Confined Spaces Code of Practice
- AS 2865-2009 Confined spaces.

This guideline applies to all University campuses.

3. Definitions

For the purpose of this Guideline, the definitions below apply.

Competent person	A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to perform correctly a specified task.
Confined space	An enclosed or partially enclosed space that: ▪ is not designed or intended primarily to be occupied by a person, and ▪ is, or is designed or intended to be, at normal atmospheric pressure while any person is in the space, and ▪ is or is likely to be a risk to health and safety from: - an atmosphere that does not have a safe oxygen level, or - contaminants, including airborne gases, vapours and dusts, that may cause injury from fire or explosion, or - harmful concentrations of any airborne contaminants, or - engulfment. Examples of confined spaces at the University include but are not limited to: ▪ sewer pits ▪ storm water manholes ▪ chemical storage tanks ▪ boilers ▪ lift pits. Places that are intended for human occupancy and have adequate ventilation, lighting and safe means of entry and exit, such as offices and workshops are not considered confined spaces.

Hot work	Work which generates a spark or flame that may increase the risk of fire or explosion. Activities may include welding, thermal or oxygen cutting, heating and grinding.
Isolation	Isolation is a method that blocks liquid, gas, electric current or other stored energy so as to ensure safe access for inspection or maintenance.
Lockout	Use of a lock and/or system to prevent energy from being turned on during equipment maintenance or repair.
Permit	A document authorising a person to undertake specific work in a designated area.
Permit Authoriser	A person who is able to review and authorise a confined space entry permit. A Permit Authoriser must be a competent UOW employee as listed in Section 6.
Permit Receiver	A person who receives a permit from a Permit Authoriser.
UOW Representative	The designated UOW role or person who engages or supervises work conducted by internal or external workers.
Standby Person	A person who assigned to continually monitor the well-being of those inside the confined space, if practicable observe the work being carried out and initiate appropriate emergency procedures when necessary.
Lower explosive limit (LEL)	Lower explosive limit is the minimum concentration of contaminant in air that will produce a flame.
Upper explosive limit (UEL)	Upper explosive limit is the maximum concentration of contaminant in air, above which an explosive atmosphere will not be formed.
Worker	Any person who carries out work for the University.

4. Responsibilities

4.1. Permit Approver

- Ensure hazards associated with the confined space have been identified, assessed and appropriate controls adopted.
- Communicate information regarding the confined space to the Permit Receiver, including of the location of the spaces, the potential hazards associated with the respective spaces, and the requirement that only authorised, trained personnel may enter the spaces using the procedures outlined in these guidelines.
- Ensure that a Confined Space Entry Permit is completed and verify that all conditions of entry outlines in the permit have been satisfied.

4.2. Permit Receiver

- Complete UOW Confined Space Entry Permit before requiring access to a confined space.
- Complete a risk assessment for any hazards that are associated with entering or working in the confined space that have not been identified through the completion of the UOW Confined Space Entry Permit.
- Ensure that entry into and the work conducted in the confined space is completed in accordance with the Entry Permit requirements.

- Inform entrants and standby person/s of the working conditions outlined in the permit including the locations of the spaces, the potential hazards associated with the respective spaces, and the requirement that only authorised, trained personnel may enter the spaces using the procedures outlined in these guidelines.
- Be satisfied that they understand the requirements of the permit.
- Be skilled, qualified trained and competent to perform the work.
- Ensure that any plant/equipment in the area as well as the area itself is safe on completion of the task.
- Ensure that appropriate control measures are followed (e.g., placement of locks and tags according to lock-out/tag-out procedures, ventilation if necessary).

4.3. UOW Representative

- Ensure that contractors engaged by the UOW Representative are aware of any work health and safety hazards that may exist in the area in which they are working.
- Ensure that contractors work safely and complete the work as specified in permits and/or other associated documents.

4.4. Managers and Supervisors

- Supervisors must understand the work for which a permit has been sought and understand isolation and tagging procedures.
- Ensure that a permit is granted before work commences.
- Ensure that the person(s) doing the work are appropriately qualified to do the work.
- Ensure that all checks are undertaken to ensure that the permit was used correctly.
- Ensure appropriate persons are informed when a job is completed or suspended and that the permit is expired.

4.5. WHS Unit

- Provide technical guidance on the application of these guidelines.
- Evaluate and update the permit to work guidelines at the review period or as procedures change.
- Provide safety expertise and regulatory guidance to Permit Authoriser.

4.6. Contractors

- Comply with the requirements as detailed in these guidelines
- Ensure entry to a confined space is carried out under a work permit and in accordance with AS/NZS 2865 Safe working in a confined space
- Provide evidence of currency for confined space training to Permit Authoriser for authorised entrants, standby persons and supervisors
- Shall not enter a confined space without an authorised UOW confined space permit
- Prepare safe work procedures and/or risk assessments for confined space work prior to entry
- Notifying the Permit Authoriser and Responsible UOW Officer of any situation they believe poses a threat to the health and safety of persons involved in confined spaces work

4.7. Authorised Entrant

- Assessed as competent to enter a confined space.
- Understand the potential entry hazards and be aware of signs and symptoms of exposure.
- Ensure that appropriate control measures are followed (e.g. placement of locks and tags according to lock-out/tag-out procedures, ventilation if necessary).
- Maintain communication with the standby person at all times.

- Evacuate the space immediately upon an emergency or notification by the standby person.
- Alert the standby person and exit the space immediately whenever a warning sign or symptom of exposure to a dangerous situation is recognized, a prohibited condition is identified, or an evacuation alarm is activated.
- Follow the requirements as stipulated on the confined space entry permit.

4.8. Standby Person

- Remain outside the space during entry operations at all times or until relieved by another Standby Person. Activities that may interfere with these duties are prohibited.
- Continuously monitor hazards both inside and outside the space.
- Maintain continuous communication with the authorised entrants so as to be aware of any problems, which may occur. Order the entrant to evacuate immediately if prohibited conditions exist.
- Initiate emergency procedures, including rescue procedures, if necessary.

5. Confined Space Register

All confined spaces identified at the University are listed in the Restricted Access Register. The register includes the following information about each confined space:

- name
- campus
- location
- hazards.

The Restricted Access Register is completed by Maintenance and the WHS Unit. Each area should also maintain a Local Confined Space Register.

6. Confined Space Entry Process

The University of Wollongong has strict controls surrounding entering and working in confined spaces. Any person prior to entering a UOW controlled confined space must:

- complete a UOW Confined Space Entry Permit form including a risk assessment for the activities occurring within the confined space, and
- have the permit signed and approved by a UOW Permit Approver.

7. Confined Space Entry Permit

The UOW Confined Space Entry Permit enables a formal check to ensure all elements of a safe system of work are in place before people are allowed to enter and work in a confined space. It is also a means of communication between the University and those carrying out the work. It ensures that all confined space entry requirements have been checked and authorised before work can proceed.

The UOW Confined Space Entry Permit is required to be completed by any person who is undertaking work in a confined space. The permit ensures the following requirements relating to legislative provision for entering and working in a confined space are satisfied including:

- completion of a confined space entry permit
- completion of a risk assessment
- communication and safety monitoring
- specific controls associated with:
  - connected plant and services

  - specific controls associated with atmosphere
  - specific controls associated with flammable gases and vapours
  - specific controls associated with fire and explosion
- emergency procedures
- personal protective equipment including in the event of an emergency
- information, training and instructions for workers entering the confined space.

A UOW Confined Space Entry Permit must be authorised by an authorised UOW Permit Approver before entry or work is undertaken in the confined space. Authorised UOW Permit Approvers list can be found in the Permit to Work and Restricted Access Guidelines.

Additional permits may be required to be completed depending on the nature of work in the space. For example cold or hot work being conducted in a confined space will require the completion of a Fire Detection Isolation and Hot Work Permit.

If a new hazard is recognised or introduced during the course of work, then the permit must be modified and revalidated. Entry permits must be kept at the onsite location for the duration of the work. If the work extends beyond the duration noted on the permit or beyond one work shift, an additional permit is required.

At the completion of the job, the permit must be returned to the Permit Approver. Expired permits will be retained by the Permit Approver for at least one year.

8. Risk Management Process

8.1. Identification of Hazards

A completed risk assessment should list all hazards associated with a confined space. Examples of hazards include:

- restricted entry or exit
- harmful airborne contaminants
- unsafe oxygen levels
- fire and explosion
- engulfment
- uncontrolled introduction of substances
- biological hazards
- mechanical hazards
- electrical hazards
- skin contact with hazardous substances
- noise
- manual tasks
- radiation
- environmental hazards
- hazards outside the confined space
- physiological and psychological demands.

8.2. Risk Assessment

The risk associated with each identified hazard needs to be assessed in accordance with the UOW Risk Management Guidelines. The assessment must be undertaken by a competent person and be recorded in writing. The risk assessment process is incorporated on the UOW Confined Space Entry Permit. A documented risk assessment may be attached to the UOW Confined Space Entry Permit if applicable.

The risk assessment must be reviewed and revised whenever there is any change to the work environment.

A copy must be kept for 28 days, or if a notifiable incident occurs in connection with the work for which the assessment relates, for 2 years after the incident occurs.

8.3. Risk Controls

Any risk associated with working in a confined space should be eliminated if it is reasonably practicable to do so. If it is not possible to eliminate the risk it should be minimised so far as is reasonable practicable by following the hierarchy of controls as outlined in the UOW Risk Management Guidelines. Where possible, to an attempt should be made to eliminate the need for entering the confined space altogether.

The following controls must be established as a minimum before workers enter or commence work in a confined space.

8.3.1. Isolation

All hazardous services must be isolated prior to any person entering a confined space. Isolation should prevent the:

- introduction of services through piping, ducts, vents, drains, conveyors, fire protection equipment
- activation or energising of machinery in the confined space
- activation of plant or services outside the confined space that could adversely impact the space
- release of any stored or potential energy in plant
- inadvertent use of electrical equipment.

The method of isolation should be determined on a case by case basis taking into account the hazards and types of services in the space.

8.3.2. Isolating Services

Prior to entry into the confined space all potentially hazardous services that are normally connected to the confined space must be isolated or otherwise controlled to prevent the:

- introduction of any materials, contaminants, agents or conditions that may be harmful to a person occupying the confined space, or;
- activation or energising in any way of equipment or services that may pose a risk to the health or safety of a person inside the Confined Space.

This includes de-energising, lock and tag out of all sources of potentially hazardous energy.

8.3.3. Atmosphere

Atmospheric testing and monitoring conducted by a competent person is required to determine appropriate control measures. Testing should be completed to analyse:

- oxygen content,
- airborne concentration of flammable contaminants,
- airborne concentration of potentially harmful contaminants (e.g. hydrogen, sulphide and carbon monoxide).

Re-testing and continuous monitoring maybe necessary if the risk assessment demonstrates that conditions may change due to work being conducted. If work stops for a period of more than 1 hour and the confined space has not been occupied for this period a new gas test will be required.

Before a person enters a confined space, it shall be ensured that:

- the confined space contains an oxygen level of 21%
- the concentration of any flammable contaminant in the atmosphere is less than 5 percent of its LEL
- the atmospheric contaminants in the confined space are reduced to below the relevant exposure standards
- there are no extremes of temperatures.

8.3.4. Special Conditions

Where the oxygen level is below 21% or atmospheric contaminants cannot be reduced below relevant exposure levels, entry may only occur with suitable PPE including supplied air.

Entry shall not occur to a confined space when flammable contaminants are greater than or equal to 5% LEL or where oxygen exceeds 23.5%.

Where a concentration of flammable contaminant is found to be more than 5% and less than 10% of its LEL, all persons must leave the confined space unless a continuous monitoring, suitably calibrated flammable contaminant detector is used in the confined space at all times while persons are present in it.

Where a concentration of flammable contaminant in the atmosphere of a confined space is found to be 10% of its LEL or more, all persons must leave the confined space.

Criteria	Entry	Entry (under specific conditions)	No Entry
Oxygen	21%	Below 21% with air supplied respiratory protection	More than 21%
Atmospheric contaminants	Below exposure standards	Above exposure standards with suitable personal protective equipment	Above exposure standards
Temperatures	Free from extreme temperatures	N/A	Extreme temperatures
Flammable contaminant	LEL below 5%	LEL between 5%-10% with continuous flammable contaminant monitoring	LEL more than 10%

8.3.5. Purging

Prior to entry, the confined space must be cleared of all contaminants, if appropriate, by use of a suitable purging agent by which contaminants are displaced from the space. Purging is to be performed by the use of an inert gas, such as nitrogen, to clear flammable gasses or vapours.

After purging is completed, the confined space is to be adequately ventilated to remove the inert gas. Atmospheric testing needs to be conducted to ensure the method of ventilation has been effective.

The purging agent must not be pure oxygen or a gas mixture in a concentration of more than 21% of oxygen by volume.

8.3.6. Ventilation

Appropriate provisions need to be made to ensure that ventilated air is not contaminated. If mechanical ventilation is required it should be monitored to ensure continuous operation when the confined space is occupied and have the controls tagged and protected to guard against unauthorised interference.

8.3.7. Respiratory Protective Equipment

When it is not reasonably practicable to maintain a safe level of oxygen or airborne contaminants, then appropriate respiratory protective equipment must be provided

8.3.8. Communication and Safety Monitoring - Standby Person

When work is being conducted in a confined space there needs to be continuous communication between a standby person and the workers in the confined space. Additionally a standby person who is in the vicinity of the confined space must monitor the conditions by observing the work being carried out if practicable.

The standby person must maintain a log of persons entering and leaving the confined space.

A standby person shall implement and maintain an effective means of communication between them and those inside the confined space.

8.3.9. Entry and Exit Procedures

Processes need to be developed that indicate when a worker is in a confined space during the period the Confined Space Entry Permit is valid for. Examples of this include using tags, a sign in system or requesting that the standby person maintain records of who is in the space.

8.3.10. Signs and Barricades

Where practicable, signage should be permanently displayed identifying a confined space. Before any work in relation to a confined space starts, signs must be erected to prevent entry of persons not involved in the work, and to ensure that all employees, contractors and visitors are aware of the hazard posed by the area. When a confined space is not in use, appropriate signage and barriers are to be erected to prevent unauthorised access. Security devices, for example locks and fixed barriers, should be installed to prevent access into a confined space.

8.3.11. Information, Instruction and Training

Training should be provided to all workers who:

- enter or work in a confined
- undertake hazard identification or risk assessment in relation to a confined space
- implement risk control measures
- issue entry permits
- act as a standby person or communicator
- monitor conditions while work is being carried out
- purchase equipment for confined space work
- design or lay out a work area that includes a confined space.

The training provided to relevant workers must cover:

- the hazards of confined spaces
- use of risk control measures
- selection, use, fit, testing and storage of any personal protective equipment
- required contents of any relevant confined space entry permit
- emergency procedures.

Re-training and refresher training should be provided when deemed necessary. Records of all training provided to workers in relation to confined space work must be kept for two years.

8.3.12. Job Completion

At the completion of the job, all tools, equipment and persons must be removed from the confined space and the permit must be returned to the Permit Authoriser. The work area is to be made safe and tidy at completion of job and all rubbish removed. Cancelled permits will be retained by the Permit Authoriser for at least one year to facilitate the annual program review.

8.3.13. Records

Risk assessments, permits and other documents associated with confined space entry are required to be stored and maintained as per the WHS Records Handling Guidelines.

As a minimum:

- permits - 1 year
- risk assessment - 7 years
- training records - 2 years.

9. Emergency Procedures

Any person who requires access into a confined space at UOW must establish first aid and rescue procedures to be followed in an emergency and ensure those procedures are practiced as necessary to ensure that they are efficient and effective. First aid and rescue procedures must be initiated from outside the confined space as soon as practicable in an emergency.

First aid and emergency procedures need to be identified on the Confined Space Entry Permit Form.

When establishing emergency procedures consideration should be given to the following factors:

- weather the work can be conducted outside of the space
- the nature of the confined space
- the potential for changes to oxygen concentration or of airborne contaminants in the confined space
- the work being conducted in the confined space
- the location of the space
- methods of communication
- rescue equipment
- capabilities of rescuers
- first aid
- local emergency services.

Workers must be competent to perform rescue procedures. Where possible the rescue should be performed from outside the confined space. Rescuers must be provided with and wear appropriate respiratory protective equipment if they are required to enter a confined space in an emergency.

10. Program Evaluation

In order to ensure that these guidelines continue to be effective and applicable to the University, the program will be regularly reviewed by the WHS Unit and Facilities Management Division.

Conditions which might warrant a review of the guidelines on a more frequent basis would include:

- unauthorised entries
- identification of a hazard not covered in a permit
- an injury or near miss resulting from a confined space entry
- detection of a condition prohibited by permit
- a change in the use/configuration of a confined space or introductions of new confined spaces

- employee, safety committee or contractor concern.

Following completion of any review, the program will be revised / updated in order to correct any deficiencies before further entries are authorised. Any changes to the program will be communicated to all affected employees.

11. Related Documentation

- Legislative Compliance Guidelines
- Permit to Work Guidelines
- UOW Risk Management Guidelines
- UOW Incident Management and Reporting Guidelines

12. Referenced Documentation

- NSW WHS Act 2011
- NSW WHS Regulation 2011
- Confined Space Code of Practice
- AS/NZS 2865 Safe working in a confined space
- HB 213 Guidelines for safe working in a confined space

13. Version Control

Version Control	Date Released	Approved By	Amendment
1	September 1999	WHS Manager	Document created
2	January 2005	WHS Manager	Updated to new document control standard
3	September 2007	WHS Manager	Updated to new document control standard
4	March 2009	WHS Manager	Inclusion of new forms and updated to organisational requirements
5	August 2010	WHS Manager	Document updated to incorporate the Personnel name change to Human Resources Division.
6	March 2012	WHS Manager	Re-brand
7	August 2012	WHS Manager	Scheduled Review – Updated in line with new WHS legislation requirements and code of practice.
8	July 2016	WHS Manager	Rebrand. Removed Appendix as the Local Confined Spaces Register exists as a stand-alone form. Updated terminology of UOW Responsible Officer to UOW Representative and Permit Authoriser to Permit Approver.