STANDARD OPERATING PROCEDURE

SAFETY Everyone. Everywhere. Every day

CONFINED SPACE

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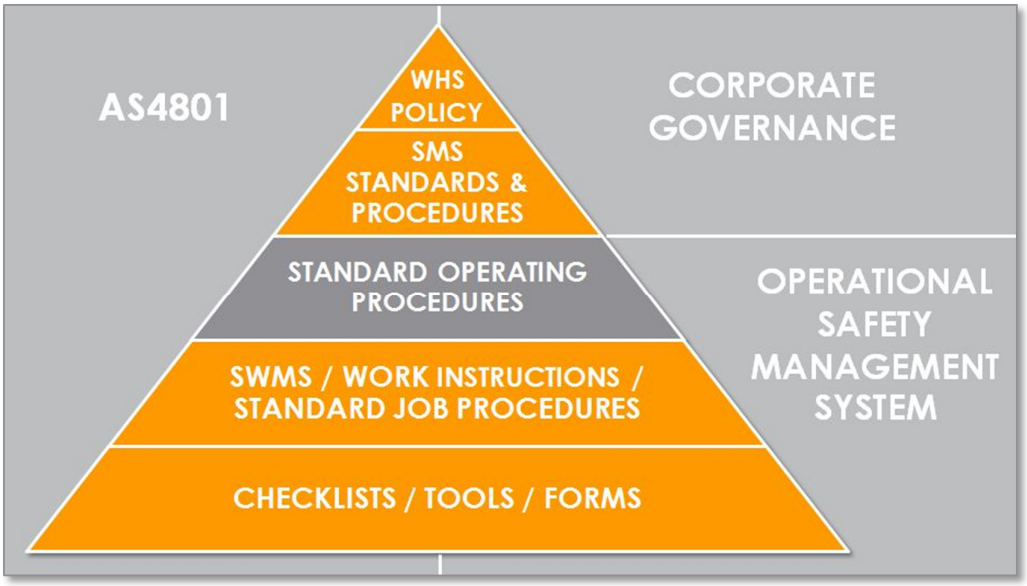
1. SMS DOCUMENT HIERARCHY



2. PURPOSE

This Standard Operating Procedure (SOP) documents Queensland Urban Utilities (QUU) approach to confined spaces at QUU controlled workplaces.

The overall purpose of this procedure is to ensure that risks associated with confined spaces are adequately managed in order to minimise the risk of injury or harm to workers.

3. SCOPE

This SOP provides practical guidance on how to manage health and safety risks associated with confined spaces. This procedure applies to all QUU staff, including contractors and other persons on QUU-controlled worksites.

4. DEFINITIONS AND ACRONYMS

Confined Spaces: QLD Code of Practice for Confined Spaces 2011 and *Australian Standard 2865-2009* defines a confined space as an enclosed or partially enclosed space, that is not intended or designed for human occupancy, or not intended to be at normal atmospheric pressure while any person is in the space and where there is a risk of one or more of the following:

- an oxygen concentration outside the safe oxygen range (below 19.5 per cent or above 23.5 per cent);
- a concentration of airborne contaminant(s) that may cause impairment or loss of consciousness, asphyxiation or long-term health effects;
- a concentration of flammable airborne contaminants that may cause injury from fire or explosion (e.g. hot works); or

- inundation by a stored, free-flowing solid or a rising level of liquid that may cause suffocation or drowning (e.g. ground disturbance, non-isolated valves etc.).

Emergency Services: internally or externally provided emergency services including ambulance services, doctor/health clinic, Poisons Information Centre and fire and other emergency services.

First Aid: the immediate treatment or care given to a person suffering from an injury or illness until more advanced care is provided or the person recovers.

LOTO: acronym used for Lock Out Tag Out.

Manager: as per QUU naming conventions, the Manager who has direct responsibility for the activity being performed or the area the activity is occurring in.

Restricted Work Area: QUU defines a restricted work area as a work area that does not meet the legislative criteria of a confined space. A restricted work area does not have the characteristics that would cause a harmful atmosphere or engulfment. A risk assessment based on the tables at Appendix A and B below should identify if an area is a confined space or a restricted work area.

Supervisor: term used for any QUU employee who acts or is appointed as a Supervisor, Coordinator or Team Leader within QUU.

SMS: acronym used for QUU's Safety Management System.

WHS: acronym used for Work Health and Safety.

Worker: employees, contractors, subcontractors, outworkers, apprentices and trainees, work experience students, volunteers and PCBUs who are individuals if they perform work for the business.

5. ROLES AND RESPONSIBILITIES

Outlined below are responsibilities specific to confined space requirements at all QUU workplaces and controlled sites.

5.1 QUU EXECUTIVE

QUU Executive and Senior Management (CEO, ELT, General Managers – Officer and Non-Officer Appointed) are responsible for overseeing and ensuring the implementation of the requirements of this SOP and related procedures within their respective functional areas. This includes ensuring all sites are suitably risk assessed and have appropriate confined space resources to ensure that risks associated with confined space are adequately managed to minimise the risk of injury or harm to workers.

5.2 MANAGERS

Managers in all operational areas and QUU worksites are responsible for ensuring the review and management of risks associated with confined spaces. This includes:

- Provision of a safe system for entry into, and the conduct of tasks within, confined spaces;
- Effective management of all activities associated with entry into, and exit from, confined spaces; and
- Provision of adequate resources for the appropriate training and refresher training outlined in this SOP.

5.3 SUPERVISORS/PICOW

Supervisors and Team Leaders in all operational areas and QUU worksites are responsible for ensuring that risks associated with confined spaces are managed. This includes:

- Coordinating the planning, issue and return of Confined Space Entry Permits and other required permits;
- Formally training and assessing staff as competent;
- Maintaining all records relating to entry into and activities conducted within confined spaces, and ensuring they are readily available; and
- Where shift changes occur, establishing and maintaining processes for the effective and efficient transfer of information on outstanding permits and other relevant work activities.

5.4 STAND-BY PERSON

The stand-by person has ultimate control over all confined space entry, exit and emergency processes. Before a worker enters a confined space, a stand-by person must be assigned to continuously monitor the wellbeing of those inside the space. The stand-by person:

- Must receive accredited training and be assessed as competent in the application of the Confined Space Entry procedures in accordance with legislation;
- Must be a 'QUU Authorised Person' with regards to confined space work;
- Must participate in the risk assessment process in preparation for the Confined Space Entry Permit;
- Must participate in the development of the Emergency Response Plan for the confined space activity;
- Must understand the Confined Space Entry Permit process;
- Has the authority to order workers to exit the space if any hazardous situation arises;
- Must be competent in the application of emergency response procedures and must initiate appropriate emergency procedures when it is required;
- Must be competent in the preparation and operation of rescue and breathing equipment, if it is required;
- Must remain at the work site monitoring staff movements into and out of the confined space, including approving and controlling access;
- Must keep in communication, according to the agreed-upon protocol, with those having entered the confined space; and
- Must never enter a confined space to attempt rescue.

5.5 RESCUE PERSON

- Participate in the risk assessment process in preparation for the Confined Space Entry Permit;
- Participate in the development of the Emergency Response Plan for the confined space activity.
- Understand the Confined Space Entry Permit process;
- Receive accredited training and be assessed as competent in the application of the Confined Space Entry procedures in accordance with legislation (including appropriate Emergency Response and First Aid training);
- Remain in the vicinity of the confined space activity so available for emergency rescue response if required.
- Be competent in the application of emergency response procedures; and
- Be competent in the preparation and operation of rescue and breathing equipment, if it is required.

5.6 WORKERS

All workers must ensure that they:

- Participate in the risk assessment process in preparation for the Confined Space Entry Permit;
- Participate in the development of the Emergency Response Plan for the confined space activity;
- Understand and follow the Confined Space Entry Permit process;
- Receive accredited training and be assessed as competent in the application of the Confined Space Entry procedures in accordance with legislation;
- Follow the requirements of this Confined Space SOP and related procedures;
- Only use QUU owned and approved equipment;
- Confirm with the supervisor or PICOW of the work that it is safe to start work;
- Confirm with the stand-by person that they can enter a confined space;

- Be competent in the preparation and operation of rescue and breathing equipment (where required); and
- Report any confined space related incidents to their supervisor and:
    - Follow the injury management procedure; and
    - Complete a QUU WHS Incident Report form in accordance with QUU WHS incident reporting procedures.

5.7 CONTRACTORS

At all times when performing work on a QUU site or for/on behalf of QUU, contractors must have available the relevant confined space documentation or comply with QUU's confined space management requirements detailed in this and related procedures and report all incidents to the relevant QUU Manager and to their employing / contracting agency in accordance with QUU WHS incident reporting procedures.

6. RELATED DOCUMENTS

- WHS Hazard and Risk Management Procedure (PRO363)
- WHS Incident Reporting, Investigation and Escalation Procedure (PRO364)
- WHS Emergency Response and Preparedness Procedure (PRO365)
- Ground Disturbance SOP (PRO419)
- Personal Protective Equipment SOP (PRO424)
- Health Management Procedure (PRO367)
- Hazardous Chemicals SOP (PRO377)
- WHS Hygiene Maintenance Standard Operating Procedure (PRO448)
- Lock Out Tag Out Procedure (PRO379)
- SWMS2 – Confined Space Entry
- SWMS47 – Restricted Work Area
- QUU Confined Space Entry Permit (FOR336)
- SWMS3 - Working at Heights
- Emergency Rescue Plan (CER91)

7. PROCEDURE

7.1 OVERVIEW

Confined spaces at QUU work sites must be managed appropriately to ensure the highest level of safety to workers and members of the public. To manage confined space risks, QUU will:

- Identify confined spaces and restricted spaces;
- Conduct confined space risk assessments to identify risks and hazards;
- Only permit competent workers to enter confined spaces;
- Maintain equipment in accordance with manufacturer's requirements by competent workers and retain maintenance history;
- Undertake Permit, SWMS and WRAPs; and
- Implement LOTO when isolating infrastructure.

Where QUU shares a workplace or site with a third party contractor or other business operator, QUU will ensure the required level of consultation occurs to ensure all required confined space arrangements and requirements are in place and effective. Consultation with other parties will be undertaken in accordance with the QUU **WHS Consultation and Communication Procedure (PRO361)**.

7.2 MEDICAL ASSESSMENTS

All QUU employees and other persons on QUU-controlled worksites who are required to enter into and work in a confined space/restricted work area must undergo a Confined Space Medical Assessment to determine their suitability for the task. All QUU employees and other persons on QUU-controlled worksites who are required to enter a confined space/restricted work area must meet the minimum QUU medical requirements.

7.2.1 IMMUNISATION

Immunisation required for employees and other persons on QUU-controlled worksites who work in confined space/restricted work areas will be determined by assessing the risks associated with the work and the particular workplace. Employees and other persons on QUU-controlled STPs or who may come into contact with sewage or wastewater must show proof of immunisation for Hepatitis A, Hepatitis B and Tetanus.

7.3 WHAT IS A CONFINED SPACE

A confined space is determined by the hazards associated with a set of specific circumstances and not just because work is performed in a small space.

Confined spaces are commonly found in vats, tanks, pits, pipes, ducts, flues, silos, containers, pressure vessels, underground sewers, wet or dry wells, shafts, trenches, tunnels or other similar enclosed or partially enclosed structures, when these examples meet the definition of a confined space in the WHS Regulation:

Regulation 5: A confined space means a space that:

- Is enclosed or partially enclosed;
- Is not designed or intended primarily to be occupied by a person;
- Is, or is designed or intended to be, at normal atmospheric pressure while any person is in the space; and
- Presents a risk from one or more of the following:
    - Harmful airborne, flammable contaminants;
    - An unsafe oxygen level; or
    - Engulfment.

Trenches are not considered confined spaces based on the risk of structural collapse alone, but **will be confined spaces** if they potentially contain concentrations of **airborne contaminants** that may cause **impairment, loss of consciousness or asphyxiation**.

7.4 DETERMINING WHETHER A SPACE IS A CONFINED SPACE

A confined space is determined by the structure and a specific set of circumstances. That same structure may or may not be a confined space depending on the circumstances when the space is entered. Entry to a confined space is considered to have **occurred when a person's head or upper body enters the space**.

Control measures such as providing temporary ventilation or achieving a satisfactory pre-entry gas test will not change the classification of a confined space.

7.5 CONFINED SPACE HAZARDS

Identifying hazards involves finding all of the things and situations that could potentially cause harm to people. At QUU the following risks/hazards must be identified prior to confined space entry:

- Atmospheric hazards and engulfment hazards, including, but not limited to:
    - the presence of contaminants within the confined space;
    - hazardous services connected to the confined space; and
    - the presence of free-flowing liquid stored in, or which could potentially enter, the confined space.

- a reduction in oxygen concentration in the atmosphere of the confined space below 19.5 per cent by volume or an enrichment of oxygen above 23.5 per cent by volume;
- the presence of airborne contaminants such as dust or fibres;
- high or low temperatures resulting from the occupational environment or weather conditions;
- Task-related hazards and other occupational hazards, including, but not limited to: an inability to maintain communications;
- noise;
- radiation from x-rays, non-destructive testing (NDT), gauges, lasers and/or welders;
- the need for manual handling;
- unsafe entry and exit, or unsafe surfaces;
- restrictions on entry or exit;
- poor lighting;
- whether openings are obstructed by fittings or equipment, with the potential to impede rescue;
- the risk of being caught in or on moving equipment;
- the risk of being overcome by fumes or other contaminants introduced as a result of performing the task; and
- exposure to potentially damaging energy sources such as electricity; and
- the potential for falling objects around confined space entries.

Note: Consideration must also be given to the interface implications of other tasks being conducted in the near vicinity of the confined space.

7.6 CONFINED SPACE WRAP

A WRAP must be conducted by the work team before the commencement of any tasks associated with the confined space.

The WRAP must take into account:

- the hazards of the confined space;
- the tasks to be conducted, including the need to enter the confined space;
- the range of methods by which the tasks can be conducted;
- the hazards and associated risks involved with the method of work selected and the equipment to be used;
- emergency response procedures; and
- the competence of the persons conducting the tasks.

The Confined Space Entry Permit and the Confined Space SWMS must be attached to the completed WRAP and adhered to for all activities associated with the confined space.

The WRAP must be reviewed and revised whenever there is evidence to indicate that the level of risk has changed or that hazards are not controlled by the current controls.

7.6.1 ISOLATION

Methods of isolation must be prepared and developed by the appointed authorised person, and verified and reviewed by the permit issuer/PICOW. For more details on the required process, refer to the Lock Out Tag Out Procedure (PRO379)

7.6.2 PURGING CONFINED SPACE

Where necessary, the confined space must be cleared of contaminants by using a suitable purging agent. The purging agent or any gas used for ventilation purposes must not be pure oxygen or a gas mixture with an oxygen concentration of less than 19.5 per cent or more than 23.5 per cent.

Exclusion zones must be considered as part of the risk assessment and consideration should be given to the erection of signage and barriers around vents and openings.

The following processes, activities, equipment or conditions that may exist in confined spaces require risk assessment and must be managed in accordance with the Confined Space Entry Permit System:

- cleaning a confined space;
- the location of contaminants;
- flammable contaminants;
- static electricity;
- ventilation;
- combustion engines;
- the location of exhausts;
- the control of mechanical ventilation equipment; and
- activities causing the generation of contaminants.

Note: additional recommendations for cleaning a confined space by hydro jetting, steam cleaning, hydro blasting and chemical cleaning can be found in Appendix G of *Australian Standard 2865-2009 Confined Spaces*.

7.6.3 ATMOSPHERIC TESTING AND MONITORING

Atmospheric testing and monitoring must be conducted in a manner consistent with the hazards identified in the Confined Space Risk Assessment.

Where the risk of a hot/ cold environment is identified, additional controls must be considered i.e. temperature monitoring, PPE etc.

Only competent and authorised gas testers must monitor or test gaseous atmospheres. No person must enter a confined space to conduct atmospheric testing or monitoring.

Approved Confined Space Entry Permits for the purposes of atmospheric testing must comply with the risk control measures identified as necessary for safe testing. Records of the test results must be recorded on the Confined Space Entry Permit.

Atmospheric tests must include testing of:

- Oxygen concentration;
- Concentration of flammable airborne contaminants (i.e. flammable/explosive gases) ; and
- Concentration of other harmful airborne contaminants (i.e. toxic gases or vapours), such as carbon monoxide, carbon dioxide and hydrogen sulphide.

Where known flammable contaminants are present, testing must be continuous and the selected monitoring device must have a visual and audible alarm sequence. This alarm must activate at a concentration of airborne contaminants no greater than 5 per cent of the lower explosive limit.

Upper explosive limits (UEL) and lower explosive limits (LEL) of known flammable contaminants can be obtained through *Australian Standard 60079 Explosive Atmospheres*.

The monitoring device must be maintained and serviced as per the manufacturer's requirements. The serial number of the device and the date of the next calibration must be recorded on the Confined Space Entry Permit.

The required frequency of re-testing or continuous monitoring must be determined by way of a risk assessment. Re-testing or continuous monitoring must be considered when a risk assessment identifies potential variations in oxygen concentration or the potential release of airborne contaminants.

7.7 CONFINED SPACE ENTRY (INCLUDING PERMITS)

Prior to entry of a confined space, the following must occur:

1. Complete WRAP (as detailed in section 7.6 above);
2. A Confined Space Entry Permit must be issued by the authorised permit issuer. The Permit identifies the conditions for confined space entry, and outlines the following details;
    - Atmospheric testing;
    - Purging;
    - Isolation, Lock Out Tag Out; and
    - Serviceability of all PPE used, including respiratory protective devices.
3. Adhere to Confined Space SWMS.

Note: A permit is required each time a new confined space entry point is established.

7.8 CONFINED SPACE RESCUE

7.8.1 RESCUE FROM A CONFINED SPACE

- Rescue procedures must be practiced in conjunction with the refresher training every 2 years to ensure that they are efficient and effective;
- An Emergency Rescue Plan must be completed, practiced and understood by all members of the team prior to entry to the space (refer to CER91 for further details); and
- Refer to the instructions in QUU Safe Work Method Statement Confined Space Entry (SWMS2).

7.8.2 RESCUE FROM A RESTRICTED WORK AREA

- Rescue procedures must be practiced in conjunction with the refresher training every 2 years to ensure that they are efficient and effective;
- An Emergency Rescue Plan must be completed, practiced and understood by all members of the team prior to entry to the space; and
- Refer to the instructions in QUU Safe Work Method Statement - Restricted Work Area (SWMS47).

7.9 CONFINED SPACE SIGNAGE

The mandatory danger sign (below) must be clearly and prominently displayed for the purpose of identifying confined spaces and to notify persons that they must not enter unless authorised under a Confined Space Entry Permit or other Permit to Work.

For QUU fixed sites (e.g. Sewage Treatment Plants, housed pump stations etc.), all confined spaces must be permanently signposted.

For QUU Water and Sewerage reticulation and trunk infrastructure, where it is not practicable for the confined space to be permanently signposted (e.g. maintenance hole/valve pit etc. in a road reservation), temporary confined space signage must be erected at the worksite while works are being undertaken.

For more information, refer to *Australian Standard 1319-1994: Safety Signs for the Occupational Environment*.

7.10 TRAINING AND COMPETENCY

Training must be provided to QUU employees and other persons on QUU-controlled worksites. All employees and other persons on QUU-controlled worksites who will enter, or supervise work in a confined space/restricted work area, must be trained and assessed to meet the required Australian Standards.

QUU requires that QUU employees and other persons on QUU-controlled worksites have their confined space and working at heights competencies reassessed within 2 years in accordance with *AS2865 2009: Confined Spaces* (reassessment requirement). Refresher training on a more frequent basis than 2 years should be provided if confined space activities are conducted infrequently, such as twice a year.

Records of employees who are trained and deemed competent will be recorded in the QUU Training Management System. Proof of 'Recognised Training', issued by a Registered Training Organisation, must be provided by contractors who:

- Enter or work in confined spaces;
- Undertake hazard identification or risk assessment in relation to a confined space;
- Implement risk control measures;
- Issue and complete entry permits;
- Manage or supervise employees and other persons working in confined spaces;
- Act as a stand-by person or communicate with workers in a confined space;
- Monitor conditions while work is being carried out; and
- Design or lay out a work area that includes a confined space.

In order to perform certain tasks, such as completing entry permits and acting as stand-by persons, QUU workers must also provide evidence that they are a 'QUU Authorised Person' with regards to confined space entry. This means that they have:

- Thorough training and/or experience acquired the knowledge and skills required to perform confined space tasks competently;
- Up-to-date confined space entry certifications, as outlined in the table in Appendix C;
- Completed 5 certified QUU Confined Space Entries (10 for apprentices/trainees);
- Been issued with, and have on their person to be sighted at any time, a QUU Authorised Person card; and
- Their current 'Authorised Person' card available for presentation prior to the commencement of a Confined Entry Task.

7.11 DOCUMENTATION AND RECORD KEEPING

The following records must be kept for all confined space entries in a manner easily accessible for audit and review:

- Completed Confined Space Entry Permits (onsite);
- Confined space work training records (onsite);
- Risk Assessment Reports (onsite); and
- Confined Space Medical Assessments (TRIM).

8. REFERENCES

The following references contain information used in the preparation and development of this SOP:

- *Queensland Work Health and Safety Act 2011*
- *Queensland Work Health and Safety Regulations 2011*
- *Queensland Confined Space Code of Practice 2011*

- *Australian Standard 2865-2009 Confined Spaces*
- *Australian Standard 1319-1994 Safety Signs for the Occupational Environment*

9. REVIEW

The Confined Space SOP is to be reviewed every 2 years or earlier if:

- There is an identified risk to business;
- A significant safety or serious injury event occurs;
- Incident investigation or audit results show that application of the standard fails to deliver the required outcomes;
- There are changes in associated legislation; or
- There is evidence that the standard is not having a positive impact on safety-related KPIs.

10. FURTHER INFORMATION

For further information, contact your Health and Safety Representative or the QUU Safety Team.

Appendix A – Confined Space Identification Criteria

Source: *Confined Spaces Code of Practice 2011 Queensland* (selected criteria only)

CONFINED SPACE CRITERIA							CONFINED SPACE?
Description of the space and activity	**A**	**B**	**C**	**D**			**If the answer to A, B, C and at least one of D is yes, then the space is a confined space.**
	Is the space enclosed or partially enclosed?	*Is the space not designed or intended to be occupied by a person?*	*Is the space designed or intended to be, at normal atmospheric pressure while any person is in the space?*	*Does the space present a risk from:*			
				Harmful airborne, flammable contaminants?	*An unsafe oxygen level?*	*Engulfment?*	
Sewer with access via a vertical ladder	✓	✓	✓	✓	✓	✓	**Yes**
Cleaning spilled cadmium pigment powder in a shipping container	✓	✓	✓	✓	×	×	**Yes**
Dislodging a sludge blockage in a drain pit	✓	✓	✓	✓	✓	✓	**Yes**
Internal inspection of a new, clean tank prior to commissioning	✓	✓	✓	×	×	×	**No**
Internal inspection of an empty cement silo through a door at ground level	✓	×	✓	×	×	×	**No**
Stocktake using an LPG forklift in a fruit cool store	✓	×	✓	✓	×	×	**No**
Meaning of symbols: ✓ = yes, × = no							

Appendix B – Confined Space Identification Flowchart

Source: *Australian Standard 2865-2009*

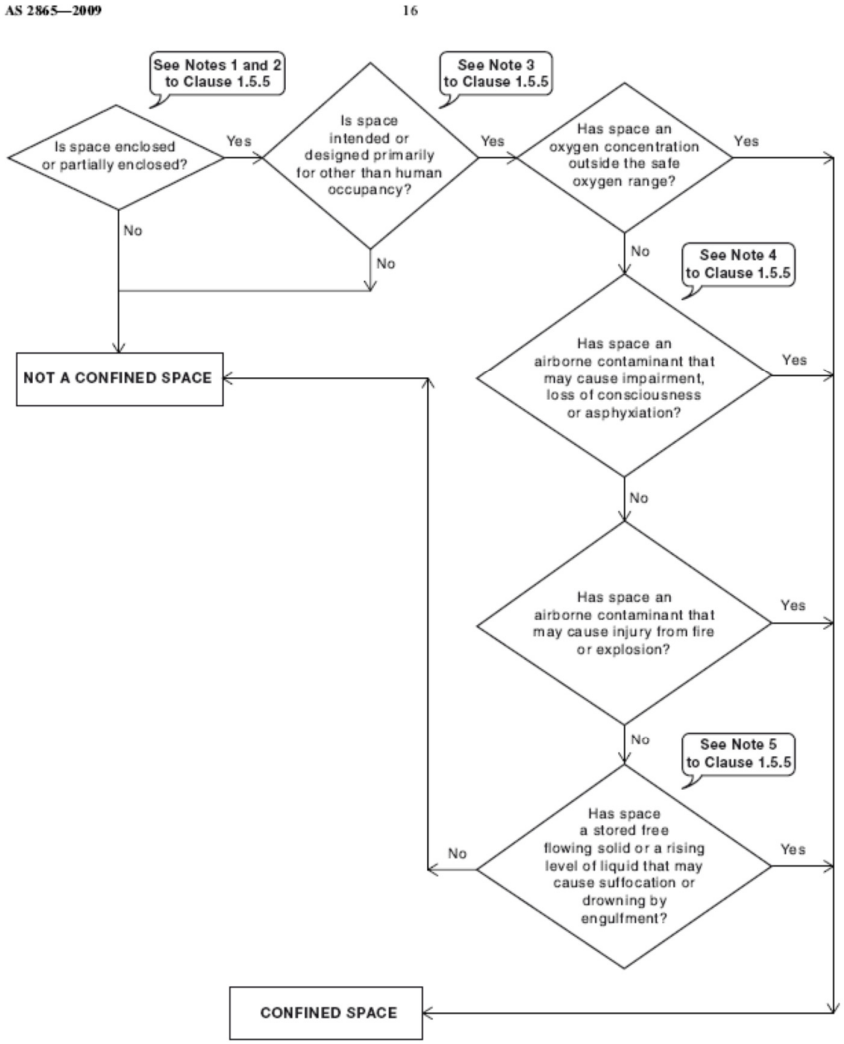


FIGURE 1 CONFINED SPACE IDENTIFICATION AND RISK CONTROL

Appendix C – Required Training and Medical Certificates

Source: *Australian Standard 2865-2009*

APPLICABLE TO:	QUU EMPLOYEES	NON-QUU EMPLOYEES ON QUU-CONTROLLED WORKSITES	QUU 'AUTHORISED PERSON' FOR CONFINED SPACE	PRINCIPAL & SUB-CONTRACTORS ON NON-QUU-CONTROLLED WORKSITES
Training/Competencies (Confined Space and Heights training must be current – within 2 years)				
Work Safely in at Heights	✓	✓	✓	✓
Approved Confined Space Training delivered by a RTO which must include; • Work safely in confined spaces • Work in Accordance with an Issued Permit • Operate Breathing Apparatus • Gas Test Atmospheres • Emergency Rescue practice	✓	✓	✓	✓
Apply First Aid Certificate with valid CPR (or equivalent)	✓	✓	✓	✓
Specific Site Risk Induction (for waste water assets)	✓	✓	✓	✓
Completed 5 Certified QUU Confined Space Entries (10 for apprentices/trainees)	✗	✗	✓	✗
Medical (must be current)	✓	✓	✓	✗
Confined Space medical certificate	✓	✓	✓	✗
Hep A, B, Tetanus immunisation (for waste water work)	✓	✓	✓	✓

Meaning of symbols: ✓ = required, ✗ = not required

Refresher training for Confined Space and Heights must be completed within 2 years; all other training requirements must be in line with the appropriate standards.