



MEAT INDUSTRY STANDARD: CONFINED SPACES



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1 Introduction



Confined Spaces

Working in a confined space is potentially one of the most dangerous of all workplace hazards. It's been calculated that working in a confined space is 150 times more dangerous than doing the same job outside. Meat processing has tanks, vats, sumps, sewers, pits, traps and other types of confined spaces which represent significant hazards, and confined spaces are recognised as a critical risk for our industry

This standard lays out the basic processes for clarifying roles and responsibilities, identifying hazards, assessing risks, and implementing controls to eliminate or minimise the hazards with confined spaces.

This standard draws on international experience and merges this with the relevant New Zealand regulations coming into force under the Health and Safety at Work Act 2015, and AS 2865:2009 Confined Spaces.

Please note that these are minimum standards and companies may (and are encouraged to) go beyond any or all of the standards in order to control risks 'so far as is reasonably practicable'.

This is a working document. This document and the subsequent family of documents will evolve over time for example to reflect changes in industry practice and regulation.

Note: This document represents **guidance only** for managers and supervisors in managing workplace health and safety in the meat industry. It is not legal advice and does not replace or amend an individual or collective employment agreement or a PCBU health and safety policy. If a member company of MIA cannot achieve a particular standard it is recommended that they conduct a risk assessment outlining their additional controls that will be used to manage the hazard.

Neither the Meat Industry Association Inc or its members, take responsibility for the results or any actions taken on the basis of the information contained in these Standards, or for any error or omissions.

1.1 Basic principles

Confined space hazards can result in injury or death resulting from entrapment, asphyxiation or engulfment. Avoid entry into a confined space where you can (i.e. complete work from the outside; use appropriate equipment to complete work so no human entry is required etc). If entry cannot be avoided:

- Before commencing any task consider all sources of potentially hazardous energy, hazardous atmospheres and other hazards within the space. Do not commence any confined space entry task if there is risk of harm to you or any other person.
- Select and use appropriate work equipment and other measures to enter a confined space safely when entry cannot be avoided (i.e. respiratory equipment, harnesses, gas detectors etc); and
- Ensure you are competent and authorised to select and use appropriate work equipment or devices to complete the isolation of the hazardous energies identified; including 'testing for dead' to confirm that energy sources are unable to start; and

- Where they cannot eliminate and entry, use work equipment and other measures in accordance with restrictions set out in a Confined Space Entry Permit that includes a full rescue plan and emergency considerations.

1.2 Confined Space Policy Statement

Work in confined spaces must be avoided where possible. Alternatives must be considered.

All confined space work on shall comply with:

- The Health and Safety at Work Act 2015 and regulations
- AS 2865:2009 Confined Spaces
- The provisions of this Standard

Where entry into a confined space is required, a Confined Space Entry Permit is mandatory.

While this standard is intended to outline policy and procedure for use within meat industry operations, it is not a comprehensive document covering all aspects of confined spaces. The applicable Standards, Approved Codes of Practice and Best Practice Guidance must be adhered to.

2 Roles & Responsibilities

2.1 Duties of the PCBU

The PCBU must manage risks to health and safety associated with working in a confined space that is reasonably likely to cause injury to the person or any other person. This includes the risk of:

- a) Unsafe oxygen level (e.g. oxygen can be displaced by gases produced during biological processes such as methane in a sewer); or
- b) Asphyxiation in a confined space, due to hazardous airborne contaminants (gases, vapours); or
- c) Engulfment in a confined space, due to inrush of any substance (solid, liquids) which can also lead to asphyxiation; or
- d) Fire and explosion (i.e. if an ignition source such as a sparking electrical tool or static on a person is introduced into a space containing a flammable atmosphere an explosion is likely to result.)

The PCBU must minimise the risk of an unsafe confined space entry by providing adequate protection against the risks. The person provides adequate protection against the risk if the person provides and maintains a safe system of work, including by:

- a) Eliminating entry to any confined space if it is reasonably practicable to do so; or
- b) If it is not reasonably practicable to eliminate all entries to confined spaces, they must be limited wherever possible and equipment provided to conduct tasks from the outside with all necessary controls, to limit all safety risk so far as is reasonably practicable; or
- c) If it is not reasonably practicable to comply with the above, providing a safe system of work to ensure safe entry and exit from the confined space with all necessary controls, to limit all safety risk so far as is reasonably practicable.

The company is responsible for assigning someone to ensure the PCBU complies with its health and safety duties towards workers at a site – depending on the company, this can be the senior manager at that site.

2.2 Responsibilities by role

Role	Responsibilities
PCBU	As above
Officers	Officers must exercise due diligence to make sure that the PCBU complies with its health and safety duties.
General Manager	The General Manager must ensure: <ul style="list-style-type: none"> • this Standard is kept up to date and distributed to all relevant staff. • ensuring the requirements of this standard are adhered to.

Role	Responsibilities
Line Managers / Team Leaders	<p>Line Managers and Team Leaders are responsible for the immediate actions required to control health and safety risk in their areas of control, in particular:</p> <ul style="list-style-type: none"> • Ensure best practice confined space management and entry practices are used in the field to reduce risk of a notifiable injury or illness or fatality, by: <ul style="list-style-type: none"> – Ensuring that all confined space entry work is scoped and planned before starting – Ensuring that a trained and competent Permit Issuer and Permit Receiver are available to issue and receive a permit for the work prior to work commencing – Being involved in investigations of breaches of the confined space entry system – Ensuring the requirements of this standard are met within their area of responsibility – Ensuring all relevant employees are suitably trained and competent in confined space safety – Ensuring that interim controls are implemented and monitored when corrective actions are raised
Health and Safety Manager/Advisor	<p>The Health and Safety Manager/Advisor are responsible for:</p> <ul style="list-style-type: none"> • Providing assistance, advice and guidance on hazard and risk management requirements. • Ensuring best practice confined space management and entry practices are in place to reduce risk of serious harm or fatality, by: <ul style="list-style-type: none"> – Driving a culture of near accident reporting including coaching and mentoring employees and managers on applying this Standard. – Ensuring this Standard is kept up to date and distributed to all relevant staff – Reviewing events and control failures in relation to the risk – Reviewing and responding to industry trends and technical developments – Ensuring that adequate resources are available to ensure the full implementation of this standard.

Role	Responsibilities
All workers	<p>All workers (including contractors and subcontractors) are responsible for ensuring:</p> <ul style="list-style-type: none"> • The requirements of this standard are applied. • Compliance with confined space entry procedures. <p>Workers at processing sites must:</p> <p>Ensure best practice confined space management and entry practices are used in the field to reduce risk of serious harm of fatality, by:</p> <ul style="list-style-type: none"> • Ensuring the requirements of this Standard are applied where relevant to their roles. • Identifying and reporting issues they encounter not previously identified in a formal risk assessment. • Ensuring their own safety and ensure that company procedures and policies are observed at all times. • Ensuring any person involved in any aspect of confined space entry, including stand-by person, permit issuer or receiver, holds the current competency for the task • Participating in risk assessment teams where appropriate and competent.
Permit Issuer and Permit Receivers	<p>The Permit Issuer and Permit Receiver must:</p> <ul style="list-style-type: none"> • Be familiar with the confined space where entry is planned • Be trained and competent in the Company's Permit to Work system • Adhere to all Company Confined Space and Permit to Work procedures at all times
Stand-by Person (safety observer)	<p>The Stand-by person is required to:</p> <ul style="list-style-type: none"> • Ensure continuous communication with workers in the confined space • Monitor conditions within the confined space • Ensure immediate notification in the event of an emergency • Adhere to all other responsibilities outlined in section 4.3 (Communication and) herein.

3 Identify Hazards and Assess the Risk

There must be a plan for the identification of confined spaces and the control of associated risks.

3.1 Identify Confined Spaces

A confined space is determined by the structure and a specific set of circumstances. Manhole risers or tank sumps, all underground and aboveground tanks and vessels, pits, excavations ≥ 1.5 meters, trenches, tank vaults, storm water management systems, crawl spaces beneath buildings, any water or waste handling systems large enough for human entry are all examples of confined spaces.

Temporary control measures such as providing temporary ventilation or achieving a satisfactory pre-entry gas test will not cause a confined space to be declassified. For a confined space to be declassified as a non-confined space, it needs to have undergone sufficient changes in structure and use to eliminate all inherent hazards that define a confined space.

Appendix C: Identification of Confined Spaces Flow Chart will help to determine whether a space is a 'confined space'.

It is important to note that even though the space may not under the definition be deemed a confined space, it does not necessarily mean that the space is safe to enter.



Hazard

Definition of a confined space

An enclosed or partially enclosed space that is not intended or designed primarily for human occupancy, within which there is a risk of one or more of the following:

- An oxygen concentration outside the safe oxygen range;
- A concentration of airborne contaminant that may cause impairment, loss of consciousness or asphyxiation;
- A concentration of flammable airborne contaminant that may cause injury from fire or explosion;
- Engulfment in a stored free flowing solid or a rising level of liquid that may cause suffocation or drowning.



Photo 1. Tank



Photo 2. Vessels



Photo 3. Sump



Photo 4. Sump

3.2 Hazards to consider

The following is a list of some of the types of hazards that should be considered.

Consider:
<ul style="list-style-type: none"> • Oxygen deficiency (by combustion or rust etc., by dilution of air with contaminants or absorption)
<ul style="list-style-type: none"> • Oxygen enriched atmosphere which increases the risk of fire or explosion
<ul style="list-style-type: none"> • Contaminants (dust, fibres, fumes, etc)
<ul style="list-style-type: none"> • Inability to maintain continuous communication and/or observation between those in confined space and stand-by person
<ul style="list-style-type: none"> • Temperature – heat or cold
<ul style="list-style-type: none"> • Mechanical hazards and operation of equipment within a confined space trapping or crushing workers (e.g. augers or conveyor belts, etc)
<ul style="list-style-type: none"> • Electrical hazards
<ul style="list-style-type: none"> • Noise
<ul style="list-style-type: none"> • Working at heights
<ul style="list-style-type: none"> • Manual handling
<ul style="list-style-type: none"> • Environment aspects i.e. lighting and temperature
<ul style="list-style-type: none"> • Restricted entry or exit or unsafe surfaces

3.2.1 Unsafe oxygen level

Air normally contains 21% oxygen by volume, although oxygen levels of 19.5% — 23.5% by volume are considered to be safe.

Oxygen deficiency

Some situations can cause the level of oxygen to dramatically decrease, leading to an oxygen-deficient atmosphere and possible asphyxiation. This may occur, for example, if oxygen in the atmosphere is:

- Displaced by gases produced during biological processes, for example, methane in a sewer
- Displaced during purging of a confined space with an inert gas to remove flammable or toxic fumes
- Depleted inside metal tanks and vessels through surface oxidation (for example, when rust forms)
- Consumed during combustion of flammable substances
- Absorbed or reacts with grains, wood chips, soil or chemicals in sealed silos.

Oxygen enriched atmospheres

Too much oxygen can increase the risk of fire or explosion. Oxygen-enriched atmospheres may occur if:

- Chemical reactions cause the production of oxygen, for example certain reactions with hydrogen peroxide

- There is a leak of oxygen from an oxygen tank or fitting while using oxy-acetylene equipment.

3.2.2 Flammable Gases and Vapours

A fire or explosion requires the presence of three elements: an ignition source, air and a fuel (gas, vapour or mist) capable of igniting. A flammable atmosphere is one in which the flammable gas, vapour or mist is likely to exceed 5% of its lower explosive limit (LEL).

Where a flammable atmosphere may exist in a confined space and there is a risk of fire or explosion, all ignition sources in the vicinity must be eliminated.

Flammable atmospheres in confined spaces may result from the evaporation of a flammable residue, flammable materials used in the space, a chemical reaction (such as the formation of methane in sewers), or from the presence of combustible dust (such as that in flour silos).

Examples of potential ignition sources, both inside and outside the space, include:

- Open flames and hot surfaces
- Electrical equipment
- Internal combustion engines
- Metal tools striking metal surfaces
- Spark-producing equipment for example grinding wheels
- Static electricity

3.2.3 Engulfment

Examples of materials that may pose a risk of engulfment include plastics, sand, liquids, fertiliser, grain, coal, coal products, fly ash, animal feed and sewage. Stored materials such as sand and grain can form a crust or bridge when a container is emptied from below, leaving the top layer in place.

3.2.4 Other hazards

Uncontrolled introduction of substances

The uncontrolled introduction of substances such as steam, water or other liquids, gases or solids may result in drowning, being overcome by fumes or other harm depending on the nature of the substance.

Vehicles and LPG forklifts operating close to the opening of the confined space can cause a build-up of exhaust gases, including carbon monoxide, in the space.

Biological hazards

Contact with micro-organisms, such as viruses, bacteria or fungi, may result in infectious diseases, dermatitis or lung conditions such as hypersensitivity pneumonitis. Sewers, grain silos and manure pits are examples of confined spaces where biological hazards may be present.

Mechanical hazards

Exposure to mechanical hazards associated with plant may result in entanglement, crushing, cutting, piercing or shearing of parts of a person's body. Sources of mechanical hazards include plant such as augers, agitators, blenders, mixers and stirrers.

Electrical hazards

Electrical hazards may cause electrocution, shocks or burns, and can arise from cables, transformers, capacitors, relays, exposed terminals and wet surfaces where electrical circuit and electrically powered plant are used.

Restricted entry or exit

Small entrances and exits make it difficult to rescue injured workers or to get equipment in or out of the confined space. In some cases, entrances and exits may be very large but their location can make them difficult to access.

Skin contact with hazardous substances

The nature of a confined space could give rise to an increased likelihood of skin contact with surface contaminants. Skin contact with hazardous substances may result in immediate health effects such as burns, irritation or allergic dermatitis, or longer-term systemic effects.

Noise

Noise generated in a confined space from the use of plant, the work method or process may be amplified due to reflections off hard surfaces. Exposure to hazardous noise may result in hearing loss, tinnitus and other non-auditory health effects. Hazardous noise may also prevent workers hearing warning signals and distract workers from their work.

Manual tasks

Hazards arising from manual tasks may be exacerbated by physical constraints associated with working in a confined space. Additional hazards may arise from the use of personal protective equipment that restricts movement, grip and mobility.

Environmental hazards

Environmental hazards associated with work in a confined space may cause or contribute to harm. Examples of environmental hazards include:

- Heat or cold stress arising from the work, process or conditions
- Slips, trips and falls arising from slippery surfaces or obstacles
- Inadequate lighting.

3.2.5 Hazards outside the confined space

Where the confined space has a vertical opening, there is a risk that people could fall in.

Work done outside the space, but near openings to it, can contaminate the atmosphere inside the space. A common example is the exhaust gases from an internal combustion engine.

3.2.6 Traffic

Traffic hazards are a concern where confined space entrances or exits are located on footpaths or roads. There is the potential for workers entering or exiting the space to be struck and injured by vehicle traffic. Where this hazard exists, a Traffic Management Plan must be developed and approved by the Permit Issuer.

3.2.7 Additional physiological and psychological demands

Working in a confined space may impose additional physiological and psychological demands over and above those encountered in a normal working environment. Consideration should be given to a worker's:

- Physical ability
- Ability to work in a restrictive space (for example claustrophobia)
- Ability to wear the personal protective equipment required to do the work (for example respirators).

3.3 Risk Assessment

Once the hazards have been identified, they need to be assessed for risk. The assessment should be conducted by a competent person and documented, and take into account the following:

- The hazards of the confined space
- The tasks to be conducted
- The range of methods by which the tasks can be conducted
- The hazards involved with the method selected and equipment to be used
- Emergency response procedures
- Competence of the persons to conduct the tasks.

When undertaking a risk assessment to determine the risks requiring control the following factors should be considered:

Consider:

- The atmosphere in the confined space, including whether testing or monitoring is to be undertaken
- The risk of engulfment of a person
- All proposed work activities, particularly those that may cause a change to the conditions in the confined space
- The number of persons occupying the space
- The soundness and security of the overall structure and the need for lighting and visibility
- The identity and nature of the substances last contained in the confined space
- Any risk control measures needed to bring the confined space to atmospheric pressure
- The number of persons required outside the space:
 - To maintain equipment essential for the task being undertaken within the confined space
 - To provide continuous communication with the persons within the confined space
 - To properly initiate emergency response procedures
- Risks associated with other hazards, such as noise or electricity
- Arrangements for emergency response, e.g. first aid and resuscitation
- The physiological and psychological demands of the task and the competency of persons involved in the tasks or emergency response duties
- The training and competency of persons in any required procedure, particularly those that are unusual or non-typical, including the use and limitations of any personal protective equipment and other equipment to be used
- The availability and adequacy of appropriate personal protective equipment and emergency equipment for all persons likely to enter the confined space.

Consider:

- The need for additional risk control measures, including:
 - Prohibiting hot work in adjacent areas
 - Prohibiting smoking and naked flames within the confined space and adjacent areas
 - Avoiding contamination of breathing air from operations or sources outside the confined space, for example, from the exhaust of an internal combustion engine
 - Prohibiting movement of equipment in adjacent areas, for example forklifts
 - Prohibiting spark-generating equipment, clothing and footwear
- Whether purging or cleaning in the confined space is necessary
- Whether hot work is necessary
- Conditions that could impede entry and exit or the conduct of the tasks in the confined space, for example, plant layout, dimensions, manual handling and ergonomic aspects of the task activity.

Factors that may change the risks in a confined space include, but are not limited to;

- Installation or modification of plant;
- A change in equipment operating conditions;
- A change in the atmosphere or occupational environment;
- A change in working arrangements or procedures; or
- Incidents that affect, or could affect, the safety of persons.

**Further information**

For further guidance on risk assessment of confined spaces refer to:

- AS 2865:2009 Safe Working in a Confined Space, section 3.3
- Confined Spaces (Model) Code of Practice, Safe Work Australia

4 Implement Controls

If it is not reasonably practicable for a PCBU to eliminate identified risks, the PCBU must implement risk-control measures. Managers should use the following hierarchy for managing the prevention of harm from hazardous energy:

- **Eliminate the risks:** Identify ways to complete the task that do not require human entry into the confined space. For example:
 - installing fixed or temporary cleaning devices for example spray balls using high-pressure hoses inserted through an access hatch to clean the inside of a tank
 - using remote cameras or a mirror attached to a probe for internal inspection of vessels
 - using remotely operated rotating flail devices, vibrators or air purgers to clear blockages in silos
 - using a hook, long-handled clasp or magnet on a string to retrieve an object dropped into a confined space.
- **Minimise the risks:** If it is not reasonably practicable to eliminate the risk, you must minimise the risks so far as is reasonably practicable by:
 - substituting the hazard giving rise to the risk with something that is safer
 - isolating the hazard from any person exposed to it, or
 - implementing engineering controls.
- **Manage any remaining (residual) risk:** If there is a remaining risk, it must be minimised so far as is reasonably practicable by:
 - implementing administrative controls, and if a risk still remains, then
 - suitable personal protective equipment must be provided and used.

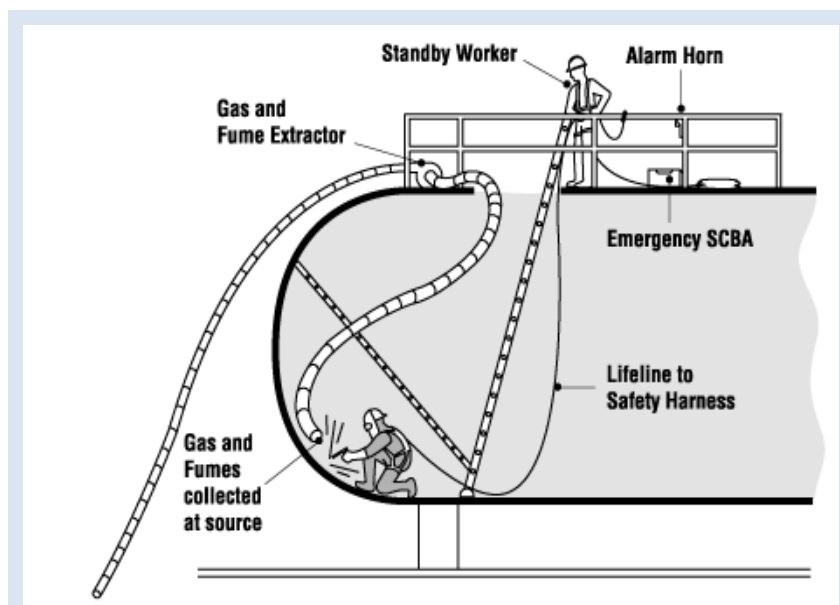


Figure 1. Examples of controls being applied

4.1 Minimise the risks

The most important step in the risk management process involves controlling risks by eliminating them so far as is reasonably practicable, or if that is not possible, by minimising the risks so far as is reasonably practicable.

Where it is impossible to eliminate the need to enter a confined space there must be a comprehensive confined space programme implemented that includes the following as a minimum:

- Hazard identification
- Risk assessment and control
- Signage for all known confined spaces
- Ventilation, cleaning and purging of the confined space
- Advice on intention to enter
- A permit to work
- Atmospheric testing in the confined space
- An emergency response plan
- Appointment of a person or persons outside the confined space who is trained to ensure that adequate communication, support, first-aid and rescue services are available to the person within the confined space.
- The provision of PPE including appropriate respiratory devices
- Appropriate training and competency standards

A simple way to remember the key phases of the process is “SPACE”. All five phases are mandatory for confined space entry:

S	SCOPE THE JOB: Is there a better way to do this job (to avoid entry)? No? Then carefully think about and plan your confined space entry. What do you need, how can this entry be done safely?
P	PERMIT: Complete permit and get signed off. Write the plan, get it approved and then stick to it.
A	ACCESS/EGRESS: Environment is safe to enter. Locate and check PPE for safe entry. Ensure you have all the correct gear or wait until you do.
C	CONTINUOUSLY MONITOR CONDITIONS: A stand-by person must continuously monitor safety. If in doubt get out.
E	EMERGENCY PREPAREDNESS: Be prepared for all emergencies. Plans have been tested. Follow the emergency/rescue plan if safety is at risk.

4.2 Typical controls

4.2.1 Confined Space Risk Register

The plant should maintain a Confined Space Risk Register that identifies types of confined spaces identified across its operations, and the hazards associated with those spaces. Every area where confined space hazards have been identified shall add local considerations into this Register.

4.2.2 Visual warnings (signage)

Confined spaces

All entry points to a confined space must be sign posted and barricaded off to prevent entry by unauthorised personnel whenever possible. The warning signs must comply with AS/NZS 1319 and indicate that only authorised access is permitted. Signage clearly identifies the number of that confined space as entered in the site Confined Space Register. This means it is easy for us to cross-check the identified hazards and risks for that space.

Wherever possible entrances to confined spaces should have warning signage in place. An example is shown below.



Figure 2. Example of Confined Space warning signage

Wherever this sign is displayed entry is prohibited under any circumstances if a confined space entry permit is not in place.

In the absence of this signage if there is any doubt about whether the vessel or space is to be treated as a confined space the Supervisor must be contacted immediately.

Other spaces where activities could affect the physical/atmospheric conditions

These activities include but are not limited to:

- Cleaning with chemicals
- Reducing air flow
- Obstruction of entry and/or exit points
- Welding
- Grinding
- Working on valves (engulfment risk)

In this case the following signage should be in place:



Figure 3. Example of potentially hazardous space warning signage

Wherever this sign is displayed entry is prohibited under any circumstances if the activities listed above are conducted unless a confined space entry permit is in place.

In the absence of this signage if there is any doubt about whether the vessel or space is to be treated as a confined space the Supervisor must be contacted immediately.

4.2.3 Protection against Unauthorised Entry

Wherever possible entrances to confined spaces are locked to ensure there are no unauthorised or unplanned entries into confined spaces.

Keys for locked confined spaces shall be kept by the Site Manager and access to keys strictly controlled. Only authorised personnel are to gain access to confined space keys. A key register shall be kept.




Figure 4. Example of confined space access cover (key required)

There are many devices available to restrict access to ladders, hatches or vessels.

Confined space entry covers over ducting and pipework can be used if there is not a built-in hatch.

4.3 Communication and Stand-By Person

	<p>Best practice advice</p> <p>A Stand-by Person should be established and in place to ensure:</p> <ul style="list-style-type: none"> • Continuous communication with workers in the confined space • Monitoring conditions within the confined space • Immediate notification in the event of an emergency <p>Depending on the conditions in the confined space, communication can be achieved by voice, radio, hand signals or other suitable methods.</p>
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The stand-by person must:

- Understand the nature of the hazards inside the particular confined space and be able to recognise signs and symptoms that workers in the confined space may experience
- Remain outside the confined space and do no other work which may interfere with their primary role of monitoring the workers inside the space
- Have all required rescue equipment (for example, safety harnesses, lifting equipment, a lifeline) immediately available including means to communicate with persons inside the confined space and emergency services and others in the event of an emergency
- Have the authority to order workers to exit the space if any hazardous situation arises
- Never enter the space to attempt rescue.

A record shall be maintained of those entering and leaving the confined space. Continuous communication and monitoring for well-being must be provided between those in the confined space and the stand-by person(s). Dependent upon conditions existing in the confined space this can be achieved in a number of ways including voice, radio, hard wired communications, observation, hand signals or other appropriate means.

4.4 Permitting

The person responsible for the work should issue a written authority – a Confined Space Entry Permit. This is essentially a safety checklist to make sure nothing is overlooked and that the controls are in place.

4.4.1 Job Safety Analysis

Due to the risks involved with confined space entry a Job Safety Analysis must be developed by a competent person in consultation with all participating employees to identify, assess and control the hazards in a confined space. The Job Safety Analysis must consider the following as a minimum:

- If the work can be carried out without the need to enter the confined space
- The nature and inherent hazards of the confined space
- The tasks required to be conducted, including the need to enter the confined space
- The range of methods by which the task can be conducted
- The hazards and risks involved with the actual method selected and the equipment proposed to be used

- Emergency response procedures/plan
- The competence of the persons to undertake the work.

4.4.2 Permit to Work

Prior to entry into a confined space a written authority shall be obtained in the form of an entry permit. A Confined Space Entry Permit is in accordance with the Job Safety Analysis for that space. The Confined Space Entry Permit must cover:

- The location and description of the task to be carried out
- Hazards that may be encountered
- Isolation requirements
- Atmospheric test results as appropriate
- Any need for monitoring ventilation and the atmosphere
- Work procedures and conditions
- Communication requirements
- Risk control measures (such as need for signposting, prohibition of naked flames in area, etc)
- PPE
- The names of all the persons who may enter or work in or on the confined space, including the stand-by person(s)
- Emergency response

The Confined Space Entry Permit must only apply to **one confined space entry** and must be signed by:

- The Permit Receiver for individual/s entering the confined space
- The Permit Issuer
- The gas tester
- The stand-by personnel (may be same person as gas tester above).



Hazard

Any phobias or history of panic of personnel entering the confined space should be known before entry and must preclude entry.

The Confined Space Entry Permit shall not be granted until:

- A Job Safety Analysis has been completed
- Measures to control the identified risks have been established
- The competency of those required to enter the space has been verified
- Emergency procedures have been determined and are in place
- There is provision of stand-by person/s (stand-by person/s must be able to initiate emergency procedures, operate monitoring equipment if required and be in continuous communication with person/s in the confined space).

- All potentially hazardous services have been isolated.



Photo 5. A typical Permit station

The Confined Space Entry Permit must be provided to the person responsible for direct control of the work and kept on prominent display to facilitate signing and clearance (this is usually where the stand by person is located).

The information and risk control measures listed on the Confined Space Entry Permit must be reconfirmed whenever it becomes evident that the duration of the task will involve a change of the person to whom the entry authority was issued or a break in continuity of the tasks that may have changed the conditions under which the entry permit was issued.

A copy of the Confined Space Entry Permit must remain on-site for the duration of the confined space entry. Before return to business as usual following completion of works the person in direct control of the work must sign the Confined Space Entry Permit to indicate the work in or on the confined space has been completed and that all persons carrying out work have left the confined space.

The Confined Space Entry Permit shall be kept on record at the site along with the Job Safety Analysis for a period no less than 1 year.

The full Confined Space Permit process is described in detail in **Appendix E: Confined Space Entry Permit Flow Chart**.

4.4.3 Emergency Response Plan

Emergency Response Plan (ERP) is the document that details specific emergency preparedness and response requirements for the job. ERPs are required for works requiring Permits.

The requirements are:

- The ERP must be developed by an appropriately trained person, in line with company processes and the risk of the work to be done.
- The worker who is to perform the work should understand the ERP.
- The Permit Issuer shall review the ERP prior to authorising the Permit.

4.4.4 Permit Validity

A Confined Space Entry Permit is valid for a specific task or activity, on a specific site, within a specific period of time. The normal working hours for the project/contract are to be used as the basis for determining the specific period of time.

A Permit that is issued for work that extends beyond one day must be renewed at the commencement of each day. Provided site conditions have not changed and the Permit validation period has not expired, the Permit Receiver is able to renew a Permit on a daily basis. If the Permit validation period has expired, the Permit Receiver must stop the work and consult the Permit Issuer. The Permit Receiver must renew the Permit each day.

Permits may be applied for in advance of the work, but the Permit shall be issued immediately prior to the performance of the permitted work.

No person is allowed to issue a Permit to themselves under any circumstances.

Long-term routine work is more effectively controlled by means of standard operating procedure or work instruction than by the use of Blanket Permits.

4.4.5 Permit Issuers

In order to be authorised to issue permits for the Company, Permit Issuers must successfully complete:

- NZ Qualification Authorities (NZQA) Unit Standard 17590 Permit Issuer or equivalent
- Competency Assessment Training for the issuing of each and every type of permit the Permit Issuer is to be authorised to issue. This competency assessment training will include as a minimum the following:
 - The ability to communicate effectively the permit requirements to the PR
 - The correct PTWS process and documentation

In addition, Permit Issuers must be conversant with the provisions of the relevant Australia/New Zealand Standards or Best Practice Guidelines in the disciplines for which they are authorised to issue Permits.

4.4.6 Permit Receivers

In order to be authorised to receive permits from the Company, Permit receivers must:

- Have completed NZ Qualification Authorities (NZQA) Unit Standard 17588 Permit Receiver or equivalent, to further understand their responsibilities as a permit receiver and the common hazards to be covered in a permit.
- be trained and competent in the tasks associated with the work for which the permit is issued

4.4.7 Authorised Gas Tester

An authorised Gas tester must successfully complete and hold:

- a current qualification to the NZQA US 3058 Gas Testing in High Risk Industries; and
- US 25510 Atmospheric Testing;
- and be trained in the use of their own/the Company's gas detector device.

The above mentioned training is to be revalidated at the set intervals specified by the approved training organization or three-yearly whichever is the minimum timeframe.

4.5 Atmosphere Testing & Monitoring

A safe atmosphere must be ensured, so far as reasonably practicable, during work in a confined space. A safe atmosphere in a confined space is one that:

- Has a safe oxygen level (between 19.5% and 23.5%)
- Is free from airborne contaminants or contains airborne contaminants below their allowable exposure standard (i.e. gas, vapours, fumes or dusts)
- Any flammable gas or vapour in the atmosphere is at concentrations below 5% of its LEL.

A safe atmosphere can be achieved within the confined space using methods such as cleaning, purging and ventilation.

4.5.1 Atmospheric Testing

Should a Job Safety Analysis or permit indicate the need for atmospheric testing this will be carried out by a person deemed to be competent.

Testing will be done using suitable, correctly calibrated equipment (detectors) and must ensure the atmosphere is checked at the top, middle, bottom and remote areas of the space to be entered.

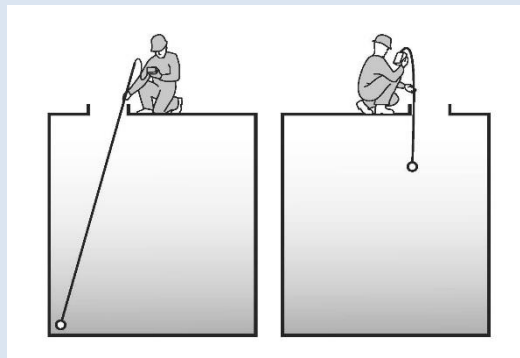


Figure 5. Atmospheric Testing must be undertaken at the top, middle, bottom and remote areas of the confined space

For example, some gases (such as hydrogen sulfide) are heavier than air and in unventilated areas will settle to the bottom of the space, while other gases (such as methane) are lighter than air and will collect at the top of the space. Testing should be carried out on a sufficient number of points to accurately reflect areas of the space that is likely to be accessed.

Only trained and authorised gas testers are permitted to carry out atmospheric testing.

It may be necessary to test the atmosphere for:

- Oxygen content
- Airborne concentration of flammable contaminants
- Airborne concentration of potentially harmful contaminants (for example, hydrogen sulphide and carbon monoxide).

A person's senses should never be used to determine if the air in a confined space is safe. Many toxic or flammable gases and unsafe oxygen levels cannot be detected using one's senses.

No person shall enter a confined space to conduct atmospheric testing or monitoring without written authority. Results of any testing shall be recorded on the Confined Space Entry Permit. Testing results shall be made available to all staff that may have to enter the confined space.

4.5.2 Atmospheric Monitoring

When work is undertaken in an underground space, space where hot work is undertaken or where there is no open air flow, a gas detector will continuously monitor the breathable atmosphere in close proximity to those completing the work. The frequency of monitoring plus the results of the monitoring shall be recorded on the Confined Space Entry Permit.

If the gas detector alarms signalling an unsafe atmosphere, then those completing work within the confined space must leave the substation immediately.

The stand-by person shall immediately make contact with the Supervisor.

Gas detection devices are calibrated on a staggered 180-day cycle to ensure adequate calibrated units are available or as specified by the manufacturer.

Calibration is completed by an authorised third party.



4.6 Purging

Purging is done using an inert gas, such as nitrogen, to clear flammable gases or vapours before work in the confined space begins.

When purging is used to clear contaminants, pure oxygen or a gas mixture in a concentration of more than 21% of oxygen by volume must not be used. When purging flammable contaminants, equipment designed for use in hazardous locations should be used and risk control measure taken to eliminate all sources of ignition.

After purging, the confined space should be adequately ventilated with sufficient fresh air to ensure that the inert gas is removed. Purging should be done in a way that ensures any contaminants removed from the confined space are expelled to a location where they present no further risk.

The space must be purged where a risk assessment identifies the potential for the confined space to contain an unacceptable level of contaminants.

4.7 Ventilation

Ventilation of a confined space with fresh air, by natural, forced or mechanical means, may be necessary to establish and maintain a safe atmosphere and temperature for as long as anyone is in the confined space. Atmospheric testing should be carried out before entry to check that the ventilation has been effective.

Supervisors are to ensure that no person will enter a confined space unless the atmosphere within the space has been positively identified and appropriate protective measures implemented.

Any airborne contaminants removed from the confined space should only be exhausted to the atmosphere at a location where they do not represent a risk. Combustion engines providing power for compressed air or any other use associated with the task being conducted should be located so that their exhaust emissions cannot enter the confined space or contaminate air being supplied to the confined space.

Where the maintenance of the atmosphere in the confined space is dependent on mechanical ventilation equipment, the equipment must be continuously monitored while the confined space is occupied and the controls must be clearly identified and tagged to guard against unauthorised operation.

4.8 Advice of Intention to Enter

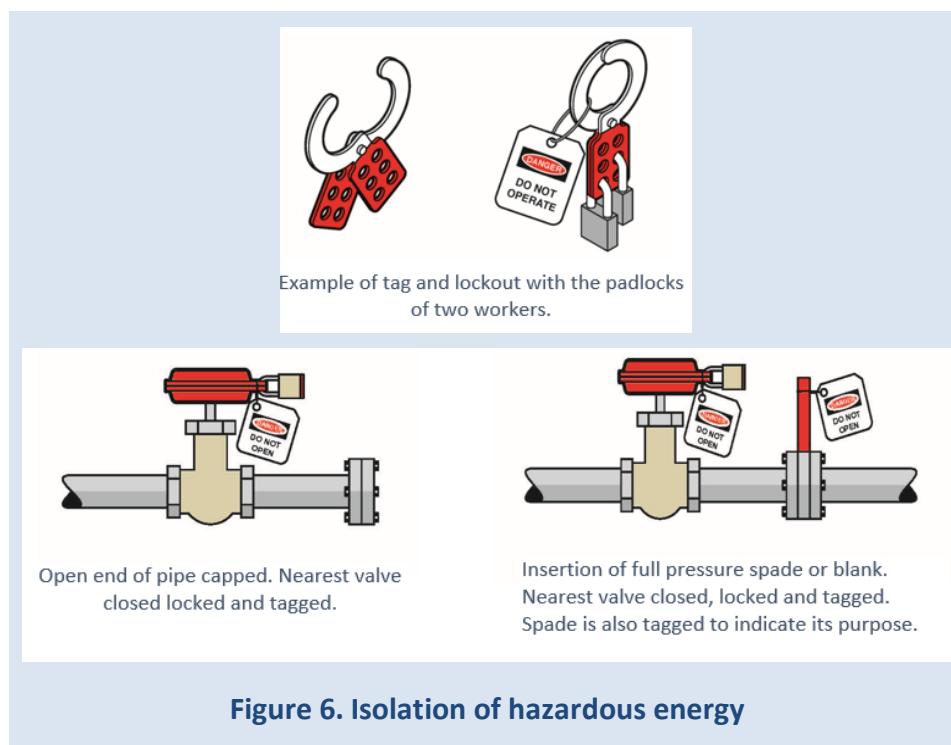
The Supervisor of the relevant area shall be advised of entry into confined spaces occurring in their area.

When the confined space work has finished and the permit relinquished, the Supervisor should be informed.

4.9 Isolation Requirements

Prior to any person entering a confined space, all potentially hazardous services normally connected to the space shall, where it is possible to do so, be isolated in order to prevent:

- The introduction of any materials, contaminants, agents or conditions harmful to persons occupying the confined space: and
- The activation or energising in any way of equipment or services that could pose a risk to the health or safety of persons within the confined space.



Equipment or devices with stored energy, including hydraulic, pneumatic, electrical, chemical, mechanical, thermal or other types of energy, should be reduced to a zero-energy condition so that no energy is left in devices and systems that could cause injury or illness.

If the confined space has agitators, blades and other moving equipment, consider chocking, wedging, chaining or removing these parts. Alternatively, de-energise the equipment, lockout and tag out machinery, mixers, agitators and other equipment containing moving parts in the confined space. This may require additional isolation, blocking or de-energising of the machinery itself to guard against the release of stored energy.

When a lock is used, the key should be kept in the possession of the person placing the lock. Spare keys should not be accessible except in emergencies. The tag should indicate that a person is in the confined space and that such isolation should not be removed until all people have left the confined space.



Further information

- Refer to the MIA Isolation of Hazardous Energy Standard; and
- Internal procedures for Isolation of Hazardous Energy

4.10 Gas Cylinders and Hoses

No cylinder of compressed or liquefied gas is to be taken into a confined space except for those cylinders used with self-contained breathing apparatus. Hoses supplying gas-operated equipment used in a confined space must be located, suspended or otherwise guarded to avoid accidental damage. Hoses must be tested for leaks prior to installation.

4.11 Confined Space Harness

A harness should be used for all work in confined spaces and worn by any person/s who enter a confined space. A suitable retrieval method will be used, with a rated cord/rope attached to the harness and extended through the exit point of the confined space to the Stand-by Person. Suitable knots and fixtures will be used by a competent person to ensure that the attachment of the cord/rope to the harness is secure and will remain in place for the duration of the confined space entry task.

The confined space fall-arrest harness will comply with the requirements of all fall-arrest harnesses as described in AS/NZS 1891.4

Where harnesses are required **only** workers with evidence of the minimum competency may enter the confined space.

4.12 Hot Work

In confined spaces that previously contained dry material capable of creating a flammable or explosive atmosphere when dispersed in air (e.g. combustible dusts), permits to work should be issued only after inspection has ensured that loose dust has been removed from the confined space, and all appropriate surfaces have been cleaned, or the material has been rendered safe (by wetting grain dust, for example).

The following fire prevention measures are mandatory:

- All combustibles in the vicinity of the hot work must be moved to a safe place
- A pressurised fire hose or other suitable extinguishing equipment must be available
- A fire watch must be assigned while the hot work is being performed. The fire watch can be the Standby Person
- When gas cutting is suspended for a period of time, such as during lunch breaks or overnight, the torch and cylinder valves must be closed. The torch and hose must be removed from the confined space.

When arc welding is suspended for a period of time, such as during lunch breaks or overnight, the power source to the equipment must be de-energised, all electrodes removed from holders and the holders positioned so that accidental contact or arcing cannot occur.

4.12.1 Control of fumes and vapours

In a confined space, all surfaces covered with coatings that decompose or volatilise under hot work into toxic, flammable, corrosive or irritant components, must be stripped from the area of heat application. Coatings must also be removed a sufficient distance from the area to be heated in order to minimise the temperature increase of the unstripped metal. Additionally, artificial cooling of the metal surrounding the hot work area may be necessary to limit the size of the area required to be cleaned.

Means must be provided to ventilate contaminated air from the confined space and introduce fresh air. The exhaust suction point should be provided as close to the source of hot works as possible.

4.12.2 Permits to work

When the area contains or contained a flammable liquid, vapour or gas, the permit should only be issued after inspection or testing has ensured the following factors have been considered:


- The concentration of flammable vapours or gases in the atmosphere
- That liquid and solid residues have been removed to prevent the release of flammable substances that may raise the concentration of flammable substances in the atmosphere

- The concentration of flammable vapours or gases within any piping within the confined space or connected to it
- LEV (local exhaust ventilation) may be required to ensure that fumes from welding/gas cutting are removed from the working area safely.

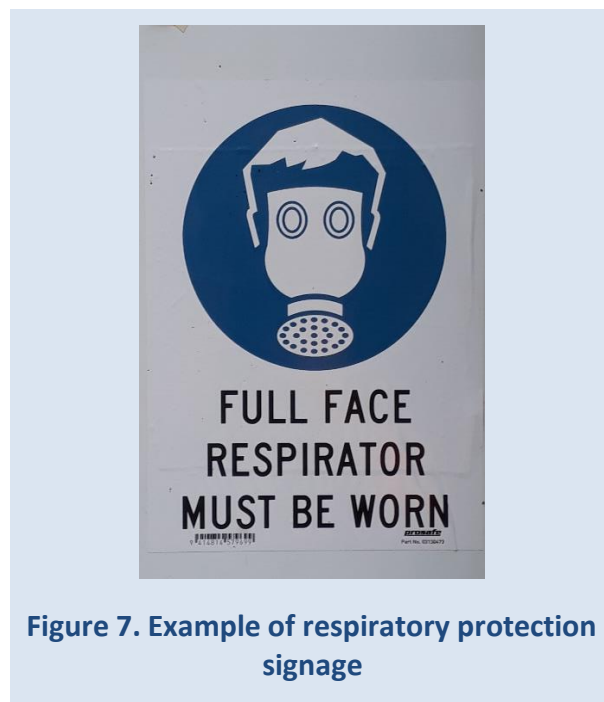
4.13 Respiratory Protective Devices

There are two types of conditions of entry used for confined spaces:

- **Standard Entry** - conditions favourable to enter and work in a confined space without the need for personal breathing equipment (supplied air or self-contained breathing apparatus (SCBA) equipment) however all other precautions need to be taken as highlighted in this document.
- **SCBA Entry** - entry permission is given only to persons wearing approved supplied air or self-contained breathing apparatus (SCBA) equipment.

	<p>Hazard</p> <p>The use of SCBA equipment has its own risks. Only fully trained, competent workers who have been specifically authorised to do so are permitted to undertake a SCBA Entry into a confined space.</p>
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Where the concentration of oxygen in the atmosphere cannot be maintained in the safe range or where airborne contaminants that may cause impairment, loss of consciousness or asphyxiation cannot be reduced to below the relevant exposure standards, no person shall enter the confined space unless they are equipped with supplied air or self-contained breathing apparatus (SCBA) equipment and other appropriate PPE.



The following criteria define a hazardous atmosphere and entry must not be permitted without breathing apparatus:

- Flammable gas, vapour or mist equal to or greater than 5% of the lower explosive limit (LEL)
- Airborne combustible dust at a concentration of 5% LEL or greater
- Oxygen concentration less than 19.5% or greater than 23.5%
- The hydrocarbon level is equal to or above 5% of LEL
- The carbon monoxide level is equal to or greater than 12.5 ppm
- The hydrogen sulphide level is equal to or greater than 5 ppm
- Any airborne contaminant that may expose a worker to above an acceptable dose or permissible exposure limit

It is important that all tasks to be performed are evaluated, particularly those that may create changes in conditions within the space.

Where persons have entered the confined space and the concentration of flammable airborne contaminant in the atmosphere of the confined space has been found to be equal to or greater than 5% LEL and less than 10% LEL, **the person shall be removed unless continuous monitoring with a suitably calibrated explosive atmosphere substance detector is used in the confined space at all times while persons are present.** Where the concentration of flammable airborne contaminants has been found to be at 10% LEL or greater, no person shall remain in the confined space.

It is important that there is careful inspection of all areas of confined spaces as potentially hazardous concentrations of contaminants may be trapped in sludge, brickwork, fittings etc. These contaminants may only be released when they are disturbed or heat is applied.

All respirator protective devices used for confined space entry must comply with AS/NZS 1715:2009 and AS/NZS 1716:2012.

4.14 Maintenance of Equipment

Proper maintenance of control measures is an integral part of any safe system of work. Maintenance may involve visual checks, inspections, testing of equipment, preventative maintenance and remedial work.



Best practice advice

Equipment that should be regularly inspected includes:

- Atmospheric testing and sampling equipment
- Personal protective equipment including respirators
- Ventilation equipment
- Safety harness and lines
- Emergency rescue equipment.

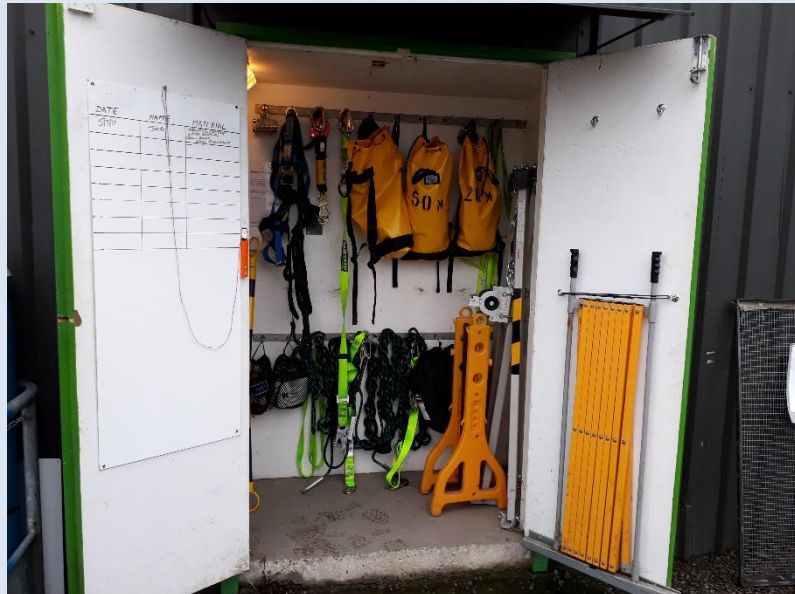


Photo 7. Ensure Equipment is stored, cleaned and maintained as per the manufacturer's instructions

4.15 Emergency Response/Rescue Procedures



Best practice advice

In a confined space emergency, the spontaneous reaction to immediately enter and attempt to rescue a person from a confined space could lead to the death or serious injury of those attempting the rescue.

All persons who might be involved in any way with emergency response associated with a confined space should be made aware that emergency response procedures are to be followed at all times.

4.15.1 Identification of possible emergency scenarios

Appropriate emergency response procedures and provisions shall be identified, planned, established and rehearsed. Supervisors must ensure that the types of emergencies likely to occur in confined spaces are identified as part of a Job Safety Analysis and rescue procedures are communicated prior to entry. Consideration must be given to the following:

- Evacuation or self-rescue situations
- Incidents with moderate injury where the person is evacuated but requires first aid or medical treatment outside the confined space.
- Incidents where entry by first aiders is necessary to treat injured person before removal from the confined space.
- Incidents where assistance is required from outside to rescue the person(s) from the confined space.
- Incidents requiring the rescue team to enter the confined space to rescue the person(s) within the space.
- Identification and control of hazards generated by the rescue process

4.15.2 Developing Emergency/Rescue Procedures

When establishing emergency procedures, the following must be considered:

- The nature of the confined space
- Any hazards associated with the level (or any change in the level) of oxygen and/or atmospheric contaminants
- The work to be done and the work method including equipment required to undertake the work
- Work done outside the confined space
- Means of entry and exit
- The location of the confined space
- Means of communication
- Rescue and resuscitation equipment
- Capabilities of rescuers
- First aid provisions
- Fire suppression equipment

- Local emergency services
- Rehearsal

Potential problems with the size of entrances and exits must be addressed when developing emergency and rescue procedures. Where openings are found to be inadequate, their size should be increased, or an alternative safe means of entry and exit should be provided.



Photo 8. Emergency equipment



Photo 9. PPE and rescue equipment



Photo 10. First aid equipment



Photo 11. Radio communications

4.15.3 Testing of emergency response and rescue procedure

- First aid and rescue procedures must be rehearsed with relevant workers to ensure they are efficient and effective.
- A testing schedule for all rescue equipment must be put in place.
- Rescuers required to wear breathing apparatus must maintain competency following initial training

- All precautions that would be taken in an actual emergency should also be taken in a test or exercise – always treat as a real emergency.

**Best practice advice**

Remember, key points about rescue:

- Rescue should be performed from outside the confined space, if possible.
- Rescuers must be provided with and wear appropriate respiratory protective equipment if they enter a confined space in an emergency.
- Workers performing rescue must be adequately trained (even in test or exercise scenarios)
- If a person inside a confined space has been overcome by lack of oxygen or airborne contaminants, it should always be assumed that entry for rescue is unsafe unless air-supplied respiratory protective equipment is used.

4.16 Training & competency

Workers and their supervisors must have the skills and knowledge to understand the hazards associated with working in the confined space, the contents of any confined space entry permit, and the control measures implemented for their protection.

Appropriate training must be provided to workers who:

- Enter or work in confined spaces
- Undertake hazard identification or risk assessment in relation to a confined space
- Implement risk control measures
- Issue entry permits
- Act as a stand-by person or communicate with workers in a confined space
- 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.

All persons with work activities related to a confined space shall be trained and assessed as competent to perform those activities. The training must be undertaken by a nationally accredited training provider and include at least the following:


- The hazards associated with confined spaces
- Undertake hazard identification and risk assessment procedures
- Implement risk control measures
- Emergency procedures and the use of suitable first aid and rescue equipment (including confined space fall-arrest harness)
- The selection, use, fit and maintenance of safety equipment including respiratory devices
- The use of any other equipment provided for the work in the confined space

- Legislative requirements and safe procedures for working in confined spaces

All trained persons shall have their competency reassessed as specified by the approved training organisation or three-yearly (whichever is the minimum timeframe) to ensure their ongoing competency to perform the activities relevant to their entry and the work associated with confined spaces.

Records of training must be kept for at least five years from the date of the training.

4.16.1 Training and Competency Requirements

	<p>Consideration</p> <p>An example of a training programme structure to meet competency requirements is provided below. There may be other ways to ensure competency.</p>
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Confined Space (only)

Role	Permit Issuer	Permit Receiver	Confined Space (Plan)	Confined Space (Hazards)	Gas Testing	First aid
NZQA Unit Standard	17590	17588	17599	18426	25510	06400, 06401, 06402
Permit Issuer	✓		✓	✓	✓	
Permit Receiver		✓	✓	✓	✓	✓
Stand-by Person			✓	✓	✓	✓
Confined Space Entrant			✓	✓	✓	✓

Hot work in a confined space

Role	Confined Space	Fire suppression
NZQA Unit Standard	As above (0)	03271, 04647
Permit Issuer	As above (0)	
Permit Receiver	As above (0)	
Stand-by Person	As above (0)	✓
Confined Space Entrant	As above (0)	✓

Use of harness in confined space and/or risk of free fall

Role	Confined Space	Harness use	Height (safe work)	Height (temp. safety systems)
NZQA Unit Standard	As above (0)	23229	17600	15757

Role	Confined Space	Harness use	Height (safe work)	Height (temp. safety systems)
Permit Issuer	As above (0)			
Permit Receiver	As above (0)		✓	✓
Stand-by Person	As above (0)	✓	✓	✓
Confined Space Entrant	As above (0)	✓	✓	✓

4.17 Design and Installation

4.17.1 Design, manufacture or modification

In design of plant, structures or processes, the need to enter a confined space or the risk of inadvertent entry should be completely eliminated or, if that is not achievable, minimised. The design stage should consider the whole life cycle of the plant or structure, from manufacture and use through to demolition and disposal.

The following features should be incorporated in the design and manufacturing stages:

- Provision of outlets and facilities for cleaning to eliminate the need for entry
- Use of lining materials that are durable, require minimal cleaning and do not react with materials contained in the confined space
- Design of the structure and mechanical parts to provide for safe and easy maintenance to reduce the need for persons to enter
- Provision of ventilation or drain valves to prevent build-up
- Design of the structure to open up for maintenance.

4.17.2 Entry and exit

If it is not reasonably practicable to eliminate entry into the confined space, then any risk associated with entry to and exit from the space must be minimised. Entry to and exit from a confined space is safer when openings (access points) are large and located in a position that allows for persons and equipment to pass easily through them.



Further information

For further guidance on design, manufacture or modification of confined spaces refer to:

- **AS 2865:2009 Safe Working in a Confined Space, section 2.4 & Appendix C.**

5 Reference Documents



Further information

- New Zealand's key work health and safety legislation is the Health and Safety at Work Act 2015 (HSWA) and regulations made under that Act. Compliance with all statutory requirements with the HSWA Act 2015 and other applicable acts and/or regulations is mandatory.
- New Zealand 'Codes of practice' (CoP or ACoP) are documents that offer an approved method of achieving compliance with regulatory requirements. A code of practice will tell you how to meet the Act or regulation requirements and controls in a way that is legally defensible. They are not mandatory and you can adopt other ways of meeting the requirements instead.
- 'Good Practice Guidelines' (GPG) are a guide to what WorkSafe New Zealand considers good practice. Health and safety inspectors may use these guidelines when visiting workplaces or conducting investigations.
- Other types of guidance including webpages, fact sheets or brochures is provided for information only. Compliance to these forms of guidance may have **limited** bearing under the law.

5.1 Relevant legislation & regulations

Compliance with all statutory requirements is mandatory. This includes requirements associated with safety, contracting work, equipment and system design, supply, testing, installation and maintenance.

Relevant legislation includes, but is not limited to:

5.1.1 Safety general

Health and Safety At Work Act 2015 (HSAW Act 2015)

<http://www.legislation.govt.nz/act/public/2015/0070/latest/DLM5976660.html>

Health and Safety at Work (General Risk and Workplace Management) Regulations 2016

<http://www.legislation.govt.nz/regulation/public/2016/0013/latest/DLM6727530.html>

5.2 Codes, Standards & Guidance

5.2.1 New Zealand

AS 2865:2009 Safe Working in a Confined Space (accepted as Best Practice standard by WorkSafe)

<https://infostore.saiglobal.com/store/details.aspx?ProductID=1137140>

AS/NZS 1891.4:2009 Industrial fall-arrest systems, selection, use and maintenance

AS/NZS 1715:2009 Selection, use and maintenance of respiratory protective equipment

AS/NZS2210.3 Safety, protective and occupational footwear - Guide to selection, care and use

AS/NZS 1716:2012 Respiratory protective devices

AS/NZS 1319:1994 Safety signs for the occupational environment

AS/NZS1337: 1992 Personal Eye Protection (and other parts)

Workplace Exposure Standards and Biological Exposure Indices (latest version June 2016)

<http://www.worksafe.govt.nz/worksafe/information-guidance/all-guidance-items/workplace-exposure-standards-and-biological-exposure-indices>

Note: This may not be an exhaustive list. Refer to a subject matter expert for more detail or with any query about requirements.

5.2.2 Other countries

Confined Spaces (Model) Code of Practice, Australia (latest version Feb 2016)

<https://www.safeworkaustralia.gov.au/doc/model-code-practice-confined-spaces>

Confined spaces (toolbox and resources) – HSE, UK

<http://www.hse.gov.uk/confinedspace/>

Confined Spaces – OSHA, USA

<https://www.osha.gov/SLTC/confinedspaces/>

6 Appendix A: Confined Space Permit (example only)

Site Location		Permit No.:	
Date:	Start time:	Est Finish time:	
Company Name:		Phone:	
		Email:	
Description of Work/Purpose of Entry:			
Names of Persons Entering Confined Space:			
Confined Space/Asset Number:			
Has WorkSafe NZ been notified (if BA used): Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>		Notification form attached: Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	
Are other Permit Certificates Required? (Hot Work/Work at height/ Isolation of Energy) Yes <input type="checkbox"/> No <input type="checkbox"/>		Appropriate Certificates Obtained (attached) Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	
Tools Used:		Tools Certified/Test and Tag? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Method of Communication:			
Tenant notified (if applicable) Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>		Date Tenant Notified:	
Tenant Permission if applicable (name and signature)			
Name of Stand-by Person:		Traffic Management Plan Accepted Yes <input type="checkbox"/> NA <input type="checkbox"/>	
Task Analysis Accepted <input type="checkbox"/>	Additional Controls (NB. Minor only permitted – where significant documentation must be reviewed in full):		
Emergency Plan Accepted <input type="checkbox"/>			

Site Inspection Before Work Starts

Date of Site Inspection:

How was the Confined Space Cleaned?			
Flushed with water <input type="checkbox"/>	Purged with inert gas <input type="checkbox"/>	Drained of Liquid <input type="checkbox"/>	Specify cleansing agent used:

Hazardous Energy Isolation (Permit Issuer ticks the isolation checks below when satisfied that the isolation is in place)				
Hazard	Location	How isolated?	How identified?	Tick
Pipelines (water, steam, gas, liquid etc)				<input type="checkbox"/>
Mechanical and Electrical drives				<input type="checkbox"/>
Sludges, deposits, wastes				<input type="checkbox"/>
Harmful materials/substances				<input type="checkbox"/>
Electrical Services				<input type="checkbox"/>
Radiation Sources				<input type="checkbox"/>
Auto fire extinguishing systems				<input type="checkbox"/>

Atmosphere (The atmosphere in the confined space has been tested after isolation and ventilation protocols)				
	Method of measurement	Result	Conditions of Entry	
Oxygen concentration	<19.5% or >23.5%		With Supplied-air respirator	<input type="checkbox"/>
Flammable Gas, vapour, mist	=/>5% LEL		Without respiratory protection	<input type="checkbox"/>
Hydrocarbon	=/>5% LEL		With escape unit	<input type="checkbox"/>
Carbon Monoxide	=/>12.5 ppm		Personal Atmospheric Monitoring	<input type="checkbox"/>
Hydrogen Sulphide	=/>5 ppm			
Airborne Combustible Dust	=/>5% LEL			
Max people to enter space:		Max time of entry:	Rest time between entries:	
Name:		Signature PI/AGT:	Date / Time:	

PPE Required – the following PPE is required.

Fresh Air Breathing Set <input type="checkbox"/>	Respiratory equipment <input type="checkbox"/>	Eye Protection <input type="checkbox"/>	Hearing Protection <input type="checkbox"/>
Rescue Line and 5 Point Harness <input type="checkbox"/>	Hand Protection <input type="checkbox"/>	Safety Footwear <input type="checkbox"/>	Safety Helmet <input type="checkbox"/>

Equipment and Emergency Arrangements – the following are required to be in place before work commences

Access/egress ladder <input type="checkbox"/>	Fire Extinguisher <input type="checkbox"/>	Temperature: <30 degrees C <input type="checkbox"/>	Safety Guardrail/cover at manhole <input type="checkbox"/>
Means of Communication <input type="checkbox"/>	Emergency Plan – practised <input type="checkbox"/>	Emergency Recovery Equipment <input type="checkbox"/>	Warning Signals understood by all <input type="checkbox"/>
Ventilation: Continuous <input type="checkbox"/>	Forced Air <input type="checkbox"/>	PPE (Respirator) <input type="checkbox"/>	Intrinsically Safe Equipment Yes <input type="checkbox"/> No <input type="checkbox"/>

Confined Space Entrants Initials By initialling this Certificate, I confirm that I have read and understood the Permit and this Certificate, and I have been given an opportunity to ask questions about the risks, hazards, and controls by the Permit Receiver.

Name	Initials	Date

Permit Issuer and Permit Receiver both to sign this Certificate. I confirm that I have reviewed the safe precautions and am satisfied the risks and hazards have been controlled appropriately.			
Permit Issuer (name):		Permit Receiver (name):	
Signature:	Date:	Signature:	Date:

Tests performed: I confirm that I have tested the confined space for gas and/or oxygen and that the results are within the specified acceptance levels.

Time of Test	Initials of Tester	Oxygen 19.5-23.5%	Carbon Monoxide = />12.5 ppm	Hydrocarbon = />5% LEL	Hydrogen Sulphide = />5 ppm	Flammable Gas, Vapour, Mist = />5% LEL	Airborne Combustible Dust = />5% LEL

7 Appendix B: High Risk Work Rescue Plan (example only)

Work details			
Site name		Work order #	
Location on site		GPS coordinates	
Plan developed by		Date	
Related permits	<input type="checkbox"/> Confined Space Entry Permit <input type="checkbox"/> Other:		

Emergency communication requirements	
Emergency phone number: from a digital mobile phone	Emergency radio channel (if applicable):
Incident hotline:	Emergency assembly location:

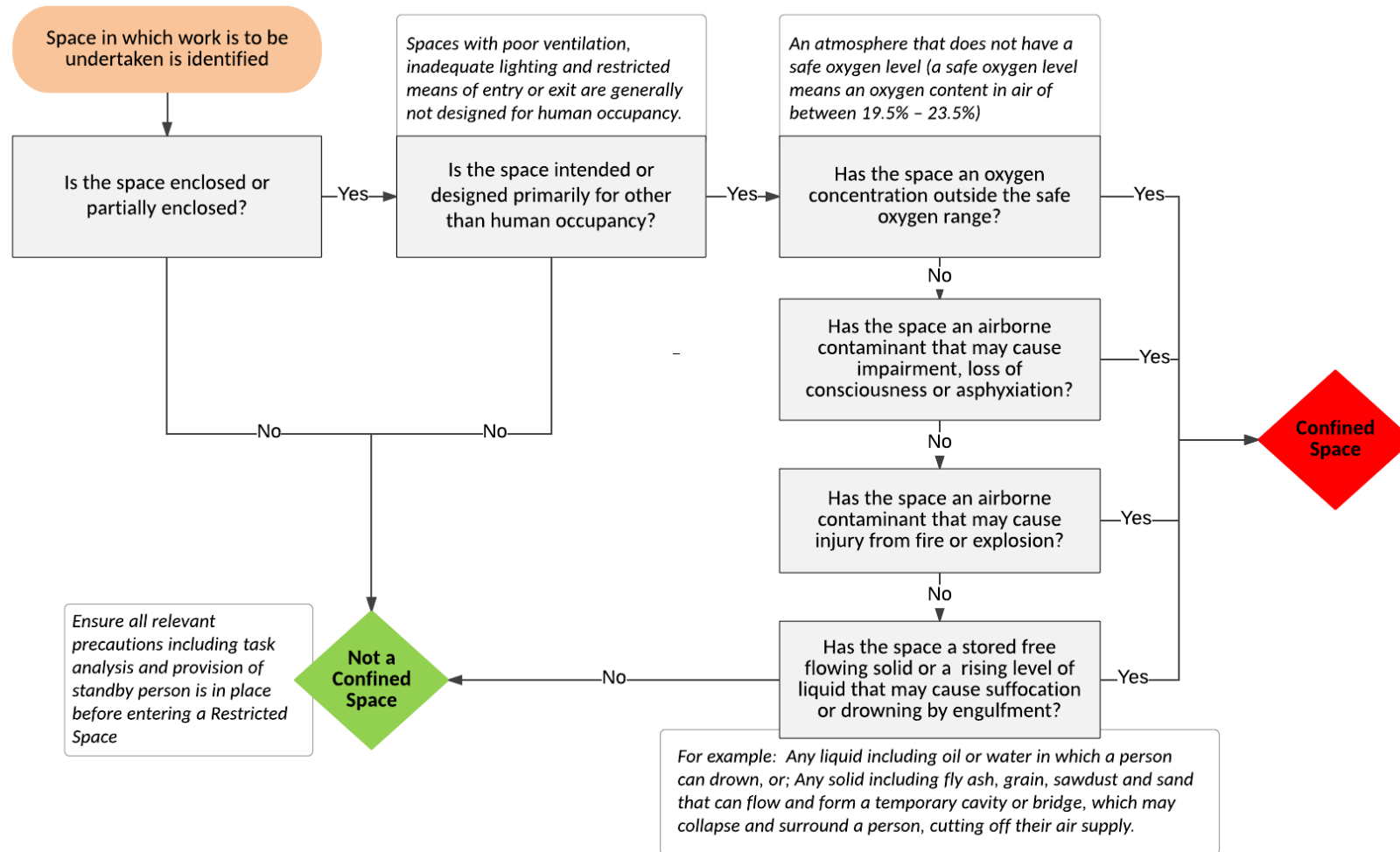
Potential rescue situations	
<input type="checkbox"/> Engulfment <input type="checkbox"/> Height <input type="checkbox"/> Hazardous atmosphere <input type="checkbox"/> Hazardous chemicals <input type="checkbox"/> Fire <input type="checkbox"/> Electrical <input type="checkbox"/> Other:	
Will entry and exit to the work area impact on any emergency rescue? <input type="checkbox"/> Yes <input type="checkbox"/> No (if YES must addressed in rescue plan)	

Emergency equipment requirements		
<input type="checkbox"/> Harness <input type="checkbox"/> Life / rescue line <input type="checkbox"/> Tripod / davit / anchor points <input type="checkbox"/> Polycarbonate slide sheet <input type="checkbox"/> Hazardous chemical suit <input type="checkbox"/> Crane	<input type="checkbox"/> First aid kit <input type="checkbox"/> Basket stretcher <input type="checkbox"/> Roll-up stretcher <input type="checkbox"/> Rescue strop <input type="checkbox"/> Satellite / mobile phone <input type="checkbox"/> Gas detector	<input type="checkbox"/> Breathing apparatus <input type="checkbox"/> Oxygen resuscitation equipment (Oxy-Viva) <input type="checkbox"/> Lighting <input type="checkbox"/> Fire fighting equipment <input type="checkbox"/> Ventilation equipment <input type="checkbox"/> Defibrillator
Other rescue equipment requirements:		
<div>Rescue equipment must be available at the job location prior to commencing the work activity.</div>		

Rescue plan (insert photo / drawing and notes)			
		Plan includes: <input type="checkbox"/> Entry and exit points <input type="checkbox"/> Location of rescue equipment <input type="checkbox"/> Evacuation point/s <input type="checkbox"/> Emergency assembly area <input type="checkbox"/> Location of identified hazards <input type="checkbox"/> Participants in rescue party <input type="checkbox"/> Role of each participant <input type="checkbox"/> Location of workers involved in rescue <input type="checkbox"/> Other:	
Rescue plan notes:			
Briefing requirements			
Participants in the rescue party been briefed on the rescue plan prior to the work commencing	Y <input type="checkbox"/>	Rescue equipment checked	Y <input type="checkbox"/>

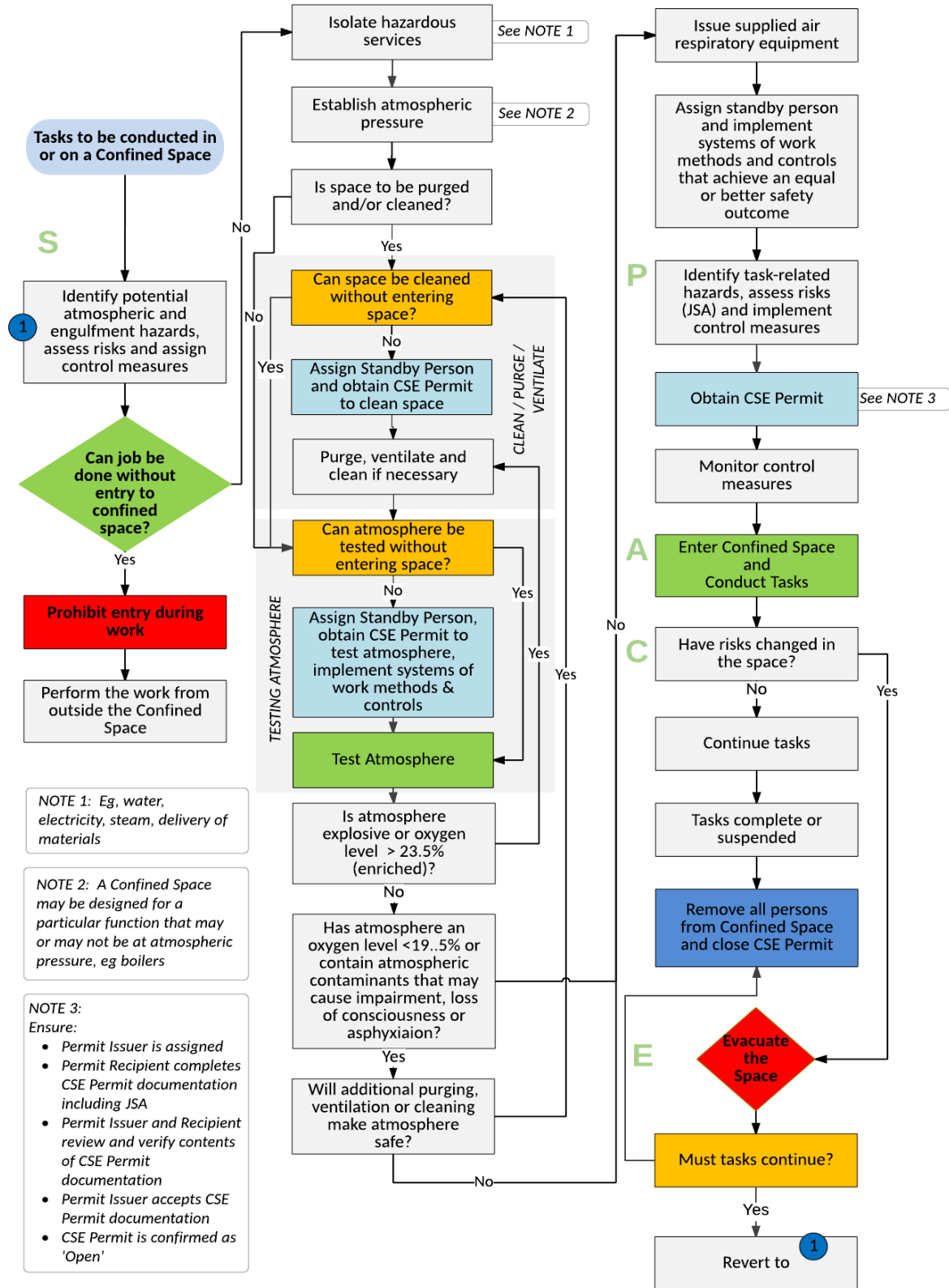
8 Appendix C: Identification of Confined Spaces Flow Chart (from AS 2865:2009)

Identification of Confined Spaces



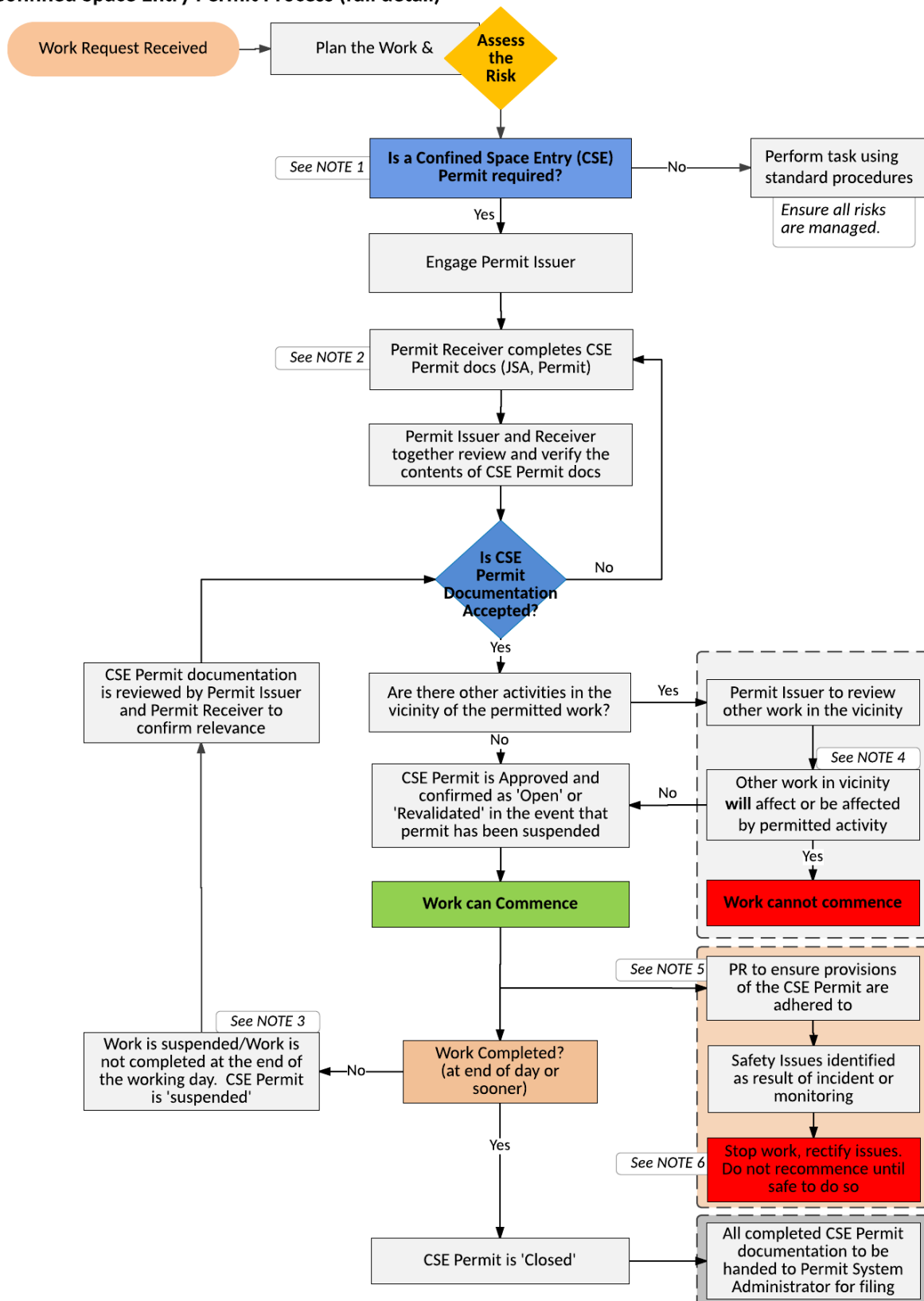
9 Appendix D: Confined Space Entry Flow Chart

Confined Space Entry



10 Appendix E: Confined Space Entry Permit (full detail)

Confined Space Entry Permit Process (full detail)



Notes

1	A CSE Permit is required to enter any confined space.
2	<p>CSE Permit documentation includes:</p> <ul style="list-style-type: none"> • Job Safety Analysis • Emergency Response Plan • CSE Permit • Other documentation (as required) <p>All relevant parties associated with the work and the site must provide input and agree hazards and appropriate controls.</p> <p>The competency of all relevant persons must be confirmed</p>
3	<p>The work will be suspended if:</p> <ul style="list-style-type: none"> • The specified equipment or tools are not available • The type of work changes • The process conditions change • An emergency occurs in the area • Weather conditions change • Conflicting work is being undertaken • The working day ends. • The CSE Permit is classed as 'suspended'. <p>No work may recommence until the CSE Permit is revalidated.</p>
4	Permit Issuer must confirm that other work in the vicinity does not present an intolerable risk and determine appropriate controls to ensure risk is managed to a level SFAIRP.
5	The work must be actively and regularly monitored by the PR and PI as determined by the CSE Permit.
6	Report and record the event in the Health and Safety Database.

11 Appendix F: Confined Space Emergency Response Flow Chart

Confined Space Entry Emergency Response

