

RIIWHS202E

Enter and Work in Confined Spaces

Learner Guide Instructions

Who is this document for?

The learner.

What is in this document?

- Course information that matches the PowerPoint presentation.
- Review questions.
- Practical assessment instructions for learners.

What do you need to do before you use it for the first time?

1. Rebrand the document.
2. Review the document as part of your validation process.
3. Set the reading and test time limits that are highlighted in pink at the end of the document.

See the 'Read Me First' document for a complete set of instructions on how to use these resources.

LEARNER GUIDE

RIIWH5202E Enter and Work in Confined Spaces

Learner Name:	
Learner ID:	
Learner Contact Number:	
Learner Email Address:	
Date Training Commenced:	

This Book Contains:

- Course Information.
- Review Questions.
- Practical Assessment overview and instructions.

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1.1 Introduction

These training materials are based on the National Unit of Competency **RIIWH202E Enter and Work in Confined Spaces**.



1.1.1 Overview

You will learn about:

- ◆ How to identify a confined space.
- ◆ Planning out confined spaces work.
- ◆ Confined spaces entry permits.
- ◆ Choosing and checking safety equipment.
- ◆ Preparing and working safely in a confined space.
- ◆ Exiting the confined space and finishing the work.



1.1.2 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.

The Code of Practice defines a confined space as an enclosed or partially enclosed space that:

- ◆ Is not designed or intended to be occupied by a person, and
- ◆ Is, or is designed or intended to be, at normal atmospheric pressure while any person is in the space; and
- ◆ Is, or is likely to be a risk to health and safety from:
 - ◇ An atmosphere that does not have a safe oxygen level, or
 - ◇ Contaminants, including airborne gases, vapours and dusts, that may cause injury from fire or explosion, or
 - ◇ Harmful concentrations of any airborne contaminants, or
 - ◇ Engulfment.
- ◆ Is not a mine shaft or workings of a mine.

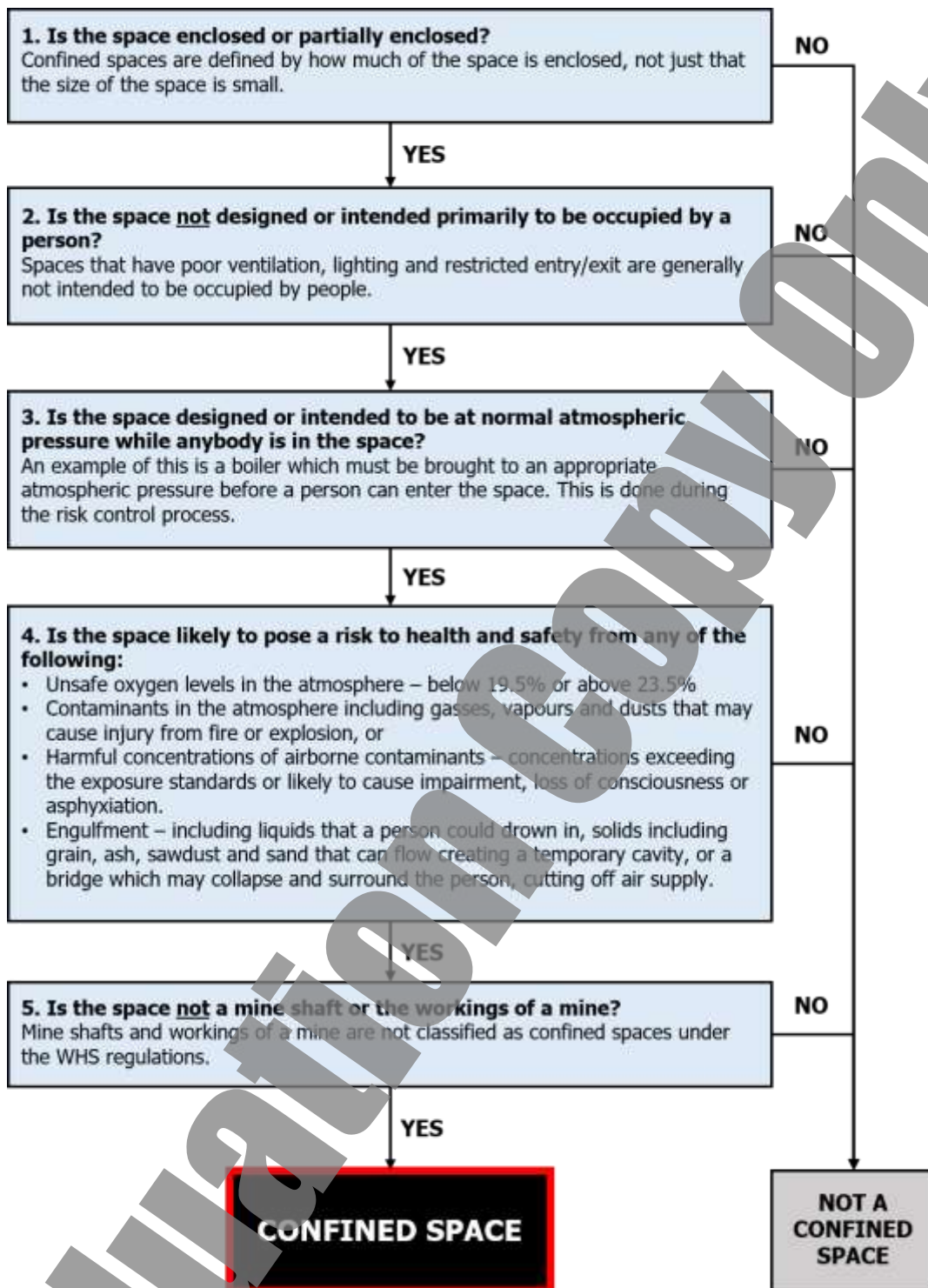
Confined spaces may be found in:

- ◆ Culverts and storm water systems.
- ◆ Pipes and live or inactive underground sewer mains.
- ◆ Shafts, ducts and access chambers.
- ◆ Pits or trenches.
- ◆ Wet or dry wells.
- ◆ Flues and chimneys.
- ◆ Environmental traps and tanks.
- ◆ Box girders and bridge voids.
- ◆ Storage tanks, process vessels, boilers, pressure vessels, silos and other tank-like compartments and containers.
- ◆ Tunnels or other similar enclosed or partially enclosed structures, when these examples meet the definition of a confined space in the WHS Regulations.

Entry into a confined space means a person's head or upper body is in the confined space or within the boundary of the confined space.



You can use a chart like the one shown below to work out if the work area is a confined space.



NOTE: This chart reflects the definition of a confined space as it appears in the model code of practice and Work Health & Safety (WHS) regulations.

1.1.3 What is Not Classified as a Confined Space?

Sometimes when a space is small we might think of it as a confined space, but that is not always the case. The following are examples of spaces that are not classified as a confined space in the WHS regulations:

Example	Reason Why it is Not Classed as a Confined Space
Mine shafts or workings of a mine.	They are spaces intended to be occupied by personnel and fall under a different classification in the regulations. They are governed by specific risk assessment and treatment requirements.
Offices and workshops.	They are spaces intended for people to occupy them and generally have adequate ventilation, lighting and safe means of entry or exit.
Abrasive blasting or spray-painting booths.	While it has harmful airborne contaminants at times, it is primarily designed for a person to occupy.
Enclosed or partially enclosed spaces (e.g. a cool room or shipping container).	They generally have easily accessible means for entry and exit.
Trenches.	The risk of collapse alone is not enough to be classified as a confined space. However, if there are unsafe concentrations of airborne contaminants that classification would change.



1.2 Confined Space Hazards

There are a range of hazards that may exist in confined spaces:

- ◆ Unsafe oxygen levels.
- ◆ Fires and explosions.
- ◆ Atmospheric hazards.
- ◆ The effect of irrespirable atmospheres on the respiratory system.
- ◆ Other hazards.



You need to be aware of the different hazards that can exist in a confined space and the effect they can have.

1.2.1 Unsafe Oxygen Levels



Levels of oxygen within a confined space that are too low (below 19.5%) or too high (above 23.5%) are a major hazard.

The oxygen levels inside a confined space may fall below a safe level for the following reasons:

- ◆ The combustion of flammable materials (for example welding or cutting).
- ◆ Slow bacterial reactions of organic substances (for example sewerage).
- ◆ Reaction of inorganic substances (for example rust).
- ◆ Oxygen absorbed by materials (for example grain in silos).
- ◆ Oxygen displaced by another gas (for example nitrogen used to remove toxic fumes).
- ◆ High oxygen consumption rate (for example many people working in a small confined space).

Leakage from oxygen lines, pipes, and fittings can raise the level of the atmosphere causing a fire, explosion or breathing hazard.

1.2.2 Fires and Explosions

'Hot work' like welding and thermal or oxygen cutting can create excessive heat, sparks and increase the risk of fires or explosions.

Fires and explosions can be caused by:

- Open flames (for example welding torches).
- Hot surfaces (for example steam lines).
- Frictional sparks (for example a metal tool striking another object).
- Incorrectly installed wires or overloaded fittings.
- Static electricity sparks (for example from synthetic clothing).
- A spark or heat produced by electrical equipment (for example a mobile phone or flashlight).

Combustible or flammable dusts can also be found in confined spaces like storage bins or grain silos.

1.2.3 Atmospheric Hazards

Dusts, gases, fumes, mists and vapours are common hazards in workplace air. These can seriously affect the health of workers.



Hazardous dusts, gases, fumes, mists and vapours can occur in a confined space because of:

- ◆ The work processes being done (for example spray painting).
- ◆ Spills or leaks from pipes or machinery.
- ◆ Disturbance of materials (for example walking through a shallow liquid substance).
- ◆ The storage or transfer of materials (for example grain).
- ◆ Gases in stormwater drains and sewers.
- ◆ Chemical reactions between substances.
- ◆ Exhaust gases from pumps or other machinery being drawn into the confined space by ventilation fans.

Residue left in confined spaces such as empty tanks and containers can cause a build-up of toxic or explosive gases.

Toxic gases can quickly overcome and kill an unprotected worker.

Inhaling some chemicals, such as solvents, can damage many parts of the body including the brain. Welding fumes, smoke and mists from spray painting are also serious respiratory hazards and workers should be adequately protected from exposure to any of them.



Confined spaces must be monitored for dangerous gases or unsafe oxygen levels, which cause irrespirable atmospheres.

Irrespirable atmospheres are atmospheres that are unfit for breathing, or are incapable of supporting life.

Types of Irrespirable Atmospheres	Description
Asphyxiating Atmospheres	Asphyxiating atmospheres have low levels of oxygen. You will not be able to breath properly in any atmosphere that has less than 19.5% oxygen. Hypoxia is the result of inadequate oxygen. Signs of hypoxia include rapid breathing, gasping for air, blueness of skin, confusion, irritability, unconsciousness and death.
Toxic Atmospheres	Toxic atmospheres can occur due to the release of toxins and poisons in materials that have been burnt in a fire.
Air Contaminated with Smoke or Suspended Particles	Air that is contaminated with smoke or particles is unbreathable. Particles can settle in the lungs and will restrict the amount of oxygen that can be taken into the body. These particles within the lungs may then develop into other respiratory problems.

1.2.3.1 Types of Contaminants and Toxic Substances

Many toxic substances are commonly encountered in industry. The presence of toxic substances may be due to materials being stored or used, the work being performed, or may be generated by natural processes.

Exposure to toxic substances can produce disease, bodily injury, or death in unprotected workers.

Common gases or substances you will be monitoring for will include:

Chemical Asphyxiates	Hydrocarbons, carbon dioxide, carbon monoxide, hydrogen cyanide, and hydrogen sulphide.
Irritants and Corrosives	Chlorine, ammonia, and acid bases.
Flammable Gases	Acetylene, petroleum, methane, ethane, propane, and butane.
Narcotics	Can be explosive as well as cause respiratory issues.

It is important to determine the amounts of any toxic materials and substances potentially present in the workplace.

Unprotected workers must not be exposed to levels of toxic contaminants that exceed Permissible Exposure Limit (PEL) concentrations.

Ongoing monitoring is necessary to ensure that exposure levels have not changed in a way that requires the use of different or more rigorous procedures or equipment.



1.2.4 The Effect of Irrespirable Atmospheres on the Respiratory System



The respiratory system is made up of the mouth, nose, windpipe, lungs and pulmonary blood vessels that surround the lungs. In this body system, oxygen is put into the blood while carbon dioxide is breathed out. Without the respiratory system working properly you will die.

Respiration in healthy adults is normally approximately 16-20 breaths per minute. However, breathing rates can increase significantly when the body is exercising, stressed, or in poor atmospheres.

The lungs cannot keep breathing in irrespirable atmospheres for long periods (depending upon the type of atmosphere). Some atmospheres can burn the lungs, while others can cause problems such as hypoxia (a lack of oxygen), which can be deadly. It is for these reasons that a breathing apparatus is used when you need to work in an irrespirable atmosphere.

1.2.5 Other Hazards



Some materials stored in or around a confined space like grains, sawdust, or soil can completely surround and trap (engulf) a person in seconds. If they are not rescued immediately they will die within a few minutes.

It is important not to forget about psychological hazards such as stress and claustrophobia (fear of confined spaces). It can cause a person to panic, make poor decisions and use up oxygen quicker than somebody who is calm.

Other common hazards that you may find while working in or around confined spaces include:

- ◆ Underground services, such as water and waste pipes, electrical cables and gas pipelines.
- ◆ Excavations.
- ◆ Traffic.
- ◆ Entrapment.
- ◆ Uncontrolled introduction of substances.
- ◆ Environmental hazards such as poor lighting or heat and cold temperatures.
- ◆ Biological hazards such as viruses, bacteria or fungi.
- ◆ Limited head space or overhangs.
- ◆ Noise, rotational equipment or vibration.
- ◆ Sharp edges, protrusions or obstructions.
- ◆ Equipment or product mass.
- ◆ Mechanical hazards (for example injury from moving mechanical parts).
- ◆ Electrical hazards.
- ◆ Slippery surfaces, spills or leaks.
- ◆ Manual handling hazards.
- ◆ Restricted access and egress (entry and exit).



Once a hazard has been identified look for any workplace instructions that describe how to eliminate or control it.

Talk to other workers, your manager, supervisor, team leader or health & safety representative to find out if the hazard has already been addressed, or what methods are available for you to deal with it.

Review Questions

1.

List 5 examples of confined spaces.



1.

2.

3.

4.

5.

2.

What are 5 atmospheric elements that are hazardous?



1.

2.

3.

4.

5.

1.3 Work Safely



You must follow all safety rules and instructions when working in a confined space.

If you are not sure about what you should do, ask your boss or supervisor. They will tell you where you can find the information you need.

1.3.1 Health and Safety Rules

Every workplace has to follow laws and rules to keep everyone safe. There are 4 main types:

Acts and Legislation	These are laws that you have to follow.
Regulations	These explain what the law means.
Codes of Practice	These are instructions on how to follow the law, based on industry standards. There is a Code of Practice written for working safely in confined spaces that includes information about atmospheric testing and working with confined space permits.
Australian Standards	These tell you what the minimum requirement is for a job, product or hazard. AS2865 is the Australian Standard for working in confined spaces.

These requirements are the basis of all policies, procedures and safe work practices within a company and/or workplace.

1.3.2 Technical and Safety Information

Like laws and rules, technical and safety information is an important part of all procedures and practices for working safely.

Before starting any work in a confined space you need to make sure you have all technical and safety information for the job. This will help you to do your work in the safest way.



Technical and Safety Information	Description
Site Details	The information and safety requirements of the workplace environment (where you will be working) including isolation of services.
Hazard Details	Any hazards in the work area or related to the confined space. This could also include instructions on how to handle dangerous or hazardous materials.
Task Details	Instructions of what the work is or what you will be doing (this includes confined space work permits).
Manufacturers' Guidelines and Specifications	How to use and maintain tools, equipment and safety devices and systems.
Faulty Equipment Procedures	Isolation procedures to follow or forms to fill out.
Signage Requirements	Site signage used to warn others that some areas are not safe to be in, or that work is being completed.
Emergency Procedures	Instructions on what to do in emergency situations, for example if there is fire, or if first aid is needed.
Communication Procedures	Technical and safety information could also include workplace procedures for communication.

Review Questions

3.	What are the 4 main types of health and safety rules?	<input type="checkbox"/>
<p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p>		

4.	Other than manufacturer's specifications, where can you get technical and safety information for confined space work?	<input type="checkbox"/>