Confined Space Requirements

Introduction

Worksafe NZ defines a Confined Space as an enclosed or partially-enclosed space that is not intended or designed primarily for human occupancy. It is liable to have an atmosphere that contains harmful contaminants or may not contain a safe oxygen level. It may have contents that could cause engulfment. It may have restricted means for entry and exit.

Certain 'spaces' may not fit into the legislative definition of a 'Confined Space' and will be deemed as 'restricted spaces'. To assess this, use the Confined or Restricted Space Decision Tree (Appendix 1).

Examples of Confined Spaces at Auckland Airport include, but are not limited to:

- Manhole risers, pits or tank sumps.
- Excavations.
- Enclosed drains and sewers.
- Roof and ceiling cavities.
- Ancillary areas (trade waste pits, mechanical service pits, etc).

Scope

This document applies to all persons working for and on behalf of Auckland Airport, it summarises the expectations from the Health and Safety at Work Act 2015 & supporting regulations, guidance issued by WorkSafe NZ and Auckland Airport's Safety Management System (SMS).

For more details on confined spaces please refer to relevant legislation, regulations, guidance and components of Auckland Airport's SMS.

In addition to this, any person working in a Confined Space must meet the requirements of AS 2865:2009 – Safe working in a Confined Space.

Definitions

Term	Definition
Authorised gas tester:	The person responsible for Confined Space gas testing. The authorised gas tester carries out gas tests prior to entry and at the frequency specified on the Permit and supporting certificates.
Confined Space:	An enclosed or partially enclosed space that is at atmospheric pressure during occupancy and is not intended or designed primarily as a place of work.
Contaminant:	Any dust, fume, mist, vapour, biological matter, gas or other substance in liquid or solid form, the presence of which may be harmful to health and safety.
Entry (to a Confined Space):	When a person's head or upper body is within the boundary of the Confined Space.

Term	Definition
	Note: Inserting an arm for the purpose of atmospheric testing is not considered as entry to a Confined Space.
Exposure standard:	An airborne concentration of a particular substance in the person's breathing zone, exposure to which should not cause adverse health effects of undue discomfort to nearly all persons.
Intrinsically safe:	Electrical equipment and wiring that is not able to release sufficient electrical or thermal energy to cause ignition.
Lower Explosive Limit (LEL):	The concentration of a flammable contaminant in air below which a flame does not occur on contact with an ignition source.
Restricted Space:	Any enclosed or partially enclosed hazardous space or area that does not fit within the legislative definition of a Confined Space (refer to the flowchart appended).
Safe oxygen level	A minimum oxygen content in air of 19.5 percent by volume under normal atmospheric pressure, and a maximum oxygen content in air of 23.5 percent by volume under normal atmospheric pressure.
Safety Observer:	A competent person assigned to: • Remain on the outside and in close proximity to the Confined Space, • Be capable of being in continuous communication with people inside, • Control hazards and prevent injury, • Initiate emergency response procedures where required.
Upper Explosive Limit: (UEL)	The concentration of a flammable contaminant in air above which the spread of a flame does not occur on contact with an ignition source.
VOCs	Volatile Organic Compounds. VOCs are substances (solvents, fumes etc.) that give off vapours that are hazardous to a person's health and/or are flammable in low concentrations.

1. Hazard/Risk Identification

Hazard	Consequence
1.1. **Flammable substances and oxygen enrichment**	There is a risk of fire or explosion in Confined Spaces if: • Residues of flammable materials are present; • Levels of oxygen are higher than the safe oxygen level (under normal atmospheric pressure); • Workers are using hazardous substances that can combust or spark in enriched (or in some cases normal) oxygen levels to carry out work in the Confined Spaces; • Dusts (especially organic materials) present in high concentrations that can ignite; • Adjoining plant or processes have not been isolated and leak into the Confined Spaces.

Hazard	Consequence
1.2. **Excessive heat**	Hot conditions can lead to heat related conditions, which can be made worse by weather conditions, wearing PPE, highly physical or strenuous work, or working at a high work rate.
1.3. **Gas, fume or vapour (VOCs)**	The presence of contaminants in the air can lead to asphyxia, unconsciousness or death. They can also contribute to a fire or explosion in a Confined Space.
1.4. **Oxygen deficiency**	Oxygen levels below the safe oxygen level can lead to asphyxia or unconsciousness. There are a number of processes and the storage of many different products that can cause oxygen deficiency: • Purging the Confined Space with an inert gas to remove flammable or toxic gas, fume, vapour or aerosols; • Naturally occurring biological or chemical processes that consume oxygen, e.g. spaces where timber, timber products, steel turnings, swarf or scrap metal are stored; • Leaving a vessel completely closed or poorly ventilated for some time (particularly those made of or containing steel), since the process of rust formation consumes oxygen; • Spaces in which there are increased levels of carbon dioxide; • Burning operations and work such as welding and grinding which consume oxygen; • Displacement of air during pipe freezing, e.g. with liquid nitrogen; • A gradual depletion of oxygen as workers breathe in Confined Spaces and where provision of replacement of air is inadequate; • A deliberate reduction in oxygen levels e.g. to reduce the effects of oxidisation.
1.5. **Ingress or presence of liquids**	Liquids can flow into the Confined Space and lead to drowning, e.g. when working in sewers. The presence of liquid in a Confined Space can also lead to other serious injury or health effect depending on the nature of the liquid, such as its corrosivity or toxicity. Drowning can occur in even a small depth of liquid.
1.6. **Solid materials which can flow**	Free-flowing solids (i.e. substances in granular or powder form) can submerge a worker, preventing breathing. In a Confined Space the risk is increased because there is no space for the material to flow away.
1.7. **Hazards not specific to Confined Spaces**	Other hazards that aren't specific to Confined Spaces can be identified when assessing the risk for entering the site. These hazards may not be specific to Confined Spaces but if they are identified the controls implemented for them need may need to be more extensive to take into consideration the enclosed nature of the Confined Space.

2. Safe System of Work

Due to the high-risk nature of entering a Confined Space, all entries require a Permit to Work, this includes providing the Permit issuer with the relevant supporting documentation:

- Permit to work application
- Rescue/Recovery plan
- JSA for entry into the Confined Space

- Confined space & hazardous atmospheres workspace testing record
- Evidence of WorkSafe notification (if applicable)
- Site locations marked up on AIAL site map.

Depending on the work being undertaken in the Confined Space, there may be other Permits required; this will be established through the SOP or JSA documentation.

3. Auckland Airport Confined Space Controls

3.1. There will be **"Danger – Confined Space'** signage at each **entry point**; and in a location where it is **visible when the Confined Space is open**.

3.2. Workers must be both **mentally and physically fit**. It is the **workers responsibility** to advise their supervisor or manager if they are not fit to work in a Confined Space.

3.3. Workers involved in Confined Space work must be **trained** to NZQA standards 17599, 18426 and 25510 or an equivalent qualification. They must also be trained to carry out the task assigned to them as required.

3.4. There must be a **communication plan** in place which enables:
- Communication between workers inside and the standby person outside the Confined Space;
- Help to be summoned in an emergency; and
- Rescue procedures to be implemented in case of an emergency.

3.5. **Atmospheric testing** must have taken place to ensure that the atmosphere has a safe oxygen level of 20.9% and is free from both toxic and flammable vapours. This must be recorded appropriately. SMS 06.02.07 (Confined Space and Hazardous Atmospheres Workplace Testing Record) can be used to record testing (or an alternative equivalent).

3.6. There must be **ongoing monitoring** of the atmosphere while the work is being undertaken, which must also be recorded on the testing record being used.

3.7. If **decontamination** of the Confined Space is required, this must be done **before** entering the Confined Space and certified by a trained person.

3.8. If there is a possibility that **contaminants can enter** the Confined Space then they will need to be **isolated** from the Confined Space. Isolation methods include:
- Complete disconnection of pipes or ducts;
- Insertion of blanks;

3.9. If **mechanical or electrical equipment within the space** could be operated while the workers are in the Confined Space, it needs to be **isolated by the equipment owner** through the lock out process and an isolation checklist should be signed off.

3.10. **Any method of isolation that is used must be tested to ensure it is reliable, effective and cannot be bypassed by other persons in the vicinity.**

3.11. At least one **safety observer** must be assigned to the task. The safety observer must not have any other tasks and must have a direct line of sight to the confined space entry. The safety observer must be trained in the use of rescue equipment.

3.12. All **electrical equipment** used in a Confined Space must be **intrinsically safe**, appropriate to the work performed, **maintained** in proper working order.

3.13. **Workers are responsible** for ensuring that the equipment is **used and maintained** in accordance with the manufacturer's instructions, checked visually for any defects and/or excessive wear, and confirm any expiry dates.

3.14. Any equipment that is **damaged, worn or outside of calibration date** shall be immediately **withdrawn from service** and usage prevented (e.g. locked out or disposed of).

3.15. **Access** to the Confined Space must be large enough to allow **workers wearing the necessary equipment** to climb in and out easily, and provide ready **access in case of emergency**.

3.16. If **flammable/combustible materials** are required for use in a Confined Space, they must be kept to a **minimum and cannot accumulate**.

3.17. **Smoking is prohibited in Confined Space.**

3.18. There must be **adequate and suitable lighting** in the Confined Space.

3.19. All **electrical equipment** must be protected by **residual current devices (RCD)**.

3.20. Use of **required PPE and/or RPE** needs to be assessed once other controls have been agreed on.

3.21. Use of a **breathing apparatus** must be notified to **Worksafe NZ** as particularly hazardous works.

3.22. There must be an **appropriate emergency/rescue procedure** to facilitate an evacuation or rescue. This rescue equipment must be set up ready to use if an evacuation or rescue is required

3.23. All workers identified on the PTW must be aware of and trained to the emergency rescue procedures and equipment as specified.

3.24. On completion of works and the Confined Space entry, the site must be returned to operational use and be safe for any other users of the area.

Appendix 1: Confined/Restricted Space Decision Tree