

# BS 2722 Restricted Space Procedure

## Safety and Wellbeing

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## 1. Purpose

The purpose of this procedure is to set out South East Water's minimum requirements for restricted space activities.

## 2. Scope

This procedure applies as a minimum requirement for all employees, contractors and other persons who maintain, open or enter South East Water assets that are classified as a restricted space.

## 3. Definitions

Confined Space	A full definition is provided in the South East Water document <i>BS 1955 Confined Space Entry Procedure</i> .
NOCC	South East Water Network Operations Control Centre.
Personal protective equipment (PPE)	Includes respiratory protective equipment (RPE) and personal protective clothing.
Respiratory protective equipment (RPE)	A range of air-supplied and air-purifying equipment.
Restricted Space	<p>A space that has limited or restricted entry or exit which could make it physically difficult to remove an injured or unconscious person.</p> <p>A restricted space may become classified as a confined space while certain work activities are being conducted that could change the atmosphere within the space, such as the introduction of contaminants.</p> <p><b>Note:</b> Guidance on determining if a space is a confined or restricted space is provided in the appendices of this document.</p>
Self rescue breathing apparatus (SRBA)	A type of RPE that provides a limited supply of breathable air for escape purposes. Includes 'Oxyboks' and Emergency Life Saving Apparatus (ELSA) units.
Unprotected edge	The edge of a surface from which there is a horizontal gap, void or space of more than 300 millimetres and which is not provided with a barrier to prevent a fall.

## 4. Roles and responsibilities

The number of persons required for works in a restricted space are dependent on the risks associated with the space and activities being conducted. With some works, consideration should be given to a safety observer being allocated.

Works within restricted spaces in sewerage assets require a minimum of two persons, with one being a safety observer who is fully trained in Confined Space Entry.

For works in water assets with less than 2 metres fall potential, a single person may enter the space unaccompanied if they are fully trained in Confined Space Entry and risks associated with the space and activities being conducted are controlled to a level that is as low as reasonably practicable. A fall arrest system should be considered where practicable.

#### 4.1. All persons entering a Restricted Space

Need to attend required training and ensure their training competency is current. Evidence of training should be readily available if required.

Shall use the required safety equipment and PPE for the task being performed. Persons entering the space may need to have suitable SRBA worn or readily available to be worn by them at all times, as identified controls for the works using a risk-based approach.

Shall report any defective equipment or unsafe conditions to the supervisor of the works.

#### 4.2. Fitness for work

Working in a restricted space may impose additional physiological and psychological demands over and above those encountered in a normal working environment.

Consideration needs to be given to an employee'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).

#### 4.3. Safety Observer (SO)

Must ensure that when a person is working in a restricted space:

- a) they are positioned in a suitable location to observe the work being performed and initiate emergency response if required; and
- b) maintain effective communication with the work team at all times.

A safety observer has the authority to order persons to exit the space should any hazardous situation be identified.

A safety observer may enter the space, if safe to do so, for rescue purposes.

### 5. Isolation of plant and services

Isolation of plant and services must be conducted to, so far as is reasonably practicable, eliminate or reduce any risk associated with work in a restricted space in relation to:

- a) the introduction of any substance or condition from or by any plant or services connected to the space;
- b) the activation or energising in any way of any plant or services connected to the space.

Isolation measures such as physically locking, tagging, closing and blanking need to be verified at each isolation point. Isolation measures need to be supported by systems of work to ensure they are not removed until all work is completed and all employees have exited the restricted space.

Refer South East Water document *BS 1882 Equipment Isolation Procedure – Lock Out Tag Out*.

## 6. Prevention of falls

Where possible, openings more than 300 mm should be avoided to prevent persons being in close proximity to an *unprotected edge* or to a hole, trench, shaft or pit that is of sufficient dimensions to allow a person to fall into the hole, trench, shaft or pit.

Where it is not possible to comply with this, controls in line with the hierarchy for prevention of falls shall be implemented so far as is reasonably practicable.

For example, signs, barricades and the application of a suitably rated temporary platform over the opening may be appropriate.

## 7. Atmosphere

### 7.1. Atmosphere - general

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

- has a safe oxygen level
- is free of atmospheric contaminants or contains atmospheric contaminants below their exposure standard (if any)
- has no flammable gas or vapour in the atmosphere.

If any of the above cannot be achieved the space will be deemed a confined space and the Confined Space Entry procedure will apply.

### 7.2. Atmospheric testing and monitoring

Prior to any persons entering a restricted space, atmospheric testing needs to be carried out by a suitably qualified or competent person, using an appropriate and correctly calibrated gas detector.

Some gases (for example, hydrogen sulphide) are heavier than air and in unventilated areas typically settle to the bottom of the space, while other gases (for example, methane) are lighter than air and typically collect at the top of the space. Tests need to be made at a sufficient number of points to accurately reflect areas of the space that are likely to be accessed.

Gas detector 'peak' readings need to be used to indicate the highest levels measured in the space.

The atmospheric levels must comply with the following:

Substance being detected	Acceptable (safe) levels
Oxygen (O <sub>2</sub> )	An oxygen content in air under normal atmospheric pressure that: (a) is <b>equal to or greater than 19.5%</b> by volume, but (b) is <b>equal to or less than 23.5%</b> by volume
Carbon Monoxide (CO)	<b>0 ppm</b>
Hydrogen sulphide (H <sub>2</sub> S)	<b>0 ppm</b>
Flammable gases or vapours (LEL)	<b>0% of its LEL</b> (Lower Explosive Limit)

Volatile organic compounds (VOC's)	<b>0 ppm</b>
Ammonia (NH <sub>3</sub> )	<b>0 ppm</b>

*Table 1: Safe atmospheric levels*

If at any time the atmosphere does not meet the above criteria, the space needs to be treated as a confined space and the NOCC must be notified.

Continuous atmospheric monitoring shall be conducted at suitable locations with an appropriate and correctly calibrated gas detector while any person is in the restricted space.

### 7.3. Ventilation

A safe atmosphere may be achieved within a restricted space by using methods of ventilation.

**Ventilation** of a restricted space with fresh air, by natural or forced (mechanical) means, may be necessary to establish and maintain a safe atmosphere.

Ventilation needs to be continued for as long as anyone is in the restricted space.

When using mechanical ventilation, this shall be running for at least **15 minutes** prior to entry.

### 7.4. Gas detectors

**Four Gas** detectors shall be used in all restricted space entries as a minimum. These gas detectors shall be fitted with sensors for flammable gas (LEL), oxygen, hydrogen sulphide and carbon monoxide.

**Six Gas** detectors may be used on South East Water assets, particularly live sewer works and trade waste. These gas detectors shall be fitted with the same sensors as four gas detectors, with the addition of volatile organic compound (VOC) and ammonia sensors.

Gas detectors shall be selected, installed, used and maintained in accordance with AS/ NZS 60079.29.2.

The accuracy of the gas detection unit shall be verified on a regular basis by performing a functionality (bump) test on a monthly basis, as a minimum. If the instrument fails the test, it must be calibrated before use.

Gas detectors shall be **calibrated at minimum 6 monthly intervals**, as a minimum.

## 8. Administrative controls

### 8.1. Signs and barricades

Once a space has been classified as a restricted space, signs must be installed where practicable.

All signs shall comply with AS 1319.



Figure 1: Sample Restricted Space sign

All reasonable steps need to be taken to prevent unauthorised entry to a restricted space by, for example, using fixed barriers, lockable covers or other suitable security devices.

Signposting alone should not be relied on to prevent unauthorised entry into a restricted space.

### 8.2. Safe Work Method Statement (SWMS)

If any **high risk construction work** is being conducted in a restricted space, a compliant Safe Work Method Statement (SWMS) must be developed for the work and reviewed, agreed and understood by the work party prior to any person entering the space.

### 8.3. Asset entry and exit

Entry to South East Water assets shall only be conducted by authorised employees and contractors who are recorded in the Asset Entry system, as set out in the South East Water document *AM 2426 Asset Entry Procedure*.

South East Water treatment plants are exempt from the asset entry process, however local permit to work systems are used.

## 9. Equipment

### 9.1. Respiratory Protective Equipment

RPE shall be compliant with AS/ NZS 1716 and selected, used and maintained in accordance with AS/ NZS 1715.

Pre use inspections of SRBA shall be conducted.

## 10. Training and competency

### 10.1. Confined Space Entry

South East Water employees and contractors allocated as a Safety Observer for restricted space activities are required to complete the competency units listed below, followed by **two-yearly refresher** training:

- **Enter and Work in Confined Spaces**
- **Work in accordance with an issued permit**
- **Operate breathing apparatus**
- **Undertake confined space rescue.**

In addition, the following competency unit is required to be completed, followed by **annual refresher** training:

- **Provide cardiopulmonary resuscitation**

Records of training must be current, with evidence of completion provided to the relevant South East Water contract manager who shall then forward them on to the NOCC.

### 10.2. Confined space awareness

South East Water employees or contractors who need to have an understanding of the risks associated with confined spaces, although do not need to enter a confined space, are required to complete a confined space awareness training course, as a minimum, followed by **annual refresher** training.

This training also covers the selection and use of gas detectors and is the minimum level of training required to undertake gas detection.

Entering a **restricted space requires confined space awareness** training as a minimum.

## 11. References

### 11.1. Legislation

- Occupational Health and Safety Act 2004 (Victoria)
- Occupational Health and Safety Regulations 2017 (Victoria)
- WorkSafe Victoria Compliance Code - Confined Spaces – Edition 2, December 2019

### 11.2. Standards

- AS 1319 - 1994 (R2018) Safety signs for the occupational environment
- AS/ NZS 1715 - 2009 Selection, use and maintenance of respiratory protective equipment
- AS/ NZS 1716 - 2012 Respiratory protective devices
- AS/ NZS 60079.29.2 – 2016 Explosive atmospheres - Gas detectors - Selection, installation, use and maintenance of detectors for flammable gases and oxygen

### 11.3. South East Water documentation

- AM 2426 Asset Entry Procedure
- BS 1882 Equipment Isolation Procedure – Lock Out Tag Out
- BS 1955 Confined Space Entry Procedure
- BS 2723 Confined or Restricted Space Classification Assessment Form



## 12. Revision status

### 12.1. Revision table

Date	Description	By	Approval by
19/12/2017	New procedure based on circulated Draft procedure. Major rewrite to align with Victorian OH&S legislation and current South East Water practices	D Sweeney	J Quilligan
03/09/2018	Minor revisions following release of revised Confined Spaces Compliance Code, stakeholder feedback and standardisation with the Victorian Urban Water Authorities (UWA)	D Sweeney	T Schubach
10/06/2020	Revisions following feedback and planned internal review	D Sweeney	P Grimson
23/11/2021	Increased training for Safety Observers in sewerage assets and single persons in water assets to full CSE. Set out gas detector bump test and calibration requirements.	D Sweeney	P Grimson
07/10/2022	Increased training refresher intervals and document review period.	D Sweeney	D Anderson

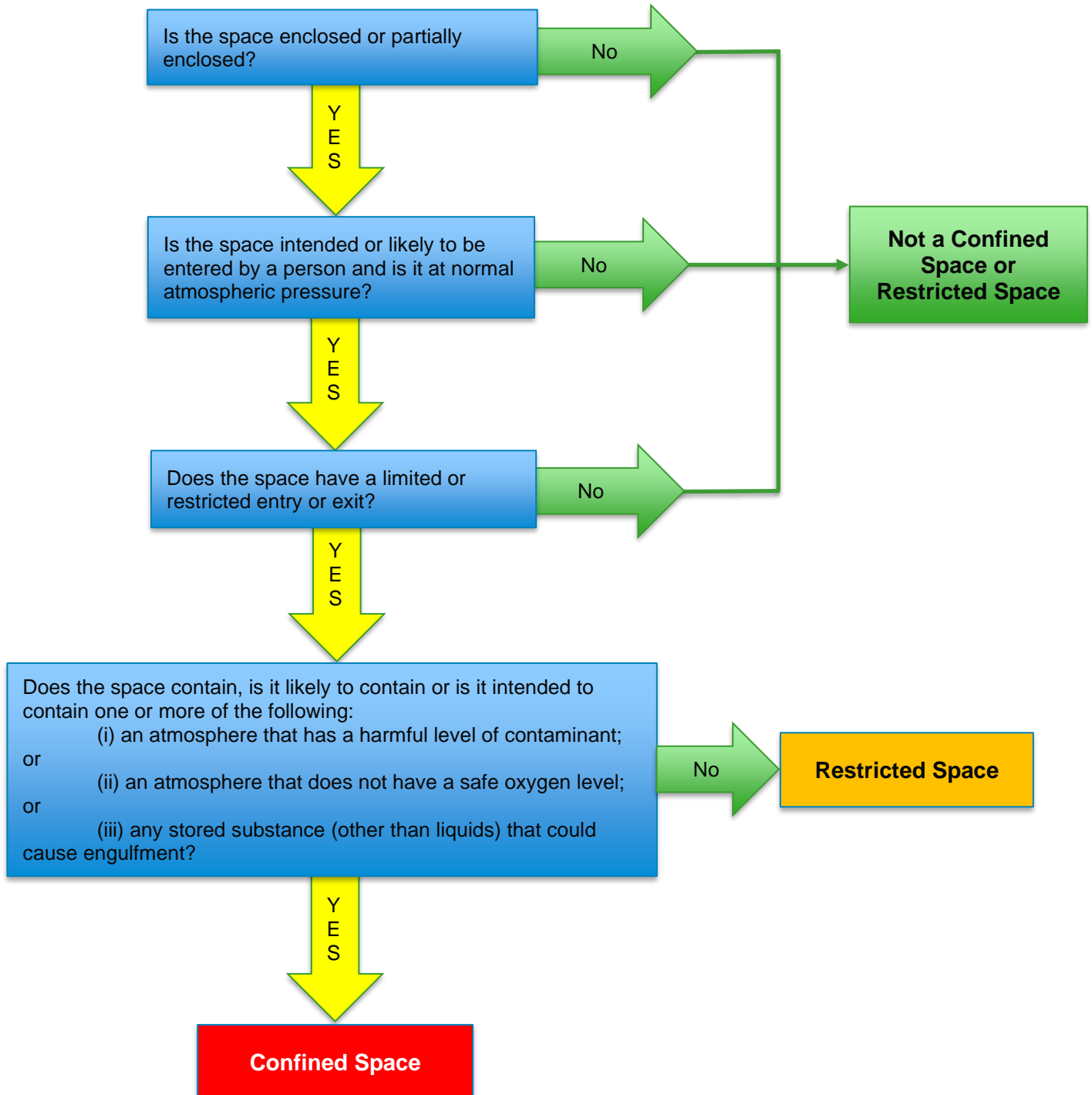
### 12.2. Review intervals

This document shall be reviewed and revised as necessary at no greater than five yearly intervals.

### 13. Appendices

#### 13.1. Determining if a space is a confined or restricted space

##### 13.1.1. Flowchart



### 13.1.2. Considerations

#### a) Is the space enclosed or partially enclosed?

The size of the space is not a factor when classifying a confined space.

#### b) Is the space intended or likely to be entered by a person and is it at normal atmospheric pressure?

Entry to a confined space occurs when a part of the body enters the space and there is a risk the person may be overcome or incapacitated by the conditions within the space.

#### c) Does the space have a limited or restricted entry or exit?

The entry or exit to the space may be restricted by the size of the opening or its location. Consideration needs to be given to whether the space is physically difficult to get in or out of and whether it would be difficult to remove an injured or unconscious person from the space.

#### d) Does the space contain, is it likely to contain or is it intended to contain one or more of the following:

- an atmosphere that has a harmful level of contaminant (e.g. a level in excess of the relevant exposure standard or, if the contaminant does not have an exposure standard, the level where the contaminant is likely to have an adverse health effect)
- an atmosphere that does not have a safe oxygen level (a safe oxygen level is defined in regulation 5 of the OHS Regulations as an oxygen content in air of between 19.5% and 23.5% under normal atmospheric pressure)
- any stored substances (other than liquids) that could cause engulfment (e.g. solids, such as fly ash, grain, animal feed, sawdust and sand, that can flow and can form a temporary cavity or bridge, which may collapse and surround a person, cutting off their air supply)?

If the answer to the **first three** questions above (a, b and c) is **yes** and the answer to the **last question** (d) is **no**, then the space is a **restricted space**.<sup>A</sup>

Space classification assessments can only be conducted by suitably trained South East Water employees.

A copy of the classification assessment for the space should be stored at or near the entrance to the space where practical, and the assessment details entered into the South East Water 'Watershed' database.

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<sup>A</sup> The flow chart and text above have been extracted from flow chart 1 and table 1 of the WorkSafe Victoria Compliance Code Confined Spaces.