THE UNIVERSITY OF QUEENSLAND



CONFINED SPACES

MANAGEMENT PLAN

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Introduction

Confined space entry has for a long time been a workplace hazard which claims several lives each year in Australia, mainly because of a lack of understanding and education of the dangers. In all Australian states, legislation has been written which is designed to manage the inherent risks of entry and working in a confined space.

The Property and Facilities Division recognises its obligations in relation to the management of risk associated with the exposure of staff, students, contractors and visitors to hazards created by workplaces or workplace activities under its control. In accordance with the Workplace Health & Safety Act (1995), the University aims to proactively meet its WH&S obligations through the development of 'Safety Management Plans' for all confined space entry work. These plans will ensure that a risk management approach has been applied to all situations likely to be considered a risk from confined space entry.

Interpretation

A **Confined space** according to *AS/NZS 2865 – Safe Working in a Confined Space*, is defined as an enclosed or partially enclosed space which:

- is at atmospheric pressure during occupancy;
- is not intended or designed primarily as a place of work;
- may have restricted means for entry and exit; and
- may –
  1. have an atmosphere which contains potentially harmful levels of contaminant;
  2. not have a safe oxygen level; or
  3. cause engulfment.

Confined spaces may include but are not limited to:

- Storage tanks, tank cars, process vessels, boilers, pressure vessels, silos and other tank like compartments usually having only a manhole for entry;
- Open topped spaces at more than 1.5m in depth such as pump wells, pits or degreasers; which are not subject to good natural ventilation;
- Pipes, sewers, tunnels, shafts, ducts and similar structures.
- Any shipboard spaces entered through a small hatchway or access point eg. Cargo tanks, cellular double bottom tanks, duct keels, coffer dams, ballast and oil tanks and void spaces, but not including dry cargo holds.

It should be noted that the definition does not apply to underground mining, tunnelling operations or work in atmospheres which are not at atmospheric pressure. These are subject to their own regulations and standards.

Objectives of the Confined Spaces Management Plan

The hazards encountered and associated with entering and working in confined spaces are capable of causing bodily injury, illness and death to the worker. Accidents occur among workers because of failure to recognise that a confined space is a potential hazard. Therefore, the aim of the confined spaces management plan is to highlight all confined spaces and remove or minimise the risks associated with work in these areas.

The management plan will give a procedure for working in confined spaces that will minimise the risk to workers. This procedure will include:

- methods for reporting confined spaces hazards and risks
- the initial risk assessment
- the magnitude of the risk, ie the category of confined space
- the confined space entry permit
- responsibilities of all staff associated with confined spaces
- emergency and evacuation procedures

In addition to this, the management plan will provide the requirement to have an up to date confined space register of all confined spaces on all University of Queensland sites. The register is to include:

- Building name
- Building number
- Location/pit number
- Confined space risk category

Regulatory Requirements

The control of confined spaces health risks in the Queensland workplace is enshrined in several pieces of legislation. Any confined space entry and procedures associated with the University of Queensland owned or leased property, shall be performed in accordance with all relevant State and Commonwealth Acts, Regulations, Advisory Standards, Codes of Practice and industry Standards, including, but not limited to the following:

- Queensland Workplace Health and Safety Act (1995) – Section 28 Employer's Obligations
- Queensland Workplace Health and Safety Regulations (1997) – Part 15 Confined Spaces
- Australian Standard/NZS 2865 – Using a confined space.

The Workplace Health and Safety Act (1995) lists the employer's obligations to ensure the health and safety of all employee's working in these areas. The Workplace Health and Safety Regulations (1997) list the parts of AS/NZS 2865 that must be followed before and during Confined Space Work.

The Australian Standard is particularly important because it sets out the particular requirements and procedures for designers, manufacturers, suppliers, employers and employees to ensure the health and safety of any persons required to enter or work in a confined space.

Risk Assessment

Before work is undertaken, potential hazards associated with all confined spaces located on UQ properties should be identified by a risk assessment. AS/NZS 2865 requires the risk assessment be conducted by a competent person. The results should be recorded and form the basis of the confined spaces register for future reference. The assessment should look at the following areas:

- Hazards within the space eg. contaminants, heat, electrical, radiation, sparks;
- Work required to be done within the space, including whether it is necessary to enter;
- The range of methods by which the work can be done;
- Equipment required and the hazards associated with these eg. welding in a flammable atmosphere can be hazardous;
- Emergency and rescue procedures
- Number of persons required to enter space, and number required outside space to maintain equipment essential for work in the confined space and communicate with those inside;
- The identity and nature of the substances last contained in the confined space;
- The atmospheric testing to be undertaken and the parameters to be tested before entry permit is issued;
- The availability and adequacy of personal protective equipment
- Whether cleaning of the confined space is necessary
- Whether hot work is to be conducted within the space
- Whether certain activities, equipment or substances should be prohibited from the area eg. naked flames, combustion sources.
- Class of confined space

Risk assessments should be kept for up to five years in accordance with statutory requirements. (AS/NZS 2865)

The University contains many similar confined spaces in which similar work is performed. For these confined spaces, a single hazard identification and risk assessment can be carried on a single or representative sample of the similar confined spaces. These generic risk assessments save time and avoid unnecessary duplication of the identification and risk assessment process. Where there are any differences in the circumstances, such as the environment of the confined space or the work performed in it, which could result in a different risk this generic procedure may not be appropriate.

UQ Risk Assessment Form

Generic Risk Assessments for similar kinds of confined spaces are allowable.

Confined Space Location:

_____

_____

Category of Confined space (please circle): 1 2 3

Nature of space (size, type of space e.g. tunnel, trench)

_____

_____

Method of entry into and exit from confined space:

_____

_____

The work to be undertaken:

_____

_____

_____

_____

_____

Selected work method	Any change that might occur during work	Hazards (specify)	Control measures
		Atmospheric:	
		Flammable concentrations:	
		Unsafe oxygen:	
		Plant process hazards:	
		Environmental hazards:	

Procedures for emergency and rescue:

_____

_____

Authorised by:
Date:

Organisational Responsibilities

Senior management (Director P&F, Operations Manager, Project Managers)
The following responsibilities apply to senior management:

- To ensure adequate resources (time, equipment, personnel) are allocated for the effective implementation of this policy;
- To audit the performance of Supervisors, P&F staff and contractors with respect to this policy;
- To ensure adequate induction and on-going training and information is provided to persons required to perform work in confined spaces;
- To obtain a safe working plan from contractors prior to performing confined entry work, as part of the tender process;
- To maintain an accurate register of confined spaces on University premises;
- To liase with the Occupational Health and Safety Unit to obtain further technical advice for confined space entry which involves unique operational activities.

Supervisors / Project Officers
The following responsibilities apply to supervisors within P&F:

- To provide adequate information, supervision and on-going training to persons entering confined spaces;
- To ensure that prior to the commencement of any activity or task (and prior to signing off an entry permit) that a safety management plan has been completed/or assessed and an entry permit has been issued;
- To apply appropriate corrective action as determined through risk management principles, to ensure compliance with this policy;
- To check that the necessary procedures, practices and equipment used for safe entry into confined spaces are in effect before authorising entry or re-entry;
- To promptly report any hazard or accident to the Occupational Health and Safety Unit;
- Not to undertake or direct to be undertaken any activity or task that is likely to endanger their own or another person's safety.
- To audit and maintain appropriate records for confined space entry

Tradesperson/Operators
The following responsibilities apply to UQ maintenance and operations staff:

- To determine whether the area is a confined space, if not already indicated at entrance to space;
- To ensure an appropriate risk assessment is undertaken of the job prior to commencing;
- To complete a Confined Space Entry Permit Form for category 1 and 2 confined spaces, and seek approval from the supervisor prior to commencing work.

Contractors:
Contractors have a responsibility to provide a health and safety plan which is in accordance with the principles outlined in this policy. They are responsible for their own health and safety, and should not endanger the health and safety of others eg. visitors, UQ staff. They should complete the entry permit prior to entering a confined space and submit to a qualified person for approval.

Security
The following responsibilities apply to the security section:

- To maintain contact with entrants for 'category 3' confined spaces
- To promptly react to confined space entry incidents, and alert the OH&S Unit as soon as possible;

Attendants/Stand-by person

Attendants are responsible for ensuring the confined space is not tampered with whilst the person is working in the confined space, as well as ensuring the conditions within the space could not adversely affect the health of the workers. They are responsible for the following:

- Maintain an accurate count of all persons working within the confined space through maintaining regular contact with all entrants;
- Monitor and maintain the conditions and requirements listed on the confined space entry permit;
- Notify everyone to evacuate the space if a hazardous condition is observed;
- Notify security of any emergency.

Do not leave the area while people are within the confined space, except to get help in an emergency. Do not enter yourself if the conditions are unfavourable, except if fitted with the correct respiratory equipment and lifelines;

Types of Confined Spaces

Before working in a confined space, the person(s) entering must determine what category of confined space will be entered, and subsequently what level of action should be followed. This information should be located in the confined spaces register as determined by a risk assessment.

There are 3 major categories of confined spaces at University of Queensland sites:

Category 1 – High risk areas which are commonly known to have a build-up of contaminants or oxygen deficiency, or a combination of these factors in addition to hot work being performed eg. silos, pits containing chemicals or grains, sewers. These areas require special precautions prior to and during working in the space.

These confined spaces can be immediately hazardous to life and some precautions are required. Chemical levels may change during normal work in category 1 confined spaces and become unsafe. Atmospheric monitoring must be ongoing during work in these areas to ensure a safe working environment.

***Category** 2* – Medium risk areas which may be hazardous because of an unusual and unexpected build-up of contaminant, or where there may be additional hazards such as noise, temperature, and manual handling.

For Category 1 and 2 confined spaces a stand-by person is required outside the entrance to the confined space. Communication must be maintained at all times between the person performing work in the confined space and the stand-by person. It may be necessary in some cases, for two-way radio to be used to maintain communication between workers.

Category 3 – Low risk areas which may fit the description of a confined space, however, are mainly hazardous because of high temperatures, awkward postures etc. These are not usually considered to contain a build-up of contaminant or unsafe oxygen levels eg. ceiling cavities, ducts.

For category 3 work, if a stand-by person is not available, communication contact with security must be maintained. A work permit is NOT required for CAT 3 confined spaces.

All confined spaces identified and recorded on the 'Confined Space Register' should be defined by the above category system. At the location, the space will be identified as being a confined space through the following signage/tag eg. 'Confined Space – Category 1. Obtain a permit prior to entry.' For spaces which are not on the register, but fit the description of a confined space, a risk assessment must be performed to determine what types of hazards may be present in the space, and what category of work should be followed.

Permit System – Category 1 and 2 Type confined spaces

Entry into a confined space shall be by permit only. The permit is authorisation and approval in writing that specifies the location and type of work to be done and certifies that all existing hazards have been evaluated by the qualified person and necessary protective measures have been taken to ensure the safety of each worker.

The shift supervisor or a qualified person shall be responsible for securing the permit and both will sign off when the following areas and actions have been reviewed and implemented:

Type of Information	***Recorded ?***	
	Category 1	*Category 2*
Location and description of the work to be done	Y	Y
Hazards that may be encountered	Y	Y
Complete the isolation checklist:		
• Electrical lockout	Y	Y
• Mechanical lockout	Y	Y
Special clothing and equipment		
• PPE	Y	Y
• Respiratory protection	Y	N
• Safety harness and/or lines	Y	Y
• Approved electrical equipment	Y	Y
Atmospheric test readings prior to entry		
• Oxygen level	Y	Y
• Flammability and/or explosive levels	Y	Y
• Toxic substance levels	Y	Y
Atmospheric monitoring while work is being performed	Y	N
Training and complete undertaking of the hazards	Y	Y
Standby person(s) as named on the permit	Y	Y
Emergency procedures and location of first aid equipment	Y	Y
Confined spaces classification	Y	Y

The entry permit serves several essential functions. It restricts entry to authorised personnel, it ensures that communication occurs and hazards are controlled and importantly it serves as an official written record of existing conditions in particular confined spaces.

This permit should be dated and carry an expiration date, with work ceasing on this date. If conditions change, work must stop and a new permit must be issued once additional safeguards are in place. The University of Queensland confined spaces entry permit follows.

THE UNIVERSITY OF QUEENSLAND AUSTRALIA

PERMIT FORM FOR CONFINED SPACE ENTRY
Category 1 and 2 type spaces

1. Name and Address

Contractor's Name …….

Location of work …….

Name(s) of workers …….

Trades supervisor (UQ) …….

2. Description of work to be undertaken

(Describe briefly the work to be undertaken)

3. Isolation of confined space

(Tick the items below which have been isolated or made safe):

- ❑ Pipelines (water, steam, gas, etc.)
- ❑ Mechanical/electrical drives
- ❑ Sludges/deposits/waste
- ❑ Harmful materials
- ❑ Electrical services
- ❑ Warning notices, locks or tags have been fixed to means of isolation
- ❑ Radiation services
- ❑ Mechanical services

4. Hot work

(Tick the items below which will be observed if hot work is performed)

- ❑ Area clean and free of all readily combustible material
- ❑ All drains within 15m covered with fireproof wet blanket
- ❑ Appropriate fire extinguishers on site near source of ignition
- ❑ Welding machine/gas cylinders located (not within 8m of any drain)
- ❑ Welding machine earthed directly to equipment being welded as close to welding point as possible
- ❑ Power leads not draped across pipelines or access ways

5. Hazards likely to be encountered

(Identify what hazards may be encountered during the work – include any work materials which might be used e.g. 2-pack epoxy paints and cleaning products. Also consider what types of contaminants are generated in confined space environments e.g. phosphine is produced when grain dust is wetted or where welding occurs in this type of environment)

6. Atmospheric test requirements

(Fill in the details below relating to atmospheric conditions. Indicate time of measurement.)

Atmosphere	Acceptable conditions	Result Time…..	Result Time…..	Result Time…..	Result Time…..	Result Time…..
Oxygen-min	>19.5%					
Oxygen-max	<23.5%					
Flammability	<10% LEL/UEL					
Hydrogen sulphide	<10ppm					
Chlorine	<1ppm					
Carbon monoxide	<30ppm					
Sulphur dioxide	<2ppm					
Other						
Test initials						

7. Stand-by personnel and rescue arrangements

Stand-by person(s): ……

Emergency procedures are understood and are available

8. Personal Protective Equipment

(Tick the personal protective equipment which will be worn):

- ❑ Supplied-air respirators
- ❑ Air-purifying respirator (filter type …….)
- ❑ Safety harness and/or safety line or lifeline/rescue
- ❑ Eye protectors
- ❑ Hand protection
- ❑ Foot protection
- ❑ Protective clothing
- ❑ Hearing protectors
- ❑ Safety helmets

8. Ventilation/ Requirement for purging

(Specify ventilation method required)

9. Authorisation

Trade Supervisor / Project Officers

Approval	The confined space described above is in my opinion in a safe condition for the work to be done provided that the precautions above are fully observed. Signed_____date/time_____ .
	I certify that I have re-examined the above confined space and that it will be safe to enter without/with approved breathing apparatus from _____on_____ to_____on_____ . Signed_____ date/time_____.
Renewal	I certify that I have re-examined the above confined space and this permit is extended to _____ on_____. Signed_____date/time_____ .

Tradesman

Acceptance	I have read and understood the above safety requirements and will ensure that they are strictly followed. Signed_____date/time_____
Completion	I certify that work has been completed and that all personnel, tools and equipment have been withdrawn, all guards and covers replaced and all barriers and notices withdrawn. Signed_____date/time_____
Extension Request	Work has not been completed and an extension is requested. Signed_____date/time_____
Inspection & Recommissioning	The above confined space has been inspected by me and is safe to be taken back into service. Signed_____date/time_____

Confined Spaces entry procedure

The Confined Spaces register should contain a detailed risk assessment for all confined spaces. This forms the basis of the entry procedure to the confined space.

A risk assessment MUST be performed by a qualified person prior to starting work in any category of confined space.

Procedure:

Can work be performed from outside confined Space? If no:

- Locate confined space risk assessment from register and identify class of confined space

- Complete entry permit. This will include:
    - Person/s entering confined space
    - Type of work being performed
    - Period of work the permit is valid for
    - Atmospheric test readings for
        - Oxygen
        - Combustible gases or vapours
        - Potentially explosive dusts
        - CO
        - Specific toxic chemicals listed in the hazard assessment
    - Name/s of standby person/s (category 1 & 2)
    - The type of ventilation required
    - Whether safety harness is required
    - Any PPE required (category 1& 2)
    - Availability of Material Safety Data Sheet for any products used in the confined space

- Ensure entry permit is checked and signed by supervisor

- Maintain work in the confined space for only the allocated time frame

- Look for any other precautions required as per risk assessment:
    - Ongoing monitoring (category 1)
    - 2-way radios/ other communication techniques

Procedure for ENTERING Great Court Tunnel

Prior to gaining entry to the Great Court Tunnel the following details/information must be obtained by WCC staff.

Person entering tunnel, are they;

- Staying on the tunnel walkway?(refer (a) below), or
- Entering floor cavity spaces?(*located underneath buildings at Forgan Smith East Wing, Steele, Richards and Parnell*) (refer (b) below)
- Carrying out hot works?(refer (c) below)

Tunnel Entry

Persons entering the tunnel must make sure ventilation fans are running while they work. The fans can be programmed (by SRF or EPO4) to run 24 hours if necessary to accommodate work program.

- WCC to sign out keys and contractor pass, hand out tunnel map & security code panel information and check relevant forms completed.
- WCC to notify Security of persons entering tunnel.
- Once works completed, personnel to reactivate alarm system upon exiting and return keys, contractor pass and hot work permit (if required) to WCC.
- WCC to notify Security that tunnel is secure.

Note: P&F do not supply equipment (e.g. hard hats, torches). Personnel entering the tunnel must supply their own equipment.

(a) Tunnel walkway area – category 3 confined space. Requirements for entry are:

- Communications (mobile phones allowable)
- 2 people in tunnel at all times
- hard hats
- Torches
- Coordination with others in area if applicable
- Coordination of isolation/fire services etc if applicable

(b) Floor cavity areas (Forgan Smith East Wing, Steele, Richards and Parnell) - category 1 & 2 confined space. Requirements for entry are:

- Permit form for Confined Spaces Entry to be completed 24 hours prior to entry
- Communications (mobile phones allowable)
- 2 people in tunnel at all times and one at tunnel entry
- hard hats
- Torches
- Gas Monitor
- Approved safety plan/risk assessment
- Ventilation
- Coordination of isolation/fire services etc

(c) Hot works to be carried out in the tunnel (category 2 confined space) or building cavities (category 1 confined space). Requirements for entry are:

- Permit form for Confined Spaces Entry to be completed 24 hours prior to entry
- Hot work permit form (PF220)
- Communications (mobile phones allowable)
- 2 people in tunnel at all times and one at tunnel entry
- hard hats
- Torches
- Gas Monitor
- Approved safety plan/risk assessment
- Ventilation
- Coordination of isolation/fire services etc
- Fire Extinguisher

Signposting

All entrances to any confined space should be signposted. The signs should be erected in the immediate vicinity of the space and must:

- Identify the space
- Notify employees that they must not enter the space unless they have an entry permit, and
- Remain clear and prominently positioned

Signs should warn against entry by persons other than those who are listed on the entry permit. They may be permanent and only erected during work. However, where unauthorised or unintentional entry is likely to occur, permanent signage should be prepared.

Category 1 Type Confined space should be access restricted.

An appropriate sign could be:

DANGER!
CATEGORY 2/1
CONFINED SPACE
ENTRY BY PERMIT
ONLY

Training

The aim of training in confined spaces is to remove or minimise risks in the workplace associated with confined spaces. The University will provide training so that all employees whose work is related by this policy acquire the understanding, knowledge and skills necessary for the safe performance of their duties.

All UQ properties and facilities staff will need an overview of the following:

- all legislative requirements relating to confined spaces;
- hazards associated with work in confined spaces;
- procedures for identification and notification of confined spaces;
- procedures required before entry;
- safe work practices;
- emergency procedures.

Training will be provided for every staff member, including stand-by persons before the employee is assigned to duties in a confined space.

Emergency Response Procedures

Emergency situations may arise during work in confined spaces. Emergency planning for confined spaces provides a safety net in the event control measures fail. All employees who may be involved with rescues from a confined space should be made aware that rescue procedures are to be followed at all times. This training will include procedures where:

- employees are uninjured and evacuate themselves
- employees are injured but still capable of self-evacuation
- entry is required to provide treatment
- employees are assisted to evacuate by persons remaining outside the confined space
- emergency entry is required in order to evacuate employees

The University contains many different confined spaces and the plans and procedures appropriate to the types of situations that may arise from work in a confined space should be put in place using the information from the risk assessment.

Definitions

The following definitions are taken from AS 2865:

Contaminant – any dust, fume, mist, vapour, gas or other substance in liquid or solid form, the presence of which may be harmful to health and safety.

Exposure Standard – an airborne concentration of a particular substance in the person's breathing zone, exposure to which, according to current knowledge, should not cause adverse health effects nor cause undue discomfort to nearly all persons. The exposure standard can be of three forms: *time weighted average (TWA)*, *short term exposure limit (STEL)* or *peak exposure limit*.

The following terms are used in calculating levels of atmospheric contaminants:

(a) *Time weighted average (TWA)* – The average airborne concentration of a particular substance when calculated over a normal 8-hour workday, for a 5-day work week.

(b) *Short term exposure limit (STEL)* A 15 minute TWA exposure which should not be exceeded at any time during a work day if the eight hour TWA average is within the TWA exposure standard. Exposure at the STEL should not be longer than 15 minutes and should not be repeated more than 4 times a day. There should be at least 60 minutes between successive exposures at the STEL.

- *Peak* – A maximum or peak airborne concentration of a particular substance determined over the shortest analytically practicable period of time, which does not exceed 15 minutes.

Flammable range – the range of flammable gas r vapour (percentage by volume) in air in which an explosion in air can occur upon ignition. Expressed by *lower explosive limit* (ie. the concentration of contaminant in air below which the propagation of a flame does not occur on contact with an ignition source, and *upper explosive limit* (ie. the concentration of contaminant above which the propagation of a flame does not occur on contact with an ignition source.

Hot work – welding, thermal or oxygen cutting, heating, and other fire producing or spark producing operations that may increase the risk of fire or explosion.

Purging – the method by which contaminants are displaced from a confined space

Safe oxygen level – a minimum oxygen content in air of 19.5 percent by volume, and a maximum oxygen content in air of 23.5 percent by volume, under normal atmospheric pressure.

Stand-by person – a competent person assigned to remain on the outside of, and in close proximity to, the confined space and capable of being in continuous communication with and to observe those inside, if practicable. In addition, where necessary, initiate rescue procedures and operate and monitor equipment used to ensure safety during entry and work in the confined space.

APPENDIX 1 - Example of Confined space entry procedure

Job Particulars

Location: Fountain outside Duhig Building
Work to be conducted: Repair of pump inside fountain pit

Procedure for safe entry

The following procedure has been developed to ensure that work within the pit is performed safely and without risk to the health and safety of workers involved. Changes to these procedures should be discussed with the trades supervisor from the University of Queensland, if necessary.

1. The area above the pit should be signposted and secured before work commences.
2. Isolate the chlorine dispenser.
3. Drain water from pit and ventilate area naturally by leaving access hole open.
4. Monitor the concentration of chlorine and oxygen content using Minigas 4 portable gas monitor. This needs to be attached to an aspirating pump which is connected to a length of rubber tubing and is lowered down into the pit. Measurements need to be taken at various locations within the pit, in particular low lying areas and those where chlorine vapours can accumulate. The monitor is set to alarm at a concentration which is considered hazardous.
5. The readings at various locations should be recorded on the confined space entry permit. Should the concentration of chlorine reach the workplace exposure standard level of 1ppm, or the oxygen level falls outside of the range 18% and 23%, the confined space area needs to be artificially ventilated by purging**. The equipment to be used for purging should be Australian Standard approved and oxygen or oxygen-enriched gas must never be used for artificial ventilation. If exhaust facilities are used to dilute the contaminant, combustion engines providing power for compressed air or any other use for the work being done, should be located so that their exhaust emissions cannot enter the confined space or contaminate air being supplied to the confined space.
6. After purging the pit, the area needs to be re-monitored prior to entry to determine whether the area is safe for entry. If the level of chlorine cannot be reduced to below 1ppm or a safe oxygen level cannot be provided, personal protective equipment is required to be worn by the person entering the confined space.
7. An entry permit should be completed by the contractor performing the work and endorsed by the trades supervisor / project officer from the University. (See copy of entry permit form).
8. The contractor must also provide a stand-by person where the atmospheric monitoring has determined that there may not be a safe oxygen level if the chlorine concentration is present at above the exposure standard.
9. Prior to working within the confined space, gloves and overalls should be worn. Neoprene or nitrile gloves are recommended if contact with chlorine residue is likely. A respirator is only necessary if the concentration of chlorine exceeds 1ppm within the space. The respirator must be fitted with filters specific for chlorine. If oxygen levels are unsafe, an air-supplied respirator must be worn.
10. Conduct work and leave confined space.

** If the concentration of chlorine cannot be reduced to below 1ppm, a respirator fitted with chlorine filters should be worn.

APPENDIX 2 - Risk Assessment Example

Space:
One or more access shafts to be excavated in North Rd, Brighton

Work required to be carried out:
Repair, replace or reline damaged live or previously live sewer lines

Nature of the space:
The spaces are shafts and trenches (and possibly tunnels) that need to be excavated to gain access to live or previously live sewer lines. These have been identified as a class of confined space

The average dimensions are to be 1m wide x 2m long and between 1.5m and 5.0m in depth and are to be made safe by either providing steel trench shields or ground support.

Excavation of this space is to be principally by excavator from the surface, during which time no person will be at risk. Uncovering of the sewer line at the base of the trench is to be by hand excavation, when at least one person will enter the space.

The range of methods by which work will be done.
Method A – Eliminate the need to enter by repairing, replacing or relining from the surface. This method cannot be used as the rectification work can only be carried out from the base of the shaft.

Method B – Enter the space and carry out rectification works from the base of the shaft.

The method of entry into and exit from the confined space or shaft
A ladder, fixed to the shaft ground support, is to be used for all entry and exits

Type of emergency procedures required:
Company emergency, rescue and first aid procedures apply

Other factors:
Company training and fitness requirements apply

Selected method of work	Any change that may occur in the level of oxygen or contaminant	Hazards	Control Measures
Enter space and carry out rectification works from base of shaft	The monitoring procedures must take into account the possibility of changes in the level of oxygen and/or contaminant at any time	**Atmospheric contaminants** • Methane, hydrogen sulphide (sewerage) • Other contaminants based on past experiences	• Permit system • Test before entering • On-going monitoring with alarm system • PPE (self rescue may be needed) • Mechanical ventilation • Stand-by persons • Signs erected • Full parachute harness worn at all times • Restrict time in space • Ensure contaminants from outside do not enter e.g. vehicle exhaust
		Flammable contaminants • methane	In addition to above: • individual on-going flammable gas monitoring • space must be assessed at 5% of the LEL • intrinsically safe equipment
		<u>Unsafe Oxygen</u> • deficiency	In addition to above: • Individual on-going oxygen monitoring • Space must be evacuated when oxygen level goes below 19.5%

		Plant/Process hazards • ignition sources e.g. generator, compressor) • mechanical, electrical, noise • poor lighting • ergonomics • road traffic	In addition to above: • hearing protection, safety helmet • refer to company's plant operating procedures • road signage and barricades
		Environmental hazards • uncontrolled introduction of substances (sewerage) • biological (hepatitis, other viruses, bacteria, needle-stick) • temperature • slippery surfaces (wet or uneven surfaces)	In addition to the above: • Vaccination policy • Barricades for traffic • Heat stress policy • Non slip footwear

Authorised by:
Date:
Date of revision:

APPENDIX 3 - Identification of a confined space

Details of the area, plant or space:

Details of manufacturing process or by-products:

Details of substances stored or by-products:

Details of the operations performed inside the space:

Question	Y/N	Details
Is the space enclosed or partially enclosed?		
Is the space primarily designed not to be a workplace?		
Does the space have restricted means of entry and exit?		
Is the space, or is it likely to be, entered by a person at work?		
Is the space, or is it intended to be, at atmospheric pressure while anyone is in the space?		
Does the space, or is there potential for the space to contain, any of the following – through either process, substances stored, by-products or operations – (i) an atmosphere that has potentially harmful levels of a contaminant; (ii) an atmosphere that does not have a safe oxygen level; (iii) anything that could cause engulfment.		

Answering YES to all of the above questions indicates that the area, plant or space is a confined space and is subject to Part 15 of the Workplace Health and Safety Regulations, 1997. If any question is answered NO, enter details for the decision, if appropriate.