

Estates and Facilities Management Policy for Working in Confined Spaces

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Estates Division

Estates and Facilities Management

Headington Campus

Gipsy Lane

Headington

Oxford

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Change Control Details

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Policy for Working in Confined Spaces

1 Scope

This procedure applies to all confined spaces on University premises that pose a risk to employees, students, contractors and other visitors.

The objective is to set out the procedures to be followed in order for Oxford Brookes University to comply with regulations related to working in confined spaces.

These procedures apply to both Oxford Brookes University personnel and any contractors or sub-contractors carrying out work at Oxford Brookes University premises.

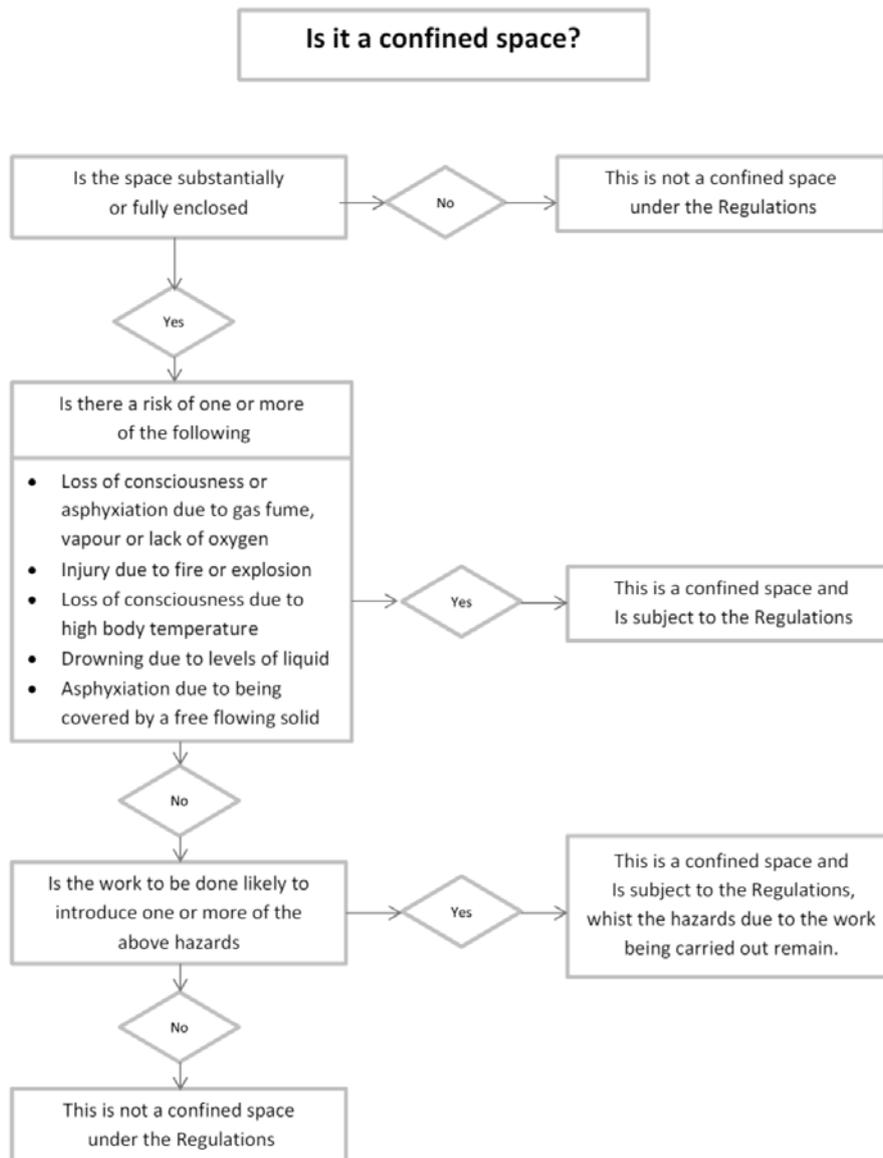
2 Definition of confined space

A confined space is defined as any place which is substantially, though not necessarily entirely, enclosed, for which there is a reasonably foreseeable specified risk of injury due to hazardous substances or conditions.

Confined spaces include ducts, sewers, chambers, tanks, vats, silos, pits, trenches, pipes, flues, wells and unventilated or poorly ventilated rooms or similar spaces.

The specified risks are defined as

- serious injury to any person at work arising from a fire or explosion
- the loss of consciousness of any person at work arising from an increase in body temperature
- the loss of consciousness or asphyxiation of any person at work arising from gas, fume, vapour or the lack of oxygen
- the drowning of any person at work arising from an increase in the level of a liquid
- the asphyxiation of any person at work arising from a free flowing solid or the inability to reach a respirable environment due to entrapment by a free-flowing solid.



3 Legal Requirements

3.1 Management of Health and Safety Regulations

Suitable and sufficient risk assessments must be carried out prior to any work activities in confined spaces in order to decide what measures must be taken to minimise risks.

The University Safety Notice for Risk Assessments, gives guidance on how to carry out risk assessments www.brookes.ac.uk/services/hr/health_safety/docs/obuhsn36.html

Risk Assessment and Method Statement templates for confined space work can be found in Appendix 1

3.2 Confined Spaces Regulations

These regulations set out the following key requirements

- Entry into confined spaces is to be avoided whenever possible.
- When entry into confined spaces is unavoidable, all hazards have been considered and there are sufficient safe systems of work
- There are emergency arrangements in place that will reduce the risk of injury to the persons involved.

The HSE Approved Code of Practice, www.hse.gov.uk/pubns/priced/l101.pdf provides guidance on how compliance to the legislation may be achieved.

4 Reasonably Foreseeable Hazards in Confined Spaces

Reasonably foreseeable hazards in confined spaces include, but are not limited to

4.1 Lack of oxygen.

This can occur:

- Where oxygen in the air has been consumed by a reaction with materials within the confined space.
- Following the action of groundwater on chalk and limestone which can produce carbon dioxide and displace normal air;
- Inside metal vessels or tanks when oxygen is consumed as rust is formed;

4.2 Poisonous gas, fume or vapour.

These can:

- Build-up in sewers and in pits connected to the system;
- Leak into trenches and pits in contaminated land.

4.3 Ingress of liquids and solids.

Free flowing solids such as grain can partially solidify or 'bridge' in silos causing blockages, which can collapse unexpectedly onto a person whilst in a vessel. Liquids may suddenly enter an occupied space unless positive steps are taken to prevent them from doing so.

4.4 Fire and explosions

Fire and explosions may occur due to flammable vapour concentrations being within the flammable range or excess oxygen being present in a sufficient concentration.

4.5 Dust.

Dust present in high concentrations may pose a risk of explosion.

4.6 Temperature.

Hot conditions or the wearing of personal protective equipment may lead to a dangerous increase in body temperature leading to a person passing out.

4.7 Mechanical and electrical isolations.

It may be necessary to ensure that certain systems within confined spaces are locked off before persons enter confined spaces, to ensure no inadvertent start up whilst a person is in contact with or in the vicinity of the equipment. Such isolations will be controlled by a permit to work system (5.5).

4.8 Hazards arising out of work activity

Work activities proposed to be carried out in a confined space may give rise to hazards as described above, for example, welding of pipework may give rise to reduction in oxygen levels and an increase in temperature.

5.0 Procedures for working in Confined Spaces

5.1 Appointment of Confined Space Supervisor

A Confined Space Supervisor, with an appropriate level of competence, see 5.2, will be appointed to oversee all confined space work. It is their responsibility to ensure all the necessary precautions are taken and that the Safe System of Work is being followed.

Where the work is to be carried out by University personnel, the Confined Space Supervisor will be a University member of staff, Contractors will appoint a Supervisor when they are carrying out any work.

The degree of supervision will be based on the findings of the risk assessment (5.3). In some cases, periodic checks may be sufficient if the work is low risk and routine. On other occasions the level of risk will require a competent person to supervise the work and remain present while the work is being undertaken.

5.2 Competence and Suitability of persons carrying out confined space work

Confined Space Operators who are required to enter confined spaces need to be physically fit, they should have good manoeuvrability and should not have medical conditions which may have an adverse effect on their ability to work in confined spaces. These considerations will be included in the Occupational Health assessments for Oxford Brookes University staff engaged in confined space work.

5.2.1 Confined Space Operators

Specific training by a recognised training provider is required for all personnel, Oxford Brookes University staff or contractors, who will carry out work within confined spaces. The Confined Space Supervisor will be provided with evidence of training.

The training will include the following topics:

- Awareness of the Confined Spaces Regulations and the need to avoid entry where possible;
- An understanding of the environment, the work to be undertaken, the hazards, the Safe System of Work and all necessary precautions;
- The use of equipment, including gas detectors, tripods, winches,
- The use of appropriate PPE including harnesses and breathing air escape sets
- The means of communication in confined spaces
- An understanding of permits to work
- How emergencies arise, the need to follow prepared emergency plans and the dangers of not doing so.

The work team will usually consist of at least three persons. The Top Person, who remains outside the confined space, close to the entrance, the Watchman, an operator who goes into the confined space and remains close to the entrance and an operator who goes further into the space to carry out the work. These three persons will remain in communication with each other (see 5.6.1) . Further operators may be needed if operators in the confined space get out of site of each other.

5.2.2. Confined Space Supervisors

Confined Space Supervisors will be persons who, in addition to the Confined Space Operators training, have undertaken additional training in order that they can carry out confined space risk assessments and draw up method statements and permits to work.

5.2.3 Confined Space Managers

Confined Space Managers are Oxford Brookes University members of staff who have received the same level of training as Confined Space Supervisor and have managerial or nominated Health and Safety roles within the University. Confined Space Managers will authorise Permits to Work (5.5)

5.3 Risk Assessment.

The Confined Spaces Regulations makes it a requirement that reasonable effort be made to avoid the need to enter confined spaces wherever possible. Where this is not possible a risk assessment must be carried out and appropriate precautions must be taken to lessen any risks identified.

It is the responsibility of the appointed Confined Space Supervisor (5.2.2) or Manger (see 5.2.3) to carry out the risk assessments in the confined space where work is to be carried out.

The University Safety Notice number 36, gives guidance on how to carry out risk assessments www.brookes.ac.uk/services/hr/health_safety/docs/obuhsn36.html

The risk assessment will consider the reasonably foreseeable hazards in confined spaces, as given in in section 4, together with any other relevant risks either within or in the vicinity of the confined space.

An example of a Risk Assessment template for confined space work can be found in Appendix 1. Other templates are acceptable so long as they consider all the relevant risks.

5.4 Safe Systems of Work or Method Statements

For all work in confined spaces, a Method Statement must be drawn up, in writing. In the case of work carried out by Oxford Brookes University staff, this will be done by an Oxford Brookes University Supervisor (5.2.2) prior to entry to a confined space. In the case of work carried out by a Contractor, the Safe System of Work will be drawn up by the Contractor with an appropriate level of training (5.2.2).

The Confined Space Supervisor will ensure that Confined Space Operators understand the risk assessment and method statement for the tasks to be undertaken.

See Appendix 2 for an example of a Safe System of Work or Method Statement template. Other templates are acceptable so long as they consider all the relevant risks.

5.5 Permit to Work in a Confined Space

A Permit to Work is required for all Confined Space work at the University. Permission for trained Confined Space Operators (5.2.1) to enter a confined space will be granted by an Oxford Brookes University Confined Space Manager (5.2.3). An example of a 'Permit to Work' can be found in Appendix 2.

The Permit must be signed in the authorisation and acceptance section by a Confined Space Supervisor (5.2.2) prior to work commencing. A hand-back signature must also be completed on the permit when the work is complete or the expiry time exceeded. It is the responsibility of the Supervisor to ensure that a permit to work has been completed for every confined space entry. The Supervisor should retain handed-back permits for at least five years.

When it is necessary to isolate electrical supplies within a confined space, the Oxford Brookes University, Electrical Safety Code of Practice, will be followed and Electrical Isolation Permit to Work will be issued.

5.6 Elements of a Safe Systems of Work or Method Statement

5.6.1 Communications

An adequate communication system is required to enable:

- Communication between people inside and people outside the confined space;
- Help to be summoned in an emergency;
- Emergency rescue procedures to be initiated.

Systems can include speech, tugs on a rope, lines of sight, telephones, radios etc. Equipment to be used in potentially flammable or explosive atmospheres should be intrinsically safe so they do not present a source of ignition.

5.6.2 Testing the air.

The risk assessment may conclude that it will be necessary to check that the atmosphere is free from both toxic and flammable vapours and that there is an adequate concentration of oxygen prior to entry. A competent person (5.2.1) using a certificated, calibrated gas detector will carry out testing prior to entry. Where the risk assessment indicates that conditions may change, continuous monitoring of the air will be carried out. The method statement will indicate the required frequency of monitoring. The results of the monitoring must be recorded and retained for a minimum for 5 years. Appendix 3 is an example of an atmosphere record sheet.

The acceptable oxygen concentration range is between 19.5% and 23.5%. Work must not be undertaken if the oxygen concentration is outside this range.

The risk assessment will determine the gases to be monitored, in addition to oxygen these typically include carbon monoxide, hydrogen sulphide and methane.

An alarm will sound if the gas detector finds a hazardous atmosphere. On activation of an alarm, the operator will call out 'Gas, Gas, Gas', then all operators must immediately make use of the emergency escape breathing apparatus and leave the confined space by the nearest exit.

5.6.3 Provision of ventilation

Ventilation in the confined space may be improved by increasing the number of openings, however, mechanical forced ventilation may be necessary to ensure an adequate supply of fresh air, if this is the case, then continuous monitoring of air quality is required. Fresh air should be drawn from a point where it is not contaminated, for example by exhaust from combustion engines or other contaminants. Any requirements for ventilation will be included in the Safe System of Work.

5.6.4 Decontamination before entry.

Where a confined space contains exposed materials which may give rise to hazardous fumes, decontamination must be carried out and the atmosphere tested prior to work commencing. It is the responsibility of the Supervisor to ensure effective decontamination has been carried out.

There are no trained Self-Contained Breathing Apparatus (SCBA) operators within the staff teams of the University. External contractors, with evidence of being competent for a decontamination operation, will carry out any confined space work where it is necessary to wear SCBA.

5.6.5 Isolation from inflowing gases, liquids and other materials.

In some instances, confined spaces need to be isolated from the ingress of substances that could pose a risk to those working within the space. Methods of isolation may include:

- Complete disconnection of pipes or ducts.
- Insertion of blanks.
- Reliable valves that can be locked shut.

Whatever means of isolation are used, it needs to be tested to ensure it is suitably reliable. It is the responsibility of the Confined Space Supervisor to ensure that all necessary isolations have been made and are effective. Any requirements for such isolations will be included in the Method Statement.

5.6.6 Isolation from mechanical and electrical equipment

Mechanical and electrical isolation of equipment within a confined space is essential if it could otherwise operate, or be operated, inadvertently while a person is in its vicinity. It is the responsibility of the Confined Space Supervisor to ensure that all necessary mechanical and electrical isolations have been made and are effective, to prevent the operation of such equipment. Any requirements for such isolations will be included in the Method Statement.

When it is necessary to isolate electrical supplies within a confined space, the Oxford Brookes University, Electrical Safety Code of Practice, will be followed and Electrical Isolation Permit to Work will be issued. The Electrical Safety Code of Practice is available at www.brookes.ac.uk/estates/estates-services/

5.6.7 Use of suitable equipment

Any equipment provided for use in a confined space needs to be suitable for the purpose. Considerations should include, but is not limited to:

- The likelihood of flammable atmospheres and sources of ignition.
- The emissions of fumes/gases.
- The risk of electrocution.
- Earthing requirements with regard to static electricity.
- Any mechanical hazards (e.g. trapping, falling, shearing etc).

5.6.8 Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE)

Ideally PPE needs will be eliminated by implementation of risk control measures. If the risk assessment finds the use of PPE or RPE to be necessary, this will be included in the Method Statement for the task. It should be noted that wearing PPE or RPE may contribute to heat stress. Where the risk assessment finds that it will be necessary to use RPE to enter a confined space, any work will be carried out by suitably qualified contractors, not Oxford Brookes University staff.

5.6.9 Entry equipment for working at height

Where there is a risk of falling into a confined space during entry or exit, the Confined Space Supervisor will carry out suitable risk assessments and draw up method statements. This may include the use of ladders, tripods, winches, lifelines and harnesses together with prior evidence of their relevant inspection, calibration and testing.

5.6.10 Gas supplied by pipes and hoses.

The use of pipes and hoses for conveying oxygen or flammable gases for welding or similar operations, into confined spaces must be controlled to minimise the risk.

Prior to them being brought into the confined space:

- The equipment must be inspected and checked to ensure they are in good working order
- That any calibrations or independent inspections are in date

At the end of every working period:

- Supply valves for pipes and hoses must be securely closed.
- Pipes and hoses should be withdrawn from the confined space to a well ventilated area.
- Where pipes and hoses cannot be removed, they must be disconnected from the supply at a point outside the confined space.

5.6.11 Size of entrance

The access/egress point of the confined space must be big enough to allow workers wearing all the necessary equipment to climb in and out easily and provide ready access and egress in an emergency.

5.6.12 Fire Prevention

Flammable and combustible materials must not be stored in confined spaces that have not been specifically created or allocated for that purpose. If this type of material is used during work it must be kept to a minimum and not be allowed to accumulate. Control of ignition sources and ventilation requirements must also be considered.

5.6.13 Lighting

Confined spaces should be adequately lit, preferably including emergency lighting. Operators will take suitable torches with them into the confined space if the risk assessment finds they are necessary equipment.

6 Emergency Arrangements

Confined space work must not be undertaken unless the Confined Space Supervisor has drawn up emergency plans for the rescue of persons in an emergency. In addition to accidents arising out of specified risks, consideration also needs to be given to any other accident in which a person may need to be recovered.

To be suitable and sufficient the arrangements for rescue should include consideration of:

- Rescue (self or assisted) and resuscitation equipment;
- Raising the alarm and rescue;
- Safeguarding the rescuer;
- Fire safety;
- Control of plant;
- First aid;
- Public emergency services;
- Training.

It is the Confined Space Supervisor's responsibility to ensure any measures deemed necessary for an emergency rescue are in place and tested prior to any confined space entry.

7 Confined Spaces Register

The Register of Confined Spaces gives their location, points of entry, details of services and know hazards within individual confined spaces. This may be used as a guide in order to carry out Risk Assessments and drawing up Method Statements in relation to the tasks being carried out within the confined spaces.

Currently the Confined Spaces Register is in the process of being drawn up.

Appendix 1 Confined Space Risk Assessment & Method Statement

Ref. No. _____

To be used prior to entry to any confined space

Confined Space Supervisor name, PRINT	Location	
	Task	
Confined Space Supervisor, Sign	Date of assessment	Time of assessment

The Supervisor;	Y	N	Sign
Confirm you have received confined space awareness training			
Confirm you understand hazards in confined spaces			

	Hazard	Yes	No	Risk before			Counter measures, if required	Risk after		
				H	M	L		H	M	L
1	Is there poor ventilation?									
2	Likely to be low oxygen?									
3	Likely to be high oxygen?									
4	Any toxic gases or vapours?									
5	Any flammable gas or substances?									
6	Any hazardous substances, including asbestos?									
7	Vermin, other animals or biological hazards?									
8	Risk of gases, fluids, solids entering area?									
9	Will proposed work change conditions in space?									
10	Are the escape routes >200m apart?									
11	Is there sufficient lighting?									
12	Are there obstructions, e.g. pipes, cables, conduits etc?									
13	Are any walkways fragile?									
14	Is there drainage or sewer runs within the space?									
15	Is there likely to be excessive heat?									
16	Are ways in/out narrow?									
17	Other:									
18	Other:									
19	Other:									

Method Statement Overleaf

Method Statement. Step by step description of how the confined space work will be undertaken.

Rescue Plan. Give details of actions to be take in an operator is unable to leave the confined space unaided.

Appendix 2 Confined space entry –Permit to Work

Section 1 Permit number -			
Location of work		Space I.D.	
Method Statement name/reference number			
Summary of Work			

Section 2. Controls & Precautions to be taken		Yes	No	N/A
1	All persons entering confined space have appropriate training & fit to work?			
2	Equipment in the vicinity isolated and locked off with appropriate permit ?			
3	Plant and equipment drained and vented?			
4	Hazardous materials removed from work area or made safe?			
5	PPE/RPE as specified in method statement to be worn?			
6	Calibrated/inspected escape breathing apparatus kits required?			
7	Entry covers or similar to be open to provide ventilation?			
8	Barriers and warning signs around open entry points?			
9	Forced ventilation required?			
10	Tripod and personnel riding winch to be used?			
11	Life line to be worn?			
12	Pre-entry gas monitoring required? Use air monitoring record sheet?			
13	Ongoing gas monitoring required?. Use air monitoring record sheet			
14	Two way communications required? If so state method			
15	Intrinsically safe tools required? If so list			
16	Other controls, including emergency arrangements?			

Section 3 Duration of permit	Date	Time
Date and time when work may commence		
Date and time when work persons must vacate confined space		

Section 4 Approval by Oxford Brookes Confined Space Manager			
Name	Job title	Date	Sign

Section 5 Prior to commencement of work - Declaration by Confined Space Supervisor			
I confirm that I, and those under my control, will abide by the Method Statement referenced to in section 1 and the controls and precautions set out in section 2, to carry out work in confined space			
Name	Job title	Date	Sign

Section 6 Completion of work - Declaration by Confined Space Supervisor			
I confirm that the work detailed above is complete and the area has been left safe and secure			
Name	Job title	Date	Sign

Section 7 Clearance of Permit by Oxford Brookes Confined Space Manager			
Name	Job title	Date	Sign

Appendix 3 Air monitoring record sheet

Section 1 Permit number -			
Location of work		Space I.D.	
Details of Work			

Initial readings, prior to entry					
Gas monitor	Model	O ₂ %	H ₂ S ppm	CO ppm	Methane %
Serial no	In Calibration Yes <input type="checkbox"/>				
Confirm safe to enter	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Supervisor name		Sign			
Company/Department		Date		Time	

Periodic readings. Location, Point of entry <input type="checkbox"/> At work place <input type="checkbox"/>					
Gas monitor	Model	O ₂ %	H ₂ S ppm	CO ppm	Methane %
Serial no	In Calibration Yes <input type="checkbox"/>				
Confirm safe to work	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Supervisor name		Sign			
Company/Department		Date		Time	

Periodic readings. Location, Point of entry <input type="checkbox"/> At work place <input type="checkbox"/>					
Gas monitor	Model	O ₂ %	H ₂ S ppm	CO ppm	Methane %
Serial no	In Calibration Yes <input type="checkbox"/>				
Confirm safe to work	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Supervisor name		Sign			
Company/Department		Date		Time	

Periodic readings. Location, Point of entry <input type="checkbox"/> At work place <input type="checkbox"/>					
Gas monitor	Model	O ₂ %	H ₂ S ppm	CO ppm	Methane %
Serial no	In Calibration Yes <input type="checkbox"/>				
Confirm safe to work	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Supervisor name		Sign			
Company/Department		Date		Time	

Periodic readings. Location, Point of entry <input type="checkbox"/> At work place <input type="checkbox"/>					
Gas monitor	Model	O ₂ %	H ₂ S ppm	CO ppm	Methane %
Serial no	In Calibration Yes <input type="checkbox"/>				
Confirm safe to work	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Supervisor name		Sign			
Company/Department		Date		Time	

Periodic readings. Location, Point of entry <input type="checkbox"/> At work place <input type="checkbox"/>					
Gas monitor	Model	O ₂ %	H ₂ S ppm	CO ppm	Methane %
Serial no	In Calibration Yes <input type="checkbox"/>				
Confirm safe to work	Yes <input type="checkbox"/> No <input type="checkbox"/>				
Supervisor name		Sign			
Company/Department		Date		Time	