HASLIN

Confined Space Entry Procedure

SEQ-PR-008

Document Revision Control

Document History			
Revision	**Description of Amendments**	**Revised By**	**Date**
4	Update to Haslin's new branding	Jeremy Wallis	01/09/2016
5	Complete review	Clare English	06/12/2022
6	Updated to include LEL and UEL appendix	Clare English	20/12/2022

Document Approval			
Revision	**Approved By**	**Signature**	**Date**
4	Colin Woods	Colin Woods	01/09/2016
5	Clare English	Clare English	06/12/2022
6	Clare English	Clare English	20/12/2022

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ISO 45001 OH&S management system
ISO 14001 Environmental management system
ISO 9001 Quality management system

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1. Scope

During the design, construction or maintenance of space that is or is intended to be a confined space, the need for any person to enter the space or inadvertently entering the space must be eliminated, so far as is reasonably practicable. If it is not reasonably practicable to do so, the need or risk must be minimised so far as is reasonably practicable and the space designed with a safe means of entry and exit. The risk to the health and safety of any person who enters the space must be eliminated so far as is reasonably practicable or, if it is not reasonably practicable to eliminate the risk, it must be minimised so far as is reasonably practicable.

2. Application

This procedure applies to confined spaces under the Haslin's management or control that are entered by any person, are intended or likely to be entered by any person or could be entered inadvertently by any person.

3. References

- WHS ACT 2011
- NSW WHS REGULATION 2017
- AS2865 - 1995 Safe working in a confined space
- NSW Code of Practice Confined Spaces 2019
- QLD Work Health and Safety Regulation 2011
- Confined Spaces Code of Practice 2021 – Worksafe QLD
- AS2381 Electrical equipment for explosive atmospheres – Selection, installation, and maintenance
- Workplace Exposure Standards for Airborne Contaminants 2013 – Safework Australia

4. Definitions

Competent person	A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to correctly perform a specified task.
Confined Space	An enclosed or partially enclosed space which: a) Is not designed or intended primarily to be occupied by a person; and b) Is, or is designed or intended to be, at normal atmospheric pressure while any person is in the space; and c) Is or is likely to be a risk to health and safety from: I. An atmosphere that does not have a safe oxygen level, or II. Contaminants, including airborne gases, vapours and dusts that may cause injury from fire or explosion, or III. harmful concentrations of any airborne contaminants, or IV. engulfment. But does not include a mineshaft or the workings of a mine. Confined spaces include but are not limited to: a) Storage tanks, tank cars, process vessels, boilers, pressure vessels, silos and other tank-like compartments; b) Open-topped spaces such as pits or degreasers; c) Pipes, sewers, shafts, ducts and similar structures; and d) Any shipboard spaces entered through a small hatchway or access point, cargo tanks, cellular double bottom tanks, duct keels, ballast and oil tanks, and void spaces, but not including dry cargo holds.

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 eight-hour workday, for a five-day working week. (b) Short-term exposure limit (STEL). A 15 minute TWA exposure which should not be exceeded at any time during a workday even 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 four times per day. There should be at least 60 minutes between successive exposures at the STEL. (c) 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 or vapour (percentage by volume) in air in which an explosion can occur upon ignition. Expressed by lower explosive limit (LEL) and upper explosive limit (UEL). NOTE: If the concentration of the flammable contaminant in the air is either below the LEL or above the UEL, propagation of a flame does not occur on contact with an ignition source.
Flashpoint	Flash point is the minimum temperature at which a liquid forms a vapor above its surface in sufficient concentration that it can be ignited. Flammable liquids have a flash point of less than 37.8°C, combustible liquids have a flashpoint at or above 37.8°C. Liquids with lower flash points ignite easier.
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 under normal atmospheric pressure and a maximum oxygen content in air of 23.5 percent by volume under normal atmospheric pressure. At pressure significantly higher or lower than the normal atmospheric pressure, expert guidance should be sought.
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.

5. Legal requirements

There are specific requirements for working in a confined space which are detailed in the NSW WHS Regulation 2017 Part 4.3. NSW WHS Regulation clause 65 states that a worker must not enter a confined space until the following has been completed:

a. A risk assessment has been completed in accordance with section 6.1 of this procedure,
b. A Confined Space entry permit has been issued in accordance with section 6.2 of this procedure,
c. Signage is in place in accordance with section 6.3 of this procedure,
d. Communication and monitoring measures are in place in accordance with section 6.4 of this procedure,

e. Specific controls are in place regarding connected plant and services, atmosphere, flammable gas, vapours, fire and explosion in accordance with section 6.5 of this procedure,
f. First aid and rescue procedures are in place and practiced in accordance with section 6.6 of this procedure,
g. PPE to be used in emergency rescues is provided and available in accordance with section 6.7 of this procedure,
h. Confined space training is provided to workers in accordance with section 6.8 of this procedure.

Further information regarding working in confined spaces can be found in the NSW Code of Practice Confined Spaces 2019.

6. Procedure

6.1. Risk Assessment

The identification and classification of a confined space shall be in accordance with a risk assessment of the space in line with the definition of confined space provided in Section 4 with reference to Appendix A and Part A of SEQ-FM-043 Confined Space Permit. For the purposes of classifying a space as a confined space, *not designed or intended primarily to be occupied by a person,* would include but not be limited to, a space which has poor ventilation, poor lighting, or the size or location of the opening or access to the space makes it physically difficult to get in and out of or to remove an injured or unconscious person from the space. If there is any doubt about the classification of a space it must be referred to senior management.

A risk assessment in accordance with SEQ-PR-001 Risk Management Procedure to manage the risks to health and safety associated with a confined space must be undertaken by a competent person in writing which includes the risks associated with entering, working in, on or in the vicinity of a confined space, including a risk of a person inadvertently entering a confined space.

This must include:

a. whether the work can be carried out without the need to enter the confined space,
b. the nature of the confined space,
c. if the hazard is associated with the concentration of oxygen or the concentration of airborne contaminants in the confined space or any change that may occur in that concentration,
d. the work required to be carried out in the confined space and the range of methods by which the work can be carried out and the proposed method of working,
e. the type of emergency procedures, including rescue procedures, that are required.

This risk assessment must be reviewed and as necessary revised by a competent person to reflect any review and revision of control measures. If a risk assessment indicates a risk to health or safety arising from work involving entry to a confined space that is under the control of Haslin Constructions, controls must be implemented to either eliminate the risk or if it is not practicable to eliminate the risk, minimise the risk using the hierarchy of controls so far as is reasonably practicable.

6.2. Confined Space Entry Permit

A worker must not enter a confined space to carry out work unless a confined space entry permit for the work has been issued. The confined space entry permit must be completed by a competent person in writing and specify the following:

a. the confined space to which the permit relates,
b. the names of persons permitted to enter the space,
c. the period of time during which the work in the space will be carried out,
d. measures to control risk associated with the proposed work in the space, and
e. contain space for an acknowledgement that work in the confined space has been completed and that all persons have left the confined space.

The control measures specified in the confined space permit must be based on the risk assessment conducted and include the control measures to be implemented for safe entry, details of the means of communication with the worker in the confined space and the monitoring to be performed.

When the work for which the confined space entry permit was issued has been completed, it must be confirmed that all workers have left the confined space, and the acknowledgement of such on the confined space permit must be completed by a competent person.

This does not apply to the entry into a confined space by an emergency service worker if, at the direction of the emergency service organisation, the worker is rescuing a person from the space, or providing first aid to a person in the space.

Part C of SEQ-FM-043 Confined space Entry Permit is required for each designated confined space being entered.

The permit will be suspended if any of the following conditions occur:

- There is a change in the authorised person who has signed the permit;
- There is a break in work continuity for a period greater than two hours; or
- The vapour concentration rises to a level greater than 10% of its LEL.

Once suspended, a permit must be revalidated by an authorised person before work in the confined space can resume.

Confined space entry permits are to be issued no more than one hour prior to the confined space entry, and will become void when:

a. Ten hours have elapsed from time of issue;
b. There is a significant change in the confined space's atmosphere;
c. There is an alarm from atmospheric testing equipment;
d. Additional or different chemicals not listed on the permit are introduced into the confined space;
e. Hazards inside the confined space change;
f. Equipment used inside the confined space changes; or
g. Workers listed on the confined space entry permit, including the designated stand-by person, are changed.

6.3. Signage

Before work in a confined space commences and while the work is being carried out, clear signs must be in place prominently located next to each entry to the space which identify the confined space and inform workers that they must not enter the space unless they have a confined space entry permit.

6.4. Communications and Safety Monitoring

A worker must not enter a confined space to carry out work unless there is a system that provides continuous communication with the worker from outside the space and monitoring of conditions within the space by a standby person who is in the vicinity of the space and, if practicable, observing the work being carried out. The standby person must remain outside of the space and initiate an emergency response if required as per section 6.6 Emergency Procedures and must never enter the space to attempt rescue.

6.5. Specific Controls

The risk of the introduction of any substance or condition into a confined space from or by any plant or services connected to the space or the activation or energising in any way of any plant or services connected to the space must be minimised so far as is reasonably practicable. This may require isolating or locking out in accordance with SEQ-PR-018 Isolation and Tag Out Procedure. If a risk assessment identifies that harmful concentrations of airborne contaminates or toxic gases may be present which exceed exposure standards then advice from an Occupational Hygienist must be sought.

Purging or ventilation to displace any contaminant from the atmosphere of a confined space must be carried out without the use of pure oxygen or gas mixtures with oxygen in a concentration exceeding 21% by volume prior to entering a confined space.
While work is being carried out in a confined space the atmosphere of the space must be continually monitored to ensure that it has a safe oxygen level, or if it is not reasonably practicable to achieve this and the atmosphere in the space has an oxygen level less than 19.5% by volume, any worker carrying out work in the space must be provided with an air supplied respiratory equipment.

While work is being carried out in a confined space, the concentration of any flammable gas, vapour or mist in the atmosphere of the space must be less than 5% of its Lower Explosive Limit (LEL).

If it is not reasonably practicable to limit the atmospheric concentration of a flammable gas, vapour or mist in a confined space to less than 5% of its LEL and the atmospheric concentration of the flammable gas, vapour or mist in the space is:

a) equal to or greater than 5% but less than 10% of its LEL - any worker must be immediately removed from the space unless a suitably calibrated, continuous-monitoring flammable gas detector is used in the space, or
b) equal to or greater than 10% of its LEL - any worker must be immediately removed from the space.

An example for methane which has a LEL of 5% and a UEL of 15% by volume of air is provided below:

0% - <5% of Methane by volume of air	5% to 15% of Methane by volume of air	>15% to 100% of Methane by volume of air
Non-Explosive (too lean)	Explosive Range	Non-Explosive (too rich)

5% of LEL = 0.25% of methane by volume of air
10% of LEL = 0.5% of methane by volume of air

A list of LEL and UEL for flammable and combustible substances is provided in Appendix B.

Equipment for testing and monitoring of flammable gases, dusts and vapours should be equipped with an audible or visual alarm and used by a competent person. Instruments used for testing the atmosphere in a confined space should be selected for their functional ability to measure hazardous concentrations and should be calibrated in accordance with the manufacturer's guidelines or manuals.

Monitoring the atmosphere inside a confined space must be performed remotely prior to entering taking samples from the top, middle and bottom of the confined space in the following order:

- Oxygen – Ensure that proper oxygen levels are present;
- Combustible gases – Ensure that combustible gases are not present:
- Toxic gases and other contaminates – Ensure that toxic gases and other contaminates are below exposure limits.

Records of monitoring at regular intervals must be recorded in Part D of SEQ-FM-043 Confined Space Permit.

An ignition source must not be introduced into a confined space (from outside or within the space) if there is a possibility of the ignition source causing a fire or explosion in the space. In confined spaces which contain or are likely to contain explosive atmospheres, all electrical equipment shall be rated for use in such atmospheres and must comply with AS2381 Electrical equipment for explosive atmospheres – Selection, installation, and maintenance.

Any hot works within a confined space must be performed in accordance with SEQ-PR-010 Hot Work Procedure.

6.6. Emergency Procedures

First aid and rescue procedures to be followed in the event of an emergency in a confined space must be established, documented using Part B of SEQ-FM-043 Confined space Entry Permit and practised by competent persons as necessary to ensure that they are efficient and effective. These must be initiated from outside the confined space as soon as practicable in an emergency and rescue should be performed from outside the confined space, if possible.

The entry and exit openings of a confined space must be large enough to allow emergency access and must not be obstructed. The plant, equipment and personal protective equipment provided for first aid or emergency rescue must be maintained in good working order.

Further details of emergency procedures relating to confined space can be found in SEQ-PR-017 Emergency Management Procedure.

6.7. Personal Protective Equipment

Suitable Personal Protective Equipment (PPE) must be used by a worker when entering a confined space. Such equipment must be readily accessible and appropriate to any hazard identified by the risk assessment. The equipment

must be selected and if necessary, fitted to suit the person who is to use it. It must also be maintained in a proper working order.

Air supplied respiratory equipment must be available for use by, and provided to, a worker who is to enter a confined space in order to carry out first aid or rescue procedures in an emergency in which:

a. the atmosphere in the confined space does not have a safe oxygen level, or
b. the atmosphere in the space has a harmful concentration of an airborne contaminant, or
c. there is a serious risk of the atmosphere in the space becoming affected in the way referred to in (a) or (b) while the worker is in the space.

Suitable personal protective equipment must be available for use by, and provided to, a worker in an emergency in which:

a. an engulfment has occurred inside the confined space, or
b. there is a serious risk of an engulfment occurring while the worker is in the space.

6.8. Information, Training and Instruction for Workers

Any worker who could enter or work in a confined space, carry out any function in relation to work in a confined space or the emergency procedures but who is not required to enter the space, or supervise any worker performing these functions, must be provided with suitable and adequate information, training and instruction in relation to the following:

a. the nature of all hazards relating to a confined space,
b. the need for, and the appropriate use of, control measures to control risks to health and safety associated with those hazards,
c. the selection, fit, use, wearing, testing, storage and maintenance of any personal protective equipment,
d. the contents of any confined space entry permit that may be issued in relation to work carried out by the worker in a confined space,
e. emergency procedures.

Details of confined space training and competencies are contained in Training and Competency Procedure SEQ-PR-069. Records of all training provided to a worker must be kept for 2 years.

6.9. Record Keeping

A copy of a confined space risk assessment must be kept until at least 28 days after the work to which it relates is completed. A copy of a confined space entry permit must be kept at least until the work to which it relates is completed.

If a notifiable incident occurs in connection with the work to which a risk assessment or permit relates, a copy of the assessment and permit must be kept for at least 2 years after the incident occurs and be available for inspection if required.

For the period for which a risk assessment or confined space permit must be kept a copy must be available to any relevant worker on request.

7. Training

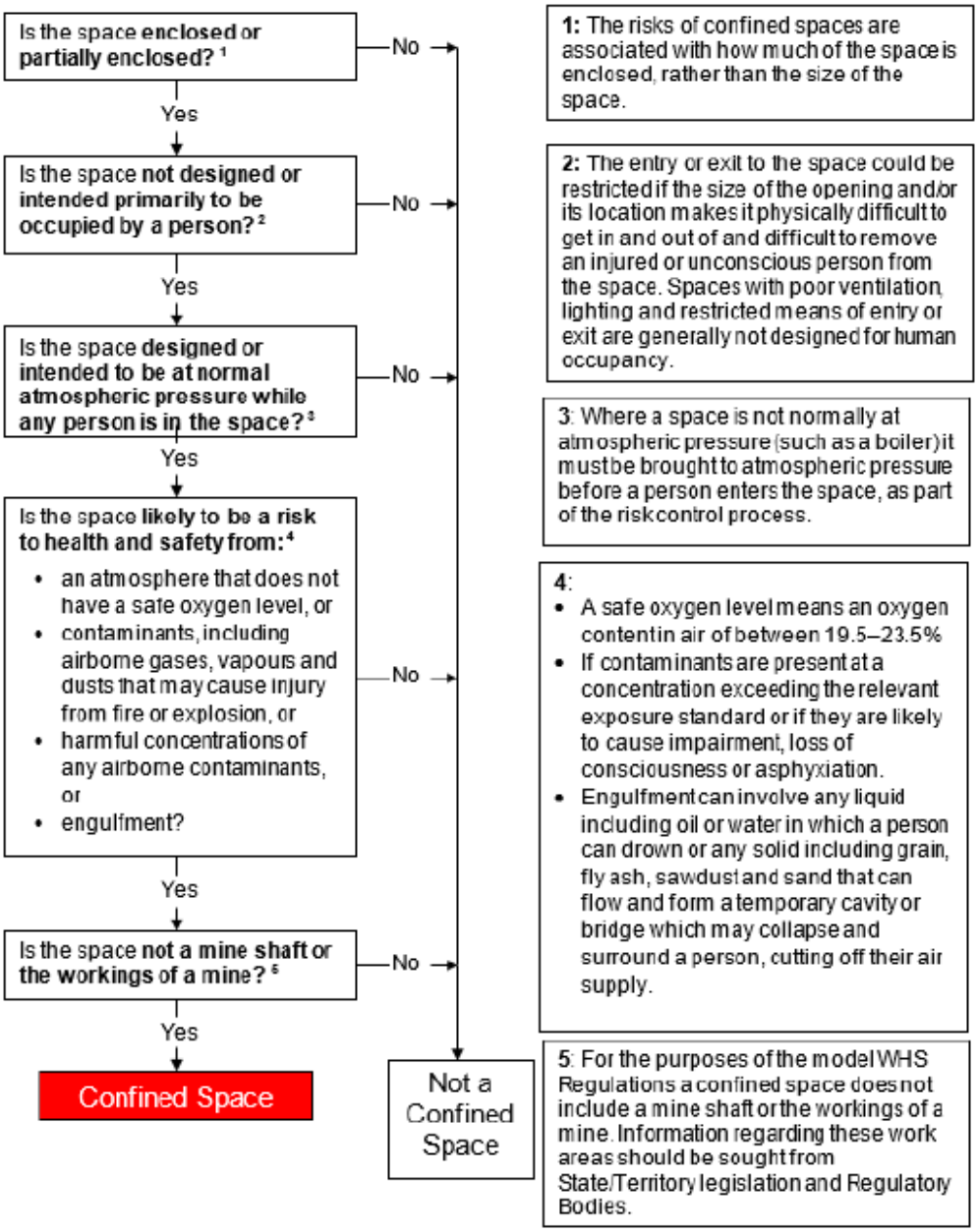
All persons with work activities related to a confined space shall be trained and assessed as a competent to perform those activities in accordance with SEQ-PR-069 Training and Competency Procedure. Separate competencies are required for:

- Confined space entry,
- Issue a confined space permit,
- Confined space rescue,
- Use self-contained breathing apparatus.

8. Relevant Templates, Forms and Checklists

SEQ-FM-043	Confined Space Entry Permit
SEQ-PR-069	Training and Competency Procedure
SEQ-PR-018	Isolation and Tag Out Procedure
SEQ-PR-010	Hot Work Procedure
SEQ-PR-017	Emergency Management Procedure
SEQ-PR-001	Risk Management Procedure

Appendix A – Confined space classification



Appendix B – LEL and UEL of flammable and combustible substances

Substance	LEL (% by volume)	UEL (% by volume)
Acetone	2.6	12.8
Acetylene	2.5	100
Acrolein	2.8	31
Acrylonitrile	3	17
Allene (propadiene)	1.5	11.5
Ammonia	15	28
Benzene	1.3	7.9
1,3-Butadiene	2	12
Butane	1.6	8.4
n-Butanol	1.4	11.2
1-Butene	1.6	10
Cis-2-Butene	1.7	9.7
Trans-2-Butene	1.7	9.7
Butyl Acetate	1.7	7.6
Carbon Disulfide	1.3	50
Carbon Monoxide	12.5	74
Carbonyl Sulfide	12	29
Chlorotrifluoroethylene	8.4	38.7
Cumene	0.9	6.5
Cyanogen	6.6	32
Cyclohexane	1.3	7.8
Cyclopropane	2.4	10.4
Decaborane	0.2	---
Deuterium	4.9	75
Diborane	0.8	88
Dichlorosilane	4.1	98.8

Substance	LEL (% by volume)	UEL (% by volume)
Diethylbenzene	0.8	---
Diethyl Ether	1.9	36
1,1-Difluoro-1-Chloroethane	9	14.8
1,1-Difluoroethane	5.1	17.1
1,1-Difluoroethylene	5.5	21.3
Dimethylamine	2.8	14.4
Dimethyl Ether	3.4	27
2,2-Dimethylpropane	1.4	7.5
Dimethyl Sulphide	2.2	20
Ethane	3	12.4
Ethanol	3.3	19
Ethyl Acetate	2.2	11
Ethyl Amine	3.5	14
Ethyl Benzene	0.8	6.7
Ethyl Chloride	3.8	15.4
Ethylene	2.7	36
Ethylene Oxide	3	100
Gasoline	1.2	7.1
Heptane	1.1	6.7
Hexane	1.2	7.4
Hydrazine	2.9	98
Hydrogen	4	75
Hydrogen Cyanide	5.6	40
Hydrogen Sulphide	4	44
Isobutane	1.8	8.4
Isobutylene	1.8	9.6
Isopropanol	2.2	12.7
Methane	5	15
Methanol	6.7	36
Methylacetylene	1.7	11.7
Methyl Bromide	10	15

Substance	LEL (% by volume)	UEL (% by volume)
3-Methyl-1-Butene	1.5	9.1
Methyl Butyl Ketone	1.2	8
Methyl Cellosolve	1.8	14
Methyl Chloride	8.1	17.4
Methyl Ethyl Ketone	1.4	11.4
Methyl Mercaptan	3.9	21.8
Methyl Vinyl Ether	2.6	39
Monoethylamine	3.5	14
Monomethylamine	4.9	20.7
Monomethylhydrazine	2.5	92
Nickel Carbonyl	2	---
Pentane	1.4	7.8
Picoline	1.4	---
Propane	2.1	9.5
Propionaldehyde	2.9	17
Propylene	2.4	11
Propylene Oxide	2.8	37
Styrene	0.9	6.8
Tetrafluoroethylene	4	43
Tetrahydrofuran	2	11.8
Toluene	1.1	7.1
Trichloroethylene	8	10.5
Triethylene Amine	1.2	8
Trimethylamine	2	11.6
Turpentine	0.7	---
Unsymmetrical dimethylhydrazine	2	95
Vinyl Acetate	2.6	13.4
Vinyl Bromide	9	15
Vinyl Chloride	3.6	33
Vinyl Fluoride	2.6	21.7
Xylene	0.9	7