



**PERMIT-REQUIRED  
CONFINED SPACE  
ENTRY WRITTEN  
PROGRAM**

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**NORTHLAND**  
**COMMUNITY & TECHNICAL COLLEGE**

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Our confined space entry program details the requirements which will prevent worker exposure to dangerous air contamination and oxygen deficiency or enrichment within confined spaces which include but are not limited to: sewers, vats, pits, tubs, vessels, boilers, silos, tanks, ducts, pipelines, bins, and compartments. It includes the recognition and evaluation of confined spaces, the establishment of permit system, training programs, and rescue procedures to ensure safe entry.

### **SAFETY OFFICER**

The responsibility and authority for the confined space entry program is assigned to Safety Officer. The responsibilities include identification, location, and classification of confined spaces, development of standard operating procedures in accordance with all laws, implementation of and training in confined space entry procedures, and evaluation of program effectiveness. The Program Administrator shall have the authority to acquire equipment needed for compliance, and to use staff, and other professionals and resources to ensure an effective program.

### **IDENTIFICATION OF CONFINED SPACES**

At Northland, we have the following confined spaces:

<b>Space</b>	<b>Location</b>	<b>Permit Status</b>	<b>Hazard/Comments</b>
<a href="#"><u>Aerospace</u></a>			
<b>Floor Drains (5)</b>	<b>Swenson Hangar</b>	<b>Permit Required</b>	
<b>Floor Drain</b>	<b>UAS Hangar</b>	<b>Permit Required</b>	
<b>Manhole</b>	<b>UAS Hangar</b>		
<b>AHU 2</b>	<b>Room 21</b>	<b>Permit Required</b>	<b>Permit Exempt as long as LOTO procedures are Followed</b>
<b>AHU 1</b>	<b>Boiler Room</b>	<b>Permit Required</b>	<b>Permit Exempt as long as LOTO procedures are Followed</b>
<b>Cooling Tower</b>	<b>Boiler Room</b>	<b>Permit Required</b>	
<b>Gas Boiler</b>	<b>Boiler Room</b>	<b>Permit Required</b>	
<b>Electric Boiler</b>	<b>Boiler Room</b>	<b>Permit Required</b>	
<a href="#"><u>TRF Main</u></a>			
<b>Floor Drain</b>	<b>Welding 651</b>	<b>Permit Required</b>	
<b>Floor Drain</b>	<b>Autobody 717</b>	<b>Permit Required</b>	
<b>Floor Drain</b>	<b>Automotive 721</b>	<b>Permit Required</b>	
<b>Catch Basin</b>	<b>Automotive 721</b>	<b>Permit Required</b>	
<b>Manhole</b>	<b>Facilities 260</b>	<b>Permit Required</b>	
<b>Manhole</b>	<b>Boiler Room 230</b>	<b>Permit Required</b>	

Crawl Space	Biology 105	Permit Required	
Crawl Space	Gym Storage 315A	Permit Required	
Lift Station	Gym Storage 315B	Permit Required	
Tunnel	Boiler Room 230	Permit Required	
Grounds Shop	Catch Basin	Permit Required	
Room 120 AHU #1	Room 120	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Room 120 AHU #2	Room 120	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Room 120 AHU #4	Room 120	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Theatre AHU	Theatre	Permit Required	Permit Exempt as long as LOTO procedures are Followed

Locker Room AHU	Roof	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Library AHU #3	Library	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Room 320 AHU #5	Room 320	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Room 330 AHU	Room 330	Permit Required	Permit Exempt as long as LOTO procedures are Followed
425 Suite AHU	Room 420	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Room 611A Infill AHU #6	Room 611A	Permit Required	Permit Exempt as long as LOTO procedures are Followed
FBM Suite AHU #7	Room 641	Permit Required	Permit Exempt as long as LOTO procedures are Followed
AHU #8		Permit Required	Permit Exempt as long as LOTO procedures are Followed
Welding AHU		Permit Required	Permit Exempt as long as LOTO procedures are Followed
Admin Suite AHU #9	Room 560	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Commons Area AHU #10	Room 520B	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Automotive AHU 11	Automotive 727A Mezz.	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Autobody AHU 12	Autobody 717	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Autobody AHU 13	Autobody 719	Permit Required	Permit Exempt as long as LOTO procedures are Followed
PAEG AHU #14	PAEG 705A Mezz.	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Music AHU #15	Room 410	Permit Required	Permit Exempt as long as LOTO procedures are Followed

Gym AHU #16	Gym Roof	Permit Required	Permit Exempt as long as LOTO procedures are Followed
461 Suite AHU #17	461E	Permit Required	Permit Exempt as long as LOTO procedures are Followed
CareerForce AHU #18	Room 713	Permit Required	Permit Exempt as long as LOTO procedures are Followed
RTU #1	Roof	Permit Required	Permit Exempt as long as LOTO procedures are Followed
RTU #2	Roof	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Suite 265 RTU	Roof 265	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Room 329 RTU	Room 329	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Room 545 RTU	Room 545	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Boiler #1	Room 520C	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Boiler #2	Room 520C	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Boiler #3	Room 520C	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Boiler #4	Room 260	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Boiler #5	Room 260	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Boiler #6	Room 260A	Permit Required	Permit Exempt as long as LOTO procedures are Followed
<a href="#">MEC</a>			
AHU #1	Boiler Room	Permit Required	Permit Exempt as long as LOTO procedures are Followed
AHU #2	Boiler Room	Permit Required	Permit Exempt as long as LOTO procedures are Followed

Space	Location	Permit Status	Hazard/Comments
<a href="#">EGF Campus</a>			
HVAC #11	FireTech Bldg.	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HVAC #1	Room 212	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HVAC #2	Room 212	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HVAC #3	Room 212	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HVAC #4	Room 510B	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HVAC #5	Room 510B	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HVAC #6	Room 252	Permit Required	Permit Exempt as long as LOTO procedures are Followed

HVAC #7	Room 309A	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HVAC #8	Room 342	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HVAC #9	Room 544	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HVAC #10	Room 544	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HVAC #12	Room 510B	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HVAC #13	Room 309A	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HV-1	Room 510B	Permit Required	Permit Exempt as long as LOTO procedures are Followed
HV-3	Room 510B		Permit Exempt as long as LOTO procedures are Followed
HV-4	Room 510B	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Boiler #1	FireTech Bldg. Room 725	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Boiler #2	FireTech Bldg. Room 725	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Boiler #3	FireTech Bldg. Room 725	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Floor Drain	Room 299	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Floor Drain	Room 530	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Floor Drain	Room 544	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Floor Drain	Room 570	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Floor Drain	Room	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Floor Drain	FireTech Bldg. Room 730	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Manhole	Room 546	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Manhole	Room 299	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Manhole	Room 570	Permit Required	Permit Exempt as long as LOTO procedures are Followed
Lift Station	Building Wide	Non Permit	When employees enter there is one in the tunnel and one outside in constant radio communication with the other.

***The complete list of confined space locations & classification information is also located in the Northland Compliance Manual under the “Confined Space – Assessments” tab. Hazard assessments for these spaces can also be found in this location. The College only enters the Air Handling Units as long as they follow the LOTO procedures developed for the units. The Safety Officer will be working with the Director of Facilities to allow the Maintenance staff to enter these spaces.***

Our goal is to minimize the hazard of our confined spaces through the use of engineering and administrative controls such as ventilation, flushing, and eliminating or minimizing time in confined spaces. Other means rather than entry will be utilized when feasible. The Program Administrator determined these confined spaces, and the Program Administrator will request additional evaluations whenever exposures are expected to change (new products, processes, jobs, equipment, etc.) or when complaints are received. All confined spaces will be appropriately labeled in the work place including class of confined space, and a warning against unauthorized entry.

## **CONTRACTOR INFORMATION**

Safety Officer will allow each contractor when they arrive on site to see the hazard assessment for the confined space that they are going to enter. The contractor then will inform the College the type of confined space equipment and program they have for entering the space. The contractor is responsible for ensuring that the proper procedures are followed, and appropriate equipment is used when entering the space (tri-pod, retrieval device, body harness, four gas meter, ventilation equipment, attendant, and communication devices).

## **ATMOSPHERIC TESTING AND VENTILATION**

Prior to entry, the contractor will perform atmospheric testing. The Contractor will use necessary monitoring equipment based on simplicity, accuracy, reliability, and maintenance considerations. The Contractor will ensure that the air monitoring equipment (i.e. gas meter) is properly calibrated. All air monitoring instruments shall be calibrated as per the manufacturer's guidelines (or at a minimum of once every six months). Calibration forms or records shall be kept with the instruments. It is the responsibility of the individual doing the air monitoring to ensure that the instrument is in calibration prior to use – this can be accomplished by checking the calibration records and/or having the instrument re-calibrated.

Atmospheric testing must include testing of all areas of a confined space (i.e. top, middle, bottom) – especially entries involving a descent into atmospheres that may be stratified or layered. In situations where stratified layers may exist, the atmospheric envelope should be tested at regular intervals (i.e. approximately every four feet). Care must be taken when testing potentially stratified atmospheres – so that the instruments sampling speed and detector response are not overwhelmed – (i.e. not able to keep up with rate of descent - so as to provide false or inaccurate readings). Adequate sampling time must be allowed when sampling stratified layers.

Atmospheric testing must be conducted in the following order:

1. Oxygen
2. Combustible Gases 10% LFL/LEL
3. Toxic gases / vapors, Hydrogen sulfide or carbon monoxide or any other hazardous substance

Ventilation equipment will be chosen which can provide the CFM's required. Consideration will also be given to its ability to fit into the confined spaces and allow workers the access and maneuverability needed to perform the work.

## VENTILATION EQUIPMENT

Make: \_\_\_\_\_

Model: \_\_\_\_\_

CFM Output: \_\_\_\_\_

Storage Location: \_\_\_\_\_

## ATMOSPHERIC TESTING EQUIPMENT

Make: MSA

Model: Altair 4

Serial #: \_\_\_\_\_

Regular Calibration Date: (minimum every six months – or as per manufacturers recommendation) \_\_\_\_\_

## ENTRY PERMIT SYSTEM FOR CONTRACTORS

The entry permit system provides for identification of confined spaces and hazards, continuous atmospheric testing or monitoring, and an emergency rescue plan.

A written permit form must be completed for each entry into a confined space. It must contain all the information listed on the Entry Permit forms and must be kept on file in the compliance documentation.

The contractor will complete a permit form for Permit-Required Confined Spaces. These will be used to train workers and authorize entry for a period of one work shift.

## PRE-ENTRY PROCEDURES FOR CONTRACTORS

- Obtain permit.
- Disconnect lines that may convey injurious substances by POSITIVE means (develop Lockout Procedure(s)).
- Calibrate monitoring equipment where used. Calibrate relative to oxygen content of the ambient air at the time of sampling. Calibration of the sampling device relative to oxygen content shall be performed where the 20.9% natural content of oxygen in the air is most likely to occur. NOTE: Oxygen calibration should not be performed near a confined space opening.
- Records are kept with the equipment and must be kept for at least one year. Test atmosphere where indicated and record results on appropriate form (Entry Permits). [NOTE: confined spaces with a combustible atmosphere greater than 10% of the lower explosive limit, shall NOT be entered even if a breathing apparatus or respirator is used.
- Personal Protective Equipment will be issued when injurious or corrosive substances are present, and their use will be enforced. An eyewash and safety shower will also be provided if these substances are present. (A hose with power nozzle and portable eyewash will be adequate.)
- Interconnected spaces will be individually tested; the most hazardous condition will govern the procedures to be followed.
- Ventilation shall be used wherever feasible to augment natural ventilation.

- Prior to entry into these spaces, the following spaces will be ventilated at least 3 times the total volume (cubic feet) of air prior to entry. The permit will describe the length of time.
- Continuous Air Monitoring shall be performed for: (see the previous section for gas testing order):
  - Oxygen enrichment condition/equipment requires oxygen monitoring to ensure O<sub>2</sub> does not exceed 23%.
  - Oxygen deficiency condition/equipment requires oxygen monitoring to ensure O<sub>2</sub> does not fall below 19.5%.
  - Combustible Gases (measured against 10% LFL/LEL);
  - Hydrogen sulfide or carbon monoxide or any other hazardous substance the college has reason believe exists in the confined space.
  - No smoking nor open flames shall be allowed within 10 feet of confined space

### **ENTRY PROCEDURES FOR CONTRACTORS**

- Permit must be completed and signed by all authorized entrants and attendants [trained in basic first aid and adult cardiopulmonary resuscitation and posted at the entrance. All individuals signing the permit will inspect the space to ensure all precautions are established.
- Residue or sludge will be removed before entry by filling the space with water and draining, or by the use of a high-powered hose nozzle to break up the residue, or other cleaning methods.
- Grounding or Ground Fault Interrupters will be used with lighting and electrical tools.
- A trained attendant must be posted outside the confined space, will maintain visual or verbal contact with the worker AT ALL TIMES.
- All trained attendants will be instructed NOT TO ENTER the space under any circumstances.
- Work completed will be written across the face of the permit when the job is complete. The permit will be sent to the Program Administrator and filed in the Documentation Section of this manual.

### **RESCUE PROCEDURES FOR CONTRACTORS**

- Trained Attendant Employee will sound the alarm: two-way radio, telephone, or other means of summoning emergency (see permit); this will alert the supervisor (see permit).
  - Trained Attendant shall be familiar with the permit procedure, be alert for changing conditions, know how to summon assistance immediately, know how to use emergency rescue equipment. Attendant will take all emergency action short of entering space.
- ! The RESCUER shall be the local Fire Department or another trained service that is capable of conducting a rescue.
- The SUPERVISOR will arrange for the Rescuer to be met and escorted to the confined space.

- The RESCUER shall have breathing air, a lifeline, a harness, a hoisting device, and an attendant trained in CPR before entering a confined space to effectively perform an emergency rescue.

### **EMPLOYEE TRAINING**

All appropriate employees will be trained in the definition and recognition of confined spaces, their hazards, and rescue procedures.

Northland will conduct initial training online. Re-training will be scheduled whenever personnel changes, process or product changes, or confined space changes occur, or the program review indicates inadequacies. Refresher training will be conducted on an annual basis.

### **PROGRAM REVIEW**

A review will be conducted at least annually of the effectiveness of Northland's confined space entry procedure.

### **RECORD KEEPING**

All records will be kept in the compliance documentation folders. The Confined Space Entry Compliance manual is located in the Safety Officer's office.

## **APPENDICES**

# CONFINED SPACE ENTRY PERMIT

## GENERAL INFORMATION

Space to be Entered: \_\_\_\_\_

Purpose of Entry: \_\_\_\_\_

Confined Space Entry No: \_\_\_\_\_

Location/Area: \_\_\_\_\_

Authorized Duration of Permit: Date: \_\_\_\_\_

Time: \_\_\_\_\_

Until Date: \_\_\_\_\_

Time: \_\_\_\_\_

### POTENTIAL HAZARDS (Check All That Apply)

- Oxygen deficiency (less than 19.5%)
- Oxygen enrichment (greater than 23.5%)
- Flammable gases/vapors (greater than 10% of LFL)
- Airborne combustible dust (vision obscured @  $\cong$  5 ft meets or exceeds the LFL)
- Toxic gases or vapors (greater than PEL)
- Mechanical hazards
- Electrical shock
- Materials harmful to skin
- Engulfment
- Inflow
- Heat
- Noise
- Working Aloft
- Stored Energy
- Other: \_\_\_\_\_

### EQUIPMENT REQUIRED FOR ENTRY AND WORK

#### PPE:

NA

#### Respiratory Protection:

NA

#### Ventilation:

2000 CFM / Welder

#### Illumination:

#### Atmospheric Testing/Monitoring (Check all that apply):

\_\_\_\_\_ Monitor / Meter Calibration Date: \_\_\_\_\_

Other (Identify): \_\_\_\_\_

#### Communication Method & Equipment:

Verbal / Visual  Equipment (List): \_\_\_\_\_

### PREPARATION FOR ENTRY (Check after steps taken)

Notification of affected personnel of service interruption

#### Isolation Methods:

Lockout  Blank/blind

Purge/clean

Other: \_\_\_\_\_

#### Personnel Awareness:

Pre-entry briefing on specific hazards & control

Notify contractors of permit & hazardous conditions

Other: \_\_\_\_\_

#### Atmospheric Testing

#### Hotwork Permit

*(Ventilation and Continuous Monitoring Required)*

### Non-Entry Rescue Equipment (Check all that apply):

Harness  Lanyard  Tripod  Wristlet

Other (List): \_\_\_\_\_

### ATTENDANT(S)

### ENTRANTS

### EMERGENCY INFO / NUMBERS / CONTACTS

### TESTING RECORD

#### Required

Oxygen >19.5% <23.5%

Flammability <10%LEL/LFL

H<sub>2</sub>S <10 ppm

CO <35 ppm

#### Other (If Potential Exists)

Other: \_\_\_\_\_

Time

Tester Initials

### PRE-ENTRY

Results

### PERIODIC MONITORING RESULTS

Results

Results

Results

Results

### AUTHORIZATION BY ENTRY SUPERVISOR

I certify that all required precautions have been taken and necessary equipment is provided for safe entry and work in this confined space.

Printed Name

Signature

Date

Time

**THIS PERMIT MUST BE POSTED AT CONFINED SPACE ENTRY POINT**

# PERMIT REQUIRED CONFINED SPACE RECLASSIFICATION FORM

1. Prior to reclassifying a Permit Required Confined Space, the Entry Supervisor is responsible for completing this form in its entirety.
2. This form must be visibly posted at the entrance to the confined space throughout the duration of the job.
3. This form cannot be used if Hot Work is to be performed in a confined space.
4. Return this form to the Safety Officer following completion of work.

Department: \_\_\_\_\_

Confined Space Name: \_\_\_\_\_

Work Description: \_\_\_\_\_

Identify what was done to eliminate all hazards that allow reclassification to a non-permit required confined space (Place a check mark in each box):

- Air monitoring has been conducted for the following hazards:

POTENTIAL ATMOSPHERIC HAZARD		PRE-ENTRY TEST RESULTS
Oxygen	<23.5% and >19.5%	
Flammability	<10% LEL/LFL	
H <sub>2</sub> S	<10 PPM	
CO	<35 PPM	
Other		

- This CONFINED SPACE will not pose a potential atmospheric hazard throughout the duration of the job.

- The following applicable physical hazards have been eliminated and will remain eliminated throughout the duration of the job:

- Equipment Locked Out                       Electrical Equipment Grounded  
 Vessel Drained / Flushed                       Chemical Lines Blinded  
 List any other requirements needed to reclassify this confined space:

\_\_\_\_\_

\_\_\_\_\_

I confirm that this Permit Required Confined Space (PRCS) can now be reclassified as a Non-Permit Required Confined Space.

\_\_\_\_\_  
**Entry Supervisor's Signature**

\_\_\_\_\_  
**Date**

## HOW TO RECLASSIFY A PERMIT REQUIRED CONFINED SPACE

Permit Required Confined Spaces may be reclassified to a non-permit confined space only under the following procedures:

- ✓ If the permit space poses no actual or potential atmospheric hazards, and if all hazards within the space can be eliminated (removed, locked-out, etc...) without entry into the space, the space may be reclassified as a non-permit required confined space for as long as the non-atmospheric hazards remain eliminated. *\*If Hot Work is to be performed in a confined space, this Reclassification Form may not be used – an Entry Permit is required.*
- ✓ If entry is required to eliminate hazards, an entry permit must be completed. If testing and inspection during that entry demonstrate that the hazards have been eliminated, the space may be reclassified (using this form) as a non-permit required confined space for as long as the hazards remain eliminated.

**NOTE:** Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards.

- ✓ The basis for determining that all hazards in a permit space have been eliminated shall be documented by completing the Reclassification Form. The completed Reclassification Form shall be posted at the entrance to the confined space and be visible to all entrants.
- ✓ If a hazard arises, all entrants must exit immediately and the space shall then be re-evaluated to determine whether it must be reclassified as a permit space.
- ✓ Reclassification Forms are good for 1-Working Shift and must be returned to the Safety Officer upon their expiration. They will be kept and filed by the Safety Officer for a minimum period of 1-Year.