

**CONFINED SPACE ENTRY**

**PROCEDURES AND GUIDELINES  
FOR  
THE CITY OF NEWTON  
P.O. Box 550  
Newton, NC 28658**

**Written in accordance with  
OSHA Code of Federal Regulations  
1910.146**

Approved by:

Public Works and Utilities Director

Effective Date:

04/01/10

Developed by:  
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## **I. Policy**

It is the policy of the City of Newton to comply with the Occupational Safety and Health Act (OSHA) Confined Space Standard 29 CFR 1910.146. City of Newton employees will enter confined spaces using alternate procedures whenever possible including purging, ventilation and continuous atmospheric monitoring. When a safe atmosphere cannot be achieved, respiratory use including SCBA and on-site rescue personnel is required.

## **II. Personnel Affected**

These procedures and guidelines apply to all job sites and to all employees temporary, permanent, part-time and full time who, while performing their jobs, are exposed to or enter into confined spaces. Visitors, vendors, contractors and any other non-employee will not be allowed to enter any confined space owned by or under service or any other work contract with the City of Newton unless all contractual requirements have been met. Contractors will be required to meet all of the standards outlined in this policy.

## **III. Responsibilities**

1. The administrators of these guidelines are departmental Supervisors.
2. It is the responsibility of the respective Supervisors to insure that the provisions of this policy are carried out at all respective job sites. They shall be responsible to initiate disciplinary action for any violation of these procedures.
3. Employees are responsible for becoming familiar with this policy and the requirements set forth in this policy. Employees must comply with this policy as well as other safety policies and are to immediately report unsafe conditions to their Supervisor.

(1)

4. Each work crew is responsible for identifying and marking each confined space before entry. A list of these must be maintained and noted for employee information and training. Listed below are the confined spaces that the employees of the City of Newton enter to perform their job tasks:

<b>Confined Spaces</b>	<b>Hazard</b>
1. Manholes/Sewers	Oxygen deficiency, methane, fall hazard, electrical hazards, bloodborne pathogens
2. Pipe Interiors	Oxygen deficiency, methane, fall hazard, electrical hazards, bloodborne pathogens
3. Trenches/Pits	IDLH atmosphere, Entrapment, crushing, fall hazard
4. Tanks	Oxygen deficiency, methane, fall hazard, electrical hazards, bloodborne pathogens
5. Pump/Lift Stations	Oxygen deficiency, methane, fall hazard, electrical hazards, bloodborne pathogens
6. Site wells/clear wells	Atmospheric hazards, electrical hazards, engulfment, fall hazards
7. Water Meter Vaults	Atmospheric hazards, electrical hazards, engulfment, fall hazards

Listed below are the potential physical, fire, and health hazards which may be present in the confined spaces that are entered by the City of Newton employees:

**Physical Hazards** - Limited access, limited egress, confined size, distance below, confined configuration, possibility of engulfment and sharp equipment blades.

**Fire Hazards** - Finely divided dust particles and potential explosive hazard.

**Health Hazards** - Possibility of engulfment or asphyxiation, possible IDLH toxic atmosphere, possible oxygen deficient atmosphere.

#### **IV. Definitions**

**Atmosphere** - Refers to gases, mists, vapors, fumes, and dusts within a confined space.

**Attendant** - An individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

**Authorized Entrant** - An employee who is authorized by the employer to enter a permit space.

**Blanking or Blinding** - The absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore

and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate. (2)

Ceiling Level - The OSHA maximum airborne concentration of a toxic agent which an employee may be exposed for 15 minutes for most chemicals.

Class A Confined Space - A confined space that could be immediately dangerous to life or health. These include, but are not limited to rotating machinery, oxygen deficient atmospheres, explosive or flammable atmospheres, and concentrations of toxic substances either present initially or from slow release from other sources.

Class B Confined Space - A confined space in which the potential hazard would not require any special modification of the work procedure or a space rendered safe using alternate procedures.

Confined Space - A space that:

- (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- (2) Has limited or restricted means for entry or exit (for example; tanks, vessels, silos, storage bins, hoppers, vaults, sewers, and pits are spaces that may have limited means of entry and exit); and
- (3) Is not designed for continuous employee occupancy.

Emergency - Any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

Engulfment - The surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry - The action by which a person passes through an opening into a permit required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into that space.

Entry Permit (Permit) - The written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in paragraph (f) of the standard.

Entry Supervisor - The person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry.

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**\*Note:** An entry Supervisor may also serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this section of the OSHA Standard for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

Hazardous Atmosphere - An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is escape unaided from a permit space), injury or acute illness from one or more of the following causes:

- (1) Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);
- (2) Airborne combustible dust at a concentration that meets or exceeds its lower flammable limit.

**\*Note** - This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 meters) or less.

- (3) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
- (4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G or Subpart Z of the OSHA Standard and which could result in employee exposure in excess of its dose or permissible limit.
- (5) Any atmospheric condition that is immediately dangerous to life or health. (IDLH)

Hot Work Permit - The employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

Immediately Dangerous to Life or Health (IDLH) - Any condition that causes an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

Inerting - The displacement of the atmosphere in a permit space by a non-combustible (such as nitrogen) to such an extent that the resulting atmosphere is non-combustible.

**\*Note** - This procedure produces an IDLH oxygen deficient atmosphere.

Isolation - The process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as blanking or blinding, or lockout/tagout of all energy sources, etc.

Non-Permit Confined Space - A confined space that does not contain or with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Oxygen Deficient Atmosphere - An atmosphere containing less than 19.5 percent oxygen by volume.

(4)

Oxygen Enriched Atmosphere - An atmosphere containing more than 23.5 percent oxygen by volume.

Peak Level - The specified concentration above the ceiling level permissible for the time period given in OSHA Table Z.3, 29 CFR 1910.1000.

Permit Required Confined Space (Permit Space) - A confined space that has one or more of the following characteristics:

- (1) Contains or has the potential to contain a hazardous atmosphere;
- (2) Contains a material that has the potential for engulfing an entrant;
- (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- (4) Contains any other recognized serious safety or health hazard.

Permit Required Confined Space Program (Permit Space Program) - The employer's overall program for controlling, and, where appropriate, for protecting employees from permit space hazards and for regulating employee entry into permit spaces.

Permit System - The employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

Prohibited Condition - Any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

Rescue Service - The personnel designated to rescue employees from permit spaces.

Retrieval System - The equipment including a retrieval line, chest or full body harness, wristlets, if appropriate, and a lifting device or anchor used for non-entry rescue of persons from permit spaces.

Testing - The process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

**\*Note** - Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately, prior to, and during entry.

## **V. Entry Policy**

Alternate Procedures will be used whenever possible to enter confined spaces if it can be demonstrated that the only hazard posed by the permit space is a hazardous or potentially hazardous atmosphere that can be altered to acceptable levels and/or electrical hazards that can be verified as zero energy state. The job site Supervisor will determine whether or not the atmosphere can be shifted to acceptable conditions through continuous forced air ventilation and monitoring. Monitoring will take place at the top, middle and bottom of the space to be entered and will be continuous. Lockout/Tagout procedures must be utilized to achieve a verifiable zero energy state. An entry permit will be completed and must be maintained for one year. The permit used by the City of Newton also acts as a confined space checklist noting potential hazards that could be encountered within the space. All permits should be turned into the Human Resources Department at the end of each day. These permits will be reviewed annually.

## **VI. Testing and Monitoring**

The City of Newton uses a multi gas detector that monitors Oxygen, LEL, CO<sub>2</sub> and H<sub>2</sub>S. It is bump tested by the job site Supervisor prior to any entry and calibrated as required per the instruction manual.

A. A record of each calibration shall be made and a copy kept with the equipment. Calibration shall be in accordance with the manufacturer's guidelines.

B. Initial testing of the atmosphere shall be conducted outside of the confined space.

C. Minimum testing prior to entering a confined space shall include levels of O<sub>2</sub>, H<sub>2</sub>S, CO and LEL. Testing shall be accomplished at top, middle and bottom of all confined spaces before entry. The monitor will be in the space with the employee at all times. Entry shall not be permitted if testing shows unacceptable atmospheric hazards classifying as a Class A space unless respiratory protection and on-site rescue personnel are utilized.

To qualify as a Class B space, atmospheric testing will be conducted using the multi gas detector alarm parameters; Oxygen lower than 19.5% to more than 23.5%, LEL 10% by volume, H<sub>2</sub>S 10ppm and CO 35ppm. Levels outside these limits must be corrected by cleaning and/or purging and ventilation followed by retesting. If acceptable levels cannot be achieved the space must continue to be classified as a Class A space therefore, respiratory protection and on-site rescue personnel must be utilized.

(6)

D. Testing for other contaminants such as carbon dioxide, carbon monoxide, hydrocarbon vapors, or any other IDLH atmosphere shall be done if potentially hazardous levels are suspected.

E. Hot work of any type is prohibited where tests indicate the oxygen concentration is above 23.5% or flammable gas concentration exceeds 10% LFL or LEL.

F. Atmospheric test results shall be recorded on the confined space entry permit.

G. Confined space work areas shall be continuously monitored while work is in progress for oxygen level, flammable or combustible gas level or any other toxic condition.

## VII. Confined Space Entry

A. Entry shall be permitted when forced ventilation is provided or the atmosphere is found to be safe by testing for oxygen deficiency and the presence of explosive and toxic gases or fumes.

B. Where an unsafe atmosphere is detected on initial testing of the confined space, the confined space shall be ventilated and retested to assure safe working conditions exist prior to personnel entering the confined space.

C. Provisions shall be made for an adequate continuous supply of air.

D. In the event a confined space atmosphere cannot be altered to acceptable atmospheric measures, respiratory equipment and on-site rescue personnel are required.

**\* Compliance with these regulations will be achieved by following the procedures set forth below:**

1. Prior to opening the man way or access cover, appropriate warning signs and/or barricades or fall protection devices shall be in place at and/or around the worksite.

2. Open all openings possible to encourage natural ventilation, if practical. Be sure that these openings are properly protected and barricaded.

3. Test for oxygen deficiency, flammable and combustible vapors, and toxic fumes.

4. Lockout/Tagout procedures will be conducted to ensure safety of employees from injury due to accidental start up, electrical hazards, pinch, crush or engulfment hazards.

5. All of the confined spaces that the City of Newton employees enter will be tested prior to entry and will be monitored continuously while a person is inside. Ventilation is required when hazardous conditions or potential hazardous conditions exist.



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6. A person entering a confined space shall wear a hard hat, safety shoes, proper clothing, and/or other appropriate personal protective equipment. Fall protection must be worn if the confined space is deeper than four feet.

**7. If at any time, while working in the confined space, the worker has any indication of a feeling of nausea, sleepiness, or loss of alertness, the worker will exit the confined space immediately.**

8. Two workers must be stationed outside when a worker or workers are inside the confined space. One worker must be at the entrance of the confined space or the point of the safest and quickest exit. That worker will function as the confined space attendant and must have been trained to operate in that role. At least one additional worker must be close enough to be called to or signaled to for assistance if necessary and that worker shall be informed of his/her standby status and the duties and responsibilities of that role.

9. If a worker is overcome or loses consciousness in a confined space, every effort will be made to effect retrieval using the attached safety harness from outside the confined space. If entry into the confined space becomes necessary, immediately dial 911 and initiate Fire Department/Rescue Squad emergency response. Be sure to specify the exact location and conditions of the emergency.

10. If the confined space atmosphere cannot be altered to acceptable conditions, respiratory equipment including SCBA and on-site personnel must be utilized.

### **VIII. Safety Equipment and Clothing**

The job site Supervisor will determine the safety equipment and clothing required for all personnel involved in the job. These items shall be inspected before use, and their use made mandatory. This will involve:

- A. Clothing as required to provide protection for the work being done.
- B. Head, hand, and foot protection as required.
- C. Inspection of harnesses, ventilation equipment, atmospheric monitoring equipment and retrieval systems as required.
- D. Smoking is prohibited in and around confined spaces.

### **IX. Safe Access**

A. If the confined space is entered by a ladder, the ladder shall remain in place and shall be securely anchored while workers are inside the confined space.

B. If the confined space is deeper than four feet (4'), a fall protection device shall be worn. (8)

C. If acceptable atmospheric conditions cannot be achieved; respiratory protection including SCBA and on-site rescue personnel must be utilized.

#### **X. Rescue and Emergency**

A. Limit the number of persons entering the confined space to the absolute minimum.

B. The attendant shall be stationed where visual contact can be maintained with the entrant in the confined space. If visual contact cannot be maintained, a method of communication must be agreed upon or provided before entry. If two way radio communication is used, ensure that the frequencies of the radio and monitoring equipment are compatible.

C. Some method of communication must be available for the attendant to alert standby personnel outside the confined space if an emergency arises.

D. The attendant and standby personnel shall have available and be trained in the use of first aid equipment and CPR.

E. Employees shall be briefed on job, entry, retrieval, and rescue procedures before a job begins to minimize confusion in the event of an emergency.

F. The appropriate fire fighting equipment shall be located near and convenient to the confined space if hot work is being performed.

G. The Newton Fire Department is trained to conduct confined space rescue should the need arise. The Newton Fire Department will be on-site in the event entry into an IDLH atmosphere is required. The Fire Department will remain on-site until the entry is completed and the permit is cancelled.

#### **XI. Multi - Person Entry**

Adequate attendants, standby personnel and equipment shall be provided for multi-person entry. The number of attendants should be determined by the type of confined space, the types of potential hazards, the number of workers in the confined space, or any other condition pertinent to the workers safety.

#### **XII. Entry Without Attendant or Standby Personnel**

**\*\*\*\*\*ABSOLUTELY FORBIDDEN\*\*\*\*\***

### **XIII. Training**

Every employee or contractor who may work in a confined space or in a support role shall have adequate, thorough and frequent training in the hazards and correct procedures for working in and around confined spaces. The administrators of this policy will keep and maintain training records, rosters, course content, etc.

## **DUTIES OF THE ENTRANT AND ATTENDANT**

### **The Entrant:**

1. Performs the assigned task.
2. Reviews the permit before entry.
3. Wears appropriate personal protective clothing, as required.
4. Uses appropriate personal protective equipment, as required.
5. Uses and attends to area and personal monitoring equipment.
6. Pays attention to own physical reactions that could signal an unsafe condition.
7. Maintains contact with the attendant and responds to evacuation orders.

**\* If the entrant senses any reaction to the environment, he or she should signal the attendant for help and leave the confined space immediately.**

### **The Attendant:**

1. Reviews the permit before entry.
2. Keeps track of who is in the confined space at all times.
3. Keeps unauthorized people out of the area.
4. Maintains continuous communication, visual or voice, with the entrant during entry.
5. Makes sure the ventilation equipment, if used, is working.
6. Monitors the atmospheric testing equipment.
7. Attends to the life line if worn by the entrant.
8. Attends to the air line, if used, to prevent tangles and kinks.
9. Remain alert for early symptoms of danger within the confined space.
10. Watches for hazards outside and inside the confined space.
11. Maintains clear access to and from the confined space.
12. Notifies the entrant and orders evacuation if conditions warrant, or if the permit limits expire.
13. Is prepared to call for emergency help if needed.
14. Remains at the entry point unless relieved by another trained attendant.

# **APPENDIX A**

**(Confined Space Entry Permit)**

## CONFINED SPACE ENTRY PERMIT

Date and Time Issued: \_\_\_\_\_ Date and Time Expires: \_\_\_\_\_

Job site/Space I.D.: \_\_\_\_\_ Job Supervisor: \_\_\_\_\_

Equipment to be worked on: \_\_\_\_\_ Work to be performed: \_\_\_\_\_

Stand-by personnel: \_\_\_\_\_

1. Atmospheric Checks: (Top/Middle/Bottom) Time: \_\_\_\_\_

Oxygen \_\_\_\_\_%

Explosive \_\_\_\_\_% L.F.L.

Toxic \_\_\_\_\_PPM

2. Tester's signature: \_\_\_\_\_

3. Source isolation (No Entry): N/A Yes No

Pumps or lines blinded,

disconnected, or blocked

4. Ventilation Modification: N/A Yes No

Mechanical

Natural Ventilation only

5. Atmospheric check after  
isolation and Ventilation:

Oxygen \_\_\_\_\_% > 19.5 % ~ 23.5%

Explosive \_\_\_\_\_% L.F.L < 10 %

Toxic \_\_\_\_\_PPM < 10 PPM H(2)S

Toxic \_\_\_\_\_PPM < 35 PPM CO

Time \_\_\_\_\_

Tester's Signature: \_\_\_\_\_

6. Communication procedures: \_\_\_\_\_

\_\_\_\_\_

7. Rescue procedures: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

8. Entry, standby, and back up persons:                      Yes      No

Successfully completed required training?

Is it current?

( )      ( )

9. Equipment:    N/A      Yes      No

Direct reading gas monitor - tested

( )      ( )      ( )

Safety harnesses and lifelines for entry and standby persons

( )      ( )      ( )

Hoisting equipment

( )      ( )      ( )

Powered communications

( )      ( )      ( )

SCBA's for entry and standby persons

( )      ( )      ( )

Protective Clothing

( )      ( )      ( )

All electric equipment listed Class I, Division I, Group D and Non-sparking tools

( )      ( )      ( )

10. Periodic atmospheric tests (Top/Middle/Bottom): Minimum every 10 minutes - Continuous Recommended

Oxygen    \_\_\_\_%    Time \_\_\_\_

Oxygen    \_\_\_\_%    Time \_\_\_\_

Explosive \_\_\_\_%    Time \_\_\_\_

Explosive \_\_\_\_%    Time \_\_\_\_

Toxic      \_\_\_\_%    Time \_\_\_\_

Toxic      \_\_\_\_%    Time \_\_\_\_

Oxygen \_\_\_\_% Time \_\_\_\_

Oxygen \_\_\_\_% Time \_\_\_\_

Explosive \_\_\_\_% Time \_\_\_\_

Explosive \_\_\_\_% Time \_\_\_\_

Toxic \_\_\_\_% Time \_\_\_\_

Toxic \_\_\_\_% Time \_\_\_\_

We have reviewed the work authorized by this permit and the information contained here-in. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid unless all appropriate items are completed.

Permit Prepared By: (Supervisor) \_\_\_\_\_

Approved By: (Unit Supervisor)

\_\_\_\_\_  
(printed name) (signature)

This permit to be kept at job site.

Return job site copy to office following job completion.



**APPENDIX B**  
**(Annual Confined Space Equipment Inspection Form)**

**City of Newton**  
**Confined Space Equipment Inspection Sheet**  
**Date: \_\_\_\_\_**

**Location:** \_\_\_\_\_

**All Confined Space Equipment is to be thoroughly inspected prior to and after each use. In addition, the equipment shall be inspected semi-annually by a competent person designated by the Supervisor. Equipment with deficiencies noted shall be taken out of service until properly repaired.**

<u><b>Equipment</b></u>	<u><b>Condition</b></u>		<u><b>Repair/Replacement Date:</b></u>
<b><u>Tripod:</u></b>			
Excessive Wear	Yes___	No___	_____
Deformation of Legs	Yes___	No___	_____
Leg/Foot Pins in Place	Yes___	No___	_____
Excessive Wear of Pulley	Yes___	No___	_____
Excess. Wear of Snaphook	Yes___	No___	_____
<b><u>Ventilation Equipment:</u></b>			
Fully Operational	Yes___	No___	_____
Cracks in Hose	Yes___	No___	_____
Fan Guards in Place	Yes___	No___	_____
Blades Cracked/Deformed	Yes___	No___	_____
Explosion Proof Switch	Yes___	No___	_____
<b><u>Monitoring Equipment:</u></b>			
Annual Calibration	Date:_____		_____
All sensors operational	Yes___	No___	_____
Manual Available	Yes___	No___	_____
Test Gas Available	Yes___	No___	_____

**Signature:** \_\_\_\_\_

**APPENDIX C**  
**(Post Job Equipment Inspection Form)**

**City of Newton  
Post Job Equipment Inspection Sheet**

**Date:** \_\_\_\_\_ **Location:** \_\_\_\_\_

<u><i>Equipment</i></u>	<u><i>Accounted</i></u>	<u><i>Deficiencies Noted</i></u>
<i>Hand Tools</i>	_____	_____
<i>Power Tools</i>	_____	_____
<i>Ventilation Equipment:</i>		
<i>Fully Operational</i>	Y__N__	_____
<i>Cracks in Hose</i>	Y__N__	_____
<i>Fan Guards In Place</i>	Y__N__	_____
<i>Blades Cracked/Deformed</i>	Y__N__	_____
<i>Explosion Proof Switch intact</i>	Y__N__	_____
<i>Monitoring Equipment:</i>		
<i>Monitor Calibration Current</i>	Y__N__	_____
<i>All Sensors Operational</i>	Y__N__	_____
<i>Manual Available</i>	Y__N__	_____
<i>Test Gas Available</i>	Y__N__	_____
<i>Tripod Equipment:</i>		
<i>Signs of Excessive Wear</i>	Y__N__	_____
<i>Deformation of Legs</i>	Y__N__	_____
<i>Leg/Foot Pins in Place</i>	Y__N__	_____
<i>Excessive Wear of Pulley</i>	Y__N__	_____
<i>Excessive Wear of Snaphook</i>	Y__N__	_____
<i>Chains/Hook/Binders</i>	_____	_____
<i>Entry Points Sealed</i>	_____	_____
<i>Barricades/Cones/Signage</i>	_____	_____
<i>Seed/Straw</i>	_____	_____
<i>Equipment Decontaminated</i>	_____	_____
<i>C/S Permit Closed</i>	_____	_____

**Signature:** \_\_\_\_\_