City of Crystal Lake
Department of Public Works
Confined Space Entry Policy

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Approved By:	**M. Magnuson**
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Purpose:
In an effort to safeguard personnel from injury or death while working in confined spaces, as well as limit municipal liability and maintain conformance with applicable state and Federal regulations, the Director of Public Works hereby authorizes the establishment of this confined space entry policy that shall be followed by all City of Crystal Lake Public Works Department personnel. It shall be the Policy of the City of Crystal Lake Public Works Department that all employees assigned to the department be required to conform with the requirements described in these procedures prior to, during execution of and upon completion of a confined space entry.

Procedure:
1) A confined space is defined by the National Institute for Occupational Safety and Health (NIOSH) as a space, which have the following characteristics:

a. Limited openings for entry and exit; and

b. Unfavorable natural ventilation; and

c. Not designed for continuous worker occupancy

2) Three classifications of a permit required confined space exist.

Level 0: Potentially Hazardous Confined Space

Level 1: Could cause injury or illness that can be protected against---not immediately dangerous to life or health.

Minimum equipment requirements for Level 0 and 1 Confined space are:

a. Forced air Ventilation b. Air monitoring
c. Confined Space Permit d. Portable 2-way radio
e. Body Harness & Life line f. Emergency Air hood
g. Direct communication with workers from outside the confined space
h. Prior to entering a confined space and when exiting a confined space the entry supervisor shall notify all of the following:
    i. Divisional superintendent and/or supervisor
    ii. Battalion 330 via phone call to the Crystal Lake Fire Rescue Department *(see Appendix B).*

Level 2: Atmosphere immediately dangerous to life – oxygen deficiency, explosiveness, toxic, flammable. There shall be no entry of a Level 2 confined space until the space can be classified as a Level 1 or Level 0.

3) Designation of City of Crystal Lake Public Works Department confined spaces for the purpose of this policy shall be the responsibility of each Division Superintendent. A list of designated confined entry spaces shall be maintained within the appendix of this policy and shall be reviewed at least annually and updated accordingly.

4) If you are in doubt about whether an area is a confined space, consider it such and enter it utilizing the approved confined space entry procedures. Each Division Superintendent shall maintain a list of confined spaces pursuant to their respective facilities (see *Appendix A*).

5) It is the objective of this policy to not only protect Public Works Division personnel from the dangers of entering a confined space incorrectly, but to also warn others of the potential hazards they may face in entering City facilities that have been designated by the Public Works Department as confined spaces. Therefore, it is required that all Public Works Department employees, upon witnessing a confined space entry into a City owned facility by personnel not subject to this policy, provide that entrant with a written notice of the Public Works Department's designation of the confined space. Printed forms shall be kept in each Public Works Division vehicles and shall be presented to the confined space entrant for signature acknowledging that the space has been designated as a confined space. Signed forms shall be returned to the Division's Superintendent. Should the entrant refuse to sign the form, the Public Works division member shall so note that fact including time, date and initials and return the unsigned form to the Departmental Superintendent.

6) In addition, it shall be a requirement of this policy that all City of Crystal Lake Public Works
Division contracts have included, as a standard condition, that a Safety Program that includes a confined space entry policy be followed by the successful contract awardee (or) and subcontractor(s).

7) Prior to the entrance of any confined space, a minimum of two (2) confined space entry trained Public Works Division personnel must be present (including the person entering the confined space)

8) In order to ensure that intrinsically safe lantern/flash-lights are utilized in hazardous areas, it is the policy of the Public Works Division that intrinsically safe lanterns and flash-lights are to be used by personnel anytime portable lighting is needed within a confined space that has been identified as flammable or explosive.

Training:

1) Training shall be provided to all employees whose work is affected by this section so they acquire the understanding, knowledge, and skills for safe performance of assigned duties.

2) Training shall be conducted:

a) Prior to first assignment
b) Prior to a change in assignment duties
c) Whenever new hazards are encountered
d) Whenever there are inadequacies in employee training
e) Refresher training shall be done on an annual basis.

3) The training shall establish the employee's proficiency in duties required by this section.

4) Each Division Superintendent shall maintain a written certification of training for each covered employee, with the name of each employee, the signatures of the trainers, and the dates of training.

5) Training records should be maintained for at least one (1) year after the date of the training session.

Confined Space Entry Permits:

There are two types of classifications for confined space entries, the "PERMIT REQUIRED" and the "NON-PERMIT REQUIRED". A permit-required confined space may be reclassified as a non-permit space under the following procedures:

a) The Superintendent can demonstrate that the only hazard posed by the permit space is a potential hazardous atmosphere.

b) The Superintendent can demonstrate that continuous forced air ventilation alone is sufficient to maintain that permit space safe for entry.

c) The Superintendent develops monitoring and inspection data that supports a & b of this section.

d) If hazards develop, employees must exit the space immediately. The Superintendent shall re-evaluate the space and re-designate as a Permit Required Space.

Required Confined Space Entry Procedures:
It shall be the policy of the City of Crystal Lake Public Works Department that all employees assigned to the department are required to conform to the procedures described in this policy both prior to, during execution of and upon completion of a confined space entry. The most successful entries are the ones that are well planned and followed as closely to the prearranged plan as possible. It is for this reason that a "tailgate meeting" shall be performed prior to each and every confined space entry. This meeting shall include designating an entry supervisor, entrant, attendants and what their responsibilities will be the scope of the job and what requirements will be needed to successfully complete the job. Also included in this plan are any potential hazards that could arise and the steps taken to eliminate them. The entry supervisor may sign the permit. If someone other than the entry supervisor signs the permit, there must be a space for initials or the signature of the supervisor who originally authorized the entry.

1) Obtain a confined space entry permit, and complete the appropriate form, (signed only by the SUPERINTENDENT, SUPERVISOR, or person designated by the SUPERINTENDENT or SUPERVISOR).

2) Complete tailgate meeting

3) No Smoking will be permitted around the Confined Space, limits to be determined at tailgate meeting.

4) Obtain the following confined space equipment
   a) Emergency Escape Tank with hood
   b) Body harness
   c) Lifeline and fall protection system (optional when entanglement hazard exist)
   d) Tripod or other supporting device (optional for horizontal entry)
   e) Air Monitor, which shall be bump tested before being taken out to the job site.
   f) Intrinsically safe flashlight when required or any other lighting needed.
   g) Portable 2-way radio
   h) Appropriate P.P.E.
   i) Ventilating fan and hoses

5) Carefully remove cover on entry door to avoid ignition of possible explosive atmosphere, since no prior air monitoring has been initiated.

6) Whenever possible, locate vehicle a minimum of 20' away from the entrance of the confined space, it is also important to determine the wind direction when using any type of ventilating setup. Vehicle shall be turned off whenever possible.

7) Set up supporting device over or next to entrance and prepare for use.

8) Set up ventilating equipment and blow fresh air into entire confined space, time to be determined by the size of the confined space, prior to entering confined space. Ventilation shall continue throughout confined space entry.

9) As per training, test atmosphere within the confined space for oxygen deficiency/enrichment, explosive and toxic gases with approved detection equipment. If atmosphere is safe, proceed to step #10, if not, repeat steps #8 and #9.

10) Person to enter (entrant) confined space shall put on a full body harness, and connect to a lifeline and fall protection system that is already connected to the supporting device from step #7.

11) Emergency Escape Tank with hood is to be carried on the entrant and/or be easily accessible by the entrant if needed.

12) Prior to entrance into the confined space, the entry supervisor shall notify Battalion 330 via phone call to Crystal Lake Fire Rescue Department that the confined space entry is starting.

13) Entry supervisors are responsible for the overall permit space entry and must coordinate all entry procedures, tests, permits, equipment and other relevant activities. The following entry supervisor duties are required:

- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Verify, by checking the appropriate entries have been made on the permit, all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
- Terminate the entry and cancel the permit when the entry is complete and there is a need for terminating the permit.
- Verify that rescue services are available and that means for summoning them are operable.

14) The attendant shall record the atmospheric readings, either through visual monitoring of the air monitor or having the readings of the monitor transferred to him/her if the monitor is in the confined space. The attendant shall not perform any duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrant. The attendant shall also continuously maintain visual and/or verbal contact with entrant, if the attendant detects the behavioral effects of hazard exposure or a situation outside the space occurs that could endanger the entrant, instruct the entrant to immediately exit the confined space.

15) During the operation, if an unsafe atmosphere is detected, the entrant must exit the confined space immediately---use the Emergency Escape Tank with hood if needed, and notify the department supervisor
REPEAT STEPS #8 AND #9 UNTIL SAFE FOR RE-ENTRY

16) Upon completion of a confined space entry, the entry supervisor shall notify Battalion 330 via phone call to the Crystal Lake Fire Rescue Department that the confined space entry is completed.

17) Upon completion of a confined space entry, the entry supervisor must cancel the confined space entry permit and turn the permit, with "cancelled" indicated on the permit, into the respective department SUPERVISOR or SUPERINTENDENT.

18) All the equipment used shall be cleaned and inspected prior to being put away.

19) All CONFINED SPACE ENTRY equipment shall be inspected and/or sent in for a factory check-up according to the manufactures required recommendations.

20) All air monitoring equipment shall be calibrated according to manufactures recommendations, and shall be sent in for factory check-up according to the manufactures required recommendations.

Emergency Response Procedures:
In the event a confined space emergency situation occurs, the following procedures shall be utilized. DO NOT, under any circumstances, enter the confined space to attempt a rescue.

A) Atmospheric emergency (i.e. lack of oxygen, gas present)

1) Call 911.

- Give exact location. Describe as precisely as possible the emergency situation. Be specific.

2) Carefully remove the victim from the confined space using the lifeline attached to the supporting device. If for some reason the victim is unable to be removed, ventilate the confined space until emergency assistance arrives. Place the vent hose as close to the victims face as possible.

3) If you have removed the victim from the confined space, monitor the victim's airway, breathing and circulation, and give assistance if necessary until emergency assistance arrives.

B) Injury-related emergency

1) Call 911.

- Give exact location. Describe as precisely as possible the emergency situation.

2) If the emergency is injury related and is not life threatening, continue to ventilate, as close to the entrants face as possible, maintain verbal contact with the victim (if conscious) and continue to monitor atmosphere until emergency assistance arrives.

While it is impossible to cover every aspect of a confined space entry, as situations will differ with each entry, this policy is designed to give a definite procedure to enter confined spaces. Common sense and the knowledge of the hazards in the confined space are just as important as the entering procedures. Stop to think before you enter. If in doubt as to whether it is a confined space, treat it as such and follow procedures for entry.

Definitions:

Acceptable entry conditions: the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the 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 attendant: an employee who is authorized by the employer to enter a permit space.

Bump test: to apply predetermined gases and a set amount of these gases to the air monitor prior to being used for a confined space entry. This shall be done according to the manufactures recommendations, to ensure that the alarm set levels are accurate.

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, and pits are spaces that may have limited means of entry)
(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 or plugging 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 ensuring 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 OSHA Confined Space Standard 1910.146. The entry permit shall be cancelled at the termination of the confined space and the word "cancelled" written on the permit.

Entry supervisor: the person (such as the employer, foreman, or crew chief) 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 the entry. 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 OSHA Confined Space Standard 1910.146 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: atmosphere that may expose employees to the risk of death, incapacitation, and 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 LFL;
Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52m) or less.

(3) Atmospheric oxygen concentration below 19.5 percent or above 23.5percent

(4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this part and which could result in employee exposure in excess of its dose or permissible limit.
Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, and impairment of ability to self-rescue, injury, or acute illness due to health effects is not covered by this provision.

(5) Any other atmospheric condition that is immediately dangerous to life or health
Note: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Data Safety Sheets that comply with the Hazard Communication Standard 1910.1200, published information and internal documents can provide guidance in establishing acceptable atmospheric conditions.

Hot work permit: the employers 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 (IDHL): any condition that poses 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.

Note: Some material-hydrogen fluoride gas and cadmium vapor, for example-may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fetal collapse 12-72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.

Inerting: the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. Note: this procedure produces IDHL oxygen-deficient atmosphere.

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. Oxygen enriched atmosphere: an atmosphere containing more than 23.5 percent oxygen by volume.
Permit-required confined space (permit space): a confined space that has one or more of the following characteristics:

(1) Contains or has 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-requires 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 procedures 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 space.

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.

Tailgate Meeting: A meeting of the confined space entry crew, held prior to filling out the entry permit, turning over a copy of the permit to the Fire/Rescue department, and traveling to the confined space site. The meeting shall go over the reason for entering the confined space, who shall be the entry supervisor, the entrant, the attendant, and site setup, also any information pertinent to the entry.

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.

Appendix A

Confined Space Classifications for Sewer & Lift Department

Sanitary manholes (Level 1)
Storm manholes (Level 1)
Storm catch basins & inlets (Level 1)
Wet well (storm & sanitary) (Level 1)
Drywells for storm sewers (Level 1)
Pump pits (storm & sanitary) (Level 1 or 0)
Valve vaults (Level 1 or 0)
Generator rooms (Level 0)
Excavations (Level 0)

Confined Space Classifications at WWTP #2

Sanitary, storm sewer, and water manholes (Level 1 or 0)
Below grade wet wells associated with sanitary/storm sewer pump stations (Level 1)
Raw sewage pump station #1 wet well (Level 1) and cleaned (Level 0)
Raw sewage pump station #2 wet well (Level 1) and cleaned (Level 0)
Empty and cleaned grit tanks (Level 1) and cleaned (Level 0)
Empty and cleaned primary tanks (Level 0)
Primary By-Pass channel (Level 0)
Screw pump base (Level 0)
Screen building wet well (Level 1) and cleaned (Level 0)
Empty and cleaned Secondary Clarifiers (Level 0)
Diversion box sluice gate (Level 0)
Empty and cleaned Aeration Basins (Level 0)
Empty Anaerobic Digester (Level 0)
Empty and cleaned Aerobic Digesters (Level 0)
Emptied and cleaned Gravity thickeners (Level 0)
Telescopic Valve stations (Level 1)
Flow Division Chambers (Level 1)
Below grade in the sand filters (Level 0)
Ultraviolet Light Channels (Level 0)
Empty Chlorine Contact Tanks (Level 0)
Empty Sodium Bisulfate Chamber (Level 0)

Confined Space Classifications at WWTP #3

Below grade wet wells associated with sanitary/storm sewer pump stations (Level 1)
Sanitary, storm sewer, and water manholes (Level 1 or 0)
Raw Sewage pump station wet well (Lift Station 12) Level 1 and Cleaned Level 0
Empty Grit tank (Level 1) cleaned (Level 0)
Empty and cleaned primary tanks (Level 0)
Scum Pit (Level 1)
Solids Holding Tanks (Level 0)
Waste Pit (Level 1)
Pack tower wet well Landings (Level 0)

Pack towers wet wells (Level 1)
Empty and cleaned Secondary Clarifiers (Level 0)
Diversion box sluice gate (Level 0)
Empty Aeration Basins (Level 0) cleaned (Level 1)
Empty Aerobic Digesters (Level 0) cleaned (Level 1)
Telescopic Valve stations (Level 1)
Flow Division Chambers (Level 1)
Below grade in the sand filters (Level 0)
Alum Tank (Level 1)
Alum Tank Holding Pit (Level 1)
Empty Chlorine Contact Tanks (Level 0)
Empty Sodium Bisulfate Chamber (Level 0)
Storm Water discharge pit (Level 0)
Storm Water Pump Wet Well (Level 1)

Confined Space Classifications at Water Treatment Plants

Water Softeners (Level 1)
Iron filters (Level 1)
WTP #3 Backwash Pit (Level 0)
WTP #5 Backwash Pit (Level 1)
Valve vaults (Level 1)
Desander Pit (Level 1)
Reservoir (Level 1)
Water Tower (Level 1)
Brine Tanks (Level 1)
Meter Pits (Level 1)
Excavations (Level 0)
Chlorine/Fluoride Rooms (Level 0)
Altitude valve enclosure

Appendix B

A. Prior to an entry, complete the full permit-required documentation that the Entry Supervisor shall keep in their possession.

B. If Possible, prior to entry, complete the following activities:

1. Appropriately isolate and block (lockout, tagout, blanking) any electrical, steam, fluid or mechanical sources.

2. Before an employee enters the space, the internal atmosphere shall be tested. If air quality is not within the acceptable range - DO NOT ENTER THE SPACE.

3. Ventilate the confined space (For securing safe atmospheric levels) using a confined space ventilator or other appropriate air movement equipment. The air quality must be sampled continuously.

4. Call and notify the Crystal Lake Fire Rescue Department via phone:
    1) Contact the Fire Rescue Shift Commander at **(815) 790-8695.**
    2) If the Fire Rescue Shift Commander is unavailable, and does not answer, contact the Deputy Chief Rick Kaiser at **(815) 529-3839.**

5. The call shall include the following information:
    1) Identify who is calling
    2) The location of the confined space
    3) The estimated time in the confined space
    4) The number of personal entering the space

    Ex: "This is _____, I am entering a confined space at _____. The estimated time in the confined space is _____. The number of people entering the space is _____."

6. Assure that all personnel entering the space are wearing the appropriate Personal Protective Equipment or PPE (See Inventory Sheet), as well as a harness (Which is required to be worn during entry). Ensure that all employees are following applicable Department of Public Works safety policies as required.

7. Assure that all members entering the space are connected to a lifeline and that all vertical spaces (Greater than 5 feet) utilize a mechanical advantage system for entry (For example, a tripod and/or haul safe).

C. During the entire duration of the entry, complete the following activities:

1. Continuously monitor the atmospheric conditions within the confined space during entry operations. (Record at a minimum of every 15 minutes)
2. The attendant shall maintain contact with the entrant using voice, visual or other means.

D. After the entry has been completed, notify the Crystal Lake Fire Rescue Department.

1. Call Fire Rescue via phone:
    1) Contact the Fire Rescue Shift Commander at **(815) 790-8695.**
    2) If the Fire Rescue Shift Commander is unavailable, and does not answer, contact the Deputy Chief Rick Kaiser at **(815) 529-3839.**

2. The call shall include the following information:
    1) Identify who is calling
    2) The location of the completed confined space entry

Ex: "This is _____, work has been completed and entrants have exited the confined space at _____."