



Confined Spaces in Construction Subpart AA

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Confined Spaces in Construction

Subpart AA

- *Confined space* means a space that:
 - (1) Is large enough and so configured that an employee can bodily enter it;
 - (2) Has limited or restricted means for entry and exit; and
 - (3) Is not designed for continuous employee occupancy.
- Confined spaces that may be found on construction sites include, but are not limited to:
 - Manholes (sewer, communication, electrical, etc.)
 - Tanks
 - Boilers
 - Pits

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- *Permit Required Confined Space* means a space that has one or more of the following characteristics:
 - Contains or has the potential to contain a hazardous atmosphere;
 - Contains material that has the potential to engulf an entrant;
 - Has walls that converge inward or floors that slope downward and taper into a smaller area which could trap or asphyxiate an entrant;
 - Or contains any other recognized safety or health hazard, such as unguarded machinery, exposed live wires, or heat stress.
 - Must impede self-rescue



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- *Before work begins an entry employer must ensure that a **competent** person has identified all confined spaces and permit spaces before their employees begin work at a worksite. 1926.1203(a)*
- *Inform exposed employees and post signage. 1926.1203(b)*

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- *If employees are not authorized to enter permit spaces:*
 - *Employer must take effective measures to prevent employees from entering the space. 1926.1203(d)*
- *If the employer decides will enter the space:*
 - *Must have a written permit space program on site and be implemented. 1926.1203(d)*

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- *Host Employer:*
 - *Employer that owns or manages the property where the construction work is taking place.*
- *Controlling Employer:*
 - *Employer with overall responsibility for construction at the worksite.*
- *Entry Employer*
 - *Employer who decides that an employee it directs will enter a permit space.*

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- *Before all entry operations, the **host employer** must notify the controlling contractor of*
 - *Location of each known permit space;*
 - *Hazards/potential hazards in each space; and*
 - *Precautionary measure that the host and/or previous controlling contractor or entry employee implemented to protect employees in permit space. 1926.1203(h)(1)*

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- *Before all entry operations, the **controlling contractor** must*
 - *Obtain host employer's information about the space; and*
 - *Provide the obtained information to each entity entering the space. 1926.1203(h)(2)*

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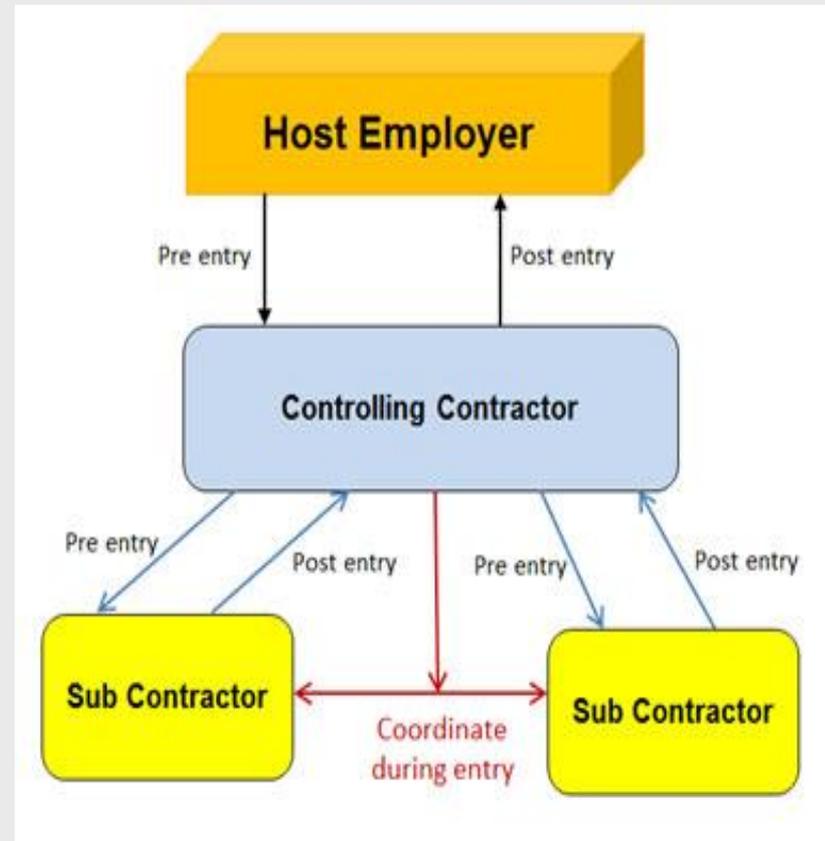
Subpart AA

- *Before all entry operations, each **entry employer** must*
 - *Obtain all of the controlling contractor's information and;*
 - *Inform the controlling contractor of the permit space program to be followed. 1926.1203(h)(3)*

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- *Coordinated entries*
 - *The controlling contractor and entry employer(s) must coordinate entry operations if more than one entity performs permit entry at the same time or;*
 - *Entry operations is performed at the same time that any activities could foreseeably result in a hazard. 1926.1203(i)*



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- *No controlling contractor*
 - *The requirements of the controlling contractor must be fulfilled by the host employer or other employer who arranges to have employees of another employer perform work that involves permit space entry. 1926.1203(i)*

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- *If an employer has employees that will enter a permit space, a written program (that complies with 1926.1204) must be implemented and available*
- *.....unless alternative entry procedures meeting the requirements of 1926.1203(e)(1)*
 - *Spaces containing only an atmospheric hazard that can be controlled by continuous forced air ventilation.*
- *Spaces may need to be reclassified by a competent person throughout a project (1926.1203(g))*
 - *Spaces that contain only contain physical (non-atmospheric) hazards.*
 - *Physical hazards must be eliminated or isolated*

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Permit Required Confined Space Program

- *Elements of a Permit Required Confined Space include, but are not limited to:*
 - Implement measures to prevent unauthorized entry;
 - Identify and evaluate permit space hazards before allowing employee entry;
 - Provide atmospheric **continuous** testing during entry;
 - Ensuring at least one attendant is stationed outside permit space;
 - Coordinate entry operations when employees of more than one employer are working within a permit space;
 - Establish procedures for summoning rescue and emergency services.

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TRAINING

- *The employer must provide training to each employee whose work is regulated by this standard*
 - *In a language and vocabulary that is understandable to employee(s)*
 - *Before employee(s) are assigned duties under this standard*
 - *Before there is a change in assigned duties*

RETRAINING

- *Whenever there is a change in permit space entry operations*
- *New hazards are discovered/presented*
- *It an employee deviates from procedures, or inadequacies are discovered*

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Rescue and Emergency Services

- Employer must evaluate ability and timeliness of rescue services/personnel (timeliness is determined by the specific hazard)
- *Evaluation and Selection of rescue team/service while considering capability, equipment and rescue proficiency and provide information during rescue operations*
- *Provide access too rescue teams/services so they may develop the rescue plan*
- *Provide all equipment and training at no cost to employees who may be assigned rescue duties. Train employees on CPR and at least one rescue team person in CPR and First Aid*
- *Provide training that is includes but is not limited to drills that meet the requirements of 1926.1211*

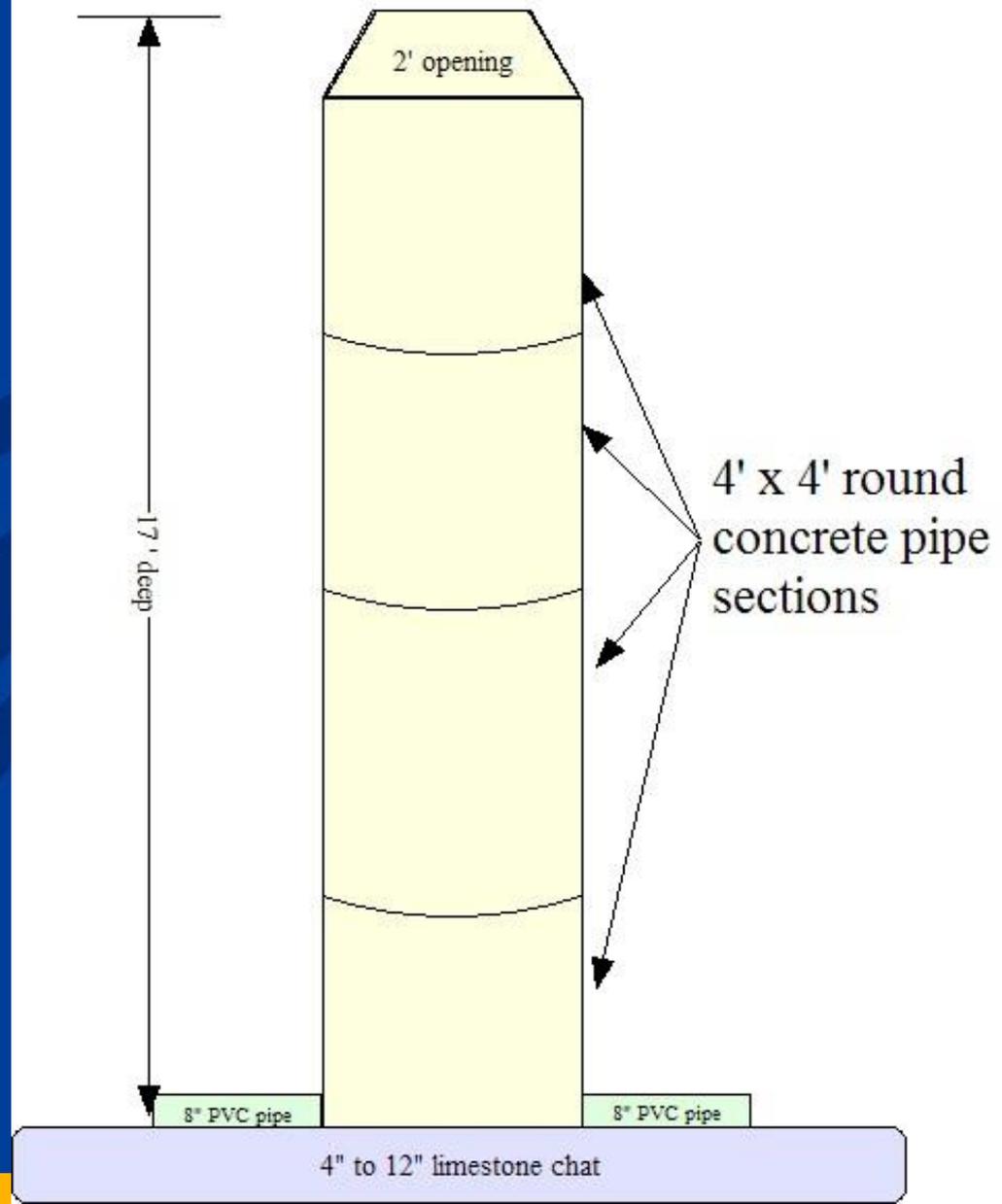
Case Study

- OSHA received notification of a construction site fatality
- Reported that the employee was found at the bottom of a manhole
- Company laying sewer pipe & manholes for a new housing development
- 6 employees onsite



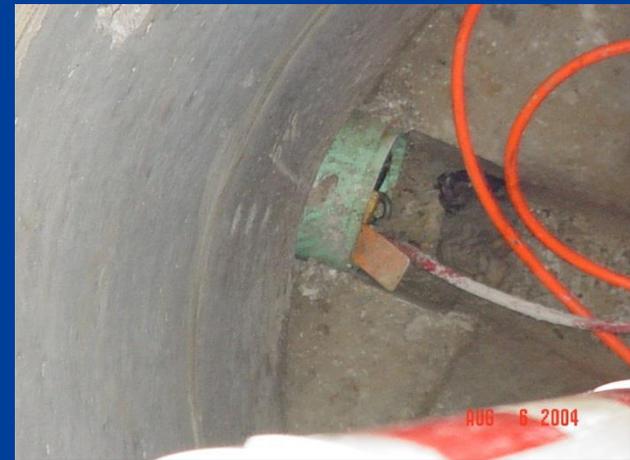
The Confined Space

- 2 foot opening
- 4 foot wide internal diameter
- Riser was constructed of 4' X 4' concrete pipe sections
- 17 feet deep outside 16 1/2 feet inside
- Two 8" PVC Pipes in the bottom
- Built on a 4" to 12" bed of limestone chat



Code Requirements

- City codes require a vacuum test – must maintain 10 inches of mercury for a specific time based on depth of manhole
- If vacuum test fails, then sections of the manhole must be grouted to get a better seal



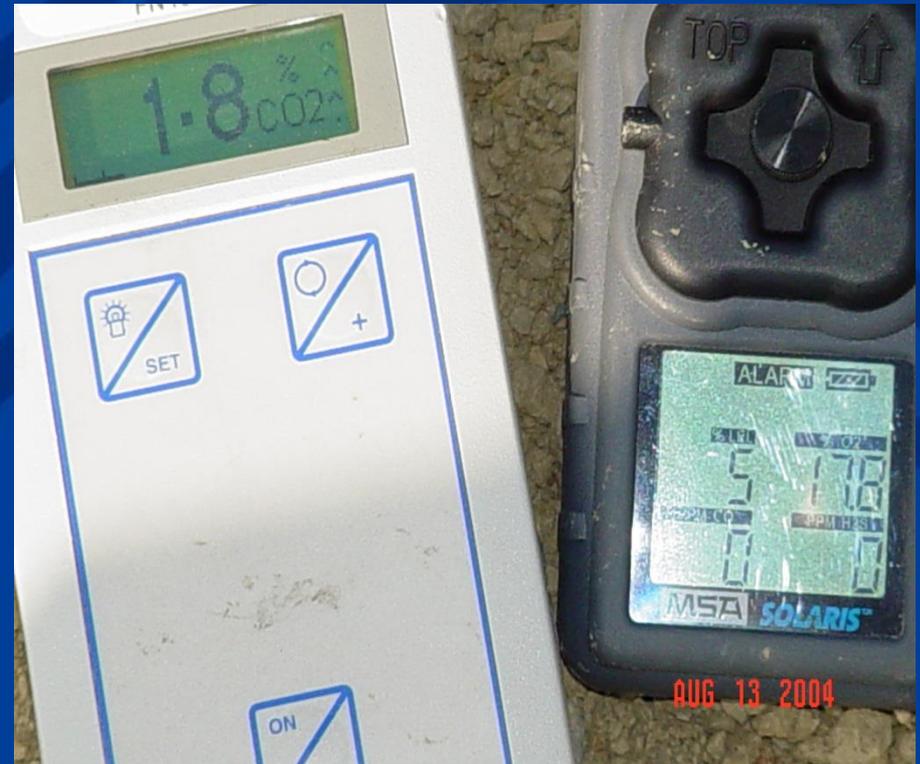
The Incident

- After vacuum test failure, employee reportedly was assigned the grouting task
- Grouting is done by hand and takes about 1 hour
- The employee was working alone
- The employee was found at the bottom of the manhole unconscious



Inspection Activity

- OSHA's Salt Lake City Technical Center Health Response Team assisted with site analysis
- Direct Reading Instruments results 9 days later revealed:
 - Oxygen – 16.0 to 18.2 %
 - CO2 – 1.8 to 3.5 % or 18,000 to 35,000 PPM
 - LEL – 5 to 8 %



Carbon Dioxide

- Colorless odorless gas
 - Displaces oxygen leading to oxygen deficiency
- Special problem in Midwest area
 - Limestone Rock
 - Calcium Carbonate
 - Acidic topsoil
 - Acid leaches from soil, which then contacts the limestone producing Carbon Dioxide
- Numerous fatalities
 - Especially in new sewer/vault leak testing using a vacuum
 - Pulls carbon dioxide into the space
 - Oxygen measured at less than 3% on other similar fatalities

Oxygen Deficient Atmospheres

19.5 %	Minimum acceptable oxygen level.
15 - 19%	Decreased ability to work strenuously. Impair coordination. Early symptoms.
12-14%	Respiration increases. Poor judgment.
10-12%	Respiration labored. Lips blue.
8-10%	Mental failure. Fainting, Nausea, Unconsciousness, Vomiting.
6-8%	4-5 minutes - possible recovery, 6 minutes - 50% fatal, & 8 minutes - fatal.
4-6%	Coma almost instantaneously. Death

Any questions?

Please contact Tom Wirgau

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