



Trenching Hazard Alert

FOR PUBLIC WORKS EMPLOYERS AND EMPLOYEES IN MASSACHUSETTS

Introduction:

Thousands of workers are killed or seriously injured each year conducting work in trenches, primarily due to cave-in of the soil walls in these narrow sub-surface excavations. Trenches are recognized by OSHA as one of the most hazardous construction work conditions, with a fatality rate more than double that for general construction work. Municipal DPW workers conduct a significant amount of work in trenches, including water and sewer installations and repair and road repair. It has been found that municipal DPWs in Massachusetts generally do not have the necessary trench safety equipment and trench safety procedures in place. Use of trench safety equipment and trench safety practices are critical in preventing worker death or injury in trenches.

Some of the Hazards encountered in Trenching and Excavation work

- Soil wall cave-in (typically resulting in suffocation, fatal internal organ compression injuries, or severe musculoskeletal injury)
- Falling loads, falling spoils pile
- Falling undermined sidewalk / structure
- Heavy equipment hazards
- Traffic / Roadway Work Zone Hazards
- Electrocutation or explosion from underground utility
- Hazardous atmosphere
- Drowning from trench filling with groundwater or compromised utility pipe

Trenching and excavation work poses a very real danger to every worker in the trench. The greatest hazard is a soil wall cave-in. When a cave-in occurs, the most likely result is the death of a worker. Some workers believe they are safe in conducting work in shallower trenches, such as the depth of many DPW trench worksites. This is a FALSE sense of security. Two comprehensive studies found:

? 70% of fatalities occurred in trenches between 5 and 9 feet deep.

? 15% of fatalities occurred in trenches less than 5 feet deep.

What regulations should be followed by public employees in Massachusetts ?

While private sector employees are covered by OSHA Standards, public sector employees in Massachusetts are not. The Division of Occupational Safety (DOS), in accordance with MGL Chapter 149, section 6, is charged with inspecting public workplaces in Massachusetts and determining what procedures and practices are required to protect public sector workers. As a matter of policy, our office references OSHA regulations, as well as other consensus standards, when we determine whether proper procedures are being followed to protect public sector workers. **Our office recommends that the OSHA Construction Standard for Trenching and Excavation (29 CFR 1926. 650-652) be followed as a minimum.** By following the OSHA standard you will be considered to be in compliance with MGL Chapter 149, section 6.

Key provisions of the OSHA Trenching/Excavation Standard

Under the OSHA Excavation Standard (29 CFR, 1926, Subpart P, Excavations), a trench is defined as a narrow excavation made below the surface of the earth; whose depth, in general is greater than its width, but whose width is not greater than 15 feet. Key provisions of the OSHA trenching standard include:

- A requirement for soil wall collapse protection (such as trench boxes or shoring) in trenches greater than 5' in depth.
- Designation and training of "competent persons," knowledgeable in trench hazards and authorized to take action to protect employees.
- Daily inspections of trench worksites by a trained "competent person" prior to start of work and when a change in conditions occurs such as a rainstorm.
- Keeping of spoils pile at least 2' back from the trench. Keeping heavy equipment and other surface encumbrances back from edge of trench. Supporting undermined sidewalks and other adjacent structures.
- Sufficient access and egress ladders in trenches greater than 4' in depth.
- Identifying location of underground utilities. Supporting or removing exposed utilities.

What is needed to implement an effective municipal trench safety program?

- **Obtaining and using trench safety equipment** (soil protective systems). Obtain appropriate trench soil protective equipment through purchase, rental, or equipment sharing. Ensure that the equipment is functional with the sizes and types of trench work sites, including piping configurations and other utility obstacles, that are encountered with the work of your DPW. This might include a combination such as a modular trench box, a fixed trench box, and aluminum hydraulic shoring. Ensure that adequate equipment is available for all simultaneous trench work sites. *DOS recommends that you always assume soil is Type C for selection and use of trench safety equipment.* Ensure that trench safety equipment is used in accordance with manufacturer's tabulated data or the OSHA excavation standard appendices (for vertical uprights spacing distance with hydraulic shoring, for example).
- ***A written trench safety policy.*** *DOS recommends that your DPW create a formal written trench safety policy outlining required trench safety procedures. It is also recommended that all managers and employees be required to read and sign this policy. This is important to ensure that management and workers all have a clear understanding of their responsibilities, and what procedures are necessary to keep workers safe in trenches. It is much more likely that trench safety practices will be followed with a formal policy that has been signed by all. DOS has prepared a model written trench safety policy for municipal DPWs, available by requesting that a CD be mailed to you (see the last page of this bulletin).*
- **Program accountability.** Designate a trench safety program manager and create an unbroken chain of accountability from the program manager down through to those conducting the trench work. It may be necessary to implement reinforcement measures such as disciplinary procedures for both managers and workers when safe trench work practices are not followed and tie-in trench safety performance to the employee evaluation and review system.
- **Pre-job planning checklist.** Evaluate and plan for upcoming trench worksites, including identification of soil protective systems to be used, and ensuring that soil protective equipment will be available at the site prior to start of work. It is recommended that a pre-job checklist be used to conduct this planning, and that the competent person signs the checklist upon completion of the job evaluation and planning steps. DOS has prepared a model written pre-job planning checklist for municipal DPWs, available by requesting that a CD be mailed to you (see last page of this bulletin).

- **Daily inspection checklist.** Daily inspections of trench worksites by a competent person must occur prior to start of work, and in addition when there is any change in conditions (such as a rainstorm). It is recommended that a checklist be used to conduct this inspection, and that the competent person signs the checklist upon completion of the inspection. DOS has prepared a model written daily trench worksite checklist for municipal DPWs, available by requesting that a CD be mailed to you (see the last page of this bulletin).
- **Designation/Training of Competent Persons.** Identify a group of competent persons to conduct daily inspections of trench worksites, and provide this group with the necessary training. Competent person training is available through the New England Water Works Association (schedule available at www.newwa.org), and also may be provided through your trench safety equipment supplier or other sources.
- **Training.** It is recommended that all DPW managers and workers in the chain of accountability for trench work attend a trench safety awareness training, preferably together as a group. This should serve to increase awareness of the very real dangers of trench work, and also to identify the barriers to why safe trench work practices are not being followed. DOS provides this training several times a year. It is also recommended that your DPW develop in-house capability for basic trench safety training to ensure that employees are trained on the specifics of your equipment and worksites and that new employees are trained in a timely manner. DOS can provide you with training tools such as PowerPoint slide presentations, available by requesting that a CD be mailed to you (see the last page of this bulletin).

What are the key safety procedures that should be followed at all trench worksites?

- Use a trench box or shoring in all trenches deeper than 5' or as necessary in shallower trenches where additional hazards exist (such as a water source).
- Have a competent person conduct daily inspections of all trench worksites prior to start of work and also when there is a change in conditions such as a rainstorm.
- Keep spoils back at least 2' from edge of trench. Also keep heavy equipment and other surface encumbrances as far back as possible from the edge of the trench as these can create pressure that increase the chance for soil collapse.
- Make sure undermined sidewalks, road surface, fencing, and other adjacent structures are adequately supported.
- Ensure that a proper ladder is available within every 25' of unobstructed travel for employees in all trenches greater than 4' deep.
- Wear and use all of the Personal Protective Equipment provided and required for the job, such as hardhats and high visibility clothing.
- Follow all traffic work zone safety guidelines as outlined in the MUTCD, available at <http://mutcd.fhwa.dot.gov>.
- Minimize vibration sources near the trench.

Where can I get more information and assistance?

The Division of Occupational Safety (DOS) can provide you with technical information and support, trench safety checklists, and a model trench safety policy. DOS also provides training on trench safety at the awareness level, including information on developing a trench safety program for municipal DPWs. This training is held several times throughout the year, and additional sessions can be scheduled for large groups.

DOS Contacts:

Hilary Eustace, 617-969-7177, ext. 333 or hilary.eustace@state.ma.us
Nancy Comeau, 617-969-7177, ext. 325 or nancy.comeau@state.ma.us

DOS IAQ Website: www.mass.gov/dos/iaq

A copy of the U.S. Occupational Safety and Health Administration (OSHA) Trenching and Excavation standard (29 CFR, 1926, Subpart P, Excavations) can be obtained at the OSHA website, www.osha.gov, keyword search on "excavation."

The National Institute of Occupational Health and Safety (NIOSH) has a web-based trench safety awareness training available at www.cdc.gov/niosh, keyword search on "trench."

Note: This bulletin is provided for informational purposes only and is not meant to be a comprehensive compliance document.

PLEASE PROVIDE THE FOLLOWING INFORMATION:
(Send this form to the address indicated below)

Please contact me about technical consultation / training on trench safety for DPWs

Please mail me a CD with the DOS model trench safety policy and checklists

Name: _____ Title: _____

Mailing Address: _____ City/Town: _____ Zip: _____

Telephone #: () _____ Fax #: () _____

E-mail _____

MAIL TO: Massachusetts Division of Occupational Safety
 Occupational Hygiene Program
 1001 Watertown Street
 West Newton, MA 02465
 or
 Fax form to 617-727-4581