

Trench Safety Awareness – Facilitator Guide

Time Requirement: 1.5 - 2 hours

Number of Instructors: 1 or more, consistent with ratio in the Minimum Criteria

Materials

- Participant Guide
- Whiteboard or equivalent; markers
- Internet access

Objectives

When completed, participants will be better able to:

- Describe risks of excavation
- Describe types of collapses
- Identify protection/preventive methods
- Distinguish between regulations and safe work practices
- Identify elements needed in an SOP if an emergency occurs

Teaching Methods

- Presentation/discussion
- Small-group activities

Suggested Instructor Preparation

- Review Participant Guide and exercises
- Test all web links prior to the session and if any are inoperative please notify your Program Director
- Review these Important resources
 - <https://www.osha.gov/SLTC/trenchingexcavation/index.html>
 - https://www.youtube.com/watch?v=zV-sVn_AUEM
 - <https://www.equipmentworld.com/special-report-death-by-trench/>
 - https://www.osha.gov/sites/default/files/enforcement/directives/CPL-02-00-161_0.pdf
 - 29 CFR Part 1926 Subpart P
 - https://www.osha.gov/dts/osta/otm/otm_v/otm_v_2.html#6
 - <https://www.cpwr.com/publications/trench-safety;>
 - https://www.ishn.com/articles/108816-trench-safety-stand-down-coming-up-june-18-23?id=108816-trench-safety-stand-down-coming-up-june-18-23&ajs_uid=756610104745E7B&ajs_trait_oebid=3782E0258467B1M
- Obtain company-specific Standard Operating Procedures (SOPs) for trench activities if possible.
- Ensure that you have assembled all the materials needed for each exercise (incident description, Worksheet for prevention exercise). See templates at the end of this Guide.
- Ensure you have the evaluation forms for Modular Refresher
- Review whistleblower protections <https://www.whistleblower.gov/>
- Prepare an outline for notes to be included in the program file, including a local or relevant example. For this section of the module, the MWC gratefully acknowledges the contributions of University of Illinois trainer and UAW member Steve Mitchell.

General resources include:

- <https://www.equipmentworld.com/special-report-death-by-trench/>
- <http://jordanbarab.com/confinedspace/category/trench-collapse/>

State-specific resources include:

Ohio

<https://www.whio.com/news/local/reports-worker-trapped-after-trench-collapse-warren-county/4f2cTJDw70felir9r0jAYL/>;

<https://www.wlwt.com/article/person-trapped-in-trench-at-morrow-construction-site/14511535>

Michigan

Detroit Free Press, August 21, 2017

Chesterfield police and fire department are currently working to rescue two men who were trapped following the collapse of a trench in Chesterfield Township.

The trench, which collapsed along Edgewater Drive around 2:30 p.m., has ensnared two male workers, who had been in the basement at the time of the collapse, according to The Macomb Daily.

Sgt. Deron Myers of the Chesterfield Township Police Department told the Macomb Daily that the two men were buried up to their waists in a ditch about ten feet below the ground and that emergency personnel were giving the men water as they worked to help rescue them.

Right after the trench collapsed, neighbors and eyewitnesses attempted to help rescue the men, according to the Macomb Daily. The incident was reported to police about 15 minutes after the collapse.

Detroit Free Press, February 26, 2018

A worker who became trapped Monday afternoon when a trench collapsed in Sterling Heights has died, Fire Chief Chris Martin said.

Local authorities and officials from the Michigan Occupational Health and Safety Administration are investigating. Martin said it appeared the trench was not properly supported.

The collapse happened just before 1:30 p.m. on the 42000 block of Mound between 18 and 19 Mile roads next to a building that is slated for demolition,

according to Police Chief Dale Dwojakowski. The building was an old motel or apartment building.

"Initial radio reports were that they could hear his voice, right when this happened," Dwojakowski said.

At 4 p.m., Martin told reporters: "We are in body recovery mode at this point." Emergency personnel recovered the body at about 5:15 p.m. Authorities did not release the worker's name or age.

Martin said the trench didn't appear to be properly shored up. "There is absolutely no shoring on the scene right now," Martin said. Martin said the trench was about 18 feet long and 4 feet wide at the top. It was at least 10 or 11 feet deep, he said.

Southbound Mound was partially closed as emergency personnel tried to recover the worker. No other information was immediately available.

Grand Rapids News, October 9, 2017

WYOMING, MI -- Nearly three hours after responding to the scene of a trench that collapsed, trapping two men in side, emergency crews recovered the body of a man killed in the incident Monday afternoon, Oct. 9.

The body, recovered around 4:45 p.m., belonged to a 30-year-old who was working in the trench with his father to replace the home's backed up sewer line, according to firefighters. Officials have not released the name of either worker.



They had dug down around eight to 10 feet, without reinforcing the side walls of the trench when it collapsed, Grand Rapids Fire Department Battalion Fire Chief Collin Kelly said.

The father, 53, was buried up to his waist while his son was completely buried. Kelly estimates the son's head was probably about six feet below the surface. A neighbor had heard the father's calls for help and called 911. Emergency crews responded to the call at about 2 p.m. Monday.

Kelly said a substantial amount of earth was on top of the father and son. A vacuum truck from the city of Wyoming sucked up about 15 yards of sand to make it safe enough for crews to go down and unbury the men, he said.

Once crews began to uncover the son, the rescue effort became a body recovery, Kelly said.

If the father had been buried even a foot deeper, Kelly said, it might have killed him due to compartment syndrome, a build-up of pressure that can affect blood circulation. The fact he was only buried up to his waist might have saved his life, he said.

MLive, October 29, 2014

GROSSE POINTE WOOD, MI -- The 59-year-old owner of a Sterling Heights contracting company died after becoming trapped in a trench being dug in Grosse Pointe Woods about 2 p.m. Wednesday.

Grosse Pointe Woods Administrator and Police Commissioner Al Fincham addressed the media about 2:30 p.m. Wednesday, shortly after rescuers confirmed the man had stopped breathing. They'd been on scene since the initial collapse shortly after noon.

Fincham said a second collapse buried the victim alive while emergency personnel, including Fincham, were attempting to dig him out, some using just their hands. Rescuers freed the man's arms just before the fatal collapse, said the police commissioner, whose pants were covered in dirt from the rescue attempt.

"There were things I would have liked to see in place that were not," said Fincham, referring to the lack of a trench box, which are used to protect against a subterranean collapse.

Michigan Occupational Safety and Health Administration investigators are reviewing the circumstances of the tragedy. In addition to the death, a Grosse Pointe Woods police officer suffered a nonfatal injury to his "spinal area" and leg, said Fincham.

The victim's company, Rumph Construction, had just begun work on a new house located on Fairview Lane in Grosse Pointe Woods. The crew dug about 20 feet below the ground, through "heavy, heavy clay," to tap into a water line, Fincham said.

At least 100 emergency responders, including personnel from Wayne, Oakland and Macomb counties, and bystanders were at the scene watching the rescue unfold. Paramedics stood by as rescuers inserted ladders down the hole where the worker was trapped. The base of the hole, at street level, was surrounded with plywood.

Emergency responders entered the hole in an attempt to shore up the sides before digging any further. About 2:20 p.m. Grosse Pointe Woods Police Commissioner Al Finchen said he was preparing to address media. Minutes later the death was confirmed.

It's not clear what caused the collapse, but a large backhoe was parked at the edge of the 10-foot hole with the tip of its bucket beneath the road surface. The dug-out area included a portion of a residential lawn and the road.

Fox 2 News, June 6, 2017

WARREN, MI. (WJBK) - A worker buried alive trapped in a trench that collapsed around him. Rescue crews spent hours working to free him. Warren firefighters pulled that construction worker from the trench to safety at about 9:30 p.m. He is in critical condition at Royal Oak Beaumont.

Dramatic rescue video shows firefighters pull the worker, from Jay's Excavating from Howell, from underground to safety.

It first happened at 7:30 this evening at the construction site for the Hampton Inn on Van Dyke. The 37-year-old went into the trench to cover up a hole, but he went in without a trench box to keep the wet soil around him from collapsing - and it did.

At one point that worker was completely covered in a mixture of wet soil and clay.

"Obviously we are talking about crush injuries and we were able to deliver high flow (oxygen), fluids, IV fluids and pain meds," said Warren Fire Commissioner Wilbert McAdams. "His extremities were buried by the compacting dirt. We do not know the extent of his injuries. He was conscious and able to talk us to, although he was very weak, very disoriented, but he is alive."

Machines are pushing that dirt to cover up the trench. MiOSHA will likely investigate because the worker went into the trench without a trench box that would have prevented the soil from collapsing.

The captain of Fire Engine 3 in Warren spoke about the effort to dig out the man - which involved their bare hands.

"When the call came in, it came in as a man in a trench trapped," the captain said. "When we got here, he was totally covered above his head. They were able to talk to him; they freed his head so he could get some oxygen. We put in two strong backs and we (set) a couple struts to keep the walls from falling in on him.

"And then it was just an army of guys hand-digging one after another, rotating guys in and out. Some of the guys are trained in trench tactics and the others relied on their fire training and the story was happy in the end."

Maryland

<http://www.wbaltv.com/article/crews-recover-body-of-construction-worker-from-trench-collapse/21091052>

<http://baltimore.cbslocal.com/2018/06/10/construction-worker-killed-in-baltimore-trench-collapse-laid-to-rest/>

Find more by searching the internet.

Organize the facts for participants using the Factsheet at the end of this Guide, showing:

- Location and soil/weather conditions
- Work being done and reason
- Anything reported about the workers—age, training
- Protective measures in place
- Outcome

Not all news stories or other reports contain all the information that may be useful. You may choose to either provide details (noted as assumptions) or ask participant to identify needed details as part of the discussion.

Minimum Content Requirements

- Review a local or industry-relevant example
- Types of Collapses
- Protection/prevention strategies

- Regulations vs guidelines
- Elements of an SOP for emergencies

Questions You May Be Asked

1. Participants might remark, "We don't do the inspection this way at our site. So, what are we supposed to do?" You should be prepared to facilitate a discussion about working through union or management representatives to facilitate review and possible changes in work practices to ensure that the Competent Person performs the needed assessments. Stress that daily inspection must be performed.

2. Be prepared to discuss the company SOP. Some participants may not know it exists, or question if it is complete. For open enrollment, general approaches of working through union or company health and safety officers to obtain a copy should be discussed. For contract programs, learn specific contacts as part of reconnaissance.

3. Trainees may question whether various procedures are adequate ('I just have to do what I am told'). For contract programs, reconnaissance will provide you with information about the written procedures, but these may not be implemented. In addition, workers fear for their employment, even if OSHA recommends not entering a trench that has not been inspected. Provide information on OSHA complaints and reference the initiative that any trench can be inspected by a CSHO, even if no apparent violation is noted immediately. Ensure that open discussions are responsive but do not jeopardize a particular participant. Be prepared to provide the local OSHA contact number and website to everyone to protect the identity of anyone who may want follow up contact. A working knowledge of Whistle Blower protections (such as they are) will be useful for every facilitator. Refusal to work is a difficult discussion.

4. "What do I do when my employer tells me there is no budget to get a ladder or trench boxes or?" Be prepared to facilitate a discussion on strategies to improve the company program through discussions with employee or management representatives. Emphasize that the law requires that employers provide protection against cave in.

Presentation of the Session

This session can be presented as follows:

Review objectives

Review trench incident example that will be used in the program

Review the figures in the Participant Guide

Introduction

Ask: Why are trenches dangerous?

Distribute your fact sheet about the trench incident that has been developed for this program. Ask the small groups to review the fact sheet and complete the short report in the Participant Guide.

Review responses from the groups and post where all can see.

Show the video clip https://www.youtube.com/watch?v=zV-sVn_AUEM and then review the key points shown in the Participant Guide.

Ask: What aspects in this list contributed to the incident we just reviewed in small groups?

Trench terms

Cover the terminology and graphic found in the Participant Guide.

Exercise - What are the risks of excavation?

Ask: What are risks or hazards during the excavation of a trench?

List responses where all can see and then review/discuss the list from the Participant Guide with the whole group.

Exercise - What are the risks in or around a trench?

Ask: What are the causes or risks of a cave in/collapse?

Ask: What are additional risks and causes in or around a trench?

List responses where all can see and then review/discuss the list from the Participant Guide with the whole group.

Continuing with the program content,

Ask: Why are trench injuries so serious?

Refer to the information in the Participant Guide

Ask: What are the costs of this kind of incident?

Refer to the information in the Participant Guide

Ask: What is OSHA doing?

Refer to the information in the Participant Guide

Exercise - Worker protection and exposure prevention methods

Distribute the Worksheet (see end of this Guide) showing Situations and Events with blanks for Strategy/Protective System. Ask participants to work in small groups to identify prevention strategies and protective systems for each situation/event. You may choose to ask each group to do different parts of the Worksheet, depending upon time.

Facilitate a report-back and compare the actions identified by participants with those in the tables in the Participant Guide.

Regulations and guidelines for safe work practices

Review HAZWOPER content regarding excavations and those working at excavations. Draw particular attention to:

Competent Person – Training, Abilities, Authority

Inspections - frequency and condition triggers

Contrast the use of 'should' and 'shall' in regulations and guidance.

Review the OSHA Quick Card

Ask: Does the CPWR graphic illustrate some of what you have learned in this module?

SOP elements for potential emergency during trench work

Ask: Using all of your experience and this training, what should be considered when planning for a potential emergency during trench work?

After discussion, review the list found in the Participant Guide.

Summary

Review the learning objectives.

Ask: Based on this exercise, what takeaways do you have as you go back to work?
List them on writing surface viewable by all.

Answer any remaining questions.

Follow up

Any participant evaluated as 'successfully completing' the program must attend this module, actively participate and contribute to the Exercises. Include the documentation in the program file.

Make this exercise better:

Forward suggestions to your Program Director

Are there other 'Questions you may be asked' that should be included?

Organize the listing of 'takeaways' and forward to your program director. These are very important impacts to report to NIEHS.

Incident Fact Sheet - Date of incident _____

State where incident occurred _____

Description of the incident

Location and soil/weather conditions:

Work being done and reason:

Anything reported about the workers—age, training:

Protective measures in place:

Outcome:

Worksheet-- Strategies and Protective Systems

Situation	Event	Strategy/Protective System
Cave-in or trench collapse		
	Spoil pile collapses wall and slides into trench	
	Lip shears off into trench	
	Material staged at lip causes wall collapse	
	Vibration around the trench causes wall collapse or slide in	
	Crack parallel to one wall	
	Too much or too little water affects soil	
	One soil layer compresses or gives way	

Situation	Event	Strategy/Protective System
Other-than cave-in		
	Injury or other medical emergency	
	Toxic gas/vapor seepage causes exposure	
	Toxic gas/vapor from external source collects	
	Falling load (pipe, supplies)	
	Shoring restraint failure	
	Dislodged boulder or spoil material falls into trench	
	Heavy equipment rolls or falls into trench	
	Worker falls in	
	Biological exposures from injured worker (blood/vomit/urine/feces)	
	Lack of communication	
	Contact with electrical lines	
	Disruption of sewer/water/natural gas/steam/gas/compressed gas	
	Limited or inadequate egress	