PRESENTER'S GUIDE

"TRENCHING AND SHORING SAFETY IN CONSTRUCTION ENVIRONMENTS"

Part of the "CONSTRUCTION SAFETY KIT" Series

Quality Safety and Health Products, for Today...and Tomorrow

THE "CONSTRUCTION SAFETY KIT" SERIES

This education program is part of the "Construction Safety Kit" Series. The programs in this series have been created to provide building and construction employees with good, basic information on everyday safety and health topics. Many of these programs also meet employee training requirements of specific OSHA regulations. This series includes the following programs:

- Crane Safety
- Dealing with Drug & Alcohol Abuse… Employees
- Dealing with Drug & Alcohol Abuse… Managers/Supervisors
- Electrocution Safety Part I… Types of Hazards and How you Can Protect Yourself
- Electrocution Safety Part II… Employer Responsibilities
- Eye Safety
- Fall Protection
- First Aid
- GHS Container Labeling
- GHS Safety Data Sheets
- Hand and Power Tool Safety
- Hand, Wrist and Finger Safety
- Hazard Communication
- Heat Stress
- Introduction to GHS (The Globally Harmonized System)
- Ladder Safety
- Personal Protective Equipment
- Rigging Safety
- Safe Lifting
- Slips, Trips and Falls
- Safe Lifting
- Safety Orientation
- Supported Scaffolding Safety
- Suspended Scaffolding Safety
- The OSHA Lead Standards
- Trenching and Shoring Safety
- Walking and Working Surfaces

Other products in the "Construction Safety Kit" product line include employee booklets and posters, which have been designed specifically to be used with the programs. Compliance manuals are also available for many of the OSHA regulatory topics. By combining these products you have all of the materials you need to promote and conduct a complete safety meeting (for information on these products, contact your local distributor).

WARRANTY/DISCLAIMER

"This program has been created to assist companies that are endeavoring to educate their employees regarding good safety and health practices. The information contained in this program is the information available to the producers of the program at the time of its production. All information in this program should be reviewed for accuracy and appropriateness by companies using the program to assure that it conforms to their situation and recommended procedures, as well as to any state, federal or other laws, standards and regulations governing their operations. There is no warranty, expressed or implied, that the information in this program is accurate or appropriate for any particular company's environment."

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INTRODUCTION TO THE PROGRAM

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Structure and Organization

Information in this program is presented in a definite order so that employees will see the relationships between the various groups of information and can retain them more easily. The sections included in the program are:

- The hazards of trenching.
- The "competent person" and inspecting the worksite.
- Soil types and protective systems.
- Ongoing inspection and testing.
- Access, egress, setback and equipment.
- Working defensively.

Each of the sections covers important information in one topic area, providing employees with the basis for knowing how to work safely in a trench.

Background

Construction work can expose employees to some pretty serious hazards. That's why one out of every five workplace fatalities in the U.S. involves construction workers.

Compared to other areas on a construction site, working in an excavation more than doubles an employee's chances of being killed on the job. And some of the greatest excavation hazards can be encountered when they work in a trench.

An average of two workers lose their lives every month when a trench they're working in collapses on them. But many of these deaths and thousands of injuries can be prevented. Employees need to understand the hazards of trenching, the safety regulations that apply to this type of work, and the safe work practices that can make working in a trench as "accident free" as possible.

Objectives

This education and training program provides employees with the information they need to work safely in and around a trench. Upon completion of the program, employees should be able to:

- Recognize the hazards they may encounter working in and around trenches.
- Understand how OSHA regulations help reduce their exposure to trenching hazards.
- Understand the types of policies and procedures that their employer uses to control the hazards that can be encountered in trenching work.
- Understand the role played by the "competent person" in controlling hazards and preventing accidents on a worksite.
- Know safe work practices they should follow to prevent accidents on trenching projects.
- Understand the conditions that can affect the stability of a trench and the quality of the air inside it.
- Know the four basic types of trench protective systems and how they work.
- Understand the importance of always thinking "safety first" on a trenching project, and identifying hazards ahead of time.

Reviewing the Program

As with any educational program, the "presenter" should go through the entire program at least once to become familiar with the content and make sure that it is consistent with company policy and directives.

As part of this review process, you should determine how you will conduct your session. The use of materials such as handouts, charts, etc., that may be available to you needs to be well thought out and integrated into the overall program presentation.

PREPARING FOR THE PRESENTATION

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Structuring the Presentation

In conducting this education session, you should proceed with a friendly and helpful attitude. Remember that the "trainees" are looking to your experience and knowledge to help them relate to the situations shown in the program. It is important to let the trainees interact with you and each other during the training session. Stimulating conversation within the group is one of the best things you, as the presenter of the program, can do to help everyone get as much as possible from the session. Be alert for comments that could help in this area in future sessions and make note of them.

As the presenter, you also should:

- Keep the session related to the topic of how to work safely in and around a trench.

- Relate discussions to the types of hazards that can be encountered in trenching and the regulations and safe work practices that can help employees avoid these hazards.

- Keep any one person or small group of employees in the session from doing all the talking.

- Get everyone involved. Ask questions of those who don't participate voluntarily.

- Clarify comments by relating them to the key points in the program.

Use the "Outline of Major Program Points" section of this guide, as well as the information included in the quiz, as the basis for answering any questions. If you don't know the answer, say so. Tragic results may occur should you provide incorrect or inaccurate information. Remember, this is a positive program on trenching safety. Make sure your attitude and words reflect this, and that the emphasis is always on providing the information needed by the attendees to work more safely in and around trenches.

Setting Up the Class and Classroom

Remember, there are a number of things that must be done to "set up" the class as well as the classroom. These fall into several groups of activities, and include:

- **Scheduling and Notification**
  - — You can use the scheduling and attendance form to schedule employees into the session (copies can be made using the printed "master" in the back of this binder or from the PDF version on the DVD).
  - — Make sure that the session is scheduled so that it fits into your attendees' work day.
  - — Send out notification of the session well in advance, to give people enough time to incorporate it into their schedule for that day.
  - — If possible, post a notification on bulletin boards in the affected employees' areas.

- **The Classroom**
  - — Schedule the room well in advance.
  - — Make sure the room can accommodate the expected number of attendees.
  - — Check it again on the day of the program to make sure there is no conflict.
  - — Make sure the room can be darkened, and won't create a glare on the television screen.
  - — Locate the light controls and test them.
  - — Make sure the power for the DVD player you are using operates separately from the room light.
  - — See if you can control the room temperature.
  - — Know where the closest restrooms are located.
  - — Assure that the room is free from distracting noises.
  - — Make sure emergency exits are marked and known to the attendees.

- **Seating**
  - — Make sure everyone can see the screen from their seat.
  - — Make sure everyone can hear the DVD and you (when you speak).

— Check to see that seating is such that writing can be done easily.
— Make sure the seating arrangement allows eye contact between attendees, and between you and attendees.

- **Equipment and Materials**
  — Make sure the DVD player, monitor, and all appropriate cables and extension cords are available.
  — Make sure a stand or table is available and is of appropriate height for all attendees to easily see the monitor.
  — If you plan on using a chart pad, blackboard, or other writing board, make sure it is available, easy to see, and you have the proper writing implements.
  — Make sure you have 6" x 8" index cards or other materials to be used as "name tents" for attendees.
  — Make sure you have made up a sufficient number of copies of the "quiz", as well as any other handouts you are using.

- **"Final Check"**
  — Make sure equipment is in the room prior to the scheduled session.
  — Make sure you have the right program, (look inside the three-ring binder).
  — Check to see that the room is set up properly.
  — Check equipment prior to the presentation to assure that it works.
  — Make sure extension cords, etc. are "taped down", if need be, to avoid tripping.

CONDUCTING THE SESSION

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The Initial Steps

In conducting the session remember the positive nature of this presentation. Everyone is attending in order to learn more about how to avoid accidents and injuries while working in a trench. Initially, you need to:

- Introduce yourself as the session leader.

- State the title of the program, "Trenching and Shoring Safety in Construction Environments" and the purpose of the session (to understand trenching hazards and learn about the safe work practices that are needed to avoid them).

- Inform the attendees when there will be breaks (if you plan them) the location of exits and restrooms and if water, coffee, or other refreshments will be available.

- Make sure all of the attendees have "signed in" on your scheduling and attendance form. Remember, it is very important to document peoples' attendance at the session.

Once this housekeeping is done, it is time to move to the "meat" of the session. First, the attendees need to be informed about the objectives of the session (this is where you can use a flip chart or board to list the objectives, which should be done prior to the class starting). This listing should be preceded with some introductory remarks. Your own words are always best, but the remarks should follow along the lines of the following:

> "Construction can expose you to some pretty serious hazards. That's why one out of every five workplace fatalities in the U.S. involves construction workers. And some of the most dangerous construction hazards can be found when you're in a hole or a depression that's been dug into the earth, also known as an 'excavation'."
>
> "Compared to other areas on a construction site, working in an excavation more than doubles your chances of being killed on the job. And some of the greatest excavation hazards can be encountered when you work in a trench."

"An average of two workers lose their lives every month when a trench they're working in collapses on them. But many of these deaths and thousands of injuries can be prevented."

"To avoid the hazards of trenching you need to understand what those hazards are, as well as the safety regulations that apply to this type of work. You also need to know the safe work practices that can make working in a trench as 'accident free' as possible… so you go home safe at the end of every day."

"The program we are going to watch today will give us some good information about trenching and shoring safety in construction. To make this the most productive session possible we need to look at what we want to accomplish here today (verbally reference the 'Objectives' list from the first section in this guide, or point to a blackboard or chart where you have written them down)."

Once the objectives have been provided, you are ready to show the program. However, you do need to let the attendees know that they will be taking a quiz at the end of the session (if you are using it). It needs to be emphasized that they are not being "graded", but that the quiz is being used to see if the session is effectively transmitting information to them in a way they will remember.

Showing the Program

At this point, you need to introduce the title of the program once again, "Trenching and Shoring Safety in Construction Environments", darken the lights if necessary, and begin the showing of the program.

You have several options as to how you can move through the program and what employees see.

The DVD menu has three "selection bars":

- "Play".
- "Scene Index".

- "Contact Info".

To just play the program from beginning to end, select "Play".

To view (or review) a specific section of the program, select "Scene Index". You will be presented with a group of buttons, each of which corresponds to a section of the program. You can then select the specific section that you want to view.

If you would like information on other programs and products that are available from MARCOM you can select "Contact Info" for information about how to contact us.

All of our DVDs, both English and Spanish, are subtitled (similar to closed captioning). If there are hearing impaired employees participating in your training session, or you want people to be able to read the program narration as well as hear it, push the "subtitle" button on your DVD player's remote control or the player's control panel. A print version of the narration will then appear on the screen as the program plays.

Using the Program for "Tailgate Meetings" and "Toolbox Talks"

The DVD version of the program has been designed specifically to facilitate "Tailgate Meetings" and "Toolbox Talks". The information in the DVD has been divided into 2-3 minute "chapters" on different issues involved with crane safety. Each chapter forms the basis for a focused 10-15 minute session on an important aspect of that topic (chapters can be directly selected from the DVD menu).

Conducting the Discussion

After the program has been shown, it is time for the group discussion on the information contained in the session. Care must be taken to make sure that the discussion is kept to the general topic of working safely in a trench. There are several ways to conduct this discussion. These include:

- Calling for questions from the attendees and using these questions as the basis for the discussion.

- "Leading" the discussion through the points covered in the program using statements such as:
    - — "One of the sections that we saw in the program discussed the hazards that the competent person will look for when surveying a work site before a project begins. Who can describe some of these hazards for us?"
    - — "We saw an interesting segment on what to do in case of an emergency on a trenching work site. Who can tell us what steps we should take when something goes wrong?"

You should use the discussion format that you are most comfortable with. The "Outline of Major Program Points" section in this guide, and the questions and answers in the master copies of the quiz should be used as a basis for this discussion, as well as the supplemental information that you have presented in this session.

Remember, you have allocated a limited amount of time in which this discussion can take place. It is important to blend the attendees' questions and areas of obvious interest with the objective of trying to touch on each major area within the session in the discussion. By touching on each area, the attendees are much more likely to retain the information presented in the session.

Concluding the Presentation

Once discussion has concluded (whether naturally or you have had to bring the discussion to a close in order to complete the session within the time allowed) it is time to give the quiz if you are using it. Copies of the quiz can be made using the printed "master" in the back of this binder or from the PDF version on the DVD. Again, remind the attendees that the quiz is only meant to help determine how effective the presentation of the information is, and that they will not be graded. Let them know that they have approximately five minutes to complete the quiz.

At the end of the five minute period, remind the attendees to date and sign their quizzes, and then collect them. The attendees should be thanked for attending the session and reminded of any other sessions in the educational program that they may be attending. They can then be dismissed to return to their normal activities.

*(An alternative to this approach is to give the quiz immediately after showing the program, then use a review of the quiz as a basis for holding your group discussion.)

"Wrapping Up" the Paperwork

Before much time has passed, and the subject matter is fresh in your mind, several areas of "paperwork" must be completed. First, check to make sure that all attendees signed the scheduling and attendance form. Next, make sure that you have a quiz from every attendee, dated and signed.

Also, depending upon what you have decided to do, a copy of the attendance form and the quiz for each attendee should be either filed in your files, or turned over to the attendee's department manager (or the personnel office) so that this paperwork can be included in their personnel file. The attendees' training logs should also be updated, and each attendee should be given a filled out and signed training certificate, signifying that they have successfully completed the course. Copies of the employee training log and the training certificate can be made using the printed "master" in the back of this binder or from the PDF version on the DVD.

Remember it is always a good idea to document information about an employee's attendance at these sessions, as well as the fact that the employee has come away from the session with an increased knowledge of how to avoid accidents and injuries when working in and around a trench.

OUTLINE OF MAJOR PROGRAM POINTS

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The following outline summarizes the major points of information presented in the program. The outline can be used to review the program before conducting a classroom session, as well as in preparing to lead a class discussion about the program.

- **The work that you do in construction can expose you to some pretty serious hazards.**
  - — That's why one out of every five workplace fatalities in the U.S. involves construction workers.

- **Some of the most dangerous construction hazards can be found when you're in a hole or a depression that's been dug into the earth, also known as an "excavation".**
  - — Compared to other areas on a construction site, working in an excavation more than doubles your chances of being killed on the job.
  - — Some of the greatest excavation hazards can be encountered when you work in a trench.

- **An average of two workers lose their lives every month when a trench they're working in collapses on them.**
  - — Many of these deaths and thousands of trenching injuries can be prevented.

- **OSHA defines a trench as a narrow excavation, deeper than it is wide, and having a maximum width of just 15 feet.**

- **From a practical standpoint, trenches are challenging places to work, because they are inherently dangerous.**
  - — Trenches are naturally unstable because with the help of gravity, they gradually "fill themselves up".
  - — All unsupported trenches will eventually collapse or "cave in".

- **So as you would expect, cave-ins are the most common type of accident in trenching work.**
  - — They can happen without warning.
  - — They travel as fast as 20 feet per second.
  - — They make very little noise.

- **One cubic yard of soil can weigh more than a ton, so when a trench caves in it can easily trap, crush and suffocate the workers inside.**

- **Other hazards can be found in a trench, as well. Digging in the ground can disturb:**
  - — Nearby structures such as buildings, walls and sidewalks.
  - — Natural surface features like trees or boulders.
  - — They can fall into the trench and onto anyone who is working there.

- **Utility lines on the site may be carrying water, sewage, natural gas or electricity.**
  - — If they are mishandled or damaged it can result in trenching workers being burned, electrocuted, drowned or asphyxiated.

- **Hazardous atmospheres can form in trenches dug near landfills and sewers or on sites that contain hazardous materials.**
  - — These fumes, gases and vapors can be colorless and odorless, and can poison or suffocate workers, catch fire or explode without warning.

- **Rain and other water that makes its way into a trench not only increases the chances of a cave-in, but the sloppy conditions make it harder to move safely inside the trench and to get out fast if need be.**
  - — Standing water also creates a drowning hazard.

- **There are other physical hazards as well.**
  - — Falls are the number one cause of fatalities in construction, and workers can and do fall into trenches.
  - — Excavated earth, building materials, equipment, tools, even vehicles can fall into a trench too, and onto anyone working there.

- **Surrounding "traffic" can also create hazards.**
  - — Employees who are working in trenches that are located near active roadways or mass transit lines can be hit by passing vehicles.
  - — Over time, the vibration that is caused by traffic or other work being done on the site can lead to a trench cave-in.

- **That's a long list, and a grim one, but you need to understand these hazards to work safely in a trench.**
  - — The good news is that your employer understands them too.

- **With guidance from OSHA regulations, your employer has created policies and procedures that are designed to guard against these hazards and help prevent accidents and injuries on trenching projects.**

- **Before any digging starts on a new trenching project, the worksite needs to be thoroughly inspected to identify potential hazards, so they can be controlled or eliminated.**
  - — The individual who is responsible for safety on a trenching job is called the "competent person".

- **The competent person has the training and experience to:**
  - — Identify any hazardous conditions on the job site.
  - — Anticipate other hazards that are likely to develop.
  - — Take the actions that are required to prevent or control these hazards.

- **The competent person will also be familiar with various soil types and the protective systems that should be used to keep a trench safe and stable under various conditions.**
  - — Soil testing and the selection of an appropriate protective system are crucial to safe trenching.

- **Additionally, the competent person will have a thorough understanding of the OSHA requirements for safe excavation as well.**
    - They're authorized to take prompt action to control or eliminate hazards whenever it's necessary.
    - That's why the competent person is likely to be a supervisor, so questions of seniority don't interfere with making the site as safe as possible as soon as possible.

- **Utilities that are in the trenching area can be especially hazardous.**
    - They're easy enough to locate when they're above the ground, but not when they're under it.

- **The competent person will use an official "one-call system" to:**
    - Identify what underground utilities are present on the site.
    - Pinpoint their location.

- **They can then be avoided, or when that's not possible, shut off, blocked or otherwise secured for the duration of the project.**

- **Another thing the competent person will do is to oversee testing for hazardous atmospheres, and if they are found, arrange to ventilate the trench to remove them.**

- **The competent person will also ensure that emergency rescue equipment will be available on the site, such as:**
    - Breathing apparatus.
    - Safety harnesses and lines.
    - A basket stretcher.

- **Additionally, the competent person will determine if any nearby structures or natural features could fall into the excavation, and arrange for proper safeguards if it is necessary.**

- **They will also inspect the site for:**
  - — Surface water, such as ponds or streams, that could divert into the trench.
  - — Patterns of runoff that may lead water into the trench during a rainstorm.
  - — Subsurface water that is present in the soil.

- **Ditches or dikes can then be constructed, or pumping equipment installed, to reduce the potential for water hazards in the trench.**

- **The competent person will evaluate street traffic, mass transit or other vehicular activity on or near the worksite as well.**
  - — Signage, barriers and high-visibility clothing will then be used to control traffic and help prevent workers from being struck.
  - — Extra support may also be used to reinforce the trench against any collapses that may be caused by traffic vibration.

- **Since trenches are naturally unstable, nearly all of them require some type of protective system to prevent cave-ins or shield the people who are working in them.**

- **OSHA safety rules require that any trench that is five feet or more deep must use some sort of "protective system".**
  - — Trenches less than five feet deep do not require a protective system if the competent person finds no potential for collapse.

- **The type of soil on the site is a key factor in the stability of any trench, and the type of protection that the trench will need.**

- **Soil is categorized by how well it "sticks together". This quality is called "cohesion".**
  - — A soil with more cohesion is less likely to collapse into a trench.
  - — Soils with less cohesion… such as those containing a lot of sand or gravel… are likelier to cave in.

- **There are four types of soils. The most cohesive type is solid mineral matter called "stable rock".**
  - — Trenches that are dug into stable rock do not need a protective system.
  - — They are the only exceptions to OSHA's requirement for protection against cave-ins.

- **"Type A" soil is less cohesive than stable rock, and "Type B" soil has less cohesion than Type A.**
  - — Trenches dug in these soil types always require protective systems.

- **"Type C" soil is the least cohesive, and as a result the least stable of all.**
  - — It's the "worst case" type of soil.
  - — Doing trenching in Type C soil requires careful precautions to prevent cave-ins.

- **It's important to remember that multiple types of soil can be found on one worksite, and even in a single trench.**
  - — If for any reason a soil type on a site cannot be determined, you must assume it's the "worst case", Type C soil.

- **Before trenching begins on any site, the competent person will:**
  - — Perform soil tests.
  - — Evaluate the results.
  - — Determine the most effective protective systems for the site's soil conditions.

- **There are four basic types of protective systems. Two of these involve angling and shaping the walls of the trench to prevent cave-ins:**
  - — "Sloping" cuts the sides of the excavation away from the trench bottom on an angle.
  - — "Benching" cuts the sides away in "bench" or "stepped" shapes.

- **The angles of the slopes and the dimensions of the "benches" are determined by the types of soil and other conditions on the site.**
  - — Sloping and benching may be used alone, or in combination with each other.
  - — Benching should never be attempted in Type C soil.

- **The two other protective systems are "shoring" and "shielding".**
  - — Shoring uses hydraulic, mechanical or timber reinforcement to support the walls of a trench to prevent a cave-in from occurring.

- **Shielding uses movable devices called "trench shields" or "trench boxes".**
  - — Their metal walls are designed to protect workers from the effects of a cave-in if one occurs.
  - — Personnel work inside the shielding system and move it along the trench as their work progresses.

- **Even with protective systems in place, conditions on a trenching worksite can change from day to day, and sometimes from one hour to the next.**
  - — Changes like these may affect the stability of the trench and protective system, or change the atmosphere from "safe" to "hazardous".

- **Conditions that affect the stability of a trench and its protective system include:**
  - — Weather, such as rain, snow, high winds and freezing or thawing.
  - — Water that collects in the trench.
  - — The weight of materials or equipment that are placed near the edge of the trench.
  - — Shock or vibration from machinery moving along the edge of the trench, or from other activity on the site.

- **The "atmosphere" in a trench can also be a safety issue.**
  - — Hazardous fumes or gases can be released as work progresses on the trench.
  - — They can accumulate in the trench overnight, or build up during a work shift, such as when gas or diesel-powered equipment is operating on the site.

- **Your employer follows policies and procedures designed to protect you and your coworkers from these hazards.**
  - — First, OSHA requires that the competent person inspect the worksite, trench and protective systems before the start of each work shift.
  - — If any hazards are found, no worker will be allowed into the trench until corrective measures have been taken, and the risk has been controlled or eliminated.

- **Inspections will also be made throughout the work shift to determine if conditions have changed and adversely affected the site, such as after a thunderstorm or the passage of heavy equipment alongside the trench.**
  - — If a hazard is identified, workers must leave the trench until the problem has been dealt with.

- **Depending on the hazard, protective measures that might be taken can include:**
  - — Installing shoring or shielding systems.
  - — Equipping workers with safety harnesses and lifelines.
  - — Pumping out accumulated water (because water removal can create hazards of its own, this process will always be overseen by the competent person).

- **OSHA also requires that trenches which are more than four feet deep and are at risk of developing hazardous atmospheres be tested at the start of each shift.**
  - — If testing reveals an unsafe condition, adequate ventilation must be installed.
  - — If necessary, workers must put on respiratory protection before they can continue work in the trench as well.

- **The air in the trench must then be retested as often as is necessary during the shift to ensure that additional changes do not endanger workers.**

- **Even with protective systems in place and inspection and testing being conducted regularly, working on a trenching site can still be hazardous.**
  - — Many accidents result from slips, trips and falls that occur as workers enter and exit the trench.
  - — Sometimes being able to get out of a trench quickly could be a matter of life and death.

- **OSHA requires that any trench four or more feet deep be provided with safe means of "access" and "egress".**
  - — This can include ladders, stairways or ramps.

- **Ladders must be fastened securely in the trench, inside its protective system.**
  - — They must extend at least three feet above the edge of the trench (this gives you something to hold on to so you don't lose your balance at the top).

- **To make sure everyone can get out of the trench quickly if they need to, ladders, ramps and stairways must be located no more than 25 feet from where people are working.**

- **Accidents can also happen when you cross over a trench, so safe walkways must be provided for this purpose.**
  - — A walkway that crosses an excavation that is more than six feet deep must be equipped with railings and toeboards, to prevent people and tools from falling into the trench.

- **The soil that is dug of out a trench is called "spoil".**
  - — When "spoil piles" or other materials or equipment are placed too close to the edge of a trench, their weight can cause the trench wall to collapse.
  - — OSHA requires all materials to be placed at least two feet back from the edge of a trench.

- **This "setback" also helps prevent these materials from sliding, rolling or falling into the trench as well as onto the workers who are inside.**

- **If conditions on the site require it, retaining devices such as the "trench shields" that we discussed earlier can be used in these situations as well.**
  - — To protect workers inside, a shield must extend at least 18 inches above the edge of the excavation.

- **Mobile digging or lifting equipment that is being used to excavate a trench can also create problems.**
  - — If it approaches too near the edge it can cause a collapse, or even fall into the trench itself.
  - — Equipment operators are required to keep their machinery back a safe distance, at least two feet, from a trench's edge.

- **When operators cannot get a clear view of how close their equipment is coming to the trench, hand or mechanical signals must be used to guide them.**
  - — If space permits barricades and stop-logs can also be used as physical barriers to prevent the equipment from getting too close to the trench.

- **On any worksite, preventing accidents and injuries requires teamwork.**
  - — When you're involved in a trenching operation you can do your part by "working defensively".

- **Like "defensive driving", working defensively means thinking "safety first" every day, and watching out for trouble so you can prevent it or avoid it before it causes an accident.**

- **Make a habit of following these safe work practices. They could save your life or someone else's:**
  - — Never enter an unprotected trench that is 5 feet or more deep.
  - — Never enter any trench that has water in it… unless precautions have been taken to keep you safe.
  - — Never enter any trench, of any depth, that has not been approved for work by a "competent person".

- **Other important practices that should be followed when working around a trench include:**
  - — Always wear a hard hat in a trench.
  - — Always stay inside the protective system of a trench.
  - — Never pass underneath or work below loads that are being handled by lifting or digging equipment.
  - — Always stand clear of any vehicle that is being loaded or unloaded.
  - — Always wear hi-visibility, "reflectorized" clothing when you are working on a site that is located near any type of vehicular traffic.

- **Don't be complacent. Stay alert for dangerous situations that could cause accidents and injuries.**

- **If you notice a hazard:**
  - — Warn your coworkers about it.
  - — Control or eliminate the hazard if you can and are authorized to do so.
  - — Otherwise, tell your supervisor or the competent person so they can take care of it.

- **If a cave-in occurs, do not enter the excavation yourself to try to rescue a coworker.**
  - — You could be trapped in a secondary cave-in and become a casualty too.

- **If you ever see a coworker overcome by hazardous fumes or gases, do not enter the trench or linger there to try to rescue them.**
  - — Many would-be rescuers have been overcome as well, and have died as a result.

- **If an emergency does strike, inform your supervisor, and call in first response professionals immediately.**
  - — These groups have the equipment and training to deal with emergencies so that nobody else gets hurt.

- **Remember that the best way to cope with a trenching accident is to prevent it happening in the first place.**

*** * * SUMMARY * * ***

- **To prevent accidents and injuries on a trenching project, your employer will follow specific safety policies and procedures as required by OSHA.**

- **Before work on a trench begins, a "competent person" will inspect the worksite and identify potential hazards.**

- **Based on soil tests and any hazards they've identified, the competent person will determine the most effective type of protective system to use in the trench.**

- **All worksites, trenches and protective systems will be inspected before the start of each shift, and as necessary during trenching activity.**

- **If conditions change, no workers will be allowed in the trench until any new hazards have been controlled or eliminated.**

- **When you're working on a trenching project, you can help keep yourself and your coworker's safe by being "safety minded" and "working defensively".**

- **Trenching work has its risks, but accidents and injuries don't have to happen.**
  - — Now that you're aware of the potential hazards and know how to avoid them, you can help ensure that everyone goes home safe at the end of the day!

ACCOMPANYING MATERIALS

ACCOMPANYING MATERIALS

In order to assist you in conducting your session on trenching and shoring safety, we have provided some materials that can be used with this program. These materials have been furnished in PDF format on the DVD as well as printed "masters" in the back pocket of this binder. This will enable you to make as many copies of these forms as you need. If you have colored paper available to you, it is often useful to put each form on a different color. This enables you to easily differentiate between the materials. The materials enclosed with this guide include:

Scheduling and Attendance Form

This form is provided so you can easily schedule your attendees into each session of the program. It is important that you have each attendee "sign-in" on the appropriate form, documenting their attendance at the session. Typically, a copy of this form is filed in the employee's personnel file.

Quiz

The quiz is normally given after viewing the program. However, if you want an indication of the "increase" in the attendees' knowledge of how to work safely in a trench, you can give the quiz both before and after the program is shown. You can also use the quiz as the basis for class discussion. If you have decided to give the quiz both before and after the attendees view the program, it is often interesting to have the attendees compare their "before" and "after" answers as part of the session. Typically, the quiz is filed in the employee's personnel file.

Training Certificate

This form allows you to give each employee their very own "certificate of completion" showing that they have attended the course and taken the quiz. Space is provided to insert the employee's name, the course instructor and the date of completion.

Employee Training Log

This log helps you to keep track of when each employee has taken the course, as well as associated courses/training. Space is provided to list pertinent data about the employee, as well as information such as the date the course was taken, and the instructor conducting the course. A copy of this form should be kept in each employee's training or personnel file.

Booklet*

A sample copy of the employee booklet that has been designed for use with this program has also been included. Using both text and illustrations to review important points, the booklet has been designed to reinforce the message that employees receive in the training session. The material is presented in the same order as seen in the program and is organized into concise sections, making it easy to understand and remember.

**Additional booklets, as well as copies of the poster that has been created to get employees thinking about trenching and shoring safety, are available from your distributor.*