

SafeSupervisor

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**TRENCHING AND EXCAVATION:
HOW TO AVOID AN EARLY GRAVE**

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Fatality Report

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Timeline of a Trenching Fatality

8:15 a.m. Police officers are called to a construction site in Des Moines, Iowa, to respond to a trench collapse. The victim, a 30-year-old male, and a few other workers were digging a trench while excavating a sewer pipe, when the walls of the trench collapsed. The trench is more than 12 feet deep and slick with thick mud. The victim is trapped and buried under the collapsed mud. Rescue efforts begin.

9:35 a.m. The fire department's tactical team switch from rescue to recovery. The rescue crew works for hours constructing a makeshift box from plywood and hydraulic jacks, but the walls of the trench continue to re-collapse during the recovery effort.

1 p.m. Authorities call for an industrial trench box, a tool used to protect workers from cave-ins. According to the police chief, the workers didn't seem to be using any kind of protection during their morning work. **A trench box was at the site but not in use.**

2:30 p.m. The victim's body is recovered. Notification of family follows.

Final Word

This death, and countless other trenching and excavation deaths, did not have to happen. Employers and employees must take responsibility for safety in excavations.

ONE
CUBIC FOOT
OF SOIL
can weigh over
45 kg
(100 pounds)

- Trenches must be properly sloped, shored, or equipped with the right type of shielding, to protect workers against cave-ins.
- Everyone needs to understand that when it comes to an excavation, it's a matter of **WHEN** a collapse will happen, not **IF** one will happen.
- Workers must exercise their right to refuse work that puts them in danger.
- Employers must train workers on trenching and excavation safety, provide required protective measures, ensure those measures are being used, and safety procedures are enforced.

BY THE NUMBERS

Occupational Noise Exposure

Hearing loss is more common than you might think. Interestingly, due to recreational, work, and environmental noise, hearing loss is occurring at younger and younger ages. Hearing loss is also one of the fastest growing and most prevalent, chronic conditions facing workers today.

- 22 million workers are exposed to hazardous noise each year.
- Noise above 80-90 decibels, on average, over an 8-hour workday is considered hazardous and can cause damage to your hearing.
- Hearing loss is the third most common complaint among adults after hypertension and arthritis.
- In Canada, hearing loss is second only to arthritis as the most common complaint among adults.
- Only 10% of hearing losses can be helped by surgery or other medical treatment.



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Trenching and Excavation

Trenching and excavation are among the most hazardous construction operations out there.

What's at Stake

On average, two workers are killed **every month** in trench collapses.

- Cave-ins pose the greatest risk and are much more likely than other excavation-related accidents to result in worker fatalities.
- One cubic yard of soil can weigh as much as a car.
- Other potential hazards include falls, falling loads, hazardous atmospheres, and incidents involving mobile equipment.

Four Ways to Protect Workers in the Trenches

Your company may train and designate you as a competent person for trenching and excavations. You may be asked to do, or verify certain safety measures, before workers can enter an excavation. Here are four easy ways supervisors can help in implementing and enforcing their company's trenching and excavation program.

1. Get Your Hands Dirty

Some types of soil are stable and some are not. When digging a trench, it's important to know the type of soil you're working with so you know how to properly slope, bench, or shore the trench. This can help prevent a cave-in. Examples of soil types include:

- Clay
- Gravel
- Sand

The three most common soil testing methods are the:

1. Plasticity test
2. Thumb penetration test
3. Pocket penetrometer test

For best results, it is recommended you use more than one of these methods to test the soil. Knowing the type of soil makes it possible to determine the right protective system to keep workers safe when they're working in an excavation. Excavations done in solid rock, do not usually require a protective system. If a site has previously been excavated, the soil will be classified one class lower, regardless of other classifying factors.

Soil can either be cohesive or granular.

- Cohesive soil contains fine particles and enough clay so that the soil will stick to itself. The more cohesive the

? DID YOU KNOW?

An excavation is a man-made cut, cavity, trench, or depression in the ground. A trench is a narrow excavation in the ground with a depth greater than its width - but not greater than 15 feet (4.6 m).

- soil, the more clay it has, and the less likely a cave-in will happen.
- Granular soils are made of coarse particles, such as sand or gravel. This type of soil will not stick to itself.
- The less cohesive the soil, the greater the measures needed to prevent a cave-in.

2. Confirm the Trench Measures Up

Know the requirements for when a protective system is required and when an engineer must design that system. For example, in the United States:

- Trenches 5 feet (1.5 meters) deep or greater require a protective system, unless the excavation is made entirely in stable rock.
- If less than 5 feet deep, a competent person may determine a protective system is not required.
- Trenches 20 feet (6.1 meters) deep or greater require a protective system designed by a registered professional engineer.

🔧 TOOL

Use the Trench/Excavation Checklist on page 9 to carry out an inspection before work begins in any excavation.

Find more related tools at SafeSupervisor.com

3. Protective Systems

Protective systems for trenches include:

- Sloping the soil for stability.
- Cutting the soil to create stepped benched grades.
- Supporting (shoring) the excavation walls by installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins.
- Shielding workers from a cave-in, by using a trench box to protect workers in a trench.

4: Other Precautions

PPE is the last line of defense used as a supplement rather than a substitute for fall protection systems. PPE for vertical fall hazards include:

- A competent person must inspect trenches daily and whenever conditions change, such as after it rains.

- Keep heavy equipment, excavated dirt, and other materials and equipment away from the edge of an excavation.
 - U.S. requires at least 2 feet back from the edge.
 - Many jurisdictions in Canada require the distance to be 3 meters.
- Employees must have a safe way to enter and exit a trench, such as a ladder or ramp.
- Locate underground utilities before digging.
- Test for atmospheric hazards such as low oxygen, hazardous fumes and toxic gases.
 - Typically required when the excavation is greater than 4 feet deep.

TOOL

Use the Fatality Report on page 2 to capture workers and drive home the message that trenching and excavation work can be deadly.

Give your workers the Trenching and Excavation Safety handout on page 5, before they start work in a trench.

Find more related tools at SafeSupervisor.com

- Never let employees work under suspended or raised loads and materials.
- Ensure employees wear high visibility or other suitable clothing when exposed to vehicular traffic.

SHOP TALK

10 Reasons Training Messages Don't Reach Their Target

1. They Really Can't Hear You

Do you mumble or talk too fast? Are you dealing with an employee with hearing loss? Is the environment distracting? These factors can affect what trainees hear.

2. You're Speaking Greek

Don't assume knowledge level and understanding. Define any words which may be unfamiliar. Keep the message focused and simple.

3. They Hear the Message but Don't Understand the Reason

Many trainees want to know the "what" and the "why". Especially if you're trying to introduce a change in procedure or technique. Explaining the "why" is what will lead to a change in behavior.

4. The Message Seems Irrelevant

Before explaining a safety procedure, point out the hazards and how it affects them. It makes a lot more sense to wear protective gloves when you know about flesh-melting chemicals.

5. Your Jokes Are Garbling the Message

Humor can be an important tool in training. But, if you kid around too much, it may be hard for trainees to tell when you are serious.

6. You're Not Listening

Give your trainees lots of chances to ask questions. You can gauge the level of understanding by what they ask. No questions, doesn't equal understanding. Trainees may

not have questions because they don't understand what you said.

7. You're Not Tailoring Your Message

Differences in literacy levels and culture may make it difficult for you to communicate with your trainees. Be sensitive to these differences and look for ways to bridge them.

8. You're Not Testing Their Comprehension

Don't assume the message has been comprehended. Ask the group to repeat the message back to you. "Okay, now what is the procedure for disposing of oily rags?"

9. You're Relying Too Heavily on the Spoken Word

Different people have different learning styles. Some need to hear. Some need to see. Others need to do. Still others won't learn a thing until they get their hands on a training manual. Most need a combination of these methods.

10. You're Not Anticipating Obstacles

There may be roadblocks to following your instructions. Habit and uncertainty are common ones. Try to anticipate and remove these. Does the trainee have the tools, equipment, or procedures to follow through on what you said?



Stop Work-related Hearing Loss

What's at Stake?

If you work in a noisy setting and are not regularly using hearing protection, you're asking for hearing loss. And once your hearing is damaged and gone, you can't get it back.

What's the Danger?

Problems faced by workers who have diminished hearing include difficulty hearing warning signals and alarms, trouble hearing directions, and an inability to determine where sounds are coming from (how close or far away they are).

Here's an example of how hearing loss can affect safety. A logging truck driver, known to have a hearing disability, was waiting for his truck to be loaded. He, and two other drivers were standing and waiting outside of their trucks at a warm-up fire.

The main cable used to move the logs snapped. The broken end whipped around the landing where the loading was taking place. The co-workers recognized the sound of the line breaking and took cover. But the truck driver apparently didn't hear the line break. It hit him in the face and threw him 50 feet. He died instantly.

How to Protect Yourself

The most effective way to protect workers' hearing is to reduce or remove hazardous noise from the workplace. This may be done by putting acoustic barriers around noisy processes, installing sound reducing mufflers on equipment, or by removing the source of the noise entirely.

When noise cannot be reduced to a safe level, your employer must provide hearing protection. It is your responsibility to wear it whenever you are in a hazardous noise situation. Some options include:

1. Ear plugs. These work by sealing the ear canal from the source of noise.



- Ear plugs are easy to use, but must be inserted correctly to provide the best protection.
- Some are designed for one-time only use and others are designed for repeated use.
 - Foam ear plugs are designed to be worn only once and thrown away after use.
 - Many plastic ear plugs are designed to be re-used.

2. Canal caps. These are a variation of ear plugs designed to fit over the top of the ear canal.



- Some people prefer canal caps because they aren't inserted into the ear canal and are more comfortable.
- Canal caps don't provide as much protection as ear plugs, but are a good option when you must put on and take off hearing protection frequently.

3. Ear muffs.

Ear muffs can last a long time if properly cared for and are generally easier to fit and wear.



- They work by sealing the entire ear with a cushioned cup.
- Ear muffs can also be worn over ear plugs to provide extra protection.

Final Word

Without proper hearing protection you put yourself at risk for hearing loss. Talk to your supervisor or safety person about finding the right hearing protection for you.

TEST YOUR KNOWLEDGE

1. People who have diminished hearing may have difficulty identifying how far away the source of a sound is.
 True False
2. Canal caps offer a higher level of noise protection than ear plugs.
 True False
3. Foam ear plugs are designed to be worn repeatedly.
 True False
4. Ear muffs cover the entire ear and can be worn with ear plugs for added protection.
 True False

What Would You Do?

Joe, a long-time employee, has severe hearing loss, to the point where he can't hear alarms or approaching forklifts. On one occasion, you had to grab him by the arm and pull him out of the path of a truck he'd neither heard nor seen. He plans to retire in a couple of months but you're concerned he might not live long enough to reach that goal. What would you do?

Meeting materials to go:

Safety meeting materials such as presentation tips, PowerPoint presentations, quiz answers and more are downloadable at www.SafeSupervisor.com

QUIZ ANSWERS: 1. True, 2. False, 3. False, 4. True

Ergonomics and the Mature Worker

What's at Stake?

Older workers are dying on the job at a higher rate than workers overall, even though the overall rate of workplace fatalities has been decreasing.

What's the Danger?

While many people are quite capable of working well into their 60s or longer, they are at greater risk for injury and job-related illnesses because of reduced strength, balance, hearing, vision, and slower reaction time.

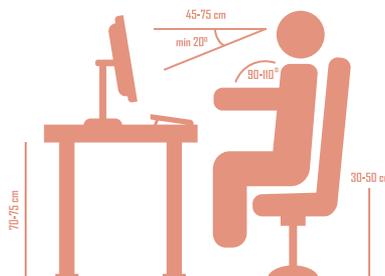
How to Protect Yourself

Following these seven ergonomic-based tips can help mature workers stay safe and be more comfortable on the job.

1. Arrange your workstation to minimize the distance you need to reach for equipment or materials.
 - The items you need to use most frequently should be centrally located.
 - Ensure your chair is at the correct height and properly adjusted to your workstation's height.
2. Shed some light on the situation.
 - Low lighting can lead to trips, slips and falls.
 - A middle-aged worker needs up to six times as much light to see, compared to someone in his or her 20's.
 - Bump up the type size at your computer to make reading documents easier. And ensure there is adequate lighting.
3. Reduce lifting demands on your body.
 - Use lifting devices such as carts whenever possible.
 - Lift with your legs instead of your back.
 - If you are repeatedly reaching into boxes, try to place them on benches or tables to reduce the need for bending.
4. Listen up.
 - If you have difficulty hearing what others are saying, have your hearing checked.
 - It's a good idea to let your supervisor know if you have hearing loss or wear a hearing aid. This helps keep everyone safe and can also affect the type of hearing protection you wear.
5. Make a move.
 - If your job involves long periods of sitting, get up and stand and stretch or take a short walk at least hourly.
 - You'll be less stiff and you'll improve your body's blood flow.
6. Watch out!
 - Take extra care when walking on slippery surfaces, particularly elevated slippery surfaces.
7. Work it out.
 - Try to get regular exercise to keep your body limber and heart strong.
 - If you haven't been exercising much and want to start, check with your doctor first to ensure you don't overdo it.

Final Word

Mature workers bring invaluable knowledge and experience to their jobs. Following a few ergonomic work practices can keep these workers safe and productive so they can continue to share that knowledge and experience.



TEST YOUR KNOWLEDGE

1. A middle-aged worker needs up to six times as much light to see, compared to someone in his or her 20's.
 True False
2. Getting up and walking or stretching can help improve blood flow.
 True False
3. A hearing aid doesn't affect hearing protection selection.
 True False
4. The items at your workstation you need to use most frequently should be spread out so you must stretch and move to reach them.
 True False

What Would You Do?

The setup of your workstation is causing you a lot of discomfort. You've tried adjusting your seat height and moved a few things around, but you're still not comfortable. What would you do?

Meeting materials to go:

Safety meeting materials such as presentation tips, PowerPoint presentations, quiz answers and more are downloadable at www.SafeSupervisor.com

QUIZ ANSWERS: 1. True, 2. True, 3. False, 4. False

Trench/Excavation Inspection Checklist

Adapt this checklist based on your company’s safety program and regulatory requirements on trenches and excavations. Require a supervisor or other “competent person” to use this checklist to inspect all trenches and excavations BEFORE work begins. Any issues identified in the inspection must be addressed before workers start work. Keep the completed forms to document that you conducted such inspections.

Location: _____ Date of Inspection: _____

Person Conducting Inspection: _____

GENERAL	YES	NO	COMMENTS
Cracks in the ground around the trench or excavation?			
Tools and materials piled or stored near edge of trench or excavation?			
Proper barriers or guardrails in place?			
Safe means of entry/exit provided?			
Any signs of water seeping into the trench or excavation?			
Workers have proper PPE?			
HYDRAULIC SHORING	YES	NO	COMMENTS
Leaks in hoses and cylinders?			
Bent bases?			
Broken or cracked nipples?			
Cracked, split or sheathing?			
TIMBER SHORING	YES	NO	COMMENTS
Are shoring members the size required for the depth of the trench/ excavation and type of soil?			
Cracked or bowed sheathing?			
Damaged or defective lumber?			
Wales crushed where they join struts?			
Split or bowed wales?			
Loose or missing cleats?			
Struts off level?			
TRENCH BOXES	YES	NO	COMMENTS
Damage or defects?			
Deformed plates?			
Cracks in welds?			
Bent or distorted welds in sleeves and struts?			
Missing struts?			
Bent struts?			
Holes, bends or other damage to plates?			
Shifting or settling to one side?			

Older Workers at Higher Risk of Dying at Work

Older people are dying on the job at a higher rate than workers overall, even as the rate of workplace fatalities decreases, according to an Associated Press analysis of federal statistics.

It's a trend that's particularly alarming as baby boomers reject the traditional retirement age of 65 and keep working. The U.S. government estimates that by 2024, older workers will account for 25 percent of the labor market.

Getting old — and the physical changes associated with it — “could potentially make a workplace injury into a much more serious injury or a potentially fatal injury,” said Ken Scott, an epidemiologist with the Denver Public Health Department.

Gerontologists say those changes include gradually worsening vision and hearing impairment, reduced response time, balance issues and chronic medical or muscle or bone problems such as arthritis.

In 2015, about 35 percent of the fatal workplace accidents involved a worker 55 and older — or 1,681 of the 4,836 fatalities reported nationally.

William White, 56, was one of them. White fell 25 feet while working at Testa Produce Inc. on Chicago's South Side. He later died of his injuries.

“I thought it wouldn't happen to him,” his son, William White Jr., said in an interview. “Accidents happen. He just made the wrong move.”

The AP analysis showed that the workplace fatality rate for all workers — and for those 55 and older — decreased by 22 percent between 2006 and 2015. But the rate of fatal accidents among older workers during that time period was 50 percent to 65 percent higher than for all workers, depending on the year.

The number of deaths among all workers dropped from 5,480 in 2005 to 4,836 in 2015. By contrast, on-the-job fatalities among older workers increased slightly, from 1,562 to 1,681, the analysis shows.

During that time, the number of older people in the workplace increased by 37 percent. That compares with a 6 percent rise in the population of workers overall.

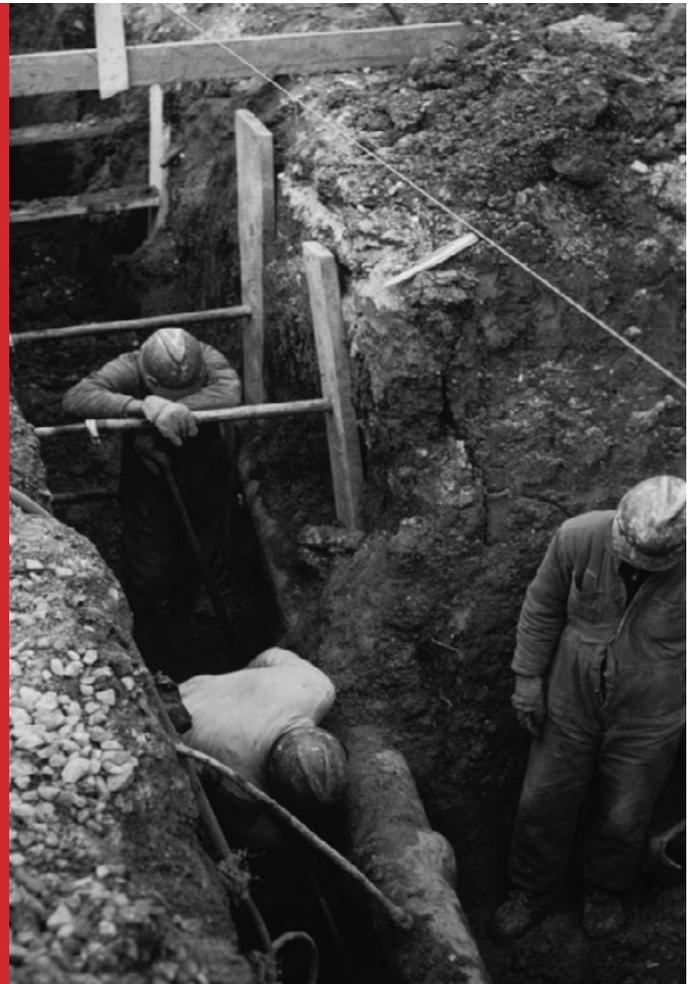
SPOT THE SAFETY VIOLATION

Excavation Hazards

Trenches and excavations poses various safety hazards to the workers who must work in and around them. What hazards and safety violations do you see in this photo?

1. Part of the trench is unsupported; leaving workers exposed to cave-in hazards.
2. Shoring is not consistently braced by screw jacks. This could allow the sides of the trench walls to collapse.
3. The spoil pile of rocks and other materials is not far enough back from the edge of the excavation.
 - Workers could easily be hit or crushed by objects and equipment that are not a safe distance away from the edge of the excavation.
 - In the U.S., material must be at least 2 feet from the edge of an excavation.
 - In Canada, the distance is at least 1 meter.
4. There doesn't appear to be a ladder or other means of safe entry and exit. Excavations must have a way for workers to safely enter and exit. Check with your supervisor or competent person on specifics.

Collapses of excavations are all too common and often fatal. Protect yourself and others by being aware of the hazards and the safety measures that should be in place, before you step into an excavation.



How Loud is It?

Sound Chart



Upcoming Deadlines, Regulatory Changes and Enforcement Events You Need to Prepare For

OHS COMPLIANCE CALENDAR

Date	Jurisdiction	Deadline/Regulatory Change/Event
July 12	Federal	New asbestos rules took effect
July 31	Alberta	Deadline to comment on Alberta cannabis legalization plan
Aug. 1	Alberta	New OHS safety regulations (Part 23) for flow piping systems at oil and gas facilities took effect
Sept. 1	Ontario	MOL Residential Construction Blitz begins
Sept. 1	BC	Deadline to comment on WorkSafeBC proposal to extend OEL review period from 1 to 3 years
Sept. 15	BC	Deadline to comment on WorkSafeBC proposal to stop using projected total cost of permanent disability awards to calculate employers' experience rating (ER)
Oct. 1	All jurisdictions	Federal WHMIS compliance inspections begin (and continue thru Dec. 31)
Oct. 1	Ontario	Deadline to provide fall protection training to workers exposed to vertical fall hazards at construction sites for employers with extensions
Oct. 1	Ontario	MOL Fall Protection Blitz begins
Oct. 1	Ontario	MOL Ladder Safety Blitz begins
Oct. 31	Québec	New deadline for Advisory Committee to complete review of OELs for Annex 1 substances
Dec. 31	Manitoba	Deadline for government to complete 5-year OHS laws review
Jan. 1	BC	New OHS storage rack requirements take effect