

Site Work Safety: Preventing Injuries Above and Below Ground

FACT SHEET

LENGTH: 13 MINUTES

Production Year: 2023

PROGRAM SYNOPSIS:

Site work, dirt work, excavation, or simply “underground” are all terms that refer to dumping, digging, pushing, compacting, hauling, and manipulating the dirt and grade of a construction job site. When site work operations are in progress, construction workers are exposed to hazards above and below the ground, and safety must always be their top priority. This program discusses common hazards that all site work operations share, such as raised loads and trenches, and how to prevent serious injuries or fatalities, such as through PPE and staying alert for hazards.

PROGRAM OBJECTIVES:

After watching the program, the participant should be able to explain the following:

- Basic and additional PPE required on a job site;
- The need to avoid being crushed or run over;
- Safety practices while lifting and placing loads;
- Underground and overhead powerlines;
- Unloading trailers and stacking objects;
- Safety in trenches and excavations;
- Hazards to stay alert for and the benefits of having a safety mindset.

PROGRAM OUTLINE:

INTRODUCTION

- Site work, dirt work, excavation, or simply “underground” are all terms that refer to dumping, digging, pushing, compacting, hauling, and manipulating the dirt and grade of a construction job site.
- When site work operations are in progress, construction workers are exposed to hazards above and below the ground, and safety must always be their top priority.
- Of course, every job is unique with differing specifications and requirements. However, all site work operations share common hazards that all workers and supervisors must understand in order to prevent serious injuries or fatalities.

PPE REQUIREMENTS

- To safely enter any construction site, a minimum level of personal protective equipment, or “PPE,” will be required. Long pants, steel-toed safety boots, a hard hat, safety glasses, and a high-visibility shirt or vest are typically required of all construction workers.
- Make a habit of wearing your PPE all the time. Put it on as soon as you arrive on site and keep it on all day. Construction incidents can happen in the blink of an eye and your PPE provides protection even when you least expect you may need it.

AVOID BEING CRUSHED OR RUN OVER

- When it comes to site work safety, the first thing you need to know is, dirt is heavy! One cubic yard of dirt can weigh over 2,000 pounds! Moving this much weight around requires powerful equipment and machinery, and every item or tool used in support of these efforts is heavy and powerful.
- Practically every object to be buried or placed into the ground is heavy. Therefore, during site work operations, the first order of business for construction workers is to avoid being run over or crushed by heavy moving equipment or objects.
- This means that wearing a high-visibility shirt or vest is a must. Doing so helps equipment and vehicle operators see you more easily. But simply wearing high-visibility clothing is not enough.
- The various machines used to move dirt around have plenty of blind spots and obstructed sight lines, so never assume an operator can see you. This is why you should never stand directly behind any type of heavy equipment. Do not approach or cross the path of any vehicle unless you first make eye contact with the operator and he or she instructs you to do so.

- Also, be aware that heavy equipment can easily move large objects that you might have assumed would remain stationary. Stay well clear of any object, regardless of its size, that is within the working zone of this type of heavy equipment.
- Before entering a worksite, take a moment to study the traffic pattern of the equipment in operation. Every worksite will have some repetition of digging, hauling, and dumping dirt, gravel, and other materials. Whenever possible, stay out of the travel paths commonly used by heavy equipment.
- Also, make sure to account for, and stay well clear of, the swing radius of mobile equipment. Many types of earth-moving equipment can pivot or turn easily, creating a hazard for anybody inside the radius of the turn, and equipment with the capability to reach beyond its base, such as an excavator, can have a large swing radius. All personnel and vehicles must remain well clear.

STAYING SAFE WHILE LIFTING AND PLACING LOADS

- Of course, dirt is not the only heavy thing being moved around on a busy job site. Heavy machines, as well as various types of cranes and lift trucks, are the work horses used to lift and place all types of construction materials and objects.
- Stay alert for any lifting operation near you and move outside the swing radius of any lifted or moving loads. Never stand directly under any raised load or any raised component of equipment or machinery.
- Of course, certain work requires personnel to work in close proximity to moving and raised loads. However, even when doing so, these workers must never be directly under the load, and they must keep their hands and feet clear of all pinch points and crush points.
- For this type of work to be performed safely, a clear work plan should be discussed before starting the job, and all workers must know their role and responsibilities.
- When loads are being lifted, moved, or placed, any worker not directly involved in the work at hand should stay well clear.
- When lifting and placing loads or when precise movements are required, a qualified signal person should be designated to assist the crane or equipment operator. To avoid confusion, only the signal person should give signals to a crane or equipment operator.
- In many instances, the signal person may also be the “rigger.” Prior to use, the rigger must inspect all lifting components and ensure each has a capacity rating sufficient for the planned lift.
- Each lifting sling or chain must have a legible capacity tag in place, and the keeper gate of the lifting hook should be present and in good condition.
- Many raised loads require a tagline be used to control the load in route and to assist in precisely landing the load. When this is the case, it’s critical for the person in charge of the tagline to pre-inspect the planned route to ensure it is safe to travel and free of any hazards.

UNDERGROUND AND OVERHEAD POWERLINES

- Staying alive depends on locating underground and overhead powerlines.
- All site work operations involve some type of digging, and no digging should take place until all underground utilities and power lines are located and marked.
- Making sure this happens is usually the job of the competent person, but all workers involved in excavation work must be aware of the dangers present by underground utilities. Of course, utility dangers are not exclusively underground.
- Overhead powerlines present a serious danger on construction sites and their locations must be well known by all. All cranes, vehicles and conductive objects must stay at least 10 feet away from powerlines of 50,000 volts or less.
- For higher voltages even more clearance distance is required. Always look up and check for powerlines before beginning any elevated work, erecting scaffolds, or carrying long conductive objects.

UNLOADING AND STACKING OBJECTS

- Another hazard to be aware of is the crushing hazard presented when unloading trailers or stacking objects. Objects on trailers may shift, roll, or fall when straps or chains are initially undone or as the trailer is being unloaded. Stay well clear.
- Round objects that can roll should not be stacked too high and should be chocked or otherwise secured to prevent shifting.
- Other materials should also be secured when stored and not stacked so high as to present a risk of falling.

TRENCHES AND EXCAVATIONS

- One of the biggest hazards of any site work operation is the risk of an excavation collapse or trench cave-in.
- Every job that requires digging must have a designated competent person who ensures the safety of all trenches and excavations. This competent person must ensure that adequate measures to prevent a trench collapse or cave-in are put into place when necessary.
- These measures may include sloping the edges of the excavation to an angle shallow enough to prevent a collapse, benching the excavation edges, or installing some type of shoring or shielding to protect workers from the risk of collapsing soil.
- Typically, these types of protections must be in place for any excavation 5 feet deep or greater.
- It's critical that workers in a trench have a safe means of exit readily available. OSHA requires that a ladder, ramp, or other means of exit be located within 25 feet of workers in a trench or excavation.
- If you are a worker involved in site work and underground installations, do not enter any excavation unless you are sure that it has been inspected by a competent person, it does not present a risk of collapse or cave-in, and a ladder or other means of exit is in place.
- The nature of excavation work often requires that work be completed in one small area, backfilled, and then the whole operation moved a short distance and repeated. This involves a constant process of workers exiting the trench, the protection system being moved to the new location, and the work being repeated.
- Workers must not become complacent during these repetitive operations. Make sure to only enter and exit the trench using the ladder, stairs, or ramp, and make sure you always remain in a protected area of the trench that has been made safe from collapse.
- Here are some other hazards related to trench work that all construction workers should be aware of.
- The spoil pile must be set back at least two feet from the trench edge. Otherwise, it may slide into the trench, or its weight could cause the trench wall to collapse.
- Similarly, the weight and vibration of large vehicles can cause a collapse and should be kept away from the edge of a trench.
- The presence of water can make a trench unstable. The competent person must dewater trenches with pumps or other means.
- Harmful fumes and vapors may settle into a trench or excavation and create a hazardous atmosphere. When this is a possibility, atmospheric testing must take place, and if necessary, forced air ventilation must be used to make entry safe.

STAYING ALERT FOR HAZARDS

- Of course, all construction job sites are in a constant state of change. Perhaps none more so than site work operations. Before entering any work area, look around for hazards and moving equipment. Be sure to also look up for any overhead hazards. Do this every time, because conditions change rapidly.
- This can make the seemingly simple task of walking around the job site as a pedestrian a serious safety challenge.
- When traveling, go slow and scan your path of travel for the inevitable tripping hazards that may be present.
- Stay alert for trench openings, drop-offs, holes, and other hazards.
- Falling onto rebar can be fatal. This is why the exposed ends of all rebar should be capped.
- Simple falls due to slips and trips are one of the leading causes of injury to construction workers each year.
- Another common source of fall injuries is falling from heavy equipment. Prevent this by using three points of contact while climbing into and out of heavy equipment. Never jump from the equipment. Always step cautiously to the ground.

ADDITIONAL PPE AND PROTECTIONS

- Earlier we discussed the minimal level of PPE that should be worn. However, some common tasks during site work operations require additional PPE and/or additional protections.
- Tasks that create masonry dust, such as cutting concrete block or pipe, can create a health hazard due to exposure to silica dust. Spraying water onto masonry material while cutting can greatly reduce levels of harmful dust. Wearing a dust mask or respirator can also reduce exposure to harmful silica dust.
- Grinding, cutting, chipping, and similar operations will require a face shield, in addition to safety glasses, to protect against fast flying debris. Hearing protection should be used when exposed to the high noise levels of power tools and other loud equipment.
- Utilize gloves to protect your hands when handling block, chains, pipe, and similar items that may injure your hands.

- Always chock the wheels of vehicles and heavy equipment prior to servicing, and use jack stands, blocks, or braces to secure lifted vehicles and/or any raised hydraulic attachments that can't be lowered to the ground.

SAFETY MINDSET

- Preventing injuries during site work operations depends on workers having a safety mindset that leads them to put their knowledge into action.
- During this program, we have provided some of the critical safety information required for construction workers to avoid injury. Now, it's up to you to use this information to ensure you remain safe, healthy, and injury-free when performing tasks related to site work operations.
- If you are ever unsure how to perform your job safely or if you encounter an unexpected hazard or concern, stop work and seek guidance from your supervisor or the general contractor responsible for the jobsite.

SITE WORK SAFETY: PREVENTING INJURIES ABOVE AND BELOW GROUND

ANSWERS TO THE REVIEW QUIZ

1. a

2. a

3. a

4. b

5. a

6. a

7. b

8. a

SITE WORK SAFETY: PREVENTING INJURIES ABOVE AND BELOW GROUND

REVIEW QUIZ

Name _____ Date _____

The following questions are provided to determine how well you understand the information presented in this program.

1. Long pants, steel-toed safety boots, a hard hat, safety glasses, and a high-visibility shirt or vest are typically required of all construction workers.
 - a. True
 - b. False

2. You should never stand directly behind any type of heavy equipment, and do not approach or cross the path of any vehicle unless you first make eye contact with the operator and he or she instructs you to do so.
 - a. True
 - b. False

3. When loads are being lifted, moved, or placed, any worker not directly involved in the work at hand should stay well clear.
 - a. True
 - b. False

4. Round objects that can roll should be stacked extra high to save space.
 - a. True
 - b. False

5. OSHA requires that a ladder, ramp, or other means of exit be located within 25 feet of workers in a trench or excavation.
 - a. True
 - b. False

6. Prevent fall injuries by using three points of contact while climbing into and out of heavy equipment.
 - a. True
 - b. False

7. For grinding, cutting, and chipping operations, you just need safety glasses to protect against fast flying debris.
 - a. True
 - b. False

8. All cranes, vehicles and conductive objects must stay at least 10 feet away from powerlines of 50,000 volts or less.
 - a. True
 - b. False