

## 2021 OVERVIEW SERIES: CONSTRUCTION'S FATAL FOUR HAZARDS FACT SHEET

**LENGTH: 17 MINUTES**

### **PROGRAM SYNOPSIS:**

A construction jobsite can be dangerous and contains hazards that can quickly injure or kill construction workers. Due to the nature of construction work, these hazards are constantly changing as the construction project enters and completes the various stages of construction. Known as the “Fatal Four” or the “Focus Four”, these hazards include: Struck-By Hazards, Caught-In or Caught-Between Hazards, Fall Hazards, and Electrocuting Hazards. All construction workers must be aware of these “Fatal Four Hazards” and follow the safe work practices and procedures required to prevent construction related injuries and fatalities.

### **PROGRAM OBJECTIVES:**

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

- The fatal four construction hazards;
- The common causes of the fatal four;
- Why PPE is a vital part of keeping you safe;
- Why being aware of surroundings is important;
- How ensuring tools and equipment are in good working order keep one safe;
- The importance of safety devices and using them properly.

### **INSTRUCTIONAL CONTENT:**

#### **CONSTRUCTION'S FATAL FOUR HAZARDS OVERVIEW**

- A construction jobsite can be dangerous and contains hazards that can quickly injure or kill construction workers.
- Due to the nature of construction work, these hazards are constantly changing as the construction project enters and completes the various stages of construction.
- Unfortunately, many construction workers do not recognize or understand these hazards and do not always follow the safe work practices necessary to prevent injury.
- In fact, over 5,000 construction workers are killed and over 150,000 are injured each year.
- In an effort to reduce the high number of construction-related injuries and fatalities, The Occupational Safety and Health Administration, OSHA, has identified the four most common causes of injuries and fatalities in construction.
- Known as the “Fatal Four” or the “Focus Four”, these hazards include: Struck-By Hazards, Caught-In or Caught-Between Hazards, Fall Hazards, and Electrocuting Hazards.
- OSHA’s “Fatal Four” construction hazards account for more than 60% of all construction related injuries and fatalities.
- Common causes of Struck-By Injuries include being struck by falling objects or flying objects, being struck by rolling objects or swinging objects and being struck by moving vehicles or other moving equipment.
- Common Causes of Caught-In or Caught-Between Injuries include having a hand or body part become caught in the blade of a power tool, being caught in moving machinery or rotating parts, becoming caught in collapsing soil or collapsing structures and being caught between moving equipment and a solid object.
- Common causes of fall related injuries in construction include a lack of proper guardrails on scaffolds or other unprotected edges, the improper use of ladders and workers failing to properly use a personal fall arrest system when required.

- And finally, some common causes of construction workers being electrocuted include the use of damaged extension cords, not using a Ground Fault Circuit Interrupter (GFCI) when required and inadvertently making contact with energized circuits or overhead power lines.
- All construction workers must be aware of these “Fatal Four Hazards” and follow the safe work practices and procedures required to prevent construction related injuries and fatalities.

## **STRUCK-BY HAZARDS IN CONSTRUCTION**

- Struck-By Hazards are one of the leading causes of injuries and fatalities in construction and are one of OSHA’s “Fatal Four” construction hazards.
- “Struck-by” injuries such as broken bones, bruises and blunt force trauma occur when any type of an object or piece of equipment makes forcible contact with an employee.
- Always keep in mind that hardhats, safety glasses and steel-toed boots provide critical protection from struck-by hazards on construction sites and must be worn when required.
- Struck-by hazards are divided into the following groups: flying objects, falling objects, swinging objects, and rolling objects.
- Flying object hazards are created when something has been thrown or propelled across the worksite.
- Common examples include projectiles from nail guns or pneumatic and powder-actuated tools, airborne materials from grinders or cleaning with compressed air, pieces sent flying from damaged, cracked or splintered tools, debris from jack hammers, masonry saws and other construction equipment.
- To prevent flying object injuries, reduce compressed air pressure to 30 PSI or less by using an approved safety nozzle. Inspect hand tools before use and do not use tools with damaged handles or mushroomed heads.
- Never point a nail gun or similar projectile tool at anyone and do not fire this type of tool into any surface where the nail or fastener could pass through and hit someone on the other side. Before using saws, drills, grinders, etc., make sure you have checked the area around you for the presence of other workers.
- Falling object hazards on a construction site include tools or pieces of material falling from upper levels, work platforms, scaffolding or unprotected edges. Also, hoists and lifting devices can fail and suddenly drop their loads dangerously to the ground.
- To avoid falling object injuries, never walk or work underneath or next to a suspended load; always keep well clear. Don’t stand under a ladder while someone is working above and only climb ladders one person at a time. Use tool-tethering devices to prevent tools from falling while climbing or working. Don’t stack stored materials too high and secure items that may shift or move with tie down straps or by other means.
- Swinging object hazards are created by hoisted materials moving about in the air, heavy equipment traveling or pivoting during operation and hinged items such as heavy doors or dumpster lids swinging open or dropping.
- To protect yourself from swinging object injuries, always stay well clear of mobile equipment and vehicles during operation. Make note of the swing radius of any equipment operating nearby and stay out of this hazardous area.
- When operating any hinged item, keep hands and other body parts well clear of the pinch points. Secure or brace any type of hinged object if you must place yourself into the line of fire.
- Rolling object hazards exist when items such as tanks, cylinders and pipes roll, move or slide unexpectedly when stored on a slope without being secured, stacked in an unstable manner or become unstable when a securing mechanism is removed. Moving vehicles are also considered a rolling object hazard.
- To prevent rolling object injuries, make sure to follow proper unloading procedures and make sure you are standing out of the line of fire. Always secure pipes and other construction materials that can roll.
- Never store tanks or cylinders on their side. Keep them upright so they cannot roll. Workers should never stand directly behind equipment where the operator cannot see them, and equipment operators should always check behind the vehicle before backing up.

- Construction workers must be able to recognize and avoid these various “Struck-By” hazards and follow the safe work practices and procedures required to prevent injuries and fatalities.

### **CAUGHT-IN AND CAUGHT-BETWEEN HAZARDS IN CONSTRUCTION**

- Caught-In and Caught-Between Hazards are some of the leading causes of injuries and fatalities in construction and are part of OSHA’s “Fatal Four” construction hazards.
- “Caught-in” or “caught-between” injuries occur when someone is caught, squeezed, pinched or pinned between two or more objects. If not fatal, these incidents often result in crushing injuries such as broken bones, amputations and asphyxiation.
- Some of the ways a worker can be caught between equipment or objects include being pinned between a piece of moving equipment and a solid wall, being pinned between two different pieces of moving equipment or being pinned between materials being stacked or stored near a solid object.
- You can prevent these types of situations by never placing yourself between any solid objects that could move, or between moving equipment and stationary objects. Make sure to secure, block or chock equipment or objects to ensure that they cannot move on their own.
- Unprotected trenches and excavations can collapse and crush or suffocate workers that are caught between shifting soil and solid objects or caught in and buried under the heavy soil as it collapses.
- Always make sure the required protective systems are in place before entering an excavation and NEVER enter a trench that appears to be unsafe. Also avoid running heavy equipment near the edge of any excavation when workers are inside.
- Place all spoil at least three feet from the edge of the excavation and only enter or exit a trench or excavation by using a ladder, stairway or properly designed ramp.
- Equipment and machinery on construction sites can quickly pull fingers, hands and arms, as well as loose clothing and long hair, into their moving or rotating parts, causing serious “caught-in” injuries. To prevent such injuries, always follow required lockout/tagout procedures to ensure equipment cannot start or move during service.
- Unplug tools before changing bits or blades. Inspect equipment before use. Don’t use equipment with missing guards and never remove or alter the guards on your power tools.
- Being caught in collapsing structures, such as scaffolding and walls, during demolition are frequent causes of injuries during construction jobs. To help prevent scaffolding from collapsing, make sure a competent person supervises and inspects scaffold activities as required.
- Do not set up or remove scaffolding unless you are trained and authorized to do so. Don’t climb any scaffolding unless it has passed inspection and make sure scaffolding is erected with solid and stable footing.
- To avoid being crushed by falling loads or collapsing walls, make sure jacks have a firm foundation, immediately secure all raised loads and install shoring and bracing materials on unsupported walls.
- Construction workers must be able to recognize and avoid these “Caught-In” and “Caught-Between” hazards and follow the safe work practices and procedures required to prevent injuries and fatalities.

### **ELECTROCUTION HAZARDS IN CONSTRUCTION**

- Electrocution Hazards are one of the leading causes of injuries and fatalities in construction and are one of OSHA’s “Fatal Four” construction hazards.
- There are three major types of electrocution hazards in the construction industry: contact with power lines, contact with energized sources, and the improper use of extension and flexible power cords.
- Before conducting any construction work, survey the site for overhead powerlines. If you plan on digging, have all underground utilities located and marked before getting started.
- The best way to protect yourself from the danger of overhead power lines is to always maintain the required safe distance between you and any energized power line. Typically, this distance is 10-feet for up to 50,000 Volts.

- Also, don't use metal ladders or conductive tools and materials when working near any energized electrical parts.
- Making contact with energized sources can result in electrical shocks and burns. To avoid such injuries, stay out of electrical rooms and avoid any electrical equipment.
- Don't touch any open or uncovered electrical boxes, breakers or panels. Also, never perform electrical work if you are not a qualified electrical worker.
- Another way to protect yourself from electrical shocks and burns is to make sure the equipment you are using has a ground fault circuit interrupter, or GFCI. In addition to using GFCI's, you should follow these precautions, avoid working on electrical equipment in damp or wet conditions.
- Never allow metallic items or tools to make contact with energized electrical parts. Follow appropriate lockout/tagout procedures to de-energize electrical equipment and wear the appropriate PPE, or personal protective equipment.
- Electrocution hazards are also created when extension and flexible power cords, plugs and grounding prongs become damaged. To avoid the risk of electrocution, always inspect tools and power cords before use. If a plug is designed to have a ground pin, make sure it is fully intact and in good condition.
- Also, never carry a tool by the cord. Never pull on a cord to disconnect it from the outlet. Keep cords away from heat, oil and sharp edges.
- Properly store and maintain your cords and don't use extension and flexible cords in wet or damp conditions.
- Construction workers must be able to recognize and avoid these electrocution hazards and follow the safe work practices and procedures required to prevent injuries and fatalities.

## **FALL HAZARDS IN CONSTRUCTION**

- Fall Hazards are one of the leading causes of injuries and fatalities in construction and are one of OSHA's "Fatal Four" construction hazards.
- Most fall-related injuries and deaths in construction result from falls from height. The three major sources of falls from height include roofs, unprotected edges, holes and openings, improper scaffold construction and the unsafe use of portable ladders.
- Holes and openings in floors, walls or roofs that are found on construction sites should be protected by guardrails or covers to prevent workers from falling through them.
- In general, all employees on a surface with an unprotected side or edge which is six feet or more above a lower level must be protected from falling by the use of fall protection such as guardrail systems or personal fall arrest systems. Never work near an unprotected edge without some type of fall protection in place.
- Standard guardrails are often the preferred choice for fall protection against unprotected edges. When guardrails are not installed, a personal fall arrest system is often used to protect workers from fall hazards. This system includes the use of a body harness, an anchor point and a connecting device.
- When working on a supported scaffold, a guardrail or a personal fall arrest system must be used. If a guardrail system is utilized, it must be installed on all open sides and ends of scaffold platforms.
- Whenever a scaffold platform is more than two feet above or below the point of access, a stair tower or suitable ladder is required for safe access.
- When climbing a scaffold ladder, maintain three points of contact when climbing and do not climb on the scaffold's cross braces.
- Let's now talk about ladder safety.
- To use a ladder safely, make sure you place an extension or straight ladder so that it sits at a four to one angle. When setting up a step ladder, ensure that the spreader bars are fully deployed. All ladders should be set up on a firm, level surface.
- When trying to access an elevated surface, such as a roof or upper platform, ensure the ladder extends three feet, or three rungs, above the landing and is tied off or secured. Use three points of contact when

climbing a ladder, which means that two feet and one hand, or two hands and one foot, must be in contact with the ladder at all times.

- Never stand on the top two steps of a step ladder or the top three rungs of a portable straight or extension ladder. Finally, make sure you're not overextending your reach when working from ladders. A good rule of thumb is to keep your belt buckle between the side rails at all times.
- Construction workers must be able to recognize and avoid these fall hazards and follow the safe work practices and procedures required to prevent injuries and fatalities.

**ANSWERS TO THE REVIEW QUIZ**

1. e
2. c
3. a
4. b
5. a
6. b
7. c
8. d
9. c
10. b

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REVIEW QUIZ**

Name \_\_\_\_\_ Date \_\_\_\_\_

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

1. Which of the following is not one of the Fatal Four?
  - a. Struck-By Hazards
  - b. Caught-In or Caught-Between Hazards
  - c. Fall Hazards
  - d. Electrocution Hazards
  - e. Driving Hazards
  
2. Which of the following best describes a struck-by injury?
  - a. When a person falls from an upper level to a lower level
  - b. When someone is caught or pinned between two or more objects
  - c. When an object or piece of equipment makes forcible contact with an employee
  - d. When a person makes contact with energized sources
  
3. A projectile from a nail gun is an example of a \_\_\_\_\_.
  - a. Flying object
  - b. Falling object
  - c. Swinging object
  - d. Rolling object
  
4. Which of the following best describes a caught-between injury?
  - a. When a person falls from an upper level to a lower level
  - b. When someone is caught or pinned between two or more objects
  - c. When an object or piece of equipment makes forcible contact with an employee
  - d. When a person makes contact with energized sources
  
5. To prevent being crushed by mobile equipment or vehicles you should never place yourself between mobile equipment and a solid subject.
  - a. True
  - b. False
  
6. Which of the following is not one of the three major types of electrocution hazards in the construction industry?
  - a. Contact with power lines
  - b. Static discharge
  - c. Contact with energized sources
  - d. Improper use of extension and flexible power cords
  
7. For power lines up to 50,000 volts, always maintain a distance of at least \_\_\_\_\_.
  - a. 5 feet
  - b. 25 feet
  - c. 10 feet
  - d. 100 feet
  
8. Which of the following will help prevent being shocked while using an extension cord or flexible power cord?
  - a. Using a GFCI
  - b. Avoiding wet conditions
  - c. Inspecting the cord and tool before use
  - d. All of the above
  
9. Which of the following is not a major source of falls from height?
  - a. Unprotected edges
  - b. Holes and openings
  - c. Uneven terrain
  - d. Improper scaffold construction
  - e. The unsafe use of portable ladders
  
10. When using a ladder to access an elevated surface, the ladder must extend \_\_\_\_\_ above the surface and be tied off.
  - a. 2 feet
  - b. 3 feet
  - c. 4 feet
  - d. 12 inches