



# Struck-By Hazards

OSHA 10-Hour Construction Industry Course

Required Online Topic Time: 60m



# Learning Objectives



## Duration

60 minutes

## Terminal Learning Objective

Given current OSHA and industry information regarding construction worksite illnesses, injuries and/or fatalities, the student will be able to recognize struck-by hazards in construction.

## Enabling Learning Objectives

- Identify common struck-by hazards
- Describe types of struck-by hazards
- Protect yourself from struck-by hazards
- Recognize employer requirements to protect workers from struck-by hazards



# Defining Struck-By Hazards



The proper word used to describe an injury produced by forcible contact or impact between a person and an object or piece of equipment is “**Struck-by**.”

- A *struck-by hazard* is when *forcible contact or impact is made between a person and an object*
- A *caught-in hazard* is when a worker is caught inside or between different objects.

Struck-by hazards can be divided into four categories:

- *Flying Hazards*
- *Falling Hazards*
- *Swinging Hazards*
- *Rolling Hazards*



# Defining Struck-By Hazards

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## Knowledge Key

A struck-by hazard is when the striking impact of the object alone might or did cause the injury. There are four types of struck-by hazards: flying, falling, swinging and rolling.

# Types of Struck-By Hazards



## Flying Hazards

Flying hazards come in many different forms, including flying **bolts**, pump components **under pressure**, and objects propelled by **compressed air**, such as nails.

**Nail guns** are popular for a reason. They get the job done in a blink of an eye. But that rapid-fire action can work against you. In a split second, a nail gun can enter your finger, your hand, or worse.

Most nail gun injuries happen:

- Through accidental or unintended firing, often associated with **recoil** of the tool after firing.
- From **ricocheting** nails.
- From a nail going **through the work surface**.
- From **airborne** nails.
- From **bypassed safety features**.
- From **unsafe work practices**.
- By holding a finger on a **contact trigger**.

# Types of Struck-By Hazards

continued...



## Falling Hazards

Struck-by falling object hazards occur when a source falls **from a higher elevation to a lower level**. This hazard includes instances where the injured person is **crushed**, **pinned**, or **caught under** a falling object. Struck-by falling object does **not** include collapsing material or structures.

### Examples:

- A worker was tearing down a transmission structure using a digger-derrick when a pole broke and struck him on the head.
- A worker was struck-by a load of wall panels that fell off his truck.
- Four workers were injured when rebuilding a bridge that was washed out by floods when the crane boom cable broke and the boom fell on them.



# Types of Struck-By Hazards

continued...



## Swinging Hazards

When materials are lifted, they have the potential to **swing** and **strike** workers. Usually the loads are going to be lifted mechanically—by machines or through use of powered winches.

As a load lifts, since it is on some sort of cable, the materials may **swing, twist or turn**. This movement can catch workers by surprise and they could be hit by the swinging load. **Windy conditions** are especially hazardous because the load will swing more.

Depending on where a worker is standing and the force behind the load, the worker may fall to another level after being struck and sustain even greater injuries.

The source of the impact injury is from an object that is **not free standing** but is **attached at some point** or is **being held by a worker**, that is, the object can and does swing.



# Types of Struck-By Hazards

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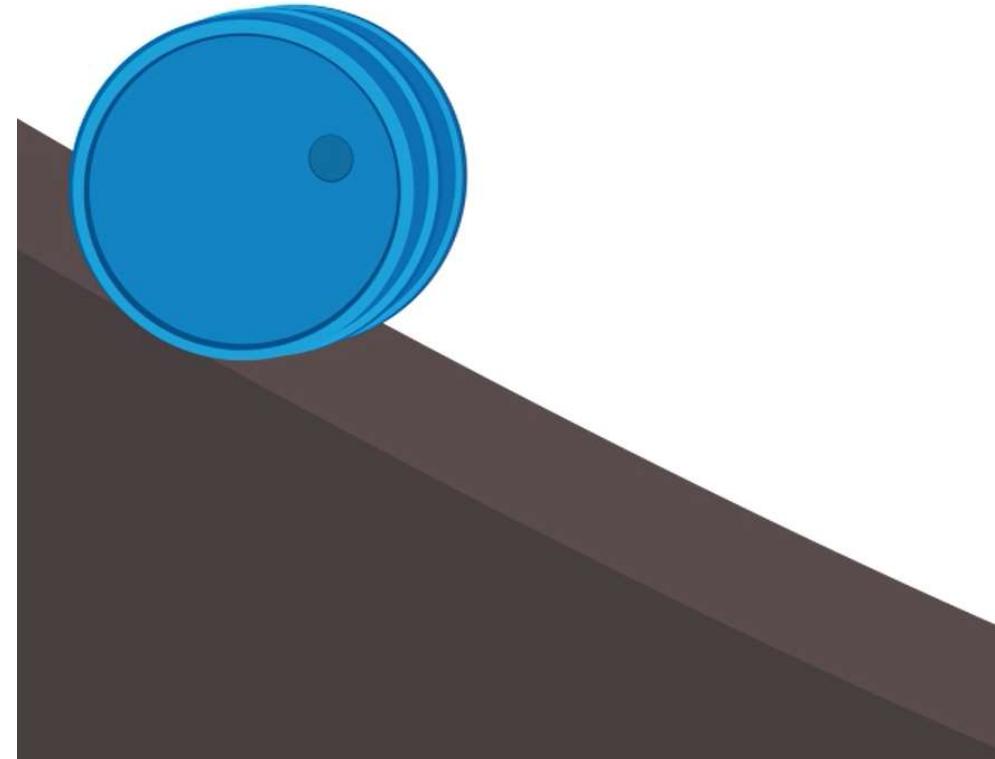
## Rolling Hazards

Struck-by rolling object is when an object is **rolling**, **moving**, or **sliding** on the **same level** at which the worker is located. It includes instances in which the worker is struck or run over by a moving vehicle without being caught under it or instances in which the worker is struck-by a sliding object or equipment on the same level.

Any rolling equipment should be viewed as potential hazards.

### Examples:

- A worker was walking along a track at the airport and was struck-by an unmanned rail car.
- A security guard was struck-by a tractor trailer and dragged, resulting in fatal injuries.
- A worker suffered fatal injuries after being struck-by a moving semi truck while loading and unloading freight.



# Types of Struck-By Hazards

continued...



## Knowledge Key

While all types of struck-by hazards can be fatal, the way you get injured or killed can vary based on whether it is a flying, falling, swinging, or rolling struck-by incident. Flying struck-by hazards involve an object flying toward you, such as a nail propelled from a nail gun. Falling hazards occur when something falls from a higher level onto a worker, such as a load of bricks. Swinging hazards, such as a load on a crane, occur when an object is suspended and moves through the air. Rolling hazards are when a vehicle or other object strikes a worker on the same level.

# Protection Against Equipment and Vehicles



## Heavy Equipment

### Non-operators:

- Always stay away from heavy equipment when it's operating. Be alert to the location of all heavy equipment **whether in use or not**.
- Always stay clear of lifted loads and **never work under a suspended load**. Beware of unbalanced loads.
- Workers should confirm and receive acknowledgement from the heavy equipment operator that they are visible.
- Be aware of the swing radius of cranes and backhoes and do not enter that zone.

### Operators:

- Drive equipment or vehicles on grades or roadways that are **safely constructed** and **maintained**.
- Make sure that all workers and other personnel are in the clear before using dumping or lifting devices.
- **Lower or block** bulldozer and scraper blades, end-loader buckets, dump bodies, etc., when not in use, and leave all controls in neutral position.
- Do **not** exceed a vehicle's rated load or lift capacity.
- Operators should not carry personnel unless there is a safe place to ride.

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# Protection Against Equipment and Vehicles

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## Motor Vehicles

Care must be taken any time there is a vehicle on or near a work site. Vehicle safety practices must be observed at construction sites to limit worker exposure to struck-by hazards such as swinging backhoes, falling/overtaking vehicles, and trucks or cars.

You should:

- *Wear a seatbelt*
- *Check vehicle condition before use*
- *Do not drive in reverse with an obstructed view*
- *Set parking brakes when not in use*
- *Ensure safety devices are working correctly*
- *Use traffic signs if near roadways*
- *Be highly visible in all levels of light*



# Protection Against Equipment and Vehicles continued...



## Knowledge Key

Heavy equipment poses unique safety hazards. What you should do around this equipment depends on whether you are an operator or a bystander. If you are not operating heavy equipment, you should stay away from it and be sure that the operator or driver can see you. If you operate heavy equipment, use your equipment correctly and always be on the lookout for other workers in the area.

Care must be taken any time there is a vehicle on or near a work site. What you should do around vehicles depends on whether you are a driver or a bystander. You should always follow instructions while on site, but be aware that if you are around vehicles on foot, you are at a greater risk of being struck. Follow warning signs and written instructions, never direct traffic unless you are a flagger, and never cross the path of a backing vehicle. Be sure to wear a high visibility vest whenever you are around or could be around vehicles on or around a construction site.

# General Practices and PPE



## General Practices

- If using compressed air for cleaning, reduce the pressure to 30 psi and use appropriate guarding and PPE.
- Inspect hand tools and impact tools every day before using them.
- Workers should be trained for any machine they will use and should inspect the machine daily, check the guards and wear the appropriate PPE around the machine.
- Follow manufacturer's instructions for any tools or machinery.
- Don't use any tools or machinery you haven't received training for.
- Secure tools and materials to prevent them rolling or falling and use devices such as debris nets and screens to catch any falling items.
- Tie down or secure anything that could slide, fall or collapse.

## Personal Protective Equipment (PPE)

It is important to always wear the correct Personal Protective Equipment, or PPE. PPE is equipment that can be worn by a worker to provide improved protection from struck-by hazards.

PPE includes both **eye and face protection** and **head protection** which are needed to help you start safe and stay safe when addressing struck-by hazards.

- Never attempt a job without having the proper PPE
- Never attempt a job that you have not been trained on
- Always be aware of your environment before starting a job

# General Practices and PPE

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## Knowledge Key

Ensuring that you wear PPE appropriate for the hazards to which you will be exposed will provide improved protection from struck-by hazards. This includes eye, face, and head protection. Using, storing, and maintaining your tools and materials correctly will reduce the likelihood of accidents occurring.



# Employer Responsibilities

## Heavy Equipment

- Determine whether the ground is level and firm enough.
- Assess hazards surrounding equipment on site.
- Erect barriers around rotating superstructures.
- Ensure equipment is kept in safe operating condition.
- Comply with all manufacturer procedures.
- Ensure safe attachment of rigging devices.
- Provide seat belts when required.
- Ensure roadways and grades are maintained.
- Ensure equipment with obstructed view does not operate in reverse unless there is a reverse alarm or a signal person assigned.

## PPE

- Pay for PPE as required by OSHA
- Provide and require the use of appropriate PPE when workers are exposed to hazards.
- Ensure proper maintenance of PPE.

## Motor Vehicles

- Conduct a hazard assessment of the worksite using the job-site coordinator.
- Post construction areas with legible traffic signs at points of hazard.
- Erect barricades.
- Place necessary warning signs along the road.
- Give all workers on site a safety and operations orientation.

## Training

- Train workers to recognize hazards in the work zone associated with equipment use and any of their assigned duties.
- Ensure crane operators are qualified or certified.
- Ensure signal persons meet OSHA's qualification requirement.
- Train workers to recognize, avoid, and control or eliminate hazards or other exposure to illness or injury.
- Ensure crane operators and riggers have been trained on rigging safety.

# Employer Responsibilities

continued...



## General Requirements

- All hand tools must be maintained in good condition.
- Saws must be equipped with guards and have a constant pressure switch which will shut off the power when the pressure is released.
- Safety guards must be on all abrasive wheel bench and stand grinders.
- Only trained workers are allowed to operate powder-actuated tools.
- All powder-actuated tools must be tested daily before use and all defects discovered before or during use must be corrected.
- Powder-actuated tools must not be loaded until immediately before use.
- Loaded tools should never be left unattended.
- Compressed air used for cleaning purposes must be reduced to less than 30 psi and chip guarding and PPE must be provided.
- All materials stored in tiers must be secured to prevent sliding, falling, or collapsing.
- Toe boards must be erected along the edge of overhead walking/working surfaces.



# Employer Responsibilities

continued...



## Knowledge Key

Your employer has five areas of responsibility to protect you, the worker, from struck-by hazards: heavy equipment, motor vehicles, general practices, PPE, and training requirements. Their responsibilities include: inspecting and maintaining tools and equipment, erecting barriers and warning signs where necessary, providing and paying for PPE, training workers to recognize hazards, and ensuring that any operators, flaggers, or signal workers are qualified or certified.

# Practice Questions



1. Four workers were installing signs on a highway when an SUV entered the work area. The vehicle struck one of the workers. What type of event is this?

- a. Caught-in or Caught-between
- b. Struck-by

2. Which of the following defines struck-by injuries?

- a. Produced by forcible contact or impact between an object or piece of equipment and the injured person
- b. Created as a result of two separate objects causing potential crushing injuries

3. Choose the list that includes all the struck-by hazards.

- a. Flying, falling, throwing, catching
- b. Flying, falling, buried, pinned
- c. Flying, swinging, rolling, crushing
- d. Flying, falling, swinging, rolling

4. Which of the following is a true statement about falling object safety?

- a. You should avoid working under loads being moved.
- b. Guardrails on scaffolds do not prevent falling objects.
- c. PPE is optional when working outside.

# Practice Questions

continued...



5. Which of the following are correct concerning struck-by swinging object hazards?

- a. Wind can cause a lifted load to swing, twist and/or freeze.
- b. A swinging object might not knock a worker to another level increasing injuries.
- c. Rigging loads properly is very important to ensure minimal swinging and to prevent slippage.

6. When a nail gun is not in use, you should leave the power on to power the safety guards.

- a. You should turn nail guns off when not in use.
- b. Leave the nail gun's power on when not in use to power the safety guards.
- c. It doesn't make a difference if you leave a nail gun's power on or off when it is not in use.

7. Stay away from heavy equipment when it's operating. In fact, be alert to the location of all heavy equipment whether in use or not. Would this be protecting yourself or not protecting yourself?

- a. Protecting yourself
- b. Not protecting yourself

# Practice Questions

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8. If you see an increase in traffic, step in and direct traffic to ensure safety. Is this a safe or unsafe practice?

- a. Safe
- b. Unsafe

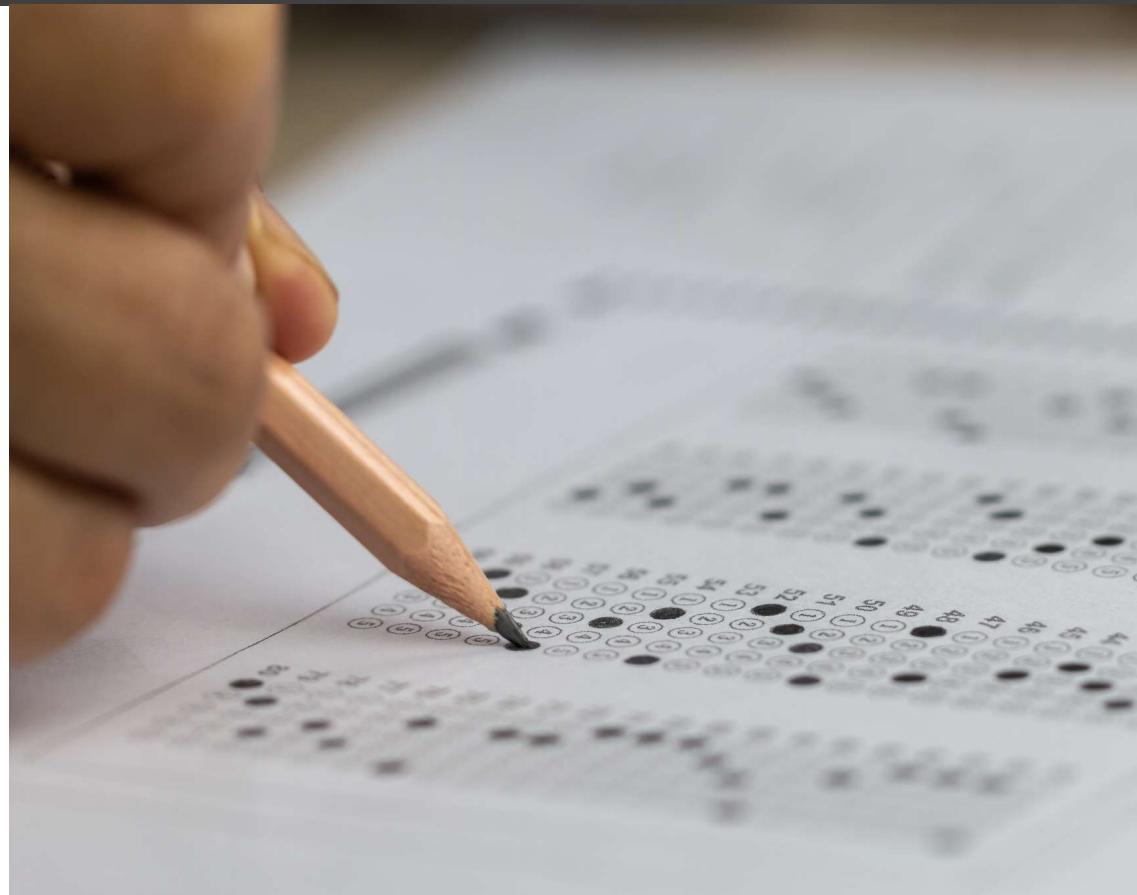
9. You should wear hard hats only where there is a potential for objects falling from above. Is that true or false?

- a. True
- b. False

# Practice Questions Answer Key



1. B
2. A
3. D
4. A
5. C
6. A
7. A
8. B
9. B



# Conclusion



**Great Job!**

You have now completed the Struck-By Hazards topic.

