

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

### **COURSE OUTLINE**

- **"Struck-by" hazards are one of the four leading causes of fatalities in construction work. These "Fatal Four" hazards also include:**
  - Falls.
  - Electrocution.
  - "Caught-in or between" hazards.
- **Struck-by injuries are caused by the impact you receive when something hits you.**
  - This is what makes them different from caught-in or between injuries, which are caused by being squeezed, pinched or compressed by something.
- **OSHA recognizes four types of struck-by accidents, based on how the "striking" object moves:**
  - Flying.
  - Falling.
  - Swinging.
  - Rolling.
- **"Flying objects" are "thrown" or propelled through the air, causing an injury or fatality when they strike someone.**
  - A loose hammer head that comes off its handle is a flying object.
  - So are metal fragments that may be thrown from the mushroomed head of a chisel when it's struck by a hammer.
  - Fasteners that are shot by a nail gun can be flying objects, too.
- **"Falling objects" drop from a higher level to hit someone below.**
  - In addition to simply "striking" a worker, falling objects can also crush and pin the people they hit.
- **Examples of falling objects include:**
  - A brick that falls from a scaffold.
  - A jib from a boom crane that falls when a bolt holding it fails.
  - A length of concrete piping that falls off a truck.

- **"Swinging objects" swing, twist or turn to strike someone. This can occur when:**
  - A worker is standing too close to heavy digging equipment and is struck by the arm.
  - A load of materials being hoisted by a crane is caught by the wind and slams into one of the crew that is landing it.
- **A raised load that slips from its rigging is also considered to be a swinging object.**
  - Windy conditions increase the risk of swinging object accidents occurring.
- **"Rolling objects" roll, slide or otherwise move to strike someone who is at the same level.**
- **The most common rolling objects on a construction site are vehicles that are in motion, such as:**
  - Traffic passing through or around the job site.
  - Cars and trucks operating on the site itself.
  - Heavy equipment such as dump trucks, bulldozers or graders that are on the site.
- **The first step in preventing struck-by accidents is to recognize these hazards on your worksite.**
  - The next step is following appropriate safe work practices to avoid them.
- **One easy and effective way you can protect yourself from struck-by hazards is to use appropriate personal protective equipment (PPE).**
  - PPE is anything you wear as a safeguard against injury.
- **For construction work, PPE can include anything from hearing protection to supplied-air respirators, but for protection against struck-by hazards, you should pay close attention to:**
  - Head protection.
  - Eye protection.
  - Foot protection.
  - High-visibility safety clothing.

- **OSHA requires your employer to:**
  - Provide you with PPE that is appropriate for protecting you while you're doing your job.
  - Maintain that PPE and replace it when it has become worn or damaged.
- **Your employer is also required to train you on how to care for the equipment, keep it clean and use it properly ... so that you get maximum protection.**
- **As you might expect, head protection protects your head against impact. You should wear it:**
  - Whenever you might be exposed to flying or falling materials.
  - Anywhere you might bump your head against beams, piping or other low-hanging objects.
- **Always inspect head protection before you put it on.**
  - Look for dents, cracks or other signs of deterioration.
  - If you find problems, take it out of service and get a replacement.
  - The same goes for any head protection that has received a heavy blow.
  - Once it has absorbed a significant impact, it can no longer give you sufficient protection.
- **Never wear any PPE that is damaged.**
- **Safety glasses or goggles should be worn any time your work can generate flying fragments, large chips or other particles.**
  - These activities include welding, cutting, grinding or nailing.
  - Even high winds can create flying object hazards by whipping up dust on your job site.
- **To safeguard your entire face you should wear a face shield.**
  - A face shield can't provide complete eye protection by itself.
  - You should always wear safety glasses or goggles under a shield.
- **Falling and rolling objects can both pose serious hazards to your feet.**
  - To prevent injuries you should wear heavy duty foot protection.
  - Steel-toe boots guard your toes against impact and compression.

- **Some boots also have built-in protection for your metatarsals, which are the small bones located in the upper part of your foot.**
  - You can get similar protection by using toe caps and metatarsal guards, which are separate shields that can be fastened to the outside of regular work boots.
- **Construction workers account for about 25% of the employees who die from being struck by a vehicle while on the job.**
- **Even before ground is broken on a project, your employer will start planning as to how traffic can move most safely through and around the job site.**
  - Safe routes will be marked out by signs, barricades and warning cones.
  - Sometimes "flaggers" will be used to control traffic movement as well.
  - You will receive site-specific traffic safety training before you begin work.
- **To avoid being hit by a vehicle you should always follow these general guidelines:**
  - Be aware of traffic on and around the site.
  - Stay alert, use caution and keep your distance.
  - Always look both ways as you walk the site.
  - Never put yourself in a position where you can't escape from the path of a moving vehicle.
- **You are much less likely to be struck when you make it easy for the driver to see you, so wearing high-visibility reflective safety clothing is also important.**
- **Construction workers are often hit by cars, trucks or other equipment when they are moving in reverse.**
  - These are called "backover" accidents, and are often the result of the driver having limited visibility.
  - To avoid backovers, never cross the path of any machine that's backing up.
- **While many vehicles are equipped with audible backup alarms to warn pedestrians, you should not depend on these devices.**
  - You might not be able to hear the alarm over worksite noise.
  - The alarm might be broken and fail to work.
  - The vehicle might not have an alarm in the first place.

- **Sometimes when backing up the driver or equipment operator will have a worker "run interference" for the vehicle by warning coworkers out of the way.**
  - If the operator's rearward vision is obstructed, they may have a "spotter" help out by guiding them with hand signals.
  - In these situations, pay attention to the workers who are assisting the driver and make sure they know where you are.
- **Spotters and flaggers receive special training in the use of proper signals, so don't try to "wing it" as an amateur!**
- **75% of the struck-by accidents and injuries that occur on construction worksites involve heavy equipment.**
  - As with motor vehicle traffic, you can reduce your risk of being hit by heavy equipment by staying alert and maintaining a safe distance.
- **Unlike ordinary motor vehicle traffic, heavy equipment can be hazardous even when it's not going anywhere.**
  - Some of this equipment has booms that can swing back and forth while the equipment remains in one place.
  - On certain equipment, the superstructure of the machine may move as well.
- **The area of ground that these parts cover when they move is called the "swing radius", and it's a serious struck-by danger zone.**
  - You should always be aware of the swing radius of heavy equipment, and stay away from it.
- **On many worksites, the swing radius will be cordoned off by barriers that warn you of the danger and prevent you from getting too close, but you shouldn't depend on them to be there.**
  - You'll be safer if you make a habit of identifying potential swing hazards yourself, and staying out of their danger zones.
- **Stay clear of loads that are being raised as well, and never work under a suspended load.**

- **Whether a piece of equipment is operating or not, if you have to approach it you should always do it with caution.**
  - Never come at it from its "blind side", or linger where the machine operator can't see you.
  - If possible, make eye contact with the operator so you know that they know you're there.
- **The more easily you can be seen, the safer you'll be.**
  - This is another reason to always wear high-visibility, reflectorized safety clothing on your job site.
- **Hand and power tools are designed to work safely, but when a tool has been damaged or misused it can create serious flying object hazards.**
- **Before you use a hand tool, always inspect it for:**
  - Splintered or cracked handles
  - Parts that could fly off, like a loose hammer head.
  - Mushroomed heads on impact tools that could throw fragments.
  - Loose or "sprung" jaws on wrenches that could slip and let the tool go flying.
- **If you find any problems, don't use the tool.**
  - Have it repaired or replaced.
- **Do the same with power tools.**
  - Inspect each one before you use it, to ensure that all the safety guards are in place and working properly.
- **Remember, it's never safe to operate a power tool that you're unfamiliar with.**
  - Be sure you're trained on how to use it before you fire it up.
  - Always follow the manufacturer's instructions.
- **Be sure to wear eye protection any time you use hand or power tools.**

- **Eye protection is also a good idea when you work with compressed air.**
  - Blasts of high-pressure air can cause particles to go flying.
  - You can reduce the risk of this happening by adjusting the equipment's operating pressure to 30 pounds per square inch (psi) or lower.
  - Even then, eye protection is a must.
- **Nail guns can use electricity, high-pressure air or gunpowder to drive fasteners into wood, metal and concrete.**
  - When these tools are misused, they can create lethal flying objects.
- **Do not operate a nail gun unless you have been trained on how to use it (and licensed as well if that's required where you work).**
  - Always test any type of nail gun before you use it.
  - Any problems that you discover during the tests or the gun's operation should be corrected right away.
- **Do not load powder-actuated tools until immediately before you intend to use them.**
  - Never leave them unattended.
- **Some situations on a construction site require special measures to prevent struck-by accidents. These include whenever:**
  - Concrete and masonry walls are being erected.
  - Work is being done overhead.
  - Materials are being stacked and stored.

**Because of their great weight, the falling, rolling and swinging objects that are associated with the construction of concrete and masonry walls can be very dangerous.**

- **To reduce these hazards:**
  - When reinforcing wire mesh is unrolled, it should be controlled or turned over so that it cannot spring back and strike someone.
  - No loads should be placed on a concrete wall until it has been determined that the structure can support the weight.
  - Masonry walls should be shored or braced until permanent supports are in place.

- **You should keep your distance from concrete or masonry walls that are under construction unless you are directly involved in putting them up.**
- **When work is being done from a scaffold, on a roof or any other overhead location, objects that fall from that level can create serious struck-by hazards for people who are working or passing by below.**
  - To reduce this risk, elevated walking and working surfaces should always be equipped with guardrails, screens, and toeboards to prevent people, tools and materials from falling off.
  - Debris nets should also be installed below work level to catch any objects that get through these safeguards.
- **When you're performing overhead work, take care to secure all the tools that you use, and keep the work area clear to avoid knocking anything off.**
  - Alert people below by posting warning signs.
  - When necessary, use barricades to keep people out of the danger zone.
- **Be sure to wear head protection when you work below overhead jobs yourself.**
- **Building materials can present struck-by hazards as well.**
  - You can help to prevent these struck-by accidents by storing and stacking materials safely.
- **Sheetrock, lumber, cinder blocks, bags of cement and other items should always be stacked solidly, to prevent slipping, sliding, rolling or falling.**
  - This can be particularly important if conditions on the site are windy.
- **In unfinished buildings, store materials more than six feet from hoistways and floor openings.**
  - This will prevent anything from falling to lower levels if "traffic" knocks them over.

**\* \* \* SUMMARY \* \* \***

- **Struck-by accidents are one of the four leading causes of fatalities on construction sites.**
- **They occur when workers are hit by objects that are flying, falling, swinging or rolling.**
- **To avoid struck-by hazards, use caution and keep your distance from vehicular traffic and heavy equipment.**
- **Never get behind a machine that is backing up. Stay out of the swing radius of heavy equipment.**
- **Always check hand and power tools for damage, and wear eye protection while using them.**
- **Be sure to wear head protection around any type of overhead work.**
- **Unless you are directly involved in building concrete or masonry walls, stay away from them until the work is finished.**
- **Stack building materials securely and out of the way of "traffic", so they won't get knocked over and become falling object hazards.**
- **Now that you know how to recognize struck-by hazards and what to do to avoid them, you have the skills you need to make sure that you and your coworkers leave your job site injury-free... every day!**