Struck-By, Caught-Between – Staying Out of the Line of Fire for Construction

Hazards cannot be avoided or controlled unless they can be recognized. Once you recognize hazards, assess risk and implement controls to eliminate or reduce the risks.

Monitor the proximity and motion of equipment and people around you. Be aware of warnings. Follow safety instructions. If you have questions or concerns, STOP until you get clarification.

To control struck-by and caught-between hazards, in order of preference, we:

1. ELIMINATE THEM by keeping people out of the line of fire
2. SUBSTITUTE safer equipment and processes
3. Provide ENGINEERING CONTROLS at the worker level
4. REDUCE exposure through safe work practices, training and job rotation
5. USE PPE for added protection

Worker-Level Control

- Complete safety training and use methods to safely operate equipment
- Pay attention to information from your employer about the hazards of activities in your work area and precautions you need to take as determined by pre-task planning
- Anticipate what might happen when operating equipment and when required to work near equipment being operated by others

Coordinating with Heavy Equipment Operators

- Don’t assume the other person sees you
- Watch out for yourself and others
- Don’t get complacent

Line of Fire or Danger Zone

Stay out of the line of fire (danger zone).

- Be mindful of crane swing radius
- Don’t walk under a load being lifted by a crane
- Go **around** the area that might be hit if the load were to suddenly shift or a portion of it were to drop from above

Other predictable danger zones include situations where:

- Welding and cutting slag is thrown downward and in the direction of cutting
- Broken towing and lifting lines recoil violently and predictably
- Uncoiled roll material recoils predictably
- Unstable materials shift predictably
- Chemical vapors and dusts migrate downwind in a predictable fashion
- Debris chutes and refuse containers are filled

Struck-By and Caught-In or Caught-Between Hazards

Work Zones

There is a lot of movement on a construction site requiring your awareness and coordination to prevent incidents. Work zones should have marshalling plans that include who will safely direct vehicle movement. In routes where worker traffic enters and exits the work zone:

- Equipment operators should know where the entrances and exits for workers are located
- Be aware of traffic moving through those areas
- Workers should not rely on the drivers of these vehicles seeing them. It is each worker's responsibility to be aware of vehicles and avoid them

Heavy Equipment

Remember that heavy equipment can’t stop fast or maneuver quickly. When it stops, it can shift the load and the operator may lose control of the material being transported

When heavy equipment is in the zone:

- Spotters should be used when equipment is backing up
    - Spotters must maintain an appropriate distance from backing equipment and remain aware of obstructions and traffic
- Make yourself aware of the spotters and the various alarms that indicate a piece of equipment is backing up, because the driver may not see you
- Make sure you are not in the path of the hazard/equipment. If you are, ensure that either the spotter or the operator has seen you
- If you see a piece of equipment above you on an incline, move away from the path of the hazard if it were to roll
- When you hear an alarm, locate the source, evaluate where the material is being dumped, and ensure you are not in the danger zone
- Be aware of crush points on moving pieces of equipment and ensure that you are not between them and a solid object
- Know the paths of escape or egress in the immediate area

Overhead/Scaffold Work

Scaffold failures can be catastrophic to a worksite and worker safety. Scaffolds must be inspected and tagged daily. If a scaffold doesn't look or feel right, do not use it and report it to your supervisor. You are at risk of being struck by falling objects when you are beneath scaffolding or where other overhead work is being done.

Overhead work controls can help prevent injury.

- Stack materials to prevent sliding, falling or collapse
- Wear a hard hat and other PPE
- Make sure toeboards, nets and other controls are in place

Scaffolds must be designed by a qualified person and inspected daily and as needed by your jobsite Competent Person. Report any concerns to the Competent Person.

When overhead utilities are present:

- Provide spotters when people and equipment will be working near the lines
- Make sure that you are out of reach of a power line that might be severed by a piece of equipment and fall to the ground
- Touching or being too close to a power line can result in arcing, fires and electrocution

Know about area obstructions and respect overhead clearances.

- Equipment tip-overs and pinching/crushing injuries are possible if equipment contacts an overhead structure or other obstruction
- Survey work areas for clearance issues and obstructions and always look in the direction of travel to avoid contact

Public Traffic

Be aware of any public traffic through the work zone:

- Know where the traffic is and how close you will be to it
- Wear high-visibility, reflective work wear that complies with ANSI/ISEA 107 or equivalent international standards to increase your visibility to drivers and to co-workers (zip vests closed)
- Watch for oncoming traffic that may not be aware of you and be prepared to quickly move out of the path of the hazard at the first sign of danger
- Always face oncoming traffic

Constructing Masonry Walls

Implement these worker-level controls when working around masonry walls:

- Identify the boundaries of the work area and the fall radius in every direction (where pieces may end up if the wall collapses)
- Stay out of the work area unless you are essential to and actively engaged in the construction or lifting operations being conducted
- Be aware when heavy equipment is working near the wall, especially when it is on the other side of the wall from you
- Pay attention to wind speed and direction
    - Directional wind shift can change where the wall might fall
    - Suspend work activities during periods of high wind
- Involve qualified persons when making decisions regarding proper bracing against wind and lateral forces and removal of temporary bracing
- Important: A hard hat can mean the difference between life and death if struck by a falling brick or other material

Projectile and Entanglement Hazards of Tools/Equipment

Projectiles may be created by the interaction of materials, tools and equipment. They may come from adjacent work, even above and below you. To avoid injury:

- Maintain guards on tools that rotate (saws, grinders, etc.)
- Choose the appropriate tool for impact tasks and avoid impact tools with mushroomed striking surfaces
- Wear eye and face PPE when people are hammering, chipping, and using pneumatic or powder-actuated tools in your work area
- Observe clearances and heed warnings at blasting sites
- Never use compressed air to clean people

- Check with your supervisor before using compressed air to clean equipment and areas (specific regulations and controls apply)

Pay attention to machine hazards.

- Moving parts such as motors, power transmission shafts, pulleys, gears, chains and belts can be hazardous
- Machine guards are placed around moving parts to lessen the chances of inadvertent contact with mechanical hazards
- Ask your supervisor for help determining tools and work practices to use when guards must be removed for tasks
- Decals and markings are commonly placed near machine danger zones
- Do not wear loose, untucked clothes, and pull back and restrain long hair
- Take note of hazards mentioned in equipment operating manuals, follow stated precautions, and ensure machine guards are maintained where required

Excavation/Trenching Work

Worker controls that you can implement mostly occur before you enter the trench. These controls include:

- Proper design including trench boxes and other shoring, sloping or benching, as needed
- Daily inspections by your crew's Competent Person to check for indicators of possible cave-in (cracking of sidewalls and materials sloughing off of the side walls)
- Making sure spoil piles/equipment are back from the edge by at least 0.6 meters (2 feet)
- Noting the position of equipment that could slide into the trench and catch you between the equipment and the ground
- Making sure you have means of quick egress from the trench, such as ladders or ramps