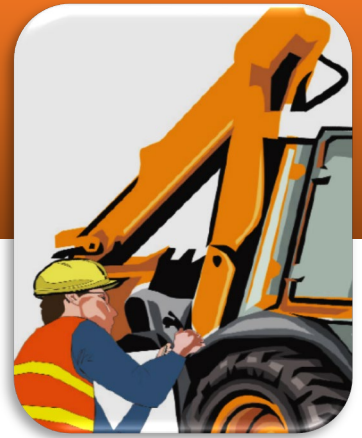


Roadway Construction “Caught-In” Series

Crushed-by and Pinned Between Hazards

According to the U.S. Occupational Safety and Health Administration (OSHA), “caught-in” or “caught-between” hazards are one of the leading causes of death and injury in the construction industry. These incidents are defined as injuries resulting from a person being squeezed, caught, crushed, pinched, or compressed between two or more objects, or between parts of an object.¹



GRAPHIC: ARTBA WORK ZONE CONSORTIUM



GRAPHIC: ARTBA

Example: A 25-year-old truck driver was crushed and killed between the frame and dump box of a dump truck. Apparently, a safety “over-travel” cable attached between the truck frame and the dump box malfunctioned by catching on a protruding nut of an air brake cylinder. This prevented the dump box from being fully raised, halting its progress at a point where about 20 inches of space remained between it and the truck frame. The employee, apparently assuming that releasing the cable would allow the dump box to continue up-ward, reached between the rear dual wheels and over the frame, and disengaged the cable with his right hand. The dump box then dropped suddenly, crushing his head. The employee had only two months’ experience at this type of work and had not received training or instruction in proper operating procedures.

What actions might have been taken to prevent the truck driver in the example above from being killed?

Workers can be pinned between equipment and a solid object, such as a wall or another piece of equipment, especially when equipment is not locked out and tagged out². They can be crushed between mechanical parts like a truck frame and a hydraulic bed that is lowering. Workers can be at risk for being caught between falling, stacked and stored materials and a solid object, such as a wall or another piece of equipment. Rigging failures resulting in dropped loads are a similar hazard.

All these types of hazards can result in multiple broken bones, asphyxiation, or death. Employers need to train workers to:

- Always be aware of equipment and materials where they can become trapped or crushed by an object, and stay a safe distance from the hazard.
- Barricade open areas where they can become trapped or crushed.
- Never be positioned between moving materials and an immovable structure, vehicle, or stacked materials.
- Make sure all loads, stacks and piles of materials are stable and secured.
- Stay out of the swing radius of cranes and other equipment.
- Block, lower and de-energize equipment such as bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment when it is being repaired or not in use.

¹ OSHA Training Institute, “Struck-By Hazards Instructor Guide.” https://www.osha.gov/sites/default/files/struckby_ig.pdf.

² Learn more at about Lockout/Tagout practices and procedures at <https://www.osha.gov/control-hazardous-energy>.

Tipping or Rolling Equipment

Steps must be taken to prevent materials and equipment from shifting, rolling, or tipping. Equipment should be blocked, chocked, balanced, or de-energized before the operator leaves the area.



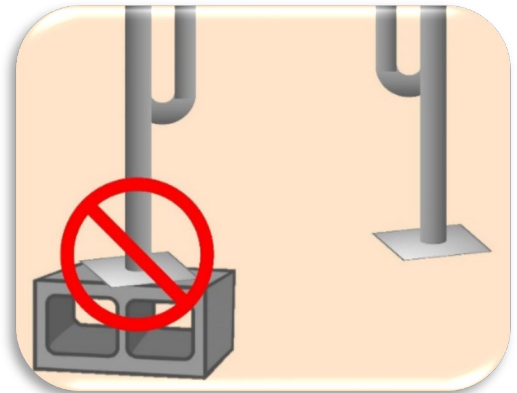
GRAPHIC: ARTBA WORK ZONE CONSORTIUM

Considerations for Avoiding Crushed-by and Caught-in/Between Hazards

- Lower excavator buckets when not in use.
- Do not exceed the load capacity of cranes.
- Equip rollover protective structures on material handling equipment such as forklifts.
- Equip motor vehicles, forklifts, and earthmoving equipment with seat belts. Workers must wear them to prevent being thrown from a vehicle or equipment and subsequently being crushed when the vehicle or equipment tips over.
- Keep workers away from loads and lift areas to avoid being crushed by dropped or collapsing materials.
- Use safe methods for rigging, hoisting, and setting.
- Secure the path of travel when loading/unloading, stacking, and storing materials so no workers will be caught between materials and moving equipment or between materials and a wall.

Scaffolds and Collapse Hazards

Measures must be taken to avoid the collapse of structures, such as scaffolds, that could bury workers underneath them. Anytime there is inadequate support, improper construction, or a shift in the components of a scaffold (including the base upon which the structure is built), there is danger of collapse. Cinder blocks or other similar materials should not be used to support a scaffold because they could be crushed. Scaffolds can only be erected, moved, dismantled or altered under the supervision of a competent person.



GRAPHIC: ARTBA



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Means are required to avoid workers from being crushed by collapsing

walls during demolition or other construction activities.

During demolition, any stand-alone wall that is more than

one story must have lateral bracing, unless the wall was designed to be stand-alone and is otherwise in a safe condition to be self-supporting. Jacks must have a firm foundation. If necessary, the base of a jack must be blocked or cribbed. After a load has been raised, it must immediately be cribbed, blocked, or otherwise secured at once.

Trees and Brush

Removing trees and brush can also create crushed-by hazards. To avoid being struck by trees, restrict worker access during felling, trimming, and loading operations. Use protective structures on equipment. Use safe hoisting and rigging for logs and limbs.

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