

Safety Hazards

Working Safely Around Heavy Equipment

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What is meant by "heavy equipment"?

Heavy equipment describes a wide range of large, heavy-duty equipment used in construction, industrial fields, mining, agriculture, and other sectors. Examples of heavy equipment include excavators, bulldozers, cranes, loaders, backhoes, dump trucks, and many more.

What are the hazards associated with working with and around heavy equipment?

Heavy equipment poses a hazard to many workplace parties, not just the operator. Hazards may include:

- Being crushed by equipment, being squeezed, pinned, or trapped between two objects
- Being struck by equipment, or being hit by a moving object or equipment.
- Equipment rolling over

- Uneven terrain
 - Overloading
 - Contact with underground utilities or overhead electrical lines
 - Fire hazard
 - [Electrocution](#)
 - Poor visibility due to blind spots
 - [Noise](#)
 - [Vibration](#)
 - [Falls from equipment](#)
 - Mechanical failures
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What are an employer's duties regarding the use of heavy equipment in the workplace?

Employers must conduct a [risk assessment](#) of their operation and ensure appropriate [control measures](#) are in place to manage heavy equipment.

Control measures at the work site include creating a traffic control plan, identifying walkways, and planning for hazardous work.

The use and operation of heavy equipment requires a safe work plan to make sure that the task is done safely. A safe work plan identifies the work being done (scope task) and can include information such as the area in which the operator will be working, information regarding a lift, and reviewing locates (of utility lines) and the associated hazards. A safe work plan should identify the hazards and control measures associated with the tasks. Operators must be educated and trained in the safe operation of the equipment. Some equipment may require specific operator licensing or certification.

Control measures at the work site may also include creating a traffic control plan. A traffic control plan will detail the flow of traffic, identify elements such as speed limits and walkways, and plan for hazardous work.

Additionally, equipment must be well-maintained and inspected according to the manufacturer's specifications and jurisdictional regulatory requirements, which may include inspection intervals.

What is a traffic control plan?

A traffic control plan is a document or diagram which outlines how traffic will be managed in a workplace. A traffic control plan should be updated as conditions change. This plan should include:

- Site layout
- Where heavy equipment will be stationed or operated
- Hazards such as overhead electrical lines
- Access and egress points
- The flow of traffic
- Methods of communication, such as hand signals and radio communication
- Roles of a traffic control person or signal person
- Pedestrian walkways
- Muster points
- Location of [fire extinguisher](#)
- [First aid](#) station
- [Eyewash station](#)

This list is not exhaustive. Check your jurisdiction's requirements for traffic control plans.

What is a traffic control person?

A traffic control person directs worksite and public traffic, ensuring the safety of all parties. They are trained in hand signals, stop/slow paddles, and two-way communication. Traffic control certification and jurisdiction-specific training are usually required.

What is a signal person?

In the context of heavy equipment operation, a signal person, or a spotter, is a person who is designated to communicate with equipment operators and direct them during lifts or movements. They can communicate with equipment operators using radio communication, standardized hand signals, and voice commands. A signal person maintains clear communication with the equipment operators to safely guide movement when the operator reverses, operates in blind spots, and navigates high-risk areas that may contain obstacles or high-volume traffic.

What training does a signal person require?

A signal person must be competent and trained in standard hand signals as outlined in CSA Standard Z150:20 *Safety code on mobile cranes*. The signal person must understand [hazard recognition](#), [hoisting](#) and [rigging](#), site communication protocols, site-specific logistics and procedures, and equipment dynamics. Check your jurisdiction's requirements if training is required for a signal person.

What should equipment operators know?

Equipment operators should be familiar with control measures and safe work practices in order to perform their job safely. Some measures include:

- Training on how to use the equipment being operated
- Training on equipment inspection and inspection frequency specific to the equipment
- Having valid and up-to-date locates inside the equipment, if participating in ground disturbance
- Avoiding operating in reverse
- When reversing, use a signal person
- Being aware of the equipment's blind spots
- Using warning devices such as automatic audible alarms that sound when reversing
- Monitoring surroundings and being aware of other equipment or work occurring nearby
- Using a seat belt
- Following safe speeds
- Following weight loading limits
- Using spotters or a signal person
- Being trained on the traffic control plan
- Being trained on hand signals
- If applicable, make sure the equipment is equipped with a fire extinguisher

What training may be required for an equipment operator?

Training for an equipment operator will depend on the equipment being operated and the site conditions. The nature of the training must be determined from a risk assessment. Certain types of heavy equipment have licensing and certification requirements. Training may include:

- Traffic control training

- [Working at heights](#)/fall arrest training
- [Hoisting](#) and rigging
- [Workplace Hazardous Materials Information System \(WHMIS\)](#).
- Manufacturer-specific training for the equipment
- Jurisdictional compulsory training

This list is not complete. Check your jurisdiction's requirements for required training.

What are good practices for workers working with and around heavy equipment?

A worker who works near heavy equipment must be aware of activities at all times. In many cases, the operator may not be able to see workers.

- Stay visible to equipment operators
 - Avoid equipment blind spots
 - Stay clear of the equipment's swing radius
 - Never approach or pass equipment without permission
 - If applicable, learn hand gestures to communicate with operators
 - Use appropriate [personal protective equipment \(PPE\)](#).
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What personal protective equipment is required when working around heavy equipment?

[Personal protective equipment \(PPE\)](#) must be adequate for the job. It should be determined based on a risk assessment and legislative requirements. Workers in workplaces with heavy equipment and equipment operators should generally wear a [hard hat](#), CSA-certified [protective footwear](#), and a highly visible vest or clothing. Generally, you should wear [high-visibility clothing](#) that complies with the CSA Standard Z96-22 High-Visibility Safety Apparel. Additional personal protective equipment, such as [vision protection](#) and [hearing protection](#), may also be required.

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