



Working at Heights

Quick Reference Guide

Rights and Responsibilities

Workers in Ontario have three basic rights:

1. **The right to know** what hazards are in the workplace
2. **The right to participate** in keeping the workplace healthy and safe
3. **The right to refuse unsafe work** that they believe endangers their health or safety or the health or safety of others.



The health and safety responsibilities of workplace parties are specified in the *Occupational Health and Safety Act and Regulation for Construction Projects* (“The Green Book”).

Working At Heights Responsibilities

Employers:

- **Provide** workers and supervisors with fall protection training.
- **Create** fall protection policies and procedures for the workplace.
- **Develop** written fall arrest rescue procedures.
- **Ensure** supervisors know how to address fall hazards on the job.

Supervisors:

- **Ensure** workers wear and use the appropriate fall protection equipment.
- **Ensure** workers follow fall protection regulations and procedures.
- **Inform** workers about fall hazards and how to work safely at heights.

Workers:

- **Participate** in fall protection training.
- **Follow** the fall protection regulations and procedures.
- **Inform** supervisor about fall hazards they find.

Recognizing Fall Hazards

Section 26 of the Construction Projects regulation (O. Reg. 213/91) applies to workers who are exposed to:

- **Falling** more than 3 metres (10 feet)
- **Falling** more than 1.2 m (4 ft), if the work area is used as a path for a wheelbarrow or similar equipment
- **Falling** into operating machinery
- **Falling** into water or another liquid
- **Falling** into or onto a hazardous substance or object
- **Falling** through an opening on a work surface.

Other common fall hazards encountered on a jobsite are

- Inadequate or missing guardrails
- Poor housekeeping
- Weather—ice, snow, rain, wind, etc.
- Poorly maintained equipment—ladders, scaffolds, etc.
- Using the wrong type of equipment
- Physical limitations or health problems
- Overhead powerlines
- Excessive noise
- Tight job deadlines
- Working alone.

Fall protection training must cover the common fall hazards. Help workers to recognize fall hazards on site by putting up fall prevention posters and stickers. Order IHSA004, P042, P043, P044, S042, or S052 by visiting ihsa.ca



Fall Protection Methods

Workers who may be exposed to a fall hazard must be protected by the highest-ranked method of fall protection that is practicable (O. Reg. 213/91, s. 26.1(2)). The higher the method is ranked, the less chance there is for a worker to be injured. These methods are ranked in order below.



Hazard Elimination

Changing the work process so the hazard no longer exists (e.g., building a roof on the ground).



Guardrails, Protective Covers, and Warning Barriers

Prevents a fall from unprotected edges or openings.



Travel Restraint System

Allows a worker to reach the edge but not fall over it.



Fall Restricting System

Designed to limit a worker's fall distance to 0.6 metres (2 feet).



Fall Arrest System

Designed to stop a falling worker before they hit the ground or objects below.



Safety Net

Designed to catch a falling worker before they hit the ground or objects below.

Fall Protection System Components

CSA-approved full-body harness

The chest strap should be snug and near the middle of the chest. Leg straps should allow a fist to fit snugly between the strap and leg. The D-ring should be in the centre of the back between the shoulder blades.



CSA-approved lifeline

A typical lifeline is 16-mm (5/8-in) synthetic rope (polypropylene blend). All lifelines must meet the CSA standard Z259.2.5-12 for fall arresters and vertical lifelines. (See page 6.)

CSA-approved lanyard with energy absorber

Lanyard must be 16 mm (5/8 in) in diameter and made of nylon rope or equivalent. It should be secured to an attachment point higher than waist level and kept as short as possible to reduce fall distance.



REMEMBER: the energy absorber can increase lanyard length by as much as 1.1 m (42 in).

CSA-approved connecting devices

Must be capable of supporting at least 22 kN (5,000 lb). Snap hooks and carabiners must be self-locking to prevent accidental roll-out. Rope grabs must be attached to the lifeline in the correct direction.



NOTE: Rope grabs are designed for use with a specific diameter of lifeline and length of lanyard.

Anchorage or fixed supports

Must be capable of supporting all loads that may be placed on it (16 kN (3,600 lb) at minimum). (See page 6.)



Inspecting Fall Protection Equipment

Inspect your equipment before each use. Your life depends on it. Always look for the CSA logo.



Check the harness to make sure that:

- the hardware and straps are intact and undamaged
- moving parts are moving freely
- the webbing is free of burns, cuts, loose or broken stitching, frayed material, and signs of heat or chemical damage
- the fall arrest indicator has not deployed.



Check the lanyard for:

- fraying, kinking, and loose or broken stitching
- rust, cracks, damage to the lanyard hardware
- stress or tearing on the cover jacket of the energy absorber.



Check the lifeline for:

- tears, cuts, or burns
- strands that are different sizes or shapes
- discoloration and brittleness
- broken or loose strands inside the rope
- buildup of powder or dirt inside the rope
- loose thimbles.

Check connecting components for:

- damage, cracking, dents, bends, or signs of deformation
- sharp edges
- moving parts that don't work smoothly
- rust and signs of wear or metal fatigue.



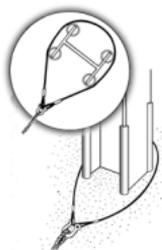
Anchors and Lifelines

There are three basic types of anchors:

- 1. Permanent anchors (Designed fixed supports)**
Load-rated anchors that are permanently installed for fall protection as an integral part of a structure (e.g., roof anchors).
- 2. Temporary fixed supports**
Designed to be connected to the structure using specific installation instructions (e.g., nail-on anchors).
- 3. Existing structural features**
Not intended as an anchor but verified by a professional engineer or competent person to serve as one (e.g., reinforced concrete columns).



NEVER anchor to roof vents or hatches, small pipes and ducts, metal chimneys, TV antennas, stair or balcony railings, or fixed-access ladders.



There are three basic types of lifelines:

- 1. Vertical lifelines**
Can be used by only one person at a time and must have a positive stop to prevent the rope grab from running off the end.
- 2. Horizontal lifelines**
Must be designed by a professional engineer and clearly indicate the anchor points, the design loads, and the number of workers that can be safely attached.
- 3. Self-retracting lifelines (SRLs)**
Allows the line to unspool and retract based on the worker's movements, thereby limiting the fall distance. Most are designed to be anchored overhead.



CAUTION: Knots along the length of a horizontal or vertical lifeline can reduce its strength by as much as 40%.

Access Structures

Ladders are not work platforms. They are a means of access. When you are working higher than 3 m (10 ft), you must follow the fall protection requirements, which includes training.

Risk factors that increase your chances of falling from a ladder:

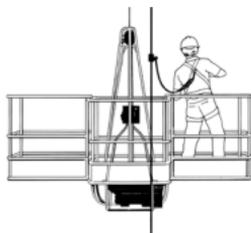
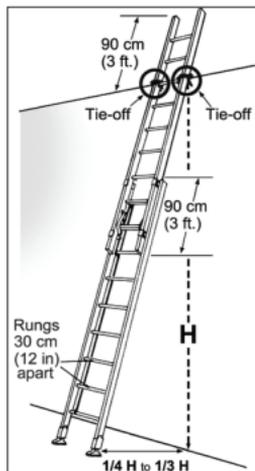
- Reaching to the side
- Handling bulky or heavy materials overhead
- Using a lot of force
- Applying a constant force
- Experiencing muscle fatigue.

Consider using a scaffold or elevating work platform instead of a ladder.

Scaffold work platforms more than 2.4 m (8 ft) high must be fully planked, have guardrails, and have a safe means of access and egress (ladder or stairway).

Elevating work platforms (EWP) must have guardrails. Operators must be trained on the specific class of EWP they will use. If the EWP will be moved, any worker on the platform must be tied off.

Suspended access equipment (SAE) work is hazardous because it is done at heights. Users must be tied off while working on or getting on or off an SAE and they must have received WAH and SAE Users training. Only a designated competent worker with SAE Installer training can install, alter, or dismantle SAE. Only a competent worker or qualified person can inspect, test, or maintain SAE. (See CAN/CSA Z271-10.)



Emergency Rescue and Suspension Trauma

Emergency rescue plan

A worker whose fall has been arrested must be brought to safety as quickly as possible without causing further injury or putting rescuers at risk. Before using a fall arrest system, employers must develop written procedures to rescue a worker whose fall has been arrested (213/91 s.26.1(4)).

IHSA's *Emergency Response Poster* (P103) can be used to list emergency contact information. When emergency services arrive on the scene, tell them how long the worker has been suspended so they can take appropriate action.

Workers should not use a fall arrest system without knowing the rescue equipment and procedures for their jobsite.

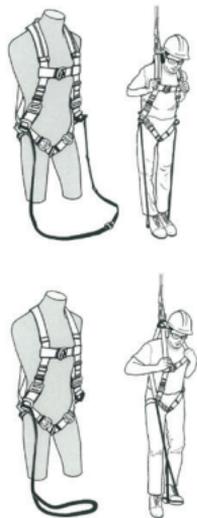
Suspension trauma

Suspension trauma, also known as orthostatic intolerance, can occur if you're suspended by your harness in an upright position for a period of time. Being suspended can cause blood to pool in your legs, depriving your brain of oxygen. This can lead to loss of consciousness, serious injury, or even death.

The best protection from suspension trauma is an effective rescue plan and timely rescue. However, using suspension trauma relief straps or tying a loop for a foothold in the lifeline can help by allowing a conscious worker to relieve the pressure and increase blood circulation.

A worker whose fall has been arrested should be taken to hospital and examined.

The poster is titled "EMERGENCY RESPONSE CONTACTS" and features the IHSA logo at the top. It includes three icons: a fire truck for "POLICE", a flame for "FIRE", and a red cross for "AMBULANCE". Below these icons are three input fields. A larger field is labeled "LOCAL EMERGENCY NUMBER". At the bottom, there are two sections: "Site Location" with fields for "Address", "City", "State", "Zip", "Country", "Telephone Number", "Fax Number", "E-mail", and "Website"; and "Personnel" with fields for "Name", "Title", "Phone Number", and "E-mail".



Fall Clearance Distance

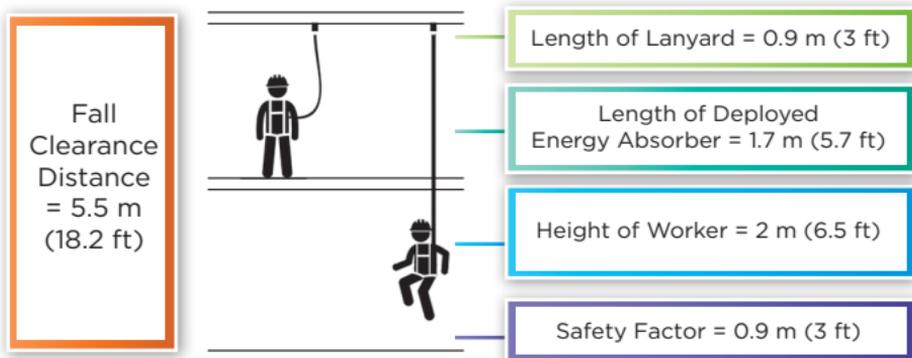
A fall protection system must prevent a falling worker from hitting the ground or an object below. This requires knowing the Fall Clearance Distance, which is the distance from the ground (or object below) to the connection point where the worker attaches their lanyard to the anchor or lifeline.

Once a worker knows the length of the lanyard and length of the deployed energy absorber used in their fall protection system, they can calculate their Fall Clearance Distance and adjust their fall protection system to prevent “**bottoming out**”.

The calculation for Fall Clearance Distance is:



In the example below, the worker's connection point to the anchor needs to be at least **5.5 m (18.2 ft)** from the ground or bottom level.



Fall Arrest Planning

Before using a fall arrest system, assess the hazards a worker may be exposed to in case of a fall:

- Will the worker “**bottom out**” (i.e., hit the ground or any material, equipment, or a lower level of the structure before the fall is arrested)?
- Will the **pendulum effect** or “**swing fall**” cause the worker to swing from side to side, possibly striking some equipment, material, or the structure?
- How will the suspended worker be rescued? (See page 9.)

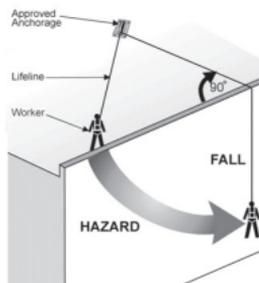
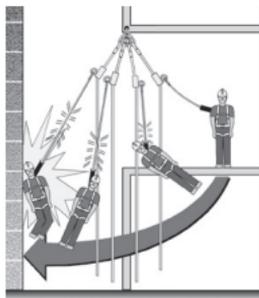
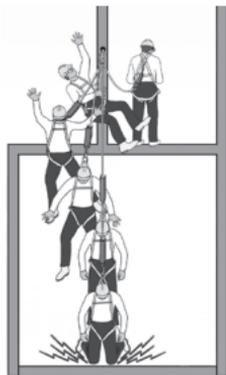
To prevent the risk of bottoming out:

Calculate the Total Fall Distance to make sure it is less than the distance from the work surface to the surface below. (See page 10.)

To minimize pendulum effect:

Keep the lanyard or lifeline perpendicular (at a 90° angle behind you) from the edge to the anchor point. Or run a horizontal lifeline parallel to the edge. The worker can attach a lanyard to it and move along the edge, staying close to perpendicular at all times.

CAUTION: The friction exerted by a swing fall may cause the lanyard or lifeline to break where it runs over a sharp edge. To minimize this risk, use edge softeners and keep your lifeline as close to perpendicular (90° from the anchor point) as possible.



You need working at heights training

IHSA can help!

Workers who may use any of the following methods of fall protection will need to complete a working at heights (WAH) training program that has been approved by Ontario's Prevention Office under the Ministry of Labour:

1. A travel restraint system.
2. A fall restricting system.
3. A fall arrest system.
4. A safety net.
5. A work belt.
6. A safety belt. (O. Reg. 297/13, s.6)



IHSA offers approved *Working at Heights - Fundamentals of Fall Prevention* training at many locations throughout Ontario and in many languages. Visit ihsa.ca/wah for details.

WAH training is valid for three years. Once expired, participants can take IHSA's *WAH Refresher* course.

Workplace-specific training

In addition to classroom-based WAH training, employers must train all workers on the fall hazards specific to their jobsite and on the types of fall protection equipment they will use.

This training must cover the exact harness, lanyard, energy absorber, rope grab, lifeline, and anchors each worker will rely on, as well as the situations in which the equipment will be used.

Visit ihsa.ca/wah for training dates and locations