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Work Safe for Life

Working at Heights

Quick Reference Guide

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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 Regulations for Construction Projects* ("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.

Work Safe for Life

Recognizing Fall Hazards

Section 26 of the Construction Projects regulation applies to workers who are exposed to:

- **Falling** more than 3 m (10 ft)
- **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. (O. Reg. 213/91, s.26)

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
- Overhead powerlines
- Excessive noise
- Physical limitations or health problems
- 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



Eliminating Fall Hazards

The best way to prevent a fall is to eliminate the fall hazard altogether.

Change the work schedule

Arrange for the work to take place after permanent safety features such as guardrails, walls, or other structural features have been installed.

Move the work location

Relocate the work to a place where the fall hazard no longer exists. (e.g., build a roof on the ground and hoist it into place or move to at least 2 m from an unprotected edge.)

Erect a guardrail system along open edges

Install guardrails no more than 1 ft from the edge. They must have a top rail (0.9 m to 1.1 m high), a mid-rail, and a toeboard (at least 89 mm high).

Cover floor and roof openings

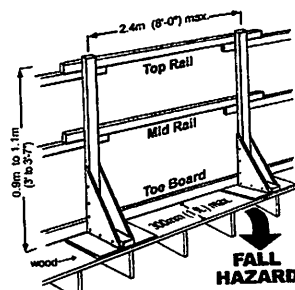
Protective covers must cover the opening completely, be fastened securely, be clearly marked as an opening cover, and be able to support a load of at least 2.4 kN/m².

Put up signs and warning barriers

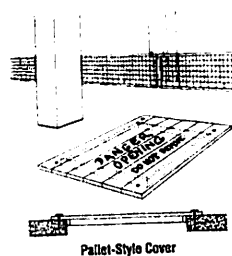
Install warning barriers at least 2 m from the edge of a fall hazard. They should be at least 1.1 m high and have signs that say "Fall Protection required beyond this point".

Use a travel restraint system

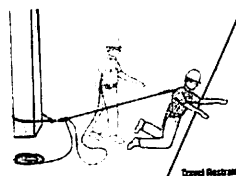
Travel restraint allows a worker to travel far enough to reach the edge but not far enough to fall over it.



Typical Dimensions for Guardrails



Pallet-Style Cover

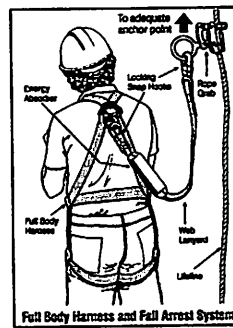


Travel Restraint

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.

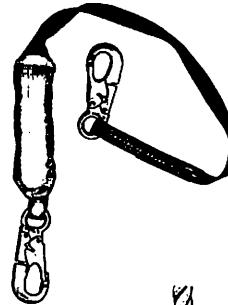


CSA-approved lifeline

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. (Refer to page 6.)

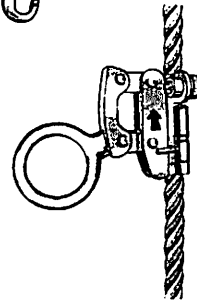
CSA-approved lanyard with energy absorber

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

Connectors 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 grab 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.**



Anchor system

Choose an anchor capable of supporting the weight of a mid-sized car 16 kN (3,600 lb). (Refer to 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, and 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
- an accumulation 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 either a horizontal or vertical lifeline can reduce its strength by as much as 40 per cent.

You need fall protection training



IHSA can help!

As of April 1, 2015, workers who use any of the following methods of fall protection will need to complete a working at heights training program that has been approved by Ontario's Chief Prevention Officer:

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)



Workers who have already received training that meets the current regulation (O. Reg. 213/91, s.26) will have until April 1, 2017, to complete this training.

Scan here for training dates and locations.

Workplace-specific training

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

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



Access Structures

Ladders are not work platforms. They are a means of access. When you are over 3 metres, you must follow the fall protection requirements, which includes training.

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

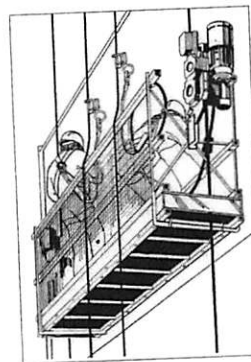
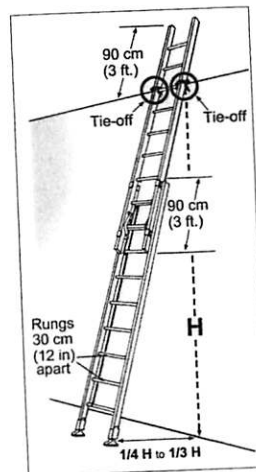
- Reaching to the side
- Handling bulky or heavy materials overhead
- Using a lot of force
- Applying a constant force
- Experiencing muscle fatigue.

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. Workers must be tied off while working on SAE or when getting on or off SAE. They must be competent to select, inspect, set up, and use the equipment and be trained in fall protection.



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 rescue procedures. (O.Reg.213/91 s.26.1(4))

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




Suspension trauma

Also known as orthostatic intolerance, suspension trauma 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.

When emergency services arrive on the jobsite, tell them how long the worker has been suspended so they can take appropriate measures.

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

EMERGENCY RESPONSE		
Have a Plan		
 FIRE	 POLICE	 AMBULANCE
LOCAL EMERGENCY NUMBER		
FIRE OFFICER		HOSPITAL
Name of Hospital		
Name of First Aid Person		
Address		
Phone		
Fax		
E-mail		
City		
Province		
Country		
Postal Code		
Phone of the Government (800-368-6822)		
Phone of the Employer (800-368-6822)		
Name of Employer		
Address		
City		
Province		
Country		
Postal Code		
Phone		
Fax		
E-mail		



Calculating Total Fall Distance

Total Fall Distance

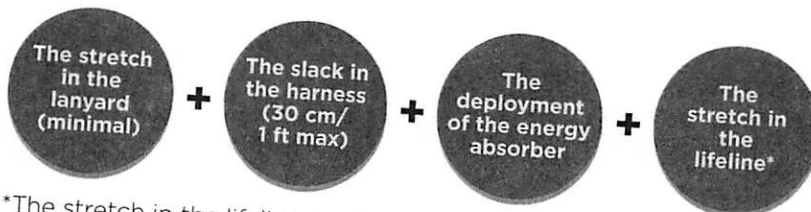
The distance required to fully arrest a fall.



Free-fall Distance

The distance from the D-ring of a worker standing on the work surface down to the point where either the lanyard or the energy absorber begins to arrest the fall. To minimize free fall, workers should tie off to an anchor overhead and use as short a lanyard as possible. Workers connected by a rope grab should position it as high above the D-ring as possible.

Fall Stopping Distance



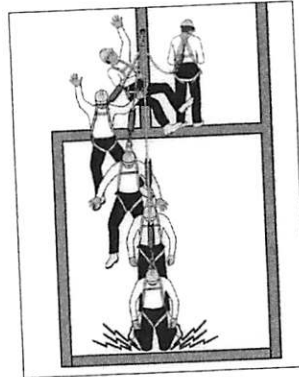
*The stretch in the lifeline can be up to 10% on lifelines labelled CAN/CSA Z259.2.5-12 and up to 22% for older lifelines.

Remember to include a safety margin in the calculation to account for any variables that were not considered.

Fall Arrest Planning

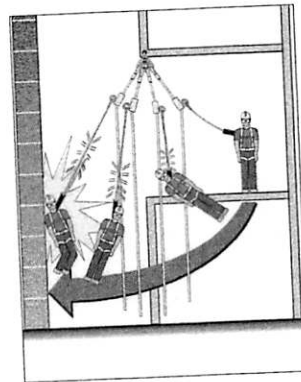
Before using a fall arrest system, assess the hazards a worker may be exposed to in case of a fall:

- 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? (Refer to 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. (Refer to 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. Use edge softeners to minimize this risk.