



HEALTH, SAFETY &
ENVIRONMENTAL MANUAL

13.4 Fall Protection

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FALL PROTECTION

Purpose

The purpose of this section is to establish the minimum requirements and guidelines to be used to protect employees from falls when they are working at elevated positions or are exposed to potential fall hazards.

Scope

This procedure is applicable to all employees, and any subcontractor(s) employed by J-AAR, as it applies to the Mining sector.

This procedure provides for the minimum requirements to be implemented by all employees and subcontractors. Where a Client's requirements are less stringent than those in this procedure, the requirements of this procedure shall still be implemented. Where a Client's requirements are more stringent than those in this procedure, the Client requirements shall be adhered to.

Background

Working from heights is a high-risk activity. Risks can be associated with the use of ladders, personnel lifts, or working on elevated walkways. Proactive protective measures must be taken prior to working at elevated heights.



To achieve 100% fall protection, either primary or secondary fall protection systems are used. In some instances, a combination of both may be required.

Legislation

According to Ontario Regulation 854, Mines and Mining Plants:

Fall Arrest: Section 14

- (1) Subject to subsection (5), where a worker is exposed to the hazard of falling more than three metres, a fall arrest system shall be used to protect the worker.
- (2) The fall arrest system required by subsection (1) shall consist of a suitable combination of a belt, a full body harness, a lanyard, an anchor and a rope-grabbing device or lifeline.
- (3) The belt, full body harness, lanyard and lifeline shall,
 - (a) be made of material with elastic properties capable of absorbing and minimizing the arrest force in case of a fall;
 - (b) be designed to distribute a fall arrest force in such a manner that the possibility of injury to the worker is minimized;
 - (c) be of sufficient strength to absorb twice the energy that may be transmitted to the fall arrest system; and
 - (d) not be knotted or allowed to become knotted, when used or worn.
- (4) When being used and worn against the hazard of falling, the lifeline of the fall arrest system shall be,
 - (a) anchored so that a worker will fall free of arrest not more than one metre; and
 - (b) connected to an object that is,
 - (i) capable of resisting the arrest force in case of a fall, and

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(ii) free of sharp edges.

(5) Subsection (1) does not apply to a worker employed in shaft sinking where measures and procedures are adopted and put into effect that will provide equal or greater protection to the worker.

Access to the Workplace: Section 46, 47, 48, 49, 54

46. (1) A safe means of access to a workplace shall be provided by a walkway, stairway or ladderway.

(2) Where workers are required to work, operate, maintain or service equipment, a safe means of access shall be provided as prescribed in subsection (1).

(3) Every walkway and every working platform more than 1.5 metres above the ground shall be provided with,
 (a) a handrail not less than 0.91 metre or more than 1.07 metres above the floor of the walkway or platform;
 (b) a second rail placed at the mid-point between the top rail and the floor of the walkway or platform or have the space between the top rail and the floor closed by a screen; and
 (c) toeboards which shall extend from the floor a height of not less than 100 millimetres.

(4) The handrail required by clause (3) (a) shall be capable of withstanding a load applied in any direction to the top rail of at least 0.9 kilonewton.

(5) Despite clauses (3) (b) and (c), toeboards and second rails are not required on a temporary walkway or working platform or on an underground drilling platform that is normally not more than three metres above the ground.

(6) When a platform consists of wooden planks, the planks shall,
 a) be sound, unpainted and free of large knots;
 b) provide a minimum safety factor of three times the maximum load to which it is likely to be subjected; and
 c) be nailed or otherwise secured against movement. R.R.O. 1990, Reg. 854, s. 46 (6).

(7) Where a means of access to a workplace is inclined at more than twenty degrees and less than fifty degrees to the horizontal, a stairway or ladderway shall be provided.

(8) Where a means of access to a workplace is inclined at more than fifty degrees to the horizontal, a ladder shall be provided.

(9) A stairway shall,
 (a) be at an angle not greater than fifty degrees to the horizontal;
 (b) not have the rise or vertical distance between landings of a flight exceed 3.6 metres;
 (c) have the treads and risers uniform in width and height respectively in any one flight; and
 (d) be provided with handrails of adequate strength not less than 0.91 metre and not more than 1.07 metres in height above the treads of the stairs.

47. (1) A ladder shall,



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- a) be of strong construction;
 - b) be free from broken or loose members or other faults;
 - c) be installed and maintained so as to reduce to a minimum the hazard of a person falling there from; if made of wood,
 - i. be of sound straight-grain lumber,
 - ii. not be painted or otherwise treated in a manner to obscure the grain;
 - d) have a distance between centers of the rungs not greater than 300 millimeters or less than 250 millimeters; have the spacing between rungs not vary more than fifteen millimeters in a ladderway;
 - e) have not less than 100 millimeters clearance behind any rung from a wall or any timber or obstruction underneath the ladder; and
 - f) project at least one meter above the landing or opening unless strong handholds are provided above the top of the ladder.
- (2) A fixed ladder shall be securely fastened in place.
48. (1) Except in an underground mine, a ladderway at an angle steeper than seventy degrees to the horizontal shall be fixed in place and be provided with,
- (a) platforms at intervals not greater than seven meters;
 - (b) a safety cage; or
 - (c) a protective device which when used will prevent a worker from falling.
- (2) Except in an underground mine, where platforms are used in conjunction with a ladderway,
- (a) the ladders shall be offset;
 - (b) a platform shall be provided at each place where ladders are offset; and
 - (c) the platform shall be not less than 600 millimeters in width by 1.2 meters in length.
49. A portable ladder shall,
- (a) be equipped with non-slip feet or otherwise secured;
 - (b) where any activity in the vicinity may create a hazard to a person thereon, be protected at its base; and
 - (c) where the ladder has metal or metal-reinforced side rails, not be used near exposed and energized electrical circuits or equipment.
54. (1) A walkway, stairway or ladderway shall be,
- (a) maintained in a safe condition;
 - (b) free from obstructions;
 - (c) of sufficient size to ensure that crowding does not occur; and
 - (d) cleared of hazardous accumulation of material without undue delay
- (2) Any opening in a floor or other surface which may be a hazard to a worker shall be,
- (a) protected by a guardrail; or
 - (b) covered with securely fastened planks or other material capable of supporting any load to which it is likely to be subjected.

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Ladders

Choose the right ladder for the job. Remember the following:

- CSA approved ladders must be used.
- Ladders will be inspected each day before the shift starts.
- Defective or broken ladders must be tagged out and removed from the site. Return to the maintenance shop.
- Aluminum ladders may not be used where there is a risk of electrocution from overhead wires or other electrical hazard areas. In this case, fiberglass ladders must be used.
- Ladder must be set up at a safe angle. Not less than 1/4 and not more than 1/3 of the length from a point directly below the top of the ladder.
- It must be located so that an adequate landing surface that is clear of obstructions is available at the top and bottom of the ladder.
- All ladders must be placed on a stable base.
- It must be secured at the top and bottom to prevent movement.
- It must extend above the top by at least 1 meter.
- When climbing up or down, always face the ladder and maintain 3-point contact.
- Do not carry tools, equipment, or material in your hands while climbing. Use a hoist line for lifting and lowering.
- When a stepladder is being used, its legs shall be fully spread open, and its spreaders shall be locked.
- No worker shall stand or step on the top cap, top step, or pail shelf of a stepladder.

Primary Fall Prevention Systems

Primary fall prevention systems are the preferred choice for performing work in elevated areas. These systems provide walking and working surfaces equipped with standard guardrail systems on all open sides.

In most cases, primary fall prevention systems are sufficient fall prevention methods and do not require the use of additional (secondary) fall protection systems such as a harness / lanyard system.

Guardrails



Guardrails are an integral part of most primary fall prevention systems and must be constructed according to the specifications noted in the Mining Regulations.

Most of J-AAR's equipment, machines and plants have guardrails, ladders and stairways constructed to protect workers from falls. This generally eliminates the need for secondary fall protection devices.

Covers

Any opening in a floor or other surface which may be a hazard to a worker shall be,

- (a) protected by a guardrail; or
- (b) covered with securely fastened planks or other material capable of supporting any load to which it is likely to be subjected.

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- (c) marked to provide adequate warning of the hazard.
- (d) only authorized personnel shall be permitted to remove covers.

Secondary Fall Protection Systems

Secondary fall protection systems must only be used after all efforts to use primary fall prevention systems have been exhausted or when being used together with primary systems.



The following minimum standards shall be met:

- Full body harnesses are the only type of harness allowed in a fall arrest system. The use of body belts or a safety belt for fall arrest is prohibited.
- A full body harness and shock-absorbing lanyard must be used when working outside guarded platforms more than 3 m (10 ft) above ground level.
- The use of a second shock-absorbing lanyard may be used to achieve continuous tie-off.
- Fall protection devices (safety harnesses, lanyards, etc.) shall be inspected for damage prior to each use. Defective equipment shall be immediately removed from service, tagged, and returned to your Supervisor.
- The lanyard shall be attached to the D-ring located in the middle back of the safety harness.
- The full body safety harness/lanyard must be attached to a secure anchor point.
- Snaphooks attached to shock absorbing lanyards shall be of the double action/locking type design. Simple spring resistant snaphooks shall not be used for fall protection.
- Fall protection devices and systems shall not be used for any other purpose other than employee safeguarding.
- Workers in elevated work platforms or personnel lifting devices shall wear full body harnesses and secure their lanyards according to manufacturer instructions.
- In situations where a fall could result in impalement or other injury (i.e. working over a hot process, operating equipment, etc.) fall protection equipment shall be utilized regardless of the potential falling distance.
- Fall protection devices subjected to shock loading imposed during fall arresting shall be removed from service, tagged, and returned to the office/shop.
- Fall protection devices shall be inspected on an annual basis by a qualified external inspection agency as required.
- All workers using fall protection devices must complete training specific to the equipment used including procedures on the use, care, inspection and maintenance of the fall protection devices or systems.

Anchor Points

The strength of a personnel fall arrest system is based on being attached to an anchor system that does not reduce the strength of the system. Anchor points must be sufficient to resist the arrest force of a fall.

Lifeline Systems

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Lifeline systems are points of attachment for fall protection lanyards and harnesses. Lifelines may be mounted either vertically or horizontally and provide fall protection for personnel working in elevated areas.

- Lifelines shall not be used for any other purpose than fall protection.
- Lifelines shall be protected against being cut or abraded (i.e. Softeners around lifelines at anchor point).
- Lifelines must be designed, installed, maintained, and removed by persons competent and trained in lifeline installations.

Training

All workers using fall protection devices must complete training specific to the equipment used including procedures on the use, care, inspection and maintenance of the fall protection devices or systems.

Training must be conducted by a competent person or organization.

Fall Protection Plan

An employer must develop procedures in a fall protection plan for a work site if a worker at the site may fall 3 meters or more and the worker is not protected by guardrails.

A fall protection plan must specify the following:

- the fall hazards at the work site.
- the fall protection system to be used at the work site.
- the anchors to be used during the work.
- clearance distances below the work area, if applicable, have been confirmed as sufficient to prevent a worker from striking the ground, an object, or another level below the work area.
- the procedures used to assemble, maintain, inspect, use, and disassemble the fall protection system, where applicable.
- the rescue procedures to be used if a worker falls and is suspended by a personal fall arrest system and needs to be rescued.

The employer must ensure that the fall protection plan is available at the work site and is reviewed with workers before work begins.

The employer must ensure that the plan is updated when conditions affecting fall protection change.