



## WORKING AT ELEVATED PLACES

### Fall Protection Standard: Guardrails, Travel Restraint, Fall Restricting and Fall Arrest Systems

#### ***Selection and Use***

Workers who require access to elevated locations are faced with a potential risk of falling. Whenever practicable, this risk should be reduced or eliminated by way of permanently installed fall protection devices such as guardrails. Where this is not possible, appropriate travel restraint, fall restricting and fall arrest systems shall be used. This standard is based on the Regulation 851, as amended (Regulation for Industrial Establishment) made under the Occupational Health and Safety Act of Ontario, and Canadian Standards Associations (CSA) Standards.

#### **APPLICATION:**

Any worker who may fall in/on a hazardous liquid/object, or fall a vertical distance of three meters or more while performing duties during the course of work at the University. This standard does not apply to activities governed by the Construction Projects Regulation made under the Occupational Health and Safety Act of Ontario.

**Note:** In this standard, "worker" includes faculty, staff, students and visitors

#### **DEFINITIONS:**

<b>Fall Protection:</b>	Any system that serves to protect a worker from falling, or minimizes travel distance in the event of a fall.
<b>Fall Arrest System:</b>	Any fall protection system that permits a limited free fall (stop and suspend).
<b>Fall Restricting System:</b>	Type of fall arrest system that has been designed to limit a worker's fall to a specified distance
<b>Travel Restraint System:</b>	Any fall protection system that limits travel in a manner such that free fall is not possible.
<b>Guardrail System:</b>	An assembly that provides a barrier to prevent a worker from falling from an edge of a surface

#### **RESPONSIBILITIES:**

Principal investigators/supervisors and all others in authority shall:

- Identify situations where fall protection is required;
- Determine (using this standard or in conjunction with the Office of Environmental Health and Safety) the appropriate fall protection system and components to be used in a particular situation;
- Ensure workers are provided with any required fall protection equipment;
- Ensure that workers are appropriately trained to use travel restraint, fall restricting and fall



- arrest equipment in a manner that is type, brand and model specific;
- Ensure that the training provided includes adequate oral and written instructions by a competent person;
- Ensure that person that provides the training and instruction prepares a written training and instruction record for each worker and signs the record;
- Ensure that the training and instruction record includes the worker's name and the dates on which the training and instruction took place;
- provide the training and instruction record for each worker to an inspector on request;
- ensure that workers use all appropriate travel restraint, fall restricting and fall arrest system components and procedures when performing their work; and
- provide an expedient means of rescue for every situation where a fall arrest system is used, not to exceed 20 minutes in any case.

Workers shall:

- Use fall protection in a manner consistent with their training at all times;
- Inspect the fall protection equipment prior to each use;
- Maintain fall protection equipment in good condition; and
- Report any defects or malfunctioning equipment to their supervisor.

#### **GUARDRAILS:**

The use of guardrails is a superior alternative to fall protection devices that must be worn by workers. Other forms of fall protection should only be used where guardrail installation is impractical.

A guardrail must be built to the structural specifications outlined in the building code. It consists of three main components: (a) top rail – the upper most horizontal rail, positioned 91-107 cm above the floor level, (b) mid rail – horizontal rail halfway between the top rail and toeboard level, and (c) toeboard – 12.5 cm. high enclosure at floor level required where tools and other objects may fall onto those below.

Typically, guardrails are installed in any location that presents a fall hazard where routine access is required.

#### **TRAVEL RESTRAINT, FALL RESTRICTING AND FALL ARREST SYSTEMS:**

Travel restraint, fall restricting and fall arrest systems are typically used where the installation of physical barriers for fall prevention is impractical. Important points regarding these two systems follow:

- Workers must visually inspect their equipment prior to use, and on an ongoing basis throughout the day;
- All equipment must be inspected yearly or more frequently by a trained and competent person and record of the inspection shall be kept on site;
- Extensive training with the type and model of equipment to be used is essential for the proper use of personal fall protection equipment by workers;
- Placement of temporary anchors must be done by highly experienced and knowledgeable individuals;
- Any piece of equipment that has sustained a fall or is otherwise damaged shall not be reused unless re-certified/reconditioned by the manufacturer. Equipment that cannot be re-certified is to be destroyed in a manner that eliminates potential reuse;
- All system components used shall be designed and rated appropriately for their intended use (see table 1 below);



- Personnel must be familiar with and guard against any degradation of the system by the work activity. Special precautions must be taken to guard against abrasion of ropes. Activities such as hot work and the use of harsh acids/alkali require the use of wire rope lanyards and lifelines. Wire rope should not be used where there is the risk of electric shock; and
- All gate style connectors such as snaphooks and carabiners shall be locking. Self-locking styles are preferred. The capacity of gated connectors must be marked on the item.

**Table 1 – Acceptable Equipment**

Item	Minimum Criteria/Certification
Full Body Harness	CAN/CSA-Z259.10-12, “Full Body Harness”
Lanyard	CAN/CSA-Z259.1-5 (R2015), “Body Belts and Saddles for Work Positioning and Travel Restraint”
Safety Belt (travel restraint only)	CAN/CSA-Z259.1-5 (R2015), “Body Belts and Saddles for Work Positioning and Travel Restraint”
Shock Absorber	CAN/CSA-Z259.11-05 (R2015), “Energy Absorbers and Lanyards”
Connecting Hardware	CAN/CSA-Z259.1-5 (R2015), “Body Belts and Saddles for Work Positioning and Travel Restraint”, Breaking strength of at least 22 kN
Vertical Lifelines	CAN/CSA-Z259.2.1-98 (R2011), “Fall Arresters, Vertical Lifelines, and Rails”, Breaking strength of at least 27 kN
Horizontal Lifeline	Designed by a Professional Engineer. Certified by a Professional Engineer following erection.

**Fall Arrest Systems**

- A full body harness shall be used as the body holding device. A work belt shall not be used for this purpose;
- When working on an aerial platform lift, a fall protection harness shall be worn and connected to anchor points provided in the lift basket;
- In the event of a fall, the system shall permit a free fall of less than 1.5 m, and transfer a maximum force of no more than 8 kN to the wearer. Total fall distance shall be restricted such that an impact on lower level or object below is not possible;
- The fall arrest system shall have capacity to absorb twice the energy and twice the load to which it is likely to be subjected;
- Vertical lifelines shall accommodate one user only;
- Lanyards should be positioned as high and directly overhead as possible to minimize pendulum effect and free fall distance.

**Fall Restricting Systems**



- A full body harness shall be used as the body holding device. A work belt shall not be used for this purpose;
- In the event of a fall, the system shall permit a free fall of less than 0.6m;

**Travel Restraint Systems**

- Travel restraint systems must be designed such that a free fall is not possible;
- Travel restraint system shall be capable of withstanding the maximum arrest forces generated through fall arrest;
- Travel restraint belts are not to be used on aerial platform lifts such as scissor lifts and boom lifts. If the worker is thrown from lift, there is a risk of severe internal injury because travel restraint systems are not designed to sustain or distribute that amount of force.