



# **Working at Heights Procedures Manual**

**Version: 1.0**

## Table of Contents

<b>1.0</b>	<b><i>General</i></b> .....	<b>1</b>
<b>2.0</b>	<b><i>Responsibilities</i></b> .....	<b>1</b>
2.1.	Supervisors .....	1
2.2.	Employees .....	1
2.3.	Employer .....	1
<b>3.0</b>	<b><i>Training</i></b> .....	<b>2</b>
<b>4.0</b>	<b><i>Fall Protection Systems</i></b> .....	<b>2</b>
4.1.	Categories of Fall Protection .....	2
4.2.	Components of a Fall Restraint/Fall Arrest System .....	4
4.3.	Proper Selection, Fitting & Use of Fall Protection .....	5
4.4.	Proper Care & Inspection of Fall Protection Equipment .....	6

## 1.0 General

Each year hundreds of injuries and deaths are attributable to work-related falls. The Association of Workers' Compensation Boards of Canada (AWCB) show falls as one of the leading causes of occupational injuries and death of which all could have been prevented by the use of fall protection. Fall protection can be in the form of guardrails, personal fall arrest systems, or under specific conditions, warning line systems.

An employee must be protected from falling when working on a surface that has an unprotected side or edge, which is three (3) meters or more above an adjacent lower level, or when working from bucket trucks or other personnel lifts with articulating booms. In each case, the fall hazards must be evaluated to determine the preferable method to protect the employee. Fall protection systems should be selected based on:

1. Eliminating the risk of falling from heights;
2. Preventing the hazard with barriers, guardrails systems, work platform or modifying the work procedure;
3. Use of fall arrest systems when the first two approaches are not feasible.

## 2.0 Responsibilities

### 2.1. Supervisors

Supervisors have the primary responsibility for the implementation of the Fall Protection Program in their work area. The supervisor should be a competent person, or ensure that responsibility for the competent person is assigned to a qualified individual within the work group. Occupational Health & Safety (OH&S) defines a competent person as:

1. A person who is capable of identifying existing and predictable hazards in the surroundings or identifying working conditions which are hazardous or dangerous to employees; and
2. Who has authorization to take prompt corrective measures to eliminate the hazards.

Supervisors must ensure that only trained individuals are assigned work that requires use of fall protection systems (other than guardrails).

### 2.2. Employees

Employees have the primary responsibility for proper care, use and inspection of their assigned fall protection equipment.

### 2.3. Employer

The employer has the primary responsibility for providing fall protection systems and appropriate training. Additionally, Squamish Terminals Health and Safety Officer (VP Ops)

has the responsibility for assisting each department in developing appropriate fall protection plans, providing technical guidance and assisting with employee training.

## 3.0 Training

Each employee who may be exposed to fall hazards will be trained to recognize the hazards and the procedures to follow to minimize the hazards. A competent person will provide the training and must train employees in the following areas:

- fall hazards in the work area;
- correct procedures for erecting, maintaining, disassembling and inspecting the fall protection systems used;
- use and operation of the fall protection systems used;
- role of employees in fall protection plans;
- what rescue procedures to follow in case of a fall;
- overview of the OH&S fall protection regulations;

As part of the General Waterfront Safety Training (GWST) conducted by the BCMEA, all longshore employees receive Fall Protection Training. Squamish Terminals will maintain a training record for each employee. The record will contain the name of the employee trained, date of training and the name of the person or department that conducted the training. Retraining should be done every 2 -3 years, if there is a change in the fall protection system being used or if an employee's actions demonstrate that the employee has not retained the understanding or skills important to fall protection.

## 4.0 Fall Protection Systems

### 4.1. Categories of Fall Protection

Fall protection is a general term which is defined as the means for protecting employees from the hazards of a fall.

When confronted with any type of fall hazard, the first option is to attempt to eliminate the fall hazard entirely. This may be achieved by modifying the work methods or by altering the work environment itself. If the hazard cannot be eliminated, four (4) specific categories of fall protection can be used:

#### 1. Conventional Fall Protection

- Utilization of a passive means of preventing an employee from reaching a potential falling situation. Guardrails, handrails and ladder cage loops are all examples of this form of fall protection and are often described as traditional fall restraint.

# Working at Heights

## Guardrail systems

Guardrails are needed at the edge of work areas three (3) meters or more in height to protect employees from falling. This includes the edge of excavations greater than 1.2 meters in depth. Guardrail systems need to meet the following criteria:

- Top rail is 1.09 M (42 inches, +/- 3 inches) above the walking/working level.
- Mid rail is located midway between the top rail and the walking/working level.

\* It is important to remember that the working level is that level where the work is being done. Someone working on a stepladder next to an edge may raise his/her working surface well above the working surface.

- Both top and mid rails should be constructed of materials at least 51mm x 102mm (2"x4") if constructed of wood. If wire rope is used for top rails it must be 8mm (3/8") in thickness, it needs to be flagged with high-visibility material at least every 1.5 meters (5') and have turnbuckles or other means to provide adequate tension on the wire rope. Manufactured railing systems made of light weight metal are also available for use as a guardrail system.
- The top rail and mid rail needs to be secured against movement.
- The system should be smooth to prevent punctures, lacerations or snagging of clothing.
- The ends of the top rail should not overhang the terminal posts, except when such overhang does not present a projection hazard.
- When a hoisting area is needed, a chain, gate or removable guardrail section must be placed across the access opening when hoisting operations are not taking place.

## 2. Fall Restraint System

- Using fall protection equipment such as an anchor, lanyard and body harness device, the employee is restrained in such a fashion that they will not be able to approach the falling hazard.

## 3. Fall Arrest System

- A specialized set of equipment which will arrest the fall in progress, before reaching the surface or any other obstruction below.

## 4. Work Procedures

- The employer will create a specific set of written instructions that will be used to maintain safety at heights.

All of the methods described above may be appropriate for protecting employees from a falling hazard however not all of the methods will work in all instances. As such, it is very important to select the correct method based on the specific situation.

## 4.2. Components of a Fall Restraint/Fall Arrest System

When considering the use of fall restraint and/or fall arrest systems, there are four (4) specific components that must be present to have a complete and properly functioning means of protecting an employee. The four (4) components include:

### 1. Anchor

Definition: A strong, safe point of attachment for a connector.

- As the first component of a fall arrest system, the anchor is the fixed object upon which the entire fall protection system relies.
- An anchor may be engineered or improvised.
- These objects must be of unquestionable strength.

### 2. Connector

Definition: The means of connecting the body holding harness to an anchorage point.

- There are a wide variety of different connectors, each serving a unique purpose.
- Workers at height must be able to select the proper connector to make sure that they are using the best possible fall protection system.
- Can include but not limited to: snap hooks, carabineers, lanyards.

### 3. Personal Protective Equipment

Definition: The equipment that attaches to the connector and is worn to support the body in the event of a fall, or restrain the employee from reaching a fall hazard.

- Body Harness

### 4. Rescue or Retrieval Plan

Definition: All sites where fall protection systems are used must have a site specific rescue plans and procedures in place. While calling 911 may be part of a rescue response, Workplace Health and Safety expects an employer to have some means of basic rescue capability at the work site. Prior to tying off to perform the work, a means of rescue must be immediately available. The basic means of rescue may include:

- Provisions for rescue should be considered before the situation arises.
- Rescue or retrieval methods may include a crane with a designated emergency platform (DEP), a scissor lift or a boom lift.
  - Having ladders on site that are capable of reaching a suspended worker.
  - Having access to a manlift or scissor lift at the work site that is capable of reaching a suspended worker. Someone must be able to competently operate the equipment.
- Equipping workers with leg loop extensions for their full body harnesses i.e. suspension relief straps. These attach to the full body harness, providing foot loops into which a suspended worker can place his or her feet and then raise the legs. Doing so allows blood pooling in the legs to circulate. Using the foot

## Working at Heights

loops may help the worker to remain comfortable until he or she returns to safe ground.

- From above the fallen worker's suspended position, having a worker lower a loop of rope into which the worker can place his or her feet and then stand up. The goal is to make the worker more comfortable by relieving the pressure of the harness straps on the legs and offering the legs something to push against to pump pooled blood back into circulation. Using the loop may help the worker to remain comfortable until he or she returns to safe ground. It may also allow the worker to connect to a descent system followed by disconnection from the fall arrest system.
- Using Type 3 self-retracting devices that include an integral hand winch that allows the suspended employee to be raised upwards or lowered to safe ground. Use of this device does not require the suspended employee to be conscious.
- Equipping workers in certain situations with self-rescue devices such as specialized descenders that allow the suspended employee to remove themselves from their lanyard and descend to safe ground using one of these devices. If a work platform or personnel basket is suspended from a crane or hoist, a fall protection plan must be in place for the rescue of the occupant(s) in the event that the crane or hoist is unable to lower the work platform or personnel basket.

### 4.3. Proper Selection, Fitting & Use of Fall Protection

Personnel requiring the use of personal fall protection equipment shall employ the "Buddy System" or have an observer to render assistance if and when required. The following is a list of positions, duties & tasks including a reference to specific procedures at Squamish Terminals where Fall Protection is required, based on hazard assessments.

JOB / POSITION	DUTIES / TASKS	FALL PROTECTION REQUIREMENTS
Electrician	Repairing lights at height	Full Harness
Heavy Duty Mechanic	Working on lift truck masts	Full Harness
Ship Foremen / Ship Superintendents	Only under special circumstances	Dependent on special circumstances
Topside	Only under special circumstances	Dependent on special circumstances
Trades Service Person	Working from man lift	Full Harness
Other Ship Personnel	Only under special circumstances	Dependent on special circumstances
Emergency Personnel (ie. Ship First Aid)	Entering & exiting hatch via safety cage	Full Harness

## **4.4. Proper Care & Inspection of Fall Protection Equipment**

### **Equipment Care**

One of the keys to a successful fall protection system is proper inspection, storage and maintenance of the equipment. As a rule of thumb, always comply with the manufacturer's recommendations. If there are any concerns, contact your supervisor.

### **Inspection**

Similar to other safety equipment, fall protection equipment must be inspected on a regular basis and must be inspected by the employee and their supervisor before it is used on each work shift as required by the manufacturer. The inspection process is designed to detect any potential problems with the proper functioning of the equipment. Equipment used as part of the fall protection system should be kept free from substances and conditions that could contribute to deterioration of the equipment and should always be re-certified as specified by the manufacturer.