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HORIZONTAL LIFELINE SYSTEMS GUIDELINE

Definitions (in this guideline):

“Anchor” means a permanent or temporary structure or component of a structure to which fall protection components are attached.

“Fall Arresting System” means a permanent or temporary assembly of components designed to arrest the fall of one or more users.

“Travel Restraint System” means a permanent or temporary assembly of components capable of preventing a worker from reaching a location from which he or she could fall.

“Free Fall” means the vertical distance from the onset of a fall to the point where the fall arresting system begins to apply force to arrest the fall. For example, distance from the carabiner before the fall to the carabiner at the first instant of arrest.

“Full Body Harness” means a body support device consisting of leg and shoulder straps and an upper dorsal assembly that will distribute and reduce the impact force of any fall. A harness may, in addition to its primary fall arresting function, have other functions such as work positioning, ladder climbing, rescue and controlled descent.

“Horizontal Lifeline” means a rope made of synthetic fibre or wire, a rail or other similar systems that are attached horizontally to two or more anchors, and to which a fall arresting system or travel restraint system may be attached.

“Lanyard” means a flexible line used to attach a full body harness or safety belt to a vertical lifeline, a horizontal lifeline or an anchor point.

“Personal Fall Protection System” means the components of a fall protection system for which the user has responsibility and includes some of the following fall protection components: a full body harness, a safety belt, a shock absorbing lanyard (or a lanyard and a separate shock absorber), a fall arrester, a self-retracting device and the connecting hardware.

“Shock Absorber” means a component of a fall arresting system that dissipates energy by creating or extending the deceleration distance.

I. SYSTEMS FOR TRAVEL RESTRAINT

A horizontal lifeline system for travel restraint must

- (a) be rigged to prevent the worker from falling off the unguarded edge, and
- (b) be attached to secure anchors in a manner, and with components capable of supporting at least two times the maximum load likely to be applied to it (approximately 800 lbs).

On a roof with a slope greater than 3 in 12, the horizontal lifeline system must be designed for fall arrest.

II. SYSTEMS FOR FALL ARREST

1. Design and certified by a professional engineer

A horizontal lifeline system used for fall arrest that is designed and certified by a professional engineer¹ can be used if the professional engineer supplies to the workplace signed and dated drawings and instructions for the horizontal lifeline system showing:

- (a) The layout in plan and elevation, including anchor locations, installation, specifications, anchor design and detailing,
- (b) Horizontal lifeline system specifications, which includes:
 - Permissible free fall distance → *please note the maximum arrest force must not exceed 8 kN (1800 lbs)*,
 - Clearance to obstructions below,
 - Cable size, breaking strength, and termination details, and
 - Initial sag or tension,
- (c) The number of workers permitted to connect to the lifeline.

2. Pre-engineered, Manufactured Systems

A horizontal lifeline system used for fall arrest that is a pre-engineered, manufactured system can be used if it is installed as per manufacturer's specifications. The system should comply with CSA standard Z259.13-04 Horizontal Lifeline System.

Written certification from the manufacturer of a designate of the manufacturer, that the horizontal lifeline system has been installed in accordance with the design documents is recommended.

3. Not certified by a professional engineer

If a horizontal lifeline system used for fall arrest is not certified by a professional engineer or a pre-engineered, manufactured system, it must meet the following requirements:

¹ Horizontal Lifeline Systems certified by a professional engineer should be designed according to CSA Z259.16-04, Design of Active Fall-Protection Systems.

- (a) When using the horizontal lifeline system, a full body harness that complies with CSA Standard Z259.10-M90, "Full Body Harness" must be worn.
Even though General Regulations 91-191 under the Occupational Health and Safety Act doesn't yet call for a full body harness, it is absolutely mandatory if this system is used.
- (b) When using the horizontal lifeline system, a shock absorber that complies with CSA Standard Z259.11-M92, "Shock Absorbers for Personal Fall Arrest Systems" must be used.
Even though General Regulations 91-191 under the Occupational Health and Safety Act doesn't yet call for a shock absorber, it is absolutely mandatory if this system is used.
- (c) The wire rope must have a diameter of a minimum of 12 mm (1/2 in) with a breaking strength, specified by the manufacturer, of at least 89 kN (20 000 lbs).
The fasteners reduce the strength of the wire rope by 25%, therefore the strength requirement for the wire rope is greater than that of the other components of the fall-arrest system.
- (d) Connecting hardware such as shackles and turnbuckles must have an ultimate load capacity of at least 71 kN (16 000 lbs).
- (e) End anchors must have an ultimate load capacity of at least 71 kN (16 000 lbs).
It is not possible to tell the load capacity of an anchor just by looking at it, therefore the employer must provide proof (an engineer's certificate) that the end anchor is capable of supporting the load capacity indicated above.
- (f) The horizontal lifeline must be free of splices except at the termination.
- (g) The span must be at least 6 m (20 ft) and not more than 18 m (60 ft).
If the length of horizontal lifeline needed for a job exceeds 18 m (60 ft), a second system with its own independent anchors must be installed or a multispan system must be designed by an engineer and meet the requirements for the "systems certified by a professional engineer".
- (h) The horizontal lifeline must have an unloaded sag no greater than one in 60. (E.g. one foot in a 60-foot span)
The greater the sag, the greater the force on the worker when a fall occurs. This increases the likelihood of injury to the worker. Therefore it is very important not to exceed this sag.
- (j) The elevation of the horizontal lifeline at any point must be a minimum of 1 m (39 in) above the working surface.
- (j) The free fall distance must be limited to 1.2 m (4 ft).
- (k) A minimum of 5.5 m (18 ft) of unobstructed clearance must be available below the working surface.

(l) No more than 3 workers may be secured to the horizontal lifeline.

(m) The horizontal lifeline must be positioned so it does not impede the safe movement of workers.

Each workplace is unique and the appropriateness of a fall protection system must be assessed in the light of the factors at that workplace. This guideline is intended as a guide of the factors that must be considered. The Commission makes no representation regarding the suitability of the information contained in this guideline for any specific purpose and makes no warranty of any type respecting the information. In no event shall WHSCC be liable for any damages of any type suffered by any user of this guideline from any cause whatsoever, whether arising in contract, tort or otherwise.