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EH&S Fact Sheet
Environment, Health and Safety Information for the Berkeley Campus

No. 65
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Fall Protection Equipment and Inspection

By law, approved personal fall arrest, personal fall restraint, or positioning systems must be worn by employees who are working in situations where they may fall more than 7 $^1/_2$ feet.

There are three components of fall protection equipment: body wear, connecting devices, and anchorage points. These are classified as personal protective equipment (PPE) because, like respirators, they attach to the body to protect the person from a specific hazard.

A basic safety principle is to use PPE as the last option to avoid injury and fatalities. Engineering controls, such as physical barricades (e.g., guard rails) or administrative controls, such as prohibited work areas (e.g., marking roofs as off-limit) are preferred over PPE.

Definitions

Body Wear

Body Harness Straps which are secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders. The harness must have the means for attaching it to other components of a personal fall arrest, restraint, or positioning system.

Personal Fall Protection System Body wear that will prevent a fall or minimize injury in case there is a fall. It includes one or more of the following: a personal fall arrest system, a positioning device, a fall restraint system, or guardrails.

Personal Fall Arrest System A system used to capture an employee in a fall. It consists of an anchorage, a connection device, and a body harness.

Personal Fall Restraint System An arrangement of devices that prevents an employee from falling. It consists of an anchorage, connectors, and body belt/harness. It may include lanyards, lifelines, and rope grabs designed for that purpose.

Positioning Device System A kind of safety belt or body harness system that is rigged to support an employee on an elevated surface such as a rebar wall or an extension ladder. It allows the person to work with both hands free. As of 1998, these must be used as part of a personal fall restraint system.

body harness

Safety Belts A belt with D-rings that must be used for positioning in conjunction with a body harness as a fall restraint system. Cal/OSHA does not permit the use of old-style safety belts that are not part of a harness for any purpose associated with fall protection or positioning.

safety belt

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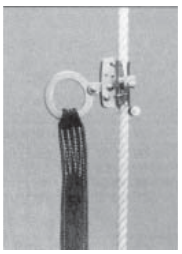
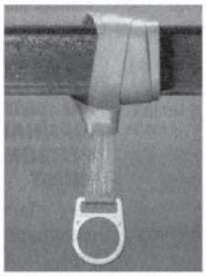
self-retracting lanyard



rope grab



anchorage connnector

Connecting Devices

Lanyard A length of fabric or cable with anchorage and harness connectors attached. It is used to connect the harness to an anchor point. Some lanyards may have shock absorbers and be self-retracting. Self-retracting lanyards act like car seat belts in that they lock when they are pulled out too fast.

Rope Grab A rope grab is a device attached to the anchor point clip of a lanyard that slides along a vertical lifeline. In case of a fall, it causes a cam to clamp on the lifeline and thereby stops the fall.

Anchor Points

Anchorage Connectors and Anchor Points These devices are attached to a structure and secure a fall restraint or arrest system. They must be capable of supporting 5,000 pounds per attached worker. There are many types of anchoring point devices. Some are fixed in place and cannot be moved; others roll along a track or beam and can be easily detached and relocated by the user.

Miscellaneous

*Guardrail A*n engineering control that can eliminate the need for fall protection PPE if it meets the Cal/OSHA requirement for standard guardrails. Guardrails are required to be 39 to 45 inches high, with a midrail. For other important requirements, contact EH&S.

Roofing operations

Activities on roofs have the same fall protection requirements as any other activities that are performed more than $7^{1}/_{2}$ feet above a surface. There are several fall protection engineering controls applicable only to roof work. See the EH&S Fact Sheet "Fall Protection for Activities on Roofs" for their descriptions and a discussion of the requirements.

Training required

Before employees perform work that requires fall protection harnesses, they should have training on fall hazards and the use of fall protection equipment. Training topics include how to use, test, and inspect specific equipment provided for their use. This training is available by calling EH&S at 642-3073.

Requirements of a rescue plan

A person can only remain suspended in a body harness after a fall for a limited time (about 20 minutes). The arrest of a fall could cause significant internal injuries. In addition, blood circulation is significantly reduced to the legs and arms when a person hangs in a harness. Therefore, a rescue plan must be in place, and rescue equipment needs to be ready for use immediately if a fall occurs. Call EH&S for help developing a rescue plan.

There are multiple reasons to rescue a worker as soon as possible if they become suspended from their fall protection harness. In as little as 15 to 30 minutes suspension trauma and reflow syndrome can take place. When a worker is suspended by their harness, blood pools in their legs which can stress the heart to the point of cardiac arrest. The blood that pools in the legs depletes the oxygen and starts developing toxic by products. After rescue, when the blood is released

back into the trunk, it can overwhelm the internal organs (reflow syndrome), killing the victim. Also, when a suspended worker is rescued it is essential not to lie them down. Doing so can kill them. They must be put in a seated position for at least 30 minutes, even if unconscious. They should be transported in a seated position as well. The only exception to this rule is to administer CPR. It is mandatory that every worker suspended from fall protection seek immediate medical attention.

Requirements for equipment inspection

Cal/OSHA requires a "competent inspector" to inspect fall protection equipment at least twice a year. If the manufacturer stipulates that the equipment be inspected more often, that recommendation must be followed.

According to Cal/OSHA, a competent inspector is a person who is capable of identifying existing and predictable hazards in the surroundings that make working conditions unsanitary, hazardous, or dangerous to employees. In addition, this person is one who has authorization to take prompt corrective measures to eliminate the hazards.

On campus, EH&S has a competent person to inspect fall arrest and restraint systems. He will visit your site if you make an appointment by calling the EH&S front desk at 642-3073. Departments that use fall protection equipment are responsible for maintaining all inspection documentation and requesting periodic re-inspections.