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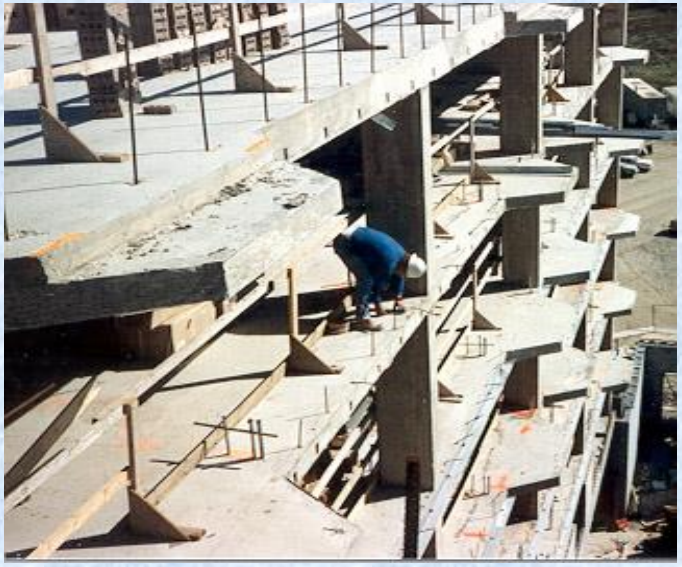
Fall Protection



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Training Objective

After the lecture, attendees will be able to identify fall protection equipment by understanding the ABC principle to a satisfactory level.

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What is fall protection?

Fall protection is the planned system for a worker who could lose his or her balance at height, in order to control or eliminate potential injury.

- Fall protection must be provided when workers are at:
  - 4 feet – general industry
  - 6 feet – construction

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What's the difference between different types of fall protection?

	Fall Prevention	Fall Restraint	Fall Arrest
How does it protect?	Prevents people from reaching the fall hazard by creating a barrier between the person and the fall hazard.	Prevents people from reaching a fall hazard through a tie off system.	Stops a fall that is in progress through a tie off system.
Equipment Needed	No individual equipment	Custom fitted equipment	Custom fitted equipment
Training Needed	None	Yes, extensive and ongoing	Yes, extensive and ongoing
Inspection	After Install and Annually	Every Use by the Individual	Every use by the individual
Maintenance	Annually	Must be inspected and cared before and after every use.	Must be inspected and cared before and after every use.
Potential for Injury	None	Mild	High
Costs	Higher up front costs.	Lower initial costs but hidden costs might be: training, equipment maintenance, and setup time.	Lower initial costs but hidden costs might be: training, equipment replacement, and setup time.
Burden to Laborer	Little to none.	Must inspect and properly wear their equipment.	Must inspect and properly wear their equipment.
OSHA Preference	Preferred because there is the least risk.	Better than fall arrest.	
Example Products	Guardrails and Skylight Screens	A harness and lanyard tied off at a set length from a weighted tie off point.	A harness and retractable tied off to an anchor point.

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Why is fall protection important?

- Falls from heights can cause serious injury or death to workers.
- DOL lists falls as one of the leading causes of traumatic occupational deaths.

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Many workers believe that they have time to regain their balance before they fall — this is not always true. The following table indicates how far you can fall in just a few seconds:

Time (seconds)	Distance (meters)	Distance (feet)
0.5	1.2	4
1	5	16
1.5	11	36
2	20	64
2.5	31	100

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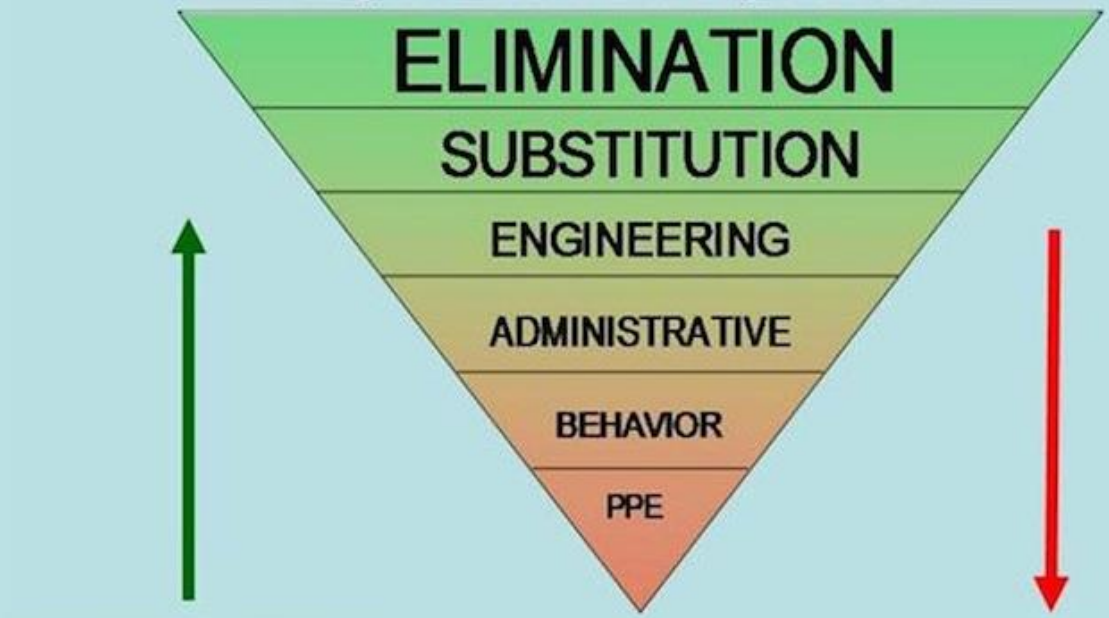
Hierarchy of Control

Apply the highest level of control commensurate with the risk level– lower value controls may be used in the interim until long-term controls are implemented.



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Hierarchy of Fall Protection

It is generally accepted by governing bodies that the hierarchy of fall protection should provide the starting point for considering what type of fall protection system is required.

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Guardrails Systems

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Fall Restraint Systems

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When Stopping A Fall

- Fall arrest system must-
  - Limit max force on an employee to 1,800 pounds when used with a body harness.
  - Be rigged so that an employee cannot free fall more than 6 feet.
  - Bring an employee to a complete stop and limit the employee's max deceleration distance to 3.5 feet.

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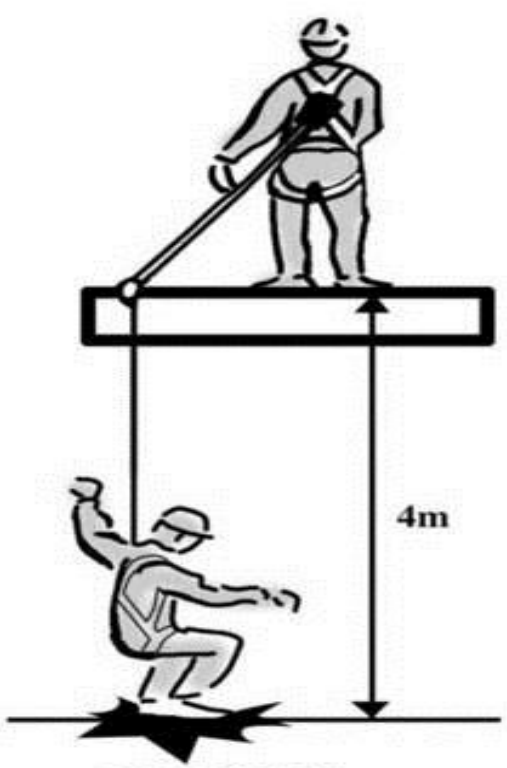
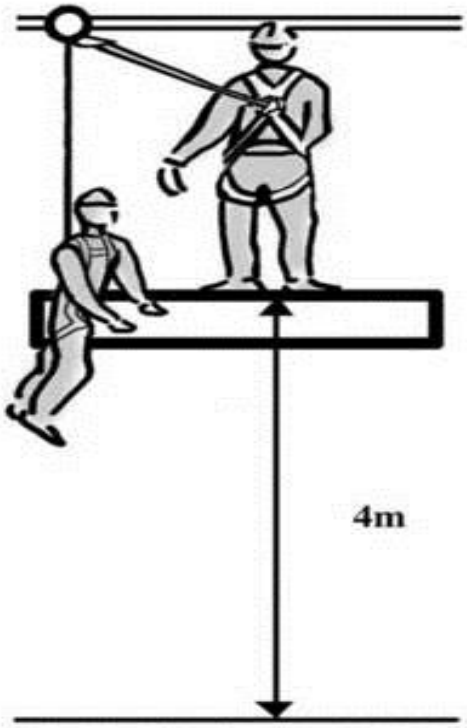


WRONG



RIGHT

Spot the difference.

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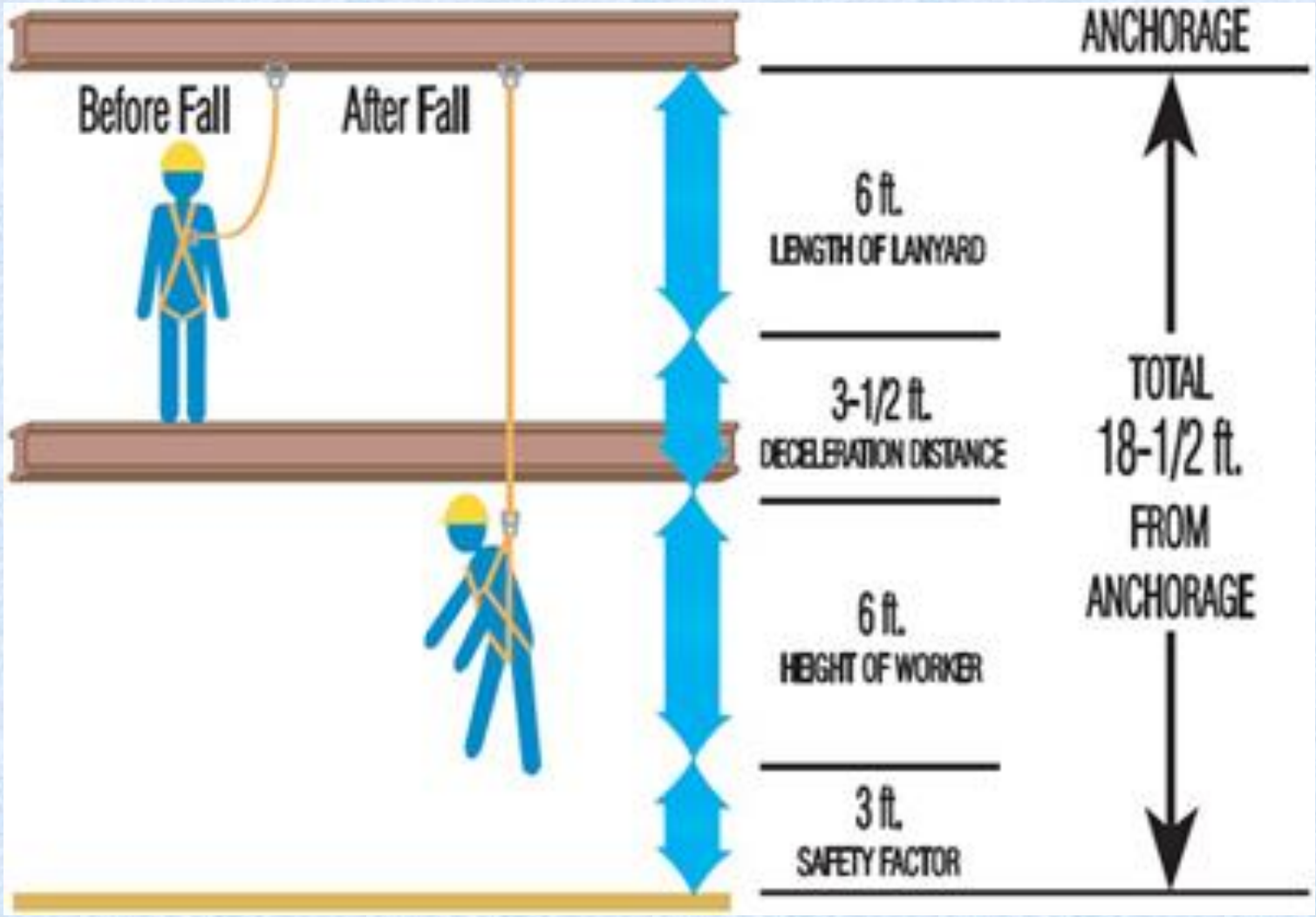

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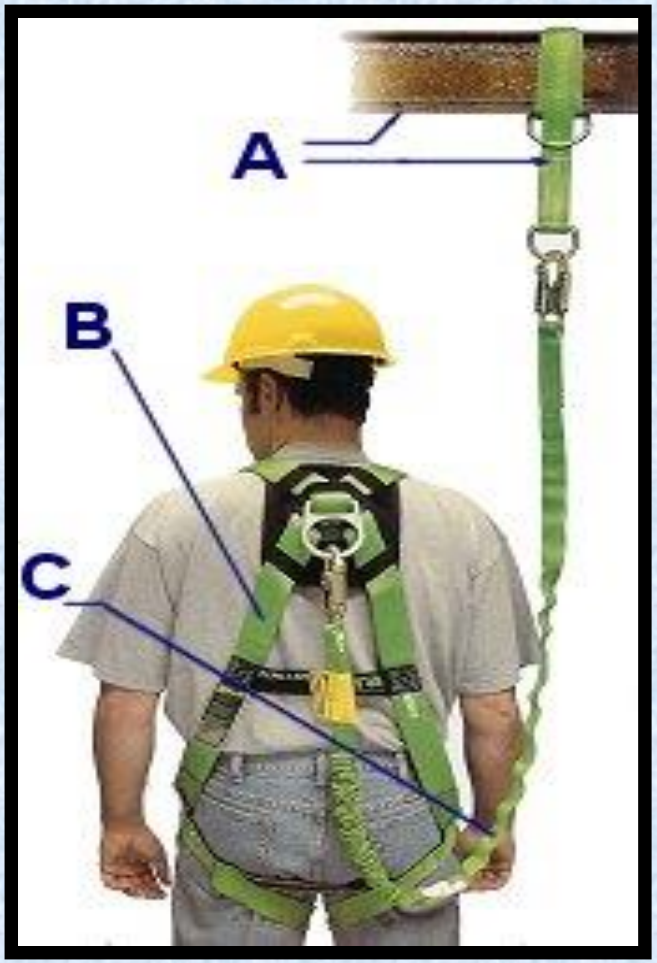
ABC's of Fall Protection

A = Anchorage

B = Body Harness

C = Connecting Device



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A = Anchorage Point

Also known as the tie-off point, this is the point of attachment for the lanyard or lifeline.

Anchor must support 5,000 lbs of pressure or twice the expected load.

Anchor points can be permanent, others are removed once the work is completed.

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Anchorage Point Examples

I-Beam Adjustable Strap

Permanent Roof-top

Roof Tie-Off

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B = Body Harness

Body harness is the combination of straps that distribute the force of the fall over the chest, thighs, waist, pelvis and shoulders.

Harnesses have buckles and adjustable straps for proper fitting. Some are sized while others are universal.

Connecting D-ring should be located right between the shoulder blades.

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B = Body Harness

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TYPES OF HARNESSES

DBI-SALA™ harnesses are available in different types, with various features, depending on their intended use.

MULTI-PURPOSE HARNESS

This type typically includes extra attachment points which allow work in a variety of situations. The belt and pad provide additional back lumbar support, positioning rings and tool carrying options.

WORK POSITIONING HARNESS

These harnesses have positioning D-rings located on the hips for use with pole straps or work positioning lanyards, which allow hands-free operation. Harnesses of this kind may include integral waist belts.

LADDER CLIMBING HARNESS

Harnesses with a frontal attachment point, for connection to permanent ladder safety systems.

DESCENT CONTROL HARNESS

These harnesses typically have frontal attachment points for use with descent control devices.

CONFINED ENTRY/RETRIEVAL HARNESS

One attachment point located on each shoulder strap facilitates upright retrieval from confined spaces.

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Step 1

Hold harness by back D-ring. Shake harness to allow straps to fall in place.

Step 2

If chest, leg and/or waist straps are buckled, release straps and unbuckle at this time.

Step 3

Slip straps over shoulders so **D-ring is located in middle of back between shoulder blades.**

Step 4

Pull leg straps between legs and connect to opposite end. Repeat with second leg strap. If belted harness, connect waist strap after leg straps.

Step 5

Connect chest strap and position in midchest area. Tighten to keep shoulder straps taut.

Step 6

After all straps have been buckled, **tighten all buckles so that harness fits snug but allows full range of movement.** Pass excess strap through loop keepers.

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C = Connecting Device

Connecting devices link the body harness to the anchor point.

Lanyards, retractable lifelines and shock-absorbing lifelines are different types of connecting devices.

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SHOCK ABSORBING LANYARDS

Lanyards used for fall protection must include a shock absorber to dissipate the energy of the fall, limiting the forces on the body of the falling worker.

SHOCK ABSORBING STRETCH LANYARDS

For added flexibility and safety, the DBI-SALA ShockWave™ and EZ-Stop® Retrax™ lanyards are available with an expansion and contraction feature that allows them to be extended when length is needed and then contracted with the movement of the worker to avoid trips, falls and snags.

POSITIONING LANYARDS

Rope or web lanyards without shock absorbers may be used for applications that require positioning or restraint of a worker or if the fall possibility is less than 2' (0.6m).

DOUBLE LEG LANYARDS OR 100% TIE-OFF LANYARDS

(Two lanyards that are connected at one end.) This style of lanyard is used to provide 100% tie-off. It allows you to stay protected while you move from one location to another.

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It's a System

- Individually these components will not provide protection from a fall.
- However, when used properly and in conjunction with each other they form a personal fall protection system that becomes a vital part of your safety.

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Equipment Do's and Don'ts

- Do inspect for wear and damage before use.
- Do remove from service after a fall for inspection.
- Don't use to lift materials.
- Don't attach to guardrails or hoists.

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Snaphooks

- Snaphooks must have a minimum tensile strength of 5,000 pounds, and be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or becoming permanently deformed.

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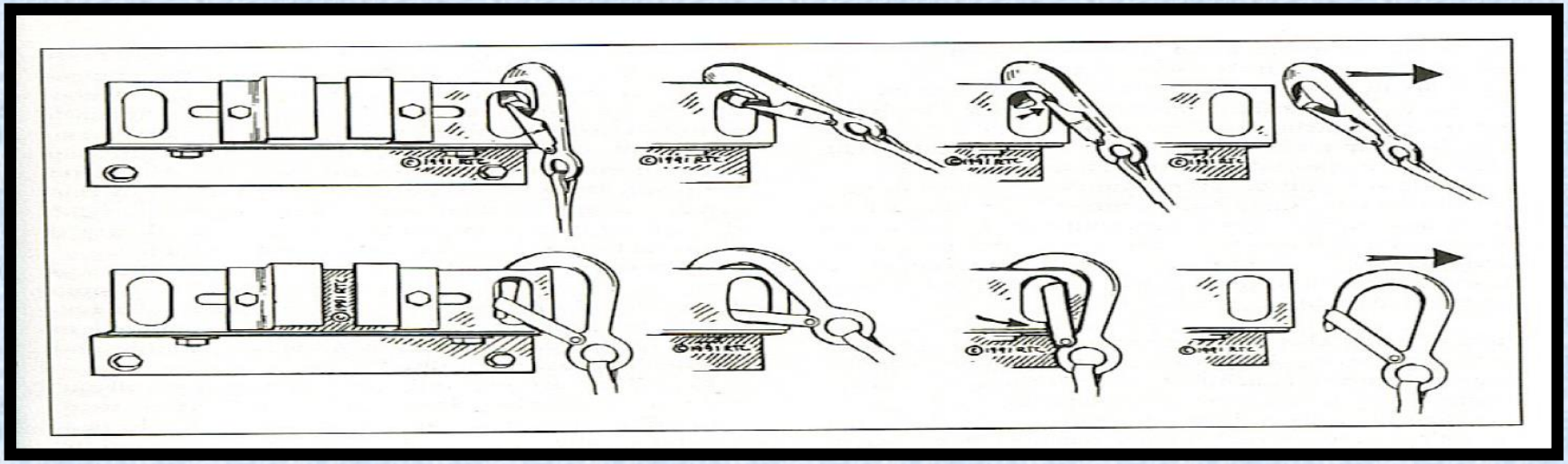
Rollout

- Rollout occurs when the snaphook disengages from the anchor point.



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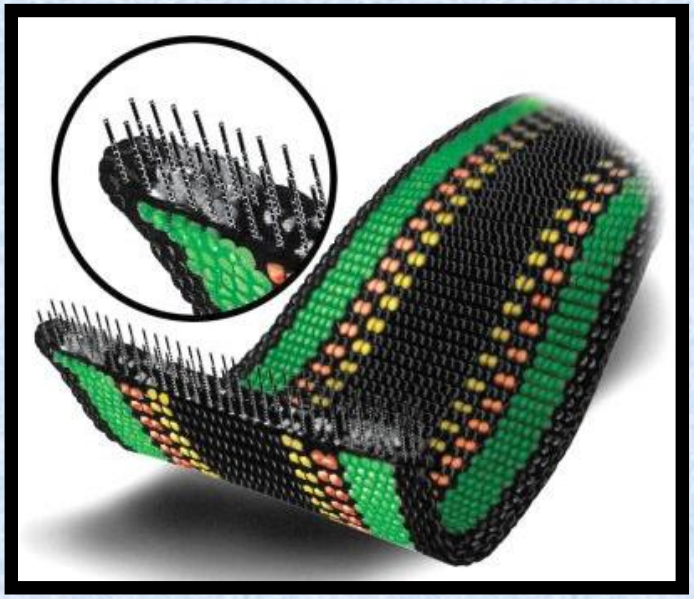
Webbing

Webbing are the ropes and straps used in lifelines, lanyards, and strength components of body harnesses. The webbing must be made of synthetic fibers.



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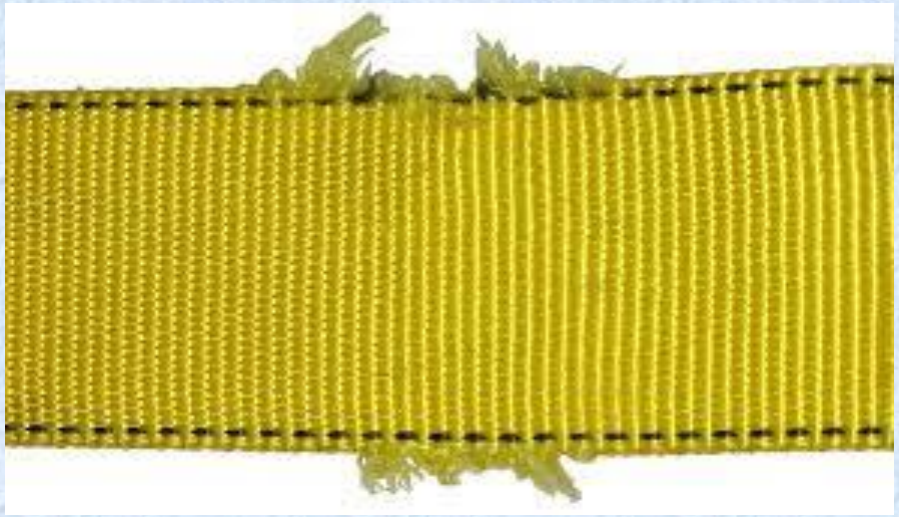
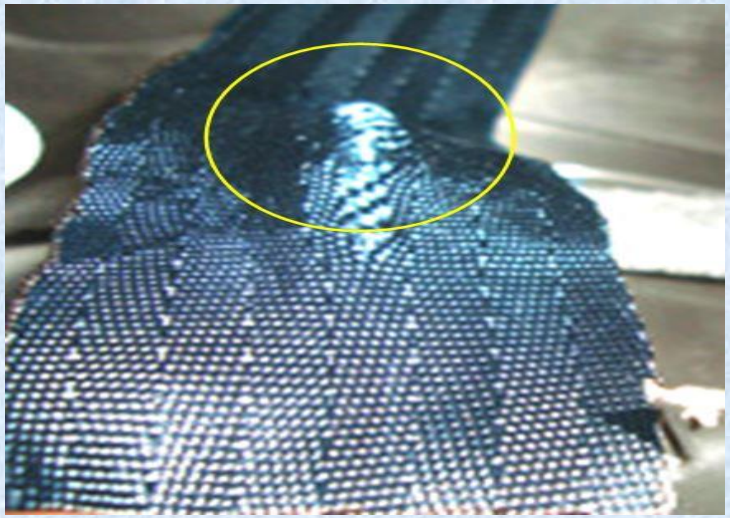
Damaged Webbing





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Fall Protection Rescue

- The hierarchy of fall protection rescue is simple:
  - **self-rescue by the worker who has fallen,**
  - **assisted rescue by co-workers, and, if all else fails,**
  - **calling in professional rescuers, example Fire Department.**

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Must be independent of any platform anchorage and capable of supporting at least 5,000 lbs. per worker

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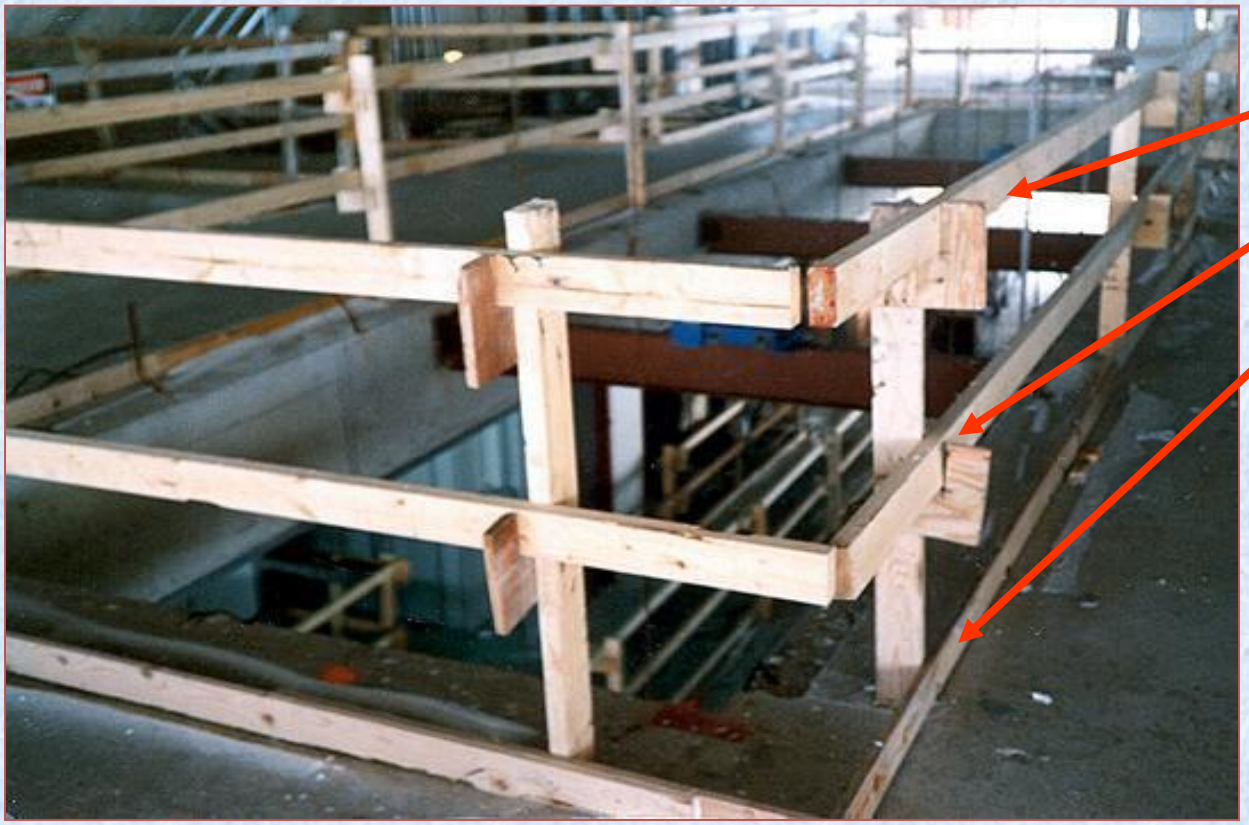

- Top rails between 39 and 45 inches tall
- Toeboards at least 3 1/2 inches high

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Review

- Defined fall protection
- Discussed importance of fall protection
- Identified ABC's
  - Anchorage
  - Body Harness
  - Connecting Device
- System works together
- Identified good and bad examples

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