

**FPST 2023 Industrial and Occupational Safety
Fall Protection – Part 2**

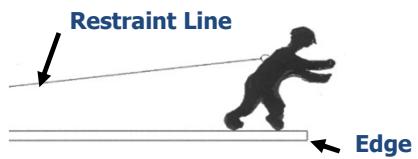


Source: OSHA

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Fall Restraint



- Fall restraint assumes the employee cannot reach the edge
- He is basically on a short leash
- If the employee could reach to the edge and fall over the edge, he must be in fall arrest

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Use of Restraint Cables

Example of restraint cables used during deck anchoring.



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Fall Prevention Needed

- Tower Construction
 - Many construction deaths from falling happen here
 - Workers fall while talking on cell phones and using pagers
 - Fall from towers cause the most deaths on construction sites



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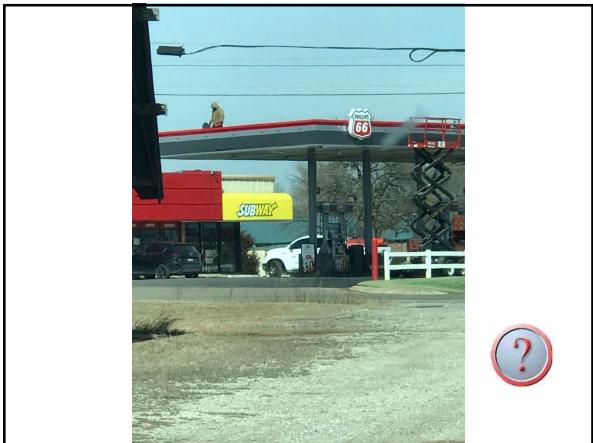


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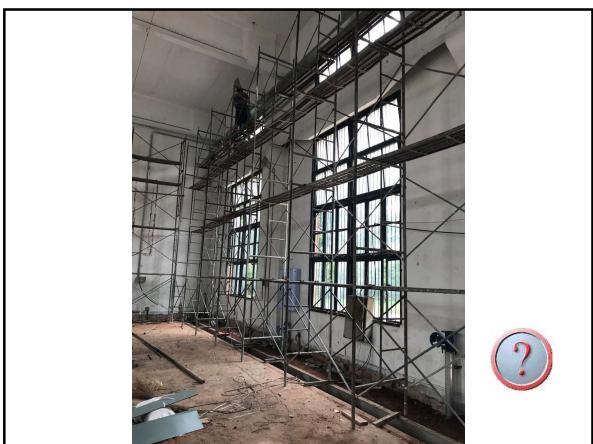


Must have guardrails or something similar

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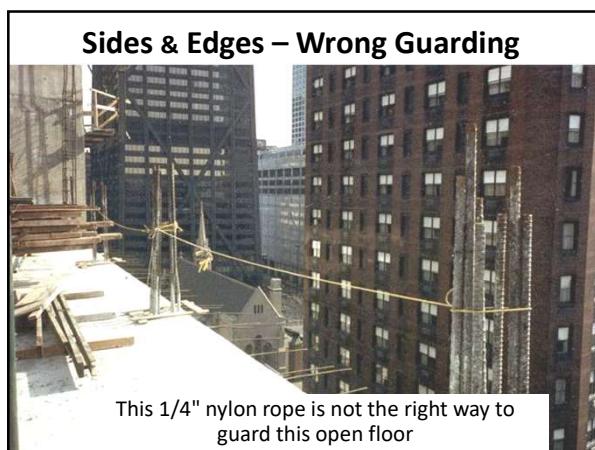
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Floor Holes



- Cover completely and securely
- If not, use personal fall arrest system

Improperly protected

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Fall Prevention Needed

- Concrete Forms and Rebar



- Use personal fall arrest system when working on formwork or rebar
- Cover or cap protruding rebar

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Fall Prevention Needed

- Excavations

- Guard excavations more than 6 feet deep



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Fall Prevention Needed

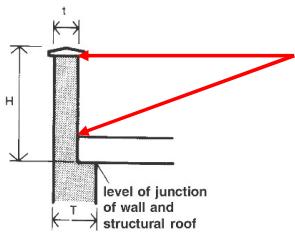
- Decking and Plywood



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Fall Prevention Needed

- Roofs
 - Parapets height must be 42 inches +/- 3 inches.



<http://www.carryduffdesigns.co.uk>

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Fall Prevention Needed

- Wall Openings

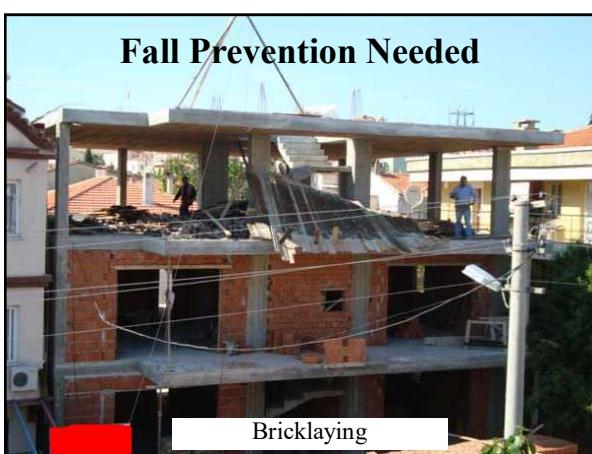


Wall opening

Workers must be protected from wall openings 6 feet or more above lower levels

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Fall Prevention Needed



Bricklaying

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Fall Prevention Needed

- Residential Buildings



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Flat/Low Slope

- 4:1 Slope or Less
 - Roof Pitch Factor App
- Beyond the Use of Guardrails, OSHA Allows the Use of
 - Warning Lines
 - Safety Monitors
- Recommended:
 - Guardrails or PFAS where feasible
 - *Limited* use of lines and monitors on flat roofs only

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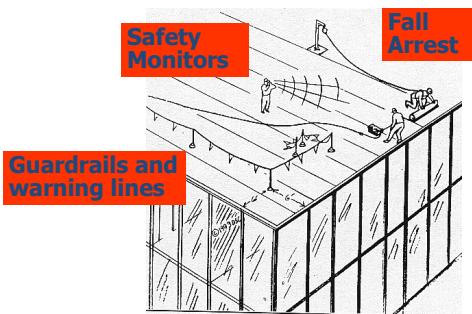
Fall Protection for a Low Slope roof

- Low Slope Roof
 - Guardrail
 - PFAS
 - Warning Line/Safety Monitor



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Methods of Roof Fall Prevention



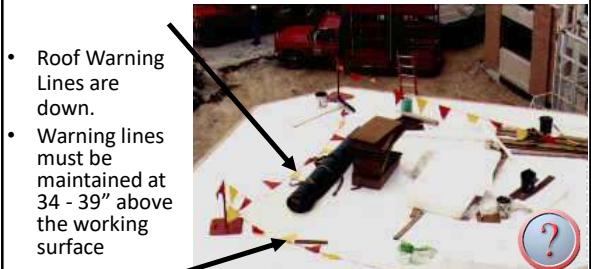
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Roof Warning Lines

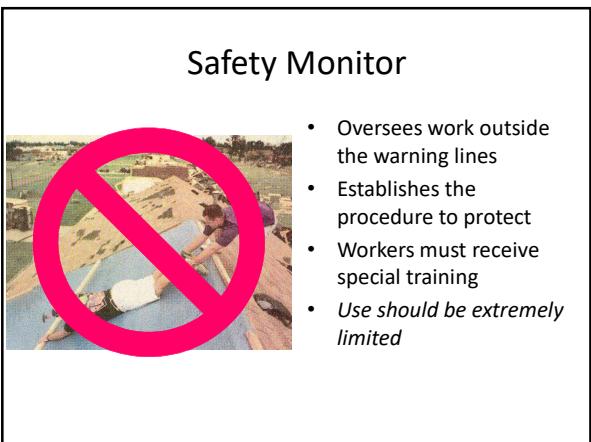
- Must be 6 feet back from edges
(10' with equipment)



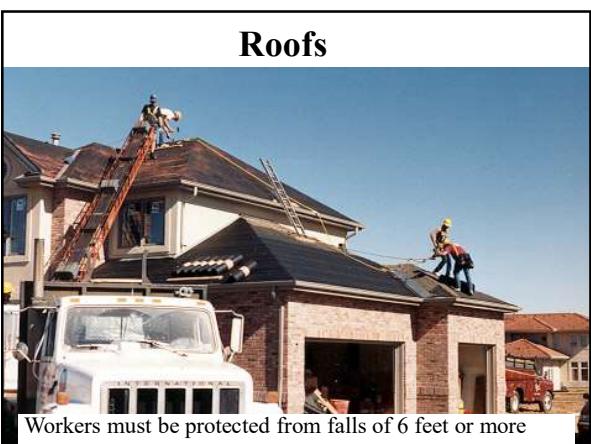
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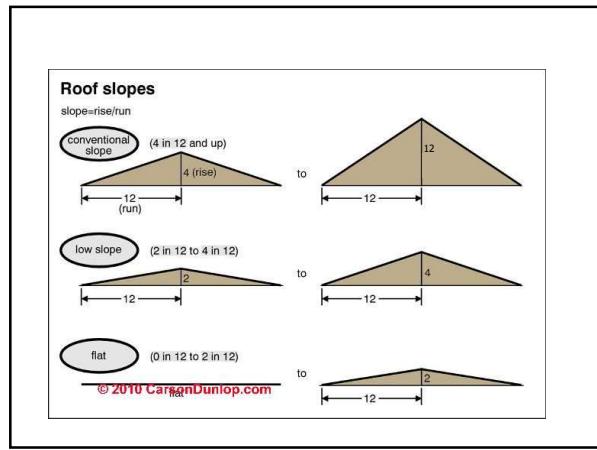
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High Slope

- Over 4:1 Slope
- OSHA Mandates
 - Guardrails
 - Catch Platforms
 - Nets
 - Restraint Devices
 - Personal Fall Arrest Systems (PFAS)

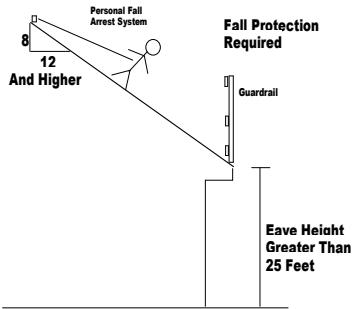
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Residential-type Roof

(Over 8:12 pitch or over 25 feet high)

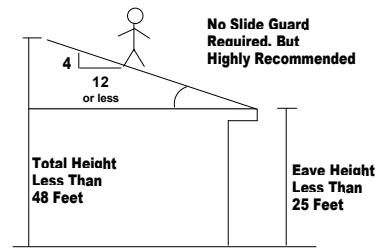


- Guard rail and Personal Fall Arrest System must be used

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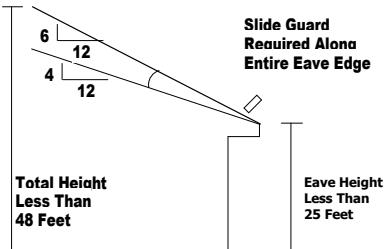
Residential-type Roof Requirements (4:12 or less)

- Safety Monitors must not be performing work
- Warning lines are OK 6 feet back



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Residential-type Roof Requirements (4:12 - 6:12)

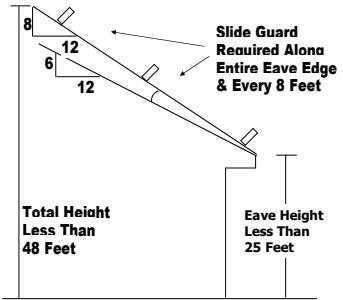


- Guards must be extend across entire eave

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Residential-type Roof Requirements (6:12 - 8:12)

- While standing on the plank below, the employee must secure roof jacks, then climb up to the plank and continue to install the roof
- Remove in reverse order



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Roof Edge Slide Guards



- Slide guard must extend across the entire eave.

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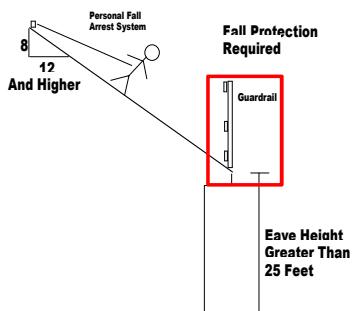
What's Wrong on this 6:12 Roof?



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Residential-type Roof
(Over 8:12 pitch or over 25 feet high)

- Conventional fall protection must be utilized.



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Roof Guardrails



Guardrails are a positive option on high slope roofs

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Fall Prevention Planning

- Fall prevention systems and work practices must be in place before you start work.
- These must be prepared by a qualified person.
- Plan shall be maintained at the job site
- Qualified person should supervise the plan

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Fall Prevention Planning

- A fall prevention plan identifies places where regular fall prevention methods, such as guardrails, cannot be used.
- These are called Controlled Access Zones.
- Safety monitoring system should be installed in Controlled Access Zones

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Competent Person

- Means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them.

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Qualified Person

- Means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter

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Training

Employers must provide fall prevention training

The training is to teach you:

- How to see hazards
- How to reduce hazards



The training must cover:

- Fall hazards
- Fall prevention systems
- Use of fall prevention devices

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Fall Rescue Procedures

- What is the most amount of time for an employee to remain hanging from a harness and lanyard after falling or being ejected from a work platform?
- **The employee should not be hanging more than four minutes after being found.**

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Suspension Trauma

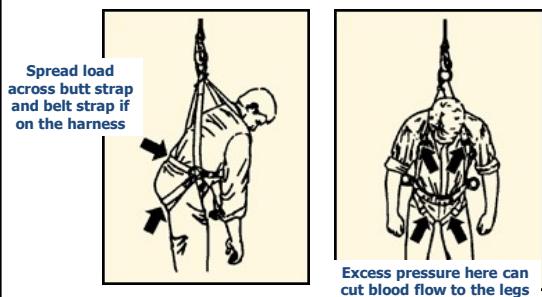
Orthostatic Intolerance

- Blood accumulates in veins
- Can occur after 4-15 min of suspension



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Harness Pressure Points



Some studies have indicated permanent damage to the lower extremities when the worker hangs for more than twenty (20) minutes

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Rescue

- Other rescue devices:
- Block & tackle systems
- Tripods
- Hoists & rescuers

An illustration showing several pieces of rescue equipment: a coiled orange and red rope, a purple tripod, a yellow pulley system with a green wheel, a black bag-like device, and a long metal pole.

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Rescue

A photograph of a worker wearing a yellow hard hat and safety harness being hoisted vertically by a red and black rescue hoist system. The background shows a green landscape under a clear blue sky.

A close-up photograph of a black and orange pulley system with a gold-colored carabiner attached to a strap.

<https://www.youtube.com/watch?v=zJmmvd0QSoA>

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Work Positioning



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Summary

- If you can fall more than 4 or 6 feet, you must be protected.
- Use fall prevention on:
 - walkways & ramps, open sides & edges, holes, concrete forms & rebar, excavations, roofs, wall openings, bricklaying, residential construction
- Protective measures include guardrails, covers, safety nets, and Personal Fall Arrest Systems
