

Welcome!

This training is provided as a service to the residential construction industry by:



Disclaimer

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- This presentation is intended to discuss Federal Regulations **only** - your individual State requirements may be more stringent as many states operate their own state OSHA and they may have adopted construction standards that are different from information presented in this training. If you live in a state with an OSHA approved state plan, you should contact your local administrator for further information on the standards applicable in your state.
- These materials are meant for informational purposes only.
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Disclaimer, cont.

- It is not the intent to provide compliance-based training in this presentation, the intent is more to address hazard awareness in the residential construction (i.e. home building) industry, and to recognize the overlapping hazards present in many construction workplaces.
- Photos shown in this presentation may depict situations that are not in compliance with applicable OSHA/safety requirements.
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- It is the responsibility of the employer and its employees to comply with all pertinent OSHA/safety rules and regulations in the jurisdiction in which they work.

Course Objectives

1. Identify the importance of fall protection.
2. Recognize fall hazards that are common in residential construction.
3. Determine the appropriate fall protection system and method to use for a given hazard.
4. Identify OSHA fall protection requirements.
5. Identify safe work practices for framing operations, roofing operations, and other leading edge work activities.
6. Identify safe work practices for ladders and scaffolding.

Course Agenda

- **Introduction:** Overview of OSHA
- **Section 1:** Overview of Fall Protection
- **Section 2:** Fall Protection Systems
- **Section 3:** Framing Operations
- **Section 4:** Roofing Operations
- **Section 5:** Ladder and Scaffold Safety
- **Section 6:** Alternative Fall Protection

Overview of OSHA

- Occupational Safety and Health Administration (OSHA).
- The mission of OSHA is to save lives, prevent injuries and protect the health of America's workers.

What does OSHA do?

- Develops job safety and health standards and enforcing them through worksite inspections,
- Maintains a reporting and recordkeeping system to keep track of job-related injuries and illnesses, and
- Provides training programs to increase knowledge about occupational safety and health.

OSHA Standards

- OSHA develops and enforces standards that both employers and employees must follow.
- OSHA has specific standards, rules and regulations on fall protection.

Employer Responsibilities

- Provide a workplace free from recognized hazards and comply with OSHA standards
- Provide training required by OSHA standards
- Keep records of injuries and illnesses
- Provide medical exams when required by OSHA standards and provide workers access to their exposure and medical records

Employer Responsibilities, cont.

- Not discriminate against workers who exercise their rights under the Act (Section 11(c))
- Post OSHA citations and abatement verification notices
- Provide and pay for most PPE

What are Workers' Responsibilities?

- Follow the employer's safety and health rules and wear or use all required safety equipment
- Follow safe work practices for your job, as directed by your employer
- Report hazardous conditions to a supervisor or safety committee

What are Workers' Responsibilities?, cont.

- Report hazardous conditions to OSHA, if employers do not fix them
- Cooperate with OSHA inspectors
- Read the OSHA poster

What are Workers' Rights?

- A safe and healthful workplace
- Know about hazardous chemicals
- Information about injuries and illnesses in your workplace
- Complain or request hazard correction from employer

What are Workers' Rights?, cont.

- Training
- Hazard exposure and medical records
- File a complaint with OSHA
- Participate in an OSHA inspection
- Be free from retaliation for exercising safety and health rights

Filing a Valid Complaint

- Any employee who believes their job is unsafe because of unprotected hazards may file a complaint through OSHA, either:
 - Online (www.OSHA.gov)
 - By Fax or Mail
 - By Telephone (1-800-321-OSHA)
- **Note:** it is unlawful to make any false statements in a complaint, and you may face a fine up to \$10,000 for doing so.



Section 1

Overview of Fall Protection





Learning Objectives: Section 1

- State why fall protection is important.
- Identify common fall hazards in residential construction.
- Define “residential construction”.
- Understand the importance of fall protection training
- Understand competent and qualified persons requirements.

Introduction To Fall Protection

- The goals of this course are to help you:
 - understand how to correct or eliminate fall hazards on your job sites
 - understand the OSHA fall protection requirements
 - gain a more thorough understanding of OSHA regulations applicable to home building

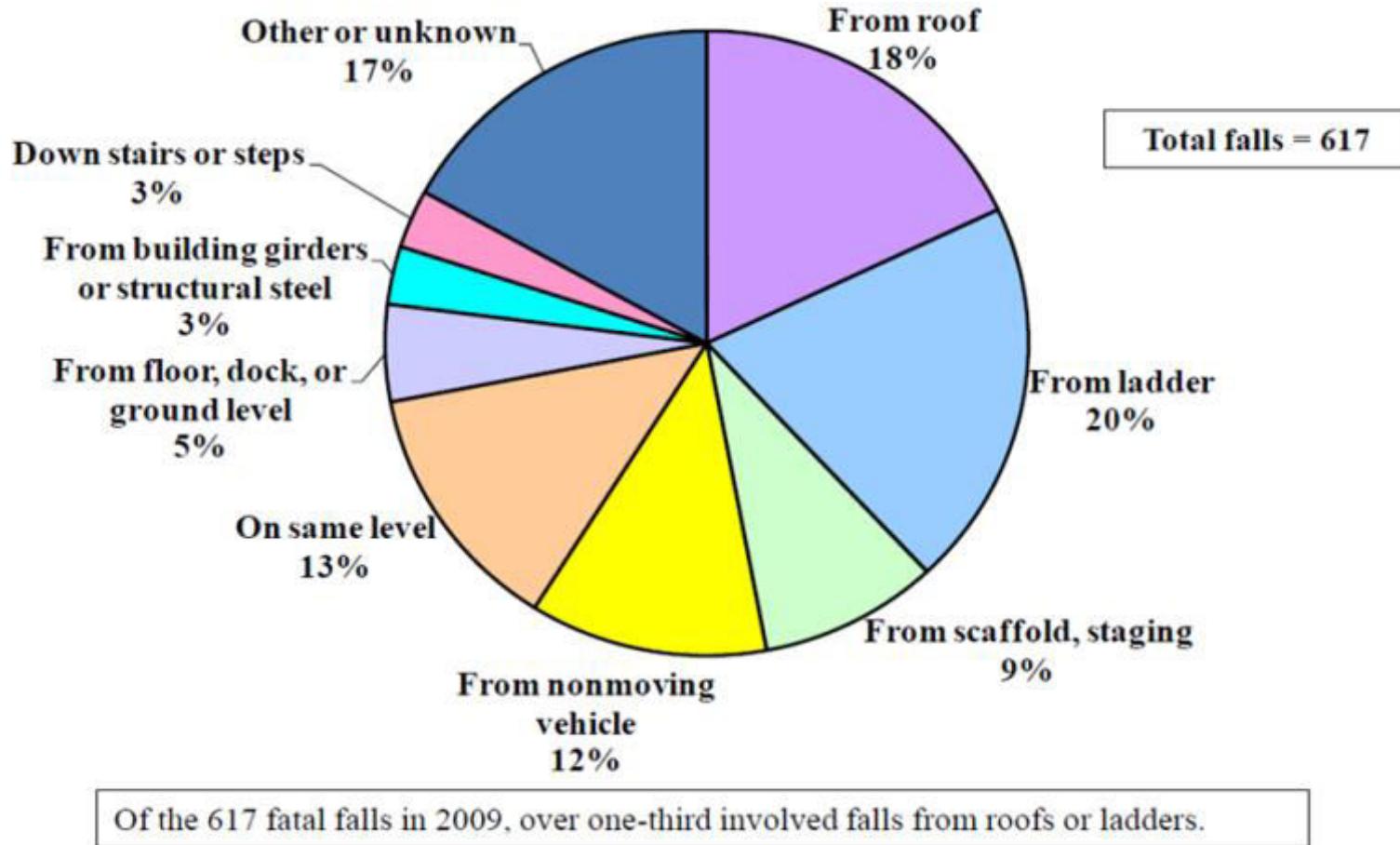
Introduction To Fall Protection, cont.

- Participants can use the information from this seminar to:
 - Provide training to employees
 - Develop fall protection best practices for employees to use on the jobsite
 - Implement a fall protection plan, as needed, in accordance with §1926.502(k) (**Discussed in Section 6**)

Why Is Fall Protection Important?

- Falls are the leading cause of serious and fatal injuries in residential construction.
- **49%** of all residential construction fatalities are from falls.
- **617** workers died from falls in 2009.
- Nearly 2 out of every 5 fatalities caused by falling from roofs.

Fatal Falls, By Type (2009)*



*Data for 2009 are preliminary.

NOTE: Percentages may not add to totals due to rounding.

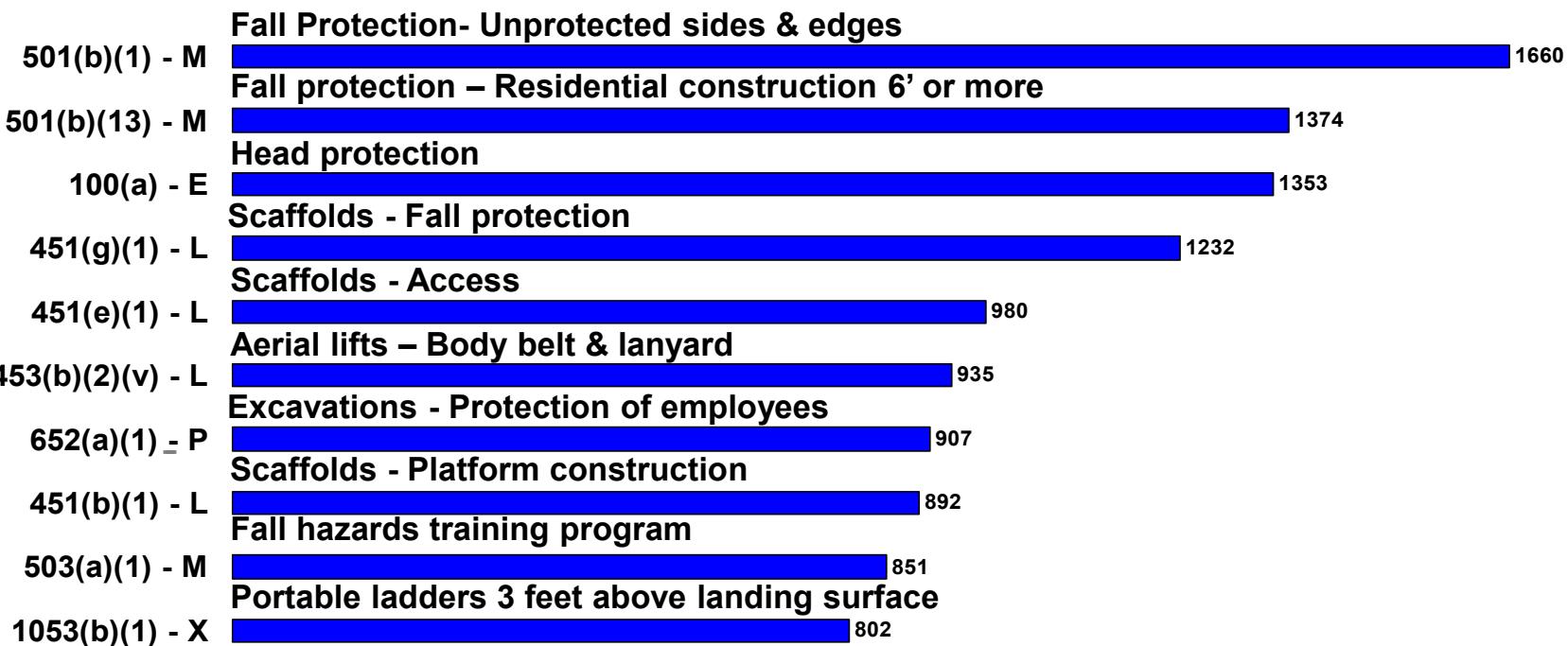
SOURCE: U.S. Bureau of Labor Statistics, U.S. Department of Labor, 2010.

Rev: 8-2011

Most Frequently Cited Serious Violations In Construction

Top 10 OSHA Citations

Standard & Subpart - 1926



Recent News

- **\$106,400** penalty for failing to provide fall protection on a residential construction jobsite in Illinois.
- **\$128,000** penalty for failing to provide fall protection or wear reflective vests in high automobile traffic areas at a home building jobsite in Idaho.
- Criminal prosecution doubled in 2008 from previous years.

Fatal Accidents

Accident #1 **What are the fall hazards?**

A worker was walking along a one-story pitched roof on a residential structure as he was installing flashing around PVC pipe roof vents. He was near the peak of the roof, when he fell through a fireplace chimney opening.

The worker fell at least 20 ft. (6.1 m) to the fireplace pit area and was killed.

The roof hole had been covered with approximately 1½ inch (3.8 cm) flat Styrofoam sheeting.

Fatal Accidents, cont.

Accident #2 **What are the fall hazards?**

A drywall finisher was sanding the ceiling in a second floor hallway.

He was standing on an open-sided floor above the concrete first floor, when he slipped off the edge and fell 10 ft. (3 m) to the first floor and sustained fatal injuries.

Guardrails had been in place previously but had been removed to move supplies such as doors, drywall, and windows to the second floor.

Identifying Fall Hazards

Activity #1

Where Do You Start?

- Understand OSHA Fall Protection Regulations.
- Evaluate fall hazards and implement conventional fall protection systems.
- Train workers to identify hazards.
- Appoint a competent person responsible for fall protection on the jobsite.
- Develop a written fall protection plan, as needed, in accordance with §1926.502(k).

What is “Residential Construction”?

- *Residential construction* is defined as construction activity that combines these two elements:
 1. Residence Requirement: the **end-use** of the building must be a home or dwelling.
 2. Wood Frame Construction Requirement: building must be constructed using **traditional** wood frame construction **materials and methods**. This includes limited use of structural steel in a predominantly wood framed home, such as a steel I-beam to support wood framing.

Is This “Residential Construction”?



Is This “Residential Construction”?



Is This “Residential Construction”?



Is This “Residential Construction”?



Evaluate Fall Protection Systems

- Competent person must evaluate the appropriate protective systems, this involves:
 - Choose the appropriate system for each unique hazard and situation
 - Ensure employees are properly trained on fall protection systems chosen
 - Understand manufacturer's recommendations and limitations of fall protection systems

Fall Protection Training

Employers must train employees to:

- Understand the correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems
- The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other methods of fall protection to be used

Fall Protection Training, cont.

Employers must train employees on:

- Proper use of fall protection equipment
 - Example: always inspect harness before each use and use approved anchor points.

Fall Protection Training, cont.

Employers must train employees on:

- The nature of fall hazards in the work area
- Correct procedures for erecting, maintaining, disassembling and inspecting the fall protection systems to be used
- The use and operation of conventional fall protection systems
- The role of each employee in the fall protection system used

Fall Protection Training, cont.

Employers must train employees on:

- The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs
- The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection
- The role of employees in fall protection plans

Fall Protection Training, cont.

Employers must certify training:

- Written certification must include:
 - Name of employee trained
 - Date of training
 - Signature of person conducting training
- Latest training certification must be maintained
- Retrain employees when employer has reason to believe it is necessary or changes have been made to fall protection.

Competent Person Responsibilities

Designated *competent person*:

- Responsible for identifying existing and predictable hazards
- Has authority to **eliminate** fall hazards
- Has authority to **stop work** if unsafe conditions exists
- Has authorization to take prompt corrective actions to eliminate them

Qualified Person

- A qualified person:
 - Has a recognizable degree, experience, professional standing, or through extensive knowledge, training and experience has demonstrated the ability to resolve subject matter issues.
 - Responsible for design, installation, use and supervision of anchorage points as part of a complete personal fall arrest system.



Section 2

Fall Protection Systems

Learning Objectives: Section 2

- Identify when fall protection is required.
- Identify types of “conventional” fall protection systems.
- Determine which protection system to use for a given fall hazard.
- Identify key requirements and basic safety practices for each protection system.







HARD
WOOD

WALNUT













When Is Fall Protection Required?

OSHA §1926 Subpart M

- Where workers on a residential construction site are exposed to vertical drops of **6 feet** or more, OSHA requires that employers provide fall protection in one of three ways before work begins:
 - 1) Conventional Fall Protection
 - 2) Other Work Methods (Section 5)
 - 3) Alternative Fall Protection (Section 6)
- 

“Conventional” Fall Protection Options



1) Guardrails



2) Covers



3) Personal Fall Arrest System (PFAS)

We'll look at each of these.

Guardrail Systems

- Barrier built to OSHA specifications; constructed to prevent workers from falling to lower levels
- Protects against these hazards:
 - Window and Wall Openings
 - Unprotected Sides and Edges
 - Floor Holes

Guardrail Systems Are Needed For:

- Stairwell Openings
- Open-sided Wall Openings
- Second and Third Story Non-loading Bearing Walls When the Studs Are 24" OC
- Low (Less Than 39") Silled Windows
- Second and Third Story Deck Floor Holes for Open Foyers or Cat Walks
- Sliding Glass and French Door Openings Onto Decks and Porches
- Skylight Openings Cut Into the Roof

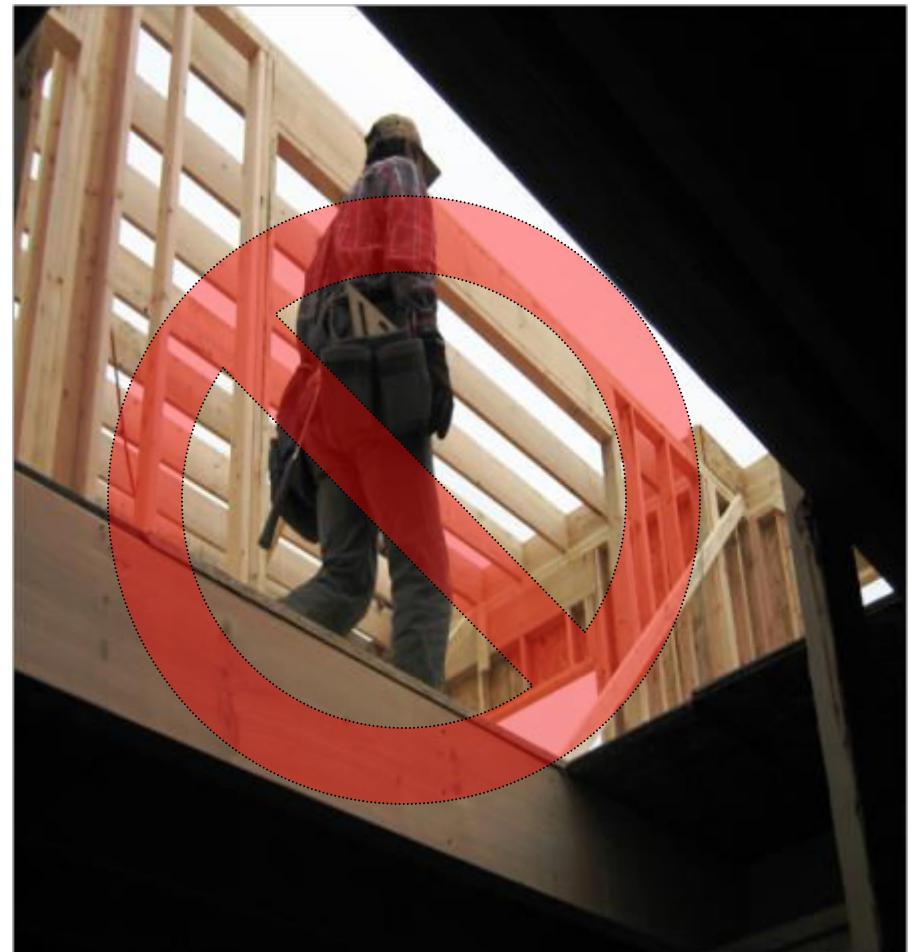
Requirements for Guardrails

- Height Requirements
 - Toprail
 - 42 in. (1.1 m)
 - Midrail
 - 21 in. (50 cm)
 - Toe Board
 - Minimum of 3-1/2 in. (4 in. nominal) (10.2 cm)

Requirements for Guardrails, cont.

- **Vertical Supports**
 - Install no more than every 8 ft. (2.4 m)
- **Weight Requirement**
 - Must support at least 200 lbs. (90.9 kg) of force outward and downward along top edge

Unguarded floor openings



Unguarded Stair Opening







Top-rail @ 42"



Mid-rail @ 21"



Toeboard min. 3-1/2"

Wall openings greater than 18" need to be protected

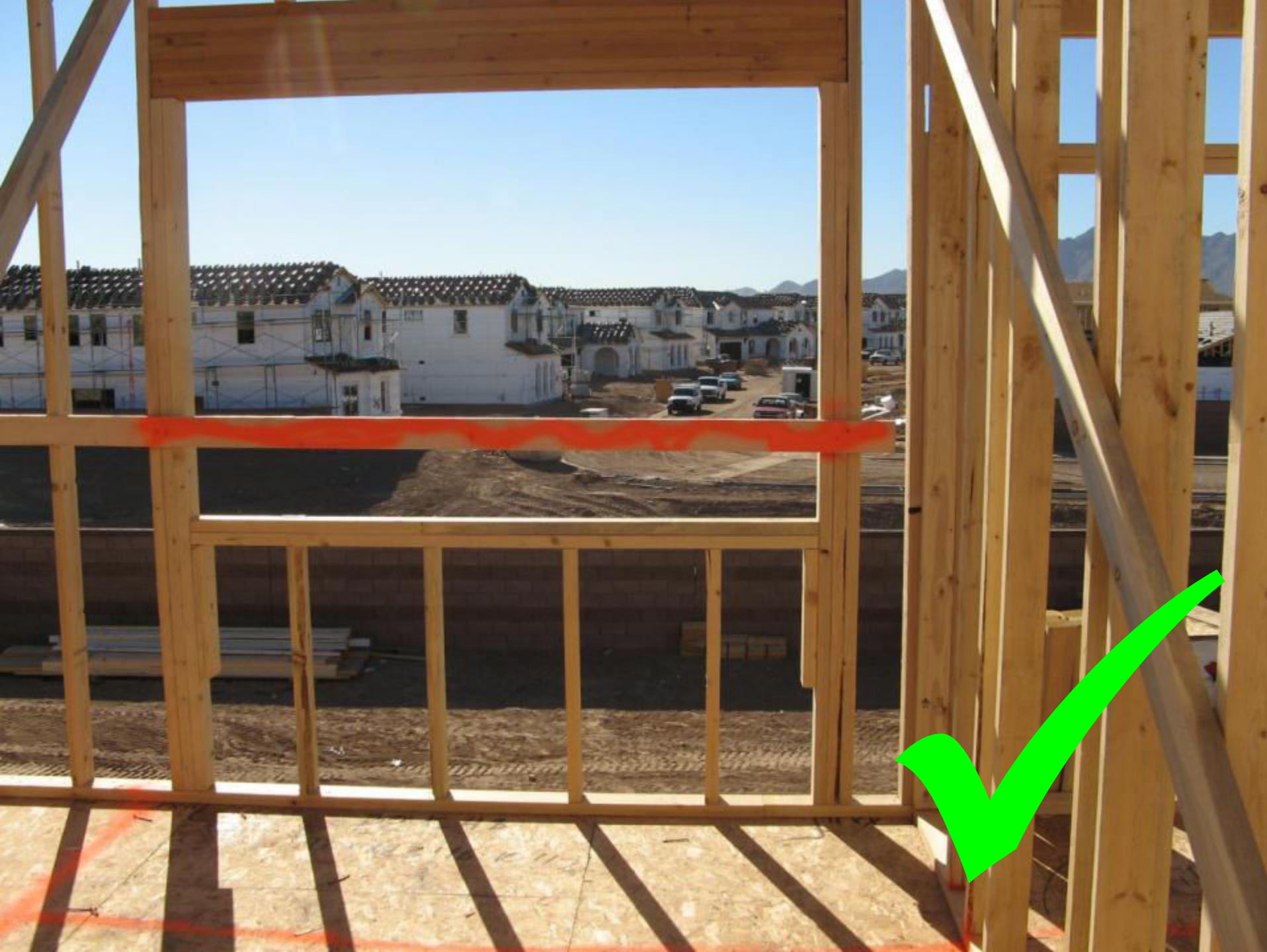


Wall openings greater than 18" need to be protected



24" On Center Studs need guardrails





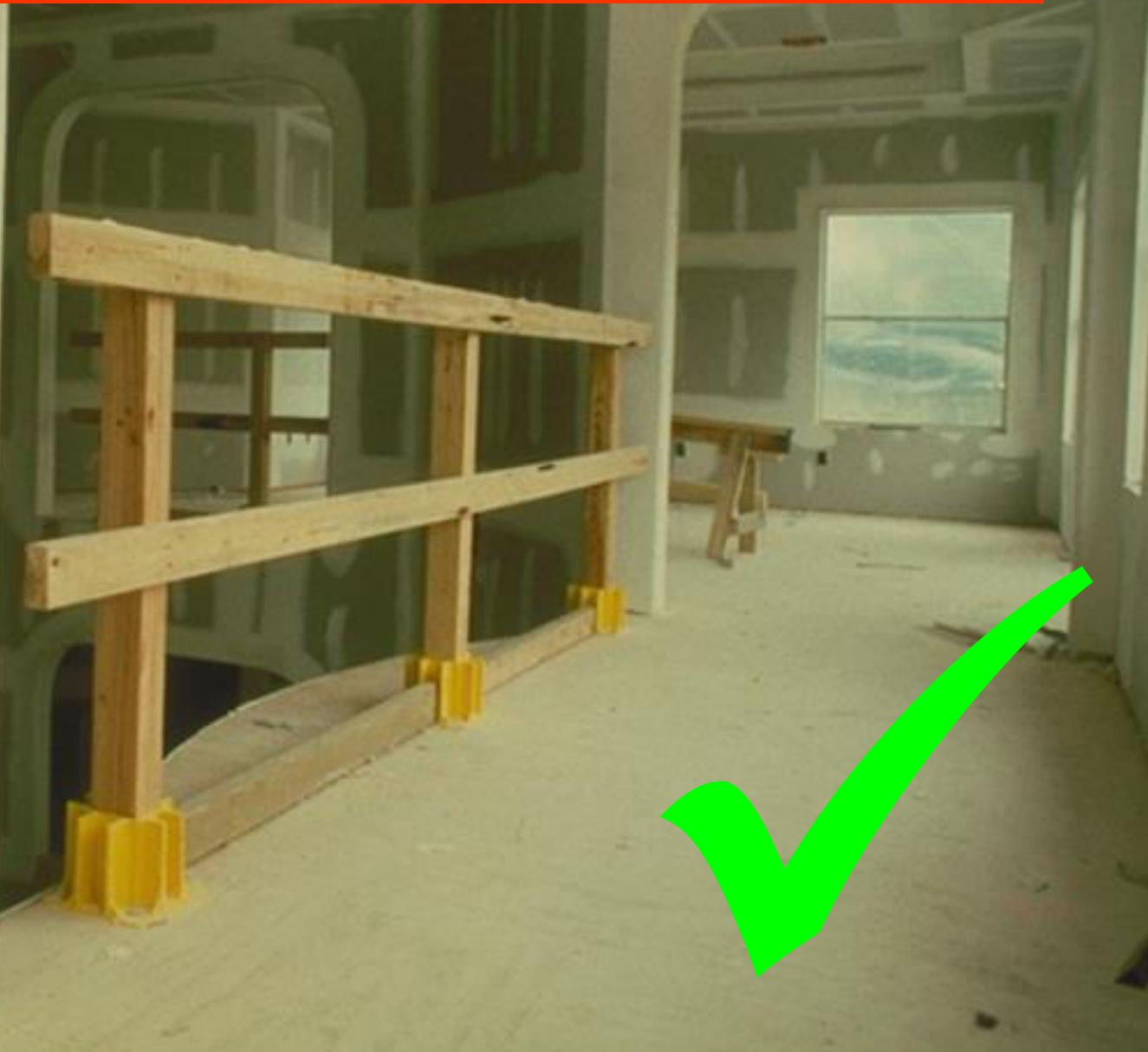
Guardrails During Drywall Installation

- Prevent the need to remove guardrails during drywall installation:
 - Build guardrail uprights 6 to 12 in. (15.4 to 30.5 cm) away from where drywall will be placed





A boot type system, shown here, will allow guardrails to be installed approximately 12 in (30.5 cm) from drywall placement.



Job Built Guardrails



Cut The Post Through The Floor, nail LVL or Floor Truss



A Free Standing Guardrail System



Rear Doors Must Be Protected



Install Permanent Guardrail As Soon As Door Is Set



Alternate Solution – Reverse Locks to Inside and Key Lock Door



Guardrails For Elevated Workers

- When using stilts, increase the height of the top edge of the top rail to an amount equal to the height of the stilts.

Double Top Rail for Workers on Stilts



Unprotected Sides/Edges

- Completed decks
- Lofts
- Stair landings
- Ramps or runways
- Open-sided balconies and platforms





Greater Than 6' Fall

Requirement for Window Openings

- Window openings with a 6 ft. fall hazard (1.8 m) require the installation of a guardrail system, **if the bottom sill height is less than 39 in. (1.1 m).**

For all window openings, the sill height determines the need for a guardrail.

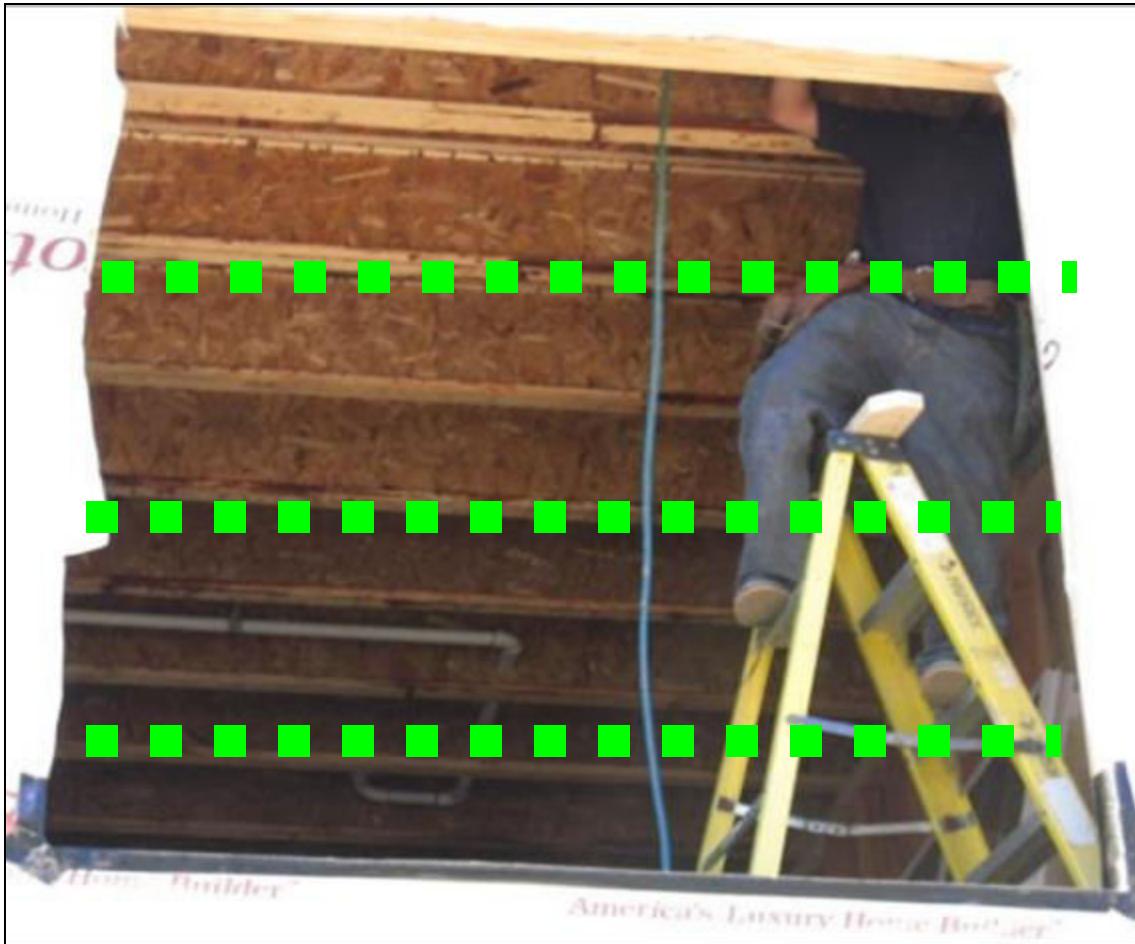


Less than 39"



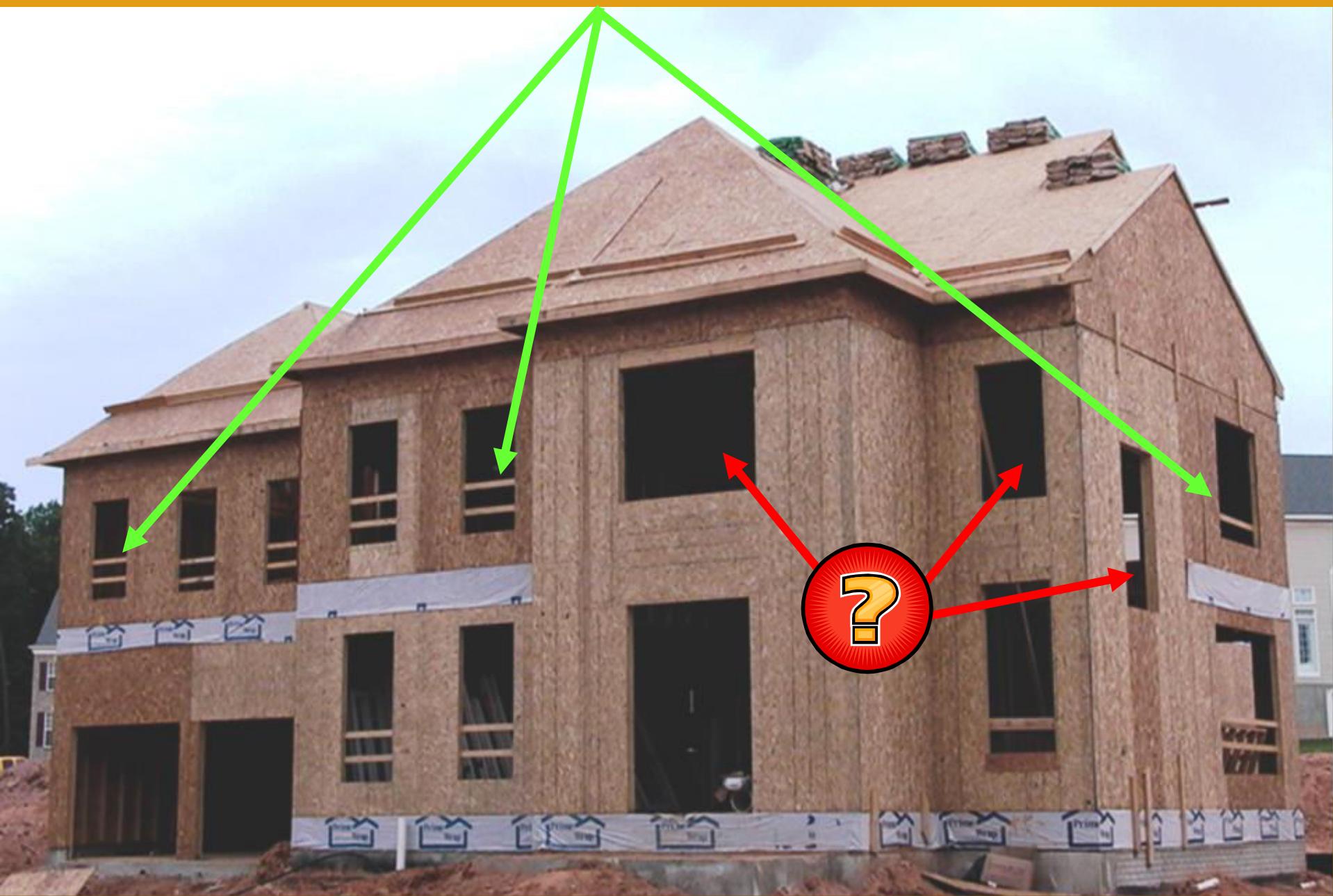


Working at a second story window-- What type of protection is needed?





Properly installed guard rails in low-sill windows.



Requirements for Handrails and Stair rails

- **Toprail**
 - 36 in. (.9 m) above the tread vertically in line with the riser
 - Install handrail 3" from wall
- **Midrail**
 - Halfway between toprail and stair stringer
- **Toe Board**
 - Minimum of 3 1/2 in. (4 in. nominal) (10.2 cm)
- **Weight Requirement**
 - At least 200 lbs. (90.9 kg)











Install a top rail 36 in.
.9 m) high to allow one
railing to serve as both
a handrail and stair rail.



Protecting Finished Stairs: Guardrails Installed Independent From Framing



Build Guardrails Into Framing



Build Guardrails Into Framing



Hole Covers

- Secured and marked cover which protects workers from tripping or stepping into or through a hole and keeps objects from falling through a hole
- Protects against falls through hazards in this category:
 - Floor Holes

Hole Covers Are Needed For:

- Any hole larger than 2" x 2", such as:
 - Fireplace openings
 - Skylights
 - Basement stair openings
 - Floor heating, ventilating, and air-conditioning (HVAC) registers
 - Plumbing floor cutouts

Requirements for Hole Covers

Hole Covers must be:

- Capable of supporting at least two times the maximum anticipated load
- Secured from movement by nailing in place or other effective method
- Clearly marked indicating the location of the hole

**Cover floor openings
larger than 2" by 2" with
material to safely support
the working load.**





Floor Opening Hazards



Unprotected Edges During Framing



Must be marked with the word "HOLE" or "COVER"



Bright orange paint is a good way to make sure hazards are seen.

HOLE
DO NOT
REMOVE!



A Well Guarded Stair Opening



Personal Fall Arrest System (PFAS)

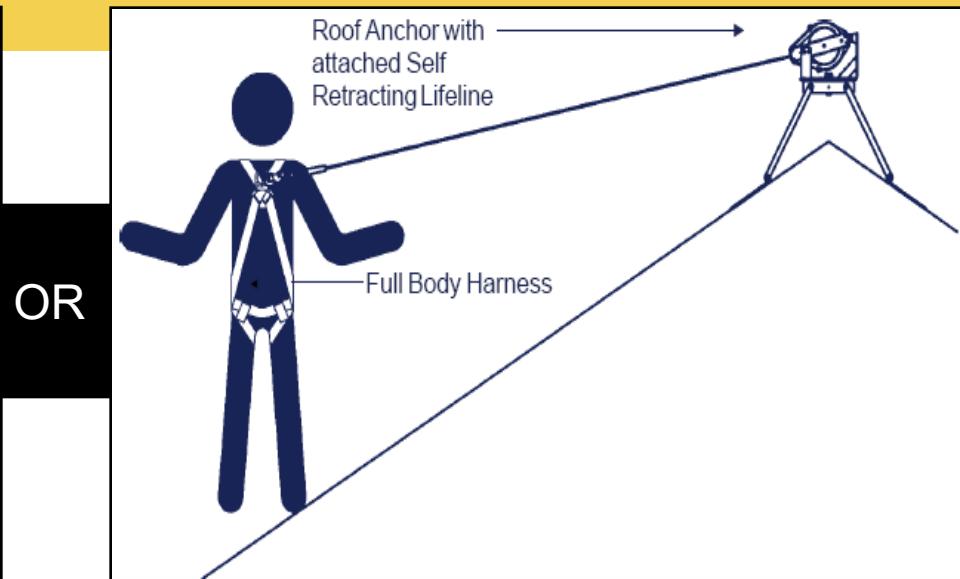
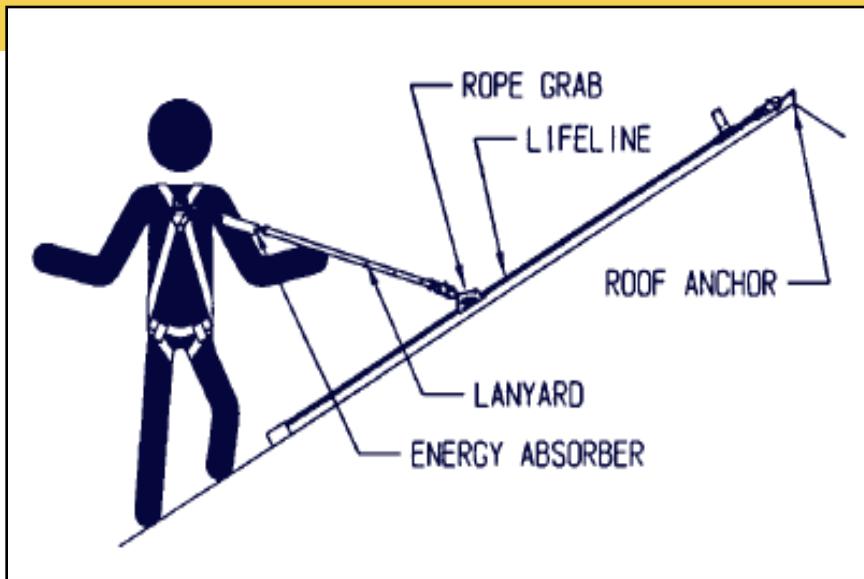
- Equipment comprised of an anchorage point, connectors, and a body harness; used to keep a worker from free falling from an elevated surface
- Protects against these hazards:
 - Unprotected Sides and Edges
 - Floor Holes
 - Leading Edges

Personal Fall Arrest System (PFAS), cont.

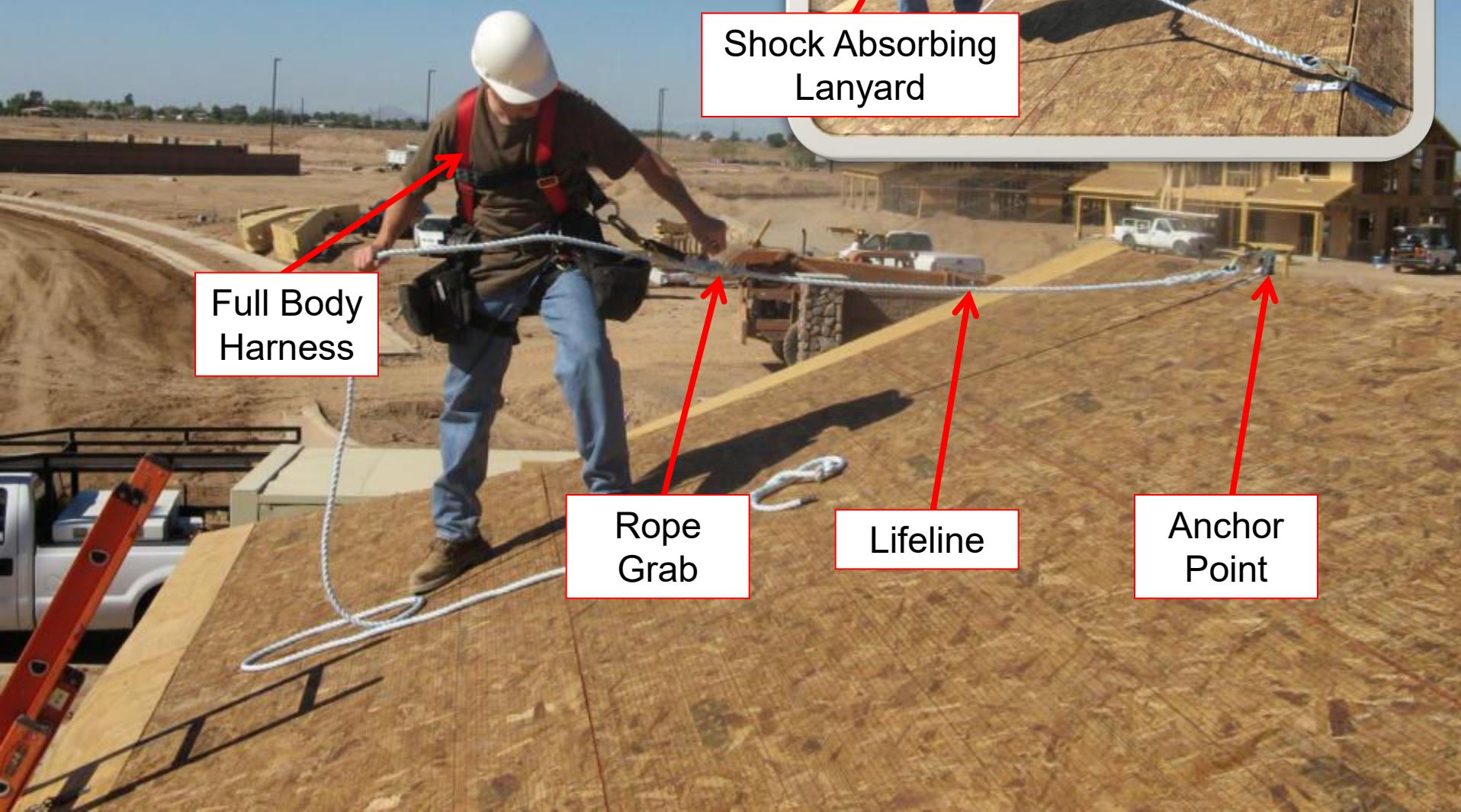
- Components of a PFAS
- Requirements for Anchor Point
- Using a PFAS

We'll look at each of these in detail.

Components of a PFAS



- Anchor point
 - Lifeline
 - Rope grab
 - Shock absorbing lanyard
 - Full body harness
-
- Anchor point
 - Self-retractable lifeline
 - In lieu of lifeline, rope grab, and shock-absorbing lanyard
 - Full body harness



Calculating Fall Distance

Illustration: Shock-Absorbing Lanyard with D-Bolt Anchorage Connector

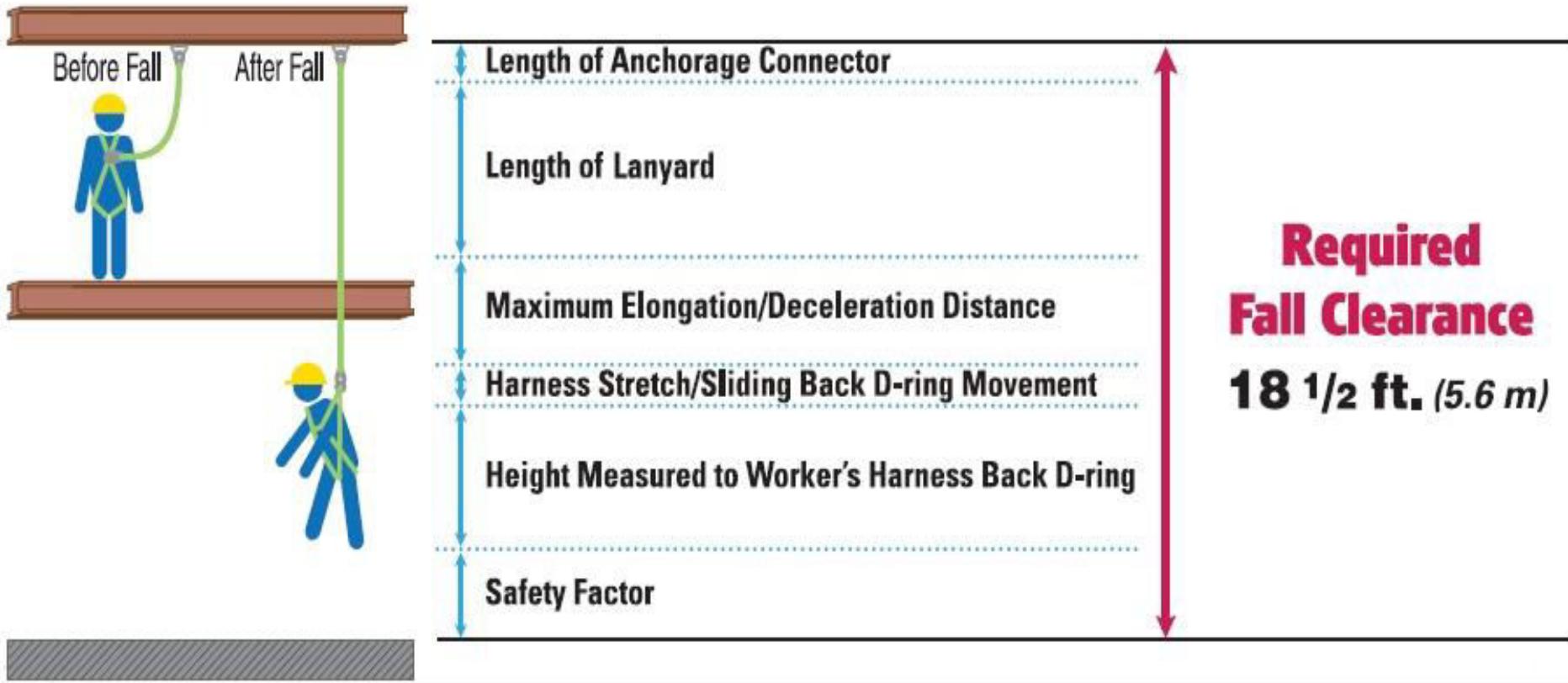


Illustration courtesy of: Miller Fall Protection, Bacou-Dalloz.

Requirements for Anchor Point

- OSHA requires that anchor points must be capable of supporting 5,000 lbs (2,273 kg) or twice the intended load.

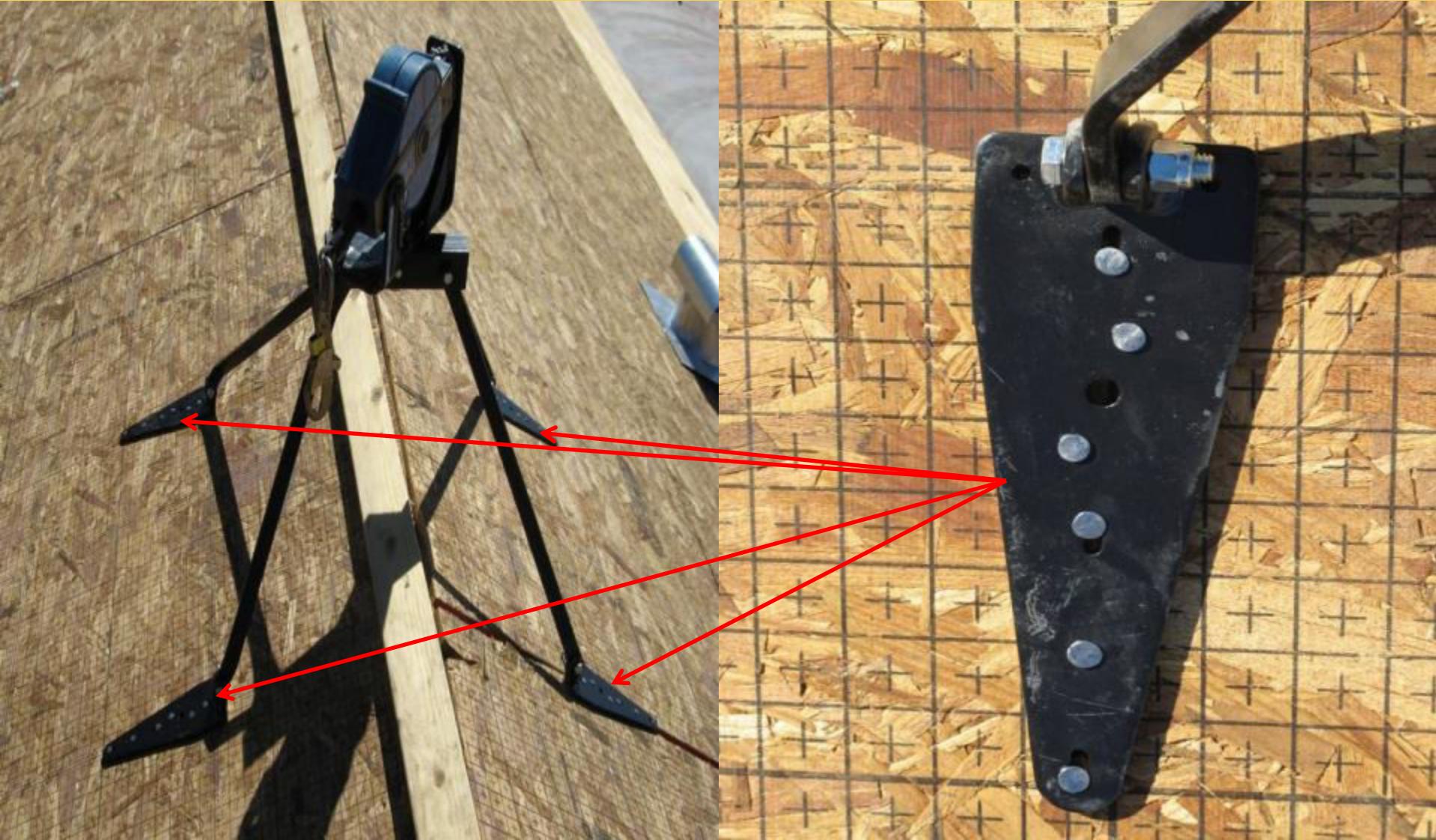


The qualified person must determine that a structure is strong enough to support an anchor point for a PFAS.

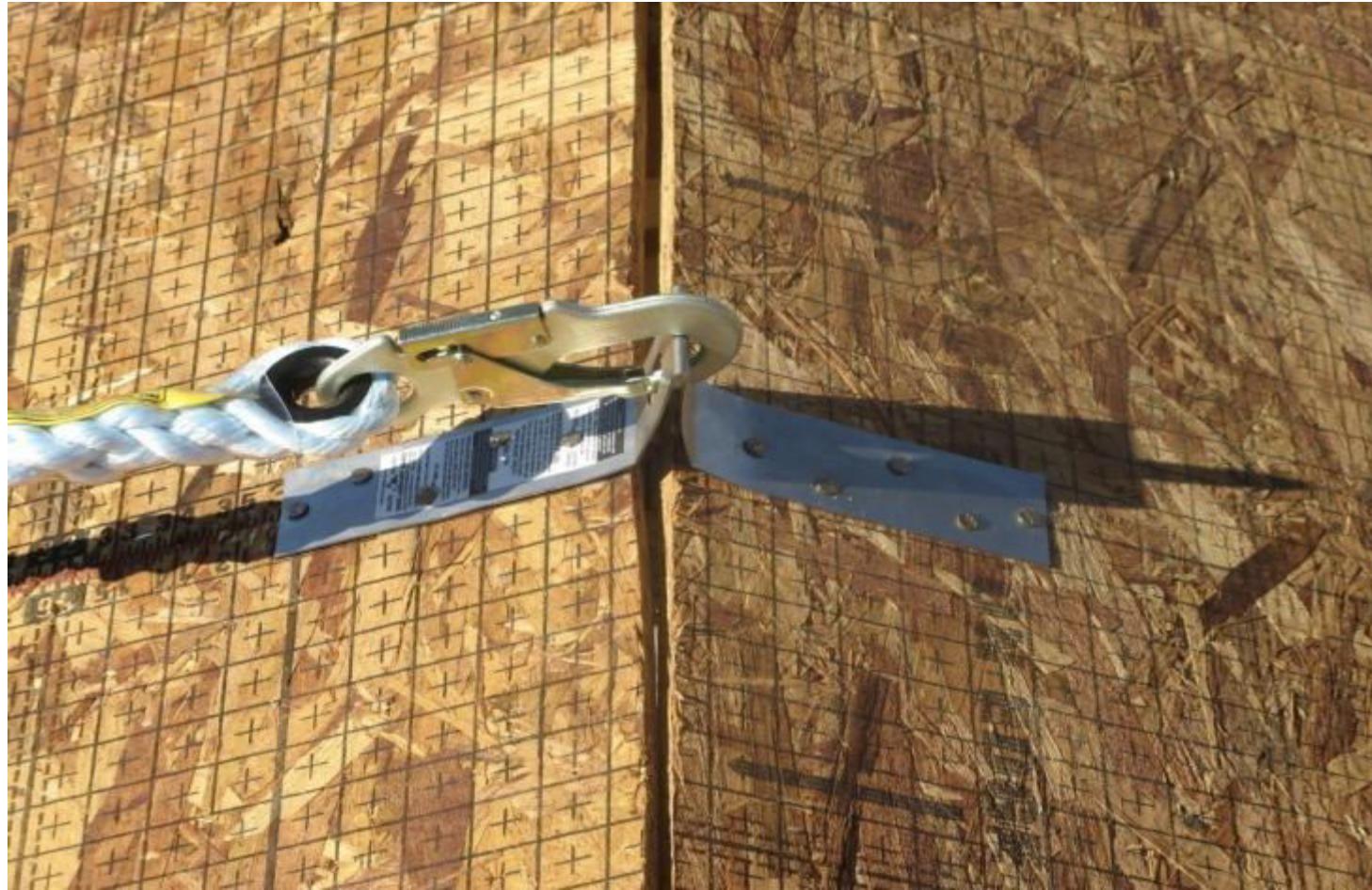
Requirements for Anchor Point, cont.

- Follow the manufacturer's specifications regarding proper installation
- Check instructions on proper bracing techniques

Anchor Points



Anchor Points, cont.



Sample Engineering Data

Specification Sheet

Materials

Stamping:.....Type 304 stainless steel (13 gauge - .090")
Flashing:.....Black - UV resistant Santoprene
Protective Cap:.....Gray - Plastisol with UV inhibitor
Nails:.....10 - 1 1/4" Stainless Steel Bracket Nails (8 required)
4 - 1 1/4" Galvanized Roofing Nails for the Flashing

*Must be used in conjunction with a shock-absorbing lanyard, that will limit fall arrest forces to 900 lbs.

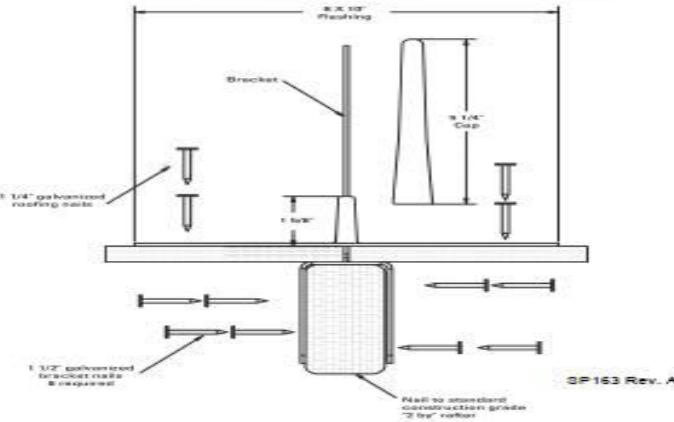
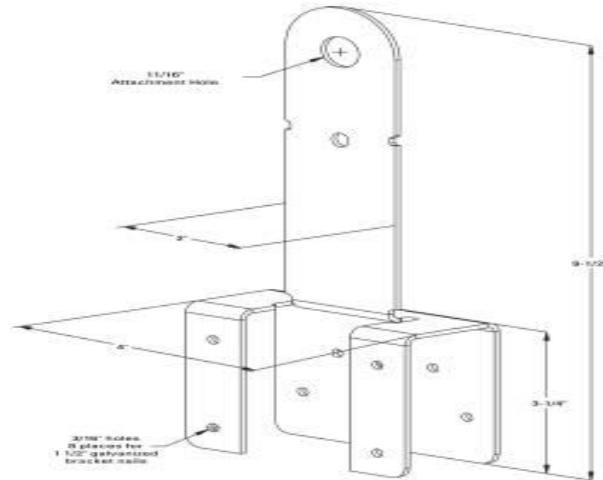
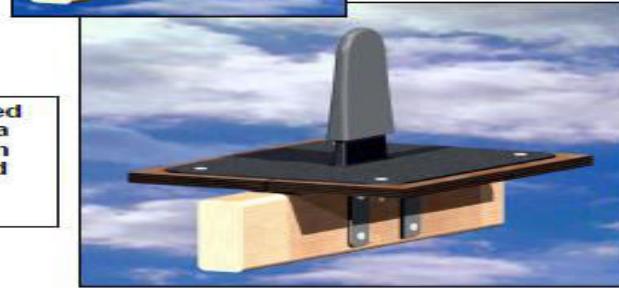
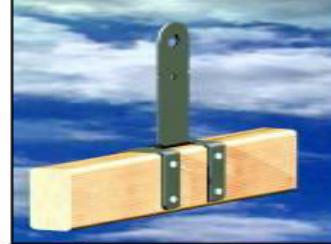
Technical

Weight:.....1.38 lbs. (0.63 kg)
Max Working Load:.....310 lbs (140.62 kg)
Rafter Requirement:.....2X4, 2X6, 2X8, 2X10 or 2X12

Certification

OSHA.....1926.502

The Miller Claw, RA45 Permanent Roof Anchor, is designed to provide fall protection on rooftops. It is installed over a 2" wide rafter and nailed into place. The sheathing is then nailed over top of the anchor base. A special flashing and interlocking cap system are included to protect the roof structure and anchorage system from the elements.



Source: Miller Fall Protection

Rev: 8-2011

Anchor Points, cont.



Outside



Inside

Using a PFAS

- Read the manufacturer's information on proper use, installation, inspection, and limitations of the equipment and accessories.
- Inspect the components for damage and excessive wear.
 - Don't use a PFAS that is damaged, worn, or has previously arrested a fall.
These systems should be repaired and recertified by the manufacturer before reuse or reissue.

Using a PFAS, cont.

Proper Wear:

Locate the attachment of the body harness in the center of your back, near the shoulder level, or above your head.



Using a PFAS, cont.

Proper Wear:

If using a retractable lifeline attach it **directly** to the *D*-ring on the full-body harness.



Inspecting a PFAS

- Inspect the harness fully before each use.
This includes:
 - Inspecting the buckles
 - Inspecting the lanyard
 - Carefully checking the webbing for distortions
 - Check the hardware (D-rings) connectors for defects
 - Inspect rope or lifeline for any rips, tears, or deformities

What if a Worker Falls? Need a Rescue Plan!

- A rescue plan describes steps taken to rescue a fallen worker (even if they are wearing a PFAS). Steps include:
 - Contacting appropriate emergency personnel
 - Using ladders or other safe work methods to rescue worker if they are suspended by PFAS
 - Ensuring the plan can safely rescue a suspended worker within 3-4 minutes of falling.

Safety Net Systems 1926.502(c)

- System consisting of connectors and net installed below a working surface; designed to prevent a worker from contacting a lower level or structure in the event of a fall.

Safety Net Systems, cont.



Photo courtesy of: Guardian Fall Protection

Positioning Device System

- A body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface and work with both hands free while leaning.

Positioning Device System, cont.

- Are used to safely position workers away from fall hazards, or in a working position where a fall cannot occur
- **NOT** designed for fall arrest
- Must be rigged such that a worker cannot free fall more than 2 feet
- Must be secured to an anchor point capable of withstanding 3,000 pounds

Hands On Demonstration

Activity #2



Section 3

Framing Operations

Learning Objectives: Section 3

- Understand when fall protection must be provided
- Evaluate the use of conventional fall protection systems and other work methods during framing operations
- Identify safe work practices for framing and other residential construction tasks

Other Work Methods

- Employers also have the option of having workers work from scaffolds (in compliance with Subpart L), ladders (in compliance with Subpart X) or aerial lifts (in compliance with 29 CFR 1926.453) **instead of complying with** 29 CFR 1926.501(b)(13).
 - 1926.501(b)(13) = Subpart M - Fall Protection

Framing Operations

- Floor Joist/Truss Installation
- Installation of Floor Sheathing
- Building and Erecting Exterior Walls
- Building and Installation of Balloon-Framed Walls
- Installation of Roof Trusses and Erecting Rafters
- Roof Sheathing Operations

We'll look at each of these in detail.

NOTE: Some practices shown may require the use of a written, site-specific fall protection plan, as needed, in accordance with §1926.502(k)



Floor Joist/Truss Installation

- Floor joists or trusses are rolled into position and secured either from ladders, or scaffolds.







Installation of Floor Sheathing

- Floor sheathing is installed from ladders or scaffolding.
- Qualified person will evaluate the use and limitations of conventional fall protection systems.

Building and Erecting Exterior Walls

- Install guardrails around perimeter of the structure prior to placement of the wall.
- After the wall is placed and braced, install guardrails in window openings where fall hazards exist.







Installation of Balloon-Framed Walls

- Methods for installing balloon-framed walls:
 - Manual lifting
 - Cranes
 - Forklifts





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Installation of Roof Trusses/Erecting Rafters

- The first two trusses or rafters are installed from scaffolding or ladders and secured in place.
- Qualified person will evaluate the use and limitations of conventional fall protection systems.







Top Plate Scaffold Used to Set Trusses



Mobile Scaffold Used to Set Trusses



Fabricated Frame Scaffold Used to Set Trusses





Walking/working on the exterior top plate is never a recognized safe work practice and has a high risk of serious injury or fatality.



Walking/working on the exterior top plate is never a recognized safe work practice and has a high risk of serious injury or fatality.

Erecting Rafters

- Erect roof rafters from scaffolding or ladders.
- Qualified person will evaluate the use and limitations of conventional fall protection systems.





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iLevel

TRUSSTech
Micro

Roof Sheathing Operations

- Install the first row of sheathing from ladders or scaffolding
- Qualified person will evaluate the use and limitations of conventional fall protection systems.
 - NOTE: Slide guards can not be used in lieu of conventional fall protection



Severe Fall Hazard



Other Safe Work Practices

- Foundation Formwork and Blockwalls
- Installation of Exterior Materials
- Working in Attics

We'll look at each of these in detail.

NOTE: Some practices shown may require the use of a written, site-specific fall protection plan, as needed, in accordance with §1926.502(k)



Foundation Formwork and Blockwalls

- Use a ladder or a secured access plank for safe access.
- Use multiple access points to reduce the travel distance required on top of the foundation wall.
- When pouring concrete for walls; consider working from a work platform such as a mobile scaffold or scaffold attached to concrete forms.

Concrete Forms with Scaffold System







ICF with Work Platform System



Installation of Exterior Materials

- Avoid walking and working on the roof level, unless using a PFAS.
- Work from one of these alternatives when possible:
 - Ladder
 - Scaffold
 - Aerial lift







Working in Attics

- Avoid working above foyers and stairways when possible.
- Use multiple access ladders to reduce the amount of travel distance required in the attic/truss area.
- Qualified person will evaluate the use and limitations of conventional fall protection systems.





Stay Clear of Falling Objects

- Do not work under or near a hazard or hazardous process.
- Do not allow other workers below your work area.
- If you are not directly involved, stay clear of these activities:
 - Lifting of a balloon-framed wall
 - Truss or rafter installation
 - Roof sheathing work
 - Work in a attic

Protect Impalement Hazards

- Guard all protruding ends of steel rebar.
- Use appropriate rebar caps.
- Bend rebar so exposed ends are no longer upright.
- Secure a 2x4 (5.1 x 10.2 cm) over the exposed rebar.
- Do not use Mushroom type caps.

Protect Impalement Hazards, cont.





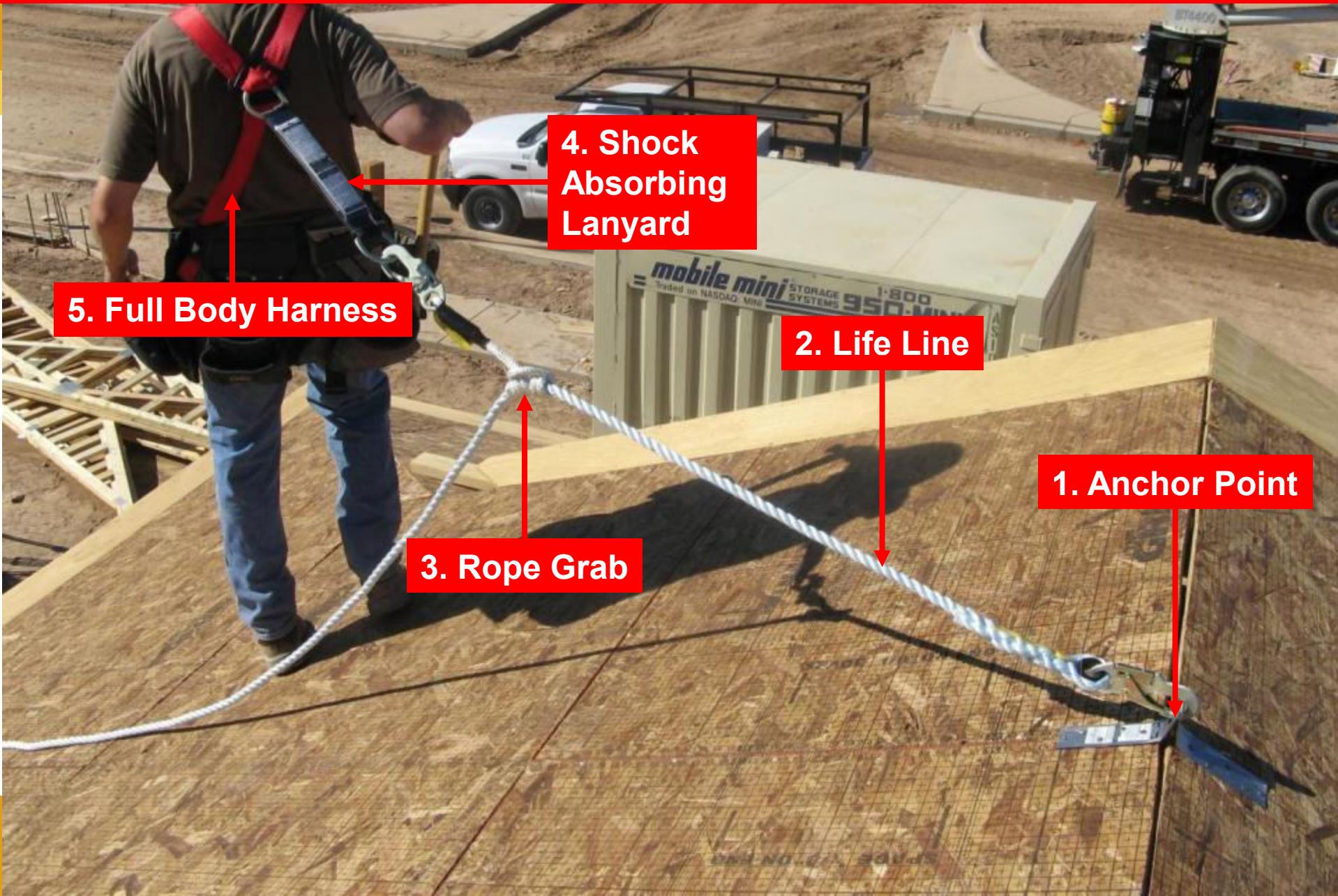
Section 4

Roofing Operations

Roofing Operations

- When installing shingles and other roofing material, use a PFAS.
- Check manufacturer instructions to determine exactly how and where to install anchor points.
- On most homes, multiple anchor points will be required to manage *swing-fall* hazards.
- It is also important to locate anchor points at a height that prevents striking a lower level should a fall occur.

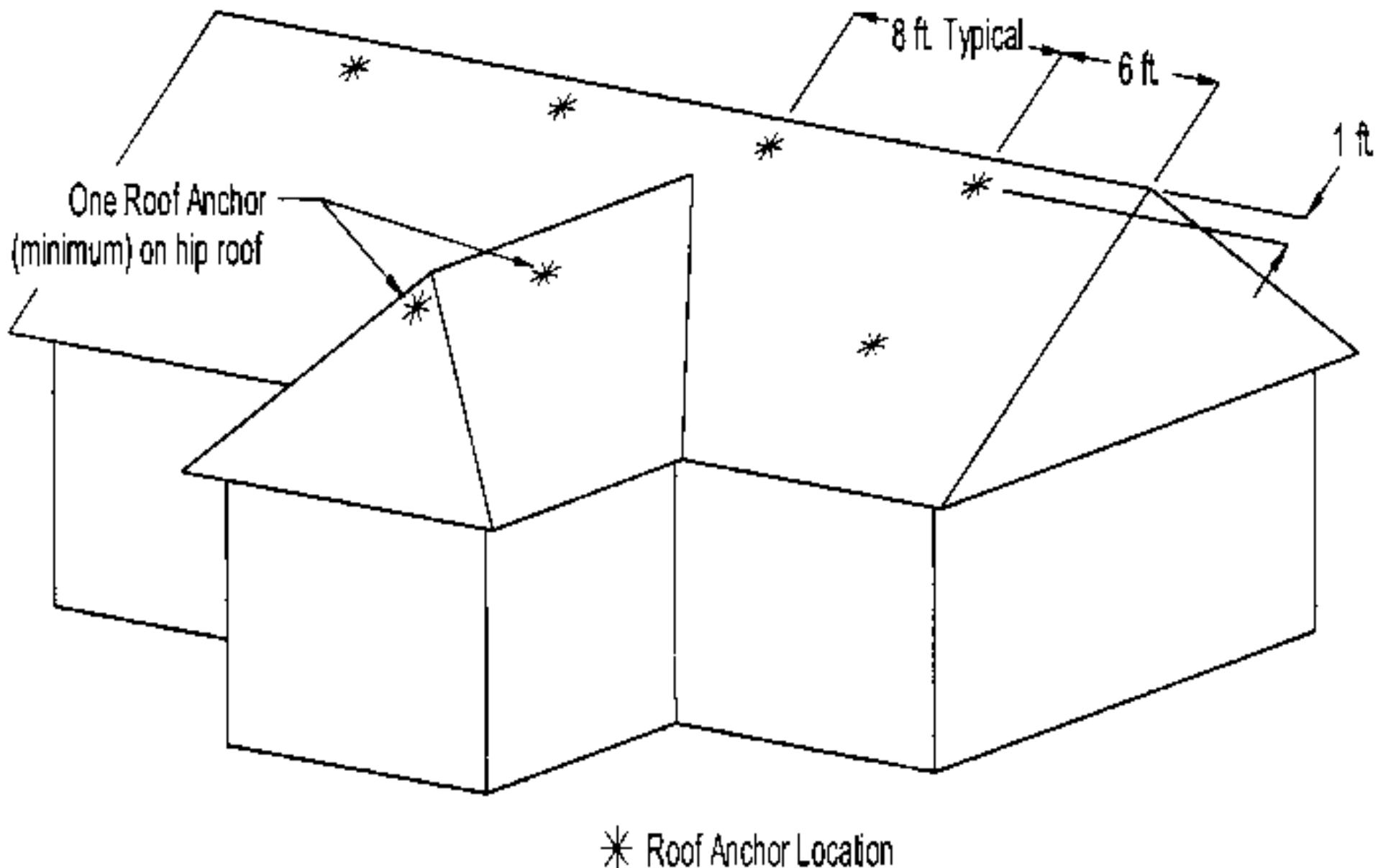
Personal Fall Arrest System (PFAS) Components







Roof Anchor Location Requirements

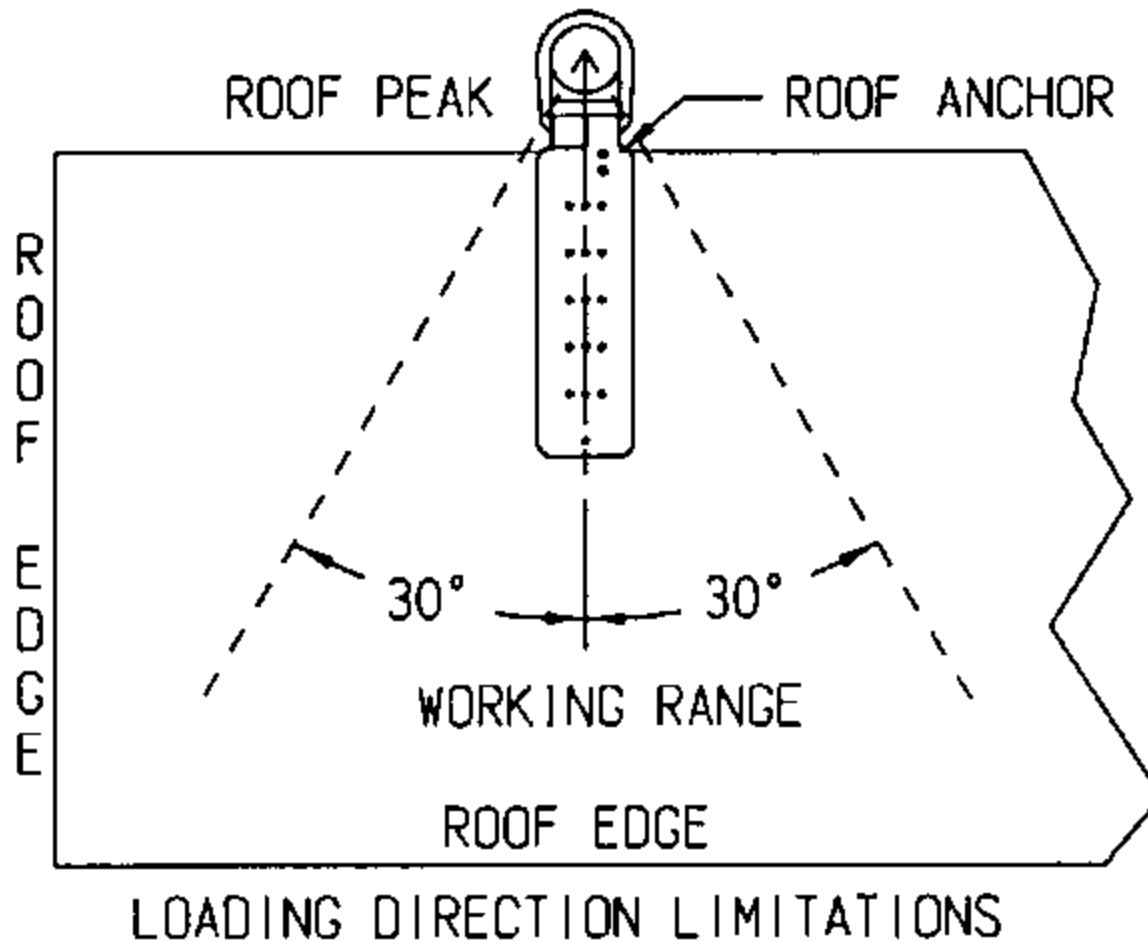


Swing Fall Hazard

Minimize swing falls:

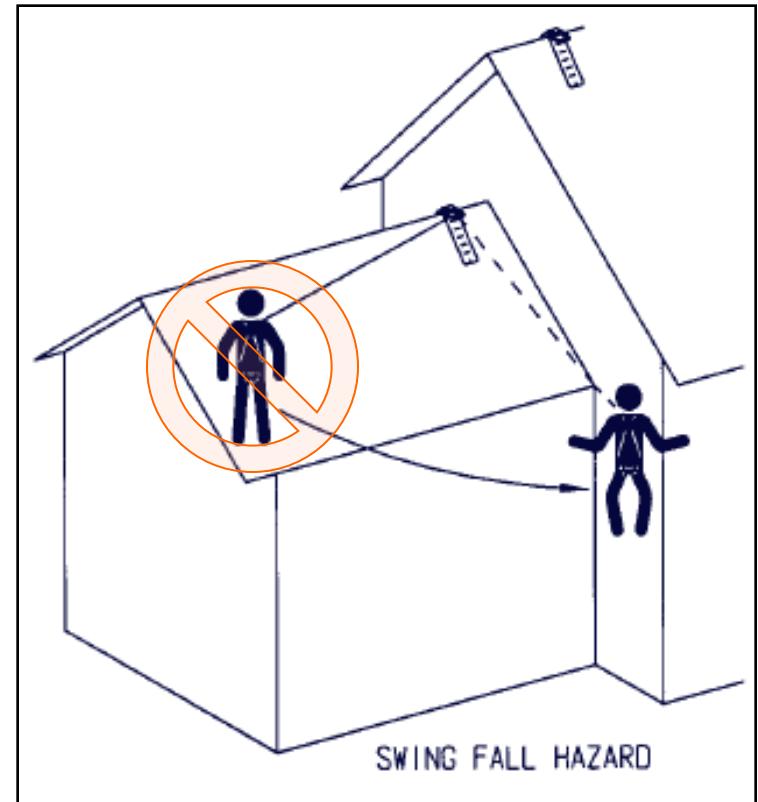
- Work directly below the anchor.
- Do not extend your work zone more than 30° from the anchor.
- Manage the slack in the rope.

Swing Fall Hazard, cont.



Swing Fall Hazard, cont.

- On most homes, multiple anchor points will be required to manage *swing-fall* hazards.
- It is also important to locate anchor points at a height that prevents striking a lower level should a fall occur.



Swing Fall Hazard







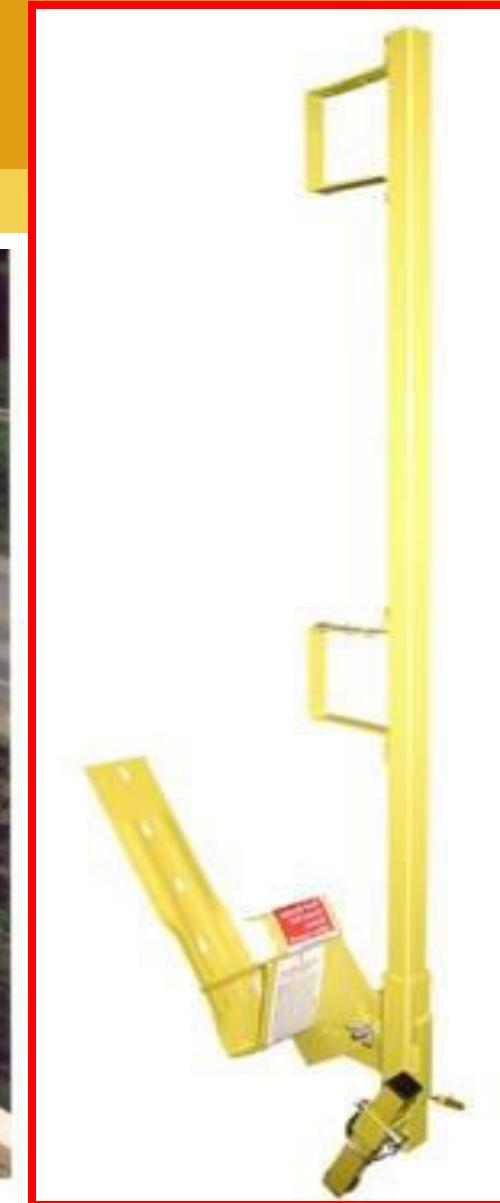




Roofing Operations, cont.

- When installing shingles and other roofing material, you can also use guardrails.
- Check manufacturer instructions to determine exactly how and where to install guardrails.
- Guardrails must meet OSHA specifications.

Guardrail Systems



Source: ACRO Building Systems

Guardrail Systems, cont.



Source: Guardian Fall Protection

Guardrail Systems, cont.



Source: Hugs, One, LLC (Hugs Safety)



Section 5

Ladders and Scaffolding

Learning Objectives: Section 5

- Determine the proper ladder to use based on weight capacity and height.
- Calculate the proper pitch of extension ladders for proper set-up, and identify how to secure and stabilize ladders.
- Identify how to maintain a safe position when using a ladder.
- Identify safety requirements and practices for scaffolding, including aerial lifts.

Ladder Training Requirements

- Each employee using ladders should be trained to recognize hazards related to their use. This includes:
 - Nature of the fall hazards in the work area
 - Correct procedures for placement, use, and maintenance
 - Maximum intended load-carrying capacities

Ladder or Scaffold?



Pick the Right Ladder

Before stepping onto a ladder, think about these things:

- Duty rating of the ladder—what capacity can it hold?
- Height of the ladder—too short or too tall?
- Condition of the ladder and instructions unique to the ladder selected.

We'll look at each of these in detail.

Proper Duty Rating/Capacity

OSHA Requirement

Ladders shall not be loaded beyond the maximum intended load for which they were built nor beyond their manufacturer's rated capacity.

Proper Duty Rating/Capacity, cont.

TYPE	DUTY RATING	USE	LOAD
1AA	Special Heavy Duty	Rugged	375 Lbs.
1A	Extra Heavy Duty	Industrial	300 Lbs.
1	Heavy Duty	Industrial	250 Lbs.
II	Medium Duty	Commercial	225 Lbs.
III	Light Duty	Household	200 Lbs.

Select a ladder with the proper duty rating for your weight and the materials you are handling.

Think About It

What do these materials weigh:

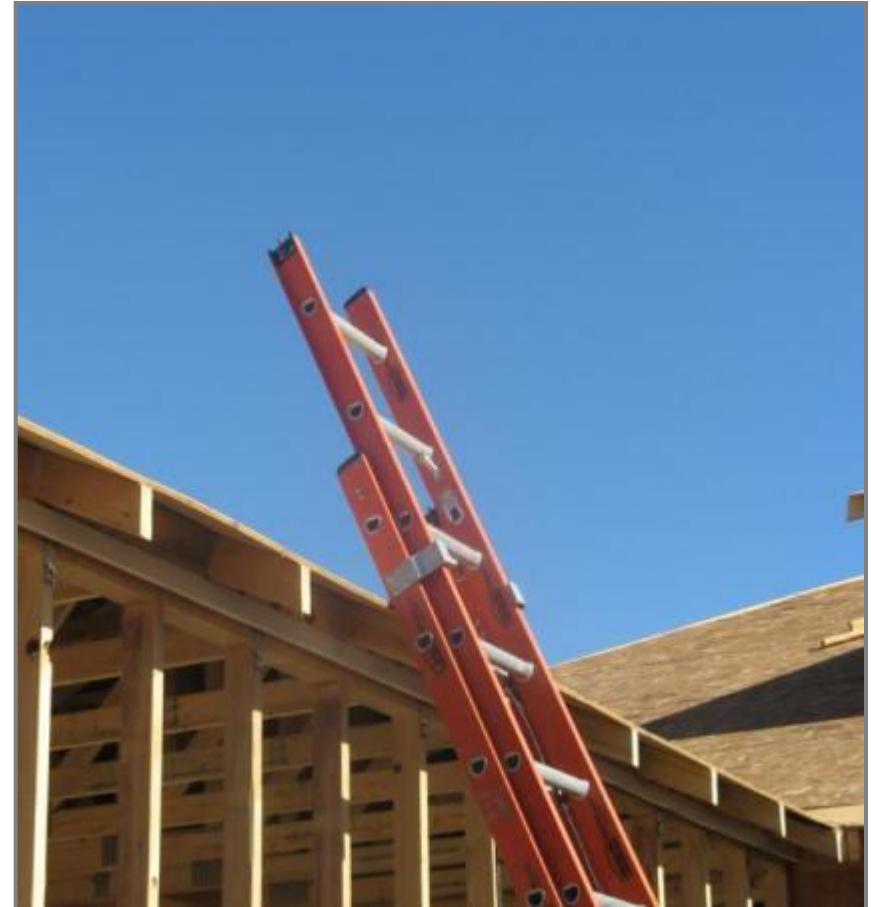
- A sheet of plywood
- A tool box with tools
- A bundle of shingles
- A 3 x 4 window



Remember: Select a ladder with the proper duty rating for your weight AND the materials you are handling.

Proper Height Extension Ladders

When using an extension ladder for access to another level, the ladder must extend at least 3 ft. (.9 m) above the landing to provide a hand hold for getting on and off the ladder.



Ladder Height Extension



Proper Height Extension Ladders, cont.

Height to Gutter or Top Support	Extension Ladder Height
9' max.	16'
9' to 13'	20'
13' to 17'	24'
17' to 21'	28'
21' to 25'	32'
25' to 28'	36'
28' to 31'	40'

Ladder heights are 9-11 ft. longer than the height to be reach to allow for the height/length lost when the ladder is positioned at an angle.

Proper Height Stepladders

Choose a stepladder that is no more than 4 ft. shorter than the height you want to reach.

Maximum Height You Need to Reach	Stepladder Height
7	3
8	4
9	5
10	6
12	8
14	10
15	11
16	12
18	14
20	16

Proper Condition and Instructions

- Inspect the ladder for visible defects.
 - Never use a ladder that is broken or otherwise damaged.
 - Remove damaged ladders from service and tag them as damaged.
- Review the safety labels on the ladder.
 - Always comply with the warnings and instructions.



Ladder Labels

- What type of information can be found on ladder labels?
 - Warnings
 - Capacity
 - Set-up



Determine Proper Ladder Set-up

- Consider placement and pitch of the ladder
- Secure and stabilize the ladder

We'll look at each of these in detail.

Placement Tips

- Avoid setting up a ladder in high traffic areas or barricaded areas.
- Do not use metal or aluminum ladders near electrical lines.
- Place ladders on stable and level surfaces.

Extension Ladders

- Extension ladders should be used at a 4 to 1 pitch (1.2 to .3 m).
- For every 4 ft. (1.2 m) in height, the bottom of the ladder should be 1 ft. (.3 m) away from the structure.

Example:

$$20 \text{ ft. (height)} \div 4 \text{ ft.} = 5 \text{ ft. pitch}$$



Correct Pitch?



Any Hazards?

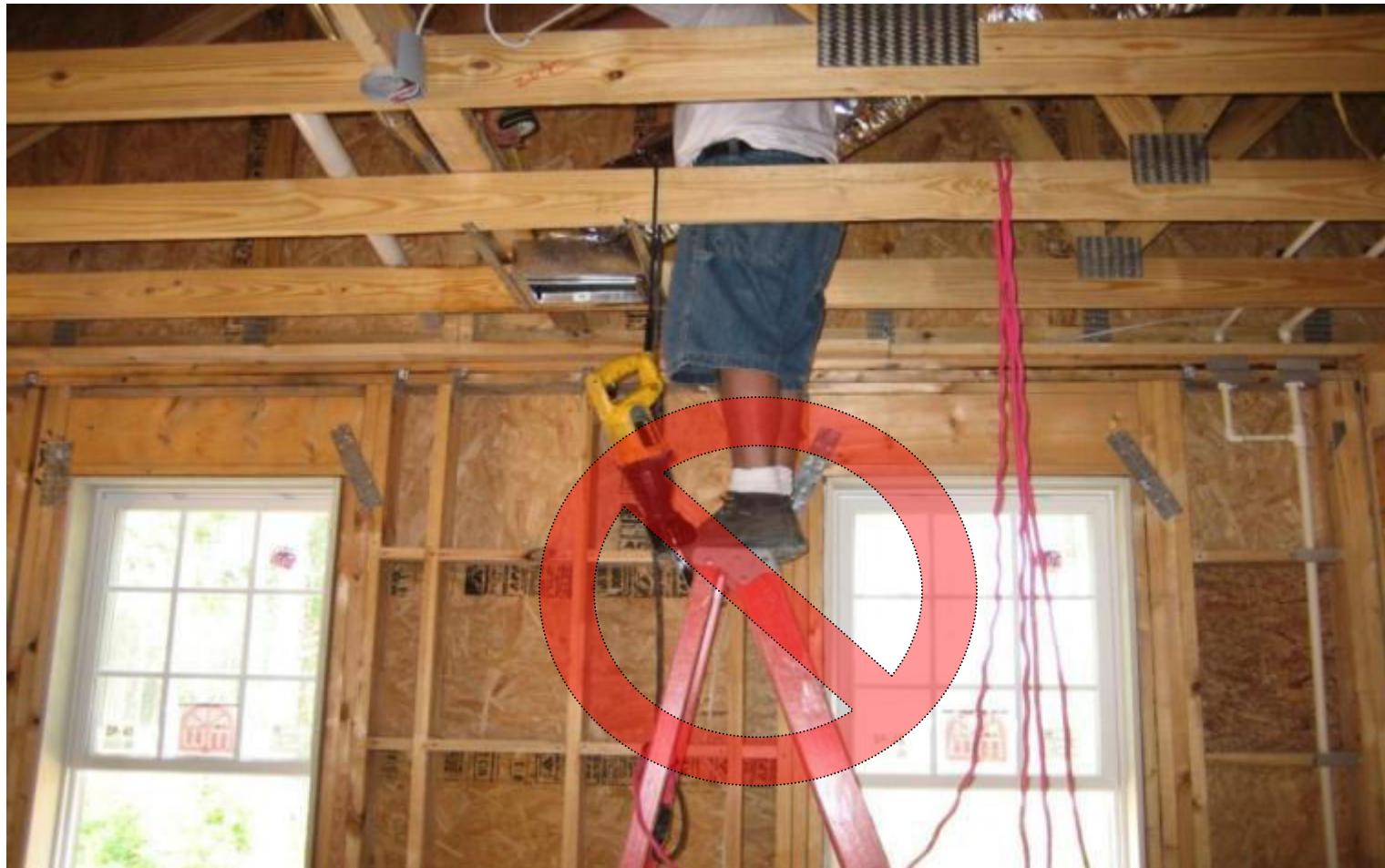


Stepladders

- Stepladders are designed for use in an opened-and-locked position.
- Do not use a stepladder that is folded or in a leaning position



Higher Ceilings Require Taller Ladders



Job built ladder over a stair opening



Secure and Stabilize Ladders

- Extension ladders should be secured at the top or bottom to prevent movement.
- The base of an extension ladder must be secured in place by using the safety feet on the ladder or other effective means.

Secured at the Top



Secured at the Bottom



Secure and Stabilize Ladders, cont.

Slippery Surfaces

Never use a ladder on a slippery surface, unless it is secured to prevent movement.

- Wet or slippery surfaces may require a cleat.
- Ladder feet should dig into the ground, and the ladder should be secured at the bottom to prevent movement/slipping.

Loose Soil



Firm Base



Unstable Base



Secure and Stabilize Ladders, cont.

Uneven Surface

When the surface is not level, use a ladder leveler (accessory) to provide even contact points.



Maintain a Safe Position on Ladders

- Face the ladder when *ascending or descending* and maintain **three points of contact at all times.**
- Keep your body centered on the ladder.
- Never let your belt buckle pass either ladder siderail.

