1926 Construction
Focus Four
Fall Hazards

What is OSHA Focus Four?

Construction Focus Four was developed to help workers in the construction industry understand the hazards they face, and know what their employer's responsibilities are regarding protecting workers from workplace hazards.

Construction safety is one of OSHA's top concerns. Construction is among the most dangerous industries in the country and construction inspections comprise 60% of OSHA's total inspections.

In 2009, preliminary data from the Bureau of Labor Statistics indicate that nearly one out of every five work-related deaths in the U.S were construction workers – more than in any other single industry sector.

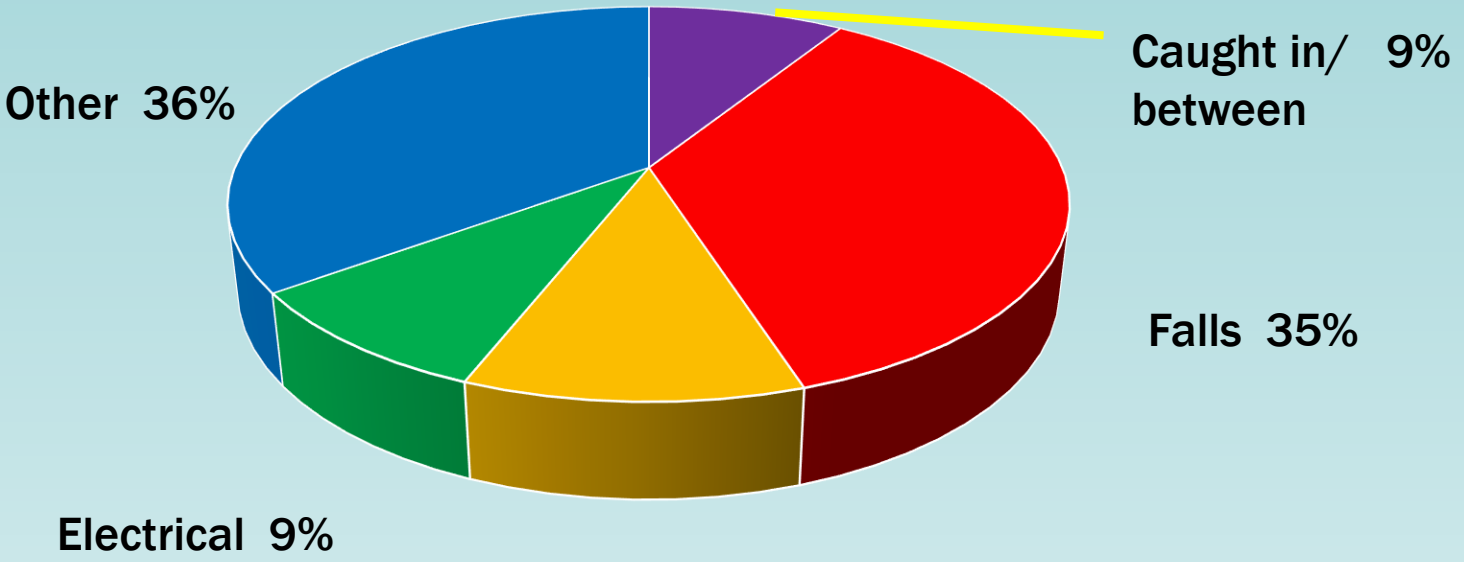
Structure of Focus Four

Construction Focus Four consists of four lessons:

- Fall Hazards (F)
- Caught–In or –Between Hazards (C)
- Struck-By Hazards (S)
- Electrocution Hazards (E)

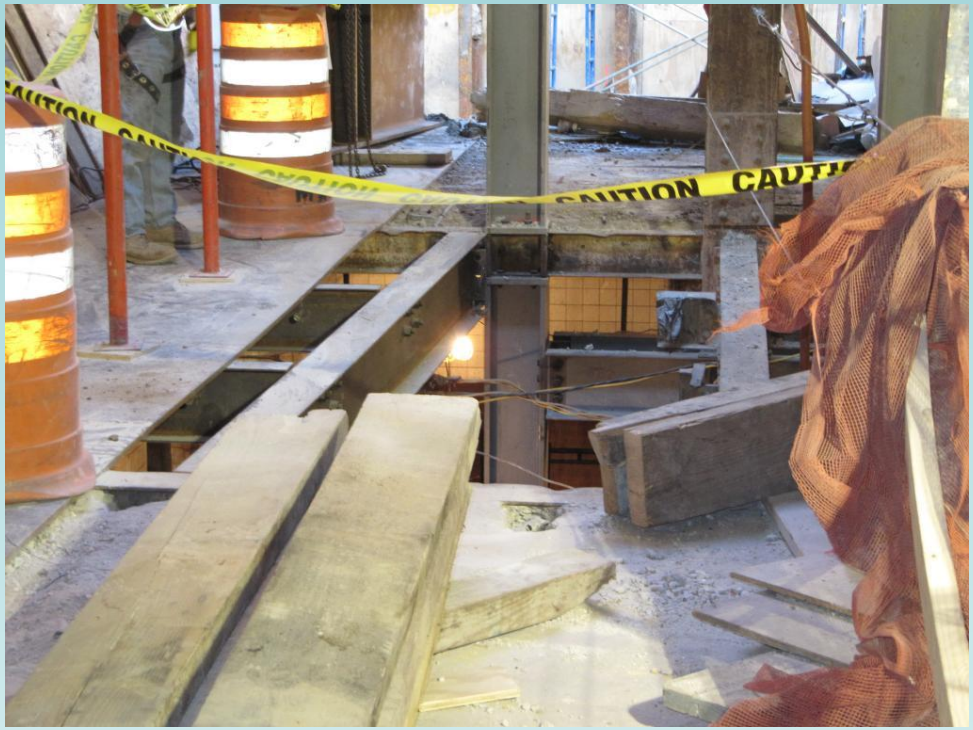
Construction Fatalities by Hazard

64% of the fatalities were from Focus Four hazards



969 Total Fatalities

Fall Hazards



Source: OSHA elcosh

FALLS ARE THE LEADING CAUSE OF DEATH IN CONSTRUCTION. In 2018, there were 320 fatal falls to a lower level out of 1,008 construction fatalities (BLS data). **These deaths are preventable**.

Since 2012, OSHA has partnered with the National Institute for Occupational Safety and Health and National Occupational Research Agenda (NORA) - Construction Sector on the Fall Prevention Campaign to raise awareness among workers and employers about common fall hazards in construction, and how falls from ladders, scaffolds and roofs can be prevented.

PLAN ahead to get the job done safely

Objectives

By the end of this session, students will be able to:

- Identify major fall hazards
- Describe types of fall hazards
- Identify methods to protect him/herself from fall hazards
- Recognize employer requirements to protect workers from fall hazards

Source: elcosh

Fall Hazards

Focus Four

Source: elcosh

Falls are the leading cause of construction fatalities.

Falls accounted for 35% of construction deaths nationwide in 2008.

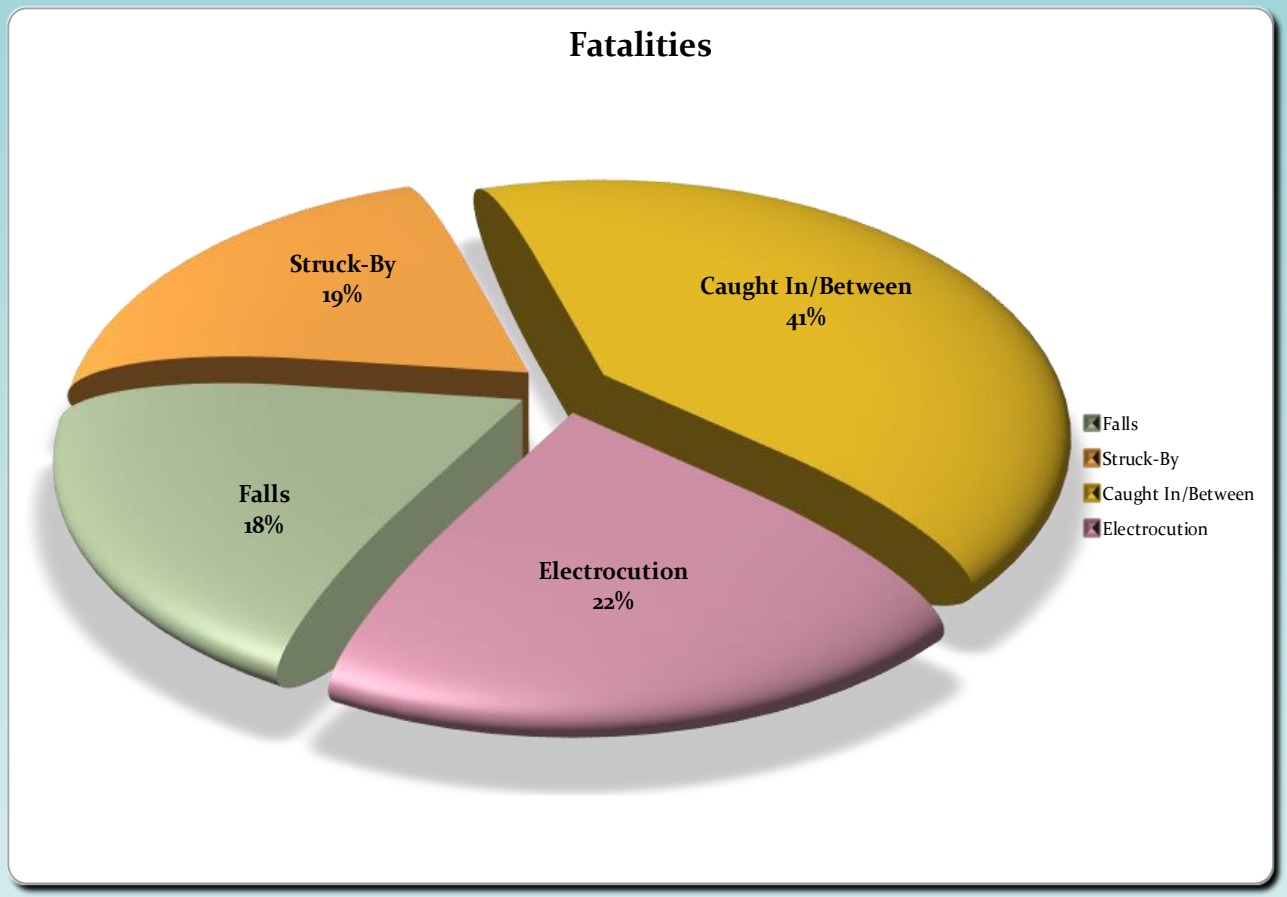
Discussion:

Have you or has anyone you know had a fall on the job?

What happened?

Elevator Industry Related Fall Hazards

Fatality Type	Total
Falls	5
Struck-By	5
Caught In/Betwee	11
Electrocution	6
Total Fatalities	27



Since 2012, 18% of Elevator Constructor deaths have been from falls.

ON THE JOB FATALITIES BEGINNING--JANUARY 2012

Falling Off an Edge.
Common exposed edges in construction:

- Roofs
- Unprotected edges
- Holes
- Stairwells
- Elevator shafts
- Decking

Source: elcosh

Can you think of any others?

Falls: Elevator-Related Hazards

Elevator constructors are exposed to falls at hoistways, wellways, false cars, running platforms, entering pits, to name just a few.

§1926.501 establishes the duty for the employer to provide fall protection.

§1926.502 establishes the criteria for Fall protection systems.

For Elevator Constructors on a construction site, fall protection is usually provided in one of three ways:

1. Eliminate the hazard.
2. A guardrail system
3. Personal fall arrest system

Since it is rare that we can eliminate the hazard, guardrails and PFAS will be discussed in more detail later.

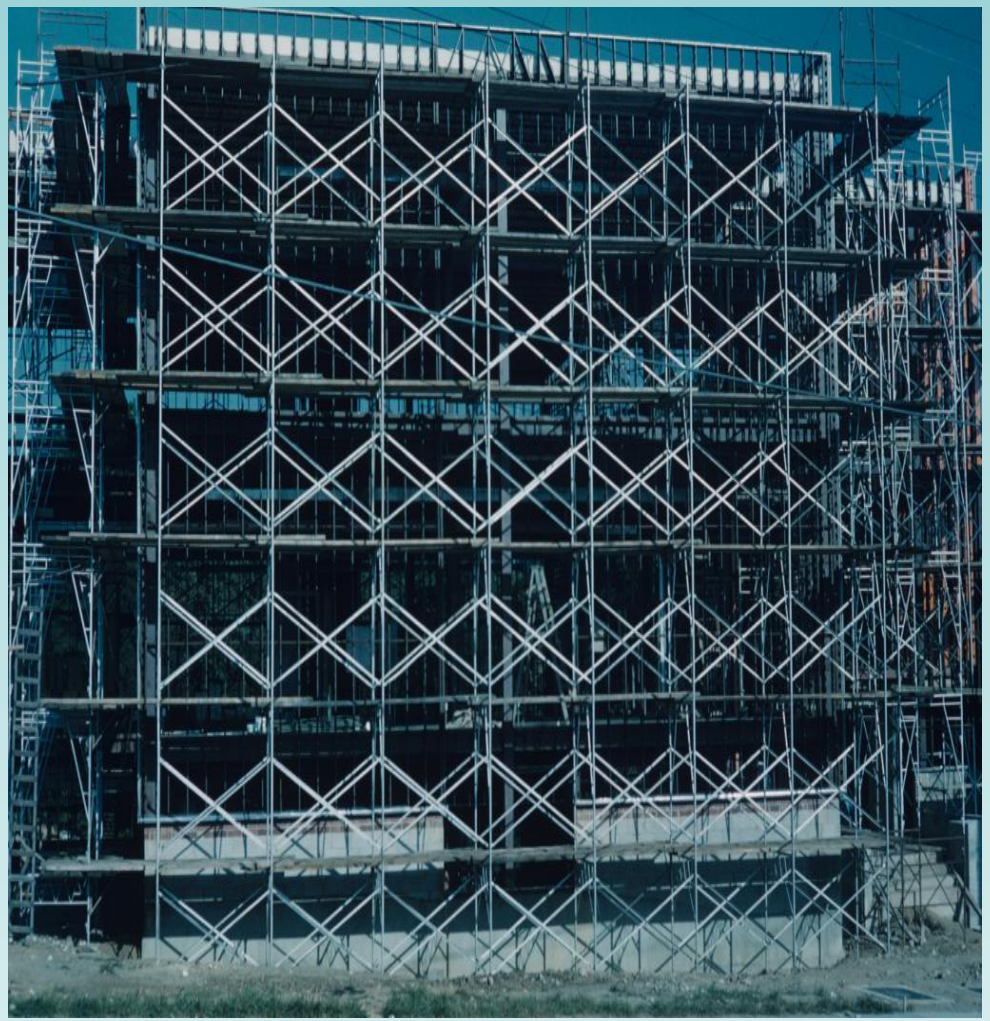
Working on Scaffolds

Scaffolds must be erected and dismantled under the supervision of a "competent person" trained in scaffold erection.

Must have guardrails, midrails, and toe boards. Top guardrail at 42" +/- 3" above working surface or utilize a Personal Fall Arrest System.

Scaffolds (and all people working on them) must be at least 10 feet from energized power lines.

Scaffolds must have safe access



Source: elcosh

Can You Identify the Fall Hazards?

Can You Identify the Fall Hazard?

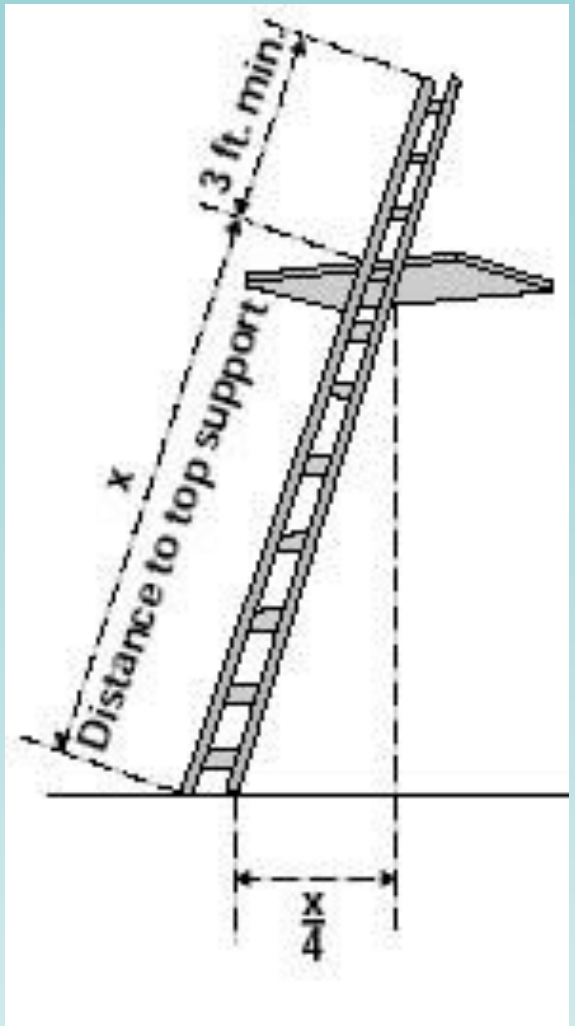
Lack of fall protection for workers on fabricated frame scaffolds.

Planks appear to be overloaded and there is no safe access for workers.

The workers are exposed to a 35-foot fall hazard from a scaffold while stacking blocks prior to overhand bricklaying operations.

Safe Ladder Practices

- Portable extension ladders should be set up in a 4:1 ratio, height to distance from wall
- Inspect ladders before using them. if it's defective, don't use it!
- Don't work on the top step of a step ladder
- Position the portable ladder so the side rails extend at least 3 feet above the landing
- Secure side rails at the top of the ladder to a rigid support
- Make sure that the weight on the ladder will not cause it to slip.



Source: OSHA

Safe Ladder Practices Cont.

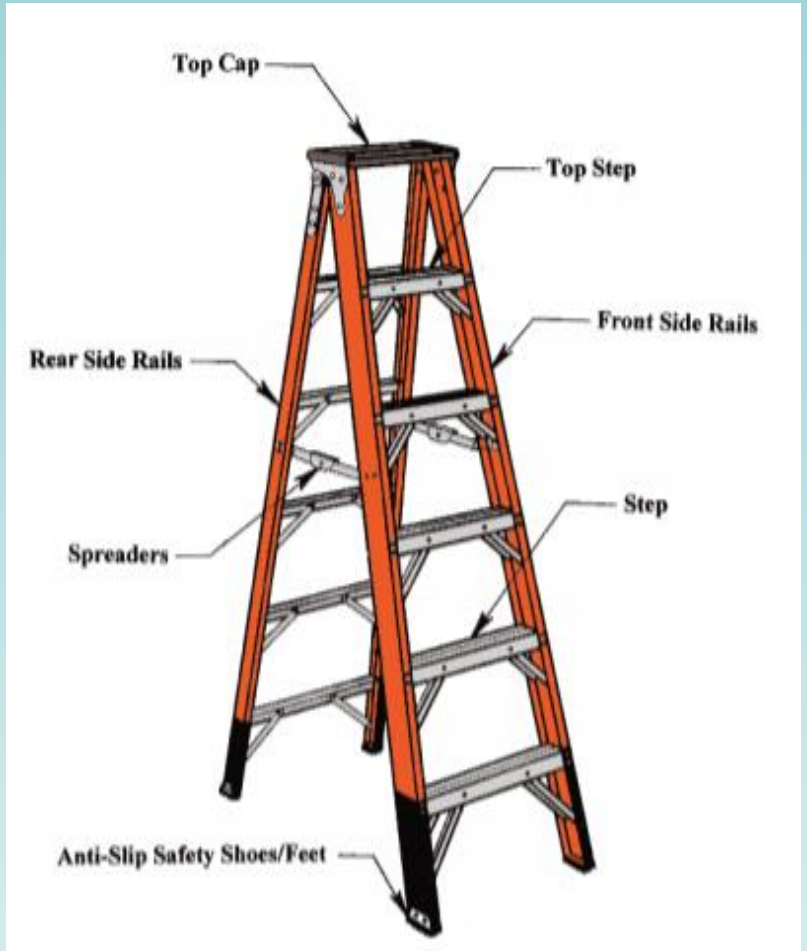
- When climbing up or down:
- Always face the ladder
- Maintain three-point contact at all times
- Don’t carry anything in your hands
- Make sure the ladder is on a firm, level surface
- Consider securing the ladder at top and bottom
- Don’t reach so far that your belt buckle is outside the rails of the ladder.

Source: elcosh

Step Ladders

A competent person must visually inspect stepladders for visible defects on a periodic basis and after any occurrence that could affect their safe use. Defects include, but are not limited to:

- Structural damage, split/bent side rails, broken or missing rungs/steps/cleats and missing or damaged safety devices.
- Grease, dirt or other contaminants that could cause slips or falls.
- Paint or stickers (except warning or safety labels) that could hide possible defects.

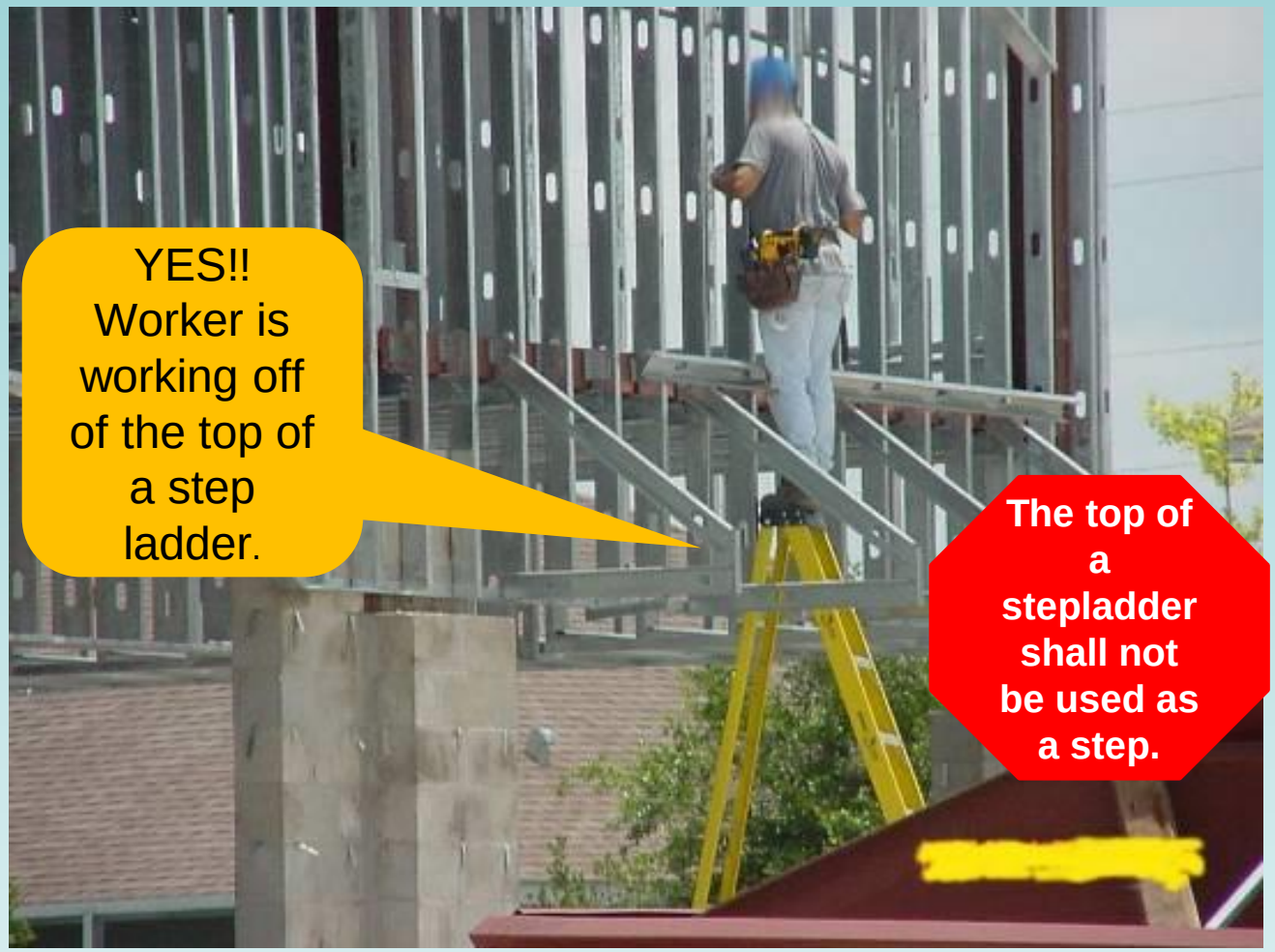


Source: OSHA

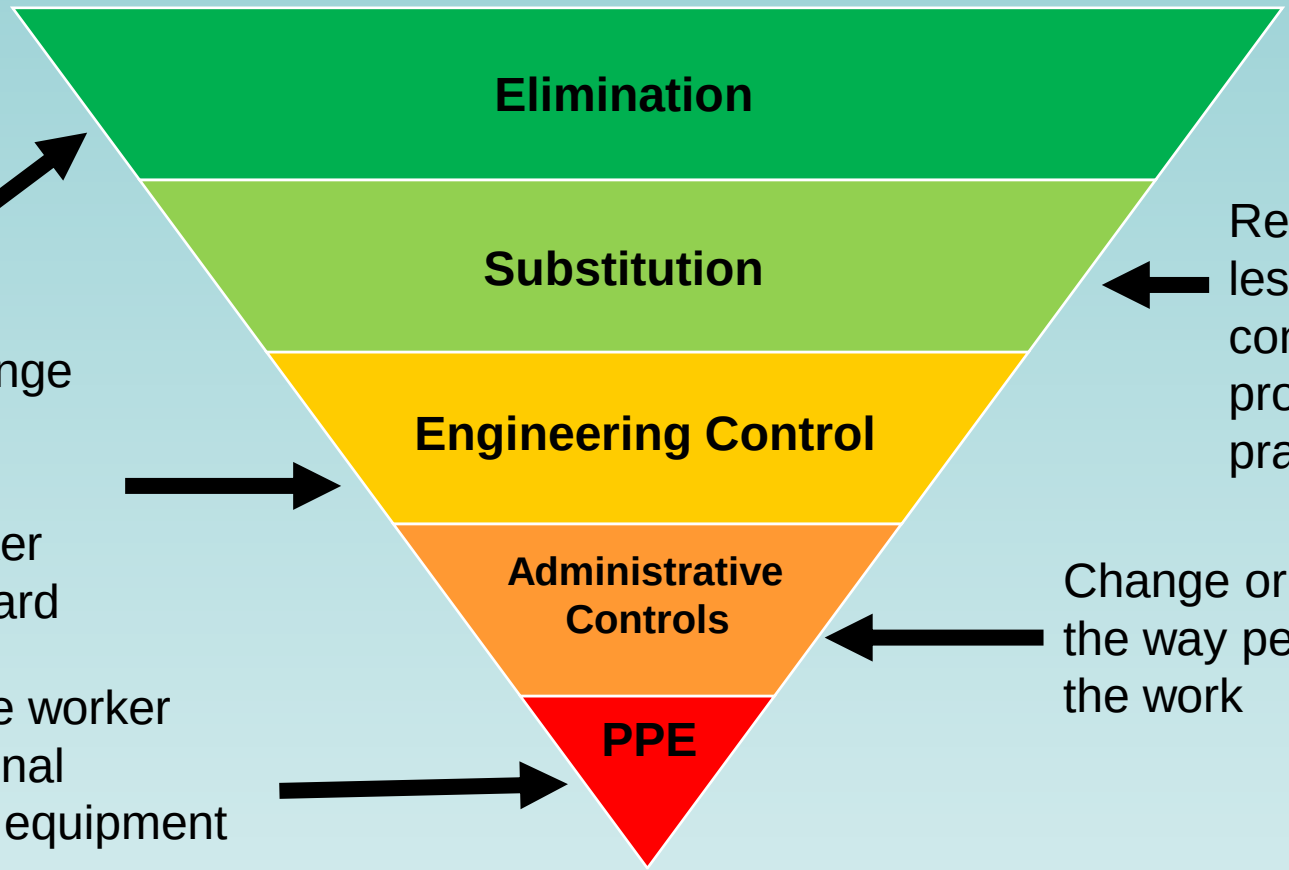
Step Ladders cont.

- Make sure all four feet of the portable step ladder are set on a level and stable surface, and that both ladder spreaders are fully extended and locked into place before use
- Keep your ladder, your body, your tools and any materials at least 10 feet away from energized electrical conductors (or even further for higher voltages exceeding 50kv)
- Maintain your balance and center of gravity on your portable step ladder by keeping your belt-buckle between the two side rails. Reposition the ladder instead of over-reaching

Is This a Fall Hazard?



Hierarchy of Hazard Controls



The hazard no longer exists

Replace with a less hazardous condition, process, or practice

Physical change that reduces exposure or isolates worker from the hazard

Change or improve the way people do the work

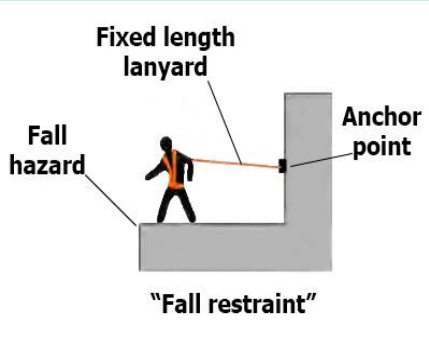
Protect the worker with personal protective equipment

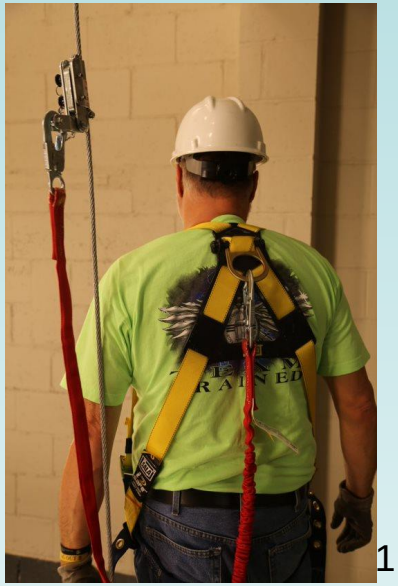
Methods of Fall Protection

We have discussed the hierarchy of controls (Elimination, substitution, engineering controls, administrative controls, and personal protective equipment). Let's look at the types of fall protection that fall under engineering and PPE.

There are two types of fall protection:

- Fall Prevention
- Fall Arrest





Fall Prevention

Fall prevention systems use equipment to prevent workers from falling.

- Barricades
- Barriers
- Guardrails
- Fall Restraint

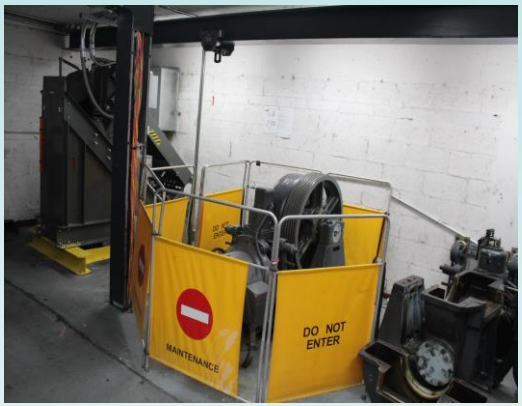
Fall arrest systems are designed to catch workers after they have fallen

Fall Prevention

Barrier, Barricade, or Guardrail System? What's the difference?

OSHA defines Barriers, Barricades, and Guardrail Systems as follows:

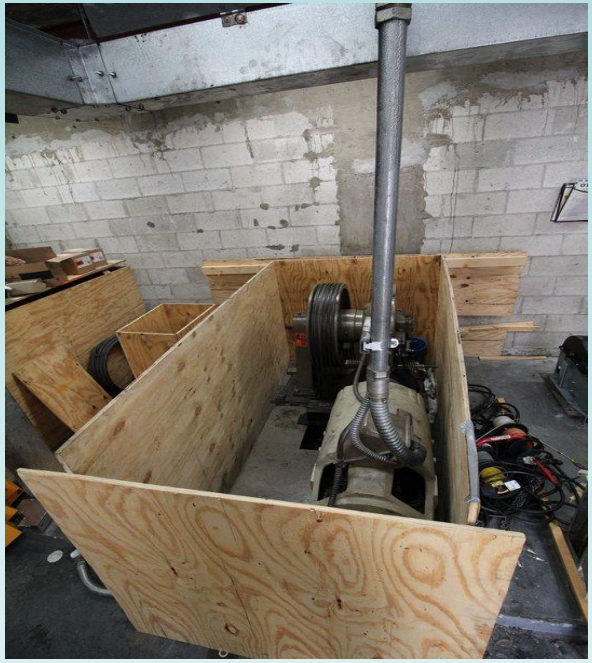
- ***Barrier.*** The term means a physical obstruction which is intended to prevent contact with energized lines or other equipment.
- ***Barricade.*** The term means a physical obstruction such as tapes, screens, or cones intended to warn and limit access to a hazardous area.
- ***Guardrail system*** means a vertical barrier, consisting of, but not limited to, toprails, midrails, toeboards, and posts erected to prevent employees from falling off a walking/working surface to lower levels.



Fall Prevention

Barrier:

- Used mostly during mod and major repair jobs to isolate running equipment and prevent people from accidentally getting caught in rotating equipment or energized electrical components.



Fall Prevention

Barricade:

- Mostly used during maintenance and repair to warn others and limit their access to fall hazards and dangerous areas.
- Escalator and moving walks MUST have barricades in place at both ends anytime work is being done. Hoistways must have barricades in place if a door will be unlocked.
- Barricades must completely surround the escalator/moving walk entrance and egress, as well as the hoistway entrance to restrict public access.
- Barricades must be at least 42” tall, and must securely attach to the balustrades, handrails, or floor on escalators and moving walks.

Fall Prevention

***Guardrail system**: Must meet the requirements of* OSHA 1926.502(1)

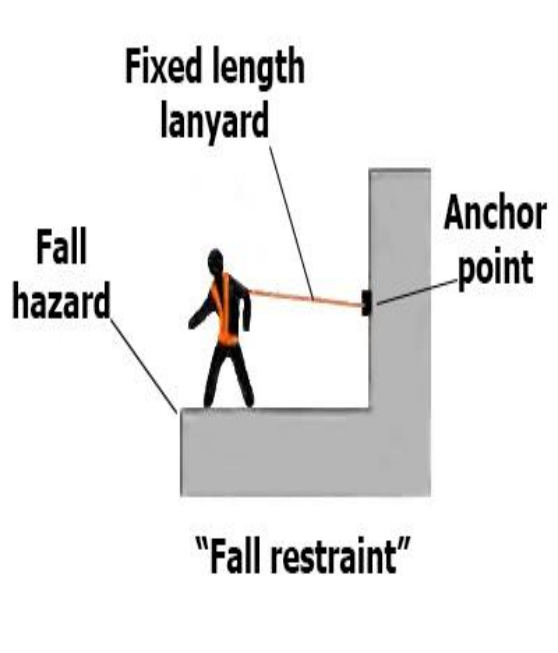
- 42” top rail (+- 3”)
- 21” mid rail
- 3 ½” toe board
- Posts shall not be more than 8” apart.

- Top rails must be capable of withstanding a force of 200 lbs. and mid-rails a force of 150 lbs, applied in any outward or downward direction.
- While not a regulation, for safe access and egress, guardrail systems must be removable at hoistway entrances, escalator/moving walk wellways, and at the entrance to false car/running platforms

Fall Prevention

Fall Restraint System means a fall protection system that prevents the user from falling any distance.

- Uses a body belt or body harness
- A fixed length or adjustable lanyard
- An anchorage



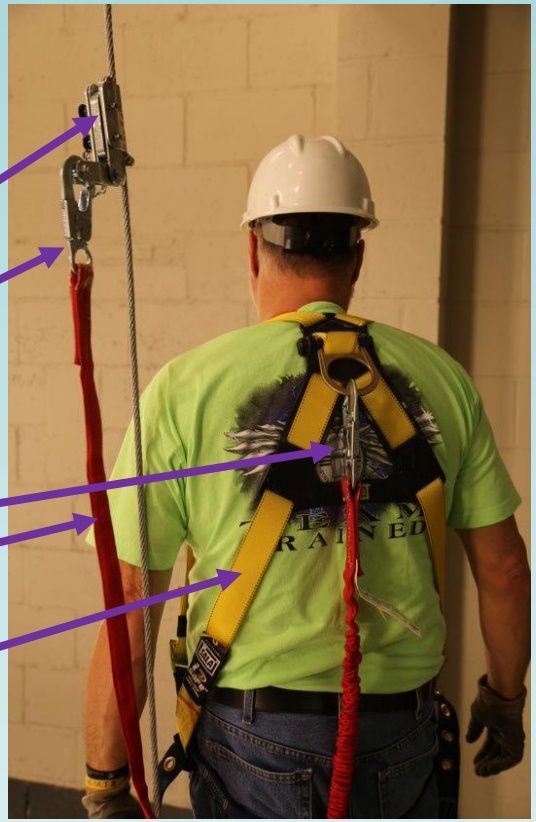
Fall restraint systems prevent the worker from getting close enough to the fall hazard to fall off the edge.

Fall Arrest

Personal Fall Arrest Systems are designed to catch workers after they have fallen.

The components of a PFAS are:

- Anchorage point
- Lifeline/Rope grab
- Connectors
- Lanyard
- Body Harness



Fall Arrest

Inspect all parts of your personal fall arrest system before each use.

Can anyone think of what you should look for when inspecting your PFAS?

Cuts

Chemical damage

Nicks

Burns

Make sure the manufacturers tag is there and legible, and includes the manufactured date

Fall Arrest Training

Required training should include:

- Explanation of the company's fall protection policies and systems
- Selection, inspection, and proper use of fall arrest systems and all related equipment and components
- Selection of an adequate anchor point

Inspect

Position D-Ring between shoulders

Buckle legs

Buckle front

Adjust the harness so it fits snug and the D-Ring is in the proper position

Source: OSHA

Fall Arrest Training

Explanation of the companies' fall protection policies and systems:

Each employer will have their own fall protection policies and procedures. OSHA requires all employees to be trained by the employer to recognize a fall hazard and how to utilize the company fall protection program to minimize those hazards.

1926.503 Training requirements.

(a) Training Program.

1. The employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.

2. The employer shall assure that each employee has been trained, as necessary, by a competent person qualified in the following areas:

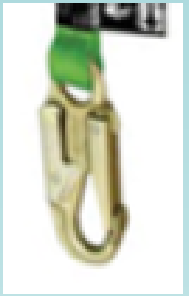
(i) The nature of fall hazards in the work area;

(ii) The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used.

Fall Arrest Selection and Use

Your employer provides you with your fall arrest PPE. It is your responsibility to use it, and use it correctly. § 1926.502(d) is the standard for fall protection systems criteria and practices. Here are some important points:

- Dee-rings and snaphooks shall have a minimum tensile strength of 5,000 pounds.
- Effective January 1, 1998, only locking type snaphooks shall be used.
- Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds.
- Each employee shall be attached to a separate lifeline. Follow your company policy on lifelines.



- Lifelines shall be protected against being cut or abraded. Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses shall be made from synthetic fibers.
- Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a competent person to be undamaged and suitable for reuse.

Fall Arrest Anchorage Selection

Where you attach your PFAS is very important. § 1926.502(15) is the standard that covers anchorage criteria.

Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used as follows:

- as part of a complete personal fall arrest system which maintains a safety factor of at least two; and
- under the supervision of a qualified person.

Personal fall arrest systems, when stopping a fall, shall:

- limit maximum arresting force on an employee to 1,800 pounds when used with a body harness;
- be rigged such that an employee can neither free fall more than 6 feet, nor contact any lower level;
- bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet (1.07 m); and,
- have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet, or the free fall distance permitted by the system, whichever is less.

Fall Arrest Rescue Plan

§ 1926.502(d)(20): The employer shall provide for prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves.

APPENDIX C TO SUBPART M OF PART 1926—PERSONAL FALL ARREST SYSTEMS:
(f) *Rescue considerations.* As required by § 1926.502(d)(20), when personal fall arrest systems are used, the employer must assure that employees can be promptly rescued or can rescue themselves should a fall occur. The availability of rescue personnel, ladders or other rescue equipment should be evaluated. In some situations, equipment which allows employees to rescue themselves after the fall has been arrested may be desirable, such as devices which have descent capability.

Always know the rescue plan and review it with your team members.

Fall Arrest Rescue cont.

So you've been in a fall arrest accident and are suspended in your PFAS waiting for rescue. What now?

Prolonged suspension from fall arrest systems can cause orthostatic intolerance, which, in turn, can result in serious physical injury, or potentially, death. Research indicates that suspension in a fall arrest device can result in unconsciousness, followed by death, in less than 30 minutes.

Signs & Symptoms of Orthostatic Intolerance:

Faintness	Nausea
Breathlessness	Dizziness
Sweating	Low heart rate
Paleness	Low blood pressure
Hot flashes	"Greying" or loss of vision
Increased heart rate	

Fall Arrest Rescue cont.

To reduce the risk associated with prolonged suspension in fall arrest systems, employers should implement plans to prevent prolonged suspension in fall protection devices. The plan should include procedures for:

- preventing prolonged suspension
- identifying orthostatic intolerance signs and symptoms
- performing rescue and treatment as quickly as possible

OSHA recommends the following general practices/considerations:

- Rescue suspended workers as quickly as possible.
- Be aware that suspended workers are at risk of orthostatic intolerance and suspension trauma.
- Be aware of signs and symptoms of orthostatic intolerance.
- Be aware that orthostatic intolerance is potentially life threatening. Suspended workers with head injuries or who are unconscious are particularly at risk.
- Be aware of factors that can increase the risk of suspension trauma.

Fall Hazards: Conclusion

The purpose of a fall protection program is to ensure that fall hazards are identified, a control method is implemented (eliminate the hazard, guardrail system, or personal fall arrest system), and workers are trained according to the control method, and the specific work practice (how to access, where to anchor, which system to use, etc.).

For employers, *ANSI/ASSE Z359.2-2017 - Minimum Requirements for a Comprehensive Managed Fall Protection Program* is a great resource for guidance on how to develop and implement a fall protection program. Employees can review this standard to educate themselves on what a fully functional fall protection program requires.

OSHA requires fall protection when an unprotected side or edge is greater than 6 feet above a lower level

Fall Hazards: Conclusion cont.

Fall prevention keeps workers from falling:
- Guardrails
- Hole covers

Fall arrest catches a worker after they have fallen:
- Personal fall arrest system

Floor openings must be covered and labeled, and covers should support twice the intended load.

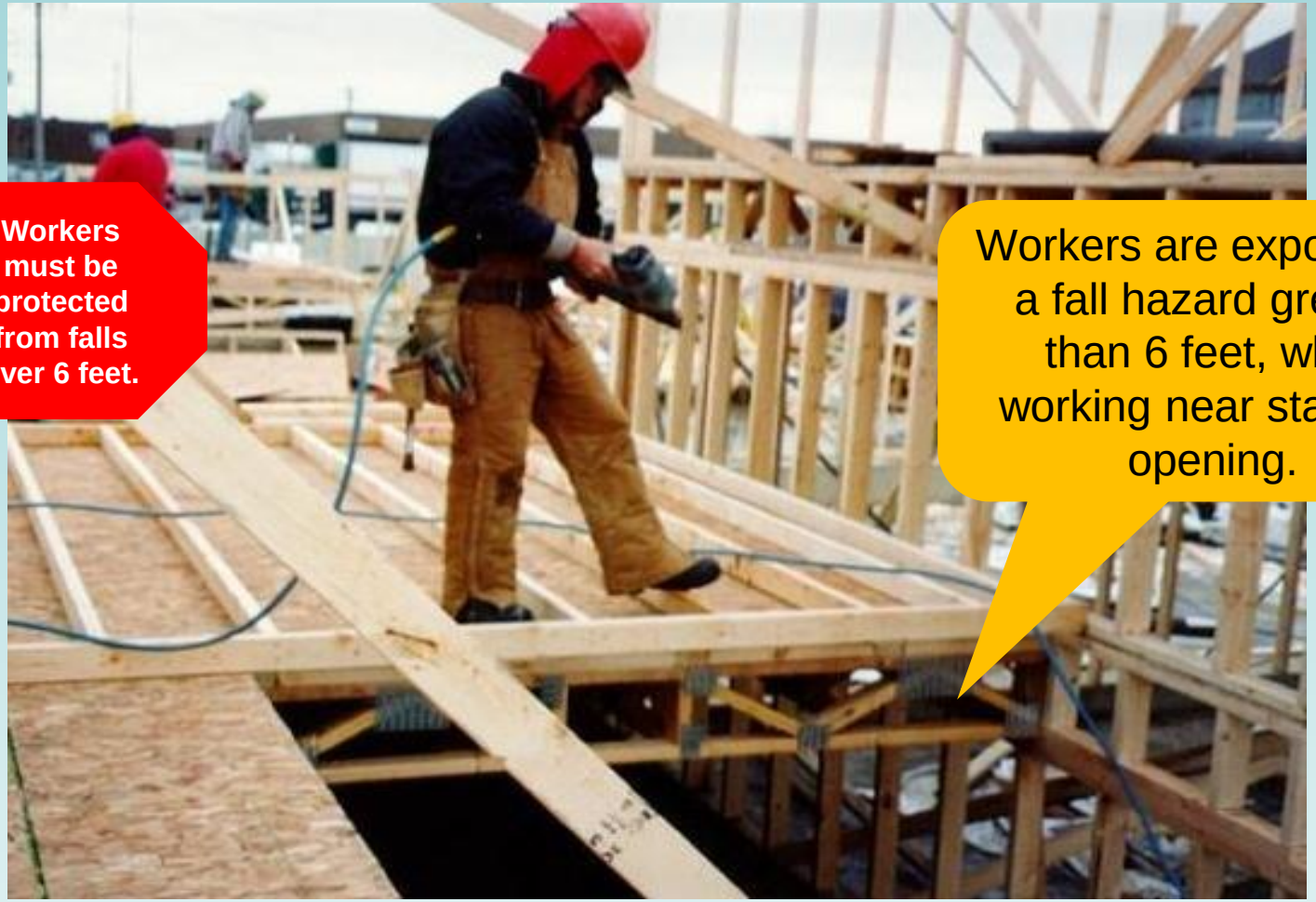
Scaffolds must be erected and dismantled under the supervision of a competer person.

Set ladders at a 4:1 height-to-base ratio, and extend at least 3’ beyond the level you are accessing. Climb ladders using 3 points of contact.

Is This a Fall Hazard? YES

Photos in this presentation are from the OSHA Region 4 National Photo Archive and OSHA Region 5.

Is This a Fall Hazard? YES



Is This a Fall Hazard? YES

Scaffold was not erected with guardrails in areas where workers were working at heights greater than 10 feet.

Fall Hazards

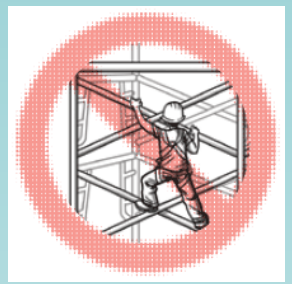
Focus Four

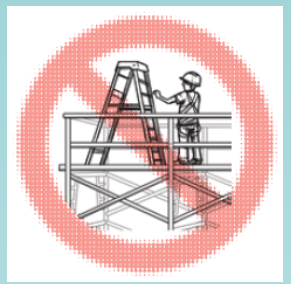
Remember PPT:

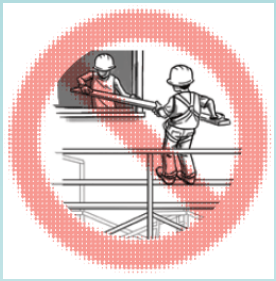
PLAN ahead to get the job done safely

PROVIDE the right equipment

TRAIN everyone to use the equipment safely







- ✓ Wear a harness and always stay connected
- ✓ Make sure your harness fits
- ✓ Use guardrails and lifelines
- ✓ Inspect all fall protection before use

- ✓ Choose the right ladder for the job
- ✓ Maintain three points of contact
- ✓ Secure the ladder
- ✓ Always face the ladder

- ✓ Guard or cover all holes and openings
- ✓ Use fully planked scaffold platforms
- ✓ Ensure proper access to scaffolds
- ✓ Inspect scaffold before use (competent person

Fall Hazards

Focus Four

Through the Alliance between OSHA's 10 Regional Offices and the Elevator Contractors of America (ECA), Elevator Industry Work Preservation Fund (EIWPF), International Union of Elevator Constructors (IUEC), National Association of Elevator Contractors (NAEC), National Elevator Industry Educational Program (NEIEP), and National Elevator Industry Inc. (NEII), collectively known as The Elevator Industry Safety Partners, developed this Fall Hazard Industry Specific Training for informational purposes only. It does not necessarily reflect the official views of OSHA or the U.S. Department of Labor. May 2021

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Any questions?