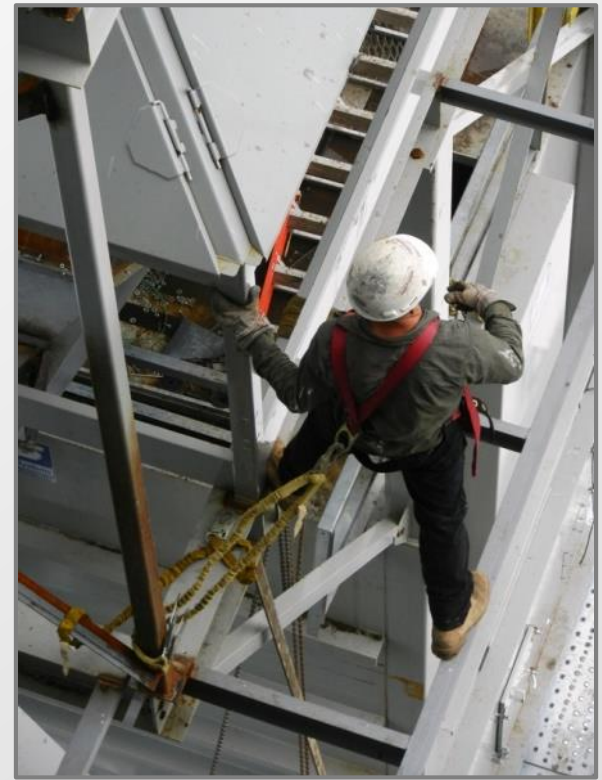


He fell about 40 or 50 feet and one of his feet was trapped under or in an auger," ...the worker was inspecting the grain elevator when he fell through a chute.

Fall Hazards & Protection



died from an accident sustained at a grain elevator ...Burnett, 28, fell approximately 60 feet from a grain elevator.

employee is dead... the man had been working inside the building on a lift that was more than 60 feet high before falling to his death.

...fell roughly 35 feet from the roof and struck his head...crane struck Lowe, knocking him from the roof... was not wearing a safety harness at the time of his death.



Dave Newcomb

PRESENTER



Employee Rights

Employees are entitled to:

- Safe & healthy working conditions
- Fair compensation for all hours worked
- Report unsafe conditions without retaliation

Employers are responsible for providing a safe workplace.

Information www.osha.gov &
www.whistleblowers.gov



Topics Covered

Overview of Fall Hazards

- ◆ Walking-Working Surfaces 1910 Subpart D
- ◆ Slip, Trip, & (Same level) Fall Hazards
- ◆ Elevated Falls

Fall Protection

Reducing Falls

Ladder Safety

Personal Fall Protections Systems - OSHA 1919.140 (Subpart I)



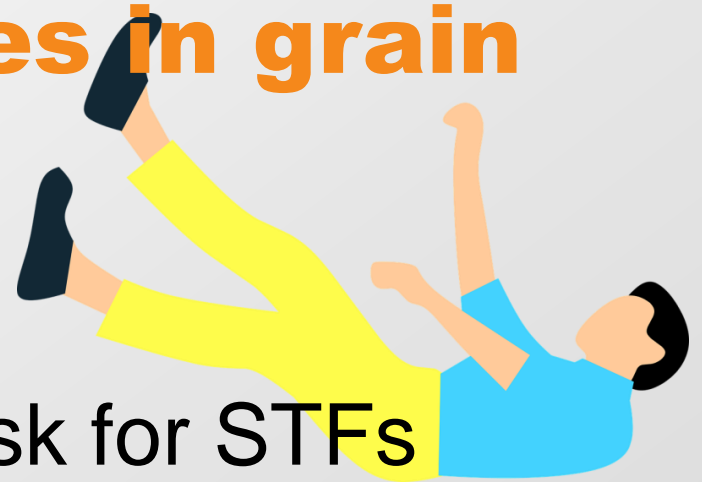
The background image shows a tall, slender metal tower with a central vertical shaft and several diagonal bracing cables. A worker is visible on a small platform or roof section near the top of the tower. The sky is blue with scattered white clouds. The text is overlaid on the left side of the image.

Walking Working Surfaces

Overview of Fall Hazards

Frequency of Falls

FALLS 2nd most common cause of injuries & fatalities in grain handling industry.



- Agriculture ranks 2nd at risk for STFs
- Typical work days lost per injury: 12*
- Over 5 years fatal (STF) work injuries increased 25%**



2 Types of Falls

Same Level Fall

- Most common
- Slip, trip, fall (STF)
- Hit object or surface



Elevated Fall

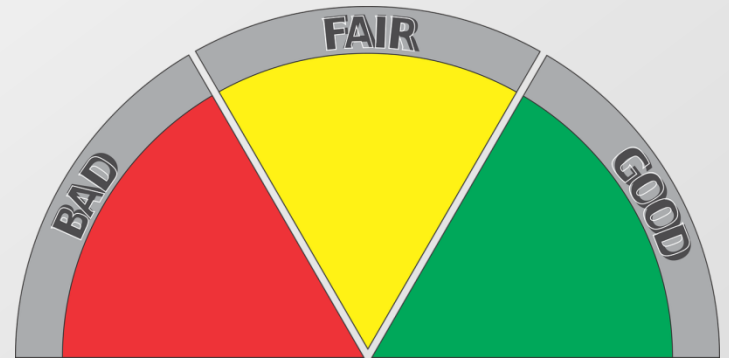
- Higher to lower level
- Less common, more severe
- Over 65% < 20 feet



Walking-Working Surfaces

1910 Subpart D

- Performance based standard
 - Minimum guidelines
- Flexible
 - Choice of fall protection
 - Performance criteria & where needed
- Align industries & consensus standards
- Address technology advances



Effective January 17, 2017.



New in Standard

- Inspect walking-working surfaces §1910.22(d)
- Ladders – use & inspection
- Fixed ladders – phase out cages
- Scaffolds – Construction industry standard
- Training requirements §1910.30
- Fall Protection criteria - 1910 Subpart I
 - 1910.140





Slips, Trips, Same Level Falls

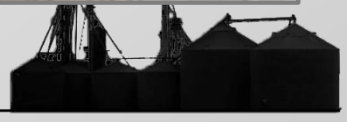
Walk & Work Hazard Free

Keep walking & working surfaces **free of hazards.**

- Inspect & maintain regularly
 - Clean, orderly
 - Floors dry
- Safe means to enter & exit
- Correct/repair hazards **before** use
 - Guard against use if hazards exist



Hazard Free Entry & Exit Areas



If It's Slick, Watch Out for Slips

Slip – loss of traction between foot & walking surface.

- Spills & leaks
- Loose material; grain, gravel
- Inappropriate footwear
- Ice, snow, sleet, etc.
- Sloped surface/terrain
- Change in surfaces
- Mount/dismount equipment



3 Point Contact for Equipment

Use 3 points of contact when mounting & dismounting vehicles or equipment.

- Keep step area clean
 - Wipe off footwear
- Release handhold only when footing is secure



Don't Get Tripped Up

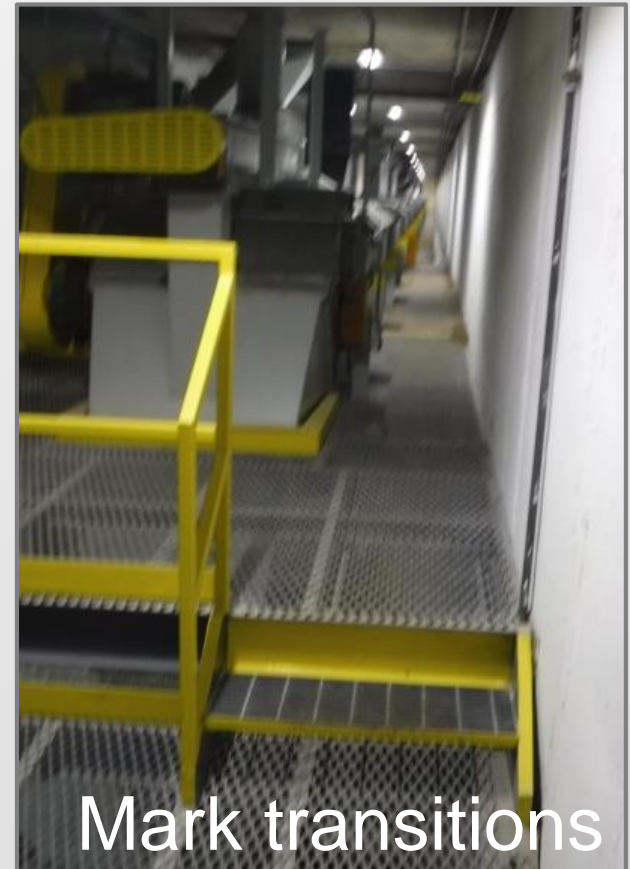
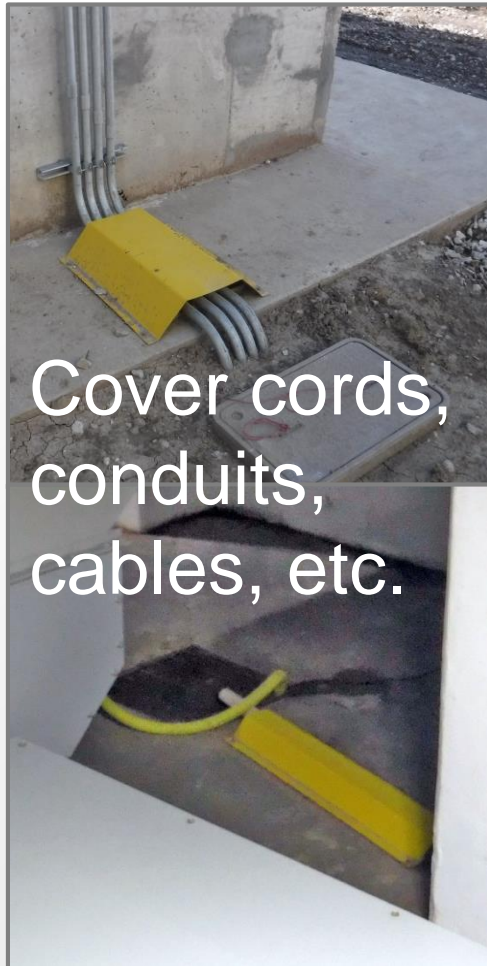


Trip – Loss of balance

- Uneven surfaces
- Obstacles, debris, protruding objects
- Loose floor covering
- Change in elevation
- Steps



Avoid a Trip – Use These Tips



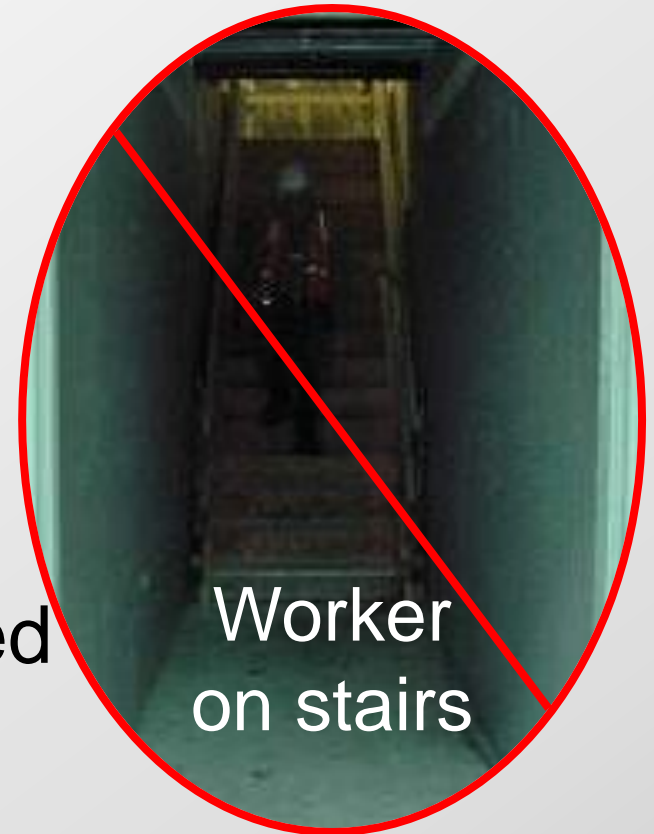
Keep Neat & Organized

Wipe up, Pick up, Clean up



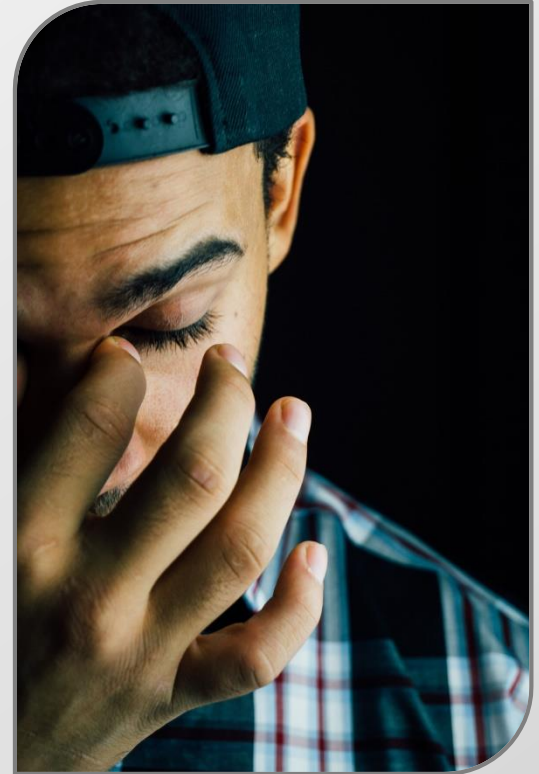
Environment Affects STF's

- Poor lighting, shadows
 - Too much light (glare)
- Excess temperatures
 - Humidity/condensation
- Noise
 - unfamiliar, loud, unexpected
- Lack anti-slip flooring
- Narrow aisles < 22" wide
- Bulky PPE



Tired, Stressed = More STF's

- Eyesight & visual perception
- Age
- Health, illness
- Physical limitations/injuries
 - Balance
- Fatigue, stress, anxiety, depression
- Judgment
- Medication, alcohol, drugs



Behavior Causes STF's

Behaviors are a leading cause of STF's.
They are choices & can be controlled.

Walking speed

Complacency

Distracted

- Cell phone use

Inattention

- Daydreaming
- Repetitive work

Unsafe Practices

- Rushing
- Shortcuts
- Blocked vision
- Running, horseplay
- Clothing – long pant legs, untied shoe laces



Elevated Falls



Elevated Falls

Ladders

Stairways

Floor openings

Elevated work surfaces

Elevated walkways

- Big culprits
- Poor design
- Poor maintenance
- Improper use



You can't "catch" yourself

*Average
reaction time

$\frac{1}{2}$ - $\frac{3}{4}$ second

0.5 seconds = 4 feet

1 second = 16 feet

2 seconds = 64 feet



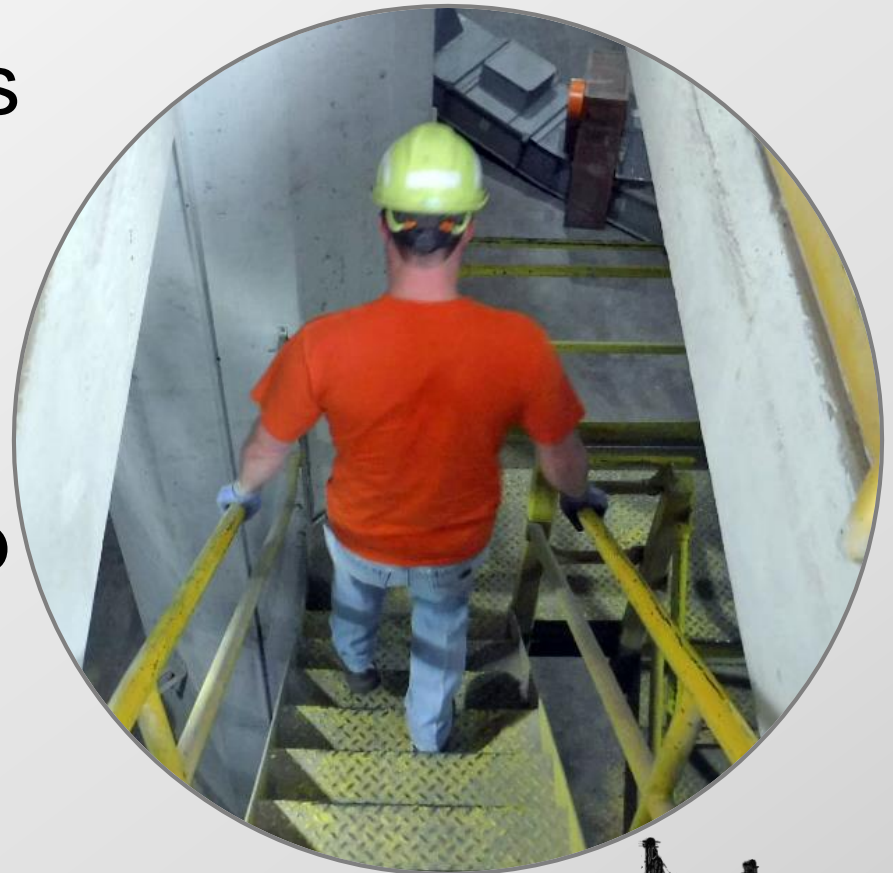
**200 lb person falling 6 feet, hits
ground at ~ 10,000 lbs of force**



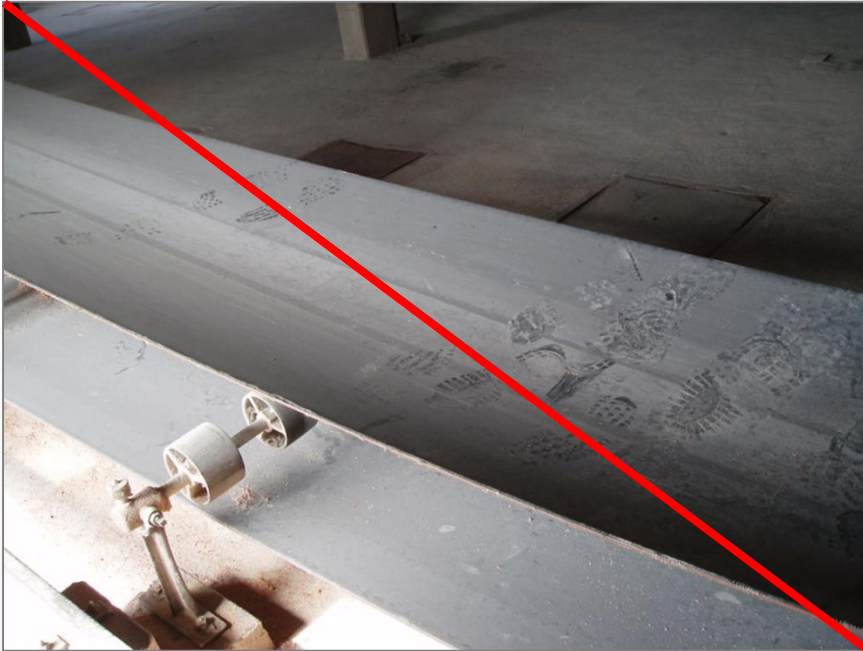
Stairway Falls

Most falls occur when descending stairs.

- Always use handrails
- Do not skip steps
- Do not place foot on edge of tread
- Lift foot clear to keep heel from catching edge.



Ways Falls May Occur



Bad Choices



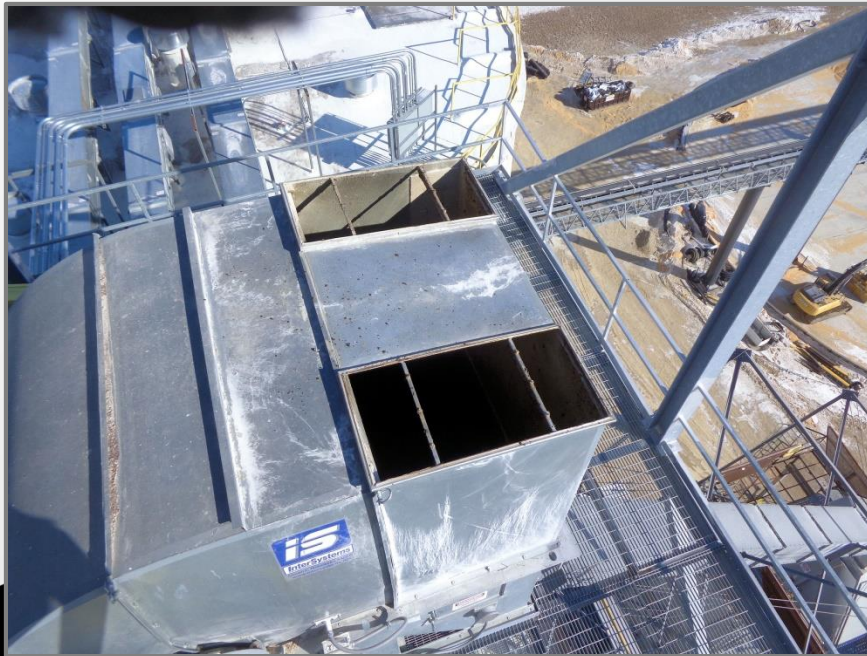


Fall Protection

Fall Protection Controls Risk

Any equipment, device or system that

- Prevents a fall
- Reduces effect of a fall



Fall Protection at 4 feet

Heights \geq 4 feet

- Floor & pit openings
- Stair & ladder openings
- Work platforms
- Elevated runways or walkways
- Above/next to dangerous equipment – **ANY** height



Structural Restraints

- Floor holes - grates, cover, guard rails
- Guard rail - exposed sides
 - Top & mid-rail, toe board (falling objects)
- Ladder/platform entrance
 - swing gate, barrier, offset



Personal Fall Protection System

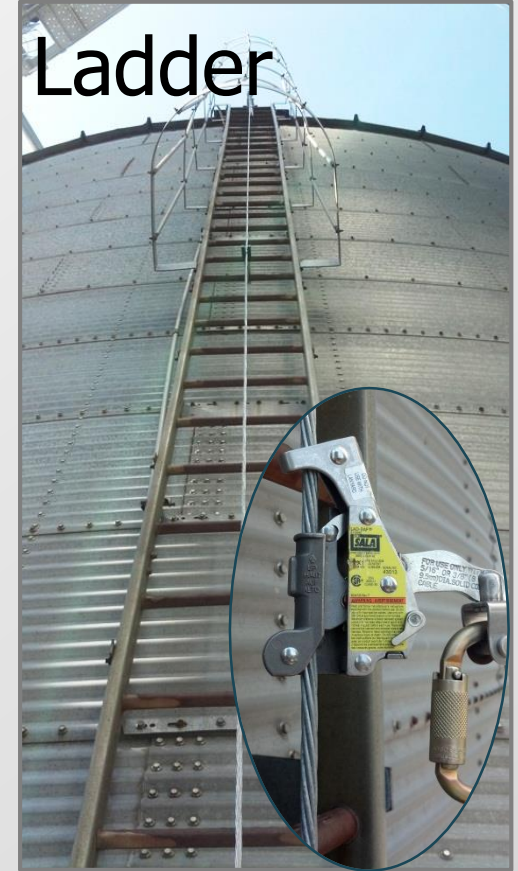
Restraint



Arrest

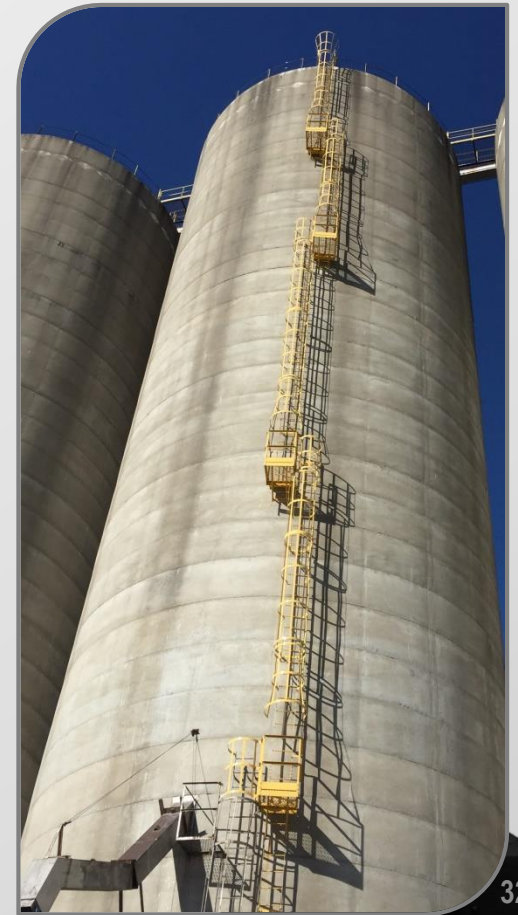


Ladder



Fixed Ladder Requirements

- Extend 42" above landing surface
- Ladder > 24 feet above lower level
 - Ladder safety system
 - Personal fall arrest system
- Platforms
 - ≤ 150 feet intervals
 - Ladder/sections with cages - offset, ≤ 50 feet



Fixed Ladder Phase-in

- Fixed ladder fall protection
 - New ladders installed after 11/18/2018
 - All fixed ladders 11/18/2036
- Inventory fixed ladders
- Make replacement schedule

Ladder cages are no longer considered fall protection.





Reducing Falls

1.8 Million Steps per Year

Walking is as natural as breathing. We do not think a fall is likely on any given step.



Low risk perception. Do not appreciate hazards & use of safe practices.



Keep Eyes on the Path

Walk with purpose & intent. Keep eyes on the walking path & focus attention.

- Eliminate distractions
- Adjust stride & speed
- Feet pointed slightly out
- Wide turns at corners
- Anticipate hazards
- No running, horseplay, etc.



Action Combats Complacency

- Active employee participation
 - ID & report hazards
 - Housekeeping tasks
- Training – frequent, repeated
- Personalize training
 - How injury would affect worker
 - Workplace photos
 - Stories, videos of others
- Signs, barriers, posters
 - Change/rotate



Strategic Design & Processes

- Housekeeping policy & procedure
 - Available & accessible supplies
- Inspections – pre-shift, other
- Hazard reporting process
 - Accountability to fix hazards
- Job & workplace design
 - Minimize multi-tasking when walking, etc.
 - Cell phone policy
 - High visibility guards
 - Material movement (avoid carrying)



A tall, silver, telescopic portable ladder structure is the central focus, extending from the bottom towards the top of the frame. It has several platforms and rungs. In the background, there are several large, conical structures with corrugated metal roofs, possibly part of an industrial facility or a fairground. The sky is blue with scattered white clouds. The overall image has a slightly faded, semi-transparent appearance.

1910.23

PORTABLE LADDER SAFETY

Ladders & You



Falls from ladders account for approximately **20%** of general industry injuries.

* Indicates inclusion in OSHA standard 1910.23



Choose Correct Ladder for Job

- Duty type - Heavy Duty (Type I, IA, IAA)
- Ladder Length (height)
- Load limit* - Do not exceed load capacity
 - User weight + PPE + tools/supplies
- Ladder type - extension, stepladder, etc.
 - Use only for purpose designed

Portable Ladder Duty Rating

LOAD CAPACITY*	DESCRIPTION	CSA CODE	ANSI CODE
200 lbs./91 kg	Household - Light Duty	Grade 3	Type III
225 lbs./102 kg	Tradesman and Farm - Medium Duty	Grade 2	Type II
250 lbs./113 kg	Construction and Industrial - Heavy Duty	Grade 1	Type I
300 lbs./136 kg	Construction and Industrial - Heavy Duty	Grade 1	Type IA
375 lbs./170 kg	Construction and Industrial - Heavy Duty	Grade 1	Type IAA

*Includes user and materials



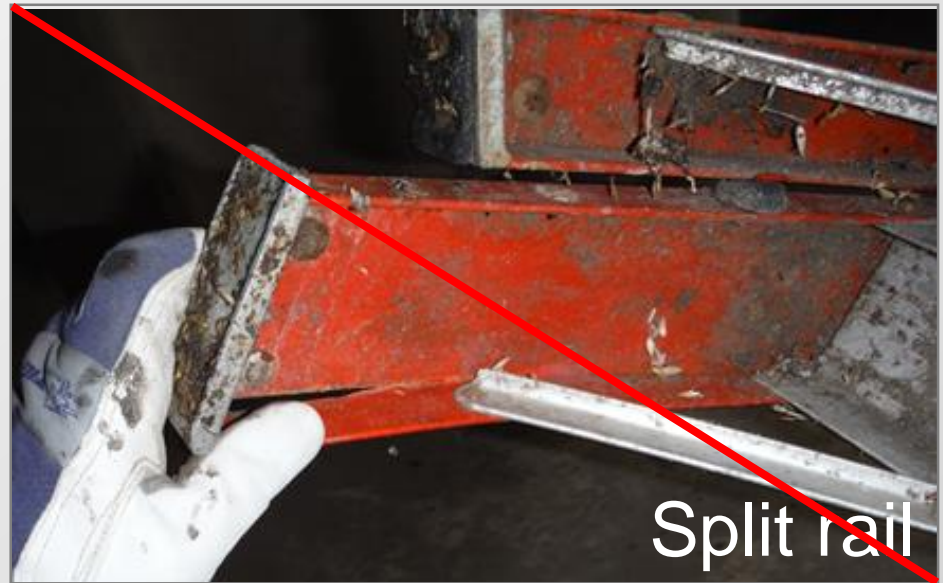
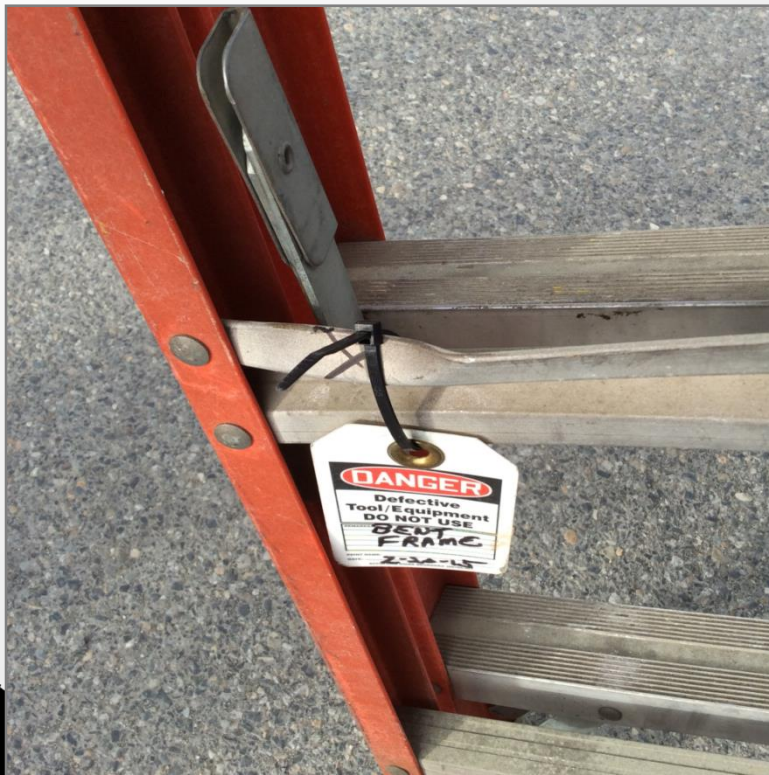
Ladder Height

- Maximum work height
 - Highest standing level + user's height & vertical reach
- Ladder too tall
 - Ceiling height prohibits proper set-up angle
 - Extends > 3 feet beyond upper support
 - ❖ Acts like a lever causing base to move or slide out
- Ladder length creates gap – too far from work surface



Get Rid of Defective Ladders

- Inspect ladders before use
- Tag & dispose of defective ladders
 - Danger - Do NOT Use



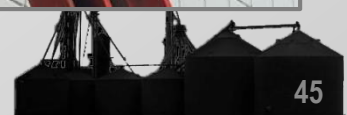
Step Ladder Set-up

- Fully extend base
- Lock spreaders
- Level support for rails



Extension Ladder Set-up

- 4:1 ratio – 75.5°
- Extend 3' above upper support
- Support both rails
- Secure top, bottom
- Lock rung locks
- 3 feet section overlap



Ladder Use



Face ladder &
3 point contact



Belt buckle
center of rails



Don't carry
materials/tools



Wrong Portable Ladder Set-up

- Placed on objects or unstable base
- Too close to power lines
- Set upside-down
- Extend ladder length
 - Tie two ladders together
 - Tie ladder sections together



Ladder Storage

- Well ventilated area
- Away from heat, sunlight, moisture, humidity & corrosive materials
- Extension ladders
 - Flat rack
 - Support with brackets to prevent sag
- Step ladders
 - Close, vertical, secure



A tall, slender metal tower with a spiral staircase winding up its side. Several thick guy wires extend from the top of the tower to the ground, forming a wide triangle. The background is a bright blue sky with scattered white clouds. In the lower part of the image, the roof of a building with a similar conical shape is visible, and a small figure of a person can be seen on one of the roof's ridges.

PERSONAL FALL PROTECTION

ABCs - Personal Fall Protection

Restraint or Arrest

Must be trained to use!



A Anchor & Anchorage Connector

B Body Harness

C Connecting Device

D Deceleration Device



Personal Fall Protection Systems

1910.140(c)

- Use **ONLY** for fall protection
- Immediately remove & do not use
 - any component subjected to impact loading
- **ALL** components **MUST** be compatible
- Inspect **BEFORE** each use
 - Mildew, wear, damage, deterioration
 - Remove any defective component
- Clean after each use



Anchors

- 5,000 lbs
- Types of attachment
 - Permanent or temporary
 - Secure structural feature
- Inspect & approve BEFORE use
 - Qualified Person
- **NEVER** attach to a ladder side rail or rung



Use Appropriate Anchors



Never attach anchor to ladder side rail or rung



Full Body Harness

- Back D-ring
 - Fall arrest
- Side D ring
 - Work positioning
- Front D-ring
 - Ladder safety device



3M™ DBI-SALA® ExoFit™



Connectors

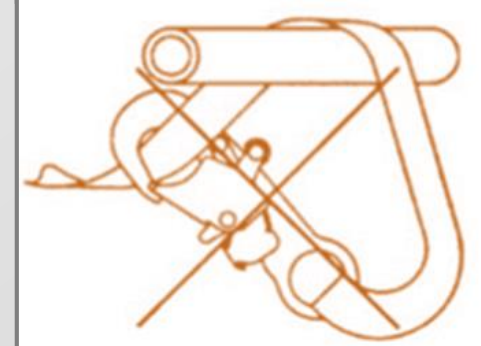
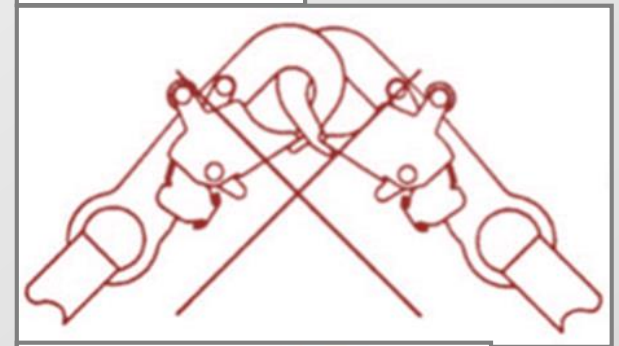
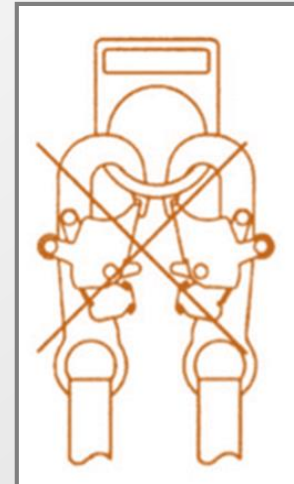
- Capable of tensile load $\geq 5,000$ pounds
- Snaphooks/carabiners - automatic locking
 - At least 2 separate consecutive movements to open



Connectors

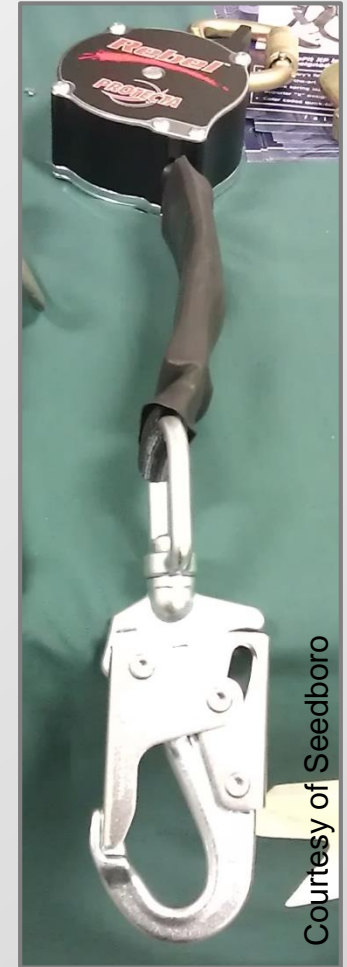
Do Not

- Attach more than 1 connector to a D-ring
- Connect 2 snap hooks or carabiners together
- Connect snap hook back on its integral lanyard
 - Only if manufacturer designed



Deceleration Device – Fall Arrest

- Self retracting lifeline –
 - needs ≤ 2 feet to arrest free fall
- Automatically locks
- Arresting force $\leq 1,800$ pounds
- Complete stop ≤ 3.5 feet
- Withstand 2X potential impact energy of the free fall distance



**Cannot free fall > 6 feet
or contact a lower level**



Lifelines

- Only one person per (vertical) lifeline
- Lanyards & vertical lifelines
 - Breaking strength $\geq 5,000$ pounds
- Travel restraint
 - Tensile load $\geq 5,000$ pounds
- Rope – must not be natural fiber
 - Polypropylene rope must contain an ultraviolet (UV) light inhibitor



Clean Harness After Each Use

- Use mild detergent & water
 - Brush off surface dirt
 - Scrub to work up lather
 - Wipe off lather
- Dry
 - Hang away from heat, steam, long periods of sunlight
 - Towel dry housing



QUESTIONS?

This material was produced under grant number SH-22288SH1 & revised under SH05033-SH8 from the Occupational Safety and Health Administration, U. S Department of Labor. It does not necessarily reflect the views or policies of the U. S. Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement by the U. S. Government.

