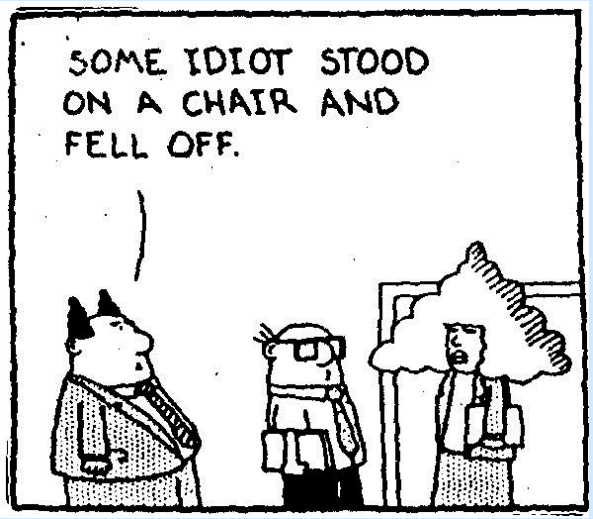
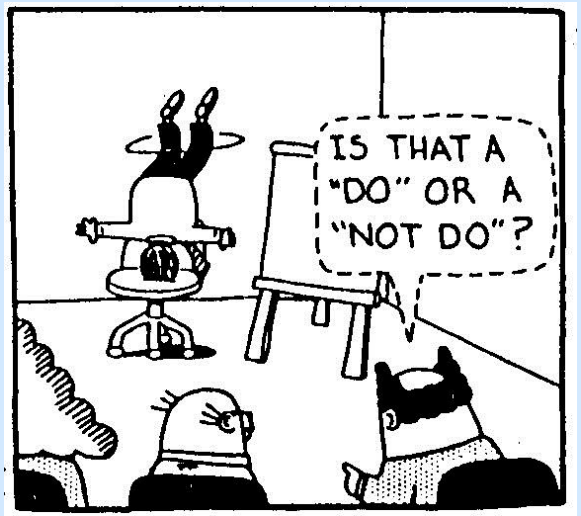
admin
THE SOUTH CAROLINA DEPARTMENT of ADMINISTRATION

What do you think of When You Hear the Term

Fall Protection?





Fall Protection

Self-Study Course & Exam

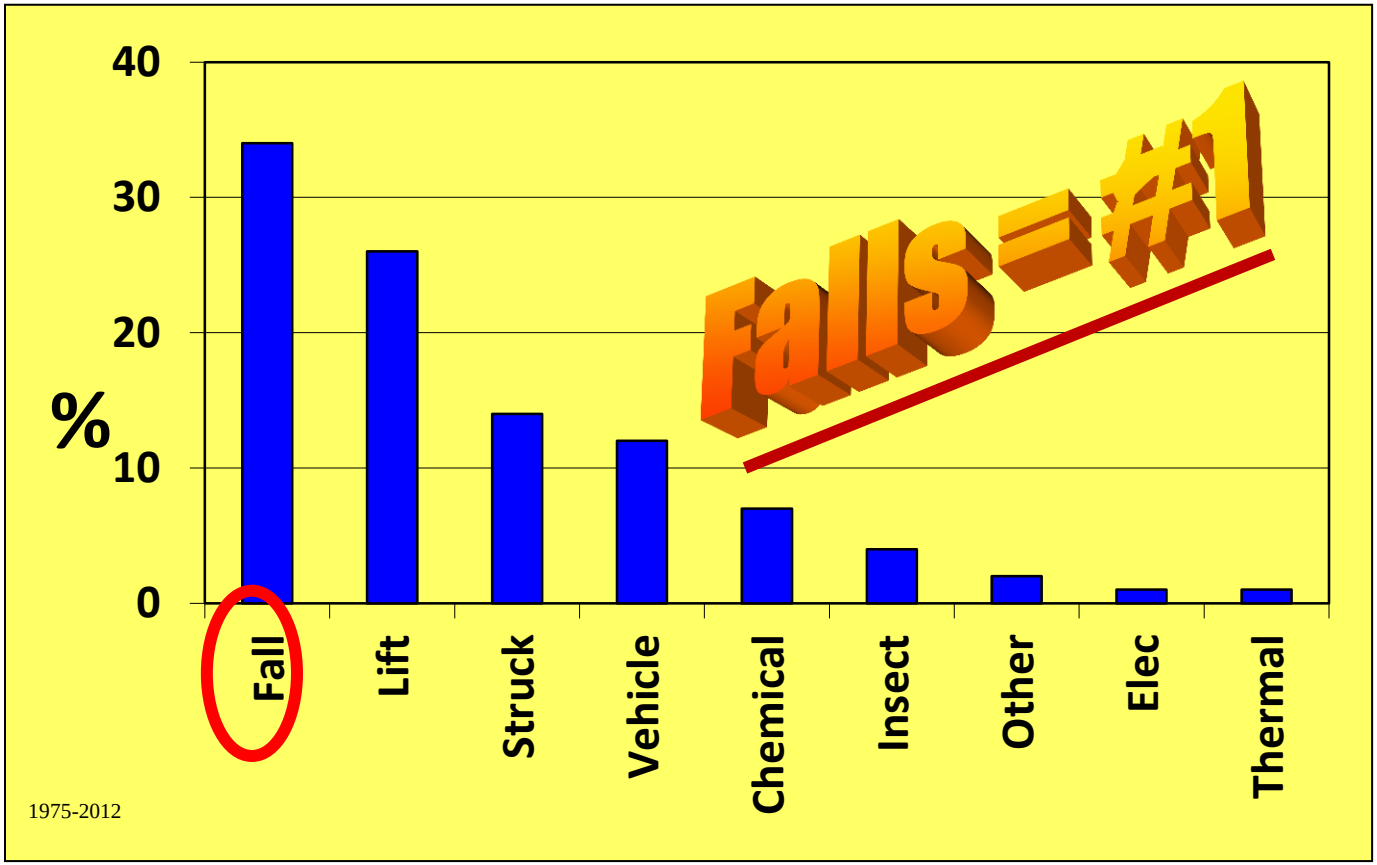
To Receive Credit For This Course
Contact The Safety Office For A Test
Or Print A Copy From On-Line

Passing Grade is **70%** Or Better

Note: Many Exam Questions Can Be Found In This Presentation But Not All. You Will Also Need To Refer To The **Fall Protection Policy** Found On Safety's Webpage. **Ladder Safety** And **Scaffold Safety** Are Additional But Separate Courses Associated With This Fall Protection Course.

Types of Accidents

(In Our Organization)



Our Problem:

How to Stop

FALLS

Safety Program

General Services Division
Facilities Management

Slip

When there is too little friction or traction between your feet (footwear) and the walking or working surface, and you lose your balance.

Trip

When your foot (or lower leg) hits an object and your upper body continues moving or you step down unexpectedly to a lower surface, i.e., stepping off a curb or misstep on a stairway, and you are thrown off balance.

Can lead to:

Fall

Occurs when you are too far off your center of balance and can no longer sit or stand.

RESULTS of Fall Accidents

- Injuries To Hands, Wrists, Arms, Ankles, Knees, Back, Head
- Medical Costs
- Time To Recuperate
- Time Away From Work
- Temporary/Permanent Disability
- Restricted Work
- Decreased Productivity
- Increased Insurance Premium

Safety Program

General Services Division
Facilities Management

COSTS for a FALL

QTY	ORGANIZATION	PAID CLAIMS *
14	Internal Operations	$70,070
12	GSD FM Building Maintenance	$164,904
7	Human Resources – TEMPO	$42,917
6	Division of State Information Technology	$7,030
3	GSD FM Custodial	$7,129
1 each	Confederate Relic Room	$35
	GSD FM Building Systems	$521
	GSD Surplus Property	$382
	GSD Interagency Mail Services	$25,285
	GSD Administration	$50
	GSD FM Parking	$1,480
	GSD FM Administration	$1,530

In 5 year Study (2007 – 2012) **- $331,333**

1975 - 2012*

$1,535,540

Largest Claim

$364,793

(1975)

Average Claim

$7,099

* Source - State Accident Fund

CAUSES
Fall Accidents

%	CAUSE
18%	**STAIRS**
16%	**FLOOR – Wet / Icy**
5% each	**FLOOR – Foreign Object** **LADDER**
4% each	**CHAIR – Getting In / Out** **CURB / PARKING CURB / SPEED BUMP** **FLOOR – Other** **UNEVEN WALK SURFACE**
2% each	**VEHICLE – Getting In / Out** **MATERIALS HANDLING – OFF BALANCE**
1% each	**IMPROPER PRODECURE** **CLOTHING** **ELEVATOR MALFUNCTION** **DOOR THRESHOLD** **ILLNESS**

Don't

FALL

For It !!!

Safety Program

General Services Division
Facilities Management

PREVENTING Fall Accidents YOUR ACTIONS

PAY ATTENTION – Watch Where You Are Going

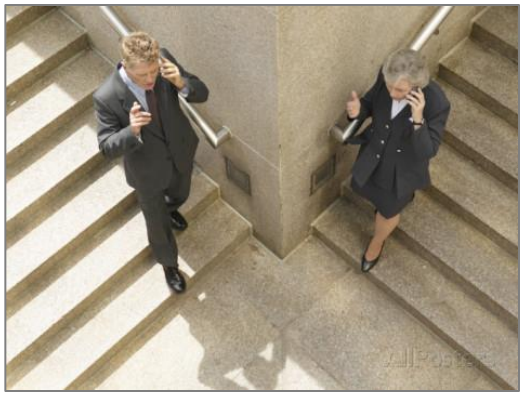
- **Adjust Stride** ***When There Is A Change In Walk Surface***
  (Between Carpet , Vinyl, Ceramic, Marble, Stone Flooring)
  - ***Slow Down*** And ***Take Shorter Steps***
  - Point Your Toes Slightly Outward
  - Make Wide Turns At Corners

PREVENTING
Fall Accidents
YOUR ACTIONS

PAY ATTENTION –
Watch Where You Are Going

Avoid *DISTRACTIONS !!!*

- Cell Phone
- Texting
- Talking



Safety Program

General Services Division
Facilities Management

PREVENTING
Fall Accidents
YOUR ACTIONS

PAY ATTENTION – Watch Where You Are Going

Use Walkways

Instead Of Shortcuts

(Across Uneven Ground)

PREVENTING
Fall Accidents
YOUR ACTIONS

Take Your Time – Don't Hurry, Rush Around, Move Too Fast For Conditions

Safety Program

General Services Division
Facilities Management

PREVENTING
Fall Accidents
FLOORS

Clean Up Clutter In Work Areas, Aisles & Walkways

- Sweep; Put Away Tools, Equipment & Storage
- Close Drawers

Keep Floors Clean

PREVENTING Fall Accidents FLOORS

Clean Up Spills

- Use Wet Floor Signs
- Use Absorbent For Oil / Grease

PREVENTING Fall Accidents FLOORS

Power Cables

- Do Not Route Across Walkway Or Under Rugs
- Use Cable Protector

Safety Program

General Services Division
Facilities Management

PREVENTING Fall Accidents FLOORS

Report Damaged Walkways For Repair

Worn, Loose Or Wrinkled Carpet, Mats & Runners

Broken Stair Tread

Uneven Sidewalks

Safety Program

General Services Division
Facilities Management

PREVENTING Fall Accidents FLOORS

Put **Non-Slip Floor Mats**
At Entrances When There Is
Rain, Snow Or **Ice**…

and
Wet Floor Signs
Until Dry

Safety Program

General Services Division
Facilities Management

PREVENTING
Fall Accidents
SHOES

Taps on Soles

Slick Smooth-Surfaced Soles

High Heels

Footwear That Reduces Traction Is Not Suitable

PREVENTING Fall Accidents SHOES

SOLES And HEELS Should Be SLIP RESISTANT

- Leather Soles Are Good For Most Environments
- Soft Rubber Is Not Good For Wet Or Greasy
- Hard Rubber Is Good For Greasy Surfaces
- PVC Or Polyurethane Is Best Around Chemicals Or Petroleum Products
- Deep Tread Is Best For A Lot Of Water
- Clean Off Dirt, Mud, Grease, Oil

PREVENTING
Fall Accidents
STAIRS

Ensure Stairs Are Well Lighted

Do Not Store Items On Stairs

PREVENTING
Fall Accidents
STAIRS

- **Use The Hand Rail**
  - For Stability
  - And To Help Pull Yourself Up The Stairs
- Take **One Step At A Time**

PREVENTING
Fall Accidents

Carrying Oversized Or Too Many Objects:

- Obstructs Your View
- Impairs Your Balance
- Keeps You From Holding Onto Handrails

INSTEAD:
Use **Hand Truck, Dolly, Cart** And / Or **Elevator** To Carry Large Number Or Heavy Packages

- See Where You Are Going
- Prevent Hurting Your Back

PREVENTING
Fall Accidents

Watch For Changes In Elevation

Curbs

Sidewalks

Speed Bumps

Safety Program

General Services Division
Facilities Management

PREVENTING
Fall Accidents
VEHICLES

When Mounting Or Climbing Down From A Vehicle:

- Have A Good Hand Hold
- Pull Yourself Up / Let Yourself Down
  - Reduces The Force Between Your Shoe And The Step Thus Reducing The Chances Of A Slip

Practice The “Three-point” Climbing Method

- Two Hands And A Foot Or Two Feet And A Hand Always In Contact With Vehicle Step

Safety Program

General Services Division
Facilities Management

PREVENTING Fall Accidents

LADDERS

Put Up Ladder At 4-to-1 Angle

Climb Using The "Three-point" Method

- Two Hands And A Foot Or Two Feet And A Hand Always In Contact With The Ladder
- Do Not Carry Tools / Materials While Climbing

Do Not Over-reach

Falling Off Of Ladders Is As Easy As . . .

1 **2** **3**

PREVENTING
Fall Accidents

Fixed Ladder Safety

Ladder Safety System

Ladder Cage

Fixed Ladders >20’ Long Need:

- A Ladder Safety System
  - Allows Only a 9” Fall Distance
- Or Cages

Fixed Ladders >30’ Long Need

Platforms

- Every 30’ In Height Or
- Every 20’ In Height When There Is No Ladder Safety System Or Has No Cages

PREVENTING
Fall Accidents

LADDER SAFETY

Will Be Discussed More
In A Separate Course
Presentation

PREVENTING
Fall Accidents

For Most Employees This Concludes The General Information On Preventing Falls

Reminder

Take Your Test

Trades Specialists And Other Designated Employees

CONTINUE

To Part II

Division of General Services

FALL PROTECTION PROGRAM

FALL PROTECTION

- Osha Required Systems
- Operations
- Inspection & Maintenance
- Planning For A Fall
- Rescue
- Other Fall Situations

FALL PROTECTION

OSHA STANDARDS

Construction Industry - 29 CFR 1926	SUBPART
•Scaffolds	**L**
•Certain Cranes & Derricks	**N**
•Steel Erection In Building	**R**
•Certain Tunneling Equipment	**S**
•Electrical Transmission & Distribution	**V**
•Stairways & Ladders	**X**
•All Other Fall Situations	**M**

Require Fall Protection To Be Provided At 6' And Above

General Industry - 29 CFR 1910 Subparts M & D

- **Require Fall Protection To Be Provided At 4' And Above**
- **At Any Height When Working Above Dangerous Equipment / Machinery**

FALL PROTECTION - OSHA

Falls are the Leading Cause of Worker Fatalities in the U.S.

- 212,760 Workers Seriously Injured & 605 Killed
- $70 Billion in Workers Compensation And Medical Costs

OSHA Standards Establish Systems and Procedures that:

- Prevent Employees from Falling Off, Onto or Through Working Levels
- Protect Employees from being Struck from Falling Objects
- Covers Workers
  - Exceptions For Inspectors, Investigators & Assessors

FALL PROTECTION

OSHA - REQUIRED SYSTEMS

Personal Fall Arrest

Nets

FALL PROTECTION

OSHA - REQUIRED SYSTEMS

Other Means Of Access:

- Scaffolds
- Aerial Lifts / Bucket Trucks
- Ladders

Each Also Requires

Fall Protection (Measures)

FALL PROTECTION

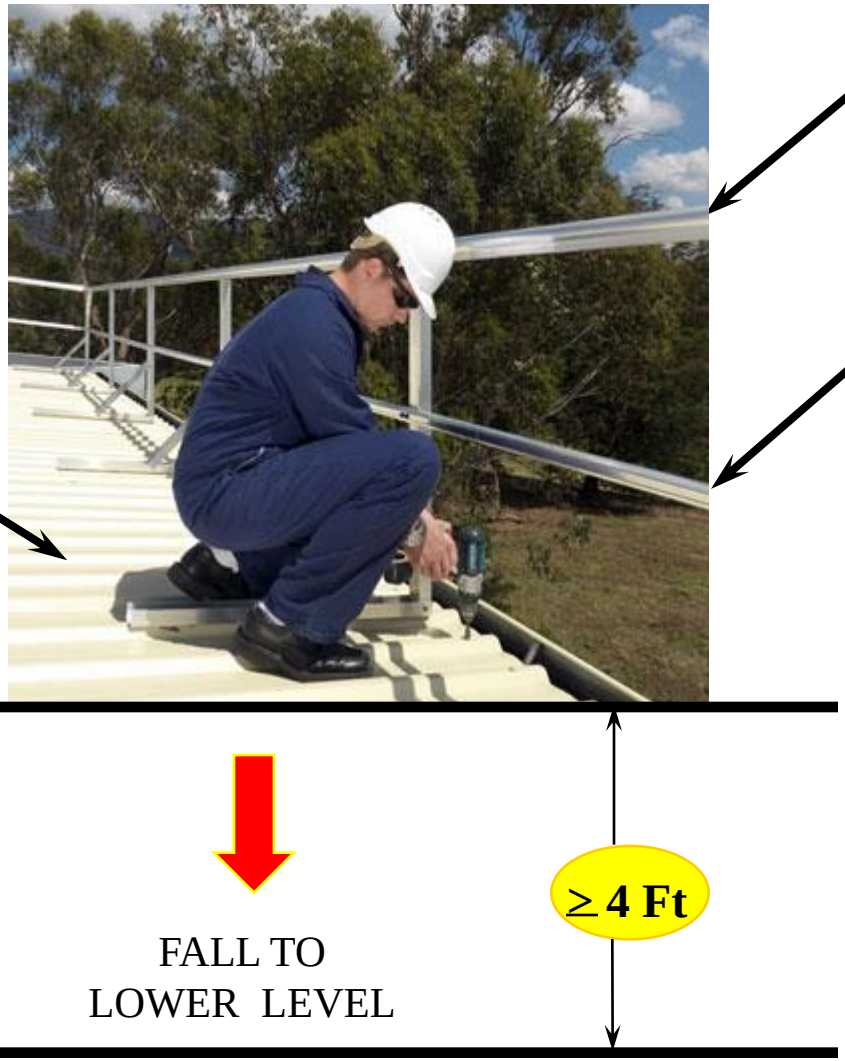
HOLES

Holes In The Walk Surface Require

- Covers
  - Secured & Marked
  - Support Intended Load
  - <1” Tall With <30^0 Edges
- Guardrails
- Screens

FALL PROTECTION

GUARDRAIL SYSTEM



Top Rail:

- 42” +/- 3”
- 200 Lbs Side Force

Mid-Rail:

- Half Way
- 150 Lbs Side Force
- 19” Object Not Pass Through

Toe Board

- Withstand 50 Lbs Force
- No More Than ¼” Above Work Surface

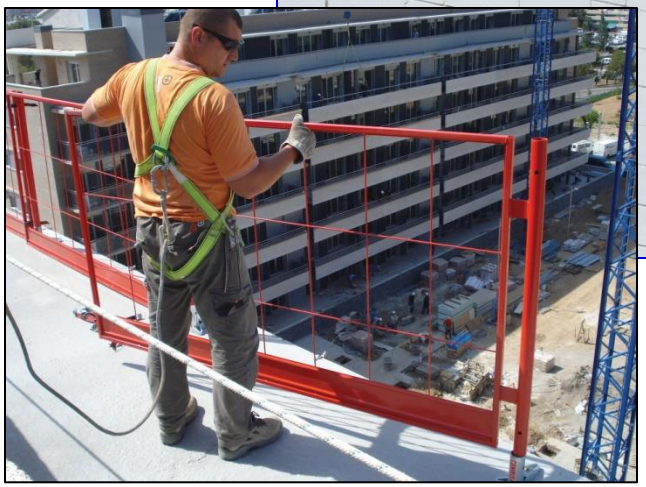
Post Spacing – 8’ Apart

FALL PROTECTION
GUARDRAIL SYSTEM

Safety Railings Can Be:

- A Permanent Installation
  (Anchored / Roof Penetration)
- Or Temporary
  (Non-Anchored / No Roof Penetration)

FALL PROTECTION
GUARDRAIL SYSTEM

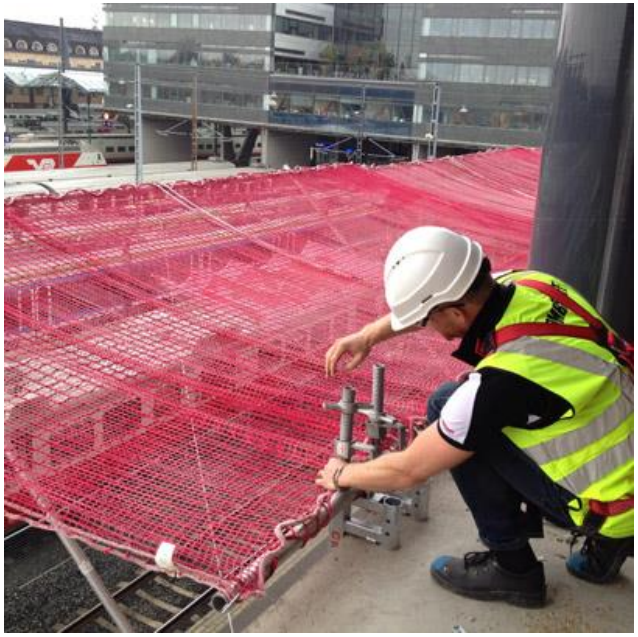


- When Not In Use, Openings For Ladders Or Hoist Accesses Must Have In Place:
  - Chain
  - Gate
  - Or Removable Guardrail

- Workers Who Could Lean Out Over Edge Must Have Personal Fall Arrest System

FALL PROTECTION

NET SYSTEM

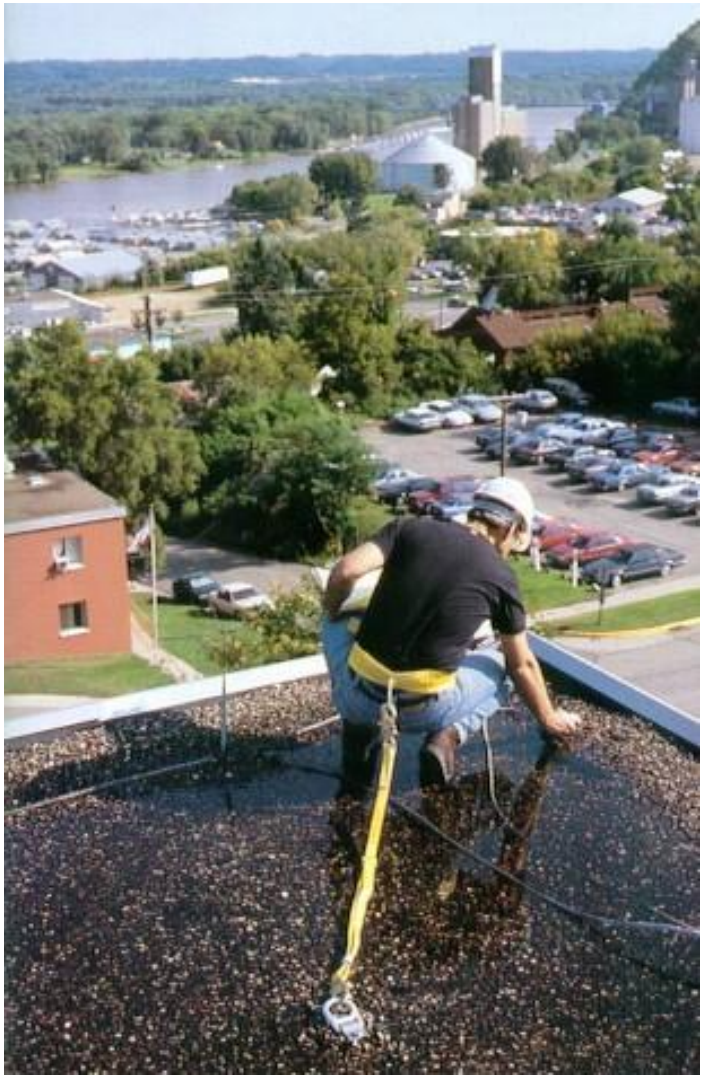


Fall Nets Must Be:

- As Close As Possible To Work Surface But Not More Than 30’ Below
- Extend Out 8’ – 13’ (Depends On Fall Distance)
- Mesh Opening Not More Than 6” x 6”
- Must Support At Least 5,000 Lbs & A 400 Lb Object Falling 42”
- Remove Objects In Net ASAP At End of Shift

Nets Are Not Practical For Most Bldg. Maintenance Jobs

FALL PROTECTION
RESTRAINT DEVICES



Prevents The User From Potential Falls, Ie., Allows One To Work Up To Unprotected Edge But Does Not Allow To Fall Over The Edge

Body Belt

Adjustable Lanyard

FALL PROTECTION
RESTRAINT DEVICES

BODY BELT

- Concentrates Full Force Of Fall On Abdomen Greatly Increasing Chance Of Internal Injuries
- Improper Wear Results In Further Injury
  - Too Low - Hang Upside Down
  - Too Loose - Belt Jerked Off
  - D-Ring Not In Back - Spinal Injury

Therefore,

BODY BELTS ARE PROHIBITED WITH FALL ARREST SYSTEMS

FALL PROTECTION
POSITIONING DEVICES

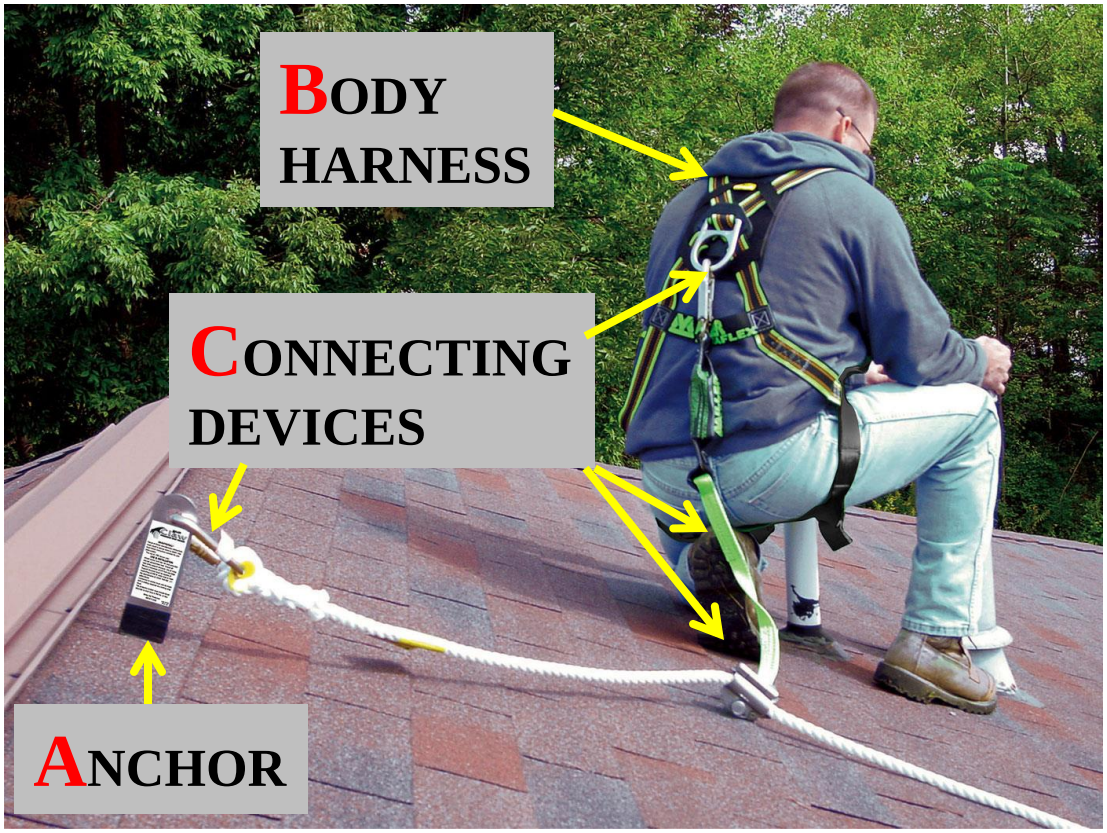
Designed To Hold The Worker In Place At Height

- Allows Hands Free To Work
- Full Body Harness* With D-Ring & Snaphook Connectors
- Not Designed For Fall Arrest (Cannot Fall > 2')
- Need To Use With Personal Fall Arrest System

* Though OSHA Allows A Body Belt With Fall Positioning Work,
DGS Employees Are To Use A FULL BODY HARNESS With Side D-Rings
(As A Body Harness Is Applicable To All Fall Situations And Provides The Better Fall Protection)

FALL PROTECTION

PERSONAL FALL ARREST SYSTEM



PARTS:

- **A**nchor
- **B**ody Harness
- **C**onnectors
  - D-Ring
  - Carabineer
  - Lanyard

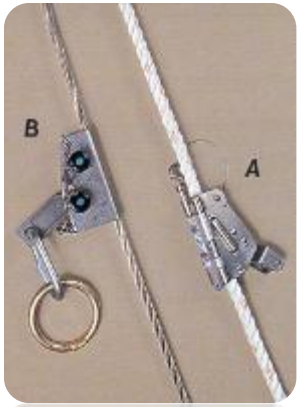
Fall arrest systems are designed to stop a person's fall and absorb the impact to make the fall survivable

FALL PROTECTION

PERSONAL FALL ARREST SYSTEM

Shock Absorbing Lanyard

Self Retracting Lifelines



Rope & Cable Grabs

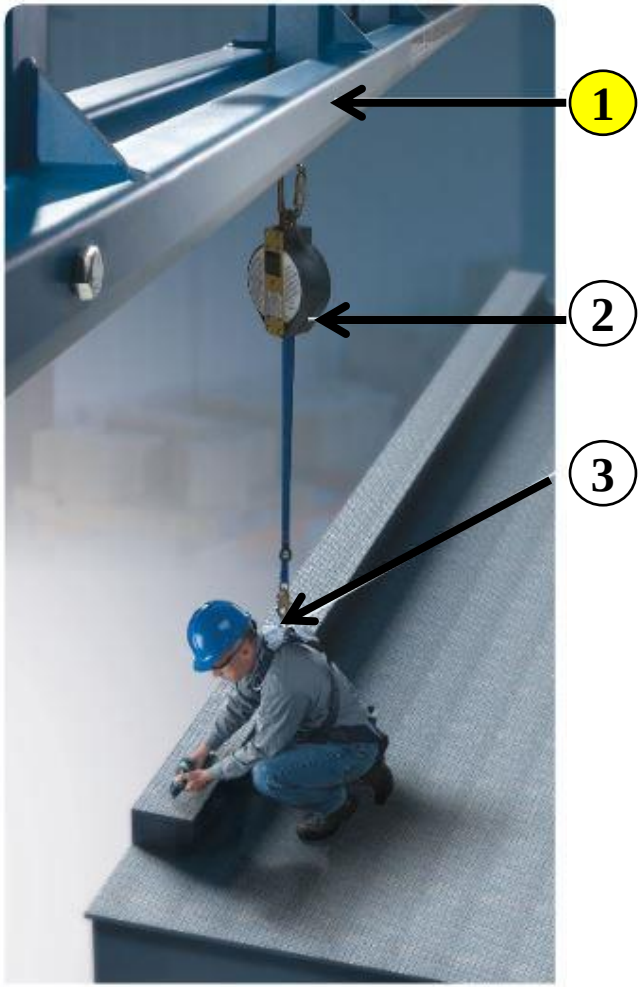
Carabiners

Cross-Arm Strap Anchor

Full Body Harness

FALL PROTECTION

PERSONAL FALL ARREST SYSTEM



PARTS:

1. **Anchorage** – A Secure Point Of Attachment For Lifelines, Lanyards Or Deceleration Devices. Commonly Called A Tie-Off Point.

   - Must Be A Fixed ***Structural*** Component Such As A Beam, Girder, Column Or Floor (i.e., Not A Guardrail) To Support the Fall Arrest Forces Exerted In A Fall

   - Must Support 5,000 Lbs Per Worker

FALL PROTECTION

Anchorage Connectors

Horizontal Lifeline

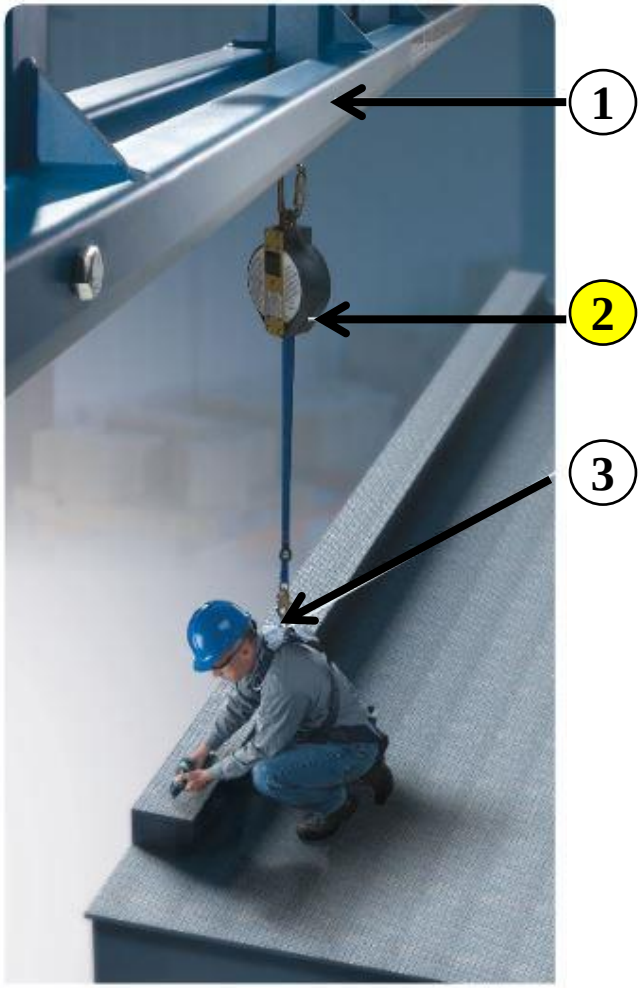
Vertical Lifeline
(Rope Grab System)

Permanent Installation

Temporary Installations

FALL PROTECTION

PERSONAL FALL ARREST SYSTEM



PARTS:

2. **Connecting Device** – Used To Link The Body Support (Harness) To The Anchorage Such As A:

Lanyard With A Shock Absorbing Device

Or A Self-Retracting Lifeline With Brake

FALL PROTECTION

PERSONAL FALL ARREST SYSTEM

Regardless The Lanyard Material, A **Deceleration Device** (i.e., A **Shock Absorber** Or **Brake)** Is Required For Fall Protection When There Is A Potential Risk To Fall Over An Unprotected Edge To a Lower Level More Than 4' Below

- Lanyard Is Folded And Stitched
- During A Fall The Stitch Is Ripped Which Slows Descent (Using Time And Distance) To A Survivable Fall

Rip-Stitch Absorber Pack

Nylon Web Lanyard

Nylon Rope

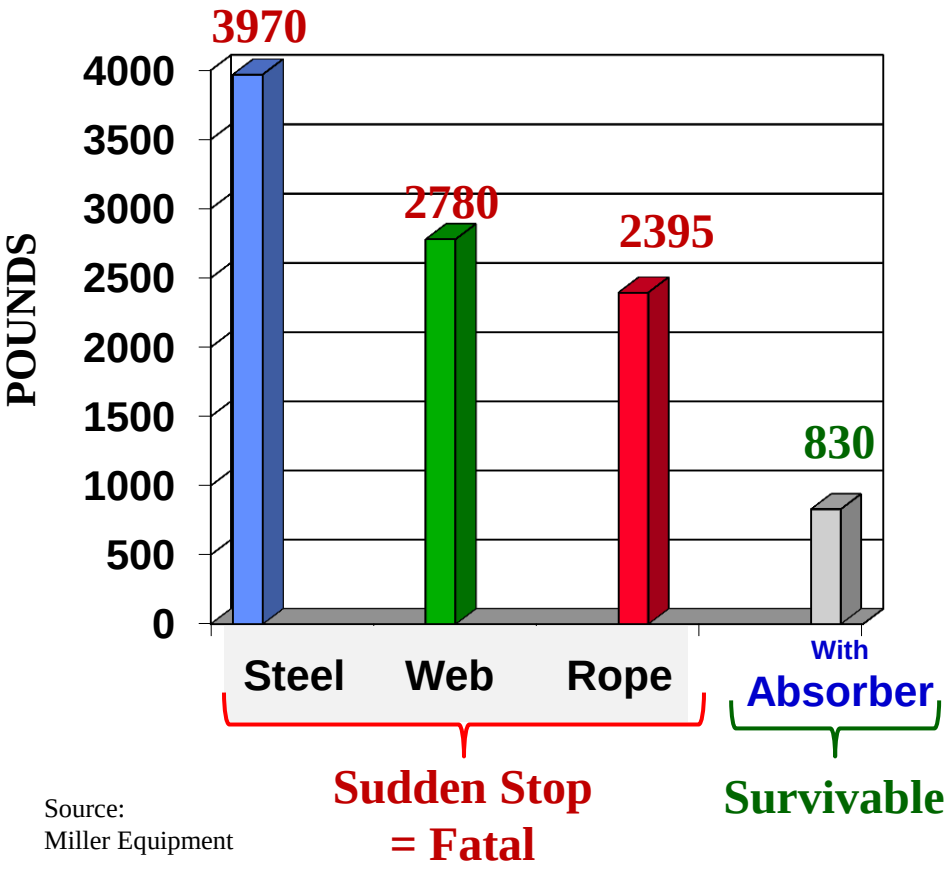
Steel Cable

Stretch

PERSONAL FALL ARREST

PEAK FORCES

For Various Lanyard Materials



Source:
Miller Equipment

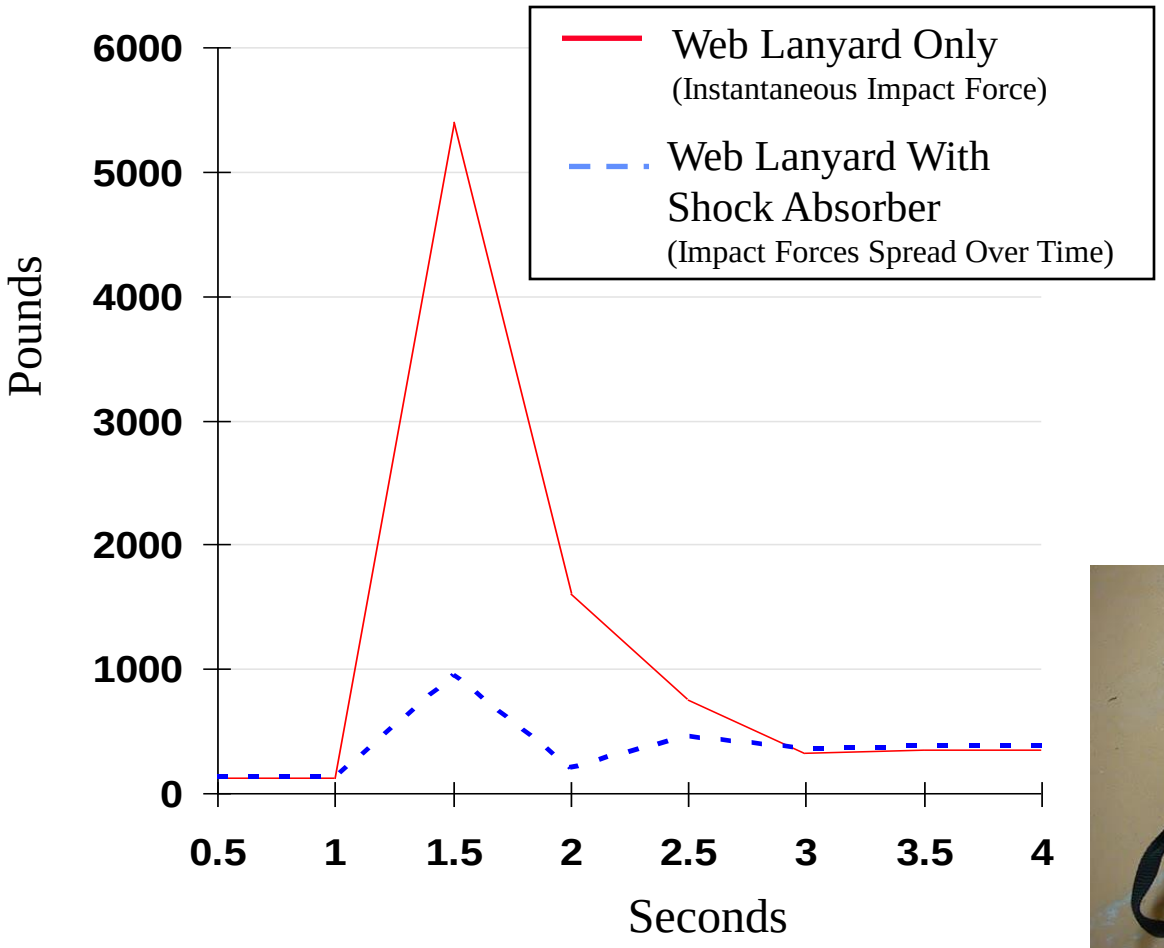
When A Person Free-falls, The Body Quickly Builds Up Forces On The Body. The Longer The Fall The Greater The Forces.

The Maximum Amount Of Force A Person's Body Can Withstand In A Fall Is 1,800 Lbs. Falls Using Lanyards Alone Can Be Fatal.

Fall Arrest Lanyards Are 6' Long Or Less And Have Decelerator Devices (Absorber) To Keep Fall Forces Under This Amount.

PERSONAL FALL ARREST

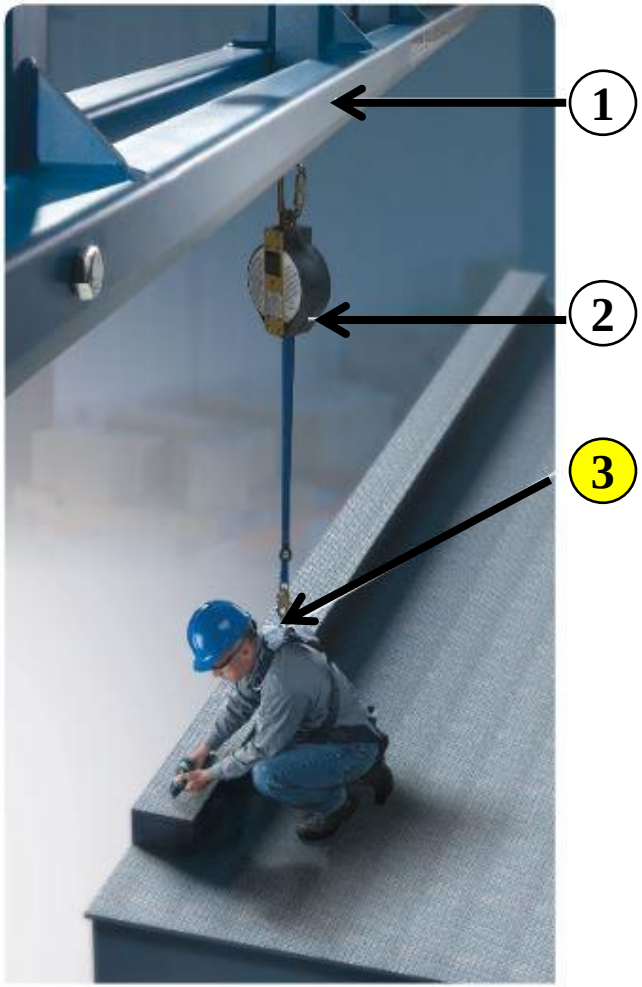
PEAK FORCES



Source: DBI / SALA

FALL PROTECTION

PERSONAL FALL ARREST SYSTEM



PARTS:

3. **Body Harness** – A Body Support Device That Distributes Fall Arrest Forces Across The Entire Torso
   - Has A D-Ring Attachment In The Center Of The Back For Connection To The Fall Arresting Device

PERSONAL FALL ARREST

FULL BODY HARNESS

- A Series of Straps Designed to Retain the User in a Fall
- Keeps The User in an Upright Position
- Distributes a Fall's Impact Forces Throughout the Thighs, Buttocks, Chest and Shoulders

HOW TO DON A FULL BODY HARNESS

Step 1 - Hold harness by back D-ring. Shake harness to allow all straps to fall in place. If chest, leg and/or waist straps are buckled, release straps and unbuckle at this time.

Step 2 - Slip straps over shoulders so D-ring is located in middle of back between shoulder blades.

Step 3 - Pull leg strap between legs and connect to opposite end. Repeat with second leg strap. If belted harness, connect waist strap after leg straps

Step 4 - Connect chest strap and position in midchest area. Tighten to keep shoulder straps taut.

Step 5 - 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.

HOW TO DON A FULL BODY HARNESS

The Back D-Ring Should Be Between Your Shoulder Blades

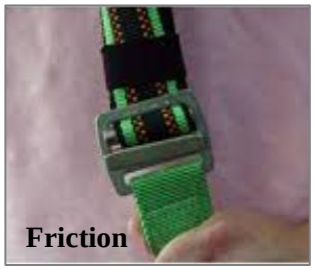
Connect All Chest, Waist And Leg Straps & Adjust For A Snug Fit

Types Of Harness Buckles

Quick-Connect

Pass-Thru

Tongue



Friction

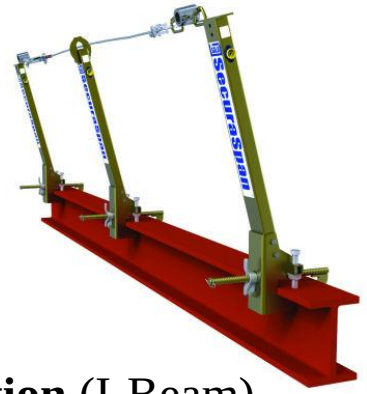
PERSONAL FALL ARREST

LIFELINES

HORIZONTAL LIFELINE SYSTEM

Anchors

- A Safety Line Connected To 2 Or More Anchor Points
- Typically Designed To Support **1** Or **2** Workers
  - Must Support 5,000 Lbs. Per Person
- Permanent Or Temporary Installations Available



Construction (I-Beam)

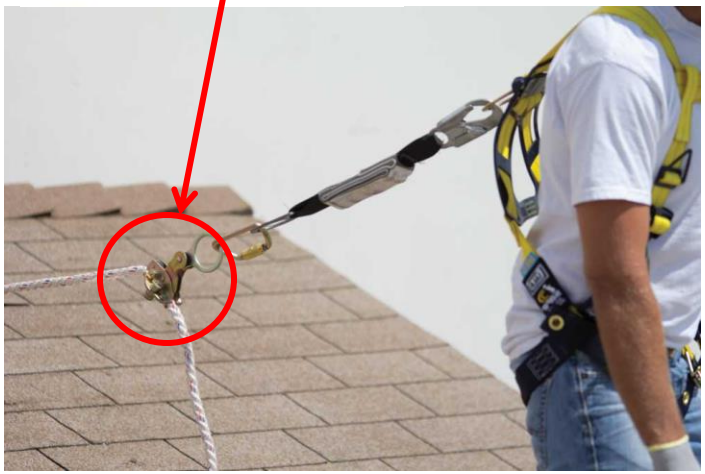
PERSONAL FALL ARREST

LIFELINES

VERTICAL SYSTEM

- A Rope Or Cable Lifeline Connected To A Single Anchor Point And Weighted Or Tied On The Bottom
- Used For Climbing And Descending
- When The Rope Grab Connector Is:
  - Unlocked - Slides Up/Down Rope
  - Locked (When Fall) - “Grabs” Rope
- Rope Must Reach The Next Lower Level Or To The Ground, Or Extend At Least 12’ Below Lowest Point For The Rope Grab
- **Each Person** Must Have Their Own Vertical Lifeline

Rope Grab Attached To Vertical Lifeline



Rope Grab

1. Remove Pin

2. Open Door

3. Insert Rope

4. Close Door

5. Reinsert Pin

Rope Grab - Operation

Up ↑ =
Unlocked

Unlocked
Device Travels
Up / Down Freely

Down ↓ =
Locked

i.e., When You Fall
The Grab Will Lock

Locked
Stops Fall in 2' or Less

PERSONAL FALL ARREST
SELF-RETRACTING LIFELINE

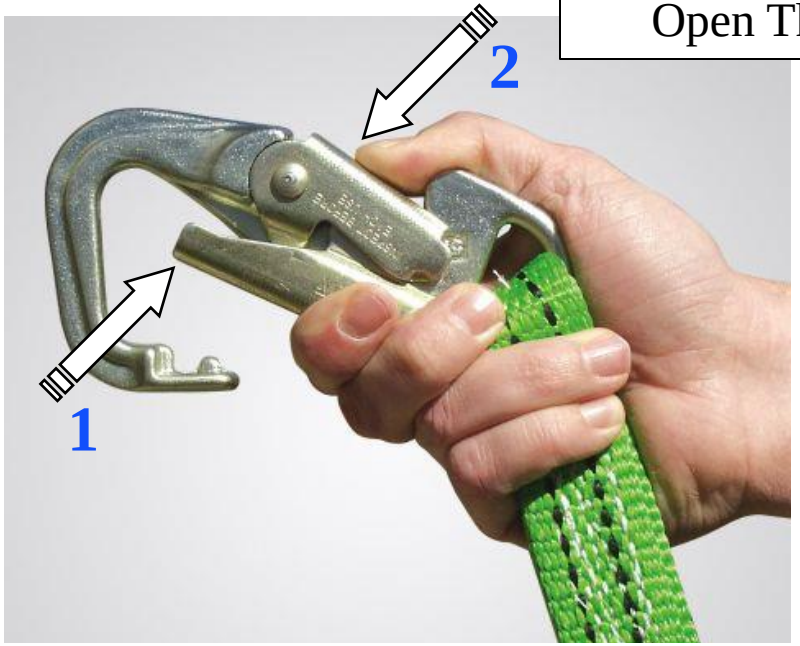
- Extends and Retracts Enabling the Worker to Freely Move About (Length - 10’ to 130’)
- Speed Sensing Brake Activates During a Fall
  - Stops Fall in 2’ or Less
  - Reduces Impact Forces to 900 Lbs or Less
- Some Models Are Personal & Lightweight

PERSONAL FALL ARREST

CONNECTORS

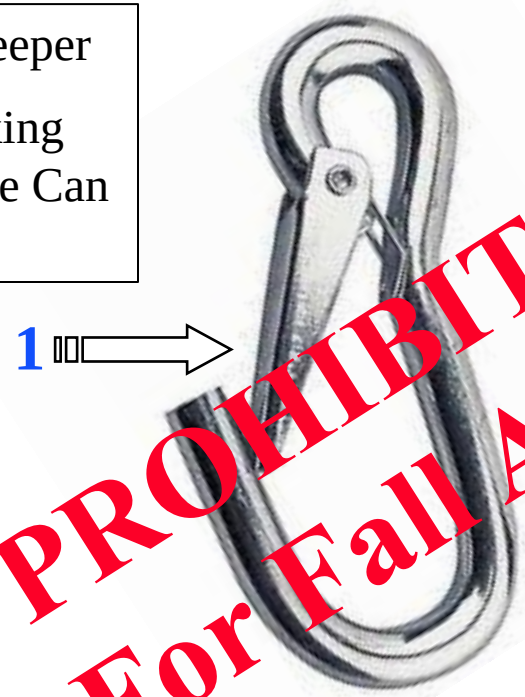
1 - Push Open The Keeper

2 - Must Push Unlocking Mechanism Before Can Open The Keeper



Double-Action (Locking) Snaphook

(Required For Fall Arrest Protection)



Single-Action Snaphook

(Non-Locking)

A Fall Could Cause Unintentional Loading On The Keeper So The Snaphook Can **Roll Out** Of Its Attachment

PERSONAL FALL ARREST
CONNECTORS

DO NOT

Hook A Lanyard Back Onto Itself

Or

Wrap A Lanyard Around A Beam

This Reduces Its Strength,
Causes Damage
& Can Lead To Failure

Instead Use A
TIE-OFF ADAPTOR /
CROSS-ARM STRAP

PERSONAL FALL ARREST

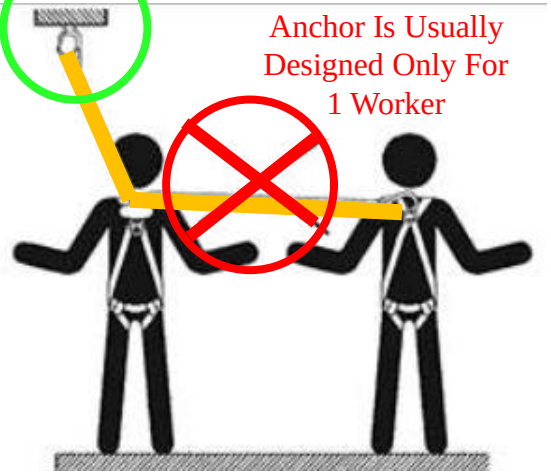
CONNECTORS

Designed Roof Anchor Is Structural

Connect Lanyard Snaphook Onto An *Appropriate* Anchor

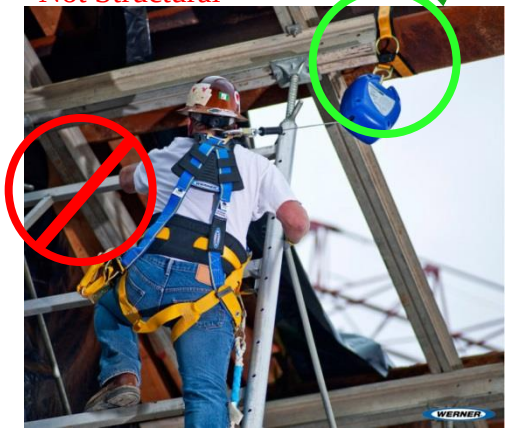
Concrete Anchor Is Structural

Anchor Is Usually Designed Only For 1 Worker

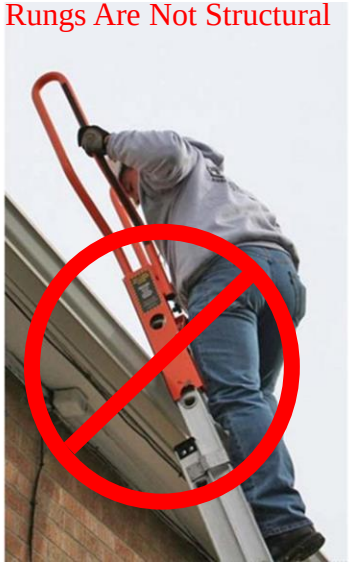


Conduits, Pipes Or Scaffold Are Not Structural

I-Beam Is Structural



Fixed / Portable Ladder Rungs Are Not Structural



Guardrail Is Not Structural

FALL PROTECTION
SUSPENSION DEVICES

BOATSWAIN'S CHAIR
(Seat Sling)

Suspends and Supports the User while being Transported Vertically and Horizontally along a Vertical Work Surface

Must be Used with Separate Lifeline

FALL PROTECTION

WARNING LINE

- No Protection Required Inside Warning Line
- No One Allowed Outside Of Line
- Ropes, Wires, Chains
  - 500 Lbs Strength
  - 16 Lbs Side Force
  - 39” High (Can Sag to 34”)
  - High-Visibility Flags Every 6’
  - Around All Sides of Roof **6’** or More From Edges
  - **For Low Slope Roof Only**
    - Slope Less Than Or Equal To 4 In 12 (Vertical To Horizontal)

FALL PROTECTION
SAFETY MONITORING

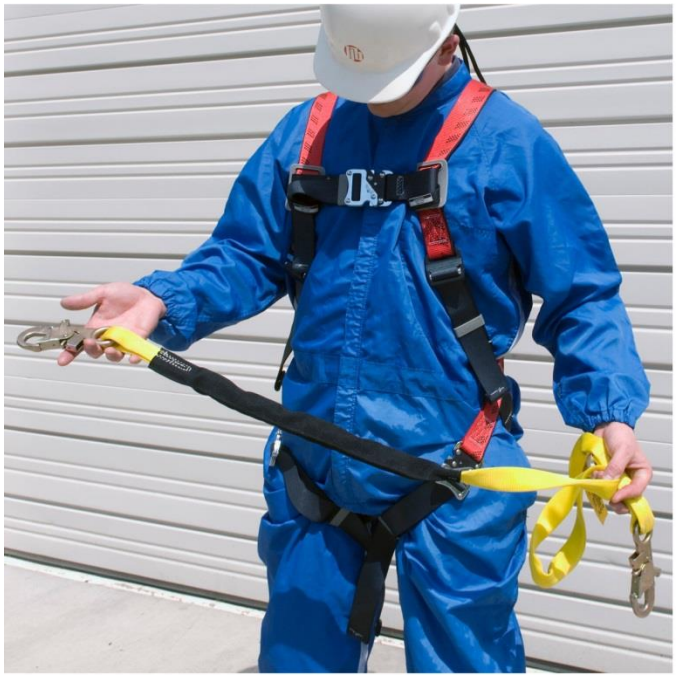
COMPETENT PERSON

- Sole Job Is To Monitor Workers - Warn Of Potential Fall Hazards
- Allowed On Low Slope Roof
  - Along With Guardrail, Safety Net And/Or Fall Arrest Systems
- Can Be Used Alone For Roofs 50’ Wide Or Less

FALL PROTECTION EQUIPMENT INSPECTION

BEFORE EVERY USE

Check For Signs Of Wear Or Damage



FALL PROTECTION
EQUIPMENT INSPECTION

Webbing - Grasp The Webbing With Your Hands 6” - 8” Apart. Bend The Webbing In An Inverted “U” As Shown. The Surface Tension Resulting Makes Damaged Fibers Or Cuts Easier To Detect. Follow This Procedure The Entire Length Of The Webbing, Inspecting Both Sides Of Each Strap. Look For Frayed Edges, Broken Fibers, Pulled Stitches, Cuts, Burns And Chemical Damage.

D-rings/Back Pads - Check D-Rings For Distortion, Cracks, Breaks, And Rough Or Sharp Edges. The D-ring Should Pivot Freely. Inspect For Any Unusual Wear, Frayed Or Cut Fibers, Or Broken Stitching Of The D-ring Attachments. Pads Should Also Be Inspected For Cracks, Excessive Wear, Or Other Signs Of Damage.

Buckles - Inspect For Any Unusual Wear, Frayed Or Cut Fibers, Or Broken Stitching Of The Buckle Attachments.

FALL PROTECTION
EQUIPMENT INSPECTION

Tongue Buckles/Grommets - Buckle Tongues Should Be Free Of Distortion In Shape And Motion. They Should Overlap The Buckle Frame And Move Freely Back And Forth In Their Socket. Roller Should Turn Freely On Frame. Check For Distortion Or Sharp Edges. Inspect For Loose, Distorted Or Broken Grommets. Webbing Should Not Have Additional Punched Holes.

Friction And Mating Buckles - Inspect The Buckle For Distortion. The Outer Bars And Center Bars Must Be Straight. Pay Special Attention To Corners And Attachment Points At The Center Bar.

Quick-connect Buckles - Inspect The Buckle For Distortion. The Outer Bars And Center Bars Must Be Straight. Make Sure Dual-tab Release Mechanism Is Free Of Debris And Engages Properly.

Harness Fall Arrest Indicators - Inspect Fall Arrest Indicators (Located On The Back D-ring Pad) For Signs Of Activation. Remove From Service If Broken Or Stretched.

FALL PROTECTION
EQUIPMENT INSPECTION

TAG & REMOVE From Service Any Personal Fall Arrest Equipment

- **Damaged**
- **Involved In A Fall**

FALL PROTECTION
EQUIPMENT MAINTENANCE

Cleaning And Maintaining Fall Protection Gear Regularly
- Helps It Last Longer
- Less Likely To Fail

Things That Weaken Or Cause Equipment Failure:
- Grease, Dirt, Mildew, Heat, Prolonged Direct Sunlight & Chemicals

CLEANING

- Web / Rope Gear
  - Remove All Surface Dirt With A Damp Sponge
    - Do Not Soak
  - Wash With Mild Soap & Water
    - Do Not Use Chlorine, Bleach Or Abrasives
  - Hang To Air Dry
    - Do NOT Dry With Hot Air Blowers
- Body Harnesses - According To Manufacturer's Guidelines

Storage – Hang In A Cool, Dry, Clean & Dark Place Away From Dire
Sunlight, Fumes or corrosive elements

PERSONAL FALL ARREST
PLANNING for a FALL

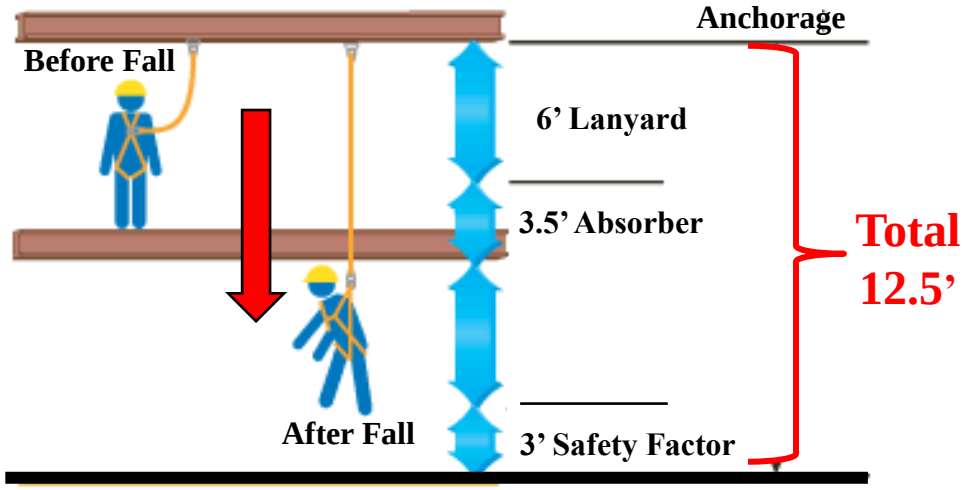
FACTORS

- FALL DISTANCE - Lanyard Length (6' Maximum) + / - Anchor Height
- ANCHOR HEIGHT - Distance the Harness D-Ring is Above / Below Anchor Point
- DECELERATION DISTANCE - How Far the Shock Absorber Extends; 3.5' Max
- STRETCH - Elasticity of Material (See Manufacturer's Information)
- EMPLOYEE HEIGHT - Height of D-Ring Above Work Surface
- SWING - Side Motion During Fall

Free Smartphone Application to calculate a safe fall protection clearance - http://itunes.apple.com/ca/app/peakworks-fall-clearance-calculator/id359065407?mt=8

PERSONAL FALL ARREST

PLANNING for a FALL



Fall Calculation – Anchor Above Worker:

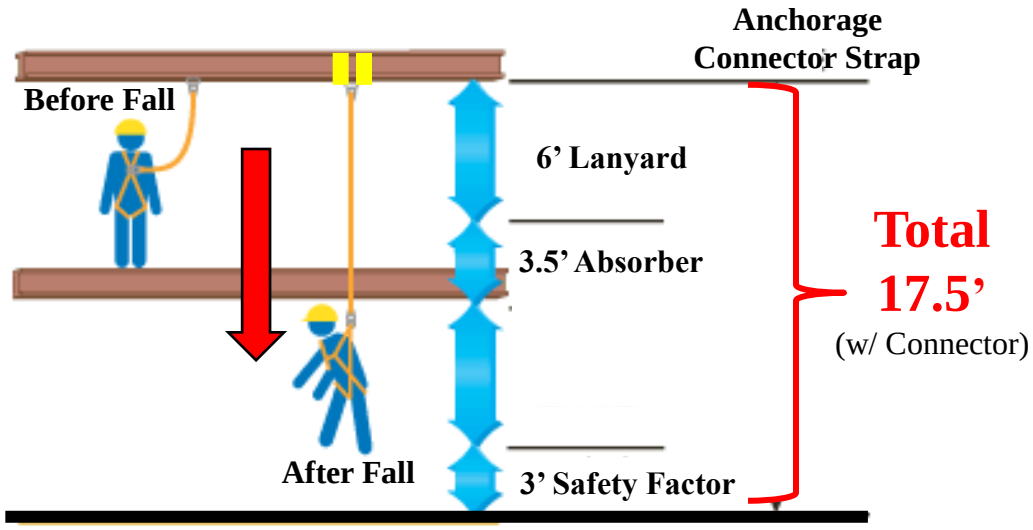
- 6' Length Of The Lanyard
- 3.5' Elongation Of The Shock Absorber During Deceleration
- 3' Safety Factor

12.5' TOTAL Fall Distance Needed

NOTE: If Your Anchor Is Above The Back D-Ring At Shoulder Blade Height Your Fall Distance Will Be **LESS**

PERSONAL FALL ARREST

PLANNING for a FALL



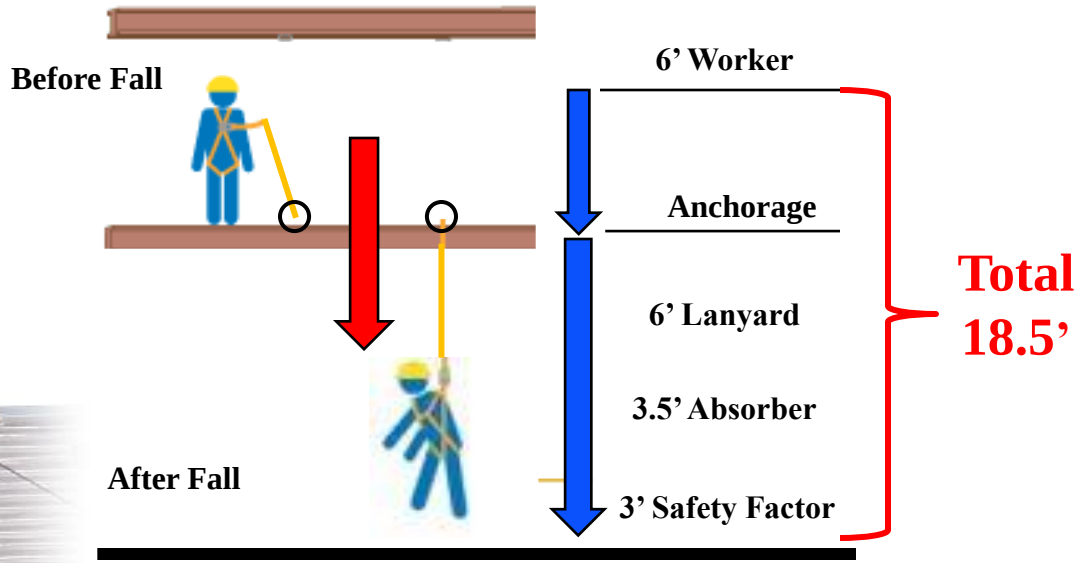
Fall Calculation – Using Cross-Arm Anchorage Connector

- 12.5' Fall Distance (From Previous Example)
- 3 - 5' Length Of The Cross-Arm Anchorage Connector

- 17.5' **TOTAL Fall Distance Needed**

PERSONAL FALL ARREST

PLANNING for a FALL



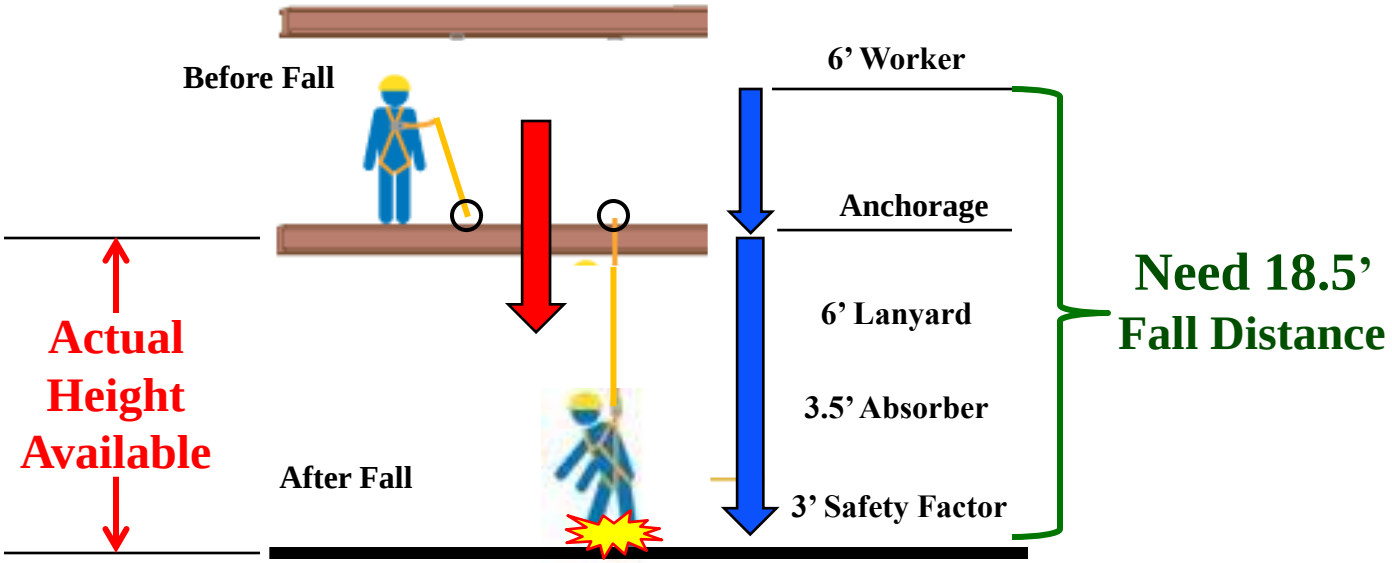
Fall Calculation – Anchor At Walk Surface (Below Worker)

- 6' Average Height Of Worker
- 6' Length Of The Lanyard
- 3.5' Elongation Of The Shock Absorber During Deceleration
- 3' Safety Factor

18.5' TOTAL Fall Distance Needed

PERSONAL FALL ARREST PLANNING for a FALL

Will You *HIT BELOW*???



YES, If Your Anchor Height To Ground (Object Below) Is Less Than The Needed Fall Distance!

PERSONAL FALL ARREST
PLANNING for a FALL

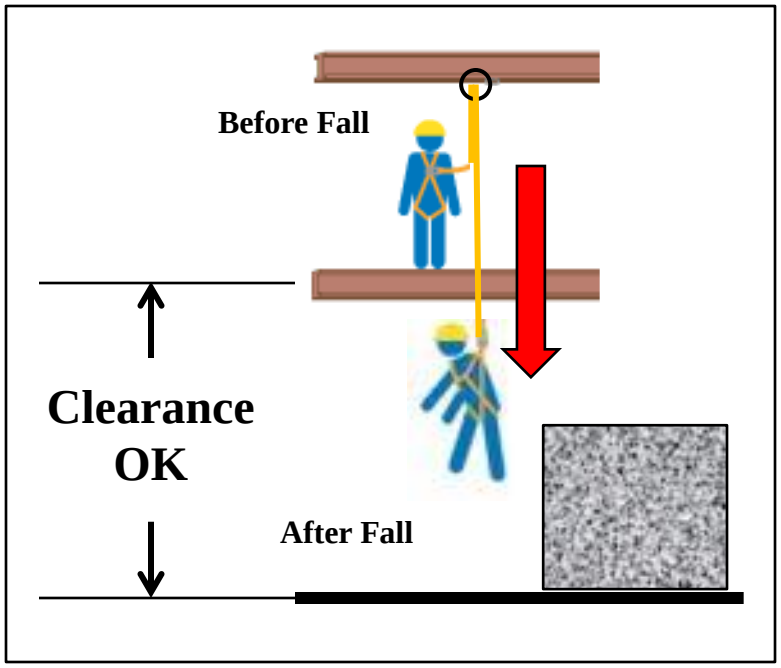
Anchor Too Low & You'll Hit Below?

OPTIONS:

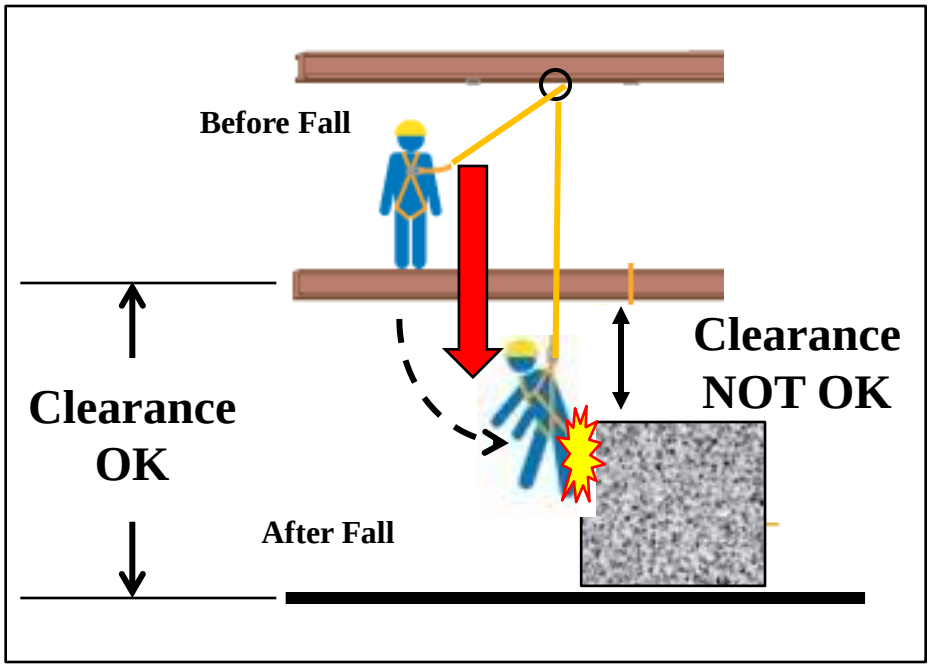
1. Shorten The Lanyard (If Adjustable)
2. Raise Your Anchor Point
   - Example: Use I-beam Attachment Overhead
3. Use A Self-retracting Lifeline
   - Stops Fall In 2' Or Less

PERSONAL FALL ARREST PLANNING for a FALL

Will You *HIT BELOW*???



Fall When Anchor Is In Line
Is To Directly Below

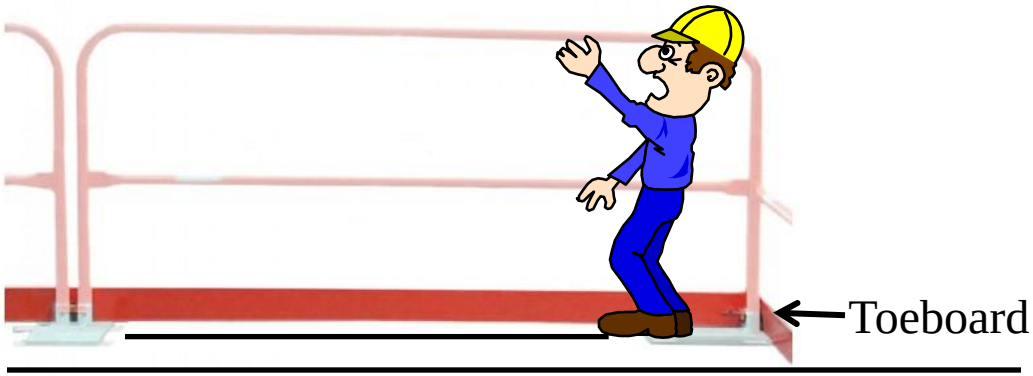


Can **Swing Into Object Below** When
Working Off To The Side Of Anchor

FALL PROTECTION

FALLING OBJECTS

- **Toeboards -** 3 1/2” Tall & 1/4” Gap Or Less Along Edge Of Overhead Work Surface To Prevent Falling Objects
- **Nets / Canopies** – To Catch Falling Objects
- **Hard Hats** To Protect Head From Dropped Object Strikes



FALL PROTECTION
RESCUE / RETRIEVAL

RESCUE PLAN:

- Is Mechanical Assistance Available?
  Example: Pre-Positioned:
  - Ladder
  - Boom Truck
  - Scaffolds
  - Rescue System
- Notify 9-1-1

Fall Arrest Rescue Pack

FALL PROTECTION
RESCUE / RETRIEVAL

Hanging For Lengthy Time In Harness Leads To

SUSPENSION TRAUMA

(Orthostatic Hypertension)

- Unconscious In 5 - 20 Minutes Due To Cutting Off Of Blood Circulation And Oxygen To The Brain (Pools In The Legs)
- Loss Of Consciousness Or Fatality Due To Return of Pooled Hypoxic Blood And Metabolic Byproducts From The Legs To The Heart (Toxic Reflow)

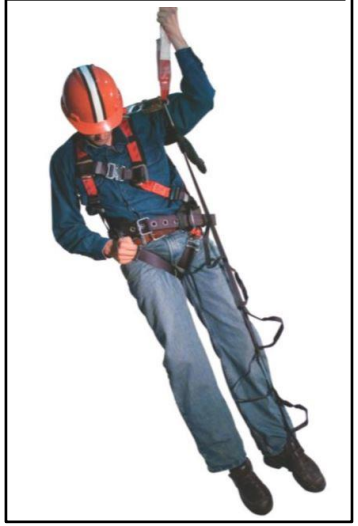
DANGER Is To Those Unable To Move For More Than 4 Minutes

Could Die In 10 - 45 Minutes

FALL PROTECTION

RESCUE / RETRIEVAL

Examples Of Suspension Trauma Straps



SUSPENSION TRAUMA SAFETY STRAP

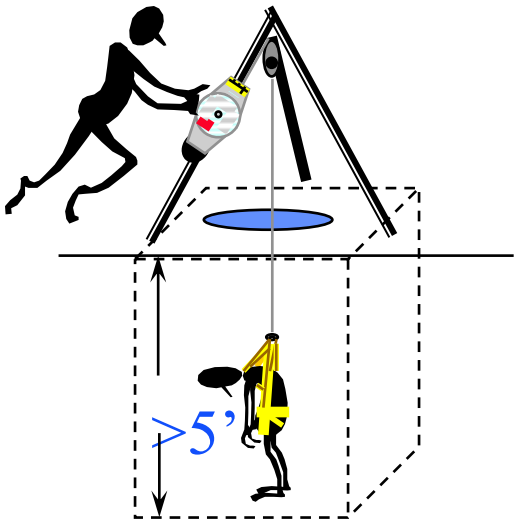
Provides Means To Keep Blood Circulation

Once Rescued Stay Seated On The Ground For 30 Minutes
(Helps Prevent Toxic Reflow)

FALL PROTECTION

CONFINED SPACE

Rescue System



CONSISTS OF:

- Full Body Harness
- Lifeline & Winch
- Tripod

A SYSTEM IN AN EMERGENCY:

- Lowers / Raises a User to Safety
- Prevents Free Fall but May or May Not Provide Fall Arrest
- Mechanically Assists Retraction (Required) When Space is > 5’ Deep

Vehicle-Mounted, Elevating and Rotating Work Platforms

- Restraint shall be worn with lanyard attached to the boom/basket
  - Keeps the Employee From Being Bounced Out
- Tying off to an adjacent pole or structure is not permitted
- Set Brakes
- Position Outriggers
- Install Wheel Chocks on an Incline
- Do Not Move Truck When the Boom is Elevated with Men in the Basket
- Emergency Override Controls at Ground Level

Vehicle-Mounted, Elevating and Rotating Work Platforms

Required Information:

- **Normal Operating Instructions**
- **Special/Emergency Instructions, Cautions & Restrictions**
- **Clearly Marked Controls**
- **Workload Capacities**
- **Statement If Platform Is Electrically Insulated or Not**

Fall Protection

Contact Your **Supervisor**
Or
Call The **Safety** Office
@ 737-2311

General Services Division
Facilities Management

Fall Protection

Course Exam

Remember

To Receive Credit For This Course Turn In Your Completed Test To The Safety Office

Passing Grade is **70%** Or Better

The
End