Fall Protection for the Construction Industry

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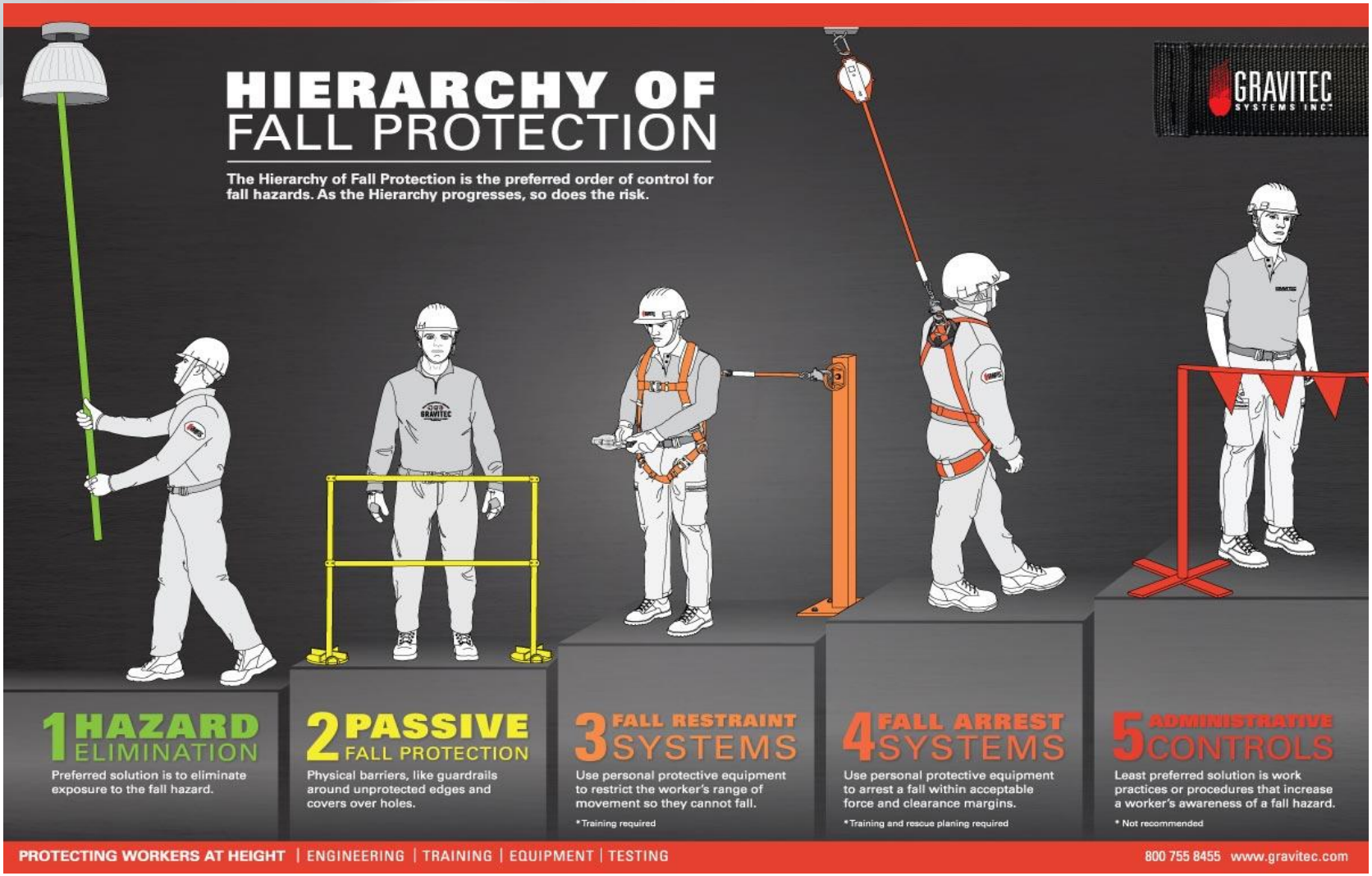
Hierarchy of Controls



Protection from Falls

- Employees 6 feet or more feet above a lower level must be protected from falling by:
  - Passive System – Guardrails
  - Restraint Device
  - Personal fall arrest system (PFAS)
  - Safety Net System
  - Controlled Access Zone

Personal fall arrest systems

- When stopping a fall:
  - limit force on employee to 1,800 pounds
  - no free fall permitted over 6 feet
  - maximum deceleration distance of 3.5 feet
  - Anchor point can support 5000 lbs or has a safety factor of 2

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Impact Forces

Elapsed Time	Distance Traveled	Velocity (fps)	Speed (mph)	Force at Impact
0.00	0	0	0	0
0.25	1 foot	8	5.5	400 lbs.
0.50	4 feet	16	11	1,600 lbs.
0.61	6 feet	20	14	2,400 lbs.
0.75	9 feet	24	16	3,600 lbs.
1.00	16 feet	32	22	6,400 lbs.
1.25	25 feet	40	27	10,000 lbs.
1.50	36 feet	48	33	14,000 lbs.
1.75	49 feet	56	38	19,600 lbs.

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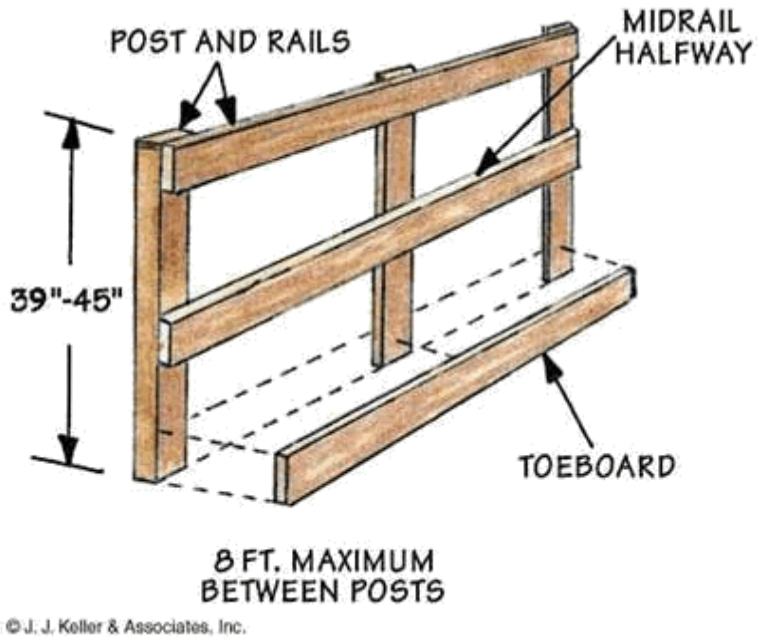
Guardrail systems

- Fall Prevention vs. Fall Protection
- Top rails 39 inches to 45 inches. Toeboard 3.5 inches minimum
- Meet design/strength requirements (200 lbs downward and outward force)



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Personal fall arrest systems

- All components must meet design, strength requirements

  ABCs

- **A**nchor
- **B**ody Harness
- **C**onnection

- Body belts are not part of a PFAS

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A = Anchorage

- Connecting to the anchorage
  - Examples of permanent anchorage connectors

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A = Anchorage

- Connecting to the anchorage
  - Examples of temporary anchorage connectors

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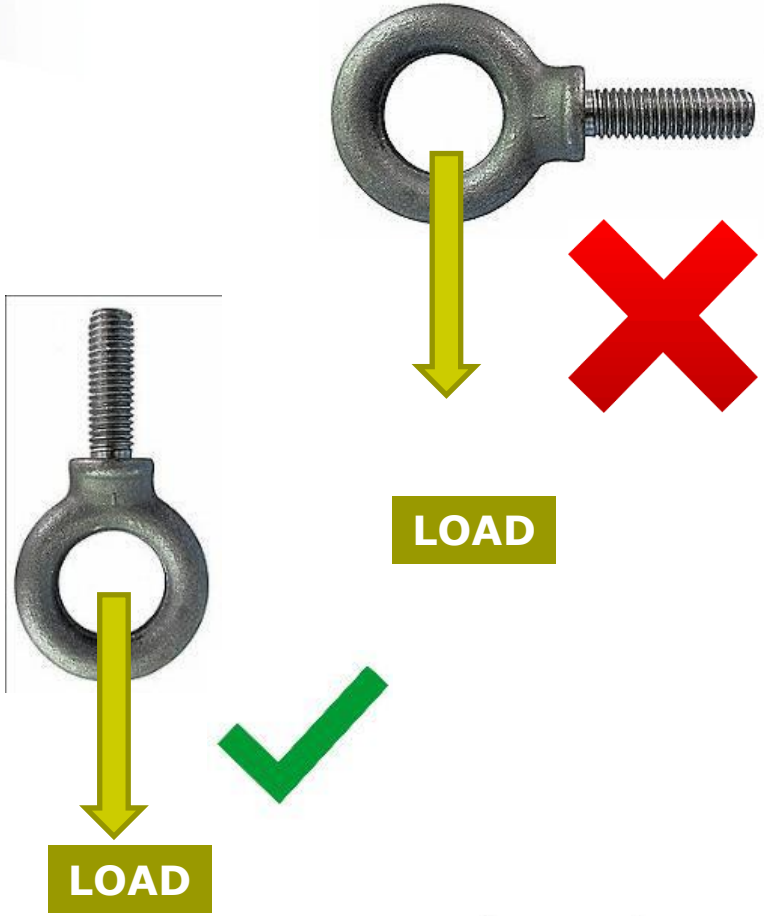
A = Anchorage

- Eyebolts are meant to be loaded in line with the threads



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A = Anchorage

- Connecting to the anchorage
  - What if I can't reach it?

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B = Body Wear

- Body Wear – The personal protective equipment worn by the worker
  - Straps around thighs distributes fall force
  - Select based on environment
    - Hot work?
    - Arc flash?
  - May have side D rings for positioning
    - (not normally used in foundries or die casting)
  - Front D rings (if present) are for ladde climbing safety devices

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B = Body Wear

- Full Body Harnesses only

  - Must be a full body harness for fall protection
  - NEVER use a body belt for fall protection as serious injury can result
    - Internal organ damage
    - Spine damage
    - Other injuries
  - Belt can be used for restraint only (rare)

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C = Connecting Device

- This component is critical and there is a huge variety available
  - Absorbs the forces of the fall
  - Ensures a good connection to the anchorage
- Select based on application – see your facility competent person

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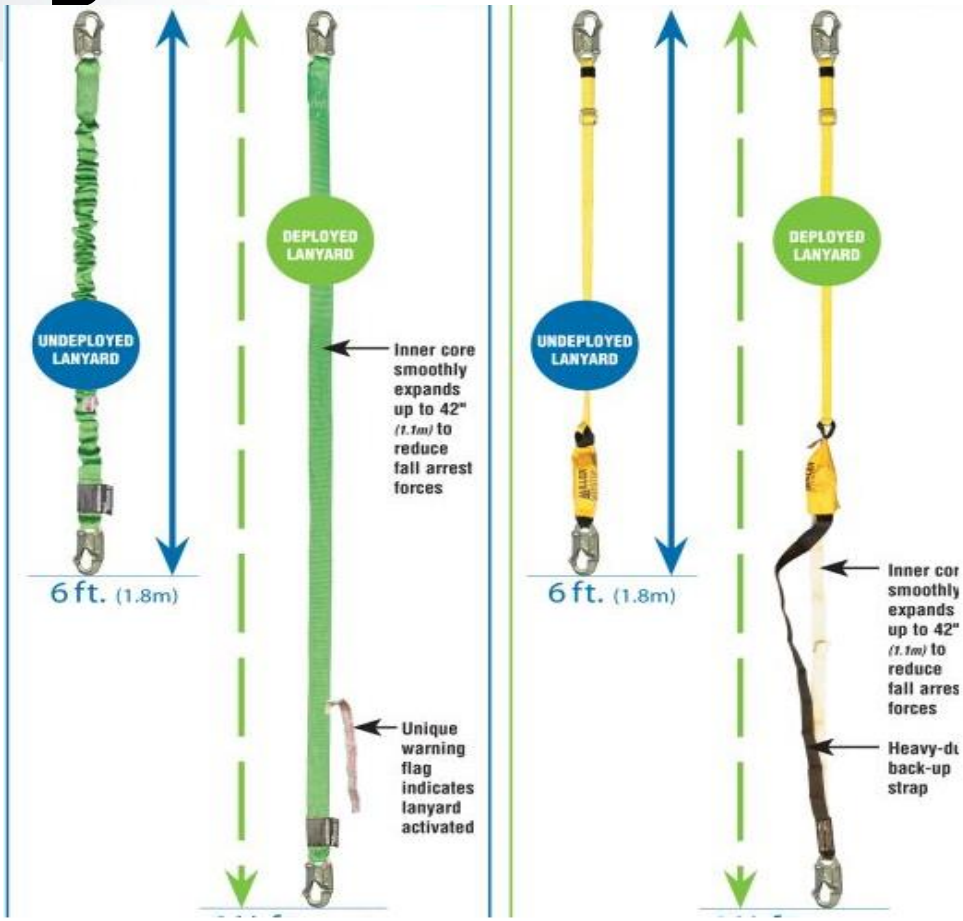
C = Connecting Device

- Shock absorbing lanyards lengthen by up to 3’ in a fall
- Must calculate fall clearance to ensure you don’t contact ground



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C = Connecting Devices

- **FALL LIMITERS**
  - Lightweight / retractable
  - Require less fall clearance,
  - Offer greater mobility
  - Prevent tripping hazards
  - Typically stay with the harness

- **SELF-RETRACTING LIFELINES (SRLs)**
  - Bigger and heavier than a fall limiter
  - Heavy-duty retractables available (cable)
  - Typically mounted separate from the harness

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C = Connecting Devices

- **SRL vs PFL**

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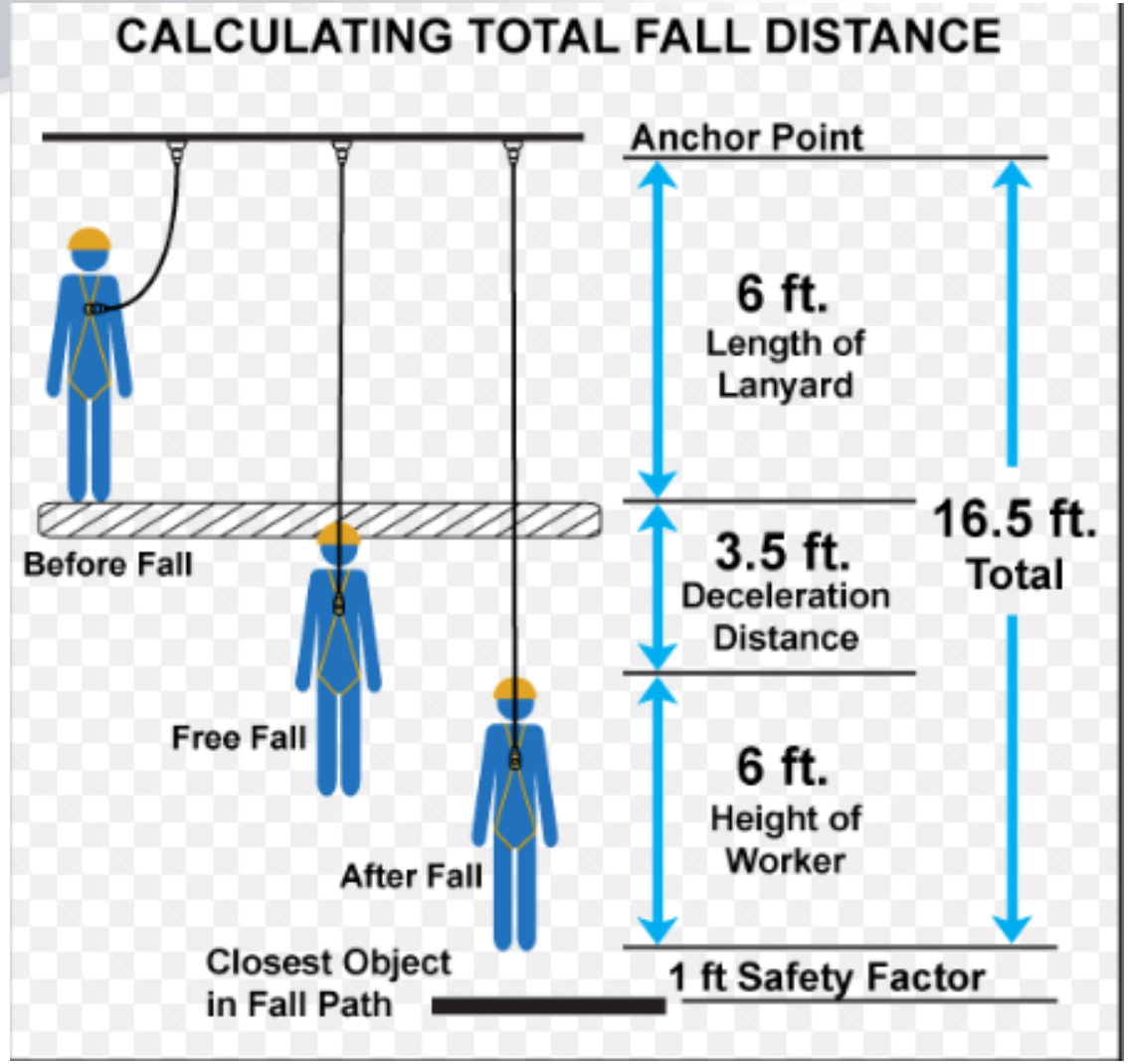
Total Fall Distances



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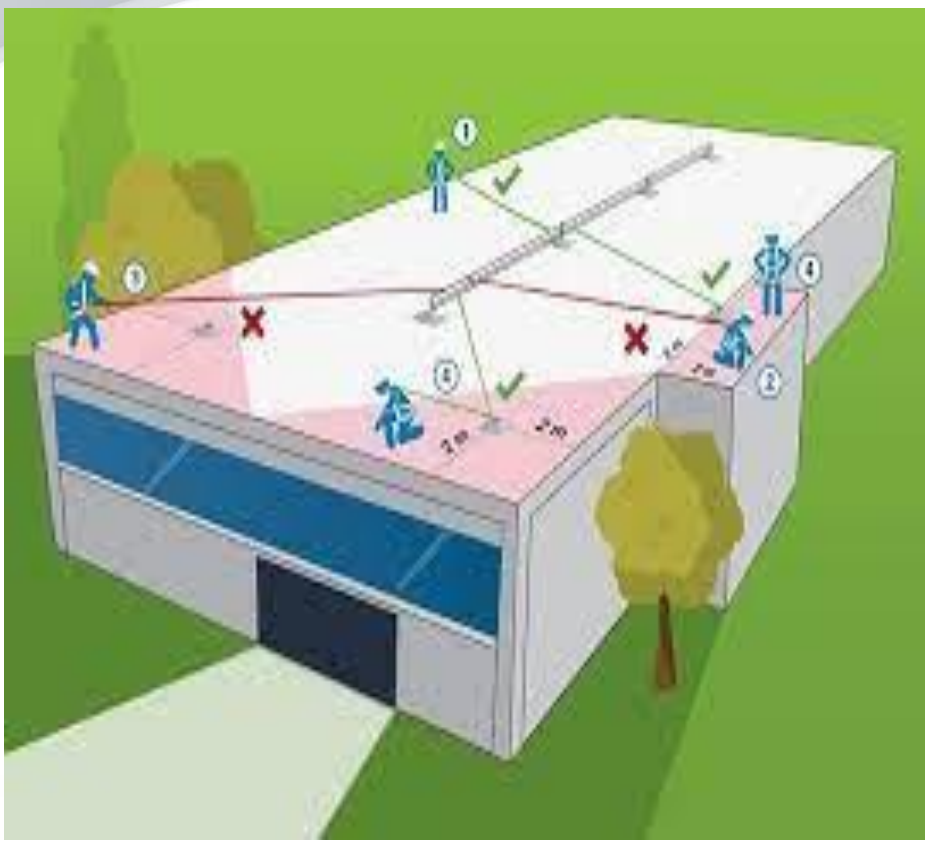
Anchor Overhead to avoid swing falls



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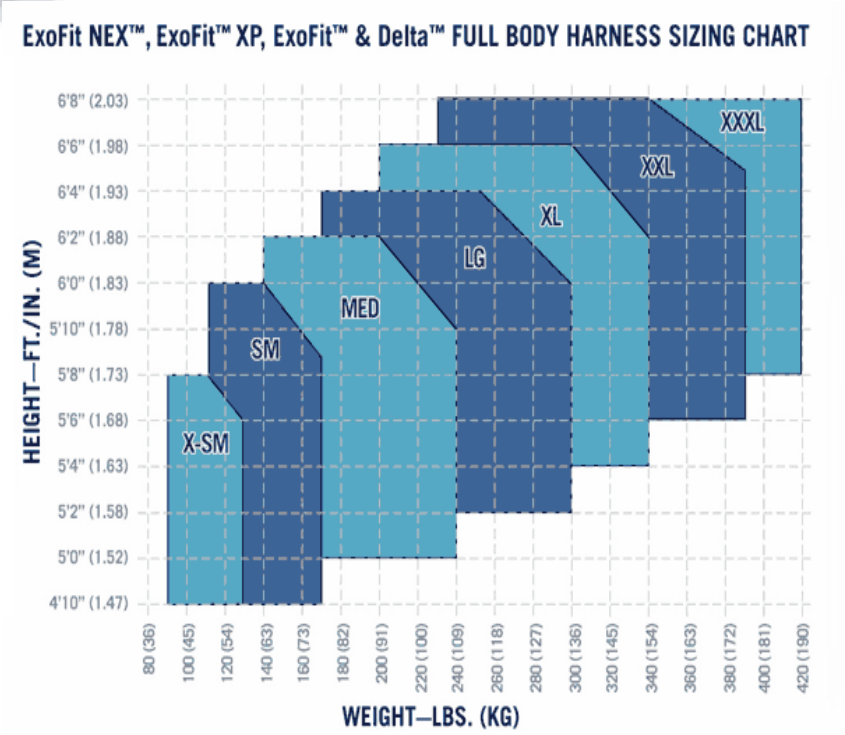
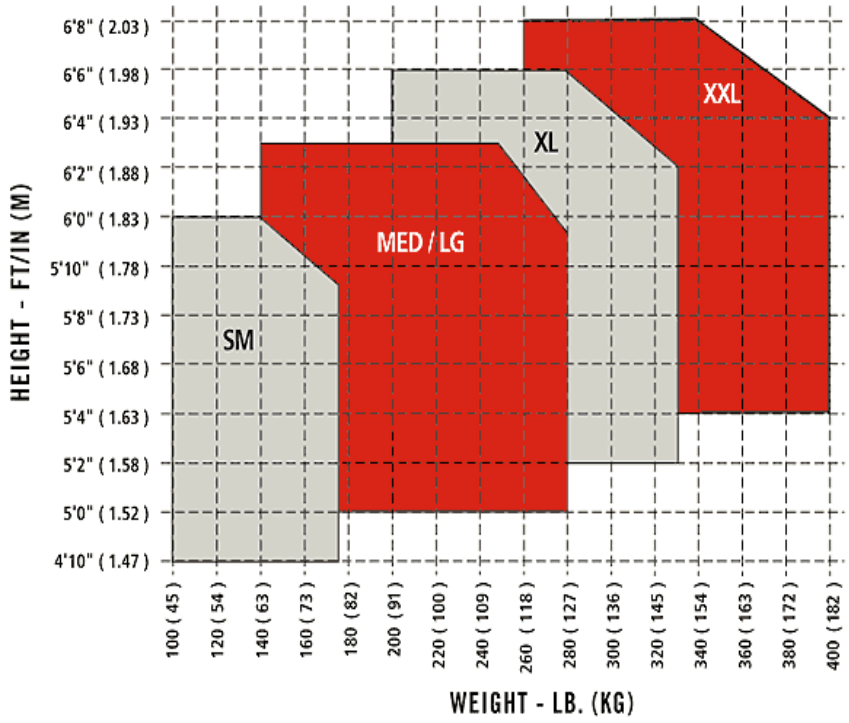
Donning

- Make sure you have the right size!



3M/Capital Safety



Miller Fall Protection

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Inspecting your harness

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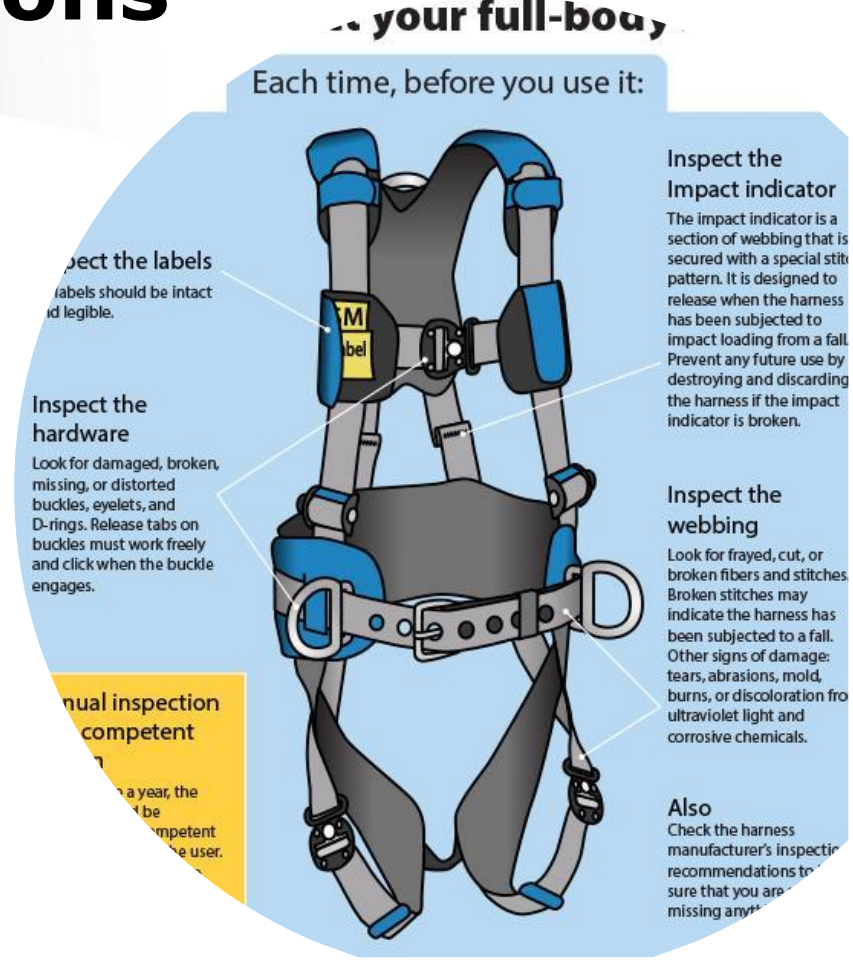
Harness Inspections

- Pre-use – each time you use it
  - Webbing
    - Stitching
    - Damage from hot work
    - Cuts
  - Rivets and eyelets
  - Suspension trauma straps
  - D-rings and buckles
  - Labels
- Looking for –
  - Damage, distortion, or corrosion on metal parts including eyelets and buckles
  - Cuts or burns in webbing
  - Fall indicator condition



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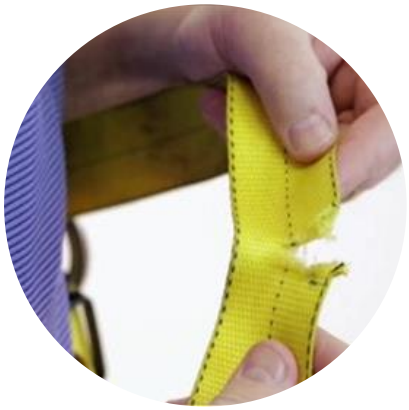
Inspections

- Pre-use and annual
  - Pre-use is by user
  - Annual by competent person



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Fall Indicators

- Fall Indicators
  - Know your equipment

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Other hazards

- Rescue Consideration
- Suspension Trauma

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Positioning device systems

- No free fall over 2 feet
- Components must meet design, strength requirements

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Advances in fall protection

Safety net systems

- Installed within 30 feet of working surface

- Inspect:
  - at least once a week
  - after any incident

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Protection for holes

- Covers must:
  - support intended weight
  - be secured in place
  - be color coded or marked with a warning

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Falls into dangerous equipment

- Protect workers from falling into/onto dangerous equipment at any height

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Falling Object Protection

- Falling object protection:
  - materials, equipment stored no less than 6 feet from roof edge unless there are guardrails
  - materials stored near a roof edge must be stable

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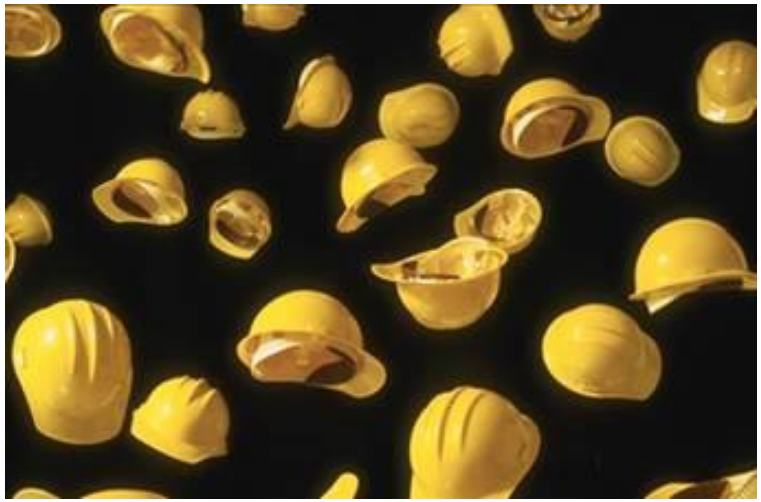
Protection from falling objects

- Wear hard hats
- Employers must also do one of the following:
  - erect toeboards, screens, guardrails
  - erect a canopy; keep objects far from the edge
  - barricade the area; keep workers out



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How can Cintas help

<u>Numerous Safety and OSHA Compliance Trainings</u> (not limited to below)

- Competent Person Fall Protection Training *(instructor led / online)*
- Fall Protection Training *(instructor led / online)*
- Fall Rescue / High Angle Rescue Training *(instructor led)*
- Harness / Fall Protection Equipment / Ladder Inspections
- Site Safety Assessments
- Fall Protection and Safety PPE
- OSHA 10 / 30 Courses General Industry or Construction *(instructor led / online / virtual)*
- First Aid / CPR / AED training *(instructor led / online / virtual)*
- Powered Industrial Vehicles training *(instruc / virtual)*

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Contact Info

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Safety is your responsibility!

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