

Fall Protection Competent Person Trainer

Introduction to Fall Protection Guardrail Systems & Safety Nets

Designed by:



Course Objectives

- ✓ This course is designed to assist construction personnel in understanding and managing fall exposures.
- ✓ We will discuss O.S.H.A requirements for fall protection.
- ✓ Best practices, in addition to minimum standards, will also be presented.

Course Objectives

- ✓ This course will review the following fall topics:
 - Guardrail & Net Systems
 - Floor Holes & Falling Object Protection
 - Personal Fall Arrest Systems
 - Equipment Inspection & Maintenance
 - Lifeline Systems
 - Fall Exposures by Trade

Scope of the Problem

- ✓ Falls have been, and continue to be, the leading cause of death in construction.

Profile of 2004 Fall Fatalities

- ✓ Fall fatalities were up 17 percent in 2004.
- ✓ There were 815 fatal falls recorded in 2004.
- ✓ This represented the highest annual number of falls ever reported by the fatality census.

Profile of 2004 Fall Fatalities

- ✓ The increase in fatal falls was led by roofing fatalities. They had a 39 percent increase in fatal falls from a roof (from 128 fatalities in 2003 to 178 in 2004).
- ✓ There was a 17 percent increase in the number of fatal falls from ladders (from 114 fatalities in 2003 to 133 in 2004).

OSHA Focus

- ✓ Fall exposures are a major focus for OSHA inspections and result in the highest number of citations.
- ✓ Falls are also a special emphasis by State and Federal OSHA in some areas of the country.

The High Cost of Falls

- ✓ The financial impact of falls on the construction industry is devastating.
- ✓ However, the real cost of falls is the impact on the families and loved ones of those who have lost their lives to build our homes, buildings, and businesses.

Hierarchy of Fall Protection

- ✓ First choice - eliminate the exposure through the use of guardrails, hole covers, use of aerial or boom lifts, scaffolds, etc.
- ✓ Restraint - prevent the fall from occurring.
- ✓ Last choice - PFAS equipment.

Prevention is the Key

- ✓ Prevention of the fall is the goal (guardrails, restraints, etc.).
- ✓ Fall arrest should be a last choice.
- ✓ Reliance on employees to use equipment correctly 100% of the time can lead to errors that may result in death.

Perception of Risk

- ✓ Repeatedly doing a task in an unsafe manner without negative consequence reinforces that behavior.
- ✓ "I feel safe, it won't happen to me".
- ✓ "I have been doing it this way for years".

It Only Takes a Second

- ✓ One mistake when working at heights can result in a fatal accident.
- ✓ By the time the worker becomes aware of the potential fall, they do not have time to re-act to prevent the fall.

Planning

- ✓ To be effective, fall prevention must be addressed in the planning stage of the job.
- ✓ Elimination of fall exposures is the ultimate goal whenever possible.
- ✓ Failure to pre-plan for fall prevention often results in risk taking behavior by employees in order to get the job done.

Planning

- ✓ Development of a site-specific plan that identifies and addresses fall exposures for each trade/activity is a best practice.
- ✓ Focus should be on high risk exposures first.
- ✓ Potential bidders should be notified where fall requirements will be more stringent than minimum OSHA standards and language included in contracts.

OSHA General Requirements

Fall Competent Person

- ✓ One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authority to take prompt corrective measures to eliminate them.

Duties of the Fall Competent Person

- ✓ Must certify safety nets and installation if not drop tested
- ✓ Must inspect fall system components that have been subjected to an impact load
- ✓ Must supervise implementation of a fall protection plan

Duties of the Fall Competent Person

- ✓ Must train employees exposed to fall hazards
- ✓ Must determine the safety of interchanging types of personal fall arrest systems
- ✓ Must define the boundaries of a controlled access zone (CAZ)

The Six-Foot Rule

- ✓ 1926.501 Subpart M begins by identifying six feet as the height exposure at which the employer must provide fall protection.
- ✓ Unprotected sides and edges, hoist areas, floor holes, ramps, walkways, steep sloped roofs and working over dangerous equipment, all fall under the 6 foot rule.

Exceptions to Six-Foot Rule

- ✓ Although insurance industry data has clearly shown six foot (or less) as the height at which the potential for serious injury or death is likely, there are many exceptions allowed under the 29 CFR Part 1926 standards.
- ✓ It should be noted however, that best practice is to provide protection at six foot or less, regardless of exceptions to the minimum standards.

Exceptions to Six-Foot Rule

- ✓ Climbing rebar - 24 foot
- ✓ Scaffolding - 10 foot
- ✓ Fixed Ladders - 24 foot
- ✓ Portable ladders - no limit
- ✓ Steel connecting and decking - 30 feet or 2 stories (other Steel Erectors - 15 feet)

Exceptions to Six-Foot Rule

- ✓ Specific activities in wood frame residential construction - 48 feet or 3 stories.
- ✓ Roofs with pitches 8:12 or less in residential-type (wood frame) construction.
- ✓ Falls into safety nets - 30 feet.

Exceptions to Six-Foot Rule

If the employer can prove that conventional fall protection is not feasible or would be more dangerous, they can develop a written plan that allows no limit to the exposure at the leading edge for employees necessary to perform the work inside a controlled access zone:

- ✓ Leading edge formwork
- ✓ Precast concrete erection
- ✓ Low slope roofs

Exceptions to Six-Foot Rule

- ✓ The burden of proof is on the employer to demonstrate that conventional fall protection is not feasible.

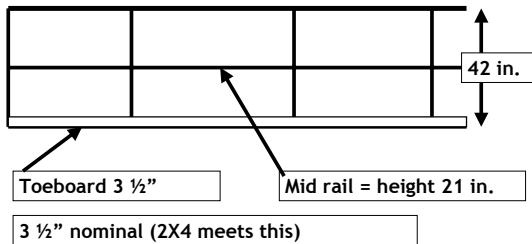
Guardrails

Fall Protection Systems Guardrail Systems

- ✓ Toprail @ 42" +/- 3" must withstand 200 lbs force
- ✓ Midrail @ 21" +/- 3" must withstand 150 lbs force
- ✓ Toeboard 4"

PROTECTION FOR FLOOR OPENING

Standard Railing - Top Rail, Mid Rail & Toeboard



Wood Guardrails

- ✓ Construction grade lumber
- ✓ Posts at least 2-inch by 4-inch lumber, spaced no more than 8 feet apart on centers
- ✓ Top rail at least 2-inch by 4-inch
- ✓ Mid rail at least 1-inch by 6-inch

Barrier Tape

- ✓ Use of barrier tape in lieu of guardrails is not allowed under any circumstances.

Wire Rope Guardrail Systems

- ✓ Wire rope guardrails must be flagged with high visibility material at least every 6 feet.
- ✓ Wire rope may not deflect more than 3" (not below 39" from walking surface).

Guardrails Impalement Protection

- ✓ Handrails must be free of hazards of impalement, lacerations, punctures, or snagging of clothes.

Fall Protection Systems Hoist Areas

- ✓ When guardrails are used at hoisting areas, a chain, gate, or removable guardrail section must be placed across the opening.
- ✓ When removed to receive materials, employee(s) must be protected by fall restraint or fall arrest systems.
- ✓ Best practice: use of a fall restraint system.

Fall Protection Systems Safety Nets

- ✓ Should be installed as close as possible, no more than 30' below working level.
- ✓ The potential fall area between the work surface and the net must be unobstructed.
- ✓ There must be sufficient clearance below nets to prevent contact with surfaces or structures.

Fall Protection Systems Safety Nets

- ✓ Nets must be installed with sufficient clearance under them to prevent contact with objects below when subjected to a drop test.

Fall Protection Systems Safety Nets

- ✓ Nets must be drop tested (or certified) after installation, before use, whenever relocated, after major repair, and at six month intervals if left in one place.
- ✓ The drop test consists of a 400 lb bag dropped from at least 42 inches above the highest level employees could be exposed to a fall.

Fall Protection Systems Safety Nets

- ✓ Defective nets shall not be used.
- ✓ Nets must be inspected at least weekly & after any event that could affect the integrity of the safety net system.
- ✓ Nets must be cleaned of scrap material at least daily.

Outward Extension of Safety Nets

Vertical Distance	Horizontal Distance
Up to 5'	8'
Greater than 5' to 10'	10'
Greater than 10'	13'

Summary

- ✓ Falls are the number one cause of death in construction.
- ✓ Elimination of the fall exposure is the first choice, use of fall equipment is the last choice.
- ✓ A complete guardrail system consists of a top rail, mid rail and toeboard.

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Floor Holes, Skylights & Falling Object Protection

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Floor Holes/Openings

- ✓ A major cause of falls in construction is due to a failure to adequately protect floor openings.
- ✓ Many fatalities occur when an employee picks up a sheet of plywood that is covering an opening and falls through.

Floor Holes/Openings

- ✓ The typical scenario is that the worker sees a piece of plywood laying on the floor.
- ✓ The worker may be doing clean-up or is in need of a sheet of plywood.
- ✓ The worker picks up one side of the plywood and walks into the opening to get closer without ever seeing what is underneath.

Floor Holes

- ✓ All holes 2" diameter or larger must be covered.
- ✓ Even small holes may allow debris or material to fall through to the floor below.
- ✓ If large enough for the foot to fall into the hole, knee, ankle or foot injuries may occur.

Floor Hole Covers

- ✓ Must be marked COVER or HOLE or color coded (some jobs mark them with a red X).
- ✓ Paint will wear and fade on a jobsite. Be sure to repaint as necessary.

Floor Hole Covers

- ✓ Cover must be secured.
- ✓ OSHA allows us to add cleats under the cover so it won't slide off the hole.
- ✓ Better practice would be to solidly anchor the cover to the floor.

Floor Hole Covers

- ✓ Must support 2 X the maximum intended load (equipment, employees, and/or materials).
- ✓ If scissor/aerial lifts are on the same level as floor covers, the potential for them to run over the hole cover must be considered in the cover design.

Floor Holes/Openings

- ✓ Best practice is to use guardrails instead of floor covers whenever possible.
- ✓ If covers are used, they must be maintained. Traffic will loosen nails and fade paint.

Skylights

- ✓ Skylight openings must also be covered.
- ✓ Most older skylights will not support the weight of workers.
- ✓ Many fatalities have occurred from workers sitting or standing on skylights causing them to break.

Skylights

- ✓ Accidents also occur when skylight openings are cut in metal roof decking.
- ✓ A dangerous situation exists from the moment the opening is cut until a structurally sound skylight is installed.

Skylights

- ✓ Fall protection is required from the moment a skylight opening is created.
- ✓ One option is to provide anchorage and a PFAS for the exposed workers.
- ✓ Another option is to position a lift or scaffolding under the area and leave it in place as a “catch platform” until the skylight is installed.

Slip & Trip Hazards

- ✓ Slip and trip hazards can also lead to falls if adjacent to exposed edges.

Falling Object Protection

- ✓ Use toeboards to protect employees below
 - 3 1/2" nominal height (2X4)
 - 50 lb strength
 - If materials extend over toeboard, must be extended to height of materials

Falling Object Protection

- ✓ Canopies must be strong enough to prevent collapse and prevent any dropped objects from penetrating.

Falling Object Protection

- ✓ Nets/netting material may also be used to collect potential falling material/debris.

Fatality

- ✓ 27-year-old carpenter dies after partially removing plywood used to cover a floor opening.
- ✓ Victim removed nails from one side of the cover so he could drop an electric cord to the floor below.
- ✓ Leaning into the opening with the plywood resting on his back, he instructed someone below to plug the cord in.
- ✓ He either lost his balance or the weight of the plywood caused him to fall headfirst through the opening which resulted in a fatality.

Summary

- ✓ Improperly protected floor and skylight openings are a frequent cause of fall fatalities.
- ✓ If plywood is used as a protective cover for a floor opening, extreme caution is advised to ensure it is properly installed and maintained.
- ✓ Where possible, consider using guardrails in lieu of plywood for protection.

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Personal Fall Arrest Systems (PFAS) Module I

Designed by:



Manufacturer's Requirements

- ✓ You must follow your manufacturers requirements/guidelines.
- ✓ Not all manufacturers equipment is compatible or interchangeable.

What is a Personal Fall Arrest System (PFAS)?

- ✓ Equipment used to protect the worker in the event of a fall.
- ✓ A PFAS consists of a harness, a connecting device and an anchorage.

Use of Body Belts

- ✓ Body belts can be used as a positioning device or restraint device only.
- ✓ They are not designed for fall arrest.

Fall Restraint Versus Fall Arrest

- ✓ Fall restraint is a tether system that does not allow the worker to get past the edge and fall.
- ✓ Fall arrest means we have put a worker in a position to fall and are relying on the equipment to save them.
- ✓ Fall restraint is the best practice of the two methods.

Restraint Systems

- ✓ Allows access to the work area while preventing the fall.
- ✓ The worker must not be able to reach the edge using restraint system.
- ✓ Anchor must support 3000 lbs.
- ✓ Good for loading/hoisting areas.

Fall Arresting Force

- ✓ Another reason fall restraint is preferred to fall arrest, is that fall restraint actually prevents the fall from occurring.
- ✓ When we use fall arrest equipment, one of the considerations is how much arresting force will be applied to the body.

Fall Arresting Force Requirements

- ✓ Impact force to the body must be less than 1800 lbs (with a harness).
- ✓ Maximum allowed free fall distance is 6 foot.
- ✓ Maximum allowed weight of individual with tools is 310 lbs (Special equipment required if over 310 lbs).

Determining Impact Force Example

Employee weight with tools	200 lbs
Free fall distance	<u>x 6 ft.</u>
Generated force =	1200 lbs
Stopping Distance	<u>/ 0.5 ft</u>
Impact force =	2400 lbs.

Minimizing Arresting Force

- ✓ Minimize the fall distance:
 - Tie off at or above d-ring height wherever possible.
 - Use a shorter lanyard.
 - Use a retractable system.

Minimizing Arresting Force

- ✓ Use shock absorbers.
- ✓ Choose appropriate harnesses, and wear them properly.

Positioning Devices

- ✓ "Positioning device system" means a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.
- ✓ A positioning system is not designed for fall arrest.

Positioning Devices

- ✓ Employees on formwork or reinforcing steel must be protected at 6 feet with personal fall arrest system, nets, OR a positioning device.
- ✓ Rebar chain assemblies are to be used as positioning devices only. A secondary approved lanyard must be used to prevent falls.
- ✓ *Best practice:* The use of fall arrest equipment, in addition to, positioning equipment.

Positioning Devices

- ✓ Letter of interpretation for use of positioning devices for work on rebar allows climbing up to 24 feet while using positioning alone.
- ✓ This is not a best practice, rather the maximum fall exposure allowed under minimum standards.

Anchorage

Anchorage Points

- ✓ Must support 5000 lbs. per employee, or
- ✓ Be designed, installed and used as part of a complete system which maintains a safety factor of at least two; and under the supervision of a qualified person.

Anchorage/Designed By Qualified Person

- ✓ Must limit maximum arresting forces in a harness to 1800 lbs.
- ✓ Be rigged so that employee cannot free fall more than six feet, nor contact lower level.

Anchorage/Designed By Qualified Person...

- ✓ Must bring an employee to a complete stop and limit shock absorber stretch distance to 3.5 feet.
- ✓ Must have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of six feet (or free fall permitted by system, whichever is less).

Anchorage/Designed By Qualified Person...

- ✓ The qualified person must have made all necessary calculations to determine that the anchorage will meet a safety factor of two (or 5000 lbs).
- ✓ Supporting data should be maintained at the project location and be site-specific (Do not use data from one project for another situation that may not be identical).

Anchorage/Designed By Qualified Person...

- ✓ The qualified person must be a registered professional engineer with experience in designing fall protection systems.
- ✓ Or, another qualified person with the appropriate education and experience to make the necessary calculations.

Anchorage Points

- ✓ Consider purchasing pre-engineered anchors. The calculations have already been done for you, as long as you follow the manufacturer's directions for installation and use.
- ✓ Both permanent and temporary/disposable anchors are available for a wide range of applications.

Anchorage Points

- ✓ If in need of an improvised anchor, a structural steel member may serve this purpose as long as an acceptable strap is used as a connector.

Anchorage Points

- ✓ A large eye-bolt made of the appropriate grade steel (forged steel) may serve as an acceptable anchor as long as the qualified person does the appropriate calculations for the system to be used.
- ✓ The qualified person must take into consideration the diameter of the eye to avoid roll out of snaphooks.

Anchorage Points

- ✓ The strength of an eye-bolt is rated along the axis of the bolt.
- ✓ Strength is greatly reduced if the force is applied at an angle to this axis.

Examples of Improper Anchor Points

- ✓ Standard guardrails
- ✓ Standard railings
- ✓ Ladders/rungs
- ✓ Scaffold cross braces
- ✓ Light fixtures
- ✓ Conduit or plumbing
- ✓ Ductwork or pipe vents
- ✓ Pipe hangers
- ✓ C-clamps
- ✓ Cable trays
- ✓ Another lanyard
- ✓ Roof stacks, vents

Fall Equipment

Harness & Lanyard

Equipment Selection

- ✓ Make sure equipment purchased will be compatible with existing equipment or employee owned/provided equipment.
- ✓ If employees provide their own equipment, the employer is responsible for ensuring it is suitable for use and in good condition.

Equipment Selection

- ✓ Employees will more readily and properly wear a comfortable harness that easily adapts to lanyards and other connecting devices and is easy to adjust to the wearer.
- ✓ Some harnesses use webbing that easily tangles, making it difficult to put on properly.

Harnesses

- ✓ Read and follow manufacturers data.
- ✓ Position D ring between shoulder blades.
- ✓ Leg straps should be fastened as high and snug as comfortably possible.
- ✓ The chest strap should be secured across chest/breastbone.

Harnesses

- ✓ Because employees may find the leg straps uncomfortable, it is common to observe them unhooked, especially during lunch/breaks.
- ✓ A best practice would be to take the entire harness off during breaks rather than unhooking the leg straps and then forgetting to rehook them when back in the workplace.

Weight Requirements

- ✓ Most fall equipment is designed for the weight of a worker and tools, not to exceed 310 lbs.
- ✓ If worker and tools exceeds this, specially designed equipment must be selected and provided.

Deceleration Device

- ✓ A shock absorbing system that limits the energy to the body during a fall arrest.
- ✓ The worker must take into consideration the length the shock absorber will elongate in the event of a fall when calculating clearance distance.

Clearance Distance

- ✓ How much clearance distance is needed to prevent the employee from striking the ground or working surface?
- ✓ Factors that affect this distance:
 - Position of anchorage
 - Type & length of lanyard
 - Height of body
 - Type of shock absorber

Pendulum Effect

- ✓ Traveling more than 15° in any direction from the anchorage point increases the possibility of a "pendulum" effect where the arc of travel allows contact with the lower level or other obstacles.
- ✓ These swing impacts can injure or kill an employee who otherwise would have survived the fall unhurt.

Summary

- ✓ Minimize fall distance where possible to minimize arresting force (max 1800 lbs).
- ✓ Safe use of a PFAS requires taking into consideration:
 - Anchorage.
 - Proper use & selection of equipment.
 - Clearance distance.
 - Potential pendulum effect.

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Personal Fall Arrest Systems (PFAS) Module II

Designed by:



Connectors

Lanyards, snap hooks, carabineers,
beam clamps/wraps, etc.

Lanyard

- ✓ A lanyard is a flexible line of rope, wire rope, or web strapping with a connector for connecting the harness to an anchorage.

Lanyard

- ✓ The maximum length of a lanyard for a fall arrest system is six feet, as that is the maximum distance a worker can be allowed to fall with a PFAS.
- ✓ Choosing a lanyard shorter than six feet will reduce the arresting force on the body and is a better practice where possible.

Lanyards

- ✓ Attach lanyard to harness at D-ring between employees shoulders.
- ✓ Never connect lanyard to itself unless designed to do so.
- ✓ Never connect two or more lanyards together.
- ✓ Never tie a knot in a lanyard or lifeline (potential capacity reduction of 50%).

Lanyard

- ✓ Never wrap a lanyard around a beam or other sharp object (there are products like the beam wrap that are designed for this purpose).

Snaphooks

- ✓ A snaphook is a connector with a hook-shaped member and a closed keeper.
- ✓ When opened to hook to an anchorage and released it must automatically close.

Snaphooks

- ✓ Must use self locking type.
- ✓ Must have minimum strength of 5000 lbs.

Compatibility

- ✓ Never attach snaphooks to:
 - Each other
 - To a D ring to which another connector is attached
 - To webbing or rope lanyard
 - To any object that would load the gate or lead to rollout

Carabineers

- ✓ A carabineer is a connector with a trapezoidal or oval body that has a normally closed gate.

Carabineers

- ✓ Carabineers originated as mountain climbing equipment and are sometimes rated in Kilo Newton (kN) versus pounds. They must have minimum strength of 5000 lbs.
- ✓ 22 kN is equal to 5000 pounds.
- ✓ Must have self closing keepers.
- ✓ Good for connecting SRL's to a stationary object/structural member.

Compatibility

- ✓ If you attach a snaphook or carabineer to an object that is undersized or irregular in shape, excessive force may cause the gate to open or fail.

Gate Loading

- ✓ Gates on snaphooks and carabineers are designed to be capable of withstanding 220 pounds of force without the gate separating from the nose.
- ✓ It is critical that the competent person supervise the installation and use of all fall equipment to ensure gate loading does not occur.
- ✓ Gate loading can result in forced roll out.

Rope & Cable Grabs (Fall Arrestors)

- ✓ Consist of cam activated fall arrestors that slide freely up and down wire or rope lifelines.
- ✓ Some rope grabs automatically follow you, giving you maximum freedom and hands free operation.
- ✓ Most manufactures require short (2-3ft lanyards).

Beam Wraps

- ✓ A lanyard should never be wrapped around a beam and subjected to a fall because it will be cut by the sharp edges of the beam.
- ✓ A beam wrap/strap is designed for this usage.

Beam Clamps

- ✓ Beam clamps attach horizontally to I or H beams of various dimensions.
- ✓ They work by gripping the beam and sliding with the worker, providing increased mobility and safety while walking beams.

Beam Clamps

- ✓ Beam clamps can be used at foot level for those situations (steel connecting) where there is no overhead structure to anchor to.
- ✓ Where an overhead beam does exist, it is much preferred to anchor the beam clamp to an overhead beam to reduce fall distance.

Wire Form Anchorage

- ✓ Used frequently in tower construction.
- ✓ Do not apply a side load to the anchorage connector.

Fall Rescue

Fall Rescue

- ✓ You must have a plan and the necessary equipment on hand for rescuing employees who are unable to self-rescue.
- ✓ You must train those who will be doing the rescue.
- ✓ Dialing 911 and letting the emergency response personnel figure it out is not acceptable.

Fall Rescue

- ✓ Train your employees in self-rescue techniques in the event of a fall.
- ✓ Where they cannot perform self rescue help must be prompt.
- ✓ Time is critical and a worker may lose consciousness in only a few minutes.

Fall Rescue

- ✓ Self rescue may be as simple as the worker pulling himself up to the level he fell from.
- ✓ Equipment is available that allows a worker to lower themselves with a wench or pulley system.

Fall Rescue

- ✓ Another option for rescue is the use of a scissor lift or aerial lift.
- ✓ When a more complicated high angle rescue is needed, you need to know the abilities, limitations, and response time of the emergency response team available when calling 911.

Post Suspension Trauma

- ✓ Can occur whenever a worker is suspended for over five minutes in an upright posture, with the legs straight beneath the body.
- ✓ Gravity causes blood to pool in the lower legs, eventually blood accumulates and the return blood flow to the right chamber of the heart is reduced.

Post Suspension Trauma

- ✓ If the worker fainted on the ground and became horizontal, blood would return and the worker would recover.
- ✓ When hanging in a harness, the worker does not become horizontal and can die from lack of oxygenated blood to vital organs

Post Suspension Trauma

- ✓ Fall victims can slow the onset of suspension trauma by pushing down vigorously with the legs, by positioning their body in a horizontal or slight leg-high position, or by standing up.
- ✓ Some harnesses have stirrups for this purpose, worker must be conscious.

Post Suspension Trauma

- ✓ Workers should be trained to try to move their legs in the harness and try to push against any footholds.
- ✓ Rescuers must be aware that post-rescue death may occur if victims are moved to a horizontal position too rapidly.
- ✓ Those attempting rescue must be trained in dealing with post-suspension trauma.

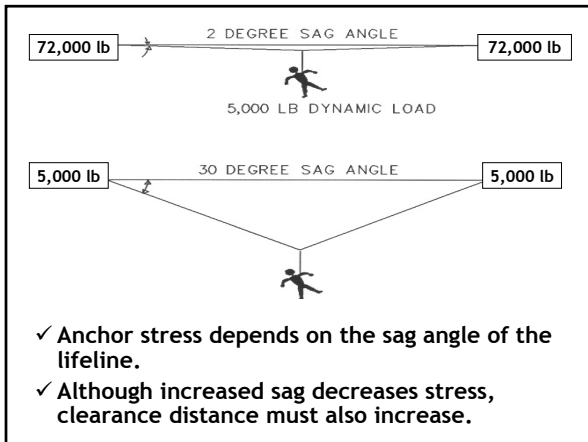
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Lifeline Systems



Lifeline Systems

- ✓ Lifelines are flexible anchorages that allow a worker to be tied off at any point along a vertical or horizontal span.
- ✓ Unlike fixed anchors, lifeline systems are susceptible to movement, elongation and deflection.
- ✓ These factors must be considered by the qualified person in their design and use.



Horizontal Lifeline Systems

- ✓ Job made systems are commonly called “rat lines” or “static lines.”
- ✓ If a system is designed at the job site, it must be designed, installed, and used under the supervision of a qualified person.

Horizontal Lifeline Systems

- ✓ As previously discussed, the qualified person must be a registered professional engineer with experience in designing fall protection systems.
- ✓ Or, a qualified person with the appropriate education and experience to make the necessary calculations.

Horizontal Lifeline Systems

- ✓ The qualified person must have made the necessary calculations to determine that all components of the horizontal lifeline system will meet at a minimum, a safety factor of two.

Horizontal Lifeline Systems

- ✓ Supporting data should be maintained at the project location and be site-specific.
- ✓ Do not use data from one project for another situation that may not be identical.
- ✓ Testing of installed lifelines prior to use is recommended.

Horizontal Lifelines

- ✓ Extreme care must be taken when more than one worker is anchored to the same lifeline.
- ✓ This is due to the additional forces that could occur should one worker fall, dragging other workers along.

Horizontal Lifelines

- ✓ Consider using a pre-engineered system where the calculations have already been done for you.
- ✓ Pre-engineered systems typically have an “in-line” shock absorber, reducing the amount of line sag and in turn reducing the clearance distance needed.

Horizontal Lifelines

- ✓ Components designed for rigging applications should not be used for fall arrest systems unless carefully evaluated by the qualified person.
- ✓ Rigging equipment is typically not designed for this use or for the potential shock loading that can occur in a fall.

Factors Impacting Lifeline Design

- | | |
|---|------------------------|
| ✓ Number of users | ✓ Environment |
| ✓ Length of line | ✓ Time used |
| ✓ Anchor points | ✓ Clearance required |
| ✓ Tension on lifelines | ✓ Type of wire rope |
| ✓ Energy absorbers (shock absorber on lifeline) | ✓ Connectors |
| | ✓ Intermediate anchors |

Misuse of Guardrails as Anchors

- ✓ **CAUTION!** Guardrail systems and horizontal lifeline systems are not the same thing.
 - Guardrails must be designed to withstand a 200 pound force.
 - Horizontal lifelines must be designed with a safety factor of two or 5000 pounds per worker.

Vertical Lifeline Systems

- ✓ Made to accommodate vertical travel from distances as short as 10 feet to 200+ feet.
- ✓ Consists of rope or cable lifeline and fall arrester combination.
- ✓ Lifeline must be protected against abrasion/damage.

Vertical Lifeline Systems

- ✓ Fall arresters are designed to work with certain types and diameters of lifelines.
- ✓ Make sure the appropriate size and type of lifeline is used. The required size is marked on the rope grab.

Vertical Lifeline Systems

- ✓ Fall arresters are available in automatic or manual mode.
- ✓ Automatic mode provides a “hands-free” operation.

Vertical Lifeline Systems

- ✓ If your grab has a directional arrow on it make sure it is pointing along the lifeline to the anchor point.
- ✓ Gravity feed latches prevent workers from accidentally placing arrester incorrectly on lifeline.

Vertical Lifeline Systems

- ✓ Inertia cams keep the arrester properly locked during fall despite “panic grab”.
- ✓ In a panic grab, the user grabs the arrester during a fall and inadvertently holds it “open,” preventing the device from working properly.

Vertical Lifeline Systems

- ✓ After mounting on the line, check to ensure the grab is working properly by pulling down sharply.
- ✓ The grab should lock within 12 inches.

Self Retracting Lifeline Systems (SRL)

- ✓ Designed for vertical applications.
- ✓ Must arrest the fall within 2 feet (usually less).
- ✓ Minimizes total fall distance and arresting forces.

Self Retracting Lifeline Systems (SRL)

- ✓ Some (not all) manufacturers allow horizontal use.
- ✓ Competent person must determine clearance distance, pendulum effect and follow manufacturers guidelines.
- ✓ Some manufacturers require a shock absorber for horizontal use.

Self Retracting Lifeline Systems (SRL)

- ✓ Typically available in lengths between 10 and 150 feet.
- ✓ Made of steel cable or webbing.

Self Retracting Lifeline Systems (SRL)

- ✓ Never allow the webbing or cable to be run over sharp objects (such as steel beams).
- ✓ The webbing/cable may be cut, especially when subjected to an impact load.

Self Retracting Lifeline Systems (SRL)

- ✓ Not designed to use with a lanyard - such use could cause locking mechanism to fail to engage and exceed allowed fall distance.
- ✓ Attach SRL directly into D ring of harness.

Self Retracting Lifeline Systems (SRL)

- ✓ Not designed to be used as fall restraint system.
- ✓ This would only work if the line was completely played out before the worker reached the edge.

Self Retracting Lifeline Systems (SRL)

- ✓ If SRL is used to provide fall protection while climbing to a work location, it will be necessary to provide a tag line to pull the line down to the worker before ascent.
- ✓ If the line is wrapped around an object to secure it at the bottom, damage to the line is possible.

Self Retracting Lifeline Systems (SRL)

- ✓ Some manufacturers require an annual factory re-certification.
- ✓ Some units include a load indicator.
- ✓ The indicator visually identifies units that have been involved in a fall and must be removed from service.

Summary

- ✓ Lifeline systems can provide continuous fall protection instead of requiring the worker to hook and un-hook.
- ✓ It is critical that systems be properly designed and used under the supervision of a qualified person.

Summary

- ✓ If using a manufactured system, make sure you are following their guidelines. Keep manufacturer's data at the jobsite.
- ✓ If using a job made system, it is critical that all components of the system be designed for the specific situation on the jobsite.

Fall Protection Competent Person Trainer PFAS Inspection, Maintenance & Training



General Guidelines

All guidelines presented here are general suggestions for inspection protocol.

See your manufacturer's guidelines for specific instructions.

General Guidelines All Equipment

- ✓ Most manufacturers (and ANSI) require inspection before use and at least semi-annually by a competent or qualified person.
- ✓ OSHA requires inspection prior to use.

General Guidelines All Equipment

- ✓ OSHA requires devices that have sustained an impact be removed from service until inspected by a competent person and determined suitable for reuse.
- ✓ Best practice is to discard all equipment that has sustained an impact.

General Guidelines All Equipment

- ✓ Know and follow your manufacturer's requirements.
- ✓ Train employees to do daily inspections.
- ✓ Document inspections by a competent person and the date of first use.

General Guidelines All Equipment

- ✓ No alterations without approval by the manufacturer.
- ✓ Ensure compatibility with other fall equipment.
- ✓ Use caution around electrical hazards or moving machinery.

General Guidelines All Equipment

- ✓ Synthetic equipment must not come in contact with high temperature, welding, heat, electrical hazards, or moving machinery.
- ✓ Keep equipment clean and store in a clean, dry area when not in use.

General Guidelines All Equipment

- ✓ Most manufacturers will establish an expected lifespan of fall equipment.
- ✓ This does not mean the equipment will always last this amount of time.
- ✓ Conditions of use and maintenance can effect the lifespan of equipment.

General Guidelines All Equipment

- ✓ The length of wearable life will vary greatly depending on the amount of wear it receives, and in what type of environment it is worn.
- ✓ A harness worn only infrequently and indoors will have a much longer life than one worn outdoors everyday.

General Guidelines All Equipment

- ✓ To clean, wipe off surface dirt with a sponge dampened with plain water and squeezed dry.
- ✓ Clean with mild solution of water and soap.
- ✓ Hang to dry away from excessive heat or sun.

Carabineers

- ✓ Visually check to see the keeper is completely closed and locked when in use.
- ✓ Inspect for signs of damaged, bent, cracked, or distorted components.

Carabineers

- ✓ Any separation by more than 0.125 inches in a jammed condition is reason to remove from use.
- ✓ Remove from service if subjected to a fall.

Harness/Webbing

- ✓ Bend webbing over a pipe or other smooth object. This will make damaged fibers or cuts easier to see.
- ✓ Inspect the entire length of the webbing and on both sides of each strap.
- ✓ Look for frayed edges, broken fibers, pulled stitches, cuts, burns, or chemical damage.

Harness/Webbing

- ✓ In excessive heat, webbing may become brittle and shriveled with a brownish appearance. Fibers will break when flexed.
- ✓ When subjected to chemical exposures the color may appear brownish. May show cracks and loss of elasticity.

Harness/Webbing

- ✓ Webbing exposed to flame may have strands fused together and with a hard, shiny and brittle feel.
- ✓ Paint and solvents dry and restrict movement of fibers.

D-rings & Buckles

- ✓ Check d-rings for distortion, cracks, breaks, and rough or sharp edges. The d-ring should pivot freely.
- ✓ Look for wear at attachment points of buckles.

Tongue & Grommets

- ✓ The tongue receives heavy wear from repeated buckling and unbuckling.
- ✓ Inspect for loose, distorted or broken grommets.
- ✓ Webbing should not have additional punched holes.

Lanyard Inspection

- ✓ Begin inspecting at one end of the lanyard and work to the opposite end.
- ✓ Slowly rotate the lanyard so that the entire surface is checked.

Lanyard Hardware

- ✓ Inspect snaps for distortion, cracks, corrosion, or pitted surfaces.
- ✓ The keeper should not be distorted or obstructed. The spring should firmly close the keeper.
- ✓ Thimble must be firmly seated and the splice should have no loose or cut strands.

Hooks

- ✓ Visually check to see the gate fully locks closed.
- ✓ Inspect for signs of damaged, bent, cracked, or distorted components.

Lanyard Shock Absorbers

- ✓ The outer portion of the shock-absorbing pack should be examined for burn holes and tears.
- ✓ Stitching on areas where the pack is sewn to the d-ring, belt or lanyard should be examined for loose strands, rips and deterioration.

SRL Inspection/Maintenance

- ✓ SRL's are self-retracting lanyard systems
- ✓ They are also called retractable lifelines

SRL Inspection/Maintenance

- ✓ Some models require an annual manufacturer's certification and some do not.
- ✓ If required, you must pull all your equipment out of the field and send to the manufacturer.
- ✓ Keep records of date of inspection.

SRL Inspection/Maintenance

- ✓ Some manufacturers have a load indicator that lets you know when you must take the equipment out of service.
- ✓ SRLs which have been subjected to impact loading must be removed from service for inspection.

SRL Inspection/Maintenance

Following are some general guidelines (refer to manufacturer for specific instructions):

- ✓ Inspect housing for damage.
- ✓ Lifeline should pull out and retract fully.
- ✓ Ensure device engages when lifeline is jerked sharply.
- ✓ Labels must be present and fully legible.
- ✓ Look for signs of corrosion on the unit.

SRL Inspection/Maintenance

- ✓ Inspect the webbing/cable for wear. Excessive wear can occur when the lifeline is anchored around a stationary object instead of using a tag line.
- ✓ Inspect wire rope for cuts, kinks, broken wires, corrosion, chemical contact areas, or severely abraded areas.

Fall Training

- ✓ Employer must provide training for all employees who might be exposed to falls.
- ✓ Training must be provided by a competent or qualified person.

Fall Training

- ✓ Training must include:
 - Fall hazards in the workplace.
 - Correct procedures for erecting, maintaining, disassembling and inspecting fall protection systems.
 - Use and operation of PFAS, nets and any other fall systems used.

Fall Training

- ✓ Training must include federal, state, local, company, or site-specific requirements.
- ✓ Training should include hands-on practice as well as lectures, demonstrations.
- ✓ Employees should demonstrate how to don, adjust, properly use, inspect, maintain, rescue, etc.

Fall Training

- ✓ A written certification record must be maintained to include the name of the employee trained, the date(s) of the training, and the signature of the person who conducted the training or the signature of the employer.

Fall Training

✓ Retraining is required when:

- Changes in the systems, equipment, or worksite render previous training obsolete; Or
- Inadequacies in employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained understanding or skill.

Scaffold Training Course

For the OSHA "Competent Person"

Designed by:
 PROSAFE Solutions

Course Objectives

- ✓ Understand the OSHA scaffold standards in subpart L.
- ✓ Understand the definition and duties of the scaffold competent person.
- ✓ Review the general hazards associated with scaffolds.
- ✓ Understand proper construction and use of scaffolds.
- ✓ Understand the training requirements of the standard.

Scaffold Definition

Any "temporary" elevated work platform (supported or suspended) and its supporting structure (including points of anchorage), used for supporting employees, or materials, or both.

Major Hazards

What are the five major hazards encountered when working with scaffolding?

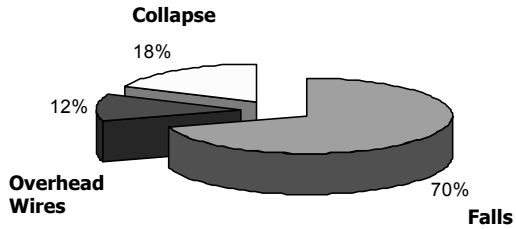
Major Hazards

- ✓ Falls
- ✓ Improper Access
- ✓ Struck by Falling Objects
- ✓ Electrocutation
- ✓ Scaffold Collapse

Fall Hazards

- ✓ Falls are the leading cause of death to employees working from scaffolding.
- ✓ OSHA requires fall protection at ten feet when working from scaffolding.

OSHA Scaffold Fatality Study



Scaffold Collapse

✓ Collapse may occur:

- ✓ During high winds
- ✓ Due to heavy equipment or crane operations
- ✓ From failure to adequately secure the scaffold to the structure
- ✓ Not considering wind loads from plastic or other material installed on the scaffold

Scaffold Access

- ✓ Proper access to scaffolding must be provided.
- ✓ It is NOT acceptable to climb crossbracing.

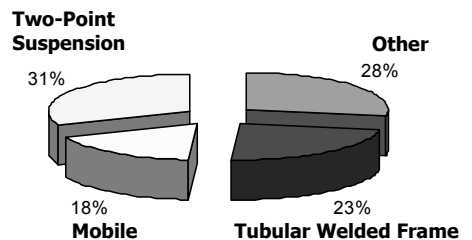
Struck By Falling Objects

- ✓ Protection must be provided for those employees who may pass around, or under, scaffolding.
- ✓ Protection may consist of screening, barricades, or toeboards.

Electrocution

- ✓ Electrical hazards may consist of close proximity to power lines, or
- ✓ Improper use or condition of electrical tools, wiring, or welding operations.

OSHA Scaffold Fatality Study



Scaffolding Related Statistics

- ✓ 72% of scaffolding accidents attributed to planking or supports giving way, employee slipping, or being struck by a falling object.
- ✓ 70% of workers learned safety requirements of scaffolds while on-the-job. 25% had NO training at all.
- ✓ Only 33% of scaffolds were equipped with guardrails.

Most Frequently Cited - 2003

- ✓ 451(g)(1) Fall protection required at work levels/platforms (1229)
- ✓ 451(e)(1) Access must be provided (1044)
- ✓ 453(b)(2)(v) Fall Protection – Aerial Lift (977)
- ✓ 451(b)(1) Scaffolds – Planked & Decked (925)
- ✓ 454(a) Training for employees (542)

Who is a Competent Person?

A competent person means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions, which are hazardous or dangerous to employees, and who has authority to take prompt corrective measures to eliminate them.

Who is a Competent Person?

- ✓ A competent person must have specific training in, and be knowledgeable about, the structural integrity of scaffolds and the maintenance requirements.
- ✓ They must have specific training in, and be knowledgeable about, the manufacturer's requirements.
- ✓ They must be knowledgeable about the requirements of the OSHA standard, Subpart L.

Duties of the Competent Person

- ✓ A competent person is required to supervise the erection, modification, and disassembly of scaffolds.
- ✓ A competent person must train employees who erect, modify, or disassemble scaffolding.
- ✓ A competent person is required to inspect scaffolding prior to each workshift.

Duties of the Competent Person

- ✓ A competent person must determine the feasibility and safety of providing fall protection during erection or dismantling of supported scaffolding.
- ✓ A competent person must determine if scaffold components from different manufacturers can be intermixed.

Summary

- ✓ **Scaffolding is a major contributor to injury and fatalities in construction.**
- ✓ **9% of all construction fatalities are scaffold related.**
- ✓ **By ensuring you have a competent person, trained employees, and focusing on the five major hazards will help prevent injuries and fatalities in your workplace.**

Scaffold Training Course

Capacity & Construction

Designed by:
 PROSAFE Solutions

Module Objectives

To understand scaffold safety issues involving:

- ✓ Capacity
- ✓ Foundations
- ✓ Platform Construction
- ✓ Securing Scaffolds From Tipping

Scaffold Manufacturer's Requirements

- ✓ Each scaffold has specific manufacturer's guidelines and requirements.
- ✓ You must have specific knowledge and training in these requirements to qualify as an OSHA competent person.

Scaffold Capacity

Each scaffold and its components must be capable of supporting, without failure, its own weight and at least 4 times the maximum intended load applied to it.

Scaffold Capacity

- ✓ You must calculate the loads to be applied to ensure you do not overload the scaffold.
- ✓ Scaffold capacity formula: square footage of scaffold X PSF rating = maximum capacity.

Manufacturer's Guidelines Based On:

Light-duty	25 pounds per square foot applied uniformly over the entire span area
Medium-duty	50 pounds per square foot applied uniformly over the entire span area
Heavy-duty	75 pounds per square foot applied uniformly over the entire span area

Rated Load Capacity	Intended Load
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<u>One-person</u>	250 pounds placed at the center of the span (total 250 pounds)
<u>Two-person</u>	250 pounds placed 18 inches to the left and right of the center span
<u>Three-person</u>	250 pounds placed at the center of the span and 250 pounds placed 18 inches to the left and right of the center of the span (total 750 pounds)

Light Duty

<u>Maximum intended load</u>	25lbs/square ft.
<u>Posts, runners & braces</u>	Nominal 2 inch steel tube or pipe
<u>Bearers</u>	Nominal 2 inch steel tube/pipe & maximum post spacing of 4 ft. x 10 ft.
<u>Maximum runner spacing vertically</u>	6 ft 6 in

Medium Duty

<u>Maximum intended load</u>	50lbs/square ft
<u>Posts, runners & braces</u>	Nominal 2 in(1.9) OD steel tube or pipe
<u>Bearers</u> -	Nominal 2 in(1.9) OD steel tube or pipe and a maximum post spacing of 4 ft. x 7 ft. OR Nominal 2.5 in (2.375 in) OD steel tube or pipe and a maximum post spacing of 6 ft. x 8 ft.*
<u>Maximum runner spacing vertically</u>	6 ft 6 in

*Bearers shall be installed in the direction of the shorter dimension

Scaffold Capacity

- ✓ Most crafts will find a light-duty scaffold adequate.
- ✓ Brickmasons may require a medium-duty scaffold.
- ✓ Stonestetters may require heavy-duty scaffolding.

Scaffold Capacity

- ✓ Scaffolds and components must never be loaded in excess of their maximum intended load or rated capacity, whichever is less.
- ✓ Platforms must not deflect more than 1/60th of span when loaded.

Scaffold Capacity

- ✓ Brackets used to support cantilevered loads (outrigger brackets) must be used only to support personnel.

Scaffold Foundations

- ✓ Survey ground conditions before beginning to erect scaffold.
- ✓ Ground must be firm and as level as possible.
- ✓ Fill holes and small trenches and compact soil as necessary.

Scaffold Foundations

- ✓ Clear ground clutter and stored materials.
- ✓ Ensure that job traffic patterns (vehicles, fork lifts, etc.) are well away from scaffold foundations.
- ✓ Physical barricades may be needed to ensure no equipment or vehicles can snag or strike scaffolds.

Scaffold Foundations

All scaffolds must be erected with adequate foundations. Use either:

- ✓ Casters (on concrete or solid surface only)
or
- ✓ Base plates
- ✓ Never use scaffold frames without base plates or casters.

Scaffold Foundations

- ✓ Mudsills – Required where erecting scaffold on soil or asphalt.
- ✓ Mudsills are designed to evenly distribute loads over a larger area than is provided by the base plate.
- ✓ Check with your scaffold supplier for mudsill dimensions.

Scaffold Foundations

Important point – All scaffolds must be:

- ✓ Plumb
- ✓ Square
- ✓ Rigid

Failure to provide adequate foundations may cause the scaffold to get out of plumb.

Scaffold Foundations

Mudsill best practices:

- ✓ 2 X 10's or 2 X 12's which run continuously under all legs of the scaffold.

Scaffold Platform Construction

- ✓ **Unstable objects shall not be used as working platforms.**

Scaffold Platform Construction

- ✓ **Supported scaffold poles, legs, posts, frames, and uprights must be plumb and braced to prevent swaying and displacement.**

Scaffold Platform Construction

- ✓ **Scaffold planks may be solid sawn wood, manufactured wood, or manufactured steel or aluminum.**

Scaffold Platform Construction

- ✓ **Each working level of the scaffold must be fully planked and decked between the front uprights and the guardrails.**

Scaffold Platform Construction

- ✓ **Wood scaffold planks must be selected following grading rules established by a recognized lumber grading association.**
- ✓ **Such planks must be identified by the grade stamp.**

Scaffold Platform Construction

- ✓ **Wood scaffold planks must be inspected and damaged planks removed from service.**

Scaffold Platform Construction – Use of Forklifts

Forklifts shall not be used to support scaffold platforms unless:

- ✓ Allowed by and designed for such use by the manufacturer.
- ✓ Entire platform attached to the fork.
- ✓ Forklift not moved horizontally while occupied.

Scaffold Platform Construction

- ✓ In areas so narrow that platforms and walkways cannot be 18 inches wide, employees must be protected by guardrails and/or personal fall arrest systems.

Scaffold Platform Construction

- ✓ The front edge of the platform can not be more than 14 inches from the face of the work unless the front edge is protected by a guardrail system and/or personal fall arrest system. The maximum distance from the face for outrigger scaffolds must be 3 inches.

Scaffold Platform Construction

- ✓ The maximum distance from the face for plastering and lathing operations is 18 inches.

Scaffold Platform Construction

- ✓ Each end of a platform, unless cleated or secured, must extend from the centerline of its support at least 6 inches, and no more than 12 inches.

Scaffold Platform Construction

- ✓ Each end of a platform 10 feet or less in length must not extend over its support more than 12 inches.

Scaffold Platform Construction

- ✓ Each end of a platform greater than 10 feet in length must not extend over its support more than 18 inches unless the cantilevered portion of the platform is able to support employees without tipping or has guardrails blocking access.

Scaffold Platform Construction

- ✓ Where platforms do overlap to create a long platform, the overlap **must** occur over supports and **not** be less than 12 inches unless secured to prevent movement.

Scaffold Platform Construction

- ✓ On scaffolds where planks are abutted to create a long platform, each end shall rest on a separate support surface.
- ✓ This does **not** preclude common support members such as "T" sections or hook on platforms designed for such use.

Scaffold Platform Construction

- ✓ When a platform changes direction, such as turning a corner, those bearing other than right angles shall be laid first, those bearing at right angles, shall be laid second (on top).
- ✓ This will ensure the bottom planks overlap the bearer and reduce tripping hazards by making sure the planks are in a straight line.

Scaffold Platform Construction

- ✓ Do not use planks or stages to bridge between scaffold tower sections unless designed by an engineer/qualified person.

Scaffold Platform Construction

- ✓ Wood planks must **not** be painted except for identifying platform edges.
- ✓ Paint might hide defects in the planks.

Scaffold Platform Construction

- ✓ Scaffold components from different manufacturers must **not** be mixed unless they fit together without force and the structural integrity is maintained.
- ✓ If components are mixed, a competent person must determine that the resulting scaffold is structurally sound.

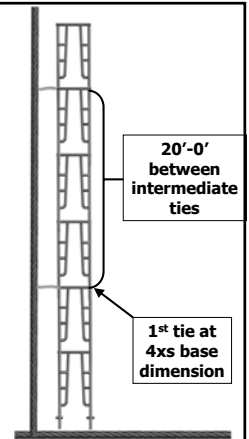
Scaffold Platform Construction

- ✓ Scaffolds with a height to width base ratio of more than 4:1 must be secured to prevent tipping by guying, tying, or bracing.
- ✓ Secure according to the manufacturer's recommendations.

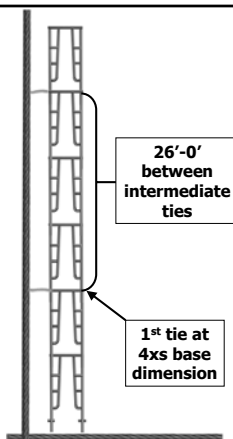
Scaffold Platform Construction

- ✓ The first tie must be no higher than 4 X the minimum base width.
- ✓ (California requires ties at 3 X base width).
- ✓ Ties must be at both ends of scaffold and every 30' horizontally.

- ✓ Scaffolds less than 3 ft. wide, must be secured every 20 ft. after installing first tie at 4X base width.



- ✓ Scaffolds greater than 3 ft. wide, must be secured every 26 ft. after installing first tie at 4X base width.



Scaffold Platform Construction

- ✓ An alternative to guying, tying or bracing is to widen the minimum base dimension by adding another scaffold section or outriggers.

Scaffold Construction

- ✓ **Where uplift can occur, frames must be locked together vertically by pins or equivalent.**
- ✓ **Using forklifts to load materials on scaffolds is an example of potential uplift.**

Summary

- ✓ **Safe scaffolds begin with solid foundations.**
- ✓ **Know the loads to be applied and ensure your scaffold has the capacity to support loads.**
- ✓ **Follow Manufacturer's guidelines.**
- ✓ **Protect against tipping by guying, tying or bracing.**

Scaffold Training Course

Use & Fall Protection

Designed by:
 PROSAFE Solutions

Module Objectives

To understand scaffold safety issues involving:

- ✓ Scaffold Access
- ✓ Proper Use
- ✓ Scaffold Inspection
- ✓ Fall Protection
- ✓ Falling Object Protection

Access

- ✓ Proper access for employees must be provided on scaffolding.

Access

When scaffold platforms are more than 2 feet above or below a point of access, one of the following must be used:

- ✓ Portable ladders
- ✓ Attachable ladders
- ✓ Stair type ladders
- ✓ Walkways
- ✓ Direct access from another scaffold or similar surface

Access Continued

- ✓ Hook-on ladders
- ✓ Stair towers
- ✓ Ramps
- ✓ Prefabricated access (ladder frame type scaffolds)
- ✓ Personnel hoist
- ✓ **NO** climbing of crossbraces is allowed

Access

- ✓ Access must be provided where it is feasible to do so and does not create a greater hazard as determined by a competent person.
- ✓ Hook-on or attachable ladders must be installed as soon as safe installation permits.

Access

Integral prefabricated scaffold access frames (ladder frame scaffolds) must:

- ✓ Be specifically designed and constructed for this use.
- ✓ Be uniformly spaced.
- ✓ Be provided with rest platforms at 35 feet maximum intervals.
- ✓ Have a maximum spacing between rungs of 16 $\frac{3}{4}$ inches.

Stair Towers

Stairway type ladders must be:

- ✓ Positioned so bottom step is no more than 24 inches from supporting level.
- ✓ Rest platforms at 12 feet intervals (vertically).
- ✓ Minimum step width of 16 inches (11.5 for mobile).
- ✓ Slip resistant treads and landings.

Stair Towers

- ✓ Bottom step not more than 24 inches above scaffold supporting level.
- ✓ Toprail and midrail on each side of stairway.
- ✓ Toprail can serve as handrail when separate handrail not provided.

Stair Towers

- ✓ Handrails and toprails provide adequate handhold.
- ✓ Handrails properly surfaced to prevent snags, punctures or lacerations.
- ✓ Stairrail ends constructed so that they do not constitute a protruding object hazard.

Stair Towers

- ✓ Handrails must be 3 inches from other objects.
- ✓ Stairrail not less than 28 inches or more than 37 inches from riser.
- ✓ Landing platform 18" X 18" provided at each level.

Stair Towers

- ✓ Each stairway must be 18 inches wide between stair rails.
- ✓ Treads and landings must be slip resistant.
- ✓ Stairways must be between 40 and 60 degrees.

Stair Towers

- ✓ Guardrails required on all open sides of landings.
- ✓ Risers uniform within 1/4 inch for each flight.
- ✓ Tread depth uniform to 1/4 inch.

Scaffold Inspection

- ✓ Scaffolds must be inspected by a competent person prior to each workshift.

Scaffold Inspection

- ✓ Do not use damaged scaffold components.
- ✓ Do not attempt field repair of scaffold components.
- ✓ Do not use rusty or corroded scaffolding.
- ✓ Do not use bent or broken scaffolding.
- ✓ When in doubt, discard or contact your scaffold supplier.

Scaffold Use

- ✓ Shore or lean-to scaffolds are prohibited.

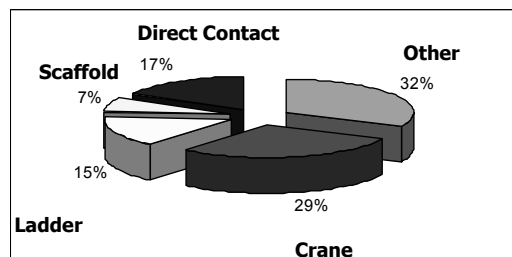
Scaffold Use

Scaffolds must not be erected, used, dismantled, altered or moved when the scaffold or any conductive material on them might come closer to power lines than:

10 feet for uninsulated lines and insulated lines of more than 300 volts

3 feet for insulated lines of less than 300 volts

OSHA Fatality Study Due to Contact with Overhead Wires



Safe Distances

<u>Insulated Lines</u>	<u>Minimum Distance</u>
<300V.....	3 feet
300 V to 50 Kv..	10 feet
>50 Kv.....	10 feet plus.4 in for every 1Kv over 50 Kv

Alternatives: 2 times length of line insulator but never less than 10 feet

Safe Distances

<u>Uninsulated Lines</u>	<u>Minimum Distance</u>
<50 Kv.....	10 feet
>50 Kv.....	10 feet plus 0.4 inches for every 1Kv over 50 Kv

Alternatives: 2 times length of line insulator but never less than 10 feet

Exception to Safe Distances

Scaffold and materials maybe closer than specified only after the utility company has been notified, the lines de-energized, relocated, or protective coverings installed to prevent accidental contact.

Scaffold Use

Scaffold best practice is to have the line deenergized or maintain at least 10' clearance at all times regardless of insulation or voltage.

Scaffold Use

- ✓ Fabricated frame, and tube and coupler scaffolds over 125 feet in height, must be designed by a registered Professional Engineer.

Scaffold Use

- ✓ Employees must not work on scaffolds covered with snow, ice, or other slippery materials except as necessary for the removal of such materials.

Scaffold Use

Ladders may not be used on scaffolds to increase working level height except when:

- ✓ The ladder is placed against a structure other than the scaffold and the scaffold is secured against the force of the ladder.
- ✓ The planks are secured to the scaffold to prevent their movement.

Scaffold Use

- ✓ The ladder legs must be on the same plank or other means must be provided to stabilize unequal deflection.
- ✓ The ladder legs are to be secured to prevent slipping or being pushed off the platform.

Mobile Scaffolds

- ✓ Use casters to create a rolling scaffold tower only on concrete or other firm surface and after inspection finds no holes, debris or other potential tipover hazards.
- ✓ Casters must be locked when scaffold in use.

Mobile Scaffolds

- ✓ When moving the scaffold, manual force must be applied as close to the base as practical.
- ✓ Mobile scaffolds are required to have a diagonal brace to prevent racking or collapse.

Mobile Scaffolds

Employees must not ride on scaffolds unless:

- ✓ Surface within is within 3 degrees of level.
- ✓ Surface free of pits, holes and obstructions.
- ✓ Height to base width ratio is 2:1 or less.
- ✓ Outrigger frames when used are on both sides of scaffold.
- ✓ No employee is on any part of the scaffold that extends beyond the wheels or casters.
- ✓ Before moving, employee made aware of the move.

Fall Protection

- ✓ Each employee on a scaffold greater than 10 feet from a lower level must be protected from falling.

Fall Protection

- ✓ If the scaffold platform cannot be fully decked, fall protection is **REQUIRED** at all working heights, not just when you reach 10'.

Fall Protection

Employees working from boatswain's chair, cantenary scaffold, float scaffold, needle beam scaffold or ladder jack must be protected by Personal Fall Arrest System (PFAS).

Workers on single-point or two-point adjustable scaffolds must be protected by PFAS and Guardrail System (GS).

What is a Personal Fall Arrest System (PFAS)?

- ✓ Safety Harness
- ✓ Lanyard & Shock Absorber
- ✓ Horizontal or Vertical Lifeline
- ✓ Anchorage Point

Fall Protection

- ✓ Workers on a self-contained adjustable scaffold must be protected by GS when supported by the frame structure and by both GS and a PFAS when supported by ropes.

Fall Protection

- ✓ Employees on walkways of scaffolds must have a GS within 9 1/2 inches of and along at least one side of walkway.
- ✓ Employees performing overhand bricklaying from suspended scaffolds must be protected at all open sides (except next to the wall being laid) by a PFAS or GS.
- ✓ For other scaffolds not specified use PFAS or GS.

Fall Protection

Vertical life lines must not be used when overhead protection or additional platforms are part of single-point or two point adjustable suspension scaffold.

Fall Protection

Guardrail Systems must:

Be installed along all open sides and ends of platforms.

Top rail at 38 in. – 45 in.

Midrail midway between platform and toprail.

Toeboards must 4" high and continuous.

Fall Protection

- ✓ When the cross point of the crossbracing is used as a toprail, it must be between 38 - 48 inches above the work platform.
- ✓ When the cross point of the crossbracing is used as a midrail, it must be between 20 - 30 inches above the work platform.

Fall Protection

OSHA requires the competent person to determine the feasibility and safety of providing fall protection for employees erecting and dismantling supported scaffolds. Fall protection for erectors and dismantlers of supported scaffolds is required when it is feasible and does not create a greater hazard.

Fall Protection

- ✓ Personal fall arrest systems on scaffolds must be attached to a vertical, or horizontal lifeline.
- ✓ Do not attach to scaffold member unless the manufacturer has designed a specific fall anchorage point, location or device for this purpose.

Fall Protection

- ✓ The competent person must start from the decision logic that there IS a way to safely provide fall protection for employees erecting/dismantling scaffolds.
- ✓ The burden of proof that fall protection is not feasible is on the competent person.

Fall Protection

Some potential means of fall protection for erectors/dismantlers might be:

- ✓ Use of horizontal or vertical lifelines anchored to structure
- ✓ Use of retractable lifeline anchored to structure

Fall Protection

- ✓ Where scaffold manufacturers require guardrails at all working heights, the ten foot rule does not apply. You must adhere to the manufacturers requirements.

Falling Object Protection

Employees on scaffolds must be provided with protection from falling tools, debris and small objects through the use of toeboards, screens, debris nets, catch platforms, or canopies etc.

Falling Object Protection

Where there is a danger of tools, materials, or equipment falling from a scaffold and striking employees below, the following measures apply:

- ✓ The area below must be barricaded, or
- ✓ Toeboards must be installed for work platforms more than 10 feet above lower levels.

Falling Object Protection

Where material is stacked higher than the toeboard:

- ✓ Screening must be installed from the toeboard to the toprail, or
- ✓ A guardrail system installed with small openings to prevent objects falling through, or

Falling Object Protection

Or:

Erect canopies, catch platform, or debris nets over employees below that are strong enough to withstand the forces of potential falling objects.

Summary

- ✓ If the scaffold frame does not have an integrated ladder system, you must provide other safe access.
- ✓ Deenergize power lines or stay at least 10' away.
- ✓ Fall protection must be provided at a height of 10'.
- ✓ It is up to the competent person to determine safe means of fall protection for erectors/dismantling.

Scaffold Training Course

Aerial & Boom Lifts

Designed by:
 PROSAFE Solutions

Aerial Lifts-Boom Platforms

Module Objectives:

- ✓ Review OSHA requirements for aerial lifts.
- ✓ Review fall protection requirements for lifts.
- ✓ Review training requirements for lifts.

Aerial Lifts-Boom Platforms

- ✓ From 1992-99, there were 26 deaths per year from lifts in construction.
 - 18 per year from boom-supported lifts
 - 8 per year from scissor and other vertical lifts
- ✓ This is 3% of all deaths in construction.

Source www.bls.gov

Aerial Lifts-Boom Platforms

- ✓ Operators must be trained on the type of equipment being used.
- ✓ OSHA does not require "certification" for aerial lift operators, however, the employer must ensure operators are properly trained for the type of equipment they will be using.

Aerial Lifts-Boom Platforms

- ✓ Must be set up level & on firm footing.

Aerial Lifts-Boom Platforms

- ✓ Equipment must not be used as crane or material hoist.
- ✓ Lifts to be used to hoist personnel, needed tools, and minimal materials only.
- ✓ No modifications can be made without written consent of manufacturer & tabulated data from P.E. or manufacturer.

Aerial Lifts-Boom Platforms

- ✓ **Equipment must be inspected before use.**
- ✓ **Weight capacity must be observed.**

Aerial Lifts-Boom Platforms

- ✓ **Proper distance from all power lines must be maintained (10' minimum).**

Aerial Lifts-Boom Platforms

- ✓ **Fall arrest equipment must be utilized in aerial lifts.**
- ✓ **Fall arrest is not required when using vertical scissor lifts properly, with guardrails installed.**
- ✓ **However, if the manufacturer has installed and anchorage point on the scissors lift, it must be used according to their guidelines.**

Aerial Lifts-Boom Platforms

- ✓ **Lift controls must be tested prior to use each day.**

Aerial Lifts-Boom Platforms

- ✓ **Employees must stand firmly on floor of basket.**
- ✓ **Not allowed to sit or climb on edge of basket.**
- ✓ **Planks, ladders or other devices not allowed to increase working height.**
- ✓ **Tying off to adjacent structures or equipment while working from lift not allowed.**

Aerial Lifts-Boom Platforms Summary

- ✓ **Operators must be trained.**
- ✓ **Proper clearance from power lines maintained.**
- ✓ **Equipment set up on firm and level surface.**
- ✓ **Equipment inspected before use.**
- ✓ **Follow manufacturer's guidelines.**
- ✓ **Use fall protection where required.**

Scaffold Training Course

Suspended Scaffolds

Designed by:
 PROSAFE Solutions

Module Objectives

- ✓ This module will review OSHA requirements when working on suspended scaffolding including:
- ✓ Fall protection
- ✓ Suspension systems
- ✓ Tiebacks
- ✓ Welding

Suspended Scaffolds

- ✓ All support devices (i.e., hooks, clamps, outrigger beams) must rest on surfaces capable of supporting 4 times the load imposed on them by the scaffold at the rated load of the hoist (or 1.5 times stall capacity of hoist, whichever is greater).
- ✓ Outrigger beams must be made of structural metal or equivalent and restrained to prevent movement.

Suspended Scaffolds

- ✓ The inboard ends of suspension scaffold outrigger beams must be stabilized by bolts or other direct connections to the floor or roof deck, or stabilized by counterweights.
- ✓ Masons' multi-point adjustable suspension scaffold outrigger beams must not be stabilized by counterweights.

Suspended Scaffolds

- ✓ Direct connections must be evaluated and approved by a competent person. For Masons' multi-point connections must be designed by engineer experienced in scaffold design.
- ✓ Counterweights must be made of non-flowable material (no sand or gravel bags).
- ✓ Counterweights designed specifically for scaffolds must be used (i.e. no masonry block or roofing felt).

Suspended Scaffolds

- ✓ Counterweights must be secured by mechanical means to the outrigger beams to prevent accidental displacement.
- ✓ Counterweights are not to be removed from the outrigger beam until the scaffold is disassembled.

Suspended Scaffolds

- ✓ Outrigger beams must be perpendicular to its bearing support.
- ✓ Tiebacks must be secured to a structurally sound anchor (not standpipes, vents or conduit).
- ✓ Tiebacks must be perpendicular to building face or at opposing angles. Single tiebacks installed at an angle are prohibited.

Suspended Scaffolds

Suspension Scaffold Outrigger Beams must be:

- ✓ Provided with stop bolts or shackles at both ends.
- ✓ Securely fastened with flanges turned out when channel iron used in lieu of I-beams.
- ✓ Bearing supports perpendicular to beam centerline.

Suspended Scaffolds

Suspension Scaffold Outrigger Beams must be:

- ✓ Set and maintained with the web in a vertical position.
- ✓ For outrigger beams, the shackle or clevis attaching the rope must be directly over the center line of the stirrup.

Suspended Scaffolds

Suspension scaffold support devices such as, cornice hooks, roof hooks, roof irons, parapet clamps must be:

- ✓ Made of steel, wrought iron or similar strength material.
- ✓ Supported by bearing blocks.
- ✓ Secured against movement, tiebacks installed at right angles or opposing angles of sufficient anchorage.
- ✓ Tiebacks equivalent strength as hoist rope.

Suspended Scaffolds

- ✓ When winding drum hoists are used, they must contain not less than 4 wraps of rope at the lowest point of scaffold travel.
- ✓ When other types of hoists are used, the suspension rope must be long enough not to allow the scaffold to be lowered to the level below without the rope end passing through the hoist, or the rope end must have other means to prevent the end from passing through the hoist.

Suspended Scaffolds

- ✓ Do not use repaired wire rope as suspension rope.
- ✓ Suspension rope must not be joined together except with thimbled eye splices connected with shackles or cover plates and bolts.
- ✓ The load end of suspension ropes must be equipped with proper size thimbles and secured by eye splicing or equivalent means.

Suspended Scaffolds

- ✓ Ropes must be inspected for defects by a competent person prior to each work shift and after each occurrence which could affect the ropes integrity.

Suspended Scaffolds

Ropes are to be replaced if:

- ✓ Any physical damage which impairs function or strength.
- ✓ Nicks present which affect drum or sheave wrapping or tracking.
- ✓ Six broken wires in one rope lay or 3 in one strand.

Suspended Scaffolds

Ropes are to be replaced if:

- ✓ Abrasion, corrosion, etc. of more than 1/3 original diameter of outside wires.
- ✓ Heat damage from torch or electrical contact.
- ✓ Evidence that secondary brake activation has occurred from an overspeed condition and has engaged the suspension rope.

Suspended Scaffolds

- ✓ Swaged or spliced eyes on wire rope must not be used unless made by the manufacturer or a qualified person.

Suspended Scaffolds

Wire Rope Clips on Suspension Scaffolds:

- ✓ Minimum 3 clips at 6 rope diameters apart.
- ✓ Installed according to manufacturer.
- ✓ Retightened after initial loading.
- ✓ Inspected and retightened at the start of each workshift.
- ✓ U-bolts Not used at suspension point of hoist.
- ✓ U-bolt over dead end, saddle over live end.

Suspended Scaffolds

- ✓ Both power and manual hoists must be tested and listed by a qualified testing laboratory.
- ✓ Gasoline powered equipment and hoists must not be used on suspension scaffolds.

Suspended Scaffolds

- ✓ Gears and brakes on powered hoists must be enclosed.
- ✓ In addition to the operating brake, hoists must be equipped with an automatic brake which engages for a change in momentum or an accelerated overspeed.

Suspended Scaffolds

- ✓ Manual hoist must require a positive crank force to descend.
- ✓ Two-point and multi-point scaffolds must be secured to prevent swaying as determined by a competent person (don't use window cleaner's anchors, they are not strong enough).
- ✓ Emergency escape and rescue devices must not be used as work platforms unless designed for both purposes.

Suspended Scaffolding Fall Protection

- ✓ The number one scaffold hazard is worker falls.
- ✓ Suspended scaffolds require both Personal Fall Arrest Systems and Guardrail Systems. This is especially critical with suspended scaffolds, because they often are operated at extreme elevations.

Suspended Scaffolding Fall Protection

Vertical lines:

- ✓ Must be fastened to a fixed safe anchorage.
- ✓ Must be protected from abrasion and sharp edges.
- ✓ Must be independent of scaffold and suspension system.

Fall Protection

- ✓ Vertical life lines must not be used when overhead protection or additional platforms are part of single or two point adjustable suspension scaffold.
- ✓ If the scaffold support failed, the employee would be struck by the falling scaffold while hanging from the vertical lifeline.

Suspended Scaffolding Fall Protection

- ✓ Vertical lifelines, independent support lines, and suspension ropes, must not be attached to each other, nor must they be attached to the same anchorage point or the same point on the scaffold or PFAS.

Suspended Scaffolding Fall Protection

Horizontal lines (For multi-tiered mason' suspension scaffolds):

- ✓ Must be secured to two or more structural scaffold members or,
- ✓ They may loop around both suspension and independent lines above the hoist and brake;
- ✓ They must not be attached to the suspension ropes only.

Suspended Scaffolding

- ✓ When lanyards are connected to horizontal lifelines or structural scaffold members:
- ✓ The scaffold must be equipped with additional, independent support lines, (equal in strength) and automatic locking devices capable of stopping the fall when one or both suspension ropes fail.

Welding & Suspended Scaffolds

- ✓ When welding is being performed from suspended scaffolds, the following precautions must be taken, to reduce the possibility of welding current arcing through the suspension wire ropes.

Welding & Suspended Scaffolds

- ✓ An insulated thimble must be used to attach each suspension wire rope to its hanging support.
- ✓ Excess suspension wire rope and any additional independent lines from grounding must also be insulated.

Welding & Suspended Scaffolds

- ✓ The suspension wire rope must be covered with insulating material at least 4 feet above the hoist.

Welding & Suspended Scaffolds

- ✓ If there is a tail line below the hoist, it must be insulated to prevent contact with the platform.
- ✓ The portion of the tail line that hangs free below the scaffold must be guided or retained, or both, so that it does not become grounded.

Welding & Suspended Scaffolds

- ✓ Each hoist must be covered with insulated protective covers.

Welding & Suspended Scaffolds

- ✓ In addition to a work lead attachment, a grounding conductor must be connected from the scaffold to the structure.
- ✓ The size of this conductor must be at least the size of the welding process work lead, and this conductor must not be in series with the welding process or the work piece.

Welding & Suspended Scaffolds

- ✓ An active welding rod or uninsulated welding lead must not be allowed to contact the scaffold or its suspension system.
- ✓ If the scaffold grounding lead is disconnected at any time, the welding machine must be shut off.

Summary

- ✓ Vertical lifelines must be independent, protected from abrasion, inspected before each shift.
- ✓ Secondary tiebacks must be properly installed in case of failure of the suspension system.
- ✓ Scaffolds must be installed by a qualified person according to manufacturer's requirements.

Scaffold Training Course

Specialty Scaffolds, Training & Review

Designed by:
 PROSAFE Solutions

Tube & Coupler Scaffolds

- ✓ When platforms are being moved to next level, the existing platform must be left in place until new bearers installed and braced.

Tube & Coupler Scaffolds

- ✓ X bracing must be installed at scaffold ends and at least every third set of posts horizontally and every fourth runner vertically.

Tube & Coupler Scaffolds

- ✓ Bracing must extend diagonally from the inner or outer posts or runners up to the next outer or inner posts or runners.
- ✓ Building ties must be installed at the bearer levels between the transverse bracing.

Tube & Coupler Scaffolds

- ✓ On straight run scaffolds, longitudinal bracing across the inner and outer rows of posts must be installed diagonally in both directions, and extend from base of end posts to top of scaffold at 45 degree angle.

Tube & Coupler Scaffolds

- ✓ On scaffolds whose length is greater than their height, bracing must be repeated at least every fifth post.

Tube & Coupler Scaffolds

- ✓ On scaffolds whose length is less than their height, bracing must be installed from base of end posts up to opposite end posts.
- ✓ Then alternate to top of scaffold.
- ✓ Bracing must be installed as close as possible to the intersection of bearer and post or runner and post.

Tube & Coupler Scaffolds

- ✓ Where it is not possible to attach bracing to posts, attach as close as possible to posts.

Tube & Coupler Scaffolds

- ✓ Bearers must be installed transversely between posts, and when coupled to posts, have the inboard coupler bear directly on the runner coupler.

Tube & Coupler Scaffolds

- ✓ Bearers must extend beyond the posts and runners and provide full contact with the coupler.

Tube & Coupler Scaffolds

- ✓ Runners must be installed along the length of the scaffold, on both inside and outside posts at level heights.
- ✓ Tube and coupler guardrails and midrails may be used in lieu of outside runners.

Tube & Coupler Scaffolds

- ✓ Runners must be interlocked on straight runs to form continuous lengths, and coupled to each post.
- ✓ Bottom runners and bearers must be as close to base as possible.

Tank Builder's Scaffolds

- ✓ Maximum distance between brackets for scaffold & guardrail support shall not be more than 10' 6".
- ✓ Not more than 3 employees on any 10' 6" span at any time.
- ✓ Guardrails to be constructed of taut wire/rope, and supported by angle irons attached to brackets welded to the steel plates.

Tank Builder's Scaffolds

- ✓ A taut wire/rope shall be installed at the scaffold plank level between the innermost edge of the scaffold platform and the curved tank shell to serve as a safety line where the space between the platform and the tank exceeds 12 inches.
- ✓ If the space on either side of the wire/rope exceeds 12 inches a second rope or guardrails must be installed to reduce the open space to less than 12 inches.

Carpenter's Bracket Scaffolds

- ✓ Brackets shall consist of triangular frame made of wood not less than 2" X 3" or angle iron 1 1/4" X 1 1/4" X 1/8".
- ✓ Bolts used to attach brackets not less than 5/8".
- ✓ Maximum bracket spacing shall be 8' on center.
- ✓ No more than 2 employees in any 8' span, tools/materials not to exceed 75 pounds.

Ladder Jack Scaffolds

- ✓ Platforms must not exceed height of 20'.
- ✓ Must be designed to bear on side rails and ladder rungs.
- ✓ Platforms must not be bridged together.
- ✓ Fall protection required at ten feet.

Pump Jack Scaffolds

- ✓ Poles must be secured to structure at bottom, top and where necessary.
- ✓ Workbench may be used as top rail only for fall protection.
- ✓ Workbenches cannot be used as scaffold platforms.
- ✓ Each bracket must have two positive gripping mechanisms.

Pump Jack Scaffolds

- ✓ Wood poles not to exceed 30 feet in height.
- ✓ Not more than two employees are allowed on a pump jack scaffold at any time between any two supports.

What Are Scaffold Collapse Hazards?

- ✓ Falls from the collapsing scaffold.
- ✓ Being struck by the collapsing scaffold or its components or materials or tools.

Preventing Scaffold Collapse

- ✓ Firm foundation
- ✓ 4:1 height or tied, guyed or braced
- ✓ Plumb with appropriate bracing
- ✓ Proper Loading

Preventing Scaffold Collapse

- ✓ Consider potential wind loads.
- ✓ Use of solid screening material to prevent concrete spatter or protect from weather, will increase potential side loading of scaffold from wind.

Scaffold User Training Requirements

- ✓ The employer must have all employees who work on scaffolds trained by a qualified person

Scaffold User Training Requirements

- ✓ Training for scaffold users must include:
 - ✓ Nature of electrical, fall, and falling object hazards
 - ✓ Correct procedures for handling electrical hazards and proper use of fall prevention and falling object prevention equipment
 - ✓ Proper scaffold use and proper material handling on scaffolds
 - ✓ The maximum intended load and load capacity of scaffold

Scaffold Erector Training Requirements

- ✓ The employer must have all employees who erect, dismantle, move, operate, repair, maintain, or inspect scaffolding trained by a competent person

Scaffold Erector Training Requirements

- ✓ Scaffold erector training must include:
 - ✓ Nature of scaffold hazards
 - ✓ Correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining scaffolds
 - ✓ Design criteria, max intended load capacity and intended use of scaffold

Scaffold Training Requirements

- ✓ When the employer has reason to believe an employee lacks skill or understanding involving scaffolding they must be retrained. Such as:
 - ✓ Changes in worksite
 - ✓ Change in type of scaffold, fall protection.....
 - ✓ Inadequacies in employees work indicates a need for retraining

Scaffold Workshop

- ✓ Identify all safety items observed in the following photo and video.

- ✓ Estimate the potential OSHA fine(s).